Seat No.	

Set P

F.Y. (B.Tech.) (Semester - I) (New) (NEP CBCS) Examination: March/April - 2025
Engineering Mathematics – I (BTCE0103) /(BTCSE0103)/ (BTETE0103)/ (BTEE0103)/ (BTME0103)/(BTECE0103)

Day & Date: Saturday 17-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the Correct Alternatives. **14**

1) If $L = \lim_{x\to\infty} x^2 e^{-x}$ then $L =$ _____.

a) 0 b) 1
c) 2 d) -2

2) If $y = cos^2 x$ then $y_n =$ _____.

a) $-2^{n-1}\cos\left(2x+\frac{n\pi}{2}\right)$ b) $2^{n-1}\cos\left(2x+\frac{n\pi}{2}\right)$
c) $2^{n-1}\sin\left(2x+\frac{n\pi}{2}\right)$ d) $2^{n+1}\sin\left(\frac{n\pi}{2}\right)$

3) If $y = (2x-5)^n$ then $y_n =$ _____.

a) 0 b) $2^n n!$
c) 2^n d) $2^n(n-1)!$

4) If $y = \log(3x-7)$ then $y_n =$ _____.

a) $\frac{(-1)^n(n)!}{(3x-7)^n}$ b) $\frac{(-1)^n(n-1)!}{(3x-7)^n}$
c) $\frac{(-1)^{n-1}(n)!}{(3x-7)^{n+1}}$ d) $\frac{(-1)^{n-1}(n-1)!\,3^n}{(3x-7)^n}$

5) The expansion of $f(x)$ in powers of $(x-a)$ is _____.

a) $f(a)+(x-a)f'(a)+\frac{(x-a)^2}{2!}f''(a)+\cdots$

b) $f(-a)+(x-a)f'(-a)+\frac{(x-a)^2}{2!}f''(-a)+\cdots$

c) $f(x)+(x-a)f'(x)+\frac{(x-a)^2}{2!}f''(x)+\cdots$

d) $f(x)-af'(x)+\frac{a^2}{2!}f''(x)-\cdots$

____

6) If $2,-2,3$ are eigen values of matrix A, then eigen values of A^{-1} are _____.

a) $2,-2,3$

b) $\frac{-1}{2},\frac{-1}{2},\frac{1}{3}$

c) $\frac{-1}{2},\frac{1}{2},\frac{-1}{3}$

d) $\frac{1}{2},\frac{-1}{2},\frac{1}{3}$

7) If $0,2,7$ are are eigen values and $1,3,K$ are diagonal elements of matrix $[A]_{3\times3}$, then the value of K equals _____.

a) 0

b) 1

c) 2

d) 6

8) $\nabla\cdot\bar{r}=?$

a) $i+j+k$

b) 0

c) 3

d) $\sqrt{3}$

9) If $\bar{a}$ is constant vector and $\bar{r}=xi+yj+zk$ then grad $(\bar{a}\cdot\bar{r})=$ _____.

a) $2\bar{a}$

b) $\bar{a}$

c) $\bar{r}$

d) $2\bar{r}$

10) Directional derivative is maximum along _____.

a) Any unit vector

b) Co-ordinate axes

c) Tangent to the surface

d) Normal to the surface

11) If $z=\tan^{-1}\left(\frac{y}{x}\right)$ then the value of $\frac{\partial z}{\partial y}$ = _____.

a) $\frac{x}{x^2+y^2}$

b) $\frac{x}{\sqrt{x^2-y^2}}$

c) $\frac{y}{x^2+y^2}$

d) $-\frac{x}{x^2+y^2}$

12) If $u=xy, v=x+y$ then the value of $J\left(\frac{u,v}{x,y}\right)=$ _____.

a) $x-y$

b) $x+y$

c) 1

d) 0

13) If $z = f(x, y)$, then the error δz in z is _____.

a) $\frac{\partial z}{\partial x}dx + \frac{\partial z}{\partial y}dy$

b) $\frac{\partial z}{\partial x}dx - \frac{\partial z}{\partial y}dy$

c) $\frac{\partial z}{\partial x}\delta x - \frac{\partial z}{\partial y}\delta y$

d) $\frac{\partial z}{\partial x}\delta x + \frac{\partial z}{\partial y}\delta y$

14) If $f(x, y) = 0$ then $\frac{dy}{dx} =$ _____.

a) $\frac{f_x}{f_y}$

b) $-\frac{f_x}{f_y}$

c) $\frac{f_y}{f_x}$

d) $-\frac{f_y}{f_x}$

Seat No.	

Set P

F.Y. (B.Tech.) (Semester - I) (New) (NEP CBCS) Examination: March/April – 2025
Engineering Mathematics – I (BTCE0103) /(BTCSE0103)/ (BTETE0103)/ (BTEE0103)/ (BTME0103)/(BTECE0103)

Day & Date: Saturday 17-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any THREE questions from the following. **09**

a) Find the rank of the matrix by reducing it to Normal form
$\begin{pmatrix} 8 & 1 & 3 & 6 \\ 0 & 3 & 2 & 2 \\ -8 & -1 & -3 & 4 \end{pmatrix}$

b) Find the nth derivative of $y = \sin x \cos 3x$

c) Investigate for what value of a and b the equations $x + 2y + 3z = 4, x + 3y + 4z = 5, x + 3y + az = b$ will have
i) no solution,
ii) infinite solutions
iii) Unique solution

d) Expand $2x^3 + 3x^2 - 8x + 7$ in powers of $(x - 2)$.

e) Expand $e^x \sin x$ in powers of x up to x^3.

Q.3 Attempt any THREE questions from the following. **09**

a) Verify Cayley Hamilton theorem for A where $A = \begin{pmatrix} 1 & 2 & 3 \\ 3 & 1 & 1 \\ 0 & 1 & 2 \end{pmatrix}$

b) Find the nth derivative of $y = \frac{x^3}{x^2-1}$

c) Prove that $\cos^{-1}\left(\frac{x-x^{-1}}{x+x^{-1}}\right) = \pi - 2\left[x - \frac{x^3}{3} + \frac{x^5}{5} - \frac{x^7}{7} + \cdots\right]$

d) Find the nth derivative of $y = e^x . x^2 . \sin x$

e) Examine the vector for Linear Dependance and Independence $[1, 1, 1], [1, 2, 3], [2, 3, 8]$

Q.4 Attempt any TWO questions from the following. **10**

a) Find the Eigen Values and Eigen Vector for the largest Eigen Value for $A = \begin{pmatrix} 3 & -1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3 \end{pmatrix}$

b) Find the values of a, b, c such that $\lim_{x\to 0} \frac{ae^x - be^{-x} + cx}{x - \sin x} = 4$

c) If $y = \sin(m \sin^{-1} x)$ then prove that $(1 - x^2)y_{n+2} - (2n + 1)xy_{n+1} + (m^2 - n^2)y_n = 0$

Section – II

Q.5 Attempt any THREE questions from the following. **09**

a) Find magnitude of velocity and acceleration of a particle which moves along the curve $x = t^3 + 2t, y = -3e^{-t}, z = 2 \sin 5t$ at $t = 0$.

b) Find the directional derivative of $\emptyset = x^2 y \cos z$ at $(1, 2, \pi/2)$ in the direction of $2i + 3j + 2k$

c) If $u = e^{xyz}$ find $\frac{\partial^3 u}{\partial x \partial y \partial z}$

d) If $z = f(x, y), x = u + v, y = uv$, prove that $\frac{\partial^2 z}{\partial x^2} - y\frac{\partial^2 z}{\partial y^2} = \frac{1}{u - v}\left(u\frac{\partial^2 z}{\partial u^2} - v\frac{\partial^2 z}{\partial v^2}\right)$

e) Find the percentage error in s where $s = kp^{\frac{1}{2}}v^2$ if the percentage errors in p and v are respectively 2 and 1.5.

Q.6 Attempt any THREE questions from the following. **09**

a) If $u = F(e^{x-y}, e^{y-z}, e^{z-x})$ prove that $u_x + u_y + u_z = 0$

b) If $x = a \cosh u \cos v, y = a \sinh u \sin v$ find $\frac{\partial(x,y)}{\partial(u,v)}$ (Note: Derivative of $\cosh x$ is $\sinh x$, derivative of $\sinh x$ is $\cosh x$ w.r.t. x)

c) Find the angle between the normal to the surfaces $x^2 y + z = 3$ and $x \log z - y^2 + 4 = 0$ at $(-1,2,1)$

d) A particle moves along the curve $\bar{r} = (t^3 - 4t)i + (t^2 + 4t)j + (8t^2 - 3t^2)k$ where t denotes time. Show that the magnitudes of acceleration along the tangent and normal at $t = 2$ are 16 and $2\sqrt{73}$ respectively.

e) Prove that $\nabla \frac{1}{r^3} = \frac{-3\vec{r}}{r^5}$

Q.7 Attempt any TWO questions from the following. **10**

a) Prove that $\bar{F} = (x^2 - yz)i + (y^2 - zx)j + (z^2 - xy)k$ is irrotational. Find the function $\emptyset$ such that $\bar{F} = \nabla\emptyset$

b) Find the stationary value of $x^3 + 3xy^2 - 15x^2 - 15y^2 + 72x$

c) If $u = \sin^{-1}\left(\frac{x+y}{\sqrt{x}+\sqrt{y}}\right)$

Prove that

i) $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = \frac{1}{2}\tan u$

ii) $x^2\frac{\partial^2 u}{\partial x^2} + 2xy\frac{\partial^2 u}{\partial x \partial y} + y^2\frac{\partial^2 u}{\partial y^2} = \frac{1}{4}(\tan^3 u - \tan u)$

Seat No.	

Set Q

F.Y. (B.Tech.) (Semester - I) (New) (NEP CBCS) Examination: March/April – 2025
Engineering Mathematics – I (BTCE0103) /(BTCSE0103)/ (BTETE0103)/ (BTEE0103)/ (BTME0103)/(BTECE0103)

Day & Date: Saturday 17-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the Correct Alternatives. 14

1) $\nabla \cdot \bar{r} = ?$

a) $i + j + k$ b) 0
c) 3 d) $\sqrt{3}$

2) If $\bar{a}$ is constant vector and $\bar{r} = xi + yj + zk$ then grad $(\bar{a} \cdot \bar{r}) =$ _____.

a) $2\bar{a}$ b) $\bar{a}$
c) $\bar{r}$ d) $2\bar{r}$

3) Directional derivative is maximum along _____.

a) Any unit vector b) Co-ordinate axes
c) Tangent to the surface d) Normal to the surface

4) If $z = \tan^{-1}\left(\frac{y}{x}\right)$ then the value of $\frac{\partial z}{\partial y}$ = _____.

a) $\frac{x}{x^2 + y^2}$ b) $\frac{x}{\sqrt{x^2 - y^2}}$
c) $\frac{y}{x^2 + y^2}$ d) $-\frac{x}{x^2 + y^2}$

5) If $u = xy, v = x + y$ then the value of $J\left(\frac{u,v}{x,y}\right) =$ _____.

a) $x - y$ b) $x + y$
c) 1 d) 0

6) If $z = f(x, y)$, then the error δz in z is _____.

a) $\frac{\partial z}{\partial x}dx + \frac{\partial z}{\partial y}dy$ b) $\frac{\partial z}{\partial x}dx - \frac{\partial z}{\partial y}dy$

c) $\frac{\partial z}{\partial x}\delta x - \frac{\partial z}{\partial y}\delta y$ d) $\frac{\partial z}{\partial x}\delta x + \frac{\partial z}{\partial y}\delta y$

7) If $f(x, y) = 0$ then $\frac{dy}{dx} =$ _____.

a) $\frac{f_x}{f_y}$ b) $-\frac{f_x}{f_y}$

c) $\frac{f_y}{f_x}$ d) $-\frac{f_y}{f_x}$

8) If $L = \lim_{x\to\infty} x^2 e^{-x}$ then $L =$ _____.

a) 0 b) 1

c) 2 d) -2

9) If $y = cos^2 x$ then $y_n =$ _____.

a) $-2^{n-1}\cos\left(2x + \frac{n\pi}{2}\right)$ b) $2^{n-1}\cos\left(2x + \frac{n\pi}{2}\right)$

c) $2^{n-1}\sin\left(2x + \frac{n\pi}{2}\right)$ d) $2^{n+1}\sin\left(\frac{n\pi}{2}\right)$

10) If $y = (2x - 5)^n$ then $y_n =$ _____.

a) 0 b) $2^n n!$

c) 2^n d) $2^n(n-1)!$

11) If $y = \log(3x - 7)$ then $y_n =$ _____.

a) $\frac{(-1)^n(n)!}{(3x-7)^n}$ b) $\frac{(-1)^n(n-1)!}{(3x-7)^n}$

c) $\frac{(-1)^{n-1}(n)!}{(3x-7)^{n+1}}$ d) $\frac{(-1)^{n-1}(n-1)!\,3^n}{(3x-7)^n}$

12) The expansion of $f(x)$ in powers of $(x - a)$ is _____.

a) $f(a) + (x-a)f'(a) + \frac{(x-a)^2}{2!}f''(a) + \cdots$

b) $f(-a) + (x-a)f'(-a) + \frac{(x-a)^2}{2!}f''(-a) + \cdots$

c) $f(x) + (x-a)f'(x) + \frac{(x-a)^2}{2!}f''(x) + \cdots$

d) $f(x) - af'(x) + \frac{a^2}{2!}f''(x) - \cdots$

___

13) If $2, -2, 3$ are eigen values of matrix A, then eigen values of A^{-1} are _____.

a) $2, -2, 3$

b) $\frac{-1}{2}, \frac{-1}{2}, \frac{1}{3}$

c) $\frac{-1}{2}, \frac{1}{2}, \frac{-1}{3}$

d) $\frac{1}{2}, \frac{-1}{2}, \frac{1}{3}$

14) If $0, 2, 7$ are are eigen values and $1, 3, K$ are diagonal elements of matrix $[A]_{3\times3}$, then the value of K equals _____.

a) 0

b) 1

c) 2

d) 6

Seat No.	

Set Q

F.Y. (B.Tech.) (Semester - I) (New) (NEP CBCS) Examination: March/April – 2025
Engineering Mathematics – I (BTCE0103) /(BTCSE0103)/ (BTETE0103)/ (BTEE0103)/ (BTME0103)/(BTECE0103)

Day & Date: Saturday 17-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any THREE questions from the following. **09**

a) Find the rank of the matrix by reducing it to Normal form
$\begin{pmatrix} 8 & 1 & 3 & 6 \\ 0 & 3 & 2 & 2 \\ -8 & -1 & -3 & 4 \end{pmatrix}$

b) Find the nth derivative of $y = \sin x \cos 3x$

c) Investigate for what value of a and b the equations $x + 2y + 3z = 4, x + 3y + 4z = 5, x + 3y + az = b$ will have
i) no solution,
ii) infinite solutions
iii) Unique solution

d) Expand $2x^3 + 3x^2 - 8x + 7$ in powers of $(x - 2)$.

e) Expand $e^x \sin x$ in powers of x up to x^3.

Q.3 Attempt any THREE questions from the following. **09**

a) Verify Cayley Hamilton theorem for A where $A = \begin{pmatrix} 1 & 2 & 3 \\ 3 & 1 & 1 \\ 0 & 1 & 2 \end{pmatrix}$

b) Find the nth derivative of $y = \frac{x^3}{x^2-1}$

c) Prove that $\cos^{-1}\left(\frac{x-x^{-1}}{x+x^{-1}}\right) = \pi - 2\left[x - \frac{x^3}{3} + \frac{x^5}{5} - \frac{x^7}{7} + \cdots\right]$

d) Find the nth derivative of $y = e^x . x^2 . \sin x$

e) Examine the vector for Linear Dependance and Independence $[1, 1, 1], [1, 2, 3], [2, 3, 8]$

Q.4 Attempt any TWO questions from the following. **10**

a) Find the Eigen Values and Eigen Vector for the largest Eigen Value for $A = \begin{pmatrix} 3 & -1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3 \end{pmatrix}$

b) Find the values of a, b, c such that $\lim_{x \to 0} \frac{ae^x - be^{-x} + cx}{x - \sin x} = 4$

c) If $y = \sin(m \sin^{-1} x)$ then prove that $(1 - x^2)y_{n+2} - (2n + 1)xy_{n+1} + (m^2 - n^2)y_n = 0$

Section – II

Q.5 Attempt any THREE questions from the following. **09**

a) Find magnitude of velocity and acceleration of a particle which moves along the curve $x = t^3 + 2t, y = -3e^{-t}, z = 2 \sin 5t$ at $t = 0$.

b) Find the directional derivative of $\emptyset = x^2 y \cos z$ at $(1, 2, \pi/2)$ in the direction of $2i + 3j + 2k$

c) If $u = e^{xyz}$ find $\frac{\partial^3 u}{\partial x \partial y \partial z}$

d) If $z = f(x, y), x = u + v, y = uv$, prove that $\frac{\partial^2 z}{\partial x^2} - y\frac{\partial^2 z}{\partial y^2} = \frac{1}{u - v}\left(u\frac{\partial^2 z}{\partial u^2} - v\frac{\partial^2 z}{\partial v^2}\right)$

e) Find the percentage error in s where $s = kp^{\frac{1}{2}}v^2$ if the percentage errors in p and v are respectively 2 and 1.5.

Q.6 Attempt any THREE questions from the following. **09**

a) If $u = F(e^{x-y}, e^{y-z}, e^{z-x})$ prove that $u_x + u_y + u_z = 0$

b) If $x = a \cosh u \cos v, y = a \sinh u \sin v$ find $\frac{\partial(x,y)}{\partial(u,v)}$ (Note: Derivative of $\cosh x$ is $\sinh x$, derivative of $\sinh x$ is $\cosh x$ w.r.t. x)

c) Find the angle between the normal to the surfaces $x^2 y + z = 3$ and $x \log z - y^2 + 4 = 0$ at $(-1,2,1)$

d) A particle moves along the curve $\bar{r} = (t^3 - 4t)i + (t^2 + 4t)j + (8t^2 - 3t^2)k$ where t denotes time. Show that the magnitudes of acceleration along the tangent and normal at $t = 2$ are 16 and $2\sqrt{73}$ respectively.

e) Prove that $\nabla \frac{1}{r^3} = \frac{-3\vec{r}}{r^5}$

Q.7 Attempt any TWO questions from the following. **10**

a) Prove that $\bar{F} = (x^2 - yz)i + (y^2 - zx)j + (z^2 - xy)k$ is irrotational. Find the function $\emptyset$ such that $\bar{F} = \nabla\emptyset$

b) Find the stationary value of $x^3 + 3xy^2 - 15x^2 - 15y^2 + 72x$

c) If $u = \sin^{-1}\left(\frac{x+y}{\sqrt{x}+\sqrt{y}}\right)$

Prove that

i) $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = \frac{1}{2}\tan u$

ii) $x^2\frac{\partial^2 u}{\partial x^2} + 2xy\frac{\partial^2 u}{\partial x \partial y} + y^2\frac{\partial^2 u}{\partial y^2} = \frac{1}{4}(\tan^3 u - \tan u)$

Seat No.	

Set R

F.Y. (B.Tech.) (Semester - I) (New) (NEP CBCS) Examination: March/April – 2025
Engineering Mathematics – I (BTCE0103) /(BTCSE0103)/ (BTETE0103)/ (BTEE0103)/ (BTME0103)/(BTECE0103)

Day & Date: Saturday 17-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the Correct Alternatives. **14**

1) If $z = \tan^{-1}\left(\frac{y}{x}\right)$ then the value of $\frac{\partial z}{\partial y}$ = _____.

a) $\frac{x}{x^2+y^2}$ b) $\frac{x}{\sqrt{x^2-y^2}}$

c) $\frac{y}{x^2+y^2}$ d) $-\frac{x}{x^2+y^2}$

2) If $u = xy, v = x + y$ then the value of $J\left(\frac{u,v}{x,y}\right) =$ _____.

a) $x - y$ b) $x + y$

c) 1 d) 0

3) If $z = f(x, y)$, then the error δz in z is _____.

a) $\frac{\partial z}{\partial x}dx + \frac{\partial z}{\partial y}dy$ b) $\frac{\partial z}{\partial x}dx - \frac{\partial z}{\partial y}dy$

c) $\frac{\partial z}{\partial x}\delta x - \frac{\partial z}{\partial y}\delta y$ d) $\frac{\partial z}{\partial x}\delta x + \frac{\partial z}{\partial y}\delta y$

4) If $f(x, y) = 0$ then $\frac{dy}{dx} =$ _____.

a) $\frac{f_x}{f_y}$ b) $-\frac{f_x}{f_y}$

c) $\frac{f_y}{f_x}$ d) $-\frac{f_y}{f_x}$

5) If $L = \lim_{x\to\infty} x^2 e^{-x}$ then $L =$ _____.

a) 0 b) 1

c) 2 d) -2

6) If $y = cos^2 x$ then $y_n =$ _____.

a) $-2^{n-1}\cos\left(2x + \frac{n\pi}{2}\right)$ b) $2^{n-1}\cos\left(2x + \frac{n\pi}{2}\right)$

c) $2^{n-1}\sin\left(2x + \frac{n\pi}{2}\right)$ d) $2^{n+1}\sin\left(\frac{n\pi}{2}\right)$

7) If $y = (2x-5)^n$ then $y_n =$ _____.

a) 0 b) $2^n n!$

c) 2^n d) $2^n(n-1)!$

8) If $y = \log(3x-7)$ then $y_n =$ _____.

a) $\frac{(-1)^n(n)!}{(3x-7)^n}$ b) $\frac{(-1)^n(n-1)!}{(3x-7)^n}$

c) $\frac{(-1)^{n-1}(n)!}{(3x-7)^{n+1}}$ d) $\frac{(-1)^{n-1}(n-1)!\,3^n}{(3x-7)^n}$

9) The expansion of $f(x)$ in powers of $(x-a)$ is _____.

a) $f(a) + (x-a)f'(a) + \frac{(x-a)^2}{2!}f''(a) + \cdots$

b) $f(-a) + (x-a)f'(-a) + \frac{(x-a)^2}{2!}f''(-a) + \cdots$

c) $f(x) + (x-a)f'(x) + \frac{(x-a)^2}{2!}f''(x) + \cdots$

d) $f(x) - af'(x) + \frac{a^2}{2!}f''(x) - \cdots$

10) If $2, -2, 3$ are eigen values of matrix A, then eigen values of A^{-1} are _____.

a) $2, -2, 3$ b) $\frac{-1}{2}, \frac{-1}{2}, \frac{1}{3}$

c) $\frac{-1}{2}, \frac{1}{2}, \frac{-1}{3}$ d) $\frac{1}{2}, \frac{-1}{2}, \frac{1}{3}$

11) If $0, 2, 7$ are are eigen values and $1, 3, K$ are diagonal elements of matrix $[A]_{3\times3}$, then the value of K equals _____.

a) 0 b) 1

c) 2 d) 6

12) $\nabla \cdot \bar{r} =?$

a) $i + j + k$ b) 0

c) 3 d) $\sqrt{3}$

13) If $\bar{a}$ is constant vector and $\bar{r} = xi + yj + zk$ then grad $(\bar{a} \cdot \bar{r}) =$ _____.

a) $2\bar{a}$ b) $\bar{a}$

c) $\bar{r}$ d) $2\bar{r}$

14) Directional derivative is maximum along _____.

a) Any unit vector b) Co-ordinate axes

c) Tangent to the surface d) Normal to the surface

Seat No.	

Set **R**

F.Y. (B.Tech.) (Semester - I) (New) (NEP CBCS) Examination: March/April – 2025
Engineering Mathematics – I (BTCE0103) /(BTCSE0103)/ (BTETE0103)/ (BTEE0103)/ (BTME0103)/(BTECE0103)

Day & Date: Saturday 17-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any THREE questions from the following. **09**

a) Find the rank of the matrix by reducing it to Normal form
$\begin{pmatrix} 8 & 1 & 3 & 6 \\ 0 & 3 & 2 & 2 \\ -8 & -1 & -3 & 4 \end{pmatrix}$

b) Find the nth derivative of $y = \sin x \cos 3x$

c) Investigate for what value of a and b the equations $x + 2y + 3z = 4, x + 3y + 4z = 5, x + 3y + az = b$ will have
i) no solution,
ii) infinite solutions
iii) Unique solution

d) Expand $2x^3 + 3x^2 - 8x + 7$ in powers of $(x - 2)$.

e) Expand $e^x \sin x$ in powers of x up to x^3.

Q.3 Attempt any THREE questions from the following. **09**

a) Verify Cayley Hamilton theorem for A where $A = \begin{pmatrix} 1 & 2 & 3 \\ 3 & 1 & 1 \\ 0 & 1 & 2 \end{pmatrix}$

b) Find the nth derivative of $y = \frac{x^3}{x^2-1}$

c) Prove that $\cos^{-1}\left(\frac{x-x^{-1}}{x+x^{-1}}\right) = \pi - 2\left[x - \frac{x^3}{3} + \frac{x^5}{5} - \frac{x^7}{7} + \cdots\right]$

d) Find the nth derivative of $y = e^x . x^2 . \sin x$

e) Examine the vector for Linear Dependance and Independence $[1, 1, 1], [1, 2, 3], [2, 3, 8]$

Q.4 Attempt any TWO questions from the following. **10**

a) Find the Eigen Values and Eigen Vector for the largest Eigen Value for $A = \begin{pmatrix} 3 & -1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3 \end{pmatrix}$

b) Find the values of a, b, c such that $\lim_{x\to 0} \frac{ae^x - be^{-x} + cx}{x - \sin x} = 4$

c) If $y = \sin(m \sin^{-1} x)$ then prove that $(1 - x^2)y_{n+2} - (2n + 1)xy_{n+1} + (m^2 - n^2)y_n = 0$

Section – II

Q.5 Attempt any THREE questions from the following. **09**

a) Find magnitude of velocity and acceleration of a particle which moves along the curve $x = t^3 + 2t, y = -3e^{-t}, z = 2 \sin 5t$ at $t = 0$.

b) Find the directional derivative of $\emptyset = x^2 y \cos z$ at $(1, 2, \pi/2)$ in the direction of $2i + 3j + 2k$

c) If $u = e^{xyz}$ find $\frac{\partial^3 u}{\partial x \partial y \partial z}$

d) If $z = f(x, y), x = u + v, y = uv$, prove that $\frac{\partial^2 z}{\partial x^2} - y\frac{\partial^2 z}{\partial y^2} = \frac{1}{u - v}\left(u\frac{\partial^2 z}{\partial u^2} - v\frac{\partial^2 z}{\partial v^2}\right)$

e) Find the percentage error in s where $s = kp^{\frac{1}{2}}v^2$ if the percentage errors in p and v are respectively 2 and 1.5.

Q.6 Attempt any THREE questions from the following. **09**

a) If $u = F(e^{x-y}, e^{y-z}, e^{z-x})$ prove that $u_x + u_y + u_z = 0$

b) If $x = a \cosh u \cos v, y = a \sinh u \sin v$ find $\frac{\partial(x,y)}{\partial(u,v)}$ (Note: Derivative of $\cosh x$ is $\sinh x$, derivative of $\sinh x$ is $\cosh x$ w.r.t. x)

c) Find the angle between the normal to the surfaces $x^2 y + z = 3$ and $x \log z - y^2 + 4 = 0$ at $(-1,2,1)$

d) A particle moves along the curve $\bar{r} = (t^3 - 4t)i + (t^2 + 4t)j + (8t^2 - 3t^2)k$ where t denotes time. Show that the magnitudes of acceleration along the tangent and normal at $t = 2$ are 16 and $2\sqrt{73}$ respectively.

e) Prove that $\nabla \frac{1}{r^3} = \frac{-3\vec{r}}{r^5}$

Q.7 Attempt any TWO questions from the following. **10**

a) Prove that $\bar{F} = (x^2 - yz)i + (y^2 - zx)j + (z^2 - xy)k$ is irrotational. Find the function $\emptyset$ such that $\bar{F} = \nabla\emptyset$

b) Find the stationary value of $x^3 + 3xy^2 - 15x^2 - 15y^2 + 72x$

c) If $u = \sin^{-1}\left(\frac{x+y}{\sqrt{x}+\sqrt{y}}\right)$

Prove that

i) $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = \frac{1}{2}\tan u$

ii) $x^2\frac{\partial^2 u}{\partial x^2} + 2xy\frac{\partial^2 u}{\partial x \partial y} + y^2\frac{\partial^2 u}{\partial y^2} = \frac{1}{4}(\tan^3 u - \tan u)$

Seat No.	

Set S

F.Y. (B.Tech.) (Semester - I) (New) (NEP CBCS) Examination: March/April – 2025
Engineering Mathematics – I (BTCE0103) /(BTCSE0103)/ (BTETE0103)/ (BTEE0103)/ (BTME0103)/(BTECE0103)

Day & Date: Saturday 17-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the Correct Alternatives. **14**

1) If $2, -2, 3$ are eigen values of matrix A, then eigen values of A^{-1} are _____.

a) $2, -2, 3$ b) $\frac{-1}{2}, \frac{-1}{2}, \frac{1}{3}$

c) $\frac{-1}{2}, \frac{1}{2}, \frac{-1}{3}$ d) $\frac{1}{2}, \frac{-1}{2}, \frac{1}{3}$

2) If $0, 2, 7$ are are eigen values and $1, 3, K$ are diagonal elements of matrix $[A]_{3\times3}$, then the value of K equals _____.

a) 0 b) 1
c) 2 d) 6

3) $\nabla \cdot \bar{r} = ?$

a) $i + j + k$ b) 0
c) 3 d) $\sqrt{3}$

4) If $\bar{a}$ is constant vector and $\bar{r} = xi + yj + zk$ then grad $(\bar{a} \cdot \bar{r}) =$ _____.

a) $2\bar{a}$ b) $\bar{a}$
c) $\bar{r}$ d) $2\bar{r}$

5) Directional derivative is maximum along _____.

a) Any unit vector b) Co-ordinate axes
c) Tangent to the surface d) Normal to the surface

6) If $z = \tan^{-1}\left(\frac{y}{x}\right)$ then the value of $\frac{\partial z}{\partial y}$ = _____.

a) $\frac{x}{x^2+y^2}$ b) $\frac{x}{\sqrt{x^2-y^2}}$

c) $\frac{y}{x^2+y^2}$ d) $-\frac{x}{x^2+y^2}$

7) If $u = xy, v = x + y$ then the value of $J\left(\frac{u,v}{x,y}\right) =$ _____.

a) $x - y$ b) $x + y$

c) 1 d) 0

8) If $z = f(x, y)$, then the error δz in z is _____.

a) $\frac{\partial z}{\partial x}dx + \frac{\partial z}{\partial y}dy$ b) $\frac{\partial z}{\partial x}dx - \frac{\partial z}{\partial y}dy$

c) $\frac{\partial z}{\partial x}\delta x - \frac{\partial z}{\partial y}\delta y$ d) $\frac{\partial z}{\partial x}\delta x + \frac{\partial z}{\partial y}\delta y$

9) If $f(x, y) = 0$ then $\frac{dy}{dx} =$ _____.

a) $\frac{f_x}{f_y}$ b) $-\frac{f_x}{f_y}$

c) $\frac{f_y}{f_x}$ d) $-\frac{f_y}{f_x}$

10) If $L = \lim_{x\to\infty} x^2 e^{-x}$ then $L =$ _____.

a) 0 b) 1

c) 2 d) -2

11) If $y = cos^2 x$ then $y_n =$ _____.

a) $-2^{n-1}\cos\left(2x + \frac{n\pi}{2}\right)$ b) $2^{n-1}\cos\left(2x + \frac{n\pi}{2}\right)$

c) $2^{n-1}\sin\left(2x + \frac{n\pi}{2}\right)$ d) $2^{n+1}\sin\left(\frac{n\pi}{2}\right)$

12) If $y = (2x - 5)^n$ then $y_n =$ _____.

a) 0 b) $2^n n!$

c) 2^n d) $2^n(n-1)!$

13) If $y = \log(3x - 7)$ then $y_n =$ _____.

a) $\frac{(-1)^n(n)!}{(3x-7)^n}$ b) $\frac{(-1)^n(n-1)!}{(3x-7)^n}$

c) $\frac{(-1)^{n-1}(n)!}{(3x-7)^{n+1}}$ d) $\frac{(-1)^{n-1}(n-1)!\,3^n}{(3x-7)^n}$

14) The expansion of $f(x)$ in powers of $(x-a)$ is _____.

a) $f(a)+(x-a)f'(a)+\frac{(x-a)^2}{2!}f''(a)+\cdots$

b) $f(-a)+(x-a)f'(-a)+\frac{(x-a)^2}{2!}f''(-a)+\cdots$

c) $f(x)+(x-a)f'(x)+\frac{(x-a)^2}{2!}f''(x)+\cdots$

d) $f(x)-af'(x)+\frac{a^2}{2!}f''(x)-\cdots$ ____

Seat No.	

Set **S**

F.Y. (B.Tech.) (Semester - I) (New) (NEP CBCS) Examination: March/April – 2025
Engineering Mathematics – I (BTCE0103) /(BTCSE0103)/ (BTETE0103)/ (BTEE0103)/ (BTME0103)/(BTECE0103)

Day & Date: Saturday 17-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any THREE questions from the following. **09**

a) Find the rank of the matrix by reducing it to Normal form
$\begin{pmatrix} 8 & 1 & 3 & 6 \\ 0 & 3 & 2 & 2 \\ -8 & -1 & -3 & 4 \end{pmatrix}$

b) Find the nth derivative of $y = \sin x \cos 3x$

c) Investigate for what value of a and b the equations $x + 2y + 3z = 4, x + 3y + 4z = 5, x + 3y + az = b$ will have
i) no solution,
ii) infinite solutions
iii) Unique solution

d) Expand $2x^3 + 3x^2 - 8x + 7$ in powers of $(x - 2)$.

e) Expand $e^x \sin x$ in powers of x up to x^3.

Q.3 Attempt any THREE questions from the following. **09**

a) Verify Cayley Hamilton theorem for A where $A = \begin{pmatrix} 1 & 2 & 3 \\ 3 & 1 & 1 \\ 0 & 1 & 2 \end{pmatrix}$

b) Find the nth derivative of $y = \frac{x^3}{x^2-1}$

c) Prove that $\cos^{-1}\left(\frac{x-x^{-1}}{x+x^{-1}}\right) = \pi - 2\left[x - \frac{x^3}{3} + \frac{x^5}{5} - \frac{x^7}{7} + \cdots\right]$

d) Find the nth derivative of $y = e^x . x^2 . \sin x$

e) Examine the vector for Linear Dependance and Independence $[1, 1, 1], [1, 2, 3], [2, 3, 8]$

Set S

Q.4 Attempt any TWO questions from the following. **10**

a) Find the Eigen Values and Eigen Vector for the largest Eigen Value for $A = \begin{pmatrix} 3 & -1 & 1 \\ -1 & 5 & -1 \\ 1 & -1 & 3 \end{pmatrix}$

b) Find the values of a, b, c such that $\lim_{x \to 0} \frac{ae^x - be^{-x} + cx}{x - \sin x} = 4$

c) If $y = \sin(m \sin^{-1} x)$ then prove that $(1 - x^2)y_{n+2} - (2n + 1)xy_{n+1} + (m^2 - n^2)y_n = 0$

Section – II

Q.5 Attempt any THREE questions from the following. **09**

a) Find magnitude of velocity and acceleration of a particle which moves along the curve $x = t^3 + 2t, y = -3e^{-t}, z = 2 \sin 5t$ at $t = 0$.

b) Find the directional derivative of $\emptyset = x^2 y \cos z$ at $(1, 2, \pi/2)$ in the direction of $2i + 3j + 2k$

c) If $u = e^{xyz}$ find $\frac{\partial^3 u}{\partial x \partial y \partial z}$

d) If $z = f(x, y), x = u + v, y = uv$, prove that $\frac{\partial^2 z}{\partial x^2} - y\frac{\partial^2 z}{\partial y^2} = \frac{1}{u - v}\left(u\frac{\partial^2 z}{\partial u^2} - v\frac{\partial^2 z}{\partial v^2}\right)$

e) Find the percentage error in s where $s = kp^{\frac{1}{2}}v^2$ if the percentage errors in p and v are respectively 2 and 1.5.

Q.6 Attempt any THREE questions from the following. **09**

a) If $u = F(e^{x-y}, e^{y-z}, e^{z-x})$ prove that $u_x + u_y + u_z = 0$

b) If $x = a \cosh u \cos v, y = a \sinh u \sin v$ find $\frac{\partial(x,y)}{\partial(u,v)}$ (Note: Derivative of $\cosh x$ is $\sinh x$, derivative of $\sinh x$ is $\cosh x$ w.r.t. x)

c) Find the angle between the normal to the surfaces $x^2 y + z = 3$ and $x \log z - y^2 + 4 = 0$ at $(-1,2,1)$

d) A particle moves along the curve $\bar{r} = (t^3 - 4t)i + (t^2 + 4t)j + (8t^2 - 3t^2)k$ where t denotes time. Show that the magnitudes of acceleration along the tangent and normal at $t = 2$ are 16 and $2\sqrt{73}$ respectively.

e) Prove that $\nabla \frac{1}{r^3} = \frac{-3\vec{r}}{r^5}$

Set S

Q.7 Attempt any TWO questions from the following. **10**

a) Prove that $\bar{F} = (x^2 - yz)i + (y^2 - zx)j + (z^2 - xy)k$ is irrotational. Find the function $\emptyset$ such that $\bar{F} = \nabla\emptyset$

b) Find the stationary value of $x^3 + 3xy^2 - 15x^2 - 15y^2 + 72x$

c) If $u = \sin^{-1}\left(\frac{x+y}{\sqrt{x}+\sqrt{y}}\right)$

Prove that

i) $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = \frac{1}{2}\tan u$

ii) $x^2\frac{\partial^2 u}{\partial x^2} + 2xy\frac{\partial^2 u}{\partial x \partial y} + y^2\frac{\partial^2 u}{\partial y^2} = \frac{1}{4}(\tan^3 u - \tan u)$

SLR-BD-2

Seat No.	

Set P

F. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
Engineering Mechanics (BTCE0106)/ (BTCSE0106) / (BTETE0106)/ (BTEE0106)/ (BTME0106)/(BTECE0106)

Day & Date: Monday 19-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figure to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Select the correct option. **14**

1) If a body is in equilibrium, we may a conclude that _____.
a) No force is acting on the body
b) The resultant of all forced acting on it is zero
c) Algebraic sum of moments of force about any point is zero
d) Both (b) and (c)

2) The type of beam support to that can resist a Moment is called as ____.
a) Roller support b) Hinged Support
c) Pin support d) Fixed support

3) Coefficient of friction depend upon _____.
a) Area of contact only b) Nature of contact surface only
c) Both (a) and(b) d) None

4) A framed structure of triangular shape is _____.
a) Perfect b) Imperfect
c) Difficult d) Redundant

5) To solve a truss by the method of Joint, the number of unknown forces at a joint should not be _____.
a) Less than two b) More than two
c) More than three d) Cannot said

6) A motion of moving car is given by an equation $s = t^3 + 3t^2 + 5$ where S is the distance traveled in m & t is the time in sec. the velocity of car after 2 second will be _____.
a) 4m/sec b) 8m/sec
c) 20m/sec d) 24m/sec

7) The horizontal range of a projectile is maximum when an angle of projection is _____.

a) 30° b) 45°
c) 60° d) 75°

8) Centroidal Rotation of body about _____.

a) Axis Parallel to its centroidal axis
b) Axis perpendicular to its plane of rotation & passing through its center
c) Both (a) & (b)
d) None of these

9) Inertia force during retardation acts in _____.

a) Same direction of motion
b) Opposite direction of motion
c) Perpendicular direction motion
d) Both (a) & (b)

10) D Alembert Principle basically depends upon _____.

a) Newton's Ist Law b) Newton's IInd Law
c) Newton's IIIrd d) None of these

11) Impulse is product of _____.

a) Force x distance b) Force x acceleration
c) Force x time d) Force x mass

12) SI unit of Work is _____.

a) $N.m$ b) $\frac{N.m}{sec}$

c) $\frac{N.m}{sec2}$ d) None of these

13) If axis symmetry exists then it passes through the _____.

a) Centroid b) Base
c) Top of web d) Side flange

14) M-I of triangular about centroidal horizontal axis of breadth 'b' & height 'h' _____.

a) $\frac{bh^3}{36}$ b) $\frac{bh^3}{12}$
c) $\frac{bh^3}{4}$ d) none

Seat No.	

Set **P**

F. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
Engineering Mechanics (BTCE0106)/ (BTCSE0106) / (BTETE0106)/ (BTEE0106)/ (BTME0106)/(BTECE0106)

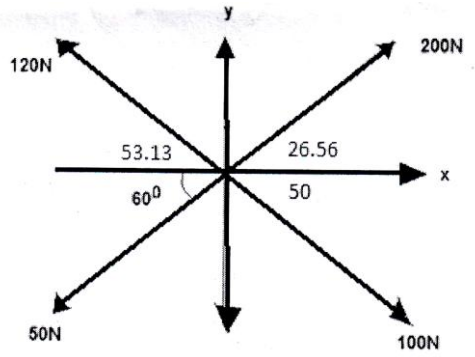
Day & Date: Monday 19-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to right indicate full marks.

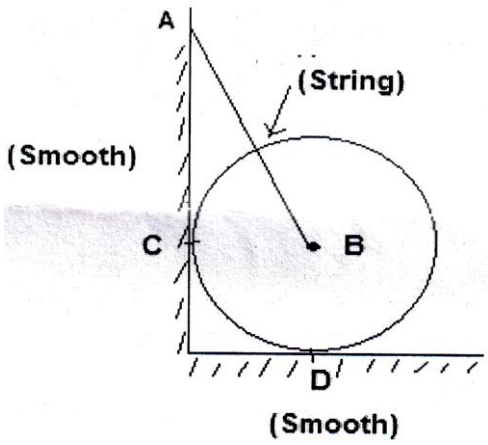
Section – I

Q.2 Attempt any Four of the following questions. **12**

a) State & Explain Lamis Theorem.
b) Explain couple & characteristics of couple.
c) State assumption made in analysis of pin jointed truss.
d) Determine the Resultant of the following force system.



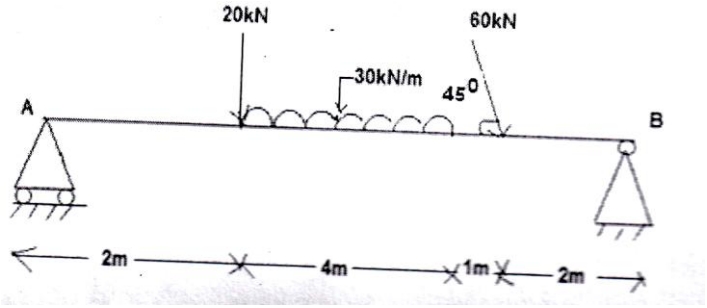
e) Draw Free body diagram of sphere resting against smooth vertical wall & smooth floor. Having weight W supported by string AB.



f) Derive any two equations of Linear motion, with uniform accelerations.

Q.3 Attempt any Two of the following questions. **16**

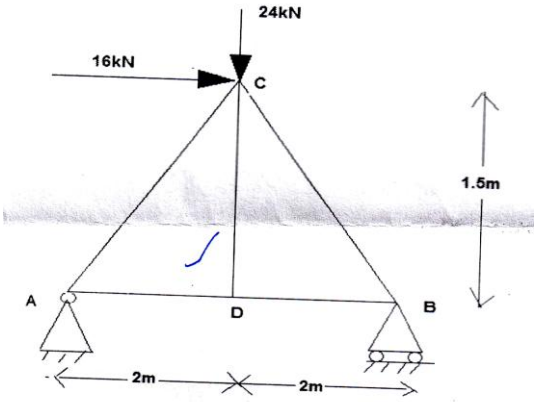
a) Find the Reactions developed at support A & B of the beam as shown in fig.



b) A projectile is fired at velocity of 800m/sec at angle 40° measured from the horizontal on level Ground. Determine.

i) The total time of flight
ii) Horizontal Range
iii) The greatest height reached
iv) Its Position after 35 Second

c) Determine the forces in member of truss as shown in fig.



Section – II

Q.4 Attempt any Four of the following questions. **12**

a) Explain D Alembert Principle.

b) Define

i) Torque
ii) Mass moment of Inertia
iii) Angular momentum

c) Define

i) Work
ii) Power
iii) Energy

d) Explain & prove Work-Energy equation.

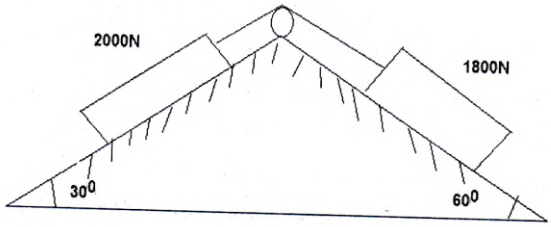
e) State parallel axis Theorem.

f) State centroid & radius of gyration.

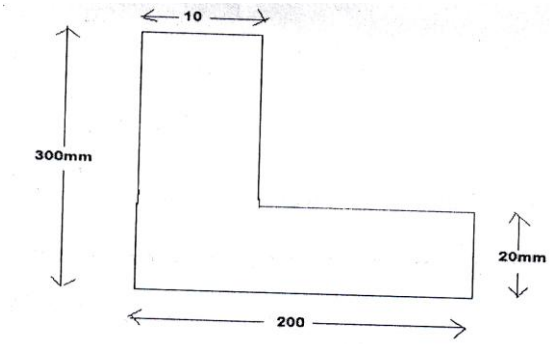
Q.5 Attempt any Two of the following questions. **16**

a) A mine cage weight 12KN & can carry a maximum load of 20KN. The average frictional resistance of the side guides is 500N. What constant cable tension is required to give loaded cage an upward velocity of 3m/sec, start from rest in the distance of 3m?

b) Determine the time required for the weights as shown in fig. to attain a velocity of 9.81 m/sec. from rest. Take μ=0.2 for both planes. Assume friction less pulley. Also Find tension in chord?



c) Determine M-I about centroidal Horizontal axis & also determine radius of gyration about same axis. For following L section.



SLR-BD-2

Seat No.	

Set Q

F. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
Engineering Mechanics (BTCE0106)/ (BTCSE0106) / (BTETE0106)/ (BTEE0106)/ (BTME0106)/(BTECE0106)

Day & Date: Monday 19-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figure to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Select the correct option. **14**

1) Centroidal Rotation of body about _____.
a) Axis Parallel to its centroidal axis
b) Axis perpendicular to its plane of rotation & passing through its center
c) Both (a) & (b)
d) None of these

2) Inertia force during retardation acts in _____.
a) Same direction of motion
b) Opposite direction of motion
c) Perpendicular direction motion
d) Both (a) & (b)

3) D Alembert Principle basically depends upon _____.
a) Newton's Ist Law b) Newton's IInd Law
c) Newton's IIIrd d) None of these

4) Impulse is product of _____.
a) Force x distance b) Force x acceleration
c) Force x time d) Force x mass

5) SI unit of Work is _____.
a) $N.m$ b) $\frac{N.m}{sec}$
c) $\frac{N.m}{sec2}$ d) None of these

6) If axis symmetry exists then it passes through the _____.
a) Centroid b) Base
c) Top of web d) Side flange

7) M-I of triangular about centroidal horizontal axis of breadth 'b' & height 'h' _____.

a) $\frac{bh^3}{36}$ b) $\frac{bh^3}{12}$

c) $\frac{bh^3}{4}$ d) none

8) If a body is in equilibrium, we may a conclude that _____.

a) No force is acting on the body
b) The resultant of all forced acting on it is zero
c) Algebraic sum of moments of force about any point is zero
d) Both (b) and (c)

9) The type of beam support to that can resist a Moment is called as ____.

a) Roller support b) Hinged Support
c) Pin support d) Fixed support

10) Coefficient of friction depend upon _____.

a) Area of contact only b) Nature of contact surface only
c) Both (a) and(b) d) None

11) A framed structure of triangular shape is _____.

a) Perfect b) Imperfect
c) Difficult d) Redundant

12) To solve a truss by the method of Joint, the number of unknown forces at a joint should not be _____.

a) Less than two b) More than two
c) More than three d) Cannot said

13) A motion of moving car is given by an equation $s = t^3 + 3t^2 + 5$ where S is the distance traveled in m & t is the time in sec. the velocity of car after 2 second will be _____.

a) 4m/sec b) 8m/sec
c) 20m/sec d) 24m/sec

14) The horizontal range of a projectile is maximum when an angle of projection is _____.

a) 30° b) 45°
c) 60° d) 75°

SLR-BD-2

Seat No.	

Set Q

F. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
Engineering Mechanics (BTCE0106)/ (BTCSE0106) / (BTETE0106)/ (BTEE0106)/ (BTME0106)/(BTECE0106)

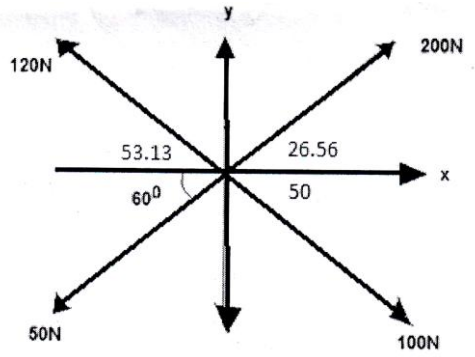
Day & Date: Monday 19-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to right indicate full marks.

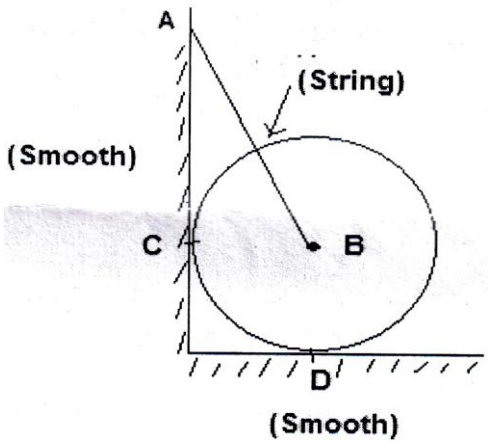
Section – I

Q.2 Attempt any Four of the following questions. **12**

a) State & Explain Lamis Theorem.
b) Explain couple & characteristics of couple.
c) State assumption made in analysis of pin jointed truss.
d) Determine the Resultant of the following force system.



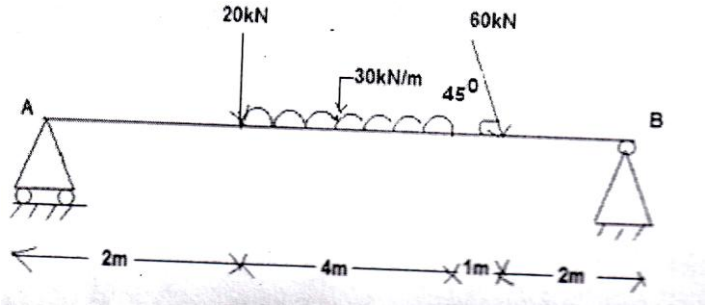
e) Draw Free body diagram of sphere resting against smooth vertical wall & smooth floor. Having weight W supported by string AB.



f) Derive any two equations of Linear motion, with uniform accelerations.

Q.3 Attempt any Two of the following questions. **16**

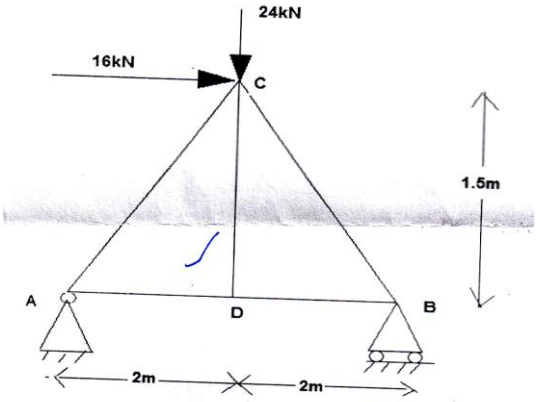
a) Find the Reactions developed at support A & B of the beam as shown in fig.



b) A projectile is fired at velocity of 800m/sec at angle 40° measured from the horizontal on level Ground. Determine.

i) The total time of flight
ii) Horizontal Range
iii) The greatest height reached
iv) Its Position after 35 Second

c) Determine the forces in member of truss as shown in fig.



Section – II

Q.4 Attempt any Four of the following questions. **12**

a) Explain D Alembert Principle.

b) Define

i) Torque
ii) Mass moment of Inertia
iii) Angular momentum

c) Define

i) Work
ii) Power
iii) Energy

d) Explain & prove Work-Energy equation.

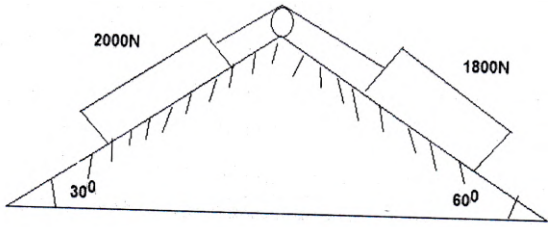
e) State parallel axis Theorem.

f) State centroid & radius of gyration.

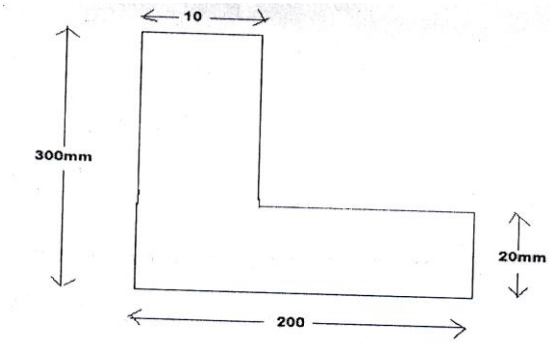
Q.5 Attempt any Two of the following questions. **16**

a) A mine cage weight 12KN & can carry a maximum load of 20KN. The average frictional resistance of the side guides is 500N. What constant cable tension is required to give loaded cage an upward velocity of 3m/sec, start from rest in the distance of 3m?

b) Determine the time required for the weights as shown in fig. to attain a velocity of 9.81 m/sec. from rest. Take μ=0.2 for both planes. Assume friction less pulley. Also Find tension in chord?



c) Determine M-I about centroidal Horizontal axis & also determine radius of gyration about same axis. For following L section.



SLR-BD-2

Seat No.	

Set R

F. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
Engineering Mechanics (BTCE0106)/ (BTCSE0106) / (BTETE0106)/ (BTEE0106)/ (BTME0106)/(BTECE0106)

Day & Date: Monday 19-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figure to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Select the correct option. **14**

1) Impulse is product of _____.
a) Force x distance b) Force x acceleration
c) Force x time d) Force x mass

2) SI unit of Work is _____.
a) $N.m$ b) $\frac{N.m}{sec}$
c) $\frac{N.m}{sec2}$ d) None of these

3) If axis symmetry exists then it passes through the _____.
a) Centroid b) Base
c) Top of web d) Side flange

4) M-I of triangular about centroidal horizontal axis of breadth 'b' & height 'h' _____.
a) $\frac{bh^3}{36}$ b) $\frac{bh^3}{12}$
c) $\frac{bh^3}{4}$ d) none

5) If a body is in equilibrium, we may a conclude that _____.
a) No force is acting on the body
b) The resultant of all forced acting on it is zero
c) Algebraic sum of moments of force about any point is zero
d) Both (b) and (c)

6) The type of beam support to that can resist a Moment is called as ____.
a) Roller support b) Hinged Support
c) Pin support d) Fixed support

7) Coefficient of friction depend upon _____.
a) Area of contact only b) Nature of contact surface only
c) Both (a) and(b) d) None

8) A framed structure of triangular shape is _____.
a) Perfect b) Imperfect
c) Difficult d) Redundant

9) To solve a truss by the method of Joint, the number of unknown forces at a joint should not be _____.
a) Less than two b) More than two
c) More than three d) Cannot said

10) A motion of moving car is given by an equation $s = t^3 + 3t^2 + 5$ where S is the distance traveled in m & t is the time in sec. the velocity of car after 2 second will be _____.
a) 4m/sec b) 8m/sec
c) 20m/sec d) 24m/sec

11) The horizontal range of a projectile is maximum when an angle of projection is _____.
a) 30° b) 45°
c) 60° d) 75°

12) Centroidal Rotation of body about _____.
a) Axis Parallel to its centroidal axis
b) Axis perpendicular to its plane of rotation & passing through its center
c) Both (a) & (b)
d) None of these

13) Inertia force during retardation acts in _____.
a) Same direction of motion
b) Opposite direction of motion
c) Perpendicular direction motion
d) Both (a) & (b)

14) D Alembert Principle basically depends upon _____.
a) Newton's Ist Law b) Newton's IInd Law
c) Newton's IIIrd d) None of these

Seat No.	

Set **R**

F. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
Engineering Mechanics (BTCE0106)/ (BTCSE0106) / (BTETE0106)/ (BTEE0106)/ (BTME0106)/(BTECE0106)

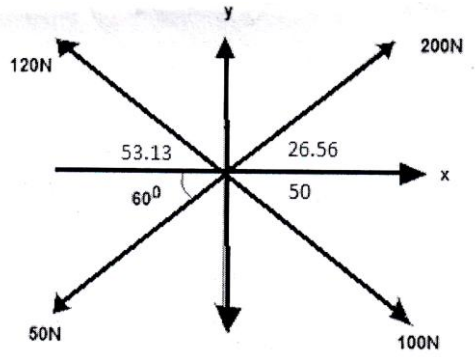
Day & Date: Monday 19-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to right indicate full marks.

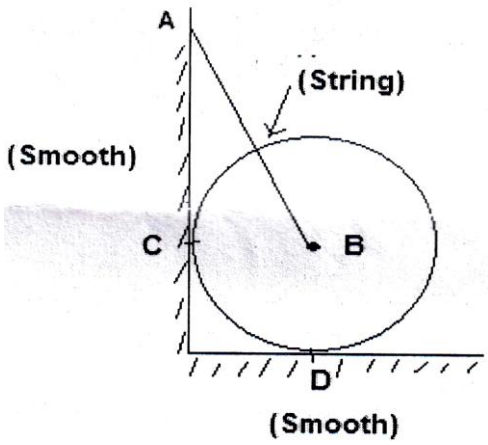
Section – I

Q.2 Attempt any Four of the following questions. **12**

a) State & Explain Lamis Theorem.
b) Explain couple & characteristics of couple.
c) State assumption made in analysis of pin jointed truss.
d) Determine the Resultant of the following force system.



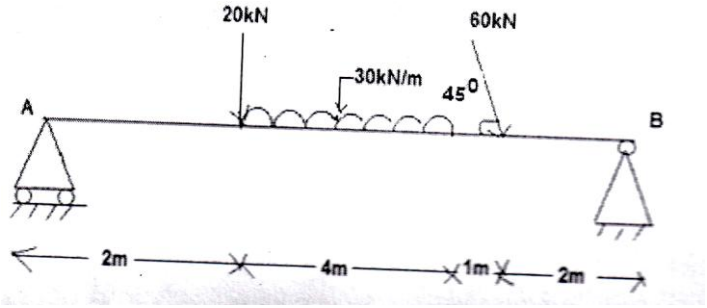
e) Draw Free body diagram of sphere resting against smooth vertical wall & smooth floor. Having weight W supported by string AB.



f) Derive any two equations of Linear motion, with uniform accelerations.

Q.3 Attempt any Two of the following questions. **16**

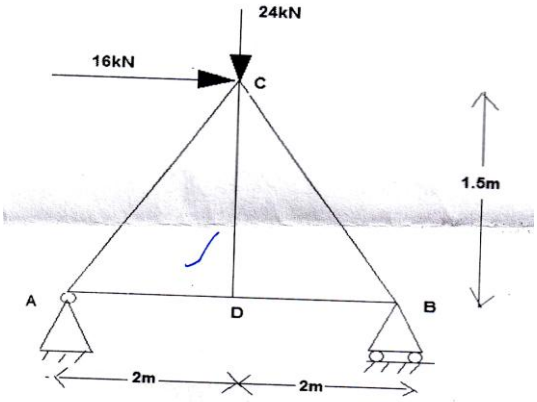
a) Find the Reactions developed at support A & B of the beam as shown in fig.



b) A projectile is fired at velocity of 800m/sec at angle 40° measured from the horizontal on level Ground. Determine.

i) The total time of flight
ii) Horizontal Range
iii) The greatest height reached
iv) Its Position after 35 Second

c) Determine the forces in member of truss as shown in fig.



Section – II

Q.4 Attempt any Four of the following questions. **12**

a) Explain D Alembert Principle.

b) Define

i) Torque
ii) Mass moment of Inertia
iii) Angular momentum

c) Define

i) Work
ii) Power
iii) Energy

d) Explain & prove Work-Energy equation.

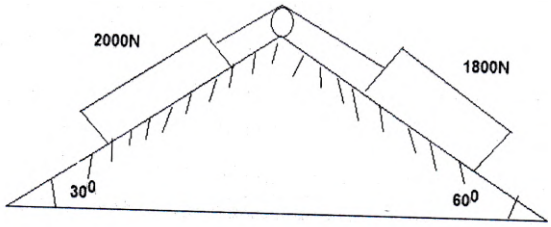
e) State parallel axis Theorem.

f) State centroid & radius of gyration.

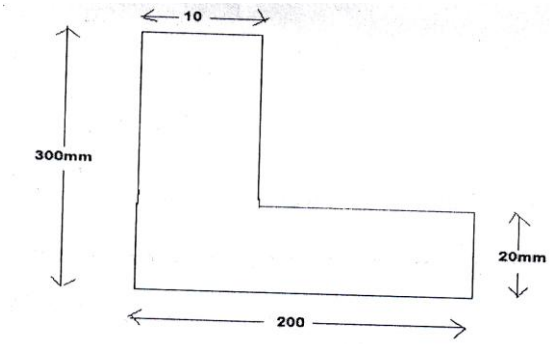
Q.5 Attempt any Two of the following questions. **16**

a) A mine cage weight 12KN & can carry a maximum load of 20KN. The average frictional resistance of the side guides is 500N. What constant cable tension is required to give loaded cage an upward velocity of 3m/sec, start from rest in the distance of 3m?

b) Determine the time required for the weights as shown in fig. to attain a velocity of 9.81 m/sec. from rest. Take μ=0.2 for both planes. Assume friction less pulley. Also Find tension in chord?



c) Determine M-I about centroidal Horizontal axis & also determine radius of gyration about same axis. For following L section.



SLR-BD-2

Seat No.	

Set S

F. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
Engineering Mechanics (BTCE0106)/ (BTCSE0106) / (BTETE0106)/ (BTEE0106)/ (BTME0106)/(BTECE0106)

Day & Date: Monday 19-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figure to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Select the correct option. **14**

1) A motion of moving car is given by an equation $s = t^3 + 3t^2 + 5$ where S is the distance traveled in m & t is the time in sec. the velocity of car after 2 second will be _____.
a) 4m/sec b) 8m/sec
c) 20m/sec d) 24m/sec

2) The horizontal range of a projectile is maximum when an angle of projection is _____.
a) 30° b) 45°
c) 60° d) 75°

3) Centroidal Rotation of body about _____.
a) Axis Parallel to its centroidal axis
b) Axis perpendicular to its plane of rotation & passing through its center
c) Both (a) & (b)
d) None of these

4) Inertia force during retardation acts in _____.
a) Same direction of motion
b) Opposite direction of motion
c) Perpendicular direction motion
d) Both (a) & (b)

5) D Alembert Principle basically depends upon _____.
a) Newton's Ist Law b) Newton's IInd Law
c) Newton's IIIrd d) None of these

6) Impulse is product of _____.
a) Force x distance
b) Force x acceleration
c) Force x time
d) Force x mass

7) SI unit of Work is _____.
a) $N.m$
b) $\frac{N.m}{sec}$
c) $\frac{N.m}{sec2}$
d) None of these

8) If axis symmetry exists then it passes through the _____.
a) Centroid
b) Base
c) Top of web
d) Side flange

9) M-I of triangular about centroidal horizontal axis of breadth 'b' & height 'h' _____.
a) $\frac{bh^3}{36}$
b) $\frac{bh^3}{12}$
c) $\frac{bh^3}{4}$
d) none

10) If a body is in equilibrium, we may a conclude that _____.
a) No force is acting on the body
b) The resultant of all forced acting on it is zero
c) Algebraic sum of moments of force about any point is zero
d) Both (b) and (c)

11) The type of beam support to that can resist a Moment is called as ____.
a) Roller support
b) Hinged Support
c) Pin support
d) Fixed support

12) Coefficient of friction depend upon _____.
a) Area of contact only
b) Nature of contact surface only
c) Both (a) and(b)
d) None

13) A framed structure of triangular shape is _____.
a) Perfect
b) Imperfect
c) Difficult
d) Redundant

14) To solve a truss by the method of Joint, the number of unknown forces at a joint should not be _____.
a) Less than two
b) More than two
c) More than three
d) Cannot said

Seat No.	

Set **S**

F. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
Engineering Mechanics (BTCE0106)/ (BTCSE0106) / (BTETE0106)/ (BTEE0106)/ (BTME0106)/(BTECE0106)

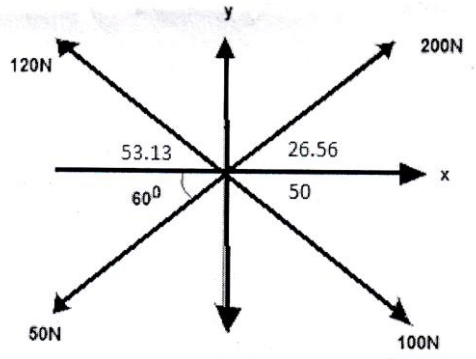
Day & Date: Monday 19-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to right indicate full marks.

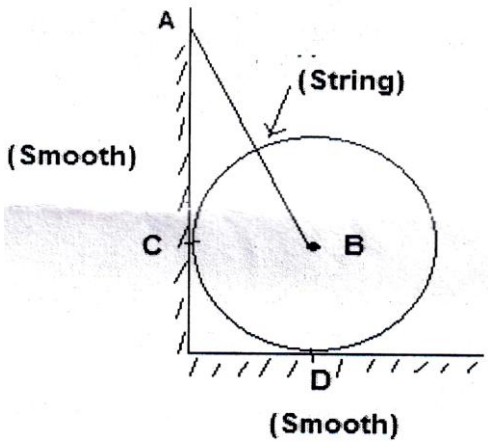
Section – I

Q.2 Attempt any Four of the following questions. **12**

a) State & Explain Lamis Theorem.
b) Explain couple & characteristics of couple.
c) State assumption made in analysis of pin jointed truss.
d) Determine the Resultant of the following force system.



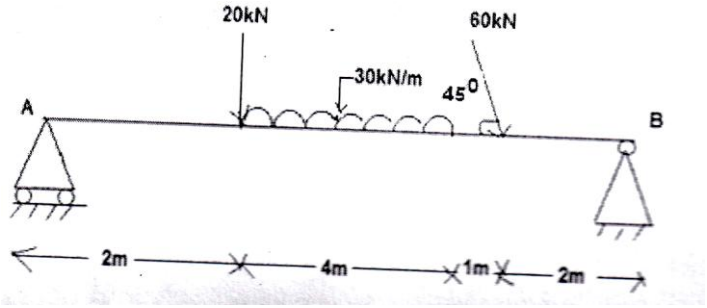
e) Draw Free body diagram of sphere resting against smooth vertical wall & smooth floor. Having weight W supported by string AB.



f) Derive any two equations of Linear motion, with uniform accelerations.

Q.3 Attempt any Two of the following questions. **16**

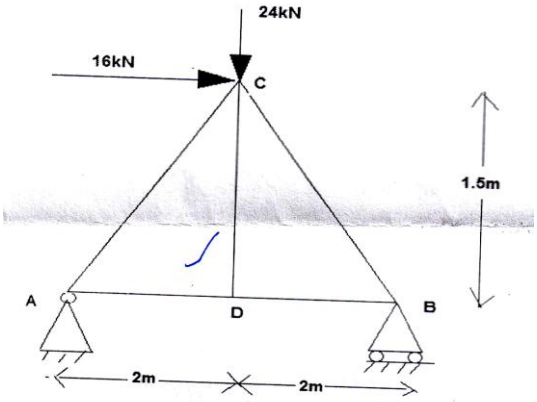
a) Find the Reactions developed at support A & B of the beam as shown in fig.



b) A projectile is fired at velocity of 800m/sec at angle 40° measured from the horizontal on level Ground. Determine.

i) The total time of flight
ii) Horizontal Range
iii) The greatest height reached
iv) Its Position after 35 Second

c) Determine the forces in member of truss as shown in fig.



Section – II

Q.4 Attempt any Four of the following questions. **12**

a) Explain D Alembert Principle.

b) Define

i) Torque
ii) Mass moment of Inertia
iii) Angular momentum

c) Define

i) Work
ii) Power
iii) Energy

d) Explain & prove Work-Energy equation.

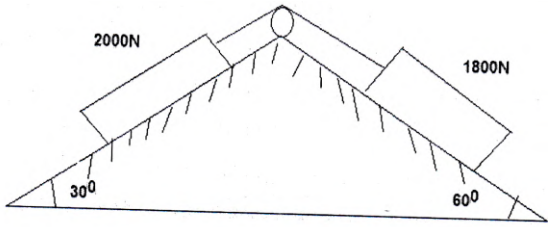
e) State parallel axis Theorem.

f) State centroid & radius of gyration.

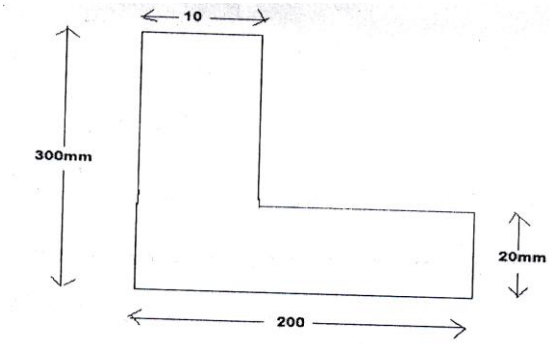
Q.5 Attempt any Two of the following questions. **16**

a) A mine cage weight 12KN & can carry a maximum load of 20KN. The average frictional resistance of the side guides is 500N. What constant cable tension is required to give loaded cage an upward velocity of 3m/sec, start from rest in the distance of 3m?

b) Determine the time required for the weights as shown in fig. to attain a velocity of 9.81 m/sec. from rest. Take μ=0.2 for both planes. Assume friction less pulley. Also Find tension in chord?



c) Determine M-I about centroidal Horizontal axis & also determine radius of gyration about same axis. For following L section.



SLR-BD-3

Seat No.	

Set P

F.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025

Engineering Physics

(BTCE0101) / (BTCSE0101) / (BTETE0101) / (BTEE0101) / (BTME0101) / (BTECE0101)

Day & Date: Tuesday 27-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary.

Constants: 1) Avogadro's no., N = 6.02 x 10^{26} / k.mol
2) Velocity of light, c = 3 x 10^{8} m/sec.
3) Charge of electron, e = 1.6 x 10^{-19} C.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) The band gap energy of silicon (Si) is approximately _____.
a) 0.3 eV b) 1.1 eV
c) 0.7 eV d) 2.5 eV

2) The mobility (μ) is given by _____.
a) $\mu = \rho . RH$ b) $\mu = \rho / RH$
c) $\mu = \sigma . RH$ s) $\mu = \sigma / RH$

3) The atomic radius of FCC lattice is _____.
a) $\frac{\sqrt{2}.a}{4}$ b) $\frac{\sqrt{3}.a}{4}$
c) $-\sqrt{2}.a$ d) $-\sqrt{3}.a$

4) The co-ordination number in case of SC structure is _____.
a) 10 b) 12
c) 8 d) 6

5) The no. of atoms in a unit cell of BCC structure is _____.
a) 1 b) 3
c) 2 d) 4

6) Optimum reverberation time for speech is _____.
a) 0.5 to 1 sec b) 0 to 1 sec
c) 1 to 2 sec d) 2 to 3 sec

7) The sound waves with frequency less than 20 Hz are called _____.
a) audible waves b) infrasonic waves
c) ultrasonic waves d) above all

8) Bending of the light at corners of slit and penetration of waves into the regions of geometrical shadow is known as _____.
a) Polarization b) Diffraction
c) Dispersion d) Interference

9) Along optic axis, the speed of o-ray and e-ray is _____.
a) Ve = Vo b) Ve > Vo
c) Ve < Vo d) none of these

10) For population inversion _____.
a) $N_1 \gg N_2$ b) $N_1 = N_2$
c) $N_2 \gg N_1$ d) $N_2 = N_1$

11) The wavelength of emission from He-Ne laser is _____.
a) 545.5 nm b) 632.8 nm
c) 794.3 nm d) 337.5 nm

12) Holography means _____.
a) To get zero dimension image
b) To get 2D image of 3D object
c) To get 3D image of 3D object
d) To get 3D image of 2D object

13) The critical angle Φ_c for fiber optics is _____.
a) $\sin\left(\frac{n_1}{n_2}\right)$ b) $\sin^{-1}\left(\frac{n_1}{n_2}\right)$
c) $\sin\left(\frac{n_2}{n_1}\right)$ d) $\sin^{-1}\left(\frac{n_2}{n_1}\right)$

14) Dimensions of nanomaterials ranging from _____.
a) 2 to 5 nm b) 1 to 100 nm
c) 100 to 200 nm d) 0.1 to 10 nm

SLR-BD-3

Seat No.	

Set P

F.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025

Engineering Physics

(BTCE0101) / (BTCSE0101) / (BTETE0101) / (BTEE0101) / (BTME0101) / (BTECE0101)

Day & Date: Tuesday 27-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary.

Section – I

Q.2 Attempt any SIX of the following: **18**

a) Classify: insulator, semiconductor and conductor on the basis of energy band structure.

b) Represent with diagrams the position of Fermi level in
i) P-type, and
ii) N-type semiconductors.

c) Define atomic packing factor and obtain its values for SC and BCC.

d) Define Coordination number and obtain the values for SC, BCC and FCC structure.

e) Write applications of ultrasonic waves.

f) What are the basic acoustic requirements of a good auditorium?

g) A semiconducting crystal 12 mm long, 5 mm wide and 1 mm thick has a magnetic flux density of 0.5 wb/m^2 applied from front to back perpendicular to largest faces. When a current of 20 mA flows lengthwise through the specimen, the voltage measured across its width is found to be 37 μV. What is the Hall coefficient of this semiconductor?

h) Lead is FCC with an atomic radius of r = 1.746 A^0. Find the spacing of:
i) (200) planes
ii) (220) planes

Q.3 Attempt any TWO of the following: **10**

a) State Hall effect? Derive the relation for Hall voltage (V_H) and Hall coefficient (R_H).

b) Explain the term Miller indices. Derive the relation between lattice constant and interplanar spacing for cubic crystal.

$$d = \frac{a}{\sqrt{h^2 + k^2 + l^2}}$$

c) State and explain the factors affecting the architectural acoustics and their remedies.

d) i) Calculate the interplanar spacing (201) planes in a cubic crystal of lattice constant 4.3 x 10^{-8} cm.

ii) The average reverberation time of a hall is 1.5 sec and the area of the interior surface is 3340 m^2. If the volume of the hall is 12000 m^3, find the absorption coefficient.

Section – II

Q.4 Attempt any SIX of the following: **18**

a) Explain: Rayleigh's criterion of resolution.

b) State and explain: Mauls law.

c) Explain:

i) Stimulated Emission and ii) Spontaneous Emission

d) State properties of LASER.

e) Explain: Structure of optical fibers with neat labeled diagrams.

f) Explain: Types of carbon nano tubes (CNTs).

g) Elow many orders will be visible if the wavelength of the incident radiation is 6500 AU and the number of lines/cm on the grating is 5000.

h) Calculate the numerical aperture and acceptance angle for an optical fibre with core and cladding refractive indices being 1.48 and 1.40 respectively.

Q.5 Attempt any TWO questions. **10**

a) Obtain the expression for acceptance angle, acceptance cone, numerical aperture and fractional refractive index change of an optical fiber.

b) What is diffraction grating? Derive an expression for the resolving power of a diffraction grating $(\lambda/d\lambda = n.N)$.

c) i) Calculate specific rotation, if the plane of polarization is rotated through 25°. Length of tube is 20 cm. Given: concentration of sugar solution 20%.

ii) Determine NA of a step index fibre when core refractive index n_1 = 1.5 and cladding refractive index n_2 = 1.48. Find maximum angle for entrance of light if fibre is placed in air.

d) Explain: He-Ne gas laser with neat energy and transition diagram.

SLR-BD-3

Seat No.	

Set Q

F.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025

Engineering Physics

(BTCE0101) / (BTCSE0101) / (BTETE0101) / (BTEE0101) / (BTME0101) / (BTECE0101)

Day & Date: Tuesday 27-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary.

Constants: 1) Avogadro's no., N = 6.02 x 10^{26} / k.mol
2) Velocity of light, c = 3 x 10^{8} m/sec.
3) Charge of electron, e = 1.6 x 10^{-19} C.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Bending of the light at corners of slit and penetration of waves into the regions of geometrical shadow is known as _____.
a) Polarization b) Diffraction
c) Dispersion d) Interference

2) Along optic axis, the speed of o-ray and e-ray is _____.
a) Ve = Vo b) Ve > Vo
c) Ve < Vo d) none of these

3) For population inversion _____.
a) $N_1 \gg N_2$ b) $N_1 = N_2$
c) $N_2 \gg N_1$ d) $N_2 = N_1$

4) The wavelength of emission from He-Ne laser is _____.
a) 545.5 nm b) 632.8 nm
c) 794.3 nm d) 337.5 nm

5) Holography means _____.
a) To get zero dimension image
b) To get 2D image of 3D object
c) To get 3D image of 3D object
d) To get 3D image of 2D object

6) The critical angle Φ_c for fiber optics is _____.

a) $\sin\left(\frac{n_1}{n_2}\right)$ b) $\sin^{-1}\left(\frac{n_1}{n_2}\right)$

c) $\sin\left(\frac{n_2}{n_1}\right)$ d) $\sin^{-1}\left(\frac{n_2}{n_1}\right)$

7) Dimensions of nanomaterials ranging from _____.

a) 2 to 5 nm b) 1 to 100 nm

c) 100 to 200 nm d) 0.1 to 10 nm

8) The band gap energy of silicon (Si) is approximately _____.

a) 0.3 eV b) 1.1 eV

c) 0.7 eV d) 2.5 eV

9) The mobility (μ) is given by _____.

a) $\mu = \rho.\mathrm{RH}$ b) $\mu = \rho/\mathrm{RH}$

c) $\mu = \sigma.\mathrm{RH}$ s) $\mu = \sigma/\mathrm{RH}$

10) The atomic radius of FCC lattice is _____.

a) $\frac{\sqrt{2}.a}{4}$ b) $\frac{\sqrt{3}.a}{4}$

c) $-\sqrt{2}.a$ d) $-\sqrt{3}.a$

11) The co-ordination number in case of SC structure is _____.

a) 10 b) 12

c) 8 d) 6

12) The no. of atoms in a unit cell of BCC structure is _____.

a) 1 b) 3

c) 2 d) 4

13) Optimum reverberation time for speech is _____.

a) 0.5 to 1 sec b) 0 to 1 sec

c) 1 to 2 sec d) 2 to 3 sec

14) The sound waves with frequency less than 20 Hz are called _____.

a) audible waves b) infrasonic waves

c) ultrasonic waves d) above all

SLR-BD-3

Seat No.	

Set Q

F.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025

Engineering Physics

(BTCE0101) / (BTCSE0101) / (BTETE0101) / (BTEE0101) / (BTME0101) / (BTECE0101)

Day & Date: Tuesday 27-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary.

Section – I

Q.2 Attempt any SIX of the following: **18**

a) Classify: insulator, semiconductor and conductor on the basis of energy band structure.

b) Represent with diagrams the position of Fermi level in
i) P-type, and
ii) N-type semiconductors.

c) Define atomic packing factor and obtain its values for SC and BCC.

d) Define Coordination number and obtain the values for SC, BCC and FCC structure.

e) Write applications of ultrasonic waves.

f) What are the basic acoustic requirements of a good auditorium?

g) A semiconducting crystal 12 mm long, 5 mm wide and 1 mm thick has a magnetic flux density of 0.5 wb/m^2 applied from front to back perpendicular to largest faces. When a current of 20 mA flows lengthwise through the specimen, the voltage measured across its width is found to be 37 μV. What is the Hall coefficient of this semiconductor?

h) Lead is FCC with an atomic radius of r = 1.746 A^0. Find the spacing of:
i) (200) planes
ii) (220) planes

Q.3 Attempt any TWO of the following: **10**

a) State Hall effect? Derive the relation for Hall voltage (V_H) and Hall coefficient (R_H).

b) Explain the term Miller indices. Derive the relation between lattice constant and interplanar spacing for cubic crystal.

$$d = \frac{a}{\sqrt{h^2 + k^2 + l^2}}$$

c) State and explain the factors affecting the architectural acoustics and their remedies.

d) i) Calculate the interplanar spacing (201) planes in a cubic crystal of lattice constant 4.3×10^{-8} cm.

ii) The average reverberation time of a hall is 1.5 sec and the area of the interior surface is 3340 m^2. If the volume of the hall is 12000 m^3, find the absorption coefficient.

Section – II

Q.4 Attempt any SIX of the following: **18**

a) Explain: Rayleigh's criterion of resolution.

b) State and explain: Mauls law.

c) Explain:

i) Stimulated Emission and ii) Spontaneous Emission

d) State properties of LASER.

e) Explain: Structure of optical fibers with neat labeled diagrams.

f) Explain: Types of carbon nano tubes (CNTs).

g) Elow many orders will be visible if the wavelength of the incident radiation is 6500 AU and the number of lines/cm on the grating is 5000.

h) Calculate the numerical aperture and acceptance angle for an optical fibre with core and cladding refractive indices being 1.48 and 1.40 respectively.

Q.5 Attempt any TWO questions. **10**

a) Obtain the expression for acceptance angle, acceptance cone, numerical aperture and fractional refractive index change of an optical fiber.

b) What is diffraction grating? Derive an expression for the resolving power of a diffraction grating $(\lambda/d\lambda = n.N)$.

c) i) Calculate specific rotation, if the plane of polarization is rotated through 25°. Length of tube is 20 cm. Given: concentration of sugar solution 20%.

ii) Determine NA of a step index fibre when core refractive index $n_1 = 1.5$ and cladding refractive index $n_2 = 1.48$. Find maximum angle for entrance of light if fibre is placed in air.

d) Explain: He-Ne gas laser with neat energy and transition diagram.

Seat No.	

Set R

F.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025

Engineering Physics

(BTCE0101) / (BTCSE0101) / (BTETE0101) / (BTEE0101) / (BTME0101) / (BTECE0101)

Day & Date: Tuesday 27-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary.

Constants: 1) Avogadro's no., N = 6.02 x 10^{26} / k.mol
2) Velocity of light, c = 3 x 10^{8} m/sec.
3) Charge of electron, e = 1.6 x 10^{-19} C.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) The wavelength of emission from He-Ne laser is _____.
a) 545.5 nm b) 632.8 nm
c) 794.3 nm d) 337.5 nm

2) Holography means _____.
a) To get zero dimension image
b) To get 2D image of 3D object
c) To get 3D image of 3D object
d) To get 3D image of 2D object

3) The critical angle Φ_c for fiber optics is _____.
a) $\sin\left(\frac{n_1}{n_2}\right)$ b) $\sin^{-1}\left(\frac{n_1}{n_2}\right)$
c) $\sin\left(\frac{n_2}{n_1}\right)$ d) $\sin^{-1}\left(\frac{n_2}{n_1}\right)$

4) Dimensions of nanomaterials ranging from _____.
a) 2 to 5 nm b) 1 to 100 nm
c) 100 to 200 nm d) 0.1 to 10 nm

5) The band gap energy of silicon (Si) is approximately _____.
a) 0.3 eV b) 1.1 eV
c) 0.7 eV d) 2.5 eV

6) The mobility (μ) is given by _____.

a) $\mu = \rho.\mathrm{RH}$ b) $\mu = \rho/\mathrm{RH}$

c) $\mu = \sigma.\mathrm{RH}$ s) $\mu = \sigma/\mathrm{RH}$

7) The atomic radius of FCC lattice is _____.

a) $\frac{\sqrt{2}.a}{4}$ b) $\frac{\sqrt{3}.a}{4}$

c) $-\sqrt{2}.a$ d) $-\sqrt{3}.a$

8) The co-ordination number in case of SC structure is _____.

a) 10 b) 12

c) 8 d) 6

9) The no. of atoms in a unit cell of BCC structure is _____.

a) 1 b) 3

c) 2 d) 4

10) Optimum reverberation time for speech is _____.

a) 0.5 to 1 sec b) 0 to 1 sec

c) 1 to 2 sec d) 2 to 3 sec

11) The sound waves with frequency less than 20 Hz are called _____.

a) audible waves b) infrasonic waves

c) ultrasonic waves d) above all

12) Bending of the light at corners of slit and penetration of waves into the regions of geometrical shadow is known as _____.

a) Polarization b) Diffraction

c) Dispersion d) Interference

13) Along optic axis, the speed of o-ray and e-ray is _____.

a) Ve = Vo b) Ve > Vo

c) Ve < Vo d) none of these

14) For population inversion _____.

a) $\mathrm{N}_1 \gg \mathrm{N}_2$ b) $\mathrm{N}_1 = \mathrm{N}_2$

c) $\mathrm{N}_2 \gg \mathrm{N}_1$ d) $\mathrm{N}_2 = \mathrm{N}_1$

SLR-BD-3

Seat No.	

Set R

F.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025

Engineering Physics

(BTCE0101) / (BTCSE0101) / (BTETE0101) / (BTEE0101) / (BTME0101) / (BTECE0101)

Day & Date: Tuesday 27-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary.

Section – I

Q.2 Attempt any SIX of the following: **18**

a) Classify: insulator, semiconductor and conductor on the basis of energy band structure.

b) Represent with diagrams the position of Fermi level in
i) P-type, and
ii) N-type semiconductors.

c) Define atomic packing factor and obtain its values for SC and BCC.

d) Define Coordination number and obtain the values for SC, BCC and FCC structure.

e) Write applications of ultrasonic waves.

f) What are the basic acoustic requirements of a good auditorium?

g) A semiconducting crystal 12 mm long, 5 mm wide and 1 mm thick has a magnetic flux density of 0.5 wb/m^2 applied from front to back perpendicular to largest faces. When a current of 20 mA flows lengthwise through the specimen, the voltage measured across its width is found to be 37 μV. What is the Hall coefficient of this semiconductor?

h) Lead is FCC with an atomic radius of r = 1.746 A^0. Find the spacing of:
i) (200) planes
ii) (220) planes

Q.3 Attempt any TWO of the following: **10**

a) State Hall effect? Derive the relation for Hall voltage (V_H) and Hall coefficient (R_H).

b) Explain the term Miller indices. Derive the relation between lattice constant and interplanar spacing for cubic crystal.

$$d = \frac{a}{\sqrt{h^2 + k^2 + l^2}}$$

c) State and explain the factors affecting the architectural acoustics and their remedies.

d) i) Calculate the interplanar spacing (201) planes in a cubic crystal of lattice constant 4.3 x 10^{-8} cm.

ii) The average reverberation time of a hall is 1.5 sec and the area of the interior surface is 3340 m^2. If the volume of the hall is 12000 m^3, find the absorption coefficient.

Section – II

Q.4 Attempt any SIX of the following: **18**

a) Explain: Rayleigh's criterion of resolution.

b) State and explain: Mauls law.

c) Explain:

i) Stimulated Emission and ii) Spontaneous Emission

d) State properties of LASER.

e) Explain: Structure of optical fibers with neat labeled diagrams.

f) Explain: Types of carbon nano tubes (CNTs).

g) Elow many orders will be visible if the wavelength of the incident radiation is 6500 AU and the number of lines/cm on the grating is 5000.

h) Calculate the numerical aperture and acceptance angle for an optical fibre with core and cladding refractive indices being 1.48 and 1.40 respectively.

Q.5 Attempt any TWO questions. **10**

a) Obtain the expression for acceptance angle, acceptance cone, numerical aperture and fractional refractive index change of an optical fiber.

b) What is diffraction grating? Derive an expression for the resolving power of a diffraction grating $(\lambda/d\lambda = n.N)$.

c) i) Calculate specific rotation, if the plane of polarization is rotated through 25°. Length of tube is 20 cm. Given: concentration of sugar solution 20%.

ii) Determine NA of a step index fibre when core refractive index n_1 = 1.5 and cladding refractive index n_2 = 1.48. Find maximum angle for entrance of light if fibre is placed in air.

d) Explain: He-Ne gas laser with neat energy and transition diagram.

SLR-BD-3

Seat No.	

Set S

F.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025

Engineering Physics

(BTCE0101) / (BTCSE0101) / (BTETE0101) / (BTEE0101) / (BTME0101) / (BTECE0101)

Day & Date: Tuesday 27-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary.

Constants: 1) Avogadro's no., N = 6.02 x 10^{26} / k.mol
2) Velocity of light, c = 3 x 10^{8} m/sec.
3) Charge of electron, e = 1.6 x 10^{-19} C.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Optimum reverberation time for speech is _____.
a) 0.5 to 1 sec b) 0 to 1 sec
c) 1 to 2 sec d) 2 to 3 sec

2) The sound waves with frequency less than 20 Hz are called _____.
a) audible waves b) infrasonic waves
c) ultrasonic waves d) above all

3) Bending of the light at corners of slit and penetration of waves into the regions of geometrical shadow is known as _____.
a) Polarization b) Diffraction
c) Dispersion d) Interference

4) Along optic axis, the speed of o-ray and e-ray is _____.
a) Ve = Vo b) Ve > Vo
c) Ve < Vo d) none of these

5) For population inversion _____.
a) $N_1 \gg N_2$ b) $N_1 = N_2$
c) $N_2 \gg N_1$ d) $N_2 = N_1$

6) The wavelength of emission from He-Ne laser is _____.
a) 545.5 nm b) 632.8 nm
c) 794.3 nm d) 337.5 nm

7) Holography means _____.
a) To get zero dimension image
b) To get 2D image of 3D object
c) To get 3D image of 3D object
d) To get 3D image of 2D object

8) The critical angle Φ_c for fiber optics is _____.
a) $\sin\left(\frac{n_1}{n_2}\right)$ b) $\sin^{-1}\left(\frac{n_1}{n_2}\right)$
c) $\sin\left(\frac{n_2}{n_1}\right)$ d) $\sin^{-1}\left(\frac{n_2}{n_1}\right)$

9) Dimensions of nanomaterials ranging from _____.
a) 2 to 5 nm b) 1 to 100 nm
c) 100 to 200 nm d) 0.1 to 10 nm

10) The band gap energy of silicon (Si) is approximately _____.
a) 0.3 eV b) 1.1 eV
c) 0.7 eV d) 2.5 eV

11) The mobility (μ) is given by _____.
a) $\mu = \rho.\mathrm{RH}$ b) $\mu = \rho/\mathrm{RH}$
c) $\mu = \sigma.\mathrm{RH}$ s) $\mu = \sigma/\mathrm{RH}$

12) The atomic radius of FCC lattice is _____.
a) $\frac{\sqrt{2}.a}{4}$ b) $\frac{\sqrt{3}.a}{4}$
c) $-\sqrt{2}.a$ d) $-\sqrt{3}.a$

13) The co-ordination number in case of SC structure is _____.
a) 10 b) 12
c) 8 d) 6

14) The no. of atoms in a unit cell of BCC structure is _____.
a) 1 b) 3
c) 2 d) 4

SLR-BD-3

Seat No.		Set	S

F.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025

Engineering Physics

(BTCE0101) / (BTCSE0101) / (BTETE0101) / (BTEE0101) / (BTME0101) / (BTECE0101)

Day & Date: Tuesday 27-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary.

Section – I

Q.2 Attempt any SIX of the following: **18**

a) Classify: insulator, semiconductor and conductor on the basis of energy band structure.

b) Represent with diagrams the position of Fermi level in
i) P-type, and
ii) N-type semiconductors.

c) Define atomic packing factor and obtain its values for SC and BCC.

d) Define Coordination number and obtain the values for SC, BCC and FCC structure.

e) Write applications of ultrasonic waves.

f) What are the basic acoustic requirements of a good auditorium?

g) A semiconducting crystal 12 mm long, 5 mm wide and 1 mm thick has a magnetic flux density of 0.5 wb/m^2 applied from front to back perpendicular to largest faces. When a current of 20 mA flows lengthwise through the specimen, the voltage measured across its width is found to be 37 μV. What is the Hall coefficient of this semiconductor?

h) Lead is FCC with an atomic radius of r = 1.746 A^0. Find the spacing of:
i) (200) planes
ii) (220) planes

Q.3 Attempt any TWO of the following: **10**

a) State Hall effect? Derive the relation for Hall voltage (V_H) and Hall coefficient (R_H).

b) Explain the term Miller indices. Derive the relation between lattice constant and interplanar spacing for cubic crystal.

$$d = \frac{a}{\sqrt{h^2 + k^2 + l^2}}$$

c) State and explain the factors affecting the architectural acoustics and their remedies.

d) i) Calculate the interplanar spacing (201) planes in a cubic crystal of lattice constant 4.3 x 10^{-8} cm.

ii) The average reverberation time of a hall is 1.5 sec and the area of the interior surface is 3340 m^2. If the volume of the hall is 12000 m^3, find the absorption coefficient.

Section – II

Q.4 Attempt any SIX of the following: **18**

a) Explain: Rayleigh's criterion of resolution.

b) State and explain: Mauls law.

c) Explain:

i) Stimulated Emission and ii) Spontaneous Emission

d) State properties of LASER.

e) Explain: Structure of optical fibers with neat labeled diagrams.

f) Explain: Types of carbon nano tubes (CNTs).

g) Elow many orders will be visible if the wavelength of the incident radiation is 6500 AU and the number of lines/cm on the grating is 5000.

h) Calculate the numerical aperture and acceptance angle for an optical fibre with core and cladding refractive indices being 1.48 and 1.40 respectively.

Q.5 Attempt any TWO questions. **10**

a) Obtain the expression for acceptance angle, acceptance cone, numerical aperture and fractional refractive index change of an optical fiber.

b) What is diffraction grating? Derive an expression for the resolving power of a diffraction grating $(\lambda/d\lambda = n.N)$.

c) i) Calculate specific rotation, if the plane of polarization is rotated through 25°. Length of tube is 20 cm. Given: concentration of sugar solution 20%.

ii) Determine NA of a step index fibre when core refractive index n_1 = 1.5 and cladding refractive index n_2 = 1.48. Find maximum angle for entrance of light if fibre is placed in air.

d) Explain: He-Ne gas laser with neat energy and transition diagram.

SLR-BD-4

Seat No.	

Set P

F.Y (B. Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025

Engineering Chemistry

(BTCE0102) / (BTCSE0102) / (BTETE0102) / (BTEE0102) / (BTME0102) / (BTECE0102)

Day & Date: Thursday 29-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat and labeled diagrams wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Water is hard when it contains _____.
a) acid solution b) precipitate in suspension
c) dissolved sodium salts d) dissolved Ca and Mg salts

2) Most popular and ideal disinfectant in water works is _____.
a) Soda b) Ozone
c) Chlorine d) Lime

3) Water matching distilled water is obtained by using _____.
a) Zeolite process b) Ion exchange process
c) lime soda process d) Boiling

4) Lubricant used in a machine working at low temperature should Possess _____.
a) high pour point b) low flash point
c) high cloud point d) low pour point

5) Oiliness is least in case of _____.
a) greases b) mineral oils
c) animal oils d) palm oils

6) During galvanic corrosion, the more noble metals acts as _____.
a) anode b) cathode
c) anode as well as cathode d) corroding metal

7) Metal at the top of electrochemical series is _____.
a) most stable b) least active
c) most noble d) most active

8) A good fuel should have _____.
a) high moisture content
b) Low calorific value
c) moderate ignition temperature
d) High ash content

9) Charcoal is a secondary fuel derived from _____.
a) Wood b) Lignite
c) Petroleum d) Coke

10) A thermoplastic is formed by the phenomenon of _____.
a) Chlorination
b) condensation polymerization
c) nitration
d) chain polymerization

11) Structural units of high polymers, are called _____.
a) fibres b) thermo units
c) monomers d) fabrics

12) Which of the following is an elastomer?
a) PVC b) Bakelite
c) Natural rubber d) Nylon

13) Which of the following technique is used to detect the steroid consumed by athletes in international sports competition?
a) IR spectroscopy b) Gas chromatography
c) UV spectroscopy d) pH measurement

14) The commonly used carrier gas in GLC is _____.
a) F_2 b) Br_2
c) Cl_2 d) N_2

Seat No.	

Set | P

F.Y (B. Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025

Engineering Chemistry

(BTCE0102) / (BTCSE0102) / (BTETE0102) / (BTEE0102) / (BTME0102) / (BTECE0102)

Day & Date: Thursday 29-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.
4) Draw neat and labeled diagrams wherever necessary.

Section – I

Q.2 Attempt any Four. **16**

a) A sample of water on analysis was found to contain the following impurities in mg/lit:

	Amount	Mo. Wt.
$Ca(HCO_3)_2$	20.15	162
$Mg(HCO_3)_2$	38.73	146
$MgSO_4$	44.10	120
$CaCl_2$	53.90	111
$CaSO_4$	67.00	136

Calculate the temporary, permanent and total hardness of water in mg/lit.

b) Define desalination. Explain desalination of water by reverse osmosis process.

c) Define following terms
i) Oiliness
ii) Acid value
iii) Flash point
iv) Aniline point

d) Select proper lubricants for
i) Gears
ii) Refrigeration systems

e) Explain Hydrogen evolution mechanism and oxygen absorption mechanism in electrochemical corrosion.

f) Describe cathodic protection in corrosion control.

Q.3 Attempt any Four. **12**

a) Define disinfection. Explain disinfection of water by bleaching powder.

b) Define COD. Explain determination of COD. Explain is its significance.

c) Define lubrication. Explain mechanism of thick film lubrication.

d) 6 gm of an oil sample after saponification with 75 ml of N/2 alcoholic KOH solution and subsequent titration with N/2 HCl gave the titre value of 12 ml to phenolphthalein end point. A blank experiment was conducted without taking oil sample. On repeating same procedure gave a titer value of 75 ml. Calculate saponification value of an oil sample.

e) Explain composition, properties and applications of cast iron.

f) Explain testing and measurement of corrosion by weight loss method.

Section – II

Q.4 Attempt any Four. **16**

a) During the determination of calorific value of a gaseous fuel by Boy's calorimeter, the following results were obtained:

Volume of the gaseous fuel burnt at STP	= 0.12 m^3
Weight of water used for cooling	= 35.2 Kg
Weight of steam condensed	= 0.054 Kg
Temperature of Inlet water	= 23.1^0 C
Temperature of Outlet water	= 37.5^0 C

Determine the gross and net calorific values of gaseous fuel.
(Take latent heat of condensation of steam = 587 kcal/kg)

b) Explain construction and working of bomb calorimeter.

c) Compare liquid and gaseous fuels.

d) Explain molding of plastics in to articles by following methods.
i) Injection molding
ii) Transfer molding

e) Explain vulcanization of natural rubber. List advantages of vulcanization of rubber.

f) Explain how components of mixture are separated by GLC.

Q.5 Attempt any Four. **12**

a) Explain characteristics of batteries.

b) Define biodiesel. Explain preparation of biodiesel by transesterification process.

c) Explain synthesis, properties and applications of BUNA-S rubber.

d) Explain instrumentation of TGA.

e) Calculate Molecular weight of polyvinyl chloride having degree of polymerization 350.
(Mol. wt. of vinyl chloride = 62.5)

f) Calculate weight of $AgNO_3$ required to prepare 0.07 M 500 ml solution.
(Mol. wt. of $AgNO_3$ = 170)

SLR-BD-4

Seat No.	

Set Q

F.Y (B. Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025

Engineering Chemistry

(BTCE0102) / (BTCSE0102) / (BTETE0102) / (BTEE0102) / (BTME0102) / (BTECE0102)

Day & Date: Thursday 29-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat and labeled diagrams wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) A good fuel should have _____.
a) high moisture content
b) Low calorific value
c) moderate ignition temperature
d) High ash content

2) Charcoal is a secondary fuel derived from _____.
a) Wood b) Lignite
c) Petroleum d) Coke

3) A thermoplastic is formed by the phenomenon of _____.
a) Chlorination
b) condensation polymerization
c) nitration
d) chain polymerization

4) Structural units of high polymers, are called _____.
a) fibres b) thermo units
c) monomers d) fabrics

5) Which of the following is an elastomer?
a) PVC b) Bakelite
c) Natural rubber d) Nylon

6) Which of the following technique is used to detect the steroid consumed by athletes in international sports competition?
a) IR spectroscopy b) Gas chromatography
c) UV spectroscopy d) pH measurement

7) The commonly used carrier gas in GLC is _____.
a) F_2 b) Br_2
c) Cl_2 d) N_2

8) Water is hard when it contains _____.
a) acid solution b) precipitate in suspension
c) dissolved sodium salts d) dissolved Ca and Mg salts

9) Most popular and ideal disinfectant in water works is _____.
a) Soda b) Ozone
c) Chlorine d) Lime

10) Water matching distilled water is obtained by using _____.
a) Zeolite process b) Ion exchange process
c) lime soda process d) Boiling

11) Lubricant used in a machine working at low temperature should Possess _____.
a) high pour point b) low flash point
c) high cloud point d) low pour point

12) Oiliness is least in case of _____.
a) greases b) mineral oils
c) animal oils d) palm oils

13) During galvanic corrosion, the more noble metals acts as _____.
a) anode b) cathode
c) anode as well as cathode d) corroding metal

14) Metal at the top of electrochemical series is _____.
a) most stable b) least active
c) most noble d) most active

SLR-BD-4

Seat No.	

Set Q

F.Y (B. Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025

Engineering Chemistry

(BTCE0102) / (BTCSE0102) / (BTETE0102) / (BTEE0102) / (BTME0102) / (BTECE0102)

Day & Date: Thursday 29-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.
4) Draw neat and labeled diagrams wherever necessary.

Section – I

Q.2 Attempt any Four. **16**

a) A sample of water on analysis was found to contain the following impurities in mg/lit:

	Amount	Mo. Wt.
$Ca(HCO_3)_2$	20.15	162
$Mg(HCO_3)_2$	38.73	146
$MgSO_4$	44.10	120
$CaCl_2$	53.90	111
$CaSO_4$	67.00	136

Calculate the temporary, permanent and total hardness of water in mg/lit.

b) Define desalination. Explain desalination of water by reverse osmosis process.

c) Define following terms
i) Oiliness
ii) Acid value
iii) Flash point
iv) Aniline point

d) Select proper lubricants for
i) Gears
ii) Refrigeration systems

e) Explain Hydrogen evolution mechanism and oxygen absorption mechanism in electrochemical corrosion.

f) Describe cathodic protection in corrosion control.

Q.3 Attempt any Four. **12**

a) Define disinfection. Explain disinfection of water by bleaching powder.

b) Define COD. Explain determination of COD. Explain is its significance.

c) Define lubrication. Explain mechanism of thick film lubrication.

d) 6 gm of an oil sample after saponification with 75 ml of N/2 alcoholic KOH solution and subsequent titration with N/2 HCl gave the titre value of 12 ml to phenolphthalein end point. A blank experiment was conducted without taking oil sample. On repeating same procedure gave a titer value of 75 ml. Calculate saponification value of an oil sample.

e) Explain composition, properties and applications of cast iron.

f) Explain testing and measurement of corrosion by weight loss method.

Section – II

Q.4 Attempt any Four. **16**

a) During the determination of calorific value of a gaseous fuel by Boy's calorimeter, the following results were obtained:

Volume of the gaseous fuel burnt at STP	= 0.12 m^3
Weight of water used for cooling	= 35.2 Kg
Weight of steam condensed	= 0.054 Kg
Temperature of Inlet water	= 23.1^0 C
Temperature of Outlet water	= 37.5^0 C

Determine the gross and net calorific values of gaseous fuel.
(Take latent heat of condensation of steam = 587 kcal/kg)

b) Explain construction and working of bomb calorimeter.

c) Compare liquid and gaseous fuels.

d) Explain molding of plastics in to articles by following methods.
i) Injection molding
ii) Transfer molding

e) Explain vulcanization of natural rubber. List advantages of vulcanization of rubber.

f) Explain how components of mixture are separated by GLC.

Q.5 Attempt any Four. **12**

a) Explain characteristics of batteries.

b) Define biodiesel. Explain preparation of biodiesel by transesterification process.

c) Explain synthesis, properties and applications of BUNA-S rubber.

d) Explain instrumentation of TGA.

e) Calculate Molecular weight of polyvinyl chloride having degree of polymerization 350.
(Mol. wt. of vinyl chloride = 62.5)

f) Calculate weight of $AgNO_3$ required to prepare 0.07 M 500 ml solution.
(Mol. wt. of $AgNO_3$ = 170)

SLR-BD-4

Seat No.	

Set R

F.Y (B. Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025

Engineering Chemistry

(BTCE0102) / (BTCSE0102) / (BTETE0102) / (BTEE0102) / (BTME0102) / (BTECE0102)

Day & Date: Thursday 29-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat and labeled diagrams wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Structural units of high polymers, are called _____.
a) fibres b) thermo units
c) monomers d) fabrics

2) Which of the following is an elastomer?
a) PVC b) Bakelite
c) Natural rubber d) Nylon

3) Which of the following technique is used to detect the steroid consumed by athletes in international sports competition?
a) IR spectroscopy b) Gas chromatography
c) UV spectroscopy d) pH measurement

4) The commonly used carrier gas in GLC is _____.
a) F_2 b) Br_2
c) Cl_2 d) N_2

5) Water is hard when it contains _____.
a) acid solution b) precipitate in suspension
c) dissolved sodium salts d) dissolved Ca and Mg salts

6) Most popular and ideal disinfectant in water works is _____.
a) Soda b) Ozone
c) Chlorine d) Lime

7) Water matching distilled water is obtained by using _____.
a) Zeolite process b) Ion exchange process
c) lime soda process d) Boiling

8) Lubricant used in a machine working at low temperature should Possess _____.
a) high pour point b) low flash point
c) high cloud point d) low pour point

9) Oiliness is least in case of _____.
a) greases b) mineral oils
c) animal oils d) palm oils

10) During galvanic corrosion, the more noble metals acts as _____.
a) anode b) cathode
c) anode as well as cathode d) corroding metal

11) Metal at the top of electrochemical series is _____.
a) most stable b) least active
c) most noble d) most active

12) A good fuel should have _____.
a) high moisture content
b) Low calorific value
c) moderate ignition temperature
d) High ash content

13) Charcoal is a secondary fuel derived from _____.
a) Wood b) Lignite
c) Petroleum d) Coke

14) A thermoplastic is formed by the phenomenon of _____.
a) Chlorination
b) condensation polymerization
c) nitration
d) chain polymerization

Seat No.	

Set **R**

F.Y (B. Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025

Engineering Chemistry

(BTCE0102) / (BTCSE0102) / (BTETE0102) / (BTEE0102) / (BTME0102) / (BTECE0102)

Day & Date: Thursday 29-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.
4) Draw neat and labeled diagrams wherever necessary.

Section – I

Q.2 Attempt any Four. **16**

a) A sample of water on analysis was found to contain the following impurities in mg/lit:

	Amount	Mo. Wt.
$Ca(HCO_3)_2$	20.15	162
$Mg(HCO_3)_2$	38.73	146
$MgSO_4$	44.10	120
$CaCl_2$	53.90	111
$CaSO_4$	67.00	136

Calculate the temporary, permanent and total hardness of water in mg/lit.

b) Define desalination. Explain desalination of water by reverse osmosis process.

c) Define following terms
i) Oiliness
ii) Acid value
iii) Flash point
iv) Aniline point

d) Select proper lubricants for
i) Gears
ii) Refrigeration systems

e) Explain Hydrogen evolution mechanism and oxygen absorption mechanism in electrochemical corrosion.

f) Describe cathodic protection in corrosion control.

Q.3 Attempt any Four. **12**

a) Define disinfection. Explain disinfection of water by bleaching powder.

b) Define COD. Explain determination of COD. Explain is its significance.

c) Define lubrication. Explain mechanism of thick film lubrication.

d) 6 gm of an oil sample after saponification with 75 ml of N/2 alcoholic KOH solution and subsequent titration with N/2 HCl gave the titre value of 12 ml to phenolphthalein end point. A blank experiment was conducted without taking oil sample. On repeating same procedure gave a titer value of 75 ml. Calculate saponification value of an oil sample.

e) Explain composition, properties and applications of cast iron.

f) Explain testing and measurement of corrosion by weight loss method.

Section – II

Q.4 Attempt any Four. **16**

a) During the determination of calorific value of a gaseous fuel by Boy's calorimeter, the following results were obtained:

Volume of the gaseous fuel burnt at STP	= 0.12 m^3
Weight of water used for cooling	= 35.2 Kg
Weight of steam condensed	= 0.054 Kg
Temperature of Inlet water	= 23.1^0 C
Temperature of Outlet water	= 37.5^0 C

Determine the gross and net calorific values of gaseous fuel.
(Take latent heat of condensation of steam = 587 kcal/kg)

b) Explain construction and working of bomb calorimeter.

c) Compare liquid and gaseous fuels.

d) Explain molding of plastics in to articles by following methods.
i) Injection molding
ii) Transfer molding

e) Explain vulcanization of natural rubber. List advantages of vulcanization of rubber.

f) Explain how components of mixture are separated by GLC.

Q.5 Attempt any Four. **12**

a) Explain characteristics of batteries.

b) Define biodiesel. Explain preparation of biodiesel by transesterification process.

c) Explain synthesis, properties and applications of BUNA-S rubber.

d) Explain instrumentation of TGA.

e) Calculate Molecular weight of polyvinyl chloride having degree of polymerization 350.
(Mol. wt. of vinyl chloride = 62.5)

f) Calculate weight of $AgNO_3$ required to prepare 0.07 M 500 ml solution.
(Mol. wt. of $AgNO_3$ = 170)

SLR-BD-4

Seat No.	

Set S

F.Y (B. Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025

Engineering Chemistry

(BTCE0102) / (BTCSE0102) / (BTETE0102) / (BTEE0102) / (BTME0102) / (BTECE0102)

Day & Date: Thursday 29-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat and labeled diagrams wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) During galvanic corrosion, the more noble metals acts as _____.
a) anode b) cathode
c) anode as well as cathode d) corroding metal

2) Metal at the top of electrochemical series is _____.
a) most stable b) least active
c) most noble d) most active

3) A good fuel should have _____.
a) high moisture content
b) Low calorific value
c) moderate ignition temperature
d) High ash content

4) Charcoal is a secondary fuel derived from _____.
a) Wood b) Lignite
c) Petroleum d) Coke

5) A thermoplastic is formed by the phenomenon of _____.
a) Chlorination
b) condensation polymerization
c) nitration
d) chain polymerization

6) Structural units of high polymers, are called _____.
a) fibres b) thermo units
c) monomers d) fabrics

7) Which of the following is an elastomer?
a) PVC b) Bakelite
c) Natural rubber d) Nylon

8) Which of the following technique is used to detect the steroid consumed by athletes in international sports competition?
a) IR spectroscopy b) Gas chromatography
c) UV spectroscopy d) pH measurement

9) The commonly used carrier gas in GLC is _____.
a) F_2 b) Br_2
c) Cl_2 d) N_2

10) Water is hard when it contains _____.
a) acid solution b) precipitate in suspension
c) dissolved sodium salts d) dissolved Ca and Mg salts

11) Most popular and ideal disinfectant in water works is _____.
a) Soda b) Ozone
c) Chlorine d) Lime

12) Water matching distilled water is obtained by using _____.
a) Zeolite process b) Ion exchange process
c) lime soda process d) Boiling

13) Lubricant used in a machine working at low temperature should Possess _____.
a) high pour point b) low flash point
c) high cloud point d) low pour point

14) Oiliness is least in case of _____.
a) greases b) mineral oils
c) animal oils d) palm oils

SLR-BD-4

Seat No.	

Set S

F.Y (B. Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025

Engineering Chemistry

(BTCE0102) / (BTCSE0102) / (BTETE0102) / (BTEE0102) / (BTME0102) / (BTECE0102)

Day & Date: Thursday 29-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if required.
4) Draw neat and labeled diagrams wherever necessary.

Section – I

Q.2 Attempt any Four. **16**

a) A sample of water on analysis was found to contain the following impurities in mg/lit:

	Amount	Mo. Wt.
$Ca(HCO_3)_2$	20.15	162
$Mg(HCO_3)_2$	38.73	146
$MgSO_4$	44.10	120
$CaCl_2$	53.90	111
$CaSO_4$	67.00	136

Calculate the temporary, permanent and total hardness of water in mg/lit.

b) Define desalination. Explain desalination of water by reverse osmosis process.

c) Define following terms
i) Oiliness
ii) Acid value
iii) Flash point
iv) Aniline point

d) Select proper lubricants for
i) Gears
ii) Refrigeration systems

e) Explain Hydrogen evolution mechanism and oxygen absorption mechanism in electrochemical corrosion.

f) Describe cathodic protection in corrosion control.

Q.3 Attempt any Four. **12**

a) Define disinfection. Explain disinfection of water by bleaching powder.

b) Define COD. Explain determination of COD. Explain is its significance.

c) Define lubrication. Explain mechanism of thick film lubrication.

d) 6 gm of an oil sample after saponification with 75 ml of N/2 alcoholic KOH solution and subsequent titration with N/2 HCl gave the titre value of 12 ml to phenolphthalein end point. A blank experiment was conducted without taking oil sample. On repeating same procedure gave a titer value of 75 ml. Calculate saponification value of an oil sample.

e) Explain composition, properties and applications of cast iron.

f) Explain testing and measurement of corrosion by weight loss method.

Section – II

Q.4 Attempt any Four. **16**

a) During the determination of calorific value of a gaseous fuel by Boy's calorimeter, the following results were obtained:

Volume of the gaseous fuel burnt at STP	= 0.12 m^3
Weight of water used for cooling	= 35.2 Kg
Weight of steam condensed	= 0.054 Kg
Temperature of Inlet water	= 23.1^0 C
Temperature of Outlet water	= 37.5^0 C

Determine the gross and net calorific values of gaseous fuel.
(Take latent heat of condensation of steam = 587 kcal/kg)

b) Explain construction and working of bomb calorimeter.

c) Compare liquid and gaseous fuels.

d) Explain molding of plastics in to articles by following methods.
i) Injection molding
ii) Transfer molding

e) Explain vulcanization of natural rubber. List advantages of vulcanization of rubber.

f) Explain how components of mixture are separated by GLC.

Q.5 Attempt any Four. **12**

a) Explain characteristics of batteries.

b) Define biodiesel. Explain preparation of biodiesel by transesterification process.

c) Explain synthesis, properties and applications of BUNA-S rubber.

d) Explain instrumentation of TGA.

e) Calculate Molecular weight of polyvinyl chloride having degree of polymerization 350.
(Mol. wt. of vinyl chloride = 62.5)

f) Calculate weight of $AgNO_3$ required to prepare 0.07 M 500 ml solution.
(Mol. wt. of $AgNO_3$ = 170)

SLR-BD-5

Seat No.	

Set P

F.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
Basics of Civil and Mechanical Engineering
(BTCE0104)/ (BTCSE0104) / (BTETE0104)/ (BTEE0104)/ (BTME0104)/ (BTECE0104)

Day & Date: Monday, 02-06-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions, if necessary and state them clearly.
5) Use of non-programmable single memory calculator is allowed.

Section - I

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 07

Q.1 Choose the correct option from the following. **07**

1) Following is the branch of Civil Engineering _____.
a) Mechanical Engineering b) Electrical Engineering
c) Environmental Engineering d) None of these

2) Following is the branch of Transportation Engineering _____.
a) Airport Engineering b) Bridge Engineering
c) Railway Engineering d) All of the above

3) The lowest part of a structure which transfers the load to the soil is known as _____.
a) Super structure b) Sub structure
c) Plinth d) Basement

4) The following element of a framed structure is designed to carry slab load only.
a) Foundation b) Wall
c) Column d) Beam

5) The process of killing the infective bacteria from the water and making it safe to the user is called _____.
a) Softening b) Coagulation
c) Flocculation d) Disinfection

6) Wastes that cause a great danger to human, animal and plant because of its toxicity reactivity, corrosivity and ignitability is termed as _____.

a) Sewage
b) Municipal waste
c) Hazardous waste
d) Refuse

7) The main principle of surveying is to work from _____.

a) The centre to the boundary
b) The whole to part
c) The part to the whole
d) All of the above

Section – II

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 07

Q.1 Choose the correct option from the following. **07**

1) To increase the pressure of air or gas, machine driven by prime mover is used. This is known as _____.

a) steam turbine b) gas turbine
c) compressor d) I.C. engine

2) Which of the following is a general-purpose machine tools _____.

a) Milling b) Lathe
c) Drilling d) Cutting

3) Most commonly used flame in gas welding is _____.

a) Neutral b) Oxidizing
c) Carburizing d) none

4) Which type of belt arrangement is used to transmit power between two shafts having same direction of rotation?

a) Open belt b) Cross belt
c) Continuous belt d) None of above

5) The refrigerator and heat pump are works on which principle _____.

a) First law of thermodynamics
b) Second law of thermodynamics
c) Third law of thermodynamics
d) Zeroth law of thermodynamics

6) During a cycle, the heat transfer are given by: 120kJ, -60kJ, -48kJ, and 12kJ then the network transfer in the cycle is _____.

a) 60000Nm b) 24000Nm
c) 12000Nm d) 4400Nm

7) A system comprising of a single phase, is known as _____.

a) Open system b) Closed system
c) Heterogeneous system d) Homogeneous system

SLR-BD-5

Seat No.	

Set P

F.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
Basics of Civil and Mechanical Engineering
(BTCE0104)/ (BTCSE0104) / (BTETE0104)/ (BTEE0104)/ (BTME0104)/ (BTECE0104)

Day & Date: Monday, 02-06-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks
3) Q.No.2 and Q.No.4 are short answer type question.
4) Q.No.3 and Q.No.5 are long answer type question.
5) Assume suitable data if required.
6) Use of non-programmable single memory calculator is allowed.

Section – I

Q.2 Attempt any Five. **15**

a) Differentiate or compare between substructure and superstructure. **03**
b) What is the role of civil engineering in various construction activities? **03**
c) What are the sub branches of civil engineering? Explain any one in short. **03**
d) Explain application of Civil Engineering to Mechanical and Computer Engineering. **03**
e) What is GPS? Give its applications in various fields. **03**
f) Explain Operation of Effluent treatment system. **03**
g) Write note on Green Building. **03**

Q.3 Solve any one out of (a) and (b) and solve any two out of (c) to (f). **13**

a) The following consecutive readings were taken with a dumpy level. 1.580, 0.635, 2.035,1.765,1.660, 0.925,1.035, 1.960. The level was shifted after 3rd and 5th readings. The first reading was taken on the bench mark of RL 950.000. Calculate the reduced levels of the change points and the difference of level between first and last points. (Use Rise and fall method.) **05**
b) Explain the temporary adjustment of dumpy Level. **05**
c) Explain with neat sketch any two types of shallow foundation. **04**
d) Differentiate between Plane Surveying and Geodetic Surveying. **04**
e) Draw a neat sketch of component of Buildings. **04**
f) Explain the IRC classification of roads. **04**

Section – II

Q.4 Answer any five of the following. **15**

a) Explain Vane Blower with neat sketch. **03**

b) Explain Double acting Reciprocating Pump. **03**

c) Explain Resistance welding with neat sketch. **03**

d) Explain types of equilibrium in thermodynamic system. **03**

e) Compare chain drive and belt drive. **03**

f) Explain Kelvin Plank & Classuis statements. **03**

g) Explain working of single acting reciprocating pump. **03**

Q.5 Solve any one out of (a) and (b) and solve any two out of (c) to (f) **13**

a) A cross belt connects two pulleys of 600 mm diameter 3 m apart. The initial tension in the belt is 500 N. If the coefficient of friction in the belt and pulley is 0.3. Find the power transmitted at 600 rpm. Also calculate length of belt. **05**

b) Describe Pillar Drilling Machine in detail. **05**

c) A cycle comprises three processes. The energy transfers in each are tabulated below. Complete the table. **04**

Process	Q(KJ)	W(KJ)	ΔU(KJ)
1-2	+80	+30	---
2-3	---	-50	+20
3-1	+50	---	---

d) Explain with neat sketch working of Francis turbine. **04**

e) Derive an expression for length of open belt drive. **04**

f) Explain Turning and Facing operation on lathe machine in detail. **04**

SLR-BD-5

Seat No.	

Set Q

F.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
Basics of Civil and Mechanical Engineering
(BTCE0104)/ (BTCSE0104) / (BTETE0104)/ (BTEE0104)/ (BTME0104)/ (BTECE0104)

Day & Date: Monday, 02-06-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions, if necessary and state them clearly.
5) Use of non-programmable single memory calculator is allowed.

Section - I

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 07

Q.1 Choose the correct option from the following. **07**

1) The process of killing the infective bacteria from the water and making it safe to the user is called _____.
a) Softening b) Coagulation
c) Flocculation d) Disinfection

2) Wastes that cause a great danger to human, animal and plant because of its toxicity reactivity, corrosivity and ignitability is termed as _____.
a) Sewage b) Municipal waste
c) Hazardous waste d) Refuse

3) The main principle of surveying is to work from _____.
a) The centre to the boundary b) The whole to part
c) The part to the whole d) All of the above

4) Following is the branch of Civil Engineering _____.
a) Mechanical Engineering b) Electrical Engineering
c) Environmental Engineering d) None of these

5) Following is the branch of Transportation Engineering _____.
a) Airport Engineering b) Bridge Engineering
c) Railway Engineering d) All of the above

6) The lowest part of a structure which transfers the load to the soil is known as _____.

a) Super structure
b) Sub structure
c) Plinth
d) Basement

7) The following element of a framed structure is designed to carry slab load only.

a) Foundation
b) Wall
c) Column
d) Beam

Section – II

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 07

Q.1 Choose the correct option from the following. 07

1) The refrigerator and heat pump are works on which principle _____.
a) First law of thermodynamics
b) Second law of thermodynamics
c) Third law of thermodynamics
d) Zeroth law of thermodynamics

2) During a cycle, the heat transfer are given by: 120kJ, -60kJ, -48kJ, and 12kJ then the network transfer in the cycle is _____.
a) 60000Nm b) 24000Nm
c) 12000Nm d) 4400Nm

3) A system comprising of a single phase, is known as _____.
a) Open system b) Closed system
c) Heterogeneous system d) Homogeneous system

4) To increase the pressure of air or gas, machine driven by prime mover is used. This is known as _____.
a) steam turbine b) gas turbine
c) compressor d) I.C. engine

5) Which of the following is a general-purpose machine tools _____.
a) Milling b) Lathe
c) Drilling d) Cutting

6) Most commonly used flame in gas welding is _____.
a) Neutral b) Oxidizing
c) Carburizing d) none

7) Which type of belt arrangement is used to transmit power between two shafts having same direction of rotation?
a) Open belt b) Cross belt
c) Continuous belt d) None of above

SLR-BD-5

Seat No.	

Set Q

F.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
Basics of Civil and Mechanical Engineering
(BTCE0104)/ (BTCSE0104) / (BTETE0104)/ (BTEE0104)/ (BTME0104)/ (BTECE0104)

Day & Date: Monday, 02-06-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks
3) Q.No.2 and Q.No.4 are short answer type question.
4) Q.No.3 and Q.No.5 are long answer type question.
5) Assume suitable data if required.
6) Use of non-programmable single memory calculator is allowed.

Section – I

Q.2 Attempt any Five. **15**

a) Differentiate or compare between substructure and superstructure. **03**
b) What is the role of civil engineering in various construction activities? **03**
c) What are the sub branches of civil engineering? Explain any one in short. **03**
d) Explain application of Civil Engineering to Mechanical and Computer Engineering. **03**
e) What is GPS? Give its applications in various fields. **03**
f) Explain Operation of Effluent treatment system. **03**
g) Write note on Green Building. **03**

Q.3 Solve any one out of (a) and (b) and solve any two out of (c) to (f). **13**

a) The following consecutive readings were taken with a dumpy level. 1.580, 0.635, 2.035,1.765,1.660, 0.925,1.035, 1.960. The level was shifted after 3rd and 5th readings. The first reading was taken on the bench mark of RL 950.000. Calculate the reduced levels of the change points and the difference of level between first and last points. (Use Rise and fall method.) **05**
b) Explain the temporary adjustment of dumpy Level. **05**
c) Explain with neat sketch any two types of shallow foundation. **04**
d) Differentiate between Plane Surveying and Geodetic Surveying. **04**
e) Draw a neat sketch of component of Buildings. **04**
f) Explain the IRC classification of roads. **04**

Section – II

Q.4 Answer any five of the following. **15**

a) Explain Vane Blower with neat sketch. **03**

b) Explain Double acting Reciprocating Pump. **03**

c) Explain Resistance welding with neat sketch. **03**

d) Explain types of equilibrium in thermodynamic system. **03**

e) Compare chain drive and belt drive. **03**

f) Explain Kelvin Plank & Classuis statements. **03**

g) Explain working of single acting reciprocating pump. **03**

Q.5 Solve any one out of (a) and (b) and solve any two out of (c) to (f) **13**

a) A cross belt connects two pulleys of 600 mm diameter 3 m apart. The initial tension in the belt is 500 N. If the coefficient of friction in the belt and pulley is 0.3. Find the power transmitted at 600 rpm. Also calculate length of belt. **05**

b) Describe Pillar Drilling Machine in detail. **05**

c) A cycle comprises three processes. The energy transfers in each are tabulated below. Complete the table. **04**

Process	Q(KJ)	W(KJ)	ΔU(KJ)
1-2	+80	+30	---
2-3	---	-50	+20
3-1	+50	---	---

d) Explain with neat sketch working of Francis turbine. **04**

e) Derive an expression for length of open belt drive. **04**

f) Explain Turning and Facing operation on lathe machine in detail. **04**

SLR-BD-5

Seat No.		Set	R

F.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
Basics of Civil and Mechanical Engineering
(BTCE0104)/ (BTCSE0104) / (BTETE0104)/ (BTEE0104)/ (BTME0104)/ (BTECE0104)

Day & Date: Monday, 02-06-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions, if necessary and state them clearly.
5) Use of non-programmable single memory calculator is allowed.

Section - I

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 07

Q.1 Choose the correct option from the following. **07**

1) The lowest part of a structure which transfers the load to the soil is known as _____.
a) Super structure b) Sub structure
c) Plinth d) Basement

2) The following element of a framed structure is designed to carry slab load only.
a) Foundation b) Wall
c) Column d) Beam

3) The process of killing the infective bacteria from the water and making it safe to the user is called _____.
a) Softening b) Coagulation
c) Flocculation d) Disinfection

4) Wastes that cause a great danger to human, animal and plant because of its toxicity reactivity, corrosivity and ignitability is termed as _____.
a) Sewage b) Municipal waste
c) Hazardous waste d) Refuse

5) The main principle of surveying is to work from _____.
a) The centre to the boundary b) The whole to part
c) The part to the whole d) All of the above

6) Following is the branch of Civil Engineering _____.

a) Mechanical Engineering
b) Electrical Engineering
c) Environmental Engineering
d) None of these

7) Following is the branch of Transportation Engineering _____.

a) Airport Engineering
b) Bridge Engineering
c) Railway Engineering
d) All of the above

Section – II

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 07

Q.1 Choose the correct option from the following. **07**

1) Most commonly used flame in gas welding is _____.
a) Neutral b) Oxidizing
c) Carburizing d) none

2) Which type of belt arrangement is used to transmit power between two shafts having same direction of rotation?
a) Open belt b) Cross belt
c) Continuous belt d) None of above

3) The refrigerator and heat pump are works on which principle _____.
a) First law of thermodynamics
b) Second law of thermodynamics
c) Third law of thermodynamics
d) Zeroth law of thermodynamics

4) During a cycle, the heat transfer are given by: 120kJ, -60kJ, -48kJ, and 12kJ then the network transfer in the cycle is _____.
a) 60000Nm b) 24000Nm
c) 12000Nm d) 4400Nm

5) A system comprising of a single phase, is known as _____.
a) Open system b) Closed system
c) Heterogeneous system d) Homogeneous system

6) To increase the pressure of air or gas, machine driven by prime mover is used. This is known as _____.
a) steam turbine b) gas turbine
c) compressor d) I.C. engine

7) Which of the following is a general-purpose machine tools _____.
a) Milling b) Lathe
c) Drilling d) Cutting

SLR-BD-5

Seat No.	

Set R

F.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
Basics of Civil and Mechanical Engineering
(BTCE0104)/ (BTCSE0104) / (BTETE0104)/ (BTEE0104)/ (BTME0104)/ (BTECE0104)

Day & Date: Monday, 02-06-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks
3) Q.No.2 and Q.No.4 are short answer type question.
4) Q.No.3 and Q.No.5 are long answer type question.
5) Assume suitable data if required.
6) Use of non-programmable single memory calculator is allowed.

Section – I

Q.2 Attempt any Five. **15**

a) Differentiate or compare between substructure and superstructure. **03**
b) What is the role of civil engineering in various construction activities? **03**
c) What are the sub branches of civil engineering? Explain any one in short. **03**
d) Explain application of Civil Engineering to Mechanical and Computer Engineering. **03**
e) What is GPS? Give its applications in various fields. **03**
f) Explain Operation of Effluent treatment system. **03**
g) Write note on Green Building. **03**

Q.3 Solve any one out of (a) and (b) and solve any two out of (c) to (f). **13**

a) The following consecutive readings were taken with a dumpy level. 1.580, 0.635, 2.035,1.765,1.660, 0.925,1.035, 1.960. The level was shifted after 3rd and 5th readings. The first reading was taken on the bench mark of RL 950.000. Calculate the reduced levels of the change points and the difference of level between first and last points. (Use Rise and fall method.) **05**
b) Explain the temporary adjustment of dumpy Level. **05**
c) Explain with neat sketch any two types of shallow foundation. **04**
d) Differentiate between Plane Surveying and Geodetic Surveying. **04**
e) Draw a neat sketch of component of Buildings. **04**
f) Explain the IRC classification of roads. **04**

Section – II

Q.4 Answer any five of the following. **15**

a) Explain Vane Blower with neat sketch. **03**

b) Explain Double acting Reciprocating Pump. **03**

c) Explain Resistance welding with neat sketch. **03**

d) Explain types of equilibrium in thermodynamic system. **03**

e) Compare chain drive and belt drive. **03**

f) Explain Kelvin Plank & Classuis statements. **03**

g) Explain working of single acting reciprocating pump. **03**

Q.5 Solve any one out of (a) and (b) and solve any two out of (c) to (f) **13**

a) A cross belt connects two pulleys of 600 mm diameter 3 m apart. The initial tension in the belt is 500 N. If the coefficient of friction in the belt and pulley is 0.3. Find the power transmitted at 600 rpm. Also calculate length of belt. **05**

b) Describe Pillar Drilling Machine in detail. **05**

c) A cycle comprises three processes. The energy transfers in each are tabulated below. Complete the table. **04**

Process	Q(KJ)	W(KJ)	ΔU(KJ)
1-2	+80	+30	---
2-3	---	-50	+20
3-1	+50	---	---

d) Explain with neat sketch working of Francis turbine. **04**

e) Derive an expression for length of open belt drive. **04**

f) Explain Turning and Facing operation on lathe machine in detail. **04**

SLR-BD-5

Seat No.		Set	S

F.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
Basics of Civil and Mechanical Engineering
(BTCE0104)/ (BTCSE0104) / (BTETE0104)/ (BTEE0104)/ (BTME0104)/ (BTECE0104)

Day & Date: Monday, 02-06-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions, if necessary and state them clearly.
5) Use of non-programmable single memory calculator is allowed.

Section - I

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 07

Q.1 Choose the correct option from the following. **07**

1) The main principle of surveying is to work from _____.
a) The centre to the boundary b) The whole to part
c) The part to the whole d) All of the above

2) Following is the branch of Civil Engineering _____.
a) Mechanical Engineering b) Electrical Engineering
c) Environmental Engineering d) None of these

3) Following is the branch of Transportation Engineering _____.
a) Airport Engineering b) Bridge Engineering
c) Railway Engineering d) All of the above

4) The lowest part of a structure which transfers the load to the soil is known as _____.
a) Super structure b) Sub structure
c) Plinth d) Basement

5) The following element of a framed structure is designed to carry slab load only.
a) Foundation b) Wall
c) Column d) Beam

6) The process of killing the infective bacteria from the water and making it safe to the user is called _____.

a) Softening
b) Coagulation
c) Flocculation
d) Disinfection

7) Wastes that cause a great danger to human, animal and plant because of its toxicity reactivity, corrosivity and ignitability is termed as _____.

a) Sewage
b) Municipal waste
c) Hazardous waste
d) Refuse

Section – II

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 07

Q.1 Choose the correct option from the following. **07**

1) A system comprising of a single phase, is known as _____.
a) Open system b) Closed system
c) Heterogeneous system d) Homogeneous system

2) To increase the pressure of air or gas, machine driven by prime mover is used. This is known as _____.
a) steam turbine b) gas turbine
c) compressor d) I.C. engine

3) Which of the following is a general-purpose machine tools _____.
a) Milling b) Lathe
c) Drilling d) Cutting

4) Most commonly used flame in gas welding is _____.
a) Neutral b) Oxidizing
c) Carburizing d) none

5) Which type of belt arrangement is used to transmit power between two shafts having same direction of rotation?
a) Open belt b) Cross belt
c) Continuous belt d) None of above

6) The refrigerator and heat pump are works on which principle _____.
a) First law of thermodynamics
b) Second law of thermodynamics
c) Third law of thermodynamics
d) Zeroth law of thermodynamics

7) During a cycle, the heat transfer are given by: 120kJ, -60kJ, -48kJ, and 12kJ then the network transfer in the cycle is _____.
a) 60000Nm b) 24000Nm
c) 12000Nm d) 4400Nm

SLR-BD-5

Seat No.		Set	S

F.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
Basics of Civil and Mechanical Engineering
(BTCE0104)/ (BTCSE0104) / (BTETE0104)/ (BTEE0104)/ (BTME0104)/ (BTECE0104)

Day & Date: Monday, 02-06-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks
3) Q.No.2 and Q.No.4 are short answer type question.
4) Q.No.3 and Q.No.5 are long answer type question.
5) Assume suitable data if required.
6) Use of non-programmable single memory calculator is allowed.

Section – I

Q.2 Attempt any Five. **15**

a) Differentiate or compare between substructure and superstructure. **03**
b) What is the role of civil engineering in various construction activities? **03**
c) What are the sub branches of civil engineering? Explain any one in short. **03**
d) Explain application of Civil Engineering to Mechanical and Computer Engineering. **03**
e) What is GPS? Give its applications in various fields. **03**
f) Explain Operation of Effluent treatment system. **03**
g) Write note on Green Building. **03**

Q.3 Solve any one out of (a) and (b) and solve any two out of (c) to (f). **13**

a) The following consecutive readings were taken with a dumpy level. 1.580, 0.635, 2.035,1.765,1.660, 0.925,1.035, 1.960. The level was shifted after 3rd and 5th readings. The first reading was taken on the bench mark of RL 950.000. Calculate the reduced levels of the change points and the difference of level between first and last points. (Use Rise and fall method.) **05**
b) Explain the temporary adjustment of dumpy Level. **05**
c) Explain with neat sketch any two types of shallow foundation. **04**
d) Differentiate between Plane Surveying and Geodetic Surveying. **04**
e) Draw a neat sketch of component of Buildings. **04**
f) Explain the IRC classification of roads. **04**

Section – II

Q.4 Answer any five of the following. **15**

a) Explain Vane Blower with neat sketch. **03**

b) Explain Double acting Reciprocating Pump. **03**

c) Explain Resistance welding with neat sketch. **03**

d) Explain types of equilibrium in thermodynamic system. **03**

e) Compare chain drive and belt drive. **03**

f) Explain Kelvin Plank & Classuis statements. **03**

g) Explain working of single acting reciprocating pump. **03**

Q.5 Solve any one out of (a) and (b) and solve any two out of (c) to (f) **13**

a) A cross belt connects two pulleys of 600 mm diameter 3 m apart. The initial tension in the belt is 500 N. If the coefficient of friction in the belt and pulley is 0.3. Find the power transmitted at 600 rpm. Also calculate length of belt. **05**

b) Describe Pillar Drilling Machine in detail. **05**

c) A cycle comprises three processes. The energy transfers in each are tabulated below. Complete the table. **04**

Process	Q(KJ)	W(KJ)	ΔU(KJ)
1-2	+80	+30	---
2-3	---	-50	+20
3-1	+50	---	---

d) Explain with neat sketch working of Francis turbine. **04**

e) Derive an expression for length of open belt drive. **04**

f) Explain Turning and Facing operation on lathe machine in detail. **04**

SLR-BD-6

Seat No.	

Set P

F.Y. (B.Tech.) (Sem - I) (NEP New) (CBCS) Examination: March/April-2025

Basic Electrical & Electronics Engineering

(BTCE0105) / (BTCSE0105) / (BTETE0105) / (BTEE0105) / (BTME0105) / (BTECE0105)

Day & Date: Wednesday, 04-June-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) KVL is concerned with _____
a) Junction voltages b) Junction currents
c) IR drop & emfs d) Both a & b

2) A sinusoidal alternating current has a maximum value of Im. Its average value will be _____
a) Im/π b) $\mathrm{Im}/2\pi$
c) $2\mathrm{Im}/\pi$ d) None of these

3) The reluctance of a magnetic circuit is _____
a) directly proportional to length and area
b) directly proportional to length and inversely proportional to area
c) directly proportional to area and inversely proportional to length
d) none of these

4) The reluctance of the magnetic circuit is _____
a) MMF/current b) MMF/flux
c) flux/current d) flux/MMF

5) If alternating voltage is given by, v= 230 sin (314.16t), then the frequency is _____
a) 60 Hz b) 50 Hz
c) 40 Hz d) 200 Hz

6) The peak factor of sinusoidal quantity is _____
a) 1.414 b) 1.57
c) 1.11 d) 0.637

7) A DC motor converts _____
   a) Electrical energy into mechanical energy
   b) Mechanical energy into electrical energy
   c) Electrical energy into magnetic energy
   d) Magnetic energy into electrical energy

8) PIV in full wave rectifier used in a centre tapped transformer is _____
   a) Vm/π b) $2\mathrm{Vm}/\pi$
   c) $2\ \mathrm{Vm}$ d) Vm

9) Ideal diode in reverse bias offers _____ resistance and is equivalent to _____ switch.
   a) Zero, open b) Zero, closed
   c) Infinite, closed d) Infinite, open

10) Transistor is operated as open switch in _____ region.
   a) Saturation b) Cut-off
   c) Active region d) None of these

11) The base of transistor is _____
   a) Lightly doped b) Moderately doped
   c) Heavily doped d) None

12) Octal equivalent of decimal number 375 is _____
   a) 560 b) 576
   c) 565 d) 567

13) Which of the following gate cannot be used as inverter?
   a) XNOR b) NOR
   c) NAND d) AND

14) The output of an AND gate is high when _____
   a) Any input is high b) All inputs are high
   c) No inputs are high d) Both a and b

Seat No.	

Set P

F.Y. (B.Tech.) (Sem - I) (NEP New) (CBCS) Examination: March/April-2025

Basic Electrical & Electronics Engineering

(BTCE0105) / (BTCSE0105) / (BTETE0105) / (BTEE0105) / (BTME0105) / (BTECE0105)

Day & Date: Wednesday, 04-June-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any four **16**

a) State and explain Ohm's law with its limitations.

b) Derive the expression for the division of current through three branches in parallel.

c) Explain series magnetic circuit with air-gap. Also derive the formula for total MMF.

d) Describe the working principle of single phase transformer with neat diagram.

e) Derive expression for purely inductive circuit. Draw phasor diagram.

f) A sinusoidal voltage is given by $v = 325.296 \sin(\omega t)$ volts at 50 Hz. Determine the RMS value, average value, angular frequency, time period of the voltage.

Q.3 Solve any two **12**

a) Derive the equation for converting delta resistances into equivalent star resistances.

b) An iron ring with mean length 80 cm and cross-sectional area 10 cm^2 is uniformly wound with 500 turns of wire, determine the current required to set up a flux density of 12 Wb/m^2 in the ring. Also find the value of magnetic flux and magnetic field strength. Assume relative permeability of iron is 1000.

c) Explain series R-L-C circuit for the condition $X_C > X_L$, with voltage triangle, impedance triangle and phasor diagram.

Section – II

Q.4 Solve any four. **16**

a) Explain VI characteristics of PN junction diode with neat diagram.

b) What is need of filter? Explain capacitor filter with neat diagram.

c) Explain working of BJT as switch.

d) Explain input and output characteristics of common emitter (CE) configuration of transistor.

e) State and prove distributive and commutative law.

f) Explain following logic gates with symbol, equation and truth table.
i) XOR ii) NAND iii) NOR iv) AND

Q.5 Solve any two. **12**

a) Explain half wave rectifier with suitable diagram and derive expression for ripple factor and efficiency.

b) Compare different transistor configurations on the basis of input resistance, output resistance, voltage gain and current gain.

c) Perform following subtraction using 2's complement method. Show the result in octal form.

i) $(512)_8 - (345)_8$

ii) $(275)_8 - (155)_8$

SLR-BD-6

Seat No.	

Set Q

F.Y. (B.Tech.) (Sem - I) (NEP New) (CBCS) Examination: March/April-2025

Basic Electrical & Electronics Engineering

(BTCE0105) / (BTCSE0105) / (BTETE0105) / (BTEE0105) / (BTME0105) / (BTECE0105)

Day & Date: Wednesday, 04-June-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) PIV in full wave rectifier used in a centre tapped transformer is _____
a) Vm/π b) $2\mathrm{Vm}/\pi$
c) $2\ \mathrm{Vm}$ d) Vm

2) Ideal diode in reverse bias offers _____ resistance and is equivalent to _____ switch.
a) Zero, open b) Zero, closed
c) Infinite, closed d) Infinite, open

3) Transistor is operated as open switch in _____ region.
a) Saturation b) Cut-off
c) Active region d) None of these

4) The base of transistor is _____
a) Lightly doped b) Moderately doped
c) Heavily doped d) None

5) Octal equivalent of decimal number 375 is _____
a) 560 b) 576
c) 565 d) 567

6) Which of the following gate cannot be used as inverter?
a) XNOR b) NOR
c) NAND d) AND

7) The output of an AND gate is high when _____
a) Any input is high b) All inputs are high
c) No inputs are high d) Both a and b

8) KVL is concerned with _____
   a) Junction voltages
   b) Junction currents
   c) IR drop & emfs
   d) Both a & b

9) A sinusoidal alternating current has a maximum value of Im. Its average value will be _____
   a) Im/π
   b) $\mathrm{Im}/2\pi$
   c) $2\mathrm{Im}/\pi$
   d) None of these

10) The reluctance of a magnetic circuit is _____
   a) directly proportional to length and area
   b) directly proportional to length and inversely proportional to area
   c) directly proportional to area and inversely proportional to length
   d) none of these

11) The reluctance of the magnetic circuit is _____
   a) MMF/current
   b) MMF/flux
   c) flux/current
   d) flux/MMF

12) If alternating voltage is given by, v= 230 sin (314.16t), then the frequency is _____
   a) 60 Hz
   b) 50 Hz
   c) 40 Hz
   d) 200 Hz

13) The peak factor of sinusoidal quantity is _____
   a) 1.414
   b) 1.57
   c) 1.11
   d) 0.637

14) A DC motor converts _____
   a) Electrical energy into mechanical energy
   b) Mechanical energy into electrical energy
   c) Electrical energy into magnetic energy
   d) Magnetic energy into electrical energy

Seat No.	

Set **Q**

F.Y. (B.Tech.) (Sem - I) (NEP New) (CBCS) Examination: March/April-2025

Basic Electrical & Electronics Engineering

(BTCE0105) / (BTCSE0105) / (BTETE0105) / (BTEE0105) / (BTME0105) / (BTECE0105)

Day & Date: Wednesday, 04-June-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any four **16**

a) State and explain Ohm's law with its limitations.

b) Derive the expression for the division of current through three branches in parallel.

c) Explain series magnetic circuit with air-gap. Also derive the formula for total MMF.

d) Describe the working principle of single phase transformer with neat diagram.

e) Derive expression for purely inductive circuit. Draw phasor diagram.

f) A sinusoidal voltage is given by $v = 325.296 \sin(\omega t)$ volts at 50 Hz. Determine the RMS value, average value, angular frequency, time period of the voltage.

Q.3 Solve any two **12**

a) Derive the equation for converting delta resistances into equivalent star resistances.

b) An iron ring with mean length 80 cm and cross-sectional area 10 cm^2 is uniformly wound with 500 turns of wire, determine the current required to set up a flux density of 12 Wb/m^2 in the ring. Also find the value of magnetic flux and magnetic field strength. Assume relative permeability of iron is 1000.

c) Explain series R-L-C circuit for the condition $X_C > X_L$, with voltage triangle, impedance triangle and phasor diagram.

Section – II

Q.4 Solve any four. **16**

a) Explain VI characteristics of PN junction diode with neat diagram.

b) What is need of filter? Explain capacitor filter with neat diagram.

c) Explain working of BJT as switch.

d) Explain input and output characteristics of common emitter (CE) configuration of transistor.

e) State and prove distributive and commutative law.

f) Explain following logic gates with symbol, equation and truth table.
i) XOR ii) NAND iii) NOR iv) AND

Q.5 Solve any two. **12**

a) Explain half wave rectifier with suitable diagram and derive expression for ripple factor and efficiency.

b) Compare different transistor configurations on the basis of input resistance, output resistance, voltage gain and current gain.

c) Perform following subtraction using 2's complement method. Show the result in octal form.

i) $(512)_8 - (345)_8$

ii) $(275)_8 - (155)_8$

SLR-BD-6

Seat No.	

Set R

F.Y. (B.Tech.) (Sem - I) (NEP New) (CBCS) Examination: March/April-2025

Basic Electrical & Electronics Engineering

(BTCE0105) / (BTCSE0105) / (BTETE0105) / (BTEE0105) / (BTME0105) / (BTECE0105)

Day & Date: Wednesday, 04-June-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The base of transistor is _____
a) Lightly doped b) Moderately doped
c) Heavily doped d) None

2) Octal equivalent of decimal number 375 is _____
a) 560 b) 576
c) 565 d) 567

3) Which of the following gate cannot be used as inverter?
a) XNOR b) NOR
c) NAND d) AND

4) The output of an AND gate is high when _____
a) Any input is high b) All inputs are high
c) No inputs are high d) Both a and b

5) KVL is concerned with _____
a) Junction voltages b) Junction currents
c) IR drop & emfs d) Both a & b

6) A sinusoidal alternating current has a maximum value of Im. Its average value will be _____
a) Im/π b) $\mathrm{Im}/2\pi$
c) $2\mathrm{Im}/\pi$ d) None of these

7) The reluctance of a magnetic circuit is _____
   a) directly proportional to length and area
   b) directly proportional to length and inversely proportional to area
   c) directly proportional to area and inversely proportional to length
   d) none of these

8) The reluctance of the magnetic circuit is _____
   a) MMF/current b) MMF/flux
   c) flux/current d) flux/MMF

9) If alternating voltage is given by, v= 230 sin (314.16t), then the frequency is _____
   a) 60 Hz b) 50 Hz
   c) 40 Hz d) 200 Hz

10) The peak factor of sinusoidal quantity is _____
   a) 1.414 b) 1.57
   c) 1.11 d) 0.637

11) A DC motor converts _____
   a) Electrical energy into mechanical energy
   b) Mechanical energy into electrical energy
   c) Electrical energy into magnetic energy
   d) Magnetic energy into electrical energy

12) PIV in full wave rectifier used in a centre tapped transformer is _____
   a) Vm/π b) $2\mathrm{Vm}/\pi$
   c) $2\ \mathrm{Vm}$ d) Vm

13) Ideal diode in reverse bias offers _____ resistance and is equivalent to _____ switch.
   a) Zero, open b) Zero, closed
   c) Infinite, closed d) Infinite, open

14) Transistor is operated as open switch in _____ region.
   a) Saturation b) Cut-off
   c) Active region d) None of these

SLR-BD-6

Seat No.	

Set R

F.Y. (B.Tech.) (Sem - I) (NEP New) (CBCS) Examination: March/April-2025

Basic Electrical & Electronics Engineering

(BTCE0105) / (BTCSE0105) / (BTETE0105) / (BTEE0105) / (BTME0105) / (BTECE0105)

Day & Date: Wednesday, 04-June-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any four **16**

a) State and explain Ohm's law with its limitations.

b) Derive the expression for the division of current through three branches in parallel.

c) Explain series magnetic circuit with air-gap. Also derive the formula for total MMF.

d) Describe the working principle of single phase transformer with neat diagram.

e) Derive expression for purely inductive circuit. Draw phasor diagram.

f) A sinusoidal voltage is given by $v = 325.296 \sin(\omega t)$ volts at 50 Hz. Determine the RMS value, average value, angular frequency, time period of the voltage.

Q.3 Solve any two **12**

a) Derive the equation for converting delta resistances into equivalent star resistances.

b) An iron ring with mean length 80 cm and cross-sectional area 10 cm^2 is uniformly wound with 500 turns of wire, determine the current required to set up a flux density of 12 Wb/m^2 in the ring. Also find the value of magnetic flux and magnetic field strength. Assume relative permeability of iron is 1000.

c) Explain series R-L-C circuit for the condition $X_C > X_L$, with voltage triangle, impedance triangle and phasor diagram.

Section – II

Q.4 Solve any four. **16**

a) Explain VI characteristics of PN junction diode with neat diagram.

b) What is need of filter? Explain capacitor filter with neat diagram.

c) Explain working of BJT as switch.

d) Explain input and output characteristics of common emitter (CE) configuration of transistor.

e) State and prove distributive and commutative law.

f) Explain following logic gates with symbol, equation and truth table.
i) XOR ii) NAND iii) NOR iv) AND

Q.5 Solve any two. **12**

a) Explain half wave rectifier with suitable diagram and derive expression for ripple factor and efficiency.

b) Compare different transistor configurations on the basis of input resistance, output resistance, voltage gain and current gain.

c) Perform following subtraction using 2's complement method. Show the result in octal form.

i) $(512)_8 - (345)_8$

ii) $(275)_8 - (155)_8$

SLR-BD-6

Seat No.	

Set S

F.Y. (B.Tech.) (Sem - I) (NEP New) (CBCS) Examination: March/April-2025

Basic Electrical & Electronics Engineering

(BTCE0105) / (BTCSE0105) / (BTETE0105) / (BTEE0105) / (BTME0105) / (BTECE0105)

Day & Date: Wednesday, 04-June-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The peak factor of sinusoidal quantity is _____
a) 1.414 b) 1.57
c) 1.11 d) 0.637

2) A DC motor converts _____
a) Electrical energy into mechanical energy
b) Mechanical energy into electrical energy
c) Electrical energy into magnetic energy
d) Magnetic energy into electrical energy

3) PIV in full wave rectifier used in a centre tapped transformer is _____
a) Vm/π b) $2\mathrm{Vm}/\pi$
c) $2\ \mathrm{Vm}$ d) Vm

4) Ideal diode in reverse bias offers _____ resistance and is equivalent to _____ switch.
a) Zero, open b) Zero, closed
c) Infinite, closed d) Infinite, open

5) Transistor is operated as open switch in _____ region.
a) Saturation b) Cut-off
c) Active region d) None of these

6) The base of transistor is _____
a) Lightly doped b) Moderately doped
c) Heavily doped d) None

7) Octal equivalent of decimal number 375 is _____
a) 560 b) 576
c) 565 d) 567

8) Which of the following gate cannot be used as inverter?
a) XNOR b) NOR
c) NAND d) AND

9) The output of an AND gate is high when _____
a) Any input is high b) All inputs are high
c) No inputs are high d) Both a and b

10) KVL is concerned with _____
a) Junction voltages b) Junction currents
c) IR drop & emfs d) Both a & b

11) A sinusoidal alternating current has a maximum value of Im. Its average value will be _____
a) Im/π b) $\mathrm{Im}/2\pi$
c) $2\mathrm{Im}/\pi$ d) None of these

12) The reluctance of a magnetic circuit is _____
a) directly proportional to length and area
b) directly proportional to length and inversely proportional to area
c) directly proportional to area and inversely proportional to length
d) none of these

13) The reluctance of the magnetic circuit is _____
a) MMF/current b) MMF/flux
c) flux/current d) flux/MMF

14) If alternating voltage is given by, v= 230 sin (314.16t), then the frequency is _____
a) 60 Hz b) 50 Hz
c) 40 Hz d) 200 Hz

SLR-BD-6

Seat No.		Set	S

F.Y. (B.Tech.) (Sem - I) (NEP New) (CBCS) Examination: March/April-2025

Basic Electrical & Electronics Engineering

(BTCE0105) / (BTCSE0105) / (BTETE0105) / (BTEE0105) / (BTME0105) / (BTECE0105)

Day & Date: Wednesday, 04-June-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any four **16**

a) State and explain Ohm's law with its limitations.

b) Derive the expression for the division of current through three branches in parallel.

c) Explain series magnetic circuit with air-gap. Also derive the formula for total MMF.

d) Describe the working principle of single phase transformer with neat diagram.

e) Derive expression for purely inductive circuit. Draw phasor diagram.

f) A sinusoidal voltage is given by $v = 325.296 \sin(\omega t)$ volts at 50 Hz. Determine the RMS value, average value, angular frequency, time period of the voltage.

Q.3 Solve any two **12**

a) Derive the equation for converting delta resistances into equivalent star resistances.

b) An iron ring with mean length 80 cm and cross-sectional area 10 cm^2 is uniformly wound with 500 turns of wire, determine the current required to set up a flux density of 12 Wb/m^2 in the ring. Also find the value of magnetic flux and magnetic field strength. Assume relative permeability of iron is 1000.

c) Explain series R-L-C circuit for the condition $X_C > X_L$, with voltage triangle, impedance triangle and phasor diagram.

Section – II

Q.4 Solve any four. **16**

a) Explain VI characteristics of PN junction diode with neat diagram.

b) What is need of filter? Explain capacitor filter with neat diagram.

c) Explain working of BJT as switch.

d) Explain input and output characteristics of common emitter (CE) configuration of transistor.

e) State and prove distributive and commutative law.

f) Explain following logic gates with symbol, equation and truth table.
i) XOR ii) NAND iii) NOR iv) AND

Q.5 Solve any two. **12**

a) Explain half wave rectifier with suitable diagram and derive expression for ripple factor and efficiency.

b) Compare different transistor configurations on the basis of input resistance, output resistance, voltage gain and current gain.

c) Perform following subtraction using 2's complement method. Show the result in octal form.

i) $(512)_8 - (345)_8$

ii) $(275)_8 - (155)_8$

SLR-BD-7

Seat No.	

Set P

F. Y (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025

Engineering Physics

(BTCE0201 / BTME0201 / BTETE0201 / BTCSE0201 / BTEE0201) / (BTECE0201)

Day & Date: Tuesday 27-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one marks.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary.

Constants: 1) Avogadro's no., N = 6.02 x 10^{26} / k.mol
2) Velocity of light, c = 3 x 10^{8} m/sec.
3) Charge of electron, e = 1.6 x 10^{-19} C.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) In N type semiconductor majority charge Carriers are _____.
a) positive holes b) negative electrons
c) neutrons d) none of the above

2) The band gap energy of Ge is approximately _____.
a) 0.7eV b) 1.1eV
c) 0.3eV s) 2.0eV

3) Effective no. of atoms belonging to BCC _____.
a) 1 b) 3
c) 2 d) 4

4) Atomic packing fraction for face centered cubic structure is _____.
a) 0.52 b) 0.68
c) 0.74 d) 0.26

5) For cubic crystal four fold (tetrads) axes of symmetry are _____.
a) 3 b) 6
c) 4 d) 2

6) The persistence or prolongation of sound in the hall even after the source has been stopped is known as _____.
a) Echo b) Reverberation
c) Pitch d) Loudness

7) The waves used in Sonography are _____.
a) micro waves b) infrasonic waves
c) ultrasonic waves d) radio waves

8) Birefriengence or amount of double refraction for positive crystal is _____.
a) positive b) negative
c) finite d) infinite

9) The resolving power of a grating is directly proportional to _____.
a) order of diffraction b) wavelength
c) phase d) frequency

10) Emission of a photon by an atom without an external energy is called _____.
a) stimulated emission b) induced emission
c) amplified emission d) spontaneous emission

11) In He-Ne lasers, the ratio of He-Ne is in the order _____.
a) 1:10 b) 10:1
c) 1:1 d) 2:1

12) The hologram records _____ of the object.
a) Both intensity variation and phase distribution
b) Only intensity variation
c) Only phase distribution
d) None

13) The fractional refractive index change is _____.
a) $\Delta = (n_1 - n_2)/n_1$ b) $\Delta = n_1 - n_2$
c) $\Delta = n_2 - n_1$ d) $\Delta = (n_2 - n_1)/n_1$

14) The chirality of Zig-Zag CNT is _____.
a) (a, a) b) (a, b)
c) (0, b) d) (a, 0)

Seat No.	

Set **P**

F. Y (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025

Engineering Physics

(BTCE0201 / BTME0201 / BTETE0201 / BTCSE0201 / BTEE0201) / (BTECE0201)

Day & Date: Tuesday 27-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary.

Section – I

Q.2 Attempt any SIX of the following: **18**

a) Classify solids on the basis of band theory. (Insulators, semiconductors, conductors)

b) Show that in intrinsic semiconductors Fermi level lies in the middle of valence and conduction band.

c) Find the relation between lattice constant (a) and atomic radius (r) for SC and FCC.

d) Explain: Plane of symmetry

e) Define:
i) Reverberation time
ii) reverberation
iii) absorption coefficient

f) Write applications of ultrasonic waves.

g) A concrete hall of volume 2500 m^3 has total surface absorption of 205. Find reverberation time. What will be the effect if you increase the total absorption of the hall?

h) An n-type germanium sample has a donor density of $10^{21}/m^3$. It is arranged in a Hall experiment having magnetic field of 0.5 T and the current density is 500 A/m^2. Determine the Hall voltage if the sample is 3 mm wide.

Q.3 Attempt any TWO of the following: **10**

a) State Hall Effect. Derive expression for Hall voltage. State the applications of Hall Effect.

b) Explain: Miller indices. Derive an expression for the spacing between consecutive parallel planes in cubic crystal of Miller indices $(h\ k\ l)$ is given by,

$$d_{hkl} = \frac{a}{\sqrt{h^2 + k^2 + l^2}}$$

c) Write down the factors affecting the architectural acoustics and their remedies

d) Solve:

i) A classroom has dimensions 20 X 15 X 10 m^3. The reverberation time is 3.0 sec. Calculate the total absorption of its surface and the average absorption coefficient.

ii) Polonium belongs to SC lattice. If the lattice constant is 3.36Å, calculate its density. The atomic weight of polonium is 209

Section – II

Q.4 Attempt any SIX of the following: **18**

a) Explain: Rayleigh's criterion of resolution.

b) Explain: Positive and negative crystals.

c) Explain:

i) Population Inversion and

ii) Metastable state

d) State properties of LASER.

e) Explain types of optical fiber with diagram.

f) Write applications of nanotechnology in various fields.

g) What is the highest order spectrum which may be seen with monochromatic light of wavelength 6000 AU by means of diffraction grating with 5000 liens per cm.

h) The numerical aperture of an optical fiber is 0.5 and the refractive index is 1.54 Find the refractive index of the cladding.

Q.5 Attempt any TWO questions. **10**

a) What is diffraction grating? Derive an expression for the resolving power of a diffraction grating.

b) Explain: He-Ne gas laser with neat energy and transition diagram.

c) Obtain the expression for acceptance angle. Hence define acceptance cone angle.

d) i) A 20 cm long glass tube containing sugar solution rotates the plane of polarization by 11°. If the specific rotation of sugar is 66°, calculate the strength of the solution.

ii) In step index fiber, core index $n_1 = 1.45$ and cladding index $n_2 = 1.41$

Find:

i) NA

ii) Δ

iii) Acceptance angle

SLR-BD-7

Seat No.	

Set Q

F. Y (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025

Engineering Physics

(BTCE0201 / BTME0201 / BTETE0201 / BTCSE0201 / BTEE0201) / (BTECE0201)

Day & Date: Tuesday 27-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one marks.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary.

Constants: 1) Avogadro's no., N = 6.02 x 10^{26} / k.mol
2) Velocity of light, c = 3 x 10^{8} m/sec.
3) Charge of electron, e = 1.6 x 10^{-19} C.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Birefriengence or amount of double refraction for positive crystal is _____.
a) positive b) negative
c) finite d) infinite

2) The resolving power of a grating is directly proportional to _____.
a) order of diffraction b) wavelength
c) phase d) frequency

3) Emission of a photon by an atom without an external energy is called _____.
a) stimulated emission b) induced emission
c) amplified emission d) spontaneous emission

4) In He-Ne lasers, the ratio of He-Ne is in the order _____.
a) 1:10 b) 10:1
c) 1:1 d) 2:1

5) The hologram records _____ of the object.
a) Both intensity variation and phase distribution
b) Only intensity variation
c) Only phase distribution
d) None

6) The fractional refractive index change is _____.

a) $\Delta = (n_1 - n_2)/n_1$ b) $\Delta = n_1 - n_2$

c) $\Delta = n_2 - n_1$ d) $\Delta = (n_2 - n_1)/n_1$

7) The chirality of Zig-Zag CNT is _____.

a) (a, a) b) (a, b)

c) (0, b) d) (a, 0)

8) In N type semiconductor majority charge Carriers are _____.

a) positive holes b) negative electrons

c) neutrons d) none of the above

9) The band gap energy of Ge is approximately _____.

a) 0.7eV b) 1.1eV

c) 0.3eV s) 2.0eV

10) Effective no. of atoms belonging to BCC _____.

a) 1 b) 3

c) 2 d) 4

11) Atomic packing fraction for face centered cubic structure is _____.

a) 0.52 b) 0.68

c) 0.74 d) 0.26

12) For cubic crystal four fold (tetrads) axes of symmetry are _____.

a) 3 b) 6

c) 4 d) 2

13) The persistence or prolongation of sound in the hall even after the source has been stopped is known as _____.

a) Echo b) Reverberation

c) Pitch d) Loudness

14) The waves used in Sonography are _____.

a) micro waves b) infrasonic waves

c) ultrasonic waves d) radio waves

SLR-BD-7

Seat No.	

Set Q

F. Y (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025

Engineering Physics

(BTCE0201 / BTME0201 / BTETE0201 / BTCSE0201 / BTEE0201) / (BTECE0201)

Day & Date: Tuesday 27-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary.

Section – I

Q.2 Attempt any SIX of the following: **18**

a) Classify solids on the basis of band theory. (Insulators, semiconductors, conductors)

b) Show that in intrinsic semiconductors Fermi level lies in the middle of valence and conduction band.

c) Find the relation between lattice constant (a) and atomic radius (r) for SC and FCC.

d) Explain: Plane of symmetry

e) Define:
i) Reverberation time
ii) reverberation
iii) absorption coefficient

f) Write applications of ultrasonic waves.

g) A concrete hall of volume 2500 m^3 has total surface absorption of 205. Find reverberation time. What will be the effect if you increase the total absorption of the hall?

h) An n-type germanium sample has a donor density of $10^{21}/m^3$. It is arranged in a Hall experiment having magnetic field of 0.5 T and the current density is 500 A/m^2. Determine the Hall voltage if the sample is 3 mm wide.

Q.3 Attempt any TWO of the following: **10**

a) State Hall Effect. Derive expression for Hall voltage. State the applications of Hall Effect.

b) Explain: Miller indices. Derive an expression for the spacing between consecutive parallel planes in cubic crystal of Miller indices $(h\ k\ l)$ is given by,

$$d_{hkl} = \frac{a}{\sqrt{h^2 + k^2 + l^2}}$$

c) Write down the factors affecting the architectural acoustics and their remedies

d) Solve:

i) A classroom has dimensions 20 X 15 X 10 m^3. The reverberation time is 3.0 sec. Calculate the total absorption of its surface and the average absorption coefficient.

ii) Polonium belongs to SC lattice. If the lattice constant is 3.36Å, calculate its density. The atomic weight of polonium is 209

Section – II

Q.4 Attempt any SIX of the following: **18**

a) Explain: Rayleigh's criterion of resolution.

b) Explain: Positive and negative crystals.

c) Explain:

i) Population Inversion and

ii) Metastable state

d) State properties of LASER.

e) Explain types of optical fiber with diagram.

f) Write applications of nanotechnology in various fields.

g) What is the highest order spectrum which may be seen with monochromatic light of wavelength 6000 AU by means of diffraction grating with 5000 liens per cm.

h) The numerical aperture of an optical fiber is 0.5 and the refractive index is 1.54 Find the refractive index of the cladding.

Q.5 Attempt any TWO questions. **10**

a) What is diffraction grating? Derive an expression for the resolving power of a diffraction grating.

b) Explain: He-Ne gas laser with neat energy and transition diagram.

c) Obtain the expression for acceptance angle. Hence define acceptance cone angle.

d) i) A 20 cm long glass tube containing sugar solution rotates the plane of polarization by 11°. If the specific rotation of sugar is 66°, calculate the strength of the solution.

ii) In step index fiber, core index $n_1 = 1.45$ and cladding index $n_2 = 1.41$

Find:

i) NA

ii) Δ

iii) Acceptance angle

SLR-BD-7

Seat No.	

Set R

F. Y (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025

Engineering Physics

(BTCE0201 / BTME0201 / BTETE0201 / BTCSE0201 / BTEE0201) / (BTECE0201)

Day & Date: Tuesday 27-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one marks.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary.

Constants: 1) Avogadro's no., N = 6.02 x 10^{26} / k.mol
2) Velocity of light, c = 3 x 10^{8} m/sec.
3) Charge of electron, e = 1.6 x 10^{-19} C.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) In He-Ne lasers, the ratio of He-Ne is in the order _____.
a) 1:10 b) 10:1
c) 1:1 d) 2:1

2) The hologram records _____ of the object.
a) Both intensity variation and phase distribution
b) Only intensity variation
c) Only phase distribution
d) None

3) The fractional refractive index change is _____.
a) $\Delta = (n_1 - n_2)/n_1$ b) $\Delta = n_1 - n_2$
c) $\Delta = n_2 - n_1$ d) $\Delta = (n_2 - n_1)/n_1$

4) The chirality of Zig-Zag CNT is _____.
a) (a, a) b) (a, b)
c) (0, b) d) (a, 0)

5) In N type semiconductor majority charge Carriers are _____.
a) positive holes b) negative electrons
c) neutrons d) none of the above

6) The band gap energy of Ge is approximately _____.
a) 0.7eV b) 1.1eV
c) 0.3eV s) 2.0eV

7) Effective no. of atoms belonging to BCC _____.
a) 1 b) 3
c) 2 d) 4

8) Atomic packing fraction for face centered cubic structure is _____.
a) 0.52 b) 0.68
c) 0.74 d) 0.26

9) For cubic crystal four fold (tetrads) axes of symmetry are _____.
a) 3 b) 6
c) 4 d) 2

10) The persistence or prolongation of sound in the hall even after the source has been stopped is known as _____.
a) Echo b) Reverberation
c) Pitch d) Loudness

11) The waves used in Sonography are _____.
a) micro waves b) infrasonic waves
c) ultrasonic waves d) radio waves

12) Birefriengence or amount of double refraction for positive crystal is _____.
a) positive b) negative
c) finite d) infinite

13) The resolving power of a grating is directly proportional to _____.
a) order of diffraction b) wavelength
c) phase d) frequency

14) Emission of a photon by an atom without an external energy is called _____.
a) stimulated emission b) induced emission
c) amplified emission d) spontaneous emission

SLR-BD-7

Seat No.	

Set R

F. Y (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025

Engineering Physics

(BTCE0201 / BTME0201 / BTETE0201 / BTCSE0201 / BTEE0201) / (BTECE0201)

Day & Date: Tuesday 27-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary.

Section – I

Q.2 Attempt any SIX of the following: **18**

a) Classify solids on the basis of band theory. (Insulators, semiconductors, conductors)

b) Show that in intrinsic semiconductors Fermi level lies in the middle of valence and conduction band.

c) Find the relation between lattice constant (a) and atomic radius (r) for SC and FCC.

d) Explain: Plane of symmetry

e) Define:
i) Reverberation time
ii) reverberation
iii) absorption coefficient

f) Write applications of ultrasonic waves.

g) A concrete hall of volume 2500 m^3 has total surface absorption of 205. Find reverberation time. What will be the effect if you increase the total absorption of the hall?

h) An n-type germanium sample has a donor density of $10^{21}/m^3$. It is arranged in a Hall experiment having magnetic field of 0.5 T and the current density is 500 A/m^2. Determine the Hall voltage if the sample is 3 mm wide.

Q.3 Attempt any TWO of the following: **10**

a) State Hall Effect. Derive expression for Hall voltage. State the applications of Hall Effect.

b) Explain: Miller indices. Derive an expression for the spacing between consecutive parallel planes in cubic crystal of Miller indices $(h\ k\ l)$ is given by,

$$d_{hkl} = \frac{a}{\sqrt{h^2 + k^2 + l^2}}$$

c) Write down the factors affecting the architectural acoustics and their remedies

d) Solve:

i) A classroom has dimensions 20 X 15 X 10 m^3. The reverberation time is 3.0 sec. Calculate the total absorption of its surface and the average absorption coefficient.

ii) Polonium belongs to SC lattice. If the lattice constant is 3.36Å, calculate its density. The atomic weight of polonium is 209

Section – II

Q.4 Attempt any SIX of the following: **18**

a) Explain: Rayleigh's criterion of resolution.

b) Explain: Positive and negative crystals.

c) Explain:

i) Population Inversion and

ii) Metastable state

d) State properties of LASER.

e) Explain types of optical fiber with diagram.

f) Write applications of nanotechnology in various fields.

g) What is the highest order spectrum which may be seen with monochromatic light of wavelength 6000 AU by means of diffraction grating with 5000 liens per cm.

h) The numerical aperture of an optical fiber is 0.5 and the refractive index is 1.54 Find the refractive index of the cladding.

Q.5 Attempt any TWO questions. **10**

a) What is diffraction grating? Derive an expression for the resolving power of a diffraction grating.

b) Explain: He-Ne gas laser with neat energy and transition diagram.

c) Obtain the expression for acceptance angle. Hence define acceptance cone angle.

d) i) A 20 cm long glass tube containing sugar solution rotates the plane of polarization by 11°. If the specific rotation of sugar is 66°, calculate the strength of the solution.

ii) In step index fiber, core index $n_1 = 1.45$ and cladding index $n_2 = 1.41$

Find:

i) NA

ii) Δ

iii) Acceptance angle

SLR-BD-7

Seat No.	

Set S

F. Y (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025

Engineering Physics

(BTCE0201 / BTME0201 / BTETE0201 / BTCSE0201 / BTEE0201) / (BTECE0201)

Day & Date: Tuesday 27-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one marks.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary.

Constants: 1) Avogadro's no., N = 6.02 x 10^{26} / k.mol
2) Velocity of light, c = 3 x 10^{8} m/sec.
3) Charge of electron, e = 1.6 x 10^{-19} C.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) The persistence or prolongation of sound in the hall even after the source has been stopped is known as _____.
a) Echo b) Reverberation
c) Pitch d) Loudness

2) The waves used in Sonography are _____.
a) micro waves b) infrasonic waves
c) ultrasonic waves d) radio waves

3) Birefriengence or amount of double refraction for positive crystal is _____.
a) positive b) negative
c) finite d) infinite

4) The resolving power of a grating is directly proportional to _____.
a) order of diffraction b) wavelength
c) phase d) frequency

5) Emission of a photon by an atom without an external energy is called _____.
a) stimulated emission b) induced emission
c) amplified emission d) spontaneous emission

6) In He-Ne lasers, the ratio of He-Ne is in the order _____.
a) 1:10 b) 10:1
c) 1:1 d) 2:1

7) The hologram records _____ of the object.
a) Both intensity variation and phase distribution
b) Only intensity variation
c) Only phase distribution
d) None

8) The fractional refractive index change is _____.
a) $\Delta = (n_1 - n_2)/n_1$ b) $\Delta = n_1 - n_2$
c) $\Delta = n_2 - n_1$ d) $\Delta = (n_2 - n_1)/n_1$

9) The chirality of Zig-Zag CNT is _____.
a) (a, a) b) (a, b)
c) (0, b) d) (a, 0)

10) In N type semiconductor majority charge Carriers are _____.
a) positive holes b) negative electrons
c) neutrons d) none of the above

11) The band gap energy of Ge is approximately _____.
a) 0.7eV b) 1.1eV
c) 0.3eV s) 2.0eV

12) Effective no. of atoms belonging to BCC _____.
a) 1 b) 3
c) 2 d) 4

13) Atomic packing fraction for face centered cubic structure is _____.
a) 0.52 b) 0.68
c) 0.74 d) 0.26

14) For cubic crystal four fold (tetrads) axes of symmetry are _____.
a) 3 b) 6
c) 4 d) 2

SLR-BD-7

Seat No.	

Set | **S**

F. Y (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025

Engineering Physics

(BTCE0201 / BTME0201 / BTETE0201 / BTCSE0201 / BTEE0201) / (BTECE0201)

Day & Date: Tuesday 27-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary.

Section – I

Q.2 Attempt any SIX of the following: **18**

a) Classify solids on the basis of band theory. (Insulators, semiconductors, conductors)

b) Show that in intrinsic semiconductors Fermi level lies in the middle of valence and conduction band.

c) Find the relation between lattice constant (a) and atomic radius (r) for SC and FCC.

d) Explain: Plane of symmetry

e) Define:
i) Reverberation time
ii) reverberation
iii) absorption coefficient

f) Write applications of ultrasonic waves.

g) A concrete hall of volume 2500 m^3 has total surface absorption of 205. Find reverberation time. What will be the effect if you increase the total absorption of the hall?

h) An n-type germanium sample has a donor density of $10^{21}/m^3$. It is arranged in a Hall experiment having magnetic field of 0.5 T and the current density is 500 A/m^2. Determine the Hall voltage if the sample is 3 mm wide.

Q.3 Attempt any TWO of the following: **10**

a) State Hall Effect. Derive expression for Hall voltage. State the applications of Hall Effect.

b) Explain: Miller indices. Derive an expression for the spacing between consecutive parallel planes in cubic crystal of Miller indices $(h\ k\ l)$ is given by,

$$d_{hkl} = \frac{a}{\sqrt{h^2 + k^2 + l^2}}$$

c) Write down the factors affecting the architectural acoustics and their remedies

d) Solve:

i) A classroom has dimensions 20 X 15 X 10 m^3. The reverberation time is 3.0 sec. Calculate the total absorption of its surface and the average absorption coefficient.

ii) Polonium belongs to SC lattice. If the lattice constant is 3.36Å, calculate its density. The atomic weight of polonium is 209

Section – II

Q.4 Attempt any SIX of the following: **18**

a) Explain: Rayleigh's criterion of resolution.

b) Explain: Positive and negative crystals.

c) Explain:

i) Population Inversion and

ii) Metastable state

d) State properties of LASER.

e) Explain types of optical fiber with diagram.

f) Write applications of nanotechnology in various fields.

g) What is the highest order spectrum which may be seen with monochromatic light of wavelength 6000 AU by means of diffraction grating with 5000 liens per cm.

h) The numerical aperture of an optical fiber is 0.5 and the refractive index is 1.54 Find the refractive index of the cladding.

Q.5 Attempt any TWO questions. **10**

a) What is diffraction grating? Derive an expression for the resolving power of a diffraction grating.

b) Explain: He-Ne gas laser with neat energy and transition diagram.

c) Obtain the expression for acceptance angle. Hence define acceptance cone angle.

d) i) A 20 cm long glass tube containing sugar solution rotates the plane of polarization by 11°. If the specific rotation of sugar is 66°, calculate the strength of the solution.

ii) In step index fiber, core index $n_1 = 1.45$ and cladding index $n_2 = 1.41$

Find:

i) NA

ii) Δ

iii) Acceptance angle

SLR-BD-8

Seat No.	

Set P

F.Y (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
Engineering Chemistry
(BTCE0202 / BTME0202 / BTETE0202 / BTCSE0202 / BTEE0202) / (BTECE0202)

Day & Date: Thursday 29-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat and labeled diagrams wherever necessary

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Water containing magnesium bicarbonate and calcium chloride is: ____.
a) Soft only b) Temporary hard only
c) Permanent hard only d) Both temporary and permanent hard

2) Water is hard when it contains: ____.
a) acid solution b) precipitate in suspension
c) dissolved sodium salts d) dissolved Ca and Mg salts

3) Water matching distilled water is obtained by using: ____.
a) Zeolite process b) Ion exchange process
c) lime soda process d) Boiling

4) When graphite is dispersed in oil, it is called: ____.
a) greases b) aquadag
c) oildag d) blended oil

5) Oiliness is least in case of: ____.
a) greases b) mineral oils
c) animal oils d) palm oils

6) Corrosion is an example of: _____.
a) Oxidation b) Reduction
c) Electrolysis d) Extraction of metal

7) Nonvolatile film-forming constituents of a paint is called ____.
a) drier b) pigments
c) thinner d) drying oil

8) A good fuel should have _____.
a) high moisture content
b) low calorific value
c) moderate ignition temperature
d) high ash content

9) A good fuel should possess ____.
a) low calorific value b) high ignition temperature
c) high calorific value d) high ash content

10) Structural units of high polymers, are called _____.
a) Fibers b) thermo units
c) Monomers d) Fabrics

11) Most commonly used vulcanizing agent is ____.
a) Graphite b) Carbon black
c) Dry ice d) Sulphur

12) Which of the following is an elastomer?
a) PVC b) Bakelite
c) Natural rubber d) Nylon

13) Which of the following technique is used to detect the steroid consumed by athletes in international sports competition?
a) IR spectroscopy b) Gas chromatography
c) UV spectroscopy d) pH measurement

14) Which of the following gas cannot be used as carrier gas in chromatography?
a) Nitrogen b) Argon
c) Oxygen d) All of these

SLR-BD-8

Seat No.	

Set P

F.Y (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
Engineering Chemistry
(BTCE0202 / BTME0202 / BTETE0202 / BTCSE0202 / BTEE0202) / (BTECE0202)

Day & Date: Thursday 29-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat and labeled diagrams wherever necessary.

Section – I

Q.2 Attempt the following: (Any Four) **16**

a) A sample of water on analysis was found to contain the following impurities in mg/lit:

	Amount	**Mo. Wt.**
$Ca(HCO_3)_2$	20.15	162
$Mg(HCO_3)_2$	38.73	146
$MgSO_4$	44.10	120
$CaCl_2$	53.90	111

Calculate the temporary, permanent, and total hardness of water in mg/lit.

b) Define aeration Explain different types of aerators.

c) Define following terms
i) Oiliness
ii) Acid value
iii) Flash point
iv) Aniline point

d) Select proper lubricants for
i) Gears
ii) Refrigeration systems

e) Define corrosion. Explain Hydrogen evolution mechanism in electrochemical corrosion.

f) Explain prevention of corrosion by galvanizing and tinning.

Q.3 Attempt the following: (Any Four) **12**

a) Define disinfection. Explain disinfection of water by chloramine.

b) Define COD. Explain determination of COD. Explain is its significance.

c) Explain mechanism of extreme pressure lubrication.

d) 7 gm of an oil sample after saponification with 75 ml of N/2 alcoholic KOH solution and subsequent titration with N/2 HCl gave the titre value of 15 ml to phenolphthalein end point. A blank experiment was conducted without taking oil sample. On repeating same procedure gave a titer value of 75 ml. Calculate saponification value of an oil sample.

e) Explain composition, properties, and applications of cast iron.

f) Explain testing and measurement of corrosion by electrical resistance method.

Section – II

Q.4 Attempt the following: (Any Four) **16**

a) During the determination of calorific value of a gaseous fuel by Boy's calorimeter, the following results were obtained:

Volume of the gaseous fuel burnt at STP	= 0.12 m^3
Weight of water used for cooling	= 35.2 Kg
Weight of steam condensed	= 0.055 Kg
Temperature of Inlet water	= 26.1^{0}C
Temperature of Outlet water	= 40.5^{0}C

Determine the gross and net calorific values of gaseous fuel.
(Take latent heat of condensation of steam = 587 kcal/kg)

b) Explain construction and working of bomb calorimeter.

c) Compare solid and gaseous fuels.

d) Explain molding of plastics in to articles by following methods.
i) Injection molding
ii) Transfer molding

e) Explain thermosoftening and thermosetting plastics.

f) Explain how components of mixture are separated by GLC.

Q.5 Attempt the following: (Any Four) **12**

a) Explain charging & discharging of Li-ion batteries.

b) Define biodiesel. Explain preparation of biodiesel by transesterification process.

c) Explain synthesis, properties, and applications of PVC.

d) Explain instrumentation of TGA.

e) A polymer has following population
15 molecules have molecular weight each 19000
20 molecules have molecular weight each 22000
25 molecules have molecular weight each 24000
30 molecules have molecular weight each 26000
Calculate its number average molecular weight.

f) Calculate weight of $AgNO_3$ required to prepare 0.07 M 500 ml solution. (Mol. Wt. of $AgNO_3$ = 170)

SLR-BD-8

Seat No.	

Set Q

F.Y (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
Engineering Chemistry
(BTCE0202 / BTME0202 / BTETE0202 / BTCSE0202 / BTEE0202) / (BTECE0202)

Day & Date: Thursday 29-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat and labeled diagrams wherever necessary

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) A good fuel should have _____.
a) high moisture content
b) low calorific value
c) moderate ignition temperature
d) high ash content

2) A good fuel should possess ____.
a) low calorific value b) high ignition temperature
c) high calorific value d) high ash content

3) Structural units of high polymers, are called _____.
a) Fibers b) thermo units
c) Monomers d) Fabrics

4) Most commonly used vulcanizing agent is ____.
a) Graphite b) Carbon black
c) Dry ice d) Sulphur

5) Which of the following is an elastomer?
a) PVC b) Bakelite
c) Natural rubber d) Nylon

6) Which of the following technique is used to detect the steroid consumed by athletes in international sports competition?
a) IR spectroscopy b) Gas chromatography
c) UV spectroscopy d) pH measurement

7) Which of the following gas cannot be used as carrier gas in chromatography?

a) Nitrogen b) Argon
c) Oxygen d) All of these

8) Water containing magnesium bicarbonate and calcium chloride is: ____.

a) Soft only b) Temporary hard only
c) Permanent hard only d) Both temporary and permanent hard

9) Water is hard when it contains: ____.

a) acid solution b) precipitate in suspension
c) dissolved sodium salts d) dissolved Ca and Mg salts

10) Water matching distilled water is obtained by using: ____.

a) Zeolite process b) Ion exchange process
c) lime soda process d) Boiling

11) When graphite is dispersed in oil, it is called: ____.

a) greases b) aquadag
c) oildag d) blended oil

12) Oiliness is least in case of: ____.

a) greases b) mineral oils
c) animal oils d) palm oils

13) Corrosion is an example of: _____.

a) Oxidation b) Reduction
c) Electrolysis d) Extraction of metal

14) Nonvolatile film-forming constituents of a paint is called ____.

a) drier b) pigments
c) thinner d) drying oil

Seat No.	

Set **Q**

F.Y (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
Engineering Chemistry
(BTCE0202 / BTME0202 / BTETE0202 / BTCSE0202 / BTEE0202) / (BTECE0202)

Day & Date: Thursday 29-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat and labeled diagrams wherever necessary.

Section – I

Q.2 Attempt the following: (Any Four) **16**

a) A sample of water on analysis was found to contain the following impurities in mg/lit:

	Amount	**Mo. Wt.**
$Ca(HCO_3)_2$	20.15	162
$Mg(HCO_3)_2$	38.73	146
$MgSO_4$	44.10	120
$CaCl_2$	53.90	111

Calculate the temporary, permanent, and total hardness of water in mg/lit.

b) Define aeration Explain different types of aerators.

c) Define following terms
i) Oiliness
ii) Acid value
iii) Flash point
iv) Aniline point

d) Select proper lubricants for
i) Gears
ii) Refrigeration systems

e) Define corrosion. Explain Hydrogen evolution mechanism in electrochemical corrosion.

f) Explain prevention of corrosion by galvanizing and tinning.

Q.3 Attempt the following: (Any Four) **12**

a) Define disinfection. Explain disinfection of water by chloramine.

b) Define COD. Explain determination of COD. Explain is its significance.

c) Explain mechanism of extreme pressure lubrication.

d) 7 gm of an oil sample after saponification with 75 ml of N/2 alcoholic KOH solution and subsequent titration with N/2 HCl gave the titre value of 15 ml to phenolphthalein end point. A blank experiment was conducted without taking oil sample. On repeating same procedure gave a titer value of 75 ml. Calculate saponification value of an oil sample.

e) Explain composition, properties, and applications of cast iron.

f) Explain testing and measurement of corrosion by electrical resistance method.

Section – II

Q.4 Attempt the following: (Any Four) **16**

a) During the determination of calorific value of a gaseous fuel by Boy's calorimeter, the following results were obtained:

Volume of the gaseous fuel burnt at STP	= 0.12 m^3
Weight of water used for cooling	= 35.2 Kg
Weight of steam condensed	= 0.055 Kg
Temperature of Inlet water	= 26.1^{0}C
Temperature of Outlet water	= 40.5^{0}C

Determine the gross and net calorific values of gaseous fuel.
(Take latent heat of condensation of steam = 587 kcal/kg)

b) Explain construction and working of bomb calorimeter.

c) Compare solid and gaseous fuels.

d) Explain molding of plastics in to articles by following methods.
i) Injection molding
ii) Transfer molding

e) Explain thermosoftening and thermosetting plastics.

f) Explain how components of mixture are separated by GLC.

Q.5 Attempt the following: (Any Four) **12**

a) Explain charging & discharging of Li-ion batteries.

b) Define biodiesel. Explain preparation of biodiesel by transesterification process.

c) Explain synthesis, properties, and applications of PVC.

d) Explain instrumentation of TGA.

e) A polymer has following population
15 molecules have molecular weight each 19000
20 molecules have molecular weight each 22000
25 molecules have molecular weight each 24000
30 molecules have molecular weight each 26000
Calculate its number average molecular weight.

f) Calculate weight of $AgNO_3$ required to prepare 0.07 M 500 ml solution. (Mol. Wt. of $AgNO_3$ = 170)

SLR-BD-8

Seat No.	

Set R

F.Y (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
Engineering Chemistry
(BTCE0202 / BTME0202 / BTETE0202 / BTCSE0202 / BTEE0202) / (BTECE0202)

Day & Date: Thursday 29-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat and labeled diagrams wherever necessary

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Most commonly used vulcanizing agent is ____.
a) Graphite b) Carbon black
c) Dry ice d) Sulphur

2) Which of the following is an elastomer?
a) PVC b) Bakelite
c) Natural rubber d) Nylon

3) Which of the following technique is used to detect the steroid consumed by athletes in international sports competition?
a) IR spectroscopy b) Gas chromatography
c) UV spectroscopy d) pH measurement

4) Which of the following gas cannot be used as carrier gas in chromatography?
a) Nitrogen b) Argon
c) Oxygen d) All of these

5) Water containing magnesium bicarbonate and calcium chloride is: ____.
a) Soft only b) Temporary hard only
c) Permanent hard only d) Both temporary and permanent hard

6) Water is hard when it contains: ____.
a) acid solution b) precipitate in suspension
c) dissolved sodium salts d) dissolved Ca and Mg salts

7) Water matching distilled water is obtained by using: ____.
a) Zeolite process b) Ion exchange process
c) lime soda process d) Boiling

8) When graphite is dispersed in oil, it is called: ____.
a) greases b) aquadag
c) oildag d) blended oil

9) Oiliness is least in case of: ____.
a) greases b) mineral oils
c) animal oils d) palm oils

10) Corrosion is an example of: _____.
a) Oxidation b) Reduction
c) Electrolysis d) Extraction of metal

11) Nonvolatile film-forming constituents of a paint is called ____.
a) drier b) pigments
c) thinner d) drying oil

12) A good fuel should have _____.
a) high moisture content
b) low calorific value
c) moderate ignition temperature
d) high ash content

13) A good fuel should possess ____.
a) low calorific value b) high ignition temperature
c) high calorific value d) high ash content

14) Structural units of high polymers, are called _____.
a) Fibers b) thermo units
c) Monomers d) Fabrics

SLR-BD-8

Seat No.	

Set R

F.Y (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
Engineering Chemistry
(BTCE0202 / BTME0202 / BTETE0202 / BTCSE0202 / BTEE0202) / (BTECE0202)

Day & Date: Thursday 29-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat and labeled diagrams wherever necessary.

Section – I

Q.2 Attempt the following: (Any Four) **16**

a) A sample of water on analysis was found to contain the following impurities in mg/lit:

	Amount	**Mo. Wt.**
$Ca(HCO_3)_2$	20.15	162
$Mg(HCO_3)_2$	38.73	146
$MgSO_4$	44.10	120
$CaCl_2$	53.90	111

Calculate the temporary, permanent, and total hardness of water in mg/lit.

b) Define aeration Explain different types of aerators.

c) Define following terms
i) Oiliness
ii) Acid value
iii) Flash point
iv) Aniline point

d) Select proper lubricants for
i) Gears
ii) Refrigeration systems

e) Define corrosion. Explain Hydrogen evolution mechanism in electrochemical corrosion.

f) Explain prevention of corrosion by galvanizing and tinning.

Q.3 Attempt the following: (Any Four) **12**

a) Define disinfection. Explain disinfection of water by chloramine.

b) Define COD. Explain determination of COD. Explain is its significance.

c) Explain mechanism of extreme pressure lubrication.

d) 7 gm of an oil sample after saponification with 75 ml of N/2 alcoholic KOH solution and subsequent titration with N/2 HCl gave the titre value of 15 ml to phenolphthalein end point. A blank experiment was conducted without taking oil sample. On repeating same procedure gave a titer value of 75 ml. Calculate saponification value of an oil sample.

e) Explain composition, properties, and applications of cast iron.

f) Explain testing and measurement of corrosion by electrical resistance method.

Section – II

Q.4 Attempt the following: (Any Four) **16**

a) During the determination of calorific value of a gaseous fuel by Boy's calorimeter, the following results were obtained:

Volume of the gaseous fuel burnt at STP	= 0.12 m^3
Weight of water used for cooling	= 35.2 Kg
Weight of steam condensed	= 0.055 Kg
Temperature of Inlet water	= 26.1^{0}C
Temperature of Outlet water	= 40.5^{0}C

Determine the gross and net calorific values of gaseous fuel.
(Take latent heat of condensation of steam = 587 kcal/kg)

b) Explain construction and working of bomb calorimeter.

c) Compare solid and gaseous fuels.

d) Explain molding of plastics in to articles by following methods.
i) Injection molding
ii) Transfer molding

e) Explain thermosoftening and thermosetting plastics.

f) Explain how components of mixture are separated by GLC.

Q.5 Attempt the following: (Any Four) **12**

a) Explain charging & discharging of Li-ion batteries.

b) Define biodiesel. Explain preparation of biodiesel by transesterification process.

c) Explain synthesis, properties, and applications of PVC.

d) Explain instrumentation of TGA.

e) A polymer has following population
15 molecules have molecular weight each 19000
20 molecules have molecular weight each 22000
25 molecules have molecular weight each 24000
30 molecules have molecular weight each 26000
Calculate its number average molecular weight.

f) Calculate weight of $AgNO_3$ required to prepare 0.07 M 500 ml solution. (Mol. Wt. of $AgNO_3$ = 170)

SLR-BD-8

Seat No.	

Set S

F.Y (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
Engineering Chemistry
(BTCE0202 / BTME0202 / BTETE0202 / BTCSE0202 / BTEE0202) / (BTECE0202)

Day & Date: Thursday 29-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat and labeled diagrams wherever necessary

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Corrosion is an example of: _____.
a) Oxidation b) Reduction
c) Electrolysis d) Extraction of metal

2) Nonvolatile film-forming constituents of a paint is called ____.
a) drier b) pigments
c) thinner d) drying oil

3) A good fuel should have _____.
a) high moisture content
b) low calorific value
c) moderate ignition temperature
d) high ash content

4) A good fuel should possess ____.
a) low calorific value b) high ignition temperature
c) high calorific value d) high ash content

5) Structural units of high polymers, are called _____.
a) Fibers b) thermo units
c) Monomers d) Fabrics

6) Most commonly used vulcanizing agent is ____.
a) Graphite b) Carbon black
c) Dry ice d) Sulphur

7) Which of the following is an elastomer?
a) PVC b) Bakelite
c) Natural rubber d) Nylon

8) Which of the following technique is used to detect the steroid consumed by athletes in international sports competition?

a) IR spectroscopy b) Gas chromatography
c) UV spectroscopy d) pH measurement

9) Which of the following gas cannot be used as carrier gas in chromatography?

a) Nitrogen b) Argon
c) Oxygen d) All of these

10) Water containing magnesium bicarbonate and calcium chloride is: ____.

a) Soft only b) Temporary hard only
c) Permanent hard only d) Both temporary and permanent hard

11) Water is hard when it contains: ____.

a) acid solution b) precipitate in suspension
c) dissolved sodium salts d) dissolved Ca and Mg salts

12) Water matching distilled water is obtained by using: ____.

a) Zeolite process b) Ion exchange process
c) lime soda process d) Boiling

13) When graphite is dispersed in oil, it is called: ____.

a) greases b) aquadag
c) oildag d) blended oil

14) Oiliness is least in case of: ____.

a) greases b) mineral oils
c) animal oils d) palm oils

SLR-BD-8

Seat No.		Set	S

F.Y (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
Engineering Chemistry
(BTCE0202 / BTME0202 / BTETE0202 / BTCSE0202 / BTEE0202) / (BTECE0202)

Day & Date: Thursday 29-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat and labeled diagrams wherever necessary.

Section – I

Q.2 Attempt the following: (Any Four) **16**

a) A sample of water on analysis was found to contain the following impurities in mg/lit:

	Amount	Mo. Wt.
$Ca(HCO_3)_2$	20.15	162
$Mg(HCO_3)_2$	38.73	146
$MgSO_4$	44.10	120
$CaCl_2$	53.90	111

Calculate the temporary, permanent, and total hardness of water in mg/lit.

b) Define aeration Explain different types of aerators.

c) Define following terms
i) Oiliness
ii) Acid value
iii) Flash point
iv) Aniline point

d) Select proper lubricants for
i) Gears
ii) Refrigeration systems

e) Define corrosion. Explain Hydrogen evolution mechanism in electrochemical corrosion.

f) Explain prevention of corrosion by galvanizing and tinning.

Q.3 Attempt the following: (Any Four) **12**

a) Define disinfection. Explain disinfection of water by chloramine.

b) Define COD. Explain determination of COD. Explain is its significance.

c) Explain mechanism of extreme pressure lubrication.

d) 7 gm of an oil sample after saponification with 75 ml of N/2 alcoholic KOH solution and subsequent titration with N/2 HCl gave the titre value of 15 ml to phenolphthalein end point. A blank experiment was conducted without taking oil sample. On repeating same procedure gave a titer value of 75 ml. Calculate saponification value of an oil sample.

e) Explain composition, properties, and applications of cast iron.

f) Explain testing and measurement of corrosion by electrical resistance method.

Section – II

Q.4 Attempt the following: (Any Four) **16**

a) During the determination of calorific value of a gaseous fuel by Boy's calorimeter, the following results were obtained:

Volume of the gaseous fuel burnt at STP	= 0.12 m^3
Weight of water used for cooling	= 35.2 Kg
Weight of steam condensed	= 0.055 Kg
Temperature of Inlet water	= 26.1^{0}C
Temperature of Outlet water	= 40.5^{0}C

Determine the gross and net calorific values of gaseous fuel.
(Take latent heat of condensation of steam = 587 kcal/kg)

b) Explain construction and working of bomb calorimeter.

c) Compare solid and gaseous fuels.

d) Explain molding of plastics in to articles by following methods.
i) Injection molding
ii) Transfer molding

e) Explain thermosoftening and thermosetting plastics.

f) Explain how components of mixture are separated by GLC.

Q.5 Attempt the following: (Any Four) **12**

a) Explain charging & discharging of Li-ion batteries.

b) Define biodiesel. Explain preparation of biodiesel by transesterification process.

c) Explain synthesis, properties, and applications of PVC.

d) Explain instrumentation of TGA.

e) A polymer has following population
15 molecules have molecular weight each 19000
20 molecules have molecular weight each 22000
25 molecules have molecular weight each 24000
30 molecules have molecular weight each 26000
Calculate its number average molecular weight.

f) Calculate weight of $AgNO_3$ required to prepare 0.07 M 500 ml solution. (Mol. Wt. of $AgNO_3$ = 170)

SLR-BD-9

Seat No.	

Set P

F.Y. (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
Basics of Civil and Mechanical Engineering (BTCE0204/ BTME0204/ BTETE0204/ BTCSE0204/ BTEE0204)/ (BTECE0204)

Day & Date: Monday, 02-06-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.
5) Use of non-programmable single memory calculator is allowed.

Section - I

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 07

Q.1 Multiple Choice Questions. **07**

1) The process of killing the infective bacteria from the water and making it safe to the user is called _____.
a) Softening b) Disinfection
c) Coagulation d) Flocculation

2) Following sub branch of Civil Engineering is related with supply of water to crops.
a) Irrigation b) Environmental Engineering
c) Foundation Engineering d) Soil Mechanics

3) Portion of structure between ground level and floor level is called as _____.
a) Plinth b) Superstructure
c) Substructure d) None of the above

4) GPS stand for _____.
a) Government Public System
b) Global Positioning System
c) Global Police System
d) Geographic Positioning Sharing

5) Green buildings are recommended to _____.
a) Use green color b) Use farm house
c) Reduce global warming d) Achieve economy

6) A point on which both fore sight and back sight readings are taken is known as ____.

a) Change point
b) Fore sight point
c) Back sight point
d) None of the above

7) Following is the branch of Civil Engineering _____.

a) Mechanical Engineering
b) Electrical Engineering
c) Environmental Engineering
d) None of these

Section - II

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 07

Q.1 Choose the correct answer. **07**

1) Pressure cooker is _____ system.
a) open system b) close system
c) Isolated system d) Adiabatic System

2) The devices, pumps, compressor, refrigerators, air conditioners which require input energy for their operation are called _____.
a) power absorbing devices
b) power producing devices
c) power transferring devices
d) none

3) It is impossible to construct a heat engine which operates in a cycle produces no effect except production of work & exchange of heat with single reservoir.
a) Kelvin plank law b) Clausius law
c) Carnot theorem d) None

4) Which of the following is sliding part of lathe?
a) Headstock b) Tailstock
c) Both a and b d) None of these

5) Generally sheet metals are welded by following joining process _____.
a) Arc welding b) Spot welding
c) TIG welding d) None of these

6) The coefficient of friction in belt drive depends upon _____.
a) material of belt b) material of pulley
c) materials of belt and pulley d) belt velocity

7) Which of the following is not an extensive property of a thermodynamic system?
a) total mass b) total volume
c) total internal energy d) temperature

SLR-BD-9

Seat No.	

Set P

F.Y. (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
Basics of Civil and Mechanical Engineering (BTCE0204/ BTME0204/ BTETE0204/ BTCSE0204/ BTEE0204)/ (BTECE0204)

Day & Date: Monday, 02-06-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q.No.2 and Q.No.4 are short answer type questions.
2) Q.No.3 and Q.No.5 are long answer type questions.
3) Use of non-programmable single memory calculator is allowed.
4) Assume suitable data if required.

Section - I

Q.2 Answer any FIVE of the following. **15**

a) Which are the sub branches of civil engineering? Describe anyone. **03**

b) Write note on rain water harvesting. **03**

c) State the unit operations of water treatment plant & explain aeration. **03**

d) Explain the relevance of Civil Engineering branch with Mechanical engineering. **03**

e) State the function of following: **03**
i) Wall
ii) Chajja
iii) Lintel

f) State and explain classification of Solid waste. **03**

g) Explain the application of Remote Sensing Technique. **03**

Q.3 Solve any one out of (a) and (b) and solve any two out of (c) to (f). **13**

a) Following readings were taken with dumpy level: **05**
1.580, 0.635, 2.035, 1.765, 1.660, 0.925, 1.035, 1.960.
The instrument was shifted after third and fifth reading. The RL of first point was 950.000 m. Calculate the RL's of all other points by Rise and Fall method and apply check.

b) The following reading were taken with dumpy level and a 4m staff at every 20 m. 1.360, 1.745, 1.920, 0.970, 1.860, 2.340, 2.675, 1.895, 2.415, 2.630, 1.970, 2.320. The instrument was shifted after 3rd, 7th and 10th reading. The RL of first point was 170.000 m. Calculate the RL's of all other points by Height of Instrument method and apply check. **05**

c) Differentiate between load bearing structure & framed structure. **04**

d) Explain principles of surveying. **04**

e) Write a note on green building. **04**

f) State the classification of survey. **04**

Section – II

Q.2 Answer any FIVE of the following. **15**

a) Explain with neat sketch Centrifugal pump.

b) Derive an expression for velocity of fluid at the exit of nozzle, by applying Steady Flow Energy Equation (SFEE).

c) Explain Thermodynamic Property and its Types.

d) State and Explain Second law of Thermodynamics

e) What are the different modes of mechanical power transmission?

f) Difference between Flat Belt drive and V belt drive.

g) Compare Electrical Arc welding with Electrical resistance welding.

Q.3 Solve any one out of (a) and (b) and solve any two out of (c) to (f) **13**

a) Explain with neat sketch oxyacetylene welding. **05**

b) A cross belt connects two pulleys of 50 cm and 90 cm radius. The distance between shafts is 2 m. The initial tension in the belt is 700 N. If the coefficient of friction between belt and pulley is 0.3. Find the power transmitted if the smaller pulley rotates at 800 rpm. Also calculate the length of the belt. **05**

c) Explain with neat sketch Reciprocating Compressor. **04**

d) A system undergoes a cycle consisting of 3 Processes. The heat and work transfer are tabulated below. Determine the change in internal energy for each process. **04**

Process	Q (KJ)	W (KJ)	dU (KJ)
a-b	1800	520	-
b-c	-1400	0	-
c-d	-800	-325	-
d-a	1020	50	-

e) Sketch and describe in brief pillar drilling machine. **04**

f) Explain lathe machines operations with neat sketch. **04**

SLR-BD-9

Seat No.	

Set Q

F.Y. (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
Basics of Civil and Mechanical Engineering (BTCE0204/ BTME0204/ BTETE0204/ BTCSE0204/ BTEE0204)/ (BTECE0204)

Day & Date: Monday, 02-06-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.
5) Use of non-programmable single memory calculator is allowed.

Section - I

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 07

Q.1 Multiple Choice Questions. **07**

1) Green buildings are recommended to _____.
a) Use green color b) Use farm house
c) Reduce global warming d) Achieve economy

2) A point on which both fore sight and back sight readings are taken is known as ____.
a) Change point b) Fore sight point
c) Back sight point d) None of the above

3) Following is the branch of Civil Engineering _____.
a) Mechanical Engineering b) Electrical Engineering
c) Environmental Engineering d) None of these

4) The process of killing the infective bacteria from the water and making it safe to the user is called _____.
a) Softening b) Disinfection
c) Coagulation d) Flocculation

5) Following sub branch of Civil Engineering is related with supply of water to crops.
a) Irrigation b) Environmental Engineering
c) Foundation Engineering d) Soil Mechanics

6) Portion of structure between ground level and floor level is called as _____.
a) Plinth b) Superstructure
c) Substructure d) None of the above

7) GPS stand for _____.
   a) Government Public System
   b) Global Positioning System
   c) Global Police System
   d) Geographic Positioning Sharing

Section - II

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 07

Q.1 Choose the correct answer. **07**

1) Generally sheet metals are welded by following joining process _____.
a) Arc welding b) Spot welding
c) TIG welding d) None of these

2) The coefficient of friction in belt drive depends upon _____.
a) material of belt b) material of pulley
c) materials of belt and pulley d) belt velocity

3) Which of the following is not an extensive property of a thermodynamic system?
a) total mass b) total volume
c) total internal energy d) temperature

4) Pressure cooker is _____ system.
a) open system b) close system
c) Isolated system d) Adiabatic System

5) The devices, pumps, compressor, refrigerators, air conditioners which require input energy for their operation are called _____.
a) power absorbing devices
b) power producing devices
c) power transferring devices
d) none

6) It is impossible to construct a heat engine which operates in a cycle produces no effect except production of work & exchange of heat with single reservoir.
a) Kelvin plank law b) Clausius law
c) Carnot theorem d) None

7) Which of the following is sliding part of lathe?
a) Headstock b) Tailstock
c) Both a and b d) None of these

SLR-BD-9

Seat No.	

Set Q

F.Y. (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
Basics of Civil and Mechanical Engineering (BTCE0204/ BTME0204/ BTETE0204/ BTCSE0204/ BTEE0204)/ (BTECE0204)

Day & Date: Monday, 02-06-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q.No.2 and Q.No.4 are short answer type questions.
2) Q.No.3 and Q.No.5 are long answer type questions.
3) Use of non-programmable single memory calculator is allowed.
4) Assume suitable data if required.

Section - I

Q.2 Answer any FIVE of the following. **15**

a) Which are the sub branches of civil engineering? Describe anyone. **03**

b) Write note on rain water harvesting. **03**

c) State the unit operations of water treatment plant & explain aeration. **03**

d) Explain the relevance of Civil Engineering branch with Mechanical engineering. **03**

e) State the function of following: **03**
i) Wall
ii) Chajja
iii) Lintel

f) State and explain classification of Solid waste. **03**

g) Explain the application of Remote Sensing Technique. **03**

Q.3 Solve any one out of (a) and (b) and solve any two out of (c) to (f). **13**

a) Following readings were taken with dumpy level: **05**
1.580, 0.635, 2.035, 1.765, 1.660, 0.925, 1.035, 1.960.
The instrument was shifted after third and fifth reading. The RL of first point was 950.000 m. Calculate the RL's of all other points by Rise and Fall method and apply check.

b) The following reading were taken with dumpy level and a 4m staff at every 20 m. 1.360, 1.745, 1.920, 0.970, 1.860, 2.340, 2.675, 1.895, 2.415, 2.630, 1.970, 2.320. The instrument was shifted after 3rd, 7th and 10th reading. The RL of first point was 170.000 m. Calculate the RL's of all other points by Height of Instrument method and apply check. **05**

c) Differentiate between load bearing structure & framed structure. **04**

d) Explain principles of surveying. **04**

e) Write a note on green building. **04**

f) State the classification of survey. **04**

Section – II

Q.2 Answer any FIVE of the following. **15**

a) Explain with neat sketch Centrifugal pump.

b) Derive an expression for velocity of fluid at the exit of nozzle, by applying Steady Flow Energy Equation (SFEE).

c) Explain Thermodynamic Property and its Types.

d) State and Explain Second law of Thermodynamics

e) What are the different modes of mechanical power transmission?

f) Difference between Flat Belt drive and V belt drive.

g) Compare Electrical Arc welding with Electrical resistance welding.

Q.3 Solve any one out of (a) and (b) and solve any two out of (c) to (f) **13**

a) Explain with neat sketch oxyacetylene welding. **05**

b) A cross belt connects two pulleys of 50 cm and 90 cm radius. The distance between shafts is 2 m. The initial tension in the belt is 700 N. If the coefficient of friction between belt and pulley is 0.3. Find the power transmitted if the smaller pulley rotates at 800 rpm. Also calculate the length of the belt. **05**

c) Explain with neat sketch Reciprocating Compressor. **04**

d) A system undergoes a cycle consisting of 3 Processes. The heat and work transfer are tabulated below. Determine the change in internal energy for each process. **04**

Process	Q (KJ)	W (KJ)	dU (KJ)
a-b	1800	520	-
b-c	-1400	0	-
c-d	-800	-325	-
d-a	1020	50	-

e) Sketch and describe in brief pillar drilling machine. **04**

f) Explain lathe machines operations with neat sketch. **04**

SLR-BD-9

Seat No.	

Set R

F.Y. (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
Basics of Civil and Mechanical Engineering (BTCE0204/ BTME0204/ BTETE0204/ BTCSE0204/ BTEE0204)/ (BTECE0204)

Day & Date: Monday, 02-06-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.
5) Use of non-programmable single memory calculator is allowed.

Section - I

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 07

Q.1 Multiple Choice Questions. **07**

1) Portion of structure between ground level and floor level is called as _____.
a) Plinth b) Superstructure
c) Substructure d) None of the above

2) GPS stand for _____.
a) Government Public System
b) Global Positioning System
c) Global Police System
d) Geographic Positioning Sharing

3) Green buildings are recommended to _____.
a) Use green color b) Use farm house
c) Reduce global warming d) Achieve economy

4) A point on which both fore sight and back sight readings are taken is known as ____.
a) Change point b) Fore sight point
c) Back sight point d) None of the above

5) Following is the branch of Civil Engineering _____.
a) Mechanical Engineering b) Electrical Engineering
c) Environmental Engineering d) None of these

6) The process of killing the infective bacteria from the water and making it safe to the user is called _____.

a) Softening
b) Disinfection
c) Coagulation
d) Flocculation

7) Following sub branch of Civil Engineering is related with supply of water to crops.

a) Irrigation
b) Environmental Engineering
c) Foundation Engineering
d) Soil Mechanics

Section - II

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 07

Q.1 Choose the correct answer. **07**

1) It is impossible to construct a heat engine which operates in a cycle produces no effect except production of work & exchange of heat with single reservoir.

a) Kelvin plank law b) Clausius law
c) Carnot theorem d) None

2) Which of the following is sliding part of lathe?

a) Headstock b) Tailstock
c) Both a and b d) None of these

3) Generally sheet metals are welded by following joining process _____.

a) Arc welding b) Spot welding
c) TIG welding d) None of these

4) The coefficient of friction in belt drive depends upon _____.

a) material of belt b) material of pulley
c) materials of belt and pulley d) belt velocity

5) Which of the following is not an extensive property of a thermodynamic system?

a) total mass b) total volume
c) total internal energy d) temperature

6) Pressure cooker is _____ system.

a) open system b) close system
c) Isolated system d) Adiabatic System

7) The devices, pumps, compressor, refrigerators, air conditioners which require input energy for their operation are called _____.

a) power absorbing devices
b) power producing devices
c) power transferring devices
d) none

SLR-BD-9

Seat No.	

Set R

F.Y. (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
Basics of Civil and Mechanical Engineering (BTCE0204/ BTME0204/ BTETE0204/ BTCSE0204/ BTEE0204)/ (BTECE0204)

Day & Date: Monday, 02-06-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q.No.2 and Q.No.4 are short answer type questions.
2) Q.No.3 and Q.No.5 are long answer type questions.
3) Use of non-programmable single memory calculator is allowed.
4) Assume suitable data if required.

Section - I

Q.2 Answer any FIVE of the following. **15**

a) Which are the sub branches of civil engineering? Describe anyone. **03**

b) Write note on rain water harvesting. **03**

c) State the unit operations of water treatment plant & explain aeration. **03**

d) Explain the relevance of Civil Engineering branch with Mechanical engineering. **03**

e) State the function of following: **03**
i) Wall
ii) Chajja
iii) Lintel

f) State and explain classification of Solid waste. **03**

g) Explain the application of Remote Sensing Technique. **03**

Q.3 Solve any one out of (a) and (b) and solve any two out of (c) to (f). **13**

a) Following readings were taken with dumpy level: **05**
1.580, 0.635, 2.035, 1.765, 1.660, 0.925, 1.035, 1.960.
The instrument was shifted after third and fifth reading. The RL of first point was 950.000 m. Calculate the RL's of all other points by Rise and Fall method and apply check.

b) The following reading were taken with dumpy level and a 4m staff at every 20 m. 1.360, 1.745, 1.920, 0.970, 1.860, 2.340, 2.675, 1.895, 2.415, 2.630, 1.970, 2.320. The instrument was shifted after 3rd, 7th and 10th reading. The RL of first point was 170.000 m. Calculate the RL's of all other points by Height of Instrument method and apply check. **05**

c) Differentiate between load bearing structure & framed structure. **04**

d) Explain principles of surveying. **04**

e) Write a note on green building. **04**

f) State the classification of survey. **04**

Section – II

Q.2 Answer any FIVE of the following. **15**

a) Explain with neat sketch Centrifugal pump.

b) Derive an expression for velocity of fluid at the exit of nozzle, by applying Steady Flow Energy Equation (SFEE).

c) Explain Thermodynamic Property and its Types.

d) State and Explain Second law of Thermodynamics

e) What are the different modes of mechanical power transmission?

f) Difference between Flat Belt drive and V belt drive.

g) Compare Electrical Arc welding with Electrical resistance welding.

Q.3 Solve any one out of (a) and (b) and solve any two out of (c) to (f) **13**

a) Explain with neat sketch oxyacetylene welding. **05**

b) A cross belt connects two pulleys of 50 cm and 90 cm radius. The distance between shafts is 2 m. The initial tension in the belt is 700 N. If the coefficient of friction between belt and pulley is 0.3. Find the power transmitted if the smaller pulley rotates at 800 rpm. Also calculate the length of the belt. **05**

c) Explain with neat sketch Reciprocating Compressor. **04**

d) A system undergoes a cycle consisting of 3 Processes. The heat and work transfer are tabulated below. Determine the change in internal energy for each process. **04**

Process	Q (KJ)	W (KJ)	dU (KJ)
a-b	1800	520	-
b-c	-1400	0	-
c-d	-800	-325	-
d-a	1020	50	-

e) Sketch and describe in brief pillar drilling machine. **04**

f) Explain lathe machines operations with neat sketch. **04**

SLR-BD-9

Seat No.	

Set S

F.Y. (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
Basics of Civil and Mechanical Engineering (BTCE0204/ BTME0204/ BTETE0204/ BTCSE0204/ BTEE0204)/ (BTECE0204)

Day & Date: Monday, 02-06-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top on page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.
5) Use of non-programmable single memory calculator is allowed.

Section - I

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 07

Q.1 Multiple Choice Questions. **07**

1) Following is the branch of Civil Engineering _____.
a) Mechanical Engineering b) Electrical Engineering
c) Environmental Engineering d) None of these

2) The process of killing the infective bacteria from the water and making it safe to the user is called _____.
a) Softening b) Disinfection
c) Coagulation d) Flocculation

3) Following sub branch of Civil Engineering is related with supply of water to crops.
a) Irrigation b) Environmental Engineering
c) Foundation Engineering d) Soil Mechanics

4) Portion of structure between ground level and floor level is called as _____.
a) Plinth b) Superstructure
c) Substructure d) None of the above

5) GPS stand for _____.
a) Government Public System
b) Global Positioning System
c) Global Police System
d) Geographic Positioning Sharing

6) Green buildings are recommended to _____.

a) Use green color
b) Use farm house
c) Reduce global warming
d) Achieve economy

7) A point on which both fore sight and back sight readings are taken is known as ____.

a) Change point
b) Fore sight point
c) Back sight point
d) None of the above

Section - II

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 07

Q.1 Choose the correct answer. **07**

1) Which of the following is not an extensive property of a thermodynamic system?

a) total mass b) total volume
c) total internal energy d) temperature

2) Pressure cooker is _____ system.

a) open system b) close system
c) Isolated system d) Adiabatic System

3) The devices, pumps, compressor, refrigerators, air conditioners which require input energy for their operation are called _____.

a) power absorbing devices
b) power producing devices
c) power transferring devices
d) none

4) It is impossible to construct a heat engine which operates in a cycle produces no effect except production of work & exchange of heat with single reservoir.

a) Kelvin plank law b) Clausius law
c) Carnot theorem d) None

5) Which of the following is sliding part of lathe?

a) Headstock b) Tailstock
c) Both a and b d) None of these

6) Generally sheet metals are welded by following joining process _____.

a) Arc welding b) Spot welding
c) TIG welding d) None of these

7) The coefficient of friction in belt drive depends upon _____.

a) material of belt b) material of pulley
c) materials of belt and pulley d) belt velocity

SLR-BD-9

Seat No.		Set	S

F.Y. (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
Basics of Civil and Mechanical Engineering (BTCE0204/ BTME0204/ BTETE0204/ BTCSE0204/ BTEE0204)/ (BTECE0204)

Day & Date: Monday, 02-06-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q.No.2 and Q.No.4 are short answer type questions.
2) Q.No.3 and Q.No.5 are long answer type questions.
3) Use of non-programmable single memory calculator is allowed.
4) Assume suitable data if required.

Section - I

Q.2 Answer any FIVE of the following. **15**

a) Which are the sub branches of civil engineering? Describe anyone. **03**

b) Write note on rain water harvesting. **03**

c) State the unit operations of water treatment plant & explain aeration. **03**

d) Explain the relevance of Civil Engineering branch with Mechanical engineering. **03**

e) State the function of following: **03**
i) Wall
ii) Chajja
iii) Lintel

f) State and explain classification of Solid waste. **03**

g) Explain the application of Remote Sensing Technique. **03**

Q.3 Solve any one out of (a) and (b) and solve any two out of (c) to (f). **13**

a) Following readings were taken with dumpy level: **05**
1.580, 0.635, 2.035, 1.765, 1.660, 0.925, 1.035, 1.960.
The instrument was shifted after third and fifth reading. The RL of first point was 950.000 m. Calculate the RL's of all other points by Rise and Fall method and apply check.

b) The following reading were taken with dumpy level and a 4m staff at every 20 m. 1.360, 1.745, 1.920, 0.970, 1.860, 2.340, 2.675, 1.895, 2.415, 2.630, 1.970, 2.320. The instrument was shifted after 3rd, 7th and 10th reading. The RL of first point was 170.000 m. Calculate the RL's of all other points by Height of Instrument method and apply check. **05**

c) Differentiate between load bearing structure & framed structure. **04**

d) Explain principles of surveying. **04**

e) Write a note on green building. **04**

f) State the classification of survey. **04**

Section – II

Q.2 Answer any FIVE of the following. **15**

a) Explain with neat sketch Centrifugal pump.

b) Derive an expression for velocity of fluid at the exit of nozzle, by applying Steady Flow Energy Equation (SFEE).

c) Explain Thermodynamic Property and its Types.

d) State and Explain Second law of Thermodynamics

e) What are the different modes of mechanical power transmission?

f) Difference between Flat Belt drive and V belt drive.

g) Compare Electrical Arc welding with Electrical resistance welding.

Q.3 Solve any one out of (a) and (b) and solve any two out of (c) to (f) **13**

a) Explain with neat sketch oxyacetylene welding. **05**

b) A cross belt connects two pulleys of 50 cm and 90 cm radius. The distance between shafts is 2 m. The initial tension in the belt is 700 N. If the coefficient of friction between belt and pulley is 0.3. Find the power transmitted if the smaller pulley rotates at 800 rpm. Also calculate the length of the belt. **05**

c) Explain with neat sketch Reciprocating Compressor. **04**

d) A system undergoes a cycle consisting of 3 Processes. The heat and work transfer are tabulated below. Determine the change in internal energy for each process. **04**

Process	Q (KJ)	W (KJ)	dU (KJ)
a-b	1800	520	-
b-c	-1400	0	-
c-d	-800	-325	-
d-a	1020	50	-

e) Sketch and describe in brief pillar drilling machine. **04**

f) Explain lathe machines operations with neat sketch. **04**

SLR-BD-10

Seat No.	

Set P

F.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025

Basic Electrical & Electronics Engineering

(BTCE0205 / BTME0205 / BTETE0205 / BTCSE0205 / BTEE0205 / BTECE0205)

Day & Date: Wednesday 04-June-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Write the Correct Option **14**

1) Kirchhoff's voltage law is related to _____
a) junction voltages b) battery e.m.fs.
c) IR drops d) both (a) and (b)

2) Flux density B =?
a) $\mu_0\mu_r/\mathrm{H}$ b) $\mu_0\mathrm{H}/\mu_r$
c) $\mu_0\mu_r\mathrm{H}$ d) $(\mu_0)^2\ \mathrm{H}$

3) Magnetomotive force is mmf = ?
a) NS b) NI
c) Iϕ d) None of the above

4) The Reluctance of magnetic circuit is _____
a) mmf/ ϕ b) $\mu_0\mu_r/\mathrm{H}$
c) B/H d) None of the above

5) Ohms law state the current flowing through conductor is directly proportional to supply voltage.
a) True b) False

6) What is value of phase difference for voltage and current in purely Resistive circuit?
a) 180 degree b) 90 degree
c) 0 degree d) All of the above

7) For a certain load, the true power is 150 W and the reactive power is 125 VAR. The apparent power is _____
a) 19.52 W b) 195.2 W
c) 275 W d) 25 W

8) Addition of trivalent impurity to a semiconductor creates many _____
a) holes b) free electrons
c) valence electrons d) bound electrons

9) The forward voltage drop across the silicon diode is about _____
a) 2.5 V b) 0.3 V
c) 10 V d) 0.7 V

10) Ripple factor of full wave rectifier without filter is _____
a) 0.2 b) 0.48
c) 0.24 d) 1.21

11) The collector of transistor is _____ doped.
a) heavily b) moderately
c) lightly d) none of above

12) A transistor connected in common base configuration has _____
a) high input and low output resistance
b) low input and high output resistance
c) low input and low output resistance
d) high input and high output resistance

13) Which of the following expresses distributive law of Boolean algebra?
a) A.B.C = A.B + C b) A + (B + C) = (A + B) + (A + C)
c) A.(B + C) = (A.B) + (A. C) d) (A + B) + C = A + (B + C)

14) Octal equivalent of decimal number 375 is _____
a) 560 b) 576
c) 565 d) 567

SLR-BD-10

Seat No.	

Set P

F.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025

Basic Electrical & Electronics Engineering

(BTCE0205 / BTME0205 / BTETE0205 / BTCSE0205 / BTEE0205 / BTECE0205)

Day & Date: Wednesday 04-June-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

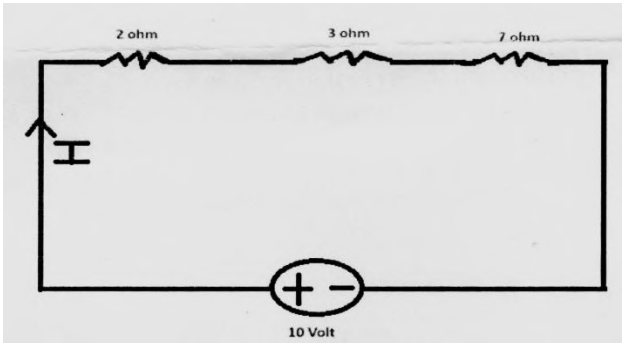
Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any four **16**

a) State and explain Kirchhoff's laws with sign conventions and enlist its applications.

b) Calculate total resistance and power in each resistance.



c) Define and explain Faraday's Laws of electromagnetic Induction.

d) A mild steel ring has a radius of 50 mm and a cross-sectional area of 400 mm^2. A current of 0.5 A flows in a coil wound uniformly around the ring and the flux produced is 0.1 mWb. If the relative permeability at this value of current is 200 find (a) the reluctance of the mild steel and (b) the number of turns on the coil.

e) Define and derive the average value of alternating quantity.

f) A capacitance of 20 μF and a resistance of 100 ohms are connected in series across 120 V, 60 Hz mains. Determine the current and average power expended in the circuit.

Q.3 Solve any two **12**

a) Derive the equation for converting star-delta transformation.

b) Explain principle of operation, working and construction of Single-Phase transformer.

c) A coil is wound with 300 turns over a steel ring if relative permeability 900 having a mean circumference of 40 cm and a cross sectional area of 5 cm^2 and magnetic flux density 1.2 wb/m^2. If the coil has a resistance of 100 ohm and connected to 250 Volts supply, calculate a) the coil mmf b) field strength c) total flux d) reluctance of ring.

Section – II

Q.4 Solve any four. **16**

a) Explain formation of N-type & P-type extrinsic semiconductors.

b) Explain the operation of bridge rectifier with help of neat circuit diagram & waveform.

c) What are different configurations in which transistor can be operated? Compare all the configurations.

d) State and prove Demorgan's theorem.

e) Perform subtraction using 2's complement and convert it into Octal. $(175)_8$ - $(100)_8$

Q.5 Solve any two. **12**

a) Draw and explain basic and derived logic gates with symbol, truth table and equation. Also write the name of Universal logic gates.

b) Draw and explain input-output characteristics for CE configuration.

c) Compare Half wave, Center tap full wave and Bridge rectifier circuit.

SLR-BD-10

Seat No.	

Set Q

F.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025

Basic Electrical & Electronics Engineering

(BTCE0205 / BTME0205 / BTETE0205 / BTCSE0205 / BTEE0205 / BTECE0205)

Day & Date: Wednesday 04-June-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Write the Correct Option **14**

1) Addition of trivalent impurity to a semiconductor creates many _____
a) holes b) free electrons
c) valence electrons d) bound electrons

2) The forward voltage drop across the silicon diode is about _____
a) 2.5 V b) 0.3 V
c) 10 V d) 0.7 V

3) Ripple factor of full wave rectifier without filter is _____
a) 0.2 b) 0.48
c) 0.24 d) 1.21

4) The collector of transistor is _____ doped.
a) heavily b) moderately
c) lightly d) none of above

5) A transistor connected in common base configuration has _____
a) high input and low output resistance
b) low input and high output resistance
c) low input and low output resistance
d) high input and high output resistance

6) Which of the following expresses distributive law of Boolean algebra?
a) A.B.C = A.B + C b) A + (B + C) = (A + B) + (A + C)
c) A.(B + C) = (A.B) + (A. C) d) (A + B) + C = A + (B + C)

7) Octal equivalent of decimal number 375 is _____
a) 560 b) 576
c) 565 d) 567

8) Kirchhoff's voltage law is related to _____

a) junction voltages b) battery e.m.fs.
c) IR drops d) both (a) and (b)

9) Flux density B =?

a) $\mu_0\mu_r/\mathrm{H}$ b) $\mu_0\mathrm{H}/\mu_r$
c) $\mu_0\mu_r\mathrm{H}$ d) $(\mu_0)^2\ \mathrm{H}$

10) Magnetomotive force is mmf = ?

a) NS b) NI
c) Iϕ d) None of the above

11) The Reluctance of magnetic circuit is _____

a) mmf/ ϕ b) $\mu_0\mu_r/\mathrm{H}$
c) B/H d) None of the above

12) Ohms law state the current flowing through conductor is directly proportional to supply voltage.

a) True b) False

13) What is value of phase difference for voltage and current in purely Resistive circuit?

a) 180 degree b) 90 degree
c) 0 degree d) All of the above

14) For a certain load, the true power is 150 W and the reactive power is 125 VAR. The apparent power is _____

a) 19.52 W b) 195.2 W
c) 275 W d) 25 W

SLR-BD-10

Seat No.	

Set Q

F.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025

Basic Electrical & Electronics Engineering

(BTCE0205 / BTME0205 / BTETE0205 / BTCSE0205 / BTEE0205 / BTECE0205)

Day & Date: Wednesday 04-June-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

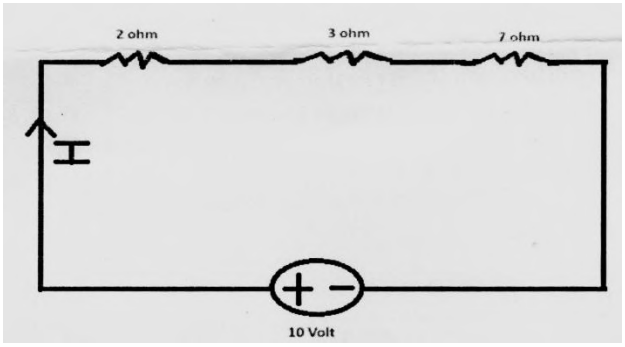
Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any four **16**

a) State and explain Kirchhoff's laws with sign conventions and enlist its applications.

b) Calculate total resistance and power in each resistance.



c) Define and explain Faraday's Laws of electromagnetic Induction.

d) A mild steel ring has a radius of 50 mm and a cross-sectional area of 400 mm^2. A current of 0.5 A flows in a coil wound uniformly around the ring and the flux produced is 0.1 mWb. If the relative permeability at this value of current is 200 find (a) the reluctance of the mild steel and (b) the number of turns on the coil.

e) Define and derive the average value of alternating quantity.

f) A capacitance of 20 μF and a resistance of 100 ohms are connected in series across 120 V, 60 Hz mains. Determine the current and average power expended in the circuit.

Q.3 Solve any two **12**

a) Derive the equation for converting star-delta transformation.

b) Explain principle of operation, working and construction of Single-Phase transformer.

c) A coil is wound with 300 turns over a steel ring if relative permeability 900 having a mean circumference of 40 cm and a cross sectional area of 5 cm^2 and magnetic flux density 1.2 wb/m^2. If the coil has a resistance of 100 ohm and connected to 250 Volts supply, calculate a) the coil mmf b) field strength c) total flux d) reluctance of ring.

Section – II

Q.4 Solve any four. **16**

a) Explain formation of N-type & P-type extrinsic semiconductors.

b) Explain the operation of bridge rectifier with help of neat circuit diagram & waveform.

c) What are different configurations in which transistor can be operated? Compare all the configurations.

d) State and prove Demorgan's theorem.

e) Perform subtraction using 2's complement and convert it into Octal. $(175)_8$ - $(100)_8$

Q.5 Solve any two. **12**

a) Draw and explain basic and derived logic gates with symbol, truth table and equation. Also write the name of Universal logic gates.

b) Draw and explain input-output characteristics for CE configuration.

c) Compare Half wave, Center tap full wave and Bridge rectifier circuit.

SLR-BD-10

Seat No.	

Set R

F.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025

Basic Electrical & Electronics Engineering

(BTCE0205 / BTME0205 / BTETE0205 / BTCSE0205 / BTEE0205 / BTECE0205)

Day & Date: Wednesday 04-June-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Write the Correct Option **14**

1) The collector of transistor is _____ doped.
a) heavily b) moderately
c) lightly d) none of above

2) A transistor connected in common base configuration has _____
a) high input and low output resistance
b) low input and high output resistance
c) low input and low output resistance
d) high input and high output resistance

3) Which of the following expresses distributive law of Boolean algebra?
a) A.B.C = A.B + C b) A + (B + C) = (A + B) + (A + C)
c) A.(B + C) = (A.B) + (A. C) d) (A + B) + C = A + (B + C)

4) Octal equivalent of decimal number 375 is _____
a) 560 b) 576
c) 565 d) 567

5) Kirchhoff's voltage law is related to _____
a) junction voltages b) battery e.m.fs.
c) IR drops d) both (a) and (b)

6) Flux density B =?
a) $\mu_0\mu_r/\mathrm{H}$ b) $\mu_0\mathrm{H}/\mu_r$
c) $\mu_0\mu_r\mathrm{H}$ d) $(\mu_0)^2\ \mathrm{H}$

7) Magnetomotive force is mmf = ?
a) NS b) NI
c) Iϕ d) None of the above

8) The Reluctance of magnetic circuit is _____
a) mmf/ ϕ
b) $\mu_0\mu_r/\mathrm{H}$
c) B/H
d) None of the above

9) Ohms law state the current flowing through conductor is directly proportional to supply voltage.
a) True
b) False

10) What is value of phase difference for voltage and current in purely Resistive circuit?
a) 180 degree
b) 90 degree
c) 0 degree
d) All of the above

11) For a certain load, the true power is 150 W and the reactive power is 125 VAR. The apparent power is _____
a) 19.52 W
b) 195.2 W
c) 275 W
d) 25 W

12) Addition of trivalent impurity to a semiconductor creates many _____
a) holes
b) free electrons
c) valence electrons
d) bound electrons

13) The forward voltage drop across the silicon diode is about _____
a) 2.5 V
b) 0.3 V
c) 10 V
d) 0.7 V

14) Ripple factor of full wave rectifier without filter is _____
a) 0.2
b) 0.48
c) 0.24
d) 1.21

SLR-BD-10

Seat No.	

Set R

F.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025

Basic Electrical & Electronics Engineering

(BTCE0205 / BTME0205 / BTETE0205 / BTCSE0205 / BTEE0205 / BTECE0205)

Day & Date: Wednesday 04-June-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

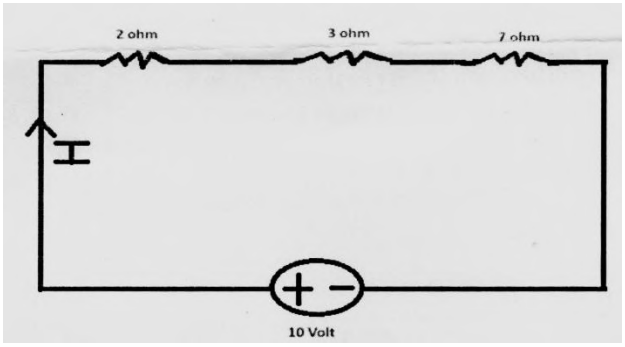
Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any four **16**

a) State and explain Kirchhoff's laws with sign conventions and enlist its applications.

b) Calculate total resistance and power in each resistance.



c) Define and explain Faraday's Laws of electromagnetic Induction.

d) A mild steel ring has a radius of 50 mm and a cross-sectional area of 400 mm^2. A current of 0.5 A flows in a coil wound uniformly around the ring and the flux produced is 0.1 mWb. If the relative permeability at this value of current is 200 find (a) the reluctance of the mild steel and (b) the number of turns on the coil.

e) Define and derive the average value of alternating quantity.

f) A capacitance of 20 μF and a resistance of 100 ohms are connected in series across 120 V, 60 Hz mains. Determine the current and average power expended in the circuit.

Q.3 Solve any two **12**

a) Derive the equation for converting star-delta transformation.

b) Explain principle of operation, working and construction of Single-Phase transformer.

c) A coil is wound with 300 turns over a steel ring if relative permeability 900 having a mean circumference of 40 cm and a cross sectional area of 5 cm^2 and magnetic flux density 1.2 wb/m^2. If the coil has a resistance of 100 ohm and connected to 250 Volts supply, calculate a) the coil mmf b) field strength c) total flux d) reluctance of ring.

Section – II

Q.4 Solve any four. **16**

a) Explain formation of N-type & P-type extrinsic semiconductors.

b) Explain the operation of bridge rectifier with help of neat circuit diagram & waveform.

c) What are different configurations in which transistor can be operated? Compare all the configurations.

d) State and prove Demorgan's theorem.

e) Perform subtraction using 2's complement and convert it into Octal. $(175)_8$ - $(100)_8$

Q.5 Solve any two. **12**

a) Draw and explain basic and derived logic gates with symbol, truth table and equation. Also write the name of Universal logic gates.

b) Draw and explain input-output characteristics for CE configuration.

c) Compare Half wave, Center tap full wave and Bridge rectifier circuit.

SLR-BD-10

Seat No.	

Set S

F.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025

Basic Electrical & Electronics Engineering

(BTCE0205 / BTME0205 / BTETE0205 / BTCSE0205 / BTEE0205 / BTECE0205)

Day & Date: Wednesday 04-June-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Write the Correct Option **14**

1) What is value of phase difference for voltage and current in purely Resistive circuit?
a) 180 degree b) 90 degree
c) 0 degree d) All of the above

2) For a certain load, the true power is 150 W and the reactive power is 125 VAR. The apparent power is _____
a) 19.52 W b) 195.2 W
c) 275 W d) 25 W

3) Addition of trivalent impurity to a semiconductor creates many _____
a) holes b) free electrons
c) valence electrons d) bound electrons

4) The forward voltage drop across the silicon diode is about _____
a) 2.5 V b) 0.3 V
c) 10 V d) 0.7 V

5) Ripple factor of full wave rectifier without filter is _____
a) 0.2 b) 0.48
c) 0.24 d) 1.21

6) The collector of transistor is _____ doped.
a) heavily b) moderately
c) lightly d) none of above

7) A transistor connected in common base configuration has _____
a) high input and low output resistance
b) low input and high output resistance
c) low input and low output resistance
d) high input and high output resistance

8) Which of the following expresses distributive law of Boolean algebra?
a) A.B.C = A.B + C
b) A + (B + C) = (A + B) + (A + C)
c) A.(B + C) = (A.B) + (A. C)
d) (A + B) + C = A + (B + C)

9) Octal equivalent of decimal number 375 is _____
a) 560
b) 576
c) 565
d) 567

10) Kirchhoff's voltage law is related to _____
a) junction voltages
b) battery e.m.fs.
c) IR drops
d) both (a) and (b)

11) Flux density B =?
a) $\mu_0\mu_r/\mathrm{H}$
b) $\mu_0\mathrm{H}/\mu_r$
c) $\mu_0\mu_r\mathrm{H}$
d) $(\mu_0)^2\ \mathrm{H}$

12) Magnetomotive force is mmf = ?
a) NS
b) NI
c) Iϕ
d) None of the above

13) The Reluctance of magnetic circuit is _____
a) mmf/ ϕ
b) $\mu_0\mu_r/\mathrm{H}$
c) B/H
d) None of the above

14) Ohms law state the current flowing through conductor is directly proportional to supply voltage.
a) True
b) False

SLR-BD-10

Seat No.	

Set S

F.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025

Basic Electrical & Electronics Engineering

(BTCE0205 / BTME0205 / BTETE0205 / BTCSE0205 / BTEE0205 / BTECE0205)

Day & Date: Wednesday 04-June-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

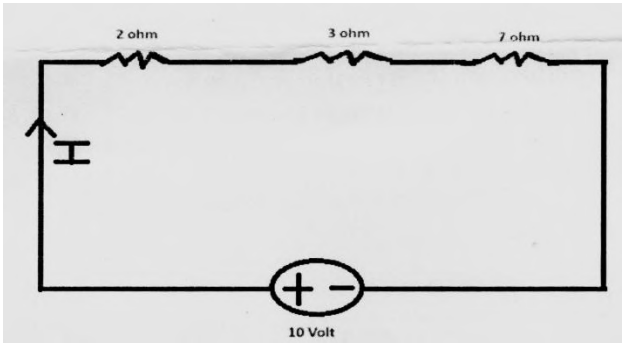
Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any four **16**

a) State and explain Kirchhoff's laws with sign conventions and enlist its applications.

b) Calculate total resistance and power in each resistance.



c) Define and explain Faraday's Laws of electromagnetic Induction.

d) A mild steel ring has a radius of 50 mm and a cross-sectional area of 400 mm^2. A current of 0.5 A flows in a coil wound uniformly around the ring and the flux produced is 0.1 mWb. If the relative permeability at this value of current is 200 find (a) the reluctance of the mild steel and (b) the number of turns on the coil.

e) Define and derive the average value of alternating quantity.

f) A capacitance of 20 μF and a resistance of 100 ohms are connected in series across 120 V, 60 Hz mains. Determine the current and average power expended in the circuit.

Q.3 Solve any two **12**

a) Derive the equation for converting star-delta transformation.

b) Explain principle of operation, working and construction of Single-Phase transformer.

c) A coil is wound with 300 turns over a steel ring if relative permeability 900 having a mean circumference of 40 cm and a cross sectional area of 5 cm^2 and magnetic flux density 1.2 wb/m^2. If the coil has a resistance of 100 ohm and connected to 250 Volts supply, calculate a) the coil mmf b) field strength c) total flux d) reluctance of ring.

Section – II

Q.4 Solve any four. **16**

a) Explain formation of N-type & P-type extrinsic semiconductors.

b) Explain the operation of bridge rectifier with help of neat circuit diagram & waveform.

c) What are different configurations in which transistor can be operated? Compare all the configurations.

d) State and prove Demorgan's theorem.

e) Perform subtraction using 2's complement and convert it into Octal. $(175)_8$ - $(100)_8$

Q.5 Solve any two. **12**

a) Draw and explain basic and derived logic gates with symbol, truth table and equation. Also write the name of Universal logic gates.

b) Draw and explain input-output characteristics for CE configuration.

c) Compare Half wave, Center tap full wave and Bridge rectifier circuit.

SLR-BD-11

Seat No.	

Set P

F.Y (B. Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
Engineering Mathematics – II
(BTCE0203 / BTME0203 / BTETE0203 / BTCSE0203 / BTEE0203 / BTECE0203)

Day & Date: Friday, 06-June-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) The differential equation $\frac{dy}{dx} = \frac{a_1x+b_1y+c_1}{a_2x+b_2y+c_2}$ will be exact if _____.

a) $b_2 = -a_1$ b) $a_2 = -b_1$
c) $b_1 = a_2$ d) $a_1 = b_2$

2) The orthogonal trajectories of family of curve $xy = a$ is _____.

a) $x^2 + y^2 = c$ b) $y^2 = 4ax$
c) $x = cy$ d) $y^2 - x^2 = c$

3) The factorial series $\sum \frac{1}{n!}$ is _____.

a) Convergent b) Divergent
c) Oscillatory d) Absolutely convergent

4) The p −series $\sum_{n=1}^{\infty} \frac{1}{n^p}$ is convergent if ____.

a) $p \leq 1$ b) $p = 0$
c) $p > 1$ d) $p = \frac{1}{2}$

5) Analytic function is also called as _____.

a) Holomorphic b) Irregular
c) Harmonic d) Laplace

6) $\cos(x + iy) =$ _____.

a) $\cos x \cos y + \sin x \sin y$ b) $\cos x \cos hy + i \sin x \sin hy$
c) $\cos x \cos hy - i \sin x \sin hy$ d) $\cos hx \sin hy - i \sin hx \sin hy$

7) $[\cos\theta - i\sin\theta]^4 =$ _____

a) $\sin 4\theta - i\ \cos 4\theta$ b) $\cos 4\theta + i\ \sin 4\theta$

c) $\cos 4\theta - i\ \sin 4\theta$ d) $\sin 4\theta + i\ \cos 4\theta$

8) $\frac{B(m+1,n)}{B(m,n)}$ is equal to _____.

a) $\frac{m}{n}$ b) $\frac{m+1}{n}$

c) $\frac{m-1}{n}$ d) $\frac{m}{m+n}$

9) Which of the following is not true?

a) $\left\lceil \frac{1}{2} \right\rceil = \sqrt{\pi}$ b) $\left\lceil \frac{1}{4} \right\rceil \left\lceil \frac{3}{4} \right\rceil = \sqrt{2\pi}$

c) $\lceil n+1 \rceil = n \lceil n \rceil$ d) $\lceil -2 \rceil = \infty$

10) The numbers of loops of $r = a\sin 2\theta$ are _____.

a) Two b) Three

c) Four d) eight

11) For the curve $y^2(2a - x) = x^3$, the origin is _____.

a) Node b) Cusp

c) Isolated point d) None of these

12) The value of $\int_0^{\pi/2}\int_0^{\pi/2} \sin(x+y)dx\,dy$ is _____.

a) 0 b) 2

c) π d) -2

13) For $\int_0^{\infty}\int_x^{\infty} f(x,y)\,dydx$ by the change of order of integration, we get _____.

a) $\int_0^{\infty}\int_0^{x} f(x,y)\,dxdy$ b) $\int_x^{\infty}\int_0^{\infty} f(x,y)\,dxdy$

c) $\int_0^{\infty}\int_y^{\infty} f(x,y)\,dxdy$ d) $\int_0^{\infty}\int_0^{y} f(x,y)\,dxdy$

14) If density ρ (rho) at any point varies as the distance of the point from $y-$ axis then ρ equals to _____.

a) kx b) kxy

c) ky d) $k(x^2+y^2)$

SLR-BD-11

Seat No.	

Set P

F.Y (B. Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
Engineering Mathematics – II
(BTCE0203 / BTME0203 / BTETE0203 / BTCSE0203 / BTEE0203 / BTECE0203)

Day & Date: Friday, 06-June-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Solve any three of the following questions. **09**

a) Solve: $(2x - 2y + 5)dy = (x - y + 3)dx$

b) Solve $y(1 + xy)dx - x(1 - xy)dy = 0$

c) Find the analytic function whose real part is $e^x \cos y$

d) Find all the values of $x^4 + x^3 + x^2 + x + 1 = 0$

e) Test the convergence of $\frac{3}{4} + \left(\frac{4}{5}\right)^2 + \left(\frac{5}{6}\right)^3 + \cdots + \left(\frac{n+2}{n+3}\right)^n + \cdots$ by using Cauchy n^{th} root test.

Q.3 Solve any three of the following questions. **09**

a) Solve: $\frac{dy}{dx} + \frac{2x}{x^2+1}y = \frac{4x^2}{x^2+1}$

b) Find the orthogonal trajectory of family of cardioids $r = a(1 + \cos\theta)$

c) Check whether following function is analytic or not. If analytic then find its derivatives. $f(z) = z^2 + \bar{z}$

d) Find k such that $f(z) = \frac{1}{2}\log(x^2 + y^2) + i\tan^{-1}\frac{ky}{x}$ is analytic.

e) Test the convergence of $\sum \frac{3^n}{2^{n+3}}$

Q.4 Solve any two of the following questions. **10**

a) The charge q on the plate of the condenser of capacity C, charged through a resistance R by a steady voltage V satisfies the differential equation
$R\frac{dq}{dt} + \frac{q}{C} = V$. And $q = 0$ when $t = 0$. Show that $q = C.V.(1 - e^{-t/CR})$

b) Define absolute and conditional convergence. Examine the convergence of the series, $\sum \frac{(-1)^n(n^2+1)}{n^3}$

c) Show that $u = \cos x \cosh y$ is a harmonic function. Find its harmonic conjugate and corresponding harmonic function.

Section – II

Q.5 Solve any three of the following questions. **09**

a) Evaluate $\int_0^{\infty} x^4 e^{-x^6} dx$

b) Evaluate by using DUIS rule: $\int_0^{\infty} \frac{e^{-x}(1-\cos ax)}{x} dx$

c) Trace the following curves with full justification $r = a\,(1-\cos\theta\,)$

d) Change to polar co-ordinate system and evaluate $\int_0^a \int_y^a \frac{x\,dxdy}{(x^2+y^2)}$

e) Find the area by double integration common of the circles $r = a$ and $r = 2\,\alpha\cos\theta$

Q.6 Solve any three of the following questions. **09**

a) Evaluate $\int_0^3 x^3\,(3-x)^4 dx$

b) Trace the curve $x = a(t-\sin t), y = a(1+\cos t)$

c) Evaluate $\int_0^2 \int_1^2 \int_0^{yz} xyz\,dx\,dy\,dz$

d) Evaluate $\int\int e^{3x+4y} dxdy$ over the triangle $x = 0, y = 0, x+y = 1$

e) Find by double integration the mass of a thin plate bounded by $y^2 = x$ and $x^2 = y$. If the density at any point varies as the square of its distance from the origin.

Q.7 Solve any two of the following questions. **10**

a) State and Prove Duplication Formula.

b) Trace the following curves with full justification $xy^2 = a^2(a-x)$

c) Change the order of integration and evaluate $\int_0^{\infty} \int_0^{x} e^{\frac{-x^2}{y}} x\,dx\,dy$

SLR-BD-11

Seat No.	

Set Q

F.Y (B. Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025

Engineering Mathematics – II

(BTCE0203 / BTME0203 / BTETE0203 / BTCSE0203 / BTEE0203 / BTECE0203)

Day & Date: Friday, 06-June-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) $\frac{B(m+1,n)}{B(m,n)}$ is equal to _____.

a) $\frac{m}{n}$ b) $\frac{m+1}{n}$

c) $\frac{m-1}{n}$ d) $\frac{m}{m+n}$

2) Which of the following is not true?

a) $\left|\frac{1}{2}\right. = \sqrt{\pi}$ b) $\left|\frac{1}{4}\right. \left|\frac{3}{4}\right. = \sqrt{2\pi}$

c) $\left|n+1\right. = n\left|n\right.$ d) $\left|-2\right. = \infty$

3) The numbers of loops of $r = a\sin 2\theta$ are _____.

a) Two b) Three
c) Four d) eight

4) For the curve $y^2(2a-x) = x^3$, the origin is _____.

a) Node b) Cusp
c) Isolated point d) None of these

5) The value of $\int_0^{\pi/2}\int_0^{\pi/2} \sin(x+y)dx\,dy$ is _____.

a) 0 b) 2
c) π d) -2

6) For $\int_0^\infty \int_x^\infty f(x,y)\,dydx$ by the change of order of integration, we get _____.

a) $\int_0^\infty \int_0^x f(x,y)\,dxdy$ b) $\int_x^\infty \int_0^\infty f(x,y)\,dxdy$

c) $\int_0^\infty \int_y^\infty f(x,y)\,dxdy$ d) $\int_0^\infty \int_0^y f(x,y)\,dxdy$

7) If density ρ (rho) at any point varies as the distance of the point from $y-$ axis then ρ equals to _____.

a) kx b) kxy

c) ky d) $k(x^2+y^2)$

8) The differential equation $\frac{dy}{dx}=\frac{a_1x+b_1y+c_1}{a_2x+b_2y+c_2}$ will be exact if _____.

a) $b_2=-a_1$ b) $a_2=-b_1$

c) $b_1=a_2$ d) $a_1=b_2$

9) The orthogonal trajectories of family of curve $xy=a$ is _____.

a) $x^2+y^2=c$ b) $y^2=4ax$

c) $x=cy$ d) $y^2-x^2=c$

10) The factorial series $\sum\frac{1}{n!}$ is _____.

a) Convergent b) Divergent

c) Oscillatory d) Absolutely convergent

11) The $p-$series $\sum_{n=1}^\infty \frac{1}{n^p}$ is convergent if ____.

a) $p\le 1$ b) $p=0$

c) $p>1$ d) $p=\frac{1}{2}$

12) Analytic function is also called as _____.

a) Holomorphic b) Irregular

c) Harmonic d) Laplace

13) $\cos(x+iy)=$ _____.

a) $\cos x\cos y+\sin x\sin y$ b) $\cos x\cos hy+i\sin x\sin hy$

c) $\cos x\cos hy-i\sin x\sin hy$ d) $\cos hx\sin hy-i\sin hx\sin hy$

14) $[\cos\theta-i\sin\theta]^4=$ _____

a) $\sin 4\theta-i\cos 4\theta$ b) $\cos 4\theta+i\sin 4\theta$

c) $\cos 4\theta-i\sin 4\theta$ d) $\sin 4\theta+i\cos 4\theta$

SLR-BD-11

Seat No.	

Set Q

F.Y (B. Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
Engineering Mathematics – II
(BTCE0203 / BTME0203 / BTETE0203 / BTCSE0203 / BTEE0203 / BTECE0203)

Day & Date: Friday, 06-June-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Solve any three of the following questions. **09**

a) Solve: $(2x - 2y + 5)dy = (x - y + 3)dx$

b) Solve $y(1 + xy)dx - x(1 - xy)dy = 0$

c) Find the analytic function whose real part is $e^x \cos y$

d) Find all the values of $x^4 + x^3 + x^2 + x + 1 = 0$

e) Test the convergence of $\frac{3}{4} + \left(\frac{4}{5}\right)^2 + \left(\frac{5}{6}\right)^3 + \cdots + \left(\frac{n+2}{n+3}\right)^n + \cdots$ by using Cauchy n^{th} root test.

Q.3 Solve any three of the following questions. **09**

a) Solve: $\frac{dy}{dx} + \frac{2x}{x^2+1}y = \frac{4x^2}{x^2+1}$

b) Find the orthogonal trajectory of family of cardioids $r = a(1 + \cos\theta)$

c) Check whether following function is analytic or not. If analytic then find its derivatives. $f(z) = z^2 + \bar{z}$

d) Find k such that $f(z) = \frac{1}{2}\log(x^2 + y^2) + i\tan^{-1}\frac{ky}{x}$ is analytic.

e) Test the convergence of $\sum \frac{3^n}{2^{n+3}}$

Q.4 Solve any two of the following questions. **10**

a) The charge q on the plate of the condenser of capacity C, charged through a resistance R by a steady voltage V satisfies the differential equation $R\frac{dq}{dt} + \frac{q}{C} = V$. And $q = 0$ when $t = 0$. Show that $q = C.V.(1 - e^{-t/CR})$

b) Define absolute and conditional convergence. Examine the convergence of the series, $\sum \frac{(-1)^n(n^2+1)}{n^3}$

c) Show that $u = \cos x \cosh y$ is a harmonic function. Find its harmonic conjugate and corresponding harmonic function.

Section – II

Q.5 Solve any three of the following questions. **09**

a) Evaluate $\int_0^{\infty} x^4 e^{-x^6} dx$

b) Evaluate by using DUIS rule: $\int_0^{\infty} \frac{e^{-x}(1-\cos ax)}{x} dx$

c) Trace the following curves with full justification $r = a\,(1-\cos\theta\,)$

d) Change to polar co-ordinate system and evaluate $\int_0^a \int_y^a \frac{x\,dxdy}{(x^2+y^2)}$

e) Find the area by double integration common of the circles $r = a$ and $r = 2\,\alpha\cos\theta$

Q.6 Solve any three of the following questions. **09**

a) Evaluate $\int_0^3 x^3\,(3-x)^4 dx$

b) Trace the curve $x = a(t-\sin t), y = a(1+\cos t)$

c) Evaluate $\int_0^2 \int_1^2 \int_0^{yz} xyz\,dx\,dy\,dz$

d) Evaluate $\int\int e^{3x+4y} dxdy$ over the triangle $x = 0, y = 0, x+y = 1$

e) Find by double integration the mass of a thin plate bounded by $y^2 = x$ and $x^2 = y$. If the density at any point varies as the square of its distance from the origin.

Q.7 Solve any two of the following questions. **10**

a) State and Prove Duplication Formula.

b) Trace the following curves with full justification $xy^2 = a^2(a-x)$

c) Change the order of integration and evaluate $\int_0^{\infty} \int_0^{x} e^{\frac{-x^2}{y}} x\,dx\,dy$

Seat No.	

Set **R**

F.Y (B. Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
Engineering Mathematics – II
(BTCE0203 / BTME0203 / BTETE0203 / BTCSE0203 / BTEE0203 / BTECE0203)

Day & Date: Friday, 06-June-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) For the curve $y^2(2a - x) = x^3$, the origin is _____.
a) Node b) Cusp
c) Isolated point d) None of these

2) The value of $\int_0^{\pi/2}\int_0^{\pi/2} \sin(x+y)dx\,dy$ is _____.
a) 0 b) 2
c) π d) -2

3) For $\int_0^{\infty}\int_x^{\infty} f(x,y)\,dydx$ by the change of order of integration, we get _____.
a) $\int_0^{\infty}\int_0^{x} f(x,y)\,dxdy$ b) $\int_x^{\infty}\int_0^{\infty} f(x,y)\,dxdy$
c) $\int_0^{\infty}\int_y^{\infty} f(x,y)\,dxdy$ d) $\int_0^{\infty}\int_0^{y} f(x,y)\,dxdy$

4) If density ρ (rho) at any point varies as the distance of the point from $y-$ axis then ρ equals to _____.
a) kx b) kxy
c) ky d) $k(x^2+y^2)$

5) The differential equation $\frac{dy}{dx} = \frac{a_1x+b_1y+c_1}{a_2x+b_2y+c_2}$ will be exact if _____.
a) $b_2 = -a_1$ b) $a_2 = -b_1$
c) $b_1 = a_2$ d) $a_1 = b_2$

6) The orthogonal trajectories of family of curve $xy = a$ is _____.

a) $x^2 + y^2 = c$ b) $y^2 = 4ax$

c) $x = cy$ d) $y^2 - x^2 = c$

7) The factorial series $\sum \frac{1}{n!}$ is _____.

a) Convergent b) Divergent

c) Oscillatory d) Absolutely convergent

8) The p −series $\sum_{n=1}^{\infty} \frac{1}{n^p}$ is convergent if ____.

a) $p \leq 1$ b) $p = 0$

c) $p > 1$ d) $p = \frac{1}{2}$

9) Analytic function is also called as _____.

a) Holomorphic b) Irregular

c) Harmonic d) Laplace

10) $\cos(x + iy) =$ _____.

a) $\cos x \cos y + \sin x \sin y$ b) $\cos x \cos hy + i \sin x \sin hy$

c) $\cos x \cos hy - i \sin x \sin hy$ d) $\cos hx \sin hy - i \sin hx \sin hy$

11) $[\cos\theta - i \sin\theta]^4 =$ _____

a) $\sin 4\theta - i \cos 4\theta$ b) $\cos 4\theta + i \sin 4\theta$

c) $\cos 4\theta - i \sin 4\theta$ d) $\sin 4\theta + i \cos 4\theta$

12) $\frac{B(m+1,n)}{B(m,n)}$ is equal to _____.

a) $\frac{m}{n}$ b) $\frac{m+1}{n}$

c) $\frac{m-1}{n}$ d) $\frac{m}{m+n}$

13) Which of the following is not true?

a) $\left\lceil \frac{1}{2} \right\rceil = \sqrt{\pi}$ b) $\left\lceil \frac{1}{4} \right\rceil \left\lceil \frac{3}{4} \right\rceil = \sqrt{2\pi}$

c) $\lceil n+1 \rceil = n \lceil n \rceil$ d) $\lceil -2 \rceil = \infty$

14) The numbers of loops of $r = a \sin 2\theta$ are _____.

a) Two b) Three

c) Four d) eight

Seat No.	

Set **R**

F.Y (B. Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
Engineering Mathematics – II
(BTCE0203 / BTME0203 / BTETE0203 / BTCSE0203 / BTEE0203 / BTECE0203)

Day & Date: Friday, 06-June-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Solve any three of the following questions. **09**

a) Solve: $(2x - 2y + 5)dy = (x - y + 3)dx$

b) Solve $y(1 + xy)dx - x(1 - xy)dy = 0$

c) Find the analytic function whose real part is $e^x \cos y$

d) Find all the values of $x^4 + x^3 + x^2 + x + 1 = 0$

e) Test the convergence of $\frac{3}{4} + \left(\frac{4}{5}\right)^2 + \left(\frac{5}{6}\right)^3 + \cdots + \left(\frac{n+2}{n+3}\right)^n + \cdots$ by using Cauchy n^{th} root test.

Q.3 Solve any three of the following questions. **09**

a) Solve: $\frac{dy}{dx} + \frac{2x}{x^2+1}y = \frac{4x^2}{x^2+1}$

b) Find the orthogonal trajectory of family of cardioids $r = a(1 + \cos\theta)$

c) Check whether following function is analytic or not. If analytic then find its derivatives. $f(z) = z^2 + \bar{z}$

d) Find k such that $f(z) = \frac{1}{2}\log(x^2 + y^2) + i\tan^{-1}\frac{ky}{x}$ is analytic.

e) Test the convergence of $\sum \frac{3^n}{2^{n+3}}$

Q.4 Solve any two of the following questions. **10**

a) The charge q on the plate of the condenser of capacity C, charged through a resistance R by a steady voltage V satisfies the differential equation $R\frac{dq}{dt} + \frac{q}{C} = V$. And $q = 0$ when $t = 0$. Show that $q = C.V.(1 - e^{-t/CR})$

b) Define absolute and conditional convergence. Examine the convergence of the series, $\sum \frac{(-1)^n(n^2+1)}{n^3}$

c) Show that $u = \cos x \cosh y$ is a harmonic function. Find its harmonic conjugate and corresponding harmonic function.

Section – II

Q.5 Solve any three of the following questions. **09**

a) Evaluate $\int_0^{\infty} x^4 e^{-x^6} dx$

b) Evaluate by using DUIS rule: $\int_0^{\infty} \frac{e^{-x}(1-\cos ax)}{x} dx$

c) Trace the following curves with full justification $r = a\,(1-\cos\theta\,)$

d) Change to polar co-ordinate system and evaluate $\int_0^a \int_y^a \frac{x\,dxdy}{(x^2+y^2)}$

e) Find the area by double integration common of the circles $r = a$ and $r = 2\,\alpha\cos\theta$

Q.6 Solve any three of the following questions. **09**

a) Evaluate $\int_0^3 x^3\,(3-x)^4 dx$

b) Trace the curve $x = a(t-\sin t), y = a(1+\cos t)$

c) Evaluate $\int_0^2 \int_1^2 \int_0^{yz} xyz\,dx\,dy\,dz$

d) Evaluate $\int\int e^{3x+4y} dxdy$ over the triangle $x = 0, y = 0, x+y = 1$

e) Find by double integration the mass of a thin plate bounded by $y^2 = x$ and $x^2 = y$. If the density at any point varies as the square of its distance from the origin.

Q.7 Solve any two of the following questions. **10**

a) State and Prove Duplication Formula.

b) Trace the following curves with full justification $xy^2 = a^2(a-x)$

c) Change the order of integration and evaluate $\int_0^{\infty} \int_0^{x} e^{\frac{-x^2}{y}} x\,dx\,dy$

SLR-BD-11

Seat No.	

Set S

F.Y (B. Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025

Engineering Mathematics – II

(BTCE0203 / BTME0203 / BTETE0203 / BTCSE0203 / BTEE0203 / BTECE0203)

Day & Date: Friday, 06-June-2025 Max. Marks: 70

Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.

2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) $\cos(x+iy) =$ _____.

a) $\cos x \cos y + \sin x \sin y$ b) $\cos x \cos hy + i \sin x \sin hy$

c) $\cos x \cos hy - i \sin x \sin hy$ d) $\cos hx \sin hy - i \sin hx \sin hy$

2) $[\cos\theta - i \sin\theta]^4 =$ _____

a) $\sin 4\theta - i \cos 4\theta$ b) $\cos 4\theta + i \sin 4\theta$

c) $\cos 4\theta - i \sin 4\theta$ d) $\sin 4\theta + i \cos 4\theta$

3) $\frac{B(m+1,n)}{B(m,n)}$ is equal to _____.

a) $\frac{m}{n}$ b) $\frac{m+1}{n}$

c) $\frac{m-1}{n}$ d) $\frac{m}{m+n}$

4) Which of the following is not true?

a) $\lceil \frac{1}{2} = \sqrt{\pi}$ b) $\lceil \frac{1}{4} \lceil \frac{3}{4} = \sqrt{2\pi}$

c) $\lceil n+1 = n \lceil n$ d) $\lceil -2 = \infty$

5) The numbers of loops of $r = a \sin 2\theta$ are _____.

a) Two b) Three

c) Four d) eight

6) For the curve $y^2(2a-x) = x^3$, the origin is _____.

a) Node b) Cusp

c) Isolated point d) None of these

7) The value of $\int_0^{\pi/2}\int_0^{\pi/2}\sin(x+y)dx\,dy$ is _____.

a) 0 b) 2

c) π d) -2

8) For $\int_0^{\infty}\int_x^{\infty} f(x,y)\,dydx$ by the change of order of integration, we get _____.

a) $\int_0^{\infty}\int_0^{x} f(x,y)\,dxdy$ b) $\int_x^{\infty}\int_0^{\infty} f(x,y)\,dxdy$

c) $\int_0^{\infty}\int_y^{\infty} f(x,y)\,dxdy$ d) $\int_0^{\infty}\int_0^{y} f(x,y)\,dxdy$

9) If density ρ (rho) at any point varies as the distance of the point from $y-$ axis then ρ equals to _____.

a) kx b) kxy

c) ky d) $k(x^2+y^2)$

10) The differential equation $\frac{dy}{dx}=\frac{a_1x+b_1y+c_1}{a_2x+b_2y+c_2}$ will be exact if _____.

a) $b_2=-a_1$ b) $a_2=-b_1$

c) $b_1=a_2$ d) $a_1=b_2$

11) The orthogonal trajectories of family of curve $xy=a$ is _____.

a) $x^2+y^2=c$ b) $y^2=4ax$

c) $x=cy$ d) $y^2-x^2=c$

12) The factorial series $\sum\frac{1}{n!}$ is _____.

a) Convergent b) Divergent

c) Oscillatory d) Absolutely convergent

13) The $p-$series $\sum_{n=1}^{\infty}\frac{1}{n^p}$ is convergent if ____.

a) $p\leq 1$ b) $p=0$

c) $p>1$ d) $p=\frac{1}{2}$

14) Analytic function is also called as _____.

a) Holomorphic b) Irregular

c) Harmonic d) Laplace

SLR-BD-11

Seat No.	

Set | **S**

F.Y (B. Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
Engineering Mathematics – II
(BTCE0203 / BTME0203 / BTETE0203 / BTCSE0203 / BTEE0203 / BTECE0203)

Day & Date: Friday, 06-June-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Solve any three of the following questions. **09**

a) Solve: $(2x - 2y + 5)dy = (x - y + 3)dx$

b) Solve $y(1 + xy)dx - x(1 - xy)dy = 0$

c) Find the analytic function whose real part is $e^x \cos y$

d) Find all the values of $x^4 + x^3 + x^2 + x + 1 = 0$

e) Test the convergence of $\frac{3}{4} + \left(\frac{4}{5}\right)^2 + \left(\frac{5}{6}\right)^3 + \cdots + \left(\frac{n+2}{n+3}\right)^n + \cdots$ by using Cauchy n^{th} root test.

Q.3 Solve any three of the following questions. **09**

a) Solve: $\frac{dy}{dx} + \frac{2x}{x^2+1}y = \frac{4x^2}{x^2+1}$

b) Find the orthogonal trajectory of family of cardioids $r = a(1 + \cos\theta)$

c) Check whether following function is analytic or not. If analytic then find its derivatives. $f(z) = z^2 + \bar{z}$

d) Find k such that $f(z) = \frac{1}{2}\log(x^2 + y^2) + i\tan^{-1}\frac{ky}{x}$ is analytic.

e) Test the convergence of $\sum \frac{3^n}{2^{n+3}}$

Q.4 Solve any two of the following questions. **10**

a) The charge q on the plate of the condenser of capacity C, charged through a resistance R by a steady voltage V satisfies the differential equation $R\frac{dq}{dt} + \frac{q}{C} = V$. And $q = 0$ when $t = 0$. Show that $q = C.V.(1 - e^{-t/CR})$

b) Define absolute and conditional convergence. Examine the convergence of the series, $\sum \frac{(-1)^n(n^2+1)}{n^3}$

c) Show that $u = \cos x \cosh y$ is a harmonic function. Find its harmonic conjugate and corresponding harmonic function.

Section – II

Q.5 Solve any three of the following questions. **09**

a) Evaluate $\int_0^{\infty} x^4 e^{-x^6} dx$

b) Evaluate by using DUIS rule: $\int_0^{\infty} \frac{e^{-x}(1-\cos ax)}{x} dx$

c) Trace the following curves with full justification $r = a\,(1-\cos\theta\,)$

d) Change to polar co-ordinate system and evaluate $\int_0^a \int_y^a \frac{x\,dxdy}{(x^2+y^2)}$

e) Find the area by double integration common of the circles $r = a$ and $r = 2\,\alpha\cos\theta$

Q.6 Solve any three of the following questions. **09**

a) Evaluate $\int_0^3 x^3\,(3-x)^4 dx$

b) Trace the curve $x = a(t-\sin t), y = a(1+\cos t)$

c) Evaluate $\int_0^2 \int_1^2 \int_0^{yz} xyz\,dx\,dy\,dz$

d) Evaluate $\int\int e^{3x+4y} dxdy$ over the triangle $x = 0, y = 0, x+y = 1$

e) Find by double integration the mass of a thin plate bounded by $y^2 = x$ and $x^2 = y$. If the density at any point varies as the square of its distance from the origin.

Q.7 Solve any two of the following questions. **10**

a) State and Prove Duplication Formula.

b) Trace the following curves with full justification $xy^2 = a^2(a-x)$

c) Change the order of integration and evaluate $\int_0^{\infty} \int_0^{x} e^{\frac{-x^2}{y}} x\,dx\,dy$

Seat No.	

Set P

S.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (NEP CBCS)
Examination: March/April – 2025
Structural Mechanics – I (CIVPCC-01)

Day & Date: Saturday 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct alternative. **14**

1) The relation between modulus of elasticity (E), modulus of rigidity (G) and bulk modulus (K) is given as _____.
a) K+G / (3K+ G) b) 3 KG / (3K+ G)
c) 3 KG / (9K+ G) d) 9 KG / (3K+ G)

2) Modulus of rigidity is the ratio of _____.
a) Lateral strain and linear strain
b) linear stress and lateral strain
c) Shear stress and shear Strain
d) Shear strain and shear stress

3) The value on shear stress on principal plane is _____.
a) Zero b) maximum
c) minimum but positive d) Average value

4) The point of contra flexure is the point where _____.
a) B. M. changes its sign b) B. M. is minimum
c) S. F. is zero d) B. M. is maximum

5) A simply supported beam carries couple at a point on its span the shear force is _____.
a) Varies by cubic law b) Varies by parabolic law
c) Varies linearly d) Is uniform throughout

6) Polar moment of inertia of solid circular shaft of diameter D is given by _____.
a) $\pi D^3/32$ b) $\pi D^4/32$
c) $\pi D^3/64$ d) $\pi D^4/64$

7) A Shaft is simultaneously subjected to torque T and bending moment M. The ratio of maximum shear stress to bending stress is _____.
a) M/T b) T/M
c) 2M/T d) T/2M

8) Top most portion of three hinged arch is called as _____.
a) Crown b) Rise
c) Span d) Thrust

9) Where the bending stress of the section of beam is zero _____.
a) Top fiber
b) Bottom Fiber
c) Depend on the section of beam
d) Neutral axis of the section

10) The strength of beam section is determined by its _____.
a) Compressive stress b) Section modulus
c) Shear modulus d) Tensile stress

11) As per assumption of theory of bending, the beam is subjected to _____.
a) Pure bending b) Pure shear
c) Pure tension d) Simple shear

12) For T section maximum shear stress occurs at _____.
a) Top fiber of section b) Bottomfiber of section
c) At neutral axis of section d) None of above

13) For which structure influence line are drawn?
a) Statically indeterminate structure
b) Statically Determinate
c) Pin Jointed Truss
d) All of the above

14) If unit loads moves from left to right on S.S. beam the nature of ILD for reaction is?
a) Parabolic b) Hyperbolic
c) Inclined straight line d) Horizontal Straight line

Seat No.		Set	P

S.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (NEP CBCS)
Examination: March/April – 2025
Structural Mechanics – I (CIVPCC-01)

Day & Date: Saturday 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 2 and Q. No. 6 are compulsory.
2) Solve any two from the remaining question of each section.
2) Figures to the right indicate full marks.
3) Assume suitable data is necessary and mention it clearly.

Section – I

Q.2 member LMNP is subjected to point load as shown in fig-I calculate force 'P' & change in length of the bar take E = 210 GPa. **10**

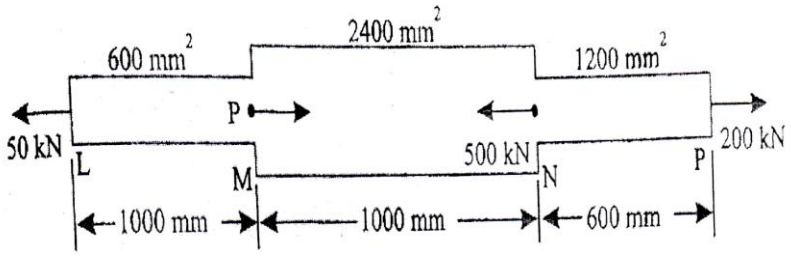


Fig-I

Q.3 At a point in a strained material within abody subjected to two mutually perpendicular directions, the stresses are 80 N/mm^2 (tensile) and 40 N/mm^2 (tensile) as shown in fig-II. Each of the above stresses is accompanied by a shear stress of 60 N/mm^2. Determine the normal stress, shear stress & resultant stress on plane inclined at 45^0 with axis of minor tensile stress. **09**

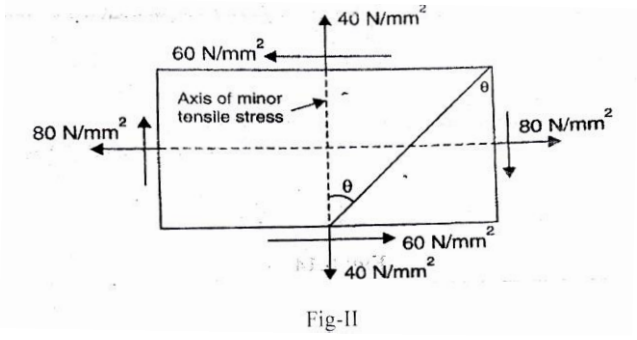


Fig-II

Q.4 Solid shaft is subjected to a bending moment of of 2.3 kNm and a twisting moment of 3.45 kNm. Find the diameter of the shaft when permissible tensile & shear stresses for the material of the shaft limited to 703 MN/m^2 & 421.8 MN/m^2 respectively. **09**

Q.5 Three hinged parabolic arch is loaded & supported as shown in fig-III. Determine normal thrust & radial shear at 4 m from the left support. **09**

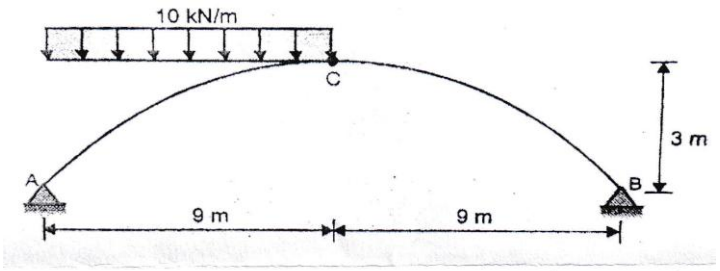


fig-III

Section – II

Q.6 Draw SFD and BMD for a beam as shown in fig-IV. **10**

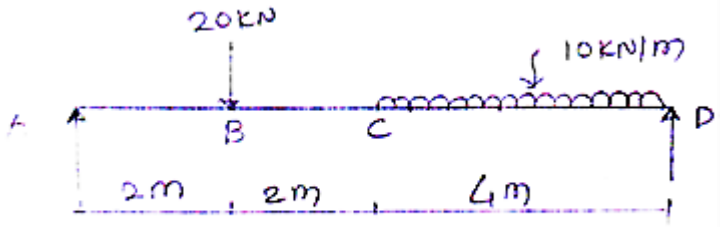


fig-IV

Q.7 Symmetric I section is 150 mm wide and 200mm deep. The flange thickness and web thickness is 10 mm. this section is used for cantilever beam having a span of 3 m subjected to uniformly distributed load. Find the maximum u.d.1. that can be supported if E= 200GPa and maximum allowable stress is180 MPa. Refer fig-V. **09**

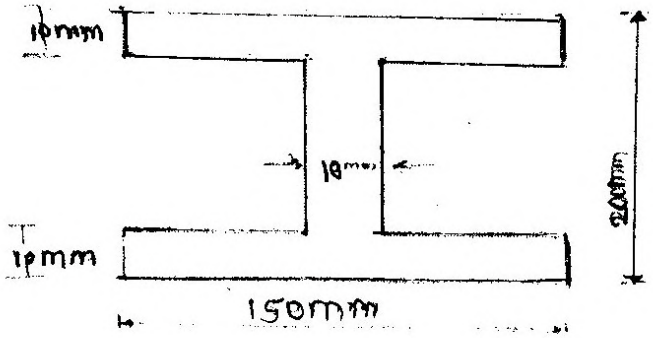


fig-V

Q.8 Simply supported beam of span 4 m. Carries UDL of 80 kN/m over the entire span. Draw the shear stress distribution diagram at support indicating all important values Refer fig-VI. **09**

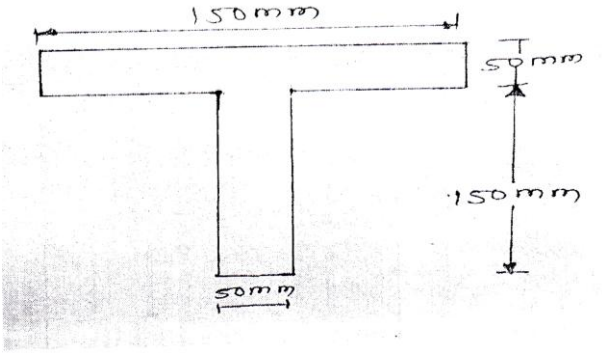


fig-VI

Q.9 Two wheel loads of 80 kN & 100 kN are spaced at 3 m. These loads are moving on a girder CD of span 13 m. Any wheel load can lead the other. Find the maximum positive & negative shear force at 5m from C. **09**

Seat No.	

Set Q

S.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (NEP CBCS)
Examination: March/April – 2025
Structural Mechanics – I (CIVPCC-01)

Day & Date: Saturday 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct alternative. **14**

1) Top most portion of three hinged arch is called as _____.
a) Crown b) Rise
c) Span d) Thrust

2) Where the bending stress of the section of beam is zero _____.
a) Top fiber
b) Bottom Fiber
c) Depend on the section of beam
d) Neutral axis of the section

3) The strength of beam section is determined by its _____.
a) Compressive stress b) Section modulus
c) Shear modulus d) Tensile stress

4) As per assumption of theory of bending, the beam is subjected to _____.
a) Pure bending b) Pure shear
c) Pure tension d) Simple shear

5) For T section maximum shear stress occurs at _____.
a) Top fiber of section b) Bottomfiber of section
c) At neutral axis of section d) None of above

6) For which structure influence line are drawn?
a) Statically indeterminate structure
b) Statically Determinate
c) Pin Jointed Truss
d) All of the above

7) If unit loads moves from left to right on S.S. beam the nature of ILD for reaction is?
a) Parabolic b) Hyperbolic
c) Inclined straight line d) Horizontal Straight line

8) The relation between modulus of elasticity (E), modulus of rigidity (G) and bulk modulus (K) is given as _____.
a) K+G / (3K+ G) b) 3 KG / (3K+ G)
c) 3 KG / (9K+ G) d) 9 KG / (3K+ G)

9) Modulus of rigidity is the ratio of _____.
a) Lateral strain and linear strain
b) linear stress and lateral strain
c) Shear stress and shear Strain
d) Shear strain and shear stress

10) The value on shear stress on principal plane is _____.
a) Zero b) maximum
c) minimum but positive d) Average value

11) The point of contra flexure is the point where _____.
a) B. M. changes its sign b) B. M. is minimum
c) S. F. is zero d) B. M. is maximum

12) A simply supported beam carries couple at a point on its span the shear force is _____.
a) Varies by cubic law b) Varies by parabolic law
c) Varies linearly d) Is uniform throughout

13) Polar moment of inertia of solid circular shaft of diameter D is given by _____.
a) $\pi D^3/32$ b) $\pi D^4/32$
c) $\pi D^3/64$ d) $\pi D^4/64$

14) A Shaft is simultaneously subjected to torque T and bending moment M. The ratio of maximum shear stress to bending stress is _____.
a) M/T b) T/M
c) 2M/T d) T/2M

Seat No.		Set	Q

S.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (NEP CBCS)
Examination: March/April – 2025
Structural Mechanics – I (CIVPCC-01)

Day & Date: Saturday 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 2 and Q. No. 6 are compulsory.
2) Solve any two from the remaining question of each section.
2) Figures to the right indicate full marks.
3) Assume suitable data is necessary and mention it clearly.

Section – I

Q.2 member LMNP is subjected to point load as shown in fig-I calculate force 'P' & change in length of the bar take E = 210 GPa. **10**

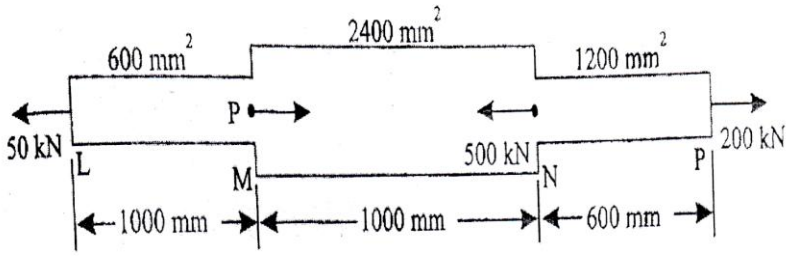


Fig-I

Q.3 At a point in a strained material within abody subjected to two mutually perpendicular directions, the stresses are 80 N/mm^2 (tensile) and 40 N/mm^2 (tensile) as shown in fig-II. Each of the above stresses is accompanied by a shear stress of 60 N/mm^2. Determine the normal stress, shear stress & resultant stress on plane inclined at 45^0 with axis of minor tensile stress. **09**

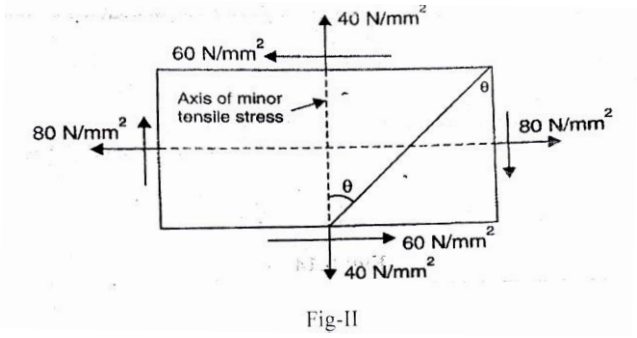


Fig-II

Q.4 Solid shaft is subjected to a bending moment of of 2.3 kNm and a twisting moment of 3.45 kNm. Find the diameter of the shaft when permissible tensile & shear stresses for the material of the shaft limited to 703 MN/m^2 & 421.8 MN/m^2 respectively. **09**

Q.5 Three hinged parabolic arch is loaded & supported as shown in fig-III. Determine normal thrust & radial shear at 4 m from the left support. **09**

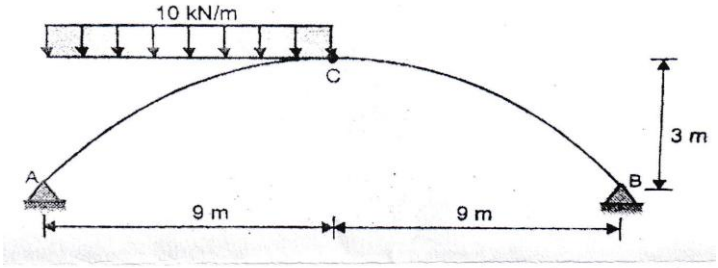


fig-III

Section – II

Q.6 Draw SFD and BMD for a beam as shown in fig-IV. **10**

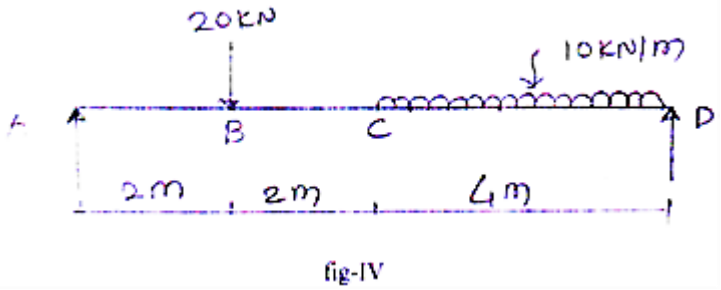


fig-IV

Q.7 Symmetric I section is 150 mm wide and 200mm deep. The flange thickness and web thickness is 10 mm. this section is used for cantilever beam having a span of 3 m subjected to uniformly distributed load. Find the maximum u.d.1. that can be supported if E= 200GPa and maximum allowable stress is180 MPa. Refer fig-V. **09**

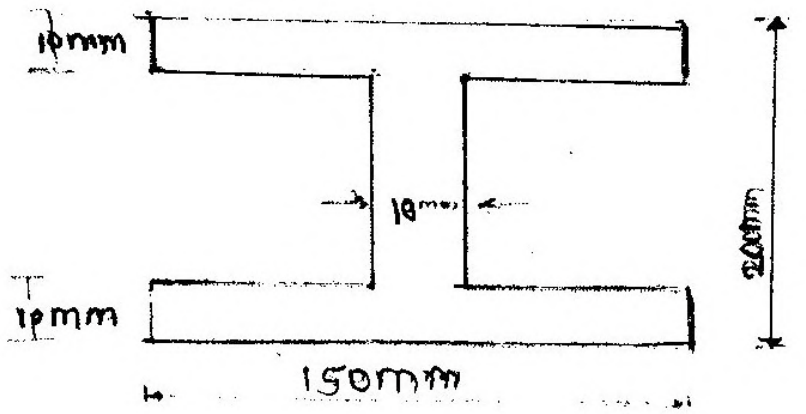


fig-V

Q.8 Simply supported beam of span 4 m. Carries UDL of 80 kN/m over the entire span. Draw the shear stress distribution diagram at support indicating all important values Refer fig-VI. **09**

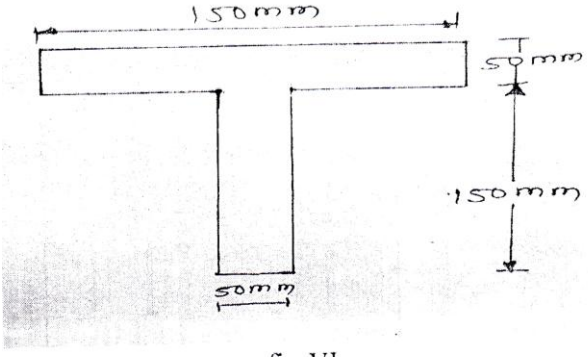


fig-VI

Q.9 Two wheel loads of 80 kN & 100 kN are spaced at 3 m. These loads are moving on a girder CD of span 13 m. Any wheel load can lead the other. Find the maximum positive & negative shear force at 5m from C. **09**

Seat No.	

Set R

S.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (NEP CBCS)
Examination: March/April – 2025
Structural Mechanics – I (CIVPCC-01)

Day & Date: Saturday 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct alternative. **14**

1) As per assumption of theory of bending, the beam is subjected to _____.
a) Pure bending b) Pure shear
c) Pure tension d) Simple shear

2) For T section maximum shear stress occurs at _____.
a) Top fiber of section b) Bottomfiber of section
c) At neutral axis of section d) None of above

3) For which structure influence line are drawn?
a) Statically indeterminate structure
b) Statically Determinate
c) Pin Jointed Truss
d) All of the above

4) If unit loads moves from left to right on S.S. beam the nature of ILD for reaction is?
a) Parabolic b) Hyperbolic
c) Inclined straight line d) Horizontal Straight line

5) The relation between modulus of elasticity (E), modulus of rigidity (G) and bulk modulus (K) is given as _____.
a) K+G / (3K+ G) b) 3 KG / (3K+ G)
c) 3 KG / (9K+ G) d) 9 KG / (3K+ G)

6) Modulus of rigidity is the ratio of _____.
a) Lateral strain and linear strain
b) linear stress and lateral strain
c) Shear stress and shear Strain
d) Shear strain and shear stress

7) The value on shear stress on principal plane is _____.
a) Zero b) maximum
c) minimum but positive d) Average value

8) The point of contra flexure is the point where _____.
a) B. M. changes its sign b) B. M. is minimum
c) S. F. is zero d) B. M. is maximum

9) A simply supported beam carries couple at a point on its span the shear force is _____.
a) Varies by cubic law b) Varies by parabolic law
c) Varies linearly d) Is uniform throughout

10) Polar moment of inertia of solid circular shaft of diameter D is given by _____.
a) $\pi D^3/32$ b) $\pi D^4/32$
c) $\pi D^3/64$ d) $\pi D^4/64$

11) A Shaft is simultaneously subjected to torque T and bending moment M. The ratio of maximum shear stress to bending stress is _____.
a) M/T b) T/M
c) 2M/T d) T/2M

12) Top most portion of three hinged arch is called as _____.
a) Crown b) Rise
c) Span d) Thrust

13) Where the bending stress of the section of beam is zero _____.
a) Top fiber
b) Bottom Fiber
c) Depend on the section of beam
d) Neutral axis of the section

14) The strength of beam section is determined by its _____.
a) Compressive stress b) Section modulus
c) Shear modulus d) Tensile stress

Seat No.		Set	R

S.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (NEP CBCS)
Examination: March/April – 2025
Structural Mechanics – I (CIVPCC-01)

Day & Date: Saturday 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 2 and Q. No. 6 are compulsory.
2) Solve any two from the remaining question of each section.
2) Figures to the right indicate full marks.
3) Assume suitable data is necessary and mention it clearly.

Section – I

Q.2 member LMNP is subjected to point load as shown in fig-I calculate force 'P' & change in length of the bar take E = 210 GPa. **10**

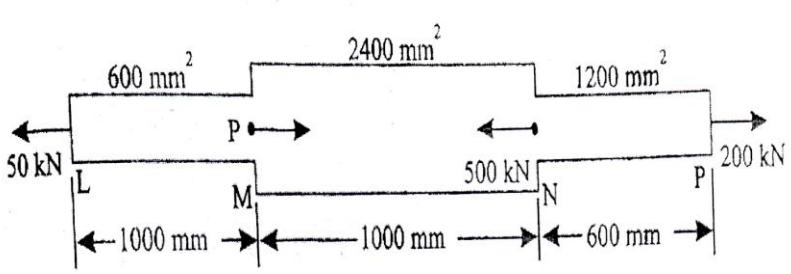


Fig-I

Q.3 At a point in a strained material within abody subjected to two mutually perpendicular directions, the stresses are 80 N/mm^2 (tensile) and 40 N/mm^2 (tensile) as shown in fig-II. Each of the above stresses is accompanied by a shear stress of 60 N/mm^2. Determine the normal stress, shear stress & resultant stress on plane inclined at 45^0 with axis of minor tensile stress. **09**

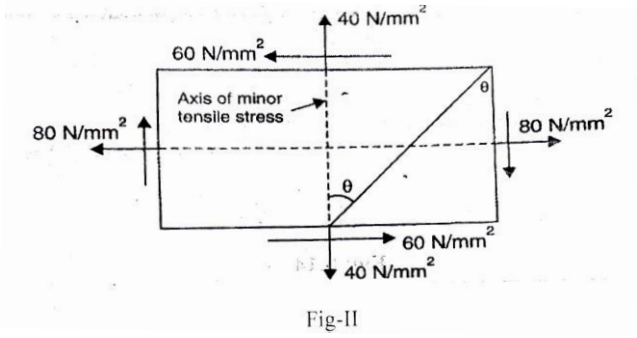


Fig-II

Q.4 Solid shaft is subjected to a bending moment of of 2.3 kNm and a twisting moment of 3.45 kNm. Find the diameter of the shaft when permissible tensile & shear stresses for the material of the shaft limited to 703 MN/m^2 & 421.8 MN/m^2 respectively. **09**

Q.5 Three hinged parabolic arch is loaded & supported as shown in fig-III. Determine normal thrust & radial shear at 4 m from the left support. **09**

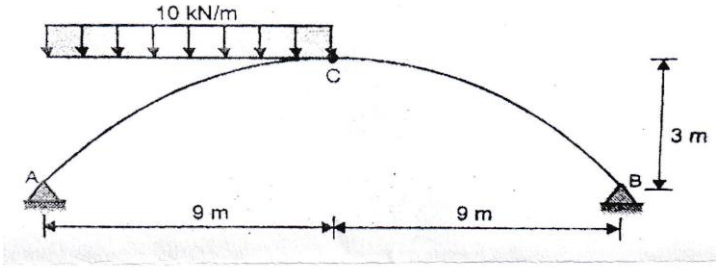


fig-III

Section – II

Q.6 Draw SFD and BMD for a beam as shown in fig-IV. **10**

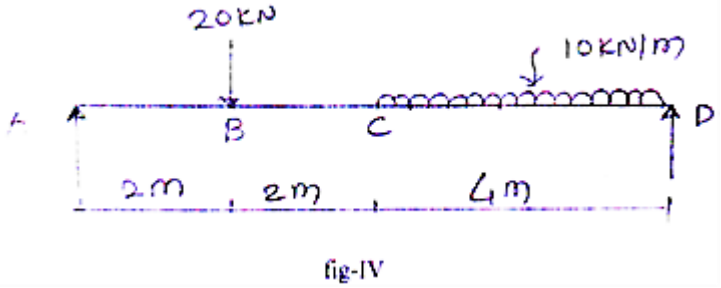


fig-IV

Q.7 Symmetric I section is 150 mm wide and 200mm deep. The flange thickness and web thickness is 10 mm. this section is used for cantilever beam having a span of 3 m subjected to uniformly distributed load. Find the maximum u.d.1. that can be supported if E= 200GPa and maximum allowable stress is180 MPa. Refer fig-V. **09**

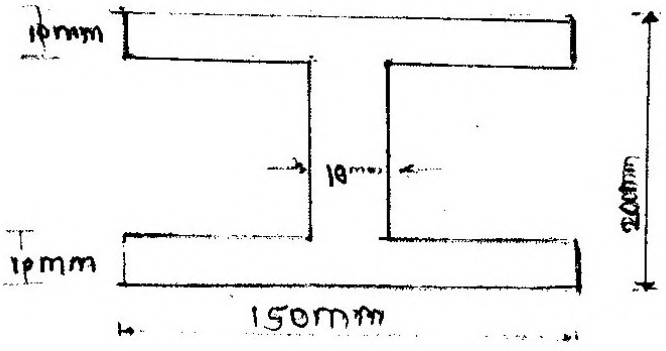


fig-V

Q.8 Simply supported beam of span 4 m. Carries UDL of 80 kN/m over the entire span. Draw the shear stress distribution diagram at support indicating all important values Refer fig-VI. **09**

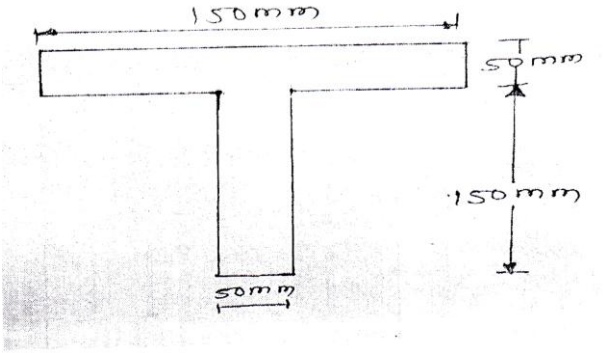


fig-VI

Q.9 Two wheel loads of 80 kN & 100 kN are spaced at 3 m. These loads are moving on a girder CD of span 13 m. Any wheel load can lead the other. Find the maximum positive & negative shear force at 5m from C. **09**

Seat No.		Set	S

S.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (NEP CBCS)
Examination: March/April – 2025
Structural Mechanics – I (CIVPCC-01)

Day & Date: Saturday 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct alternative. **14**

1) Polar moment of inertia of solid circular shaft of diameter D is given by _____.
a) $\pi D^3/32$ b) $\pi D^4/32$
c) $\pi D^3/64$ d) $\pi D^4/64$

2) A Shaft is simultaneously subjected to torque T and bending moment M. The ratio of maximum shear stress to bending stress is _____.
a) M/T b) T/M
c) 2M/T d) T/2M

3) Top most portion of three hinged arch is called as _____.
a) Crown b) Rise
c) Span d) Thrust

4) Where the bending stress of the section of beam is zero _____.
a) Top fiber
b) Bottom Fiber
c) Depend on the section of beam
d) Neutral axis of the section

5) The strength of beam section is determined by its _____.
a) Compressive stress b) Section modulus
c) Shear modulus d) Tensile stress

6) As per assumption of theory of bending, the beam is subjected to _____.
a) Pure bending b) Pure shear
c) Pure tension d) Simple shear

7) For T section maximum shear stress occurs at _____.
a) Top fiber of section b) Bottomfiber of section
c) At neutral axis of section d) None of above

8) For which structure influence line are drawn?
a) Statically indeterminate structure
b) Statically Determinate
c) Pin Jointed Truss
d) All of the above

9) If unit loads moves from left to right on S.S. beam the nature of ILD for reaction is?
a) Parabolic b) Hyperbolic
c) Inclined straight line d) Horizontal Straight line

10) The relation between modulus of elasticity (E), modulus of rigidity (G) and bulk modulus (K) is given as _____.
a) K+G / (3K+ G) b) 3 KG / (3K+ G)
c) 3 KG / (9K+ G) d) 9 KG / (3K+ G)

11) Modulus of rigidity is the ratio of _____.
a) Lateral strain and linear strain
b) linear stress and lateral strain
c) Shear stress and shear Strain
d) Shear strain and shear stress

12) The value on shear stress on principal plane is _____.
a) Zero b) maximum
c) minimum but positive d) Average value

13) The point of contra flexure is the point where _____.
a) B. M. changes its sign b) B. M. is minimum
c) S. F. is zero d) B. M. is maximum

14) A simply supported beam carries couple at a point on its span the shear force is _____.
a) Varies by cubic law b) Varies by parabolic law
c) Varies linearly d) Is uniform throughout

Seat No.		Set	S

S.Y. (B.Tech.) (Civil Engineering) (Semester - I) (New) (NEP CBCS)
Examination: March/April – 2025
Structural Mechanics – I (CIVPCC-01)

Day & Date: Saturday 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 2 and Q. No. 6 are compulsory.
2) Solve any two from the remaining question of each section.
2) Figures to the right indicate full marks.
3) Assume suitable data is necessary and mention it clearly.

Section – I

Q.2 member LMNP is subjected to point load as shown in fig-I calculate force 'P' & change in length of the bar take E = 210 GPa. **10**

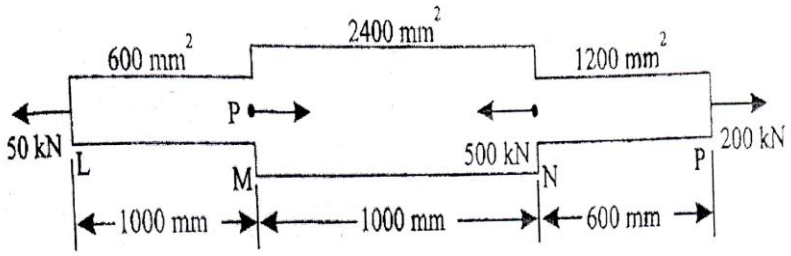


Fig-I

Q.3 At a point in a strained material within abody subjected to two mutually perpendicular directions, the stresses are 80 N/mm^2 (tensile) and 40 N/mm^2 (tensile) as shown in fig-II. Each of the above stresses is accompanied by a shear stress of 60 N/mm^2. Determine the normal stress, shear stress & resultant stress on plane inclined at 45^0 with axis of minor tensile stress. **09**

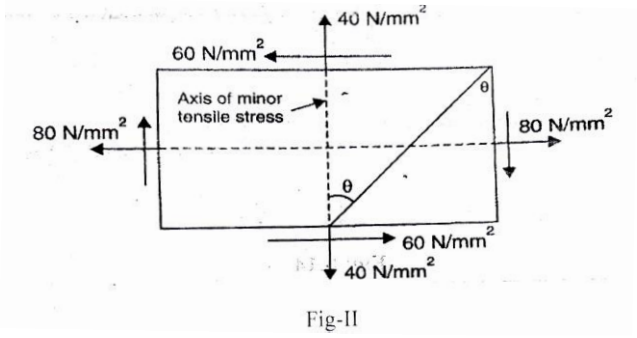


Fig-II

Q.4 Solid shaft is subjected to a bending moment of of 2.3 kNm and a twisting moment of 3.45 kNm. Find the diameter of the shaft when permissible tensile & shear stresses for the material of the shaft limited to 703 MN/m^2 & 421.8 MN/m^2 respectively. **09**

Q.5 Three hinged parabolic arch is loaded & supported as shown in fig-III. Determine normal thrust & radial shear at 4 m from the left support. **09**

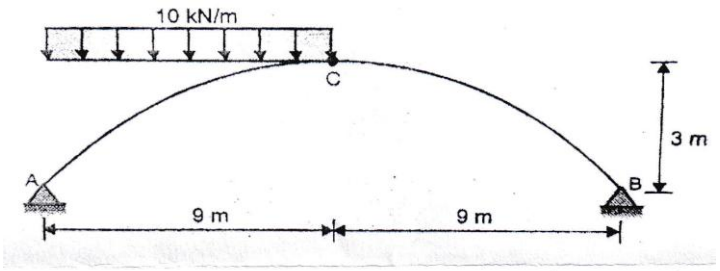


fig-III

Section – II

Q.6 Draw SFD and BMD for a beam as shown in fig-IV. **10**

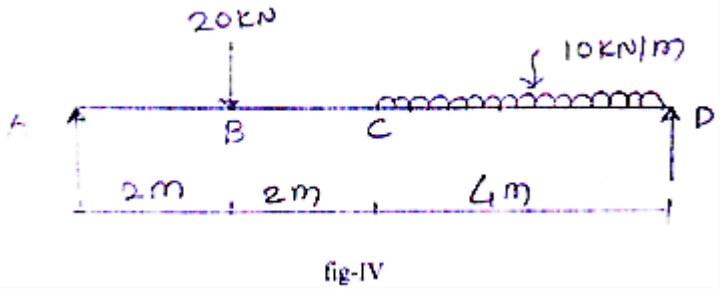


fig-IV

Q.7 Symmetric I section is 150 mm wide and 200mm deep. The flange thickness and web thickness is 10 mm. this section is used for cantilever beam having a span of 3 m subjected to uniformly distributed load. Find the maximum u.d.1. that can be supported if E= 200GPa and maximum allowable stress is180 MPa. Refer fig-V. **09**

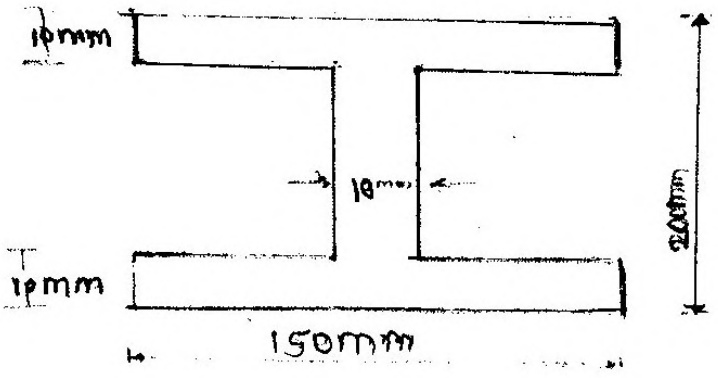


fig-V

Q.8 Simply supported beam of span 4 m. Carries UDL of 80 kN/m over the entire span. Draw the shear stress distribution diagram at support indicating all important values Refer fig-VI. **09**

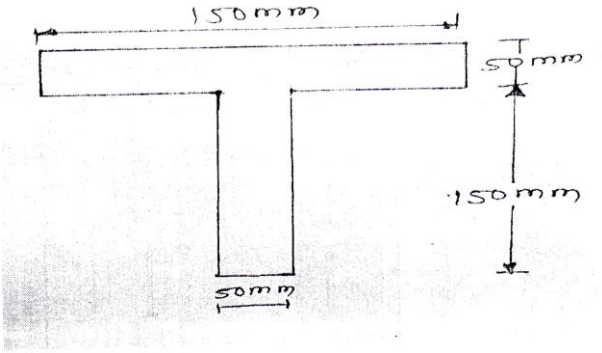


fig-VI

Q.9 Two wheel loads of 80 kN & 100 kN are spaced at 3 m. These loads are moving on a girder CD of span 13 m. Any wheel load can lead the other. Find the maximum positive & negative shear force at 5m from C. **09**

SLR-BD-13

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fluid Mechanics and Machines (CIVPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Assume suitable data if necessary and state it clearly.
4) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Newton's law of viscosity is given by the relation _____.

a) $\tau = \mu^2 dudy$ b) $\tau = \sqrt{\mu} dudyc$

c) $\tau = \mu \frac{du}{dy}$ d) $\tau = \mu^{3/2} dudy$

2) Raindrops are spherical in shape because of _____.

a) Capillarity b) Surface Tension
c) Downward motion d) Acceleration due to gravity

3) Submerged body will be in stable equilibrium when _____.

a) M is above G b) M is below G
c) B is above G d) B is below G

4) The line traced out by a given particle as it flows from one point to another is called _____.

a) path line b) Streamline
c) streak line d) none of the above

5) The point of application of the total pressure on the surface is _____.

a) centroid of the surface b) centre of pressure
c) either of the above d) none of the above

6) The length of a convergent section of the Venturimeter is _____ divergent section.

a) is equal to b) is more than
c) is less than d) none of the above

7) If the liquid hasa specific weight of 7000 N/m^3 then its specific gravity is _____.

a) 0.832 b) 0.981
c) 0.965 d) 0.713

8) When pipes are connected in series, the rate of flow _____.

a) is the same as flowing through each pipe
b) is equal to the sum of the rate of flow in each pipe
c) is equal to the reciprocal of the sum of the rate of flow in each pipe
d) None of the above

9) The following is not a minor head loss _____.

a) loss at the exit of the pipe
b) loss at the entrance of the pipe
c) friction loss
d) Noe of these

10) Given that, N = speed; P = power, H = head, the specific speed of a hydraulic turbine is given by _____.

a) $\frac{N\sqrt{P}}{H^{3/2}}$ b) $\frac{N\sqrt{P}}{H^{5/4}}$
c) $\frac{N\sqrt{P}}{H^{4/5}}$ d) $\frac{P\sqrt{N}}{H^{5/4}}$

11) The force exerted by the jet of water on a stationary vertical plate in the direction of motion of the plate is given by _____.

a) ρaV b) ρaV^3
c) ρa^2V d) ρaV^2

12) In a centrifugal pump the regulating valve is provided on _____.

a) the suction pipe b) the delivery pipe
c) the casing d) none of the above

13) Total Energy Line (T.E.L.) represents the sum of _____.

a) pressure head, kinetic head and datum head
b) pressure head and kinetic head
c) kinetic head and datum head
d) pressure head and datum head

14) Which of the following turbines is not the reaction turbine?

a) Kaplan b) Propeller
c) Francis d) Pelton wheel

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fluid Mechanics and Machines (CIVPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section - I, all questions are compulsory.
2) In Section II, Q. 5 is compulsory, and you must attempt any two questions from the remaining questions.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary and state it clearly.
5) Use of a non-programmable calculator is allowed.

Section – I

Q.2 Attempt any Two. **08**

a) Define and Write the Units.
i) Viscosity
ii) Specific Gravity
iii) Compressibility
iv) Capillarity

b) A rectangular plate 1.2m X 0.4 m, weighing 970 N slides down a 45° inclined surface at a uniform velocity of 2.25 m/s. If a 2mm gap between the plate and the inclined surface is filled with oil, determine the oil's viscosity.

c) With a neat sketch explain the conditions of the equilibrium for floating and submerged body.

Q.3 Attempt any Two. **10**

a) Derive an expression with a neat sketch for the total pressure and centre of pressure for the inclined plane surface submerged in the liquid.

b) Determine the total pressure on a circular plate of diameter 1.5 m which is placed vertically in water in such a way that the center of the plate is 3 m below the free surface of the water. Find the position of the centre of pressure also.

c) The right limb of a simple U-tube manometer containing mercury is open to the atmosphere while the left limb is connected to a pipe in which a fluid of sp.gr. 0.9 is flowing. The centre of the pipe is 12 cm below the level of mercury in the right limb. Find the pressure of fluid in the pipe if the difference in mercury level in the two limbs is 20 cm.

Q.4 Solve any Two of the following. **10**

a) Define:
- i) Steady flow
- ii) Uniform flow
- iii) Compressible flow
- iv) Laminar flow
- v) Rate of flow

b) The velocity potential function $\phi = 5(x^2 - y^2)$. Calculate velocity components at the point (4, 5); also find the magnitude and direction of resultant velocity.

c) An oil of specific gravity 0.8 is flowing through a venturi meter having an inlet diameter of 20 cm and a throat diameter of 10 cm. The oil-mercury differential manometer shows a reading of 25 cm. Calculate the discharge of oil through a horizontal Venturimeter. Take Cd=0.98

Section – II

Q.5 Solve any two of the following. **10**

a) Find the discharge of water flowing over a rectangular notch of 2m length when the constant head over the notch is 300mm. Take Cd = 0.62.

b) Find the displacement thickness, momentum thickness, energy thickness and shape factor for the velocity distribution in the boundary layer given by $u/U = y/\delta$.

c) Show that for triangular notch 1% of error in measurement of the head causes a 2.5% error in measurement of discharge.

Q.6 a) Derive Darcy Weisbach equation for head loss due to friction in pipe flow. Draw the sketch. **04**

b) Determine the difference in elevation between water surfaces in two tanks which are connected by horizontal pipe of diameter 30cm and length 400m.The discharge through the pipe is 300 lps. Consider all losses and assume f=0.008 **05**

Q.7 a) Derive an expression for force exerted by a jet on a stationary curved plate, when the jet strikes at the centre of a symmetrically curved plate. **04**

b) A centrifugal pump delivers water against a net head of 14.5m and a design speed of 1000 rpm. The vane angle is 30° curved back. If the impeller diameter is 300 mm and the outlet width is 50 mm. Determine discharge of pump if manometric efficiency is 95% **05**

Q.8 a) What are the different efficiencies of centrifugal pump? Explain them. **04**

b) A turbine is to operate under a head of 25m at 200 rpm. The discharge is $9m^3/s$. If the efficiency is 90%, Determine: **05**
- i) Power generated
- ii) Specific speed of turbine
- iii) Identify the type of turbine

SLR-BD-13

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fluid Mechanics and Machines (CIVPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Assume suitable data if necessary and state it clearly.
4) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) When pipes are connected in series, the rate of flow _____.
a) is the same as flowing through each pipe
b) is equal to the sum of the rate of flow in each pipe
c) is equal to the reciprocal of the sum of the rate of flow in each pipe
d) None of the above

2) The following is not a minor head loss _____.
a) loss at the exit of the pipe
b) loss at the entrance of the pipe
c) friction loss
d) Noe of these

3) Given that, N = speed; P = power, H = head, the specific speed of a hydraulic turbine is given by _____.
a) $\frac{N\sqrt{P}}{H^{3/2}}$ b) $\frac{N\sqrt{P}}{H^{5/4}}$
c) $\frac{N\sqrt{P}}{H^{4/5}}$ d) $\frac{P\sqrt{N}}{H^{5/4}}$

4) The force exerted by the jet of water on a stationary vertical plate in the direction of motion of the plate is given by _____.
a) ρaV b) ρaV^3
c) ρa^2V d) ρaV^2

5) In a centrifugal pump the regulating valve is provided on _____.
a) the suction pipe b) the delivery pipe
c) the casing d) none of the above

6) Total Energy Line (T.E.L.) represents the sum of _____.
a) pressure head, kinetic head and datum head
b) pressure head and kinetic head
c) kinetic head and datum head
d) pressure head and datum head

7) Which of the following turbines is not the reaction turbine?
a) Kaplan
b) Propeller
c) Francis
d) Pelton wheel

8) Newton's law of viscosity is given by the relation _____.
a) $\tau = \mu^2 dudy$
b) $\tau = \sqrt{\mu} dudyc$
c) $\tau = \mu \frac{du}{dy}$
d) $\tau = \mu^{3/2} dudy$

9) Raindrops are spherical in shape because of _____.
a) Capillarity
b) Surface Tension
c) Downward motion
d) Acceleration due to gravity

10) Submerged body will be in stable equilibrium when _____.
a) M is above G
b) M is below G
c) B is above G
d) B is below G

11) The line traced out by a given particle as it flows from one point to another is called _____.
a) path line
b) Streamline
c) streak line
d) none of the above

12) The point of application of the total pressure on the surface is _____.
a) centroid of the surface
b) centre of pressure
c) either of the above
d) none of the above

13) The length of a convergent section of the Venturimeter is _____ divergent section.
a) is equal to
b) is more than
c) is less than
d) none of the above

14) If the liquid hasa specific weight of 7000 N/m^3 then its specific gravity is _____.
a) 0.832
b) 0.981
c) 0.965
d) 0.713

SLR-BD-13

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fluid Mechanics and Machines (CIVPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section - I, all questions are compulsory.
2) In Section II, Q. 5 is compulsory, and you must attempt any two questions from the remaining questions.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary and state it clearly.
5) Use of a non-programmable calculator is allowed.

Section – I

Q.2 Attempt any Two. **08**

a) Define and Write the Units.
i) Viscosity
ii) Specific Gravity
iii) Compressibility
iv) Capillarity

b) A rectangular plate 1.2m X 0.4 m, weighing 970 N slides down a 45° inclined surface at a uniform velocity of 2.25 m/s. If a 2mm gap between the plate and the inclined surface is filled with oil, determine the oil's viscosity.

c) With a neat sketch explain the conditions of the equilibrium for floating and submerged body.

Q.3 Attempt any Two. **10**

a) Derive an expression with a neat sketch for the total pressure and centre of pressure for the inclined plane surface submerged in the liquid.

b) Determine the total pressure on a circular plate of diameter 1.5 m which is placed vertically in water in such a way that the center of the plate is 3 m below the free surface of the water. Find the position of the centre of pressure also.

c) The right limb of a simple U-tube manometer containing mercury is open to the atmosphere while the left limb is connected to a pipe in which a fluid of sp.gr. 0.9 is flowing. The centre of the pipe is 12 cm below the level of mercury in the right limb. Find the pressure of fluid in the pipe if the difference in mercury level in the two limbs is 20 cm.

Q.4 Solve any Two of the following. **10**

a) Define:
- i) Steady flow
- ii) Uniform flow
- iii) Compressible flow
- iv) Laminar flow
- v) Rate of flow

b) The velocity potential function $\phi = 5(x^2 - y^2)$. Calculate velocity components at the point (4, 5); also find the magnitude and direction of resultant velocity.

c) An oil of specific gravity 0.8 is flowing through a venturi meter having an inlet diameter of 20 cm and a throat diameter of 10 cm. The oil-mercury differential manometer shows a reading of 25 cm. Calculate the discharge of oil through a horizontal Venturimeter. Take Cd=0.98

Section – II

Q.5 Solve any two of the following. **10**

a) Find the discharge of water flowing over a rectangular notch of 2m length when the constant head over the notch is 300mm. Take Cd = 0.62.

b) Find the displacement thickness, momentum thickness, energy thickness and shape factor for the velocity distribution in the boundary layer given by $u/U = y/\delta$.

c) Show that for triangular notch 1% of error in measurement of the head causes a 2.5% error in measurement of discharge.

Q.6 a) Derive Darcy Weisbach equation for head loss due to friction in pipe flow. Draw the sketch. **04**

b) Determine the difference in elevation between water surfaces in two tanks which are connected by horizontal pipe of diameter 30cm and length 400m.The discharge through the pipe is 300 lps. Consider all losses and assume f=0.008 **05**

Q.7 a) Derive an expression for force exerted by a jet on a stationary curved plate, when the jet strikes at the centre of a symmetrically curved plate. **04**

b) A centrifugal pump delivers water against a net head of 14.5m and a design speed of 1000 rpm. The vane angle is 30° curved back. If the impeller diameter is 300 mm and the outlet width is 50 mm. Determine discharge of pump if manometric efficiency is 95% **05**

Q.8 a) What are the different efficiencies of centrifugal pump? Explain them. **04**

b) A turbine is to operate under a head of 25m at 200 rpm. The discharge is $9m^3/s$. If the efficiency is 90%, Determine: **05**
- i) Power generated
- ii) Specific speed of turbine
- iii) Identify the type of turbine

SLR-BD-13

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fluid Mechanics and Machines (CIVPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Assume suitable data if necessary and state it clearly.
4) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) The force exerted by the jet of water on a stationary vertical plate in the direction of motion of the plate is given by _____.
a) ρaV b) ρaV^3
c) ρa^2V d) ρaV^2

2) In a centrifugal pump the regulating valve is provided on _____.
a) the suction pipe b) the delivery pipe
c) the casing d) none of the above

3) Total Energy Line (T.E.L.) represents the sum of _____.
a) pressure head, kinetic head and datum head
b) pressure head and kinetic head
c) kinetic head and datum head
d) pressure head and datum head

4) Which of the following turbines is not the reaction turbine?
a) Kaplan b) Propeller
c) Francis d) Pelton wheel

5) Newton's law of viscosity is given by the relation _____.
a) $\tau = \mu^2 dudy$ b) $\tau = \sqrt{\mu} dudyc$
c) $\tau = \mu \frac{du}{dy}$ d) $\tau = \mu^{3/2} dudy$

6) Raindrops are spherical in shape because of _____.
a) Capillarity b) Surface Tension
c) Downward motion d) Acceleration due to gravity

7) Submerged body will be in stable equilibrium when _____.
a) M is above G
b) M is below G
c) B is above G
d) B is below G

8) The line traced out by a given particle as it flows from one point to another is called _____.
a) path line
b) Streamline
c) streak line
d) none of the above

9) The point of application of the total pressure on the surface is _____.
a) centroid of the surface
b) centre of pressure
c) either of the above
d) none of the above

10) The length of a convergent section of the Venturimeter is _____ divergent section.
a) is equal to
b) is more than
c) is less than
d) none of the above

11) If the liquid hasa specific weight of 7000 N/m^3 then its specific gravity is _____.
a) 0.832
b) 0.981
c) 0.965
d) 0.713

12) When pipes are connected in series, the rate of flow _____.
a) is the same as flowing through each pipe
b) is equal to the sum of the rate of flow in each pipe
c) is equal to the reciprocal of the sum of the rate of flow in each pipe
d) None of the above

13) The following is not a minor head loss _____.
a) loss at the exit of the pipe
b) loss at the entrance of the pipe
c) friction loss
d) Noe of these

14) Given that, N = speed; P = power, H = head, the specific speed of a hydraulic turbine is given by _____.
a) $\frac{N\sqrt{P}}{H^{3/2}}$
b) $\frac{N\sqrt{P}}{H^{5/4}}$
c) $\frac{N\sqrt{P}}{H^{4/5}}$
d) $\frac{P\sqrt{N}}{H^{5/4}}$

SLR-BD-13

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fluid Mechanics and Machines (CIVPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section - I, all questions are compulsory.
2) In Section II, Q. 5 is compulsory, and you must attempt any two questions from the remaining questions.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary and state it clearly.
5) Use of a non-programmable calculator is allowed.

Section – I

Q.2 Attempt any Two. **08**

a) Define and Write the Units.
i) Viscosity
ii) Specific Gravity
iii) Compressibility
iv) Capillarity

b) A rectangular plate 1.2m X 0.4 m, weighing 970 N slides down a 45° inclined surface at a uniform velocity of 2.25 m/s. If a 2mm gap between the plate and the inclined surface is filled with oil, determine the oil's viscosity.

c) With a neat sketch explain the conditions of the equilibrium for floating and submerged body.

Q.3 Attempt any Two. **10**

a) Derive an expression with a neat sketch for the total pressure and centre of pressure for the inclined plane surface submerged in the liquid.

b) Determine the total pressure on a circular plate of diameter 1.5 m which is placed vertically in water in such a way that the center of the plate is 3 m below the free surface of the water. Find the position of the centre of pressure also.

c) The right limb of a simple U-tube manometer containing mercury is open to the atmosphere while the left limb is connected to a pipe in which a fluid of sp.gr. 0.9 is flowing. The centre of the pipe is 12 cm below the level of mercury in the right limb. Find the pressure of fluid in the pipe if the difference in mercury level in the two limbs is 20 cm.

Q.4 Solve any Two of the following. **10**

a) Define:
- i) Steady flow
- ii) Uniform flow
- iii) Compressible flow
- iv) Laminar flow
- v) Rate of flow

b) The velocity potential function $\phi = 5(x^2 - y^2)$. Calculate velocity components at the point (4, 5); also find the magnitude and direction of resultant velocity.

c) An oil of specific gravity 0.8 is flowing through a venturi meter having an inlet diameter of 20 cm and a throat diameter of 10 cm. The oil-mercury differential manometer shows a reading of 25 cm. Calculate the discharge of oil through a horizontal Venturimeter. Take Cd=0.98

Section – II

Q.5 Solve any two of the following. **10**

a) Find the discharge of water flowing over a rectangular notch of 2m length when the constant head over the notch is 300mm. Take Cd = 0.62.

b) Find the displacement thickness, momentum thickness, energy thickness and shape factor for the velocity distribution in the boundary layer given by $u/U = y/\delta$.

c) Show that for triangular notch 1% of error in measurement of the head causes a 2.5% error in measurement of discharge.

Q.6 a) Derive Darcy Weisbach equation for head loss due to friction in pipe flow. Draw the sketch. **04**

b) Determine the difference in elevation between water surfaces in two tanks which are connected by horizontal pipe of diameter 30cm and length 400m.The discharge through the pipe is 300 lps. Consider all losses and assume f=0.008 **05**

Q.7 a) Derive an expression for force exerted by a jet on a stationary curved plate, when the jet strikes at the centre of a symmetrically curved plate. **04**

b) A centrifugal pump delivers water against a net head of 14.5m and a design speed of 1000 rpm. The vane angle is 30° curved back. If the impeller diameter is 300 mm and the outlet width is 50 mm. Determine discharge of pump if manometric efficiency is 95% **05**

Q.8 a) What are the different efficiencies of centrifugal pump? Explain them. **04**

b) A turbine is to operate under a head of 25m at 200 rpm. The discharge is $9m^3/s$. If the efficiency is 90%, Determine: **05**
- i) Power generated
- ii) Specific speed of turbine
- iii) Identify the type of turbine

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fluid Mechanics and Machines (CIVPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Assume suitable data if necessary and state it clearly.
4) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) The length of a convergent section of the Venturimeter is _____ divergent section.
a) is equal to b) is more than
c) is less than d) none of the above

2) If the liquid hasa specific weight of 7000 N/m^3 then its specific gravity is _____.
a) 0.832 b) 0.981
c) 0.965 d) 0.713

3) When pipes are connected in series, the rate of flow _____.
a) is the same as flowing through each pipe
b) is equal to the sum of the rate of flow in each pipe
c) is equal to the reciprocal of the sum of the rate of flow in each pipe
d) None of the above

4) The following is not a minor head loss _____.
a) loss at the exit of the pipe
b) loss at the entrance of the pipe
c) friction loss
d) Noe of these

5) Given that, N = speed; P = power, H = head, the specific speed of a hydraulic turbine is given by _____.
a) $\frac{N\sqrt{P}}{H^{3/2}}$ b) $\frac{N\sqrt{P}}{H^{5/4}}$
c) $\frac{N\sqrt{P}}{H^{4/5}}$ d) $\frac{P\sqrt{N}}{H^{5/4}}$

6) The force exerted by the jet of water on a stationary vertical plate in the direction of motion of the plate is given by _____.

a) ρaV b) ρaV^3

c) ρa^2V d) ρaV^2

7) In a centrifugal pump the regulating valve is provided on _____.

a) the suction pipe b) the delivery pipe

c) the casing d) none of the above

8) Total Energy Line (T.E.L.) represents the sum of _____.

a) pressure head, kinetic head and datum head

b) pressure head and kinetic head

c) kinetic head and datum head

d) pressure head and datum head

9) Which of the following turbines is not the reaction turbine?

a) Kaplan b) Propeller

c) Francis d) Pelton wheel

10) Newton's law of viscosity is given by the relation _____.

a) $\tau = \mu^2 dudy$ b) $\tau = \sqrt{\mu} dudyc$

c) $\tau = \mu \frac{du}{dy}$ d) $\tau = \mu^{3/2} dudy$

11) Raindrops are spherical in shape because of _____.

a) Capillarity b) Surface Tension

c) Downward motion d) Acceleration due to gravity

12) Submerged body will be in stable equilibrium when _____.

a) M is above G b) M is below G

c) B is above G d) B is below G

13) The line traced out by a given particle as it flows from one point to another is called _____.

a) path line b) Streamline

c) streak line d) none of the above

14) The point of application of the total pressure on the surface is _____.

a) centroid of the surface b) centre of pressure

c) either of the above d) none of the above

SLR-BD-13

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fluid Mechanics and Machines (CIVPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section - I, all questions are compulsory.
2) In Section II, Q. 5 is compulsory, and you must attempt any two questions from the remaining questions.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary and state it clearly.
5) Use of a non-programmable calculator is allowed.

Section – I

Q.2 Attempt any Two. **08**

a) Define and Write the Units.
i) Viscosity
ii) Specific Gravity
iii) Compressibility
iv) Capillarity

b) A rectangular plate 1.2m X 0.4 m, weighing 970 N slides down a 45° inclined surface at a uniform velocity of 2.25 m/s. If a 2mm gap between the plate and the inclined surface is filled with oil, determine the oil's viscosity.

c) With a neat sketch explain the conditions of the equilibrium for floating and submerged body.

Q.3 Attempt any Two. **10**

a) Derive an expression with a neat sketch for the total pressure and centre of pressure for the inclined plane surface submerged in the liquid.

b) Determine the total pressure on a circular plate of diameter 1.5 m which is placed vertically in water in such a way that the center of the plate is 3 m below the free surface of the water. Find the position of the centre of pressure also.

c) The right limb of a simple U-tube manometer containing mercury is open to the atmosphere while the left limb is connected to a pipe in which a fluid of sp.gr. 0.9 is flowing. The centre of the pipe is 12 cm below the level of mercury in the right limb. Find the pressure of fluid in the pipe if the difference in mercury level in the two limbs is 20 cm.

Q.4 Solve any Two of the following. **10**

a) Define:
- i) Steady flow
- ii) Uniform flow
- iii) Compressible flow
- iv) Laminar flow
- v) Rate of flow

b) The velocity potential function $\phi = 5(x^2 - y^2)$. Calculate velocity components at the point (4, 5); also find the magnitude and direction of resultant velocity.

c) An oil of specific gravity 0.8 is flowing through a venturi meter having an inlet diameter of 20 cm and a throat diameter of 10 cm. The oil-mercury differential manometer shows a reading of 25 cm. Calculate the discharge of oil through a horizontal Venturimeter. Take Cd=0.98

Section – II

Q.5 Solve any two of the following. **10**

a) Find the discharge of water flowing over a rectangular notch of 2m length when the constant head over the notch is 300mm. Take Cd = 0.62.

b) Find the displacement thickness, momentum thickness, energy thickness and shape factor for the velocity distribution in the boundary layer given by $u/U = y/\delta$.

c) Show that for triangular notch 1% of error in measurement of the head causes a 2.5% error in measurement of discharge.

Q.6 a) Derive Darcy Weisbach equation for head loss due to friction in pipe flow. Draw the sketch. **04**

b) Determine the difference in elevation between water surfaces in two tanks which are connected by horizontal pipe of diameter 30cm and length 400m.The discharge through the pipe is 300 lps. Consider all losses and assume f=0.008 **05**

Q.7 a) Derive an expression for force exerted by a jet on a stationary curved plate, when the jet strikes at the centre of a symmetrically curved plate. **04**

b) A centrifugal pump delivers water against a net head of 14.5m and a design speed of 1000 rpm. The vane angle is 30° curved back. If the impeller diameter is 300 mm and the outlet width is 50 mm. Determine discharge of pump if manometric efficiency is 95% **05**

Q.8 a) What are the different efficiencies of centrifugal pump? Explain them. **04**

b) A turbine is to operate under a head of 25m at 200 rpm. The discharge is $9m^3/s$. If the efficiency is 90%, Determine: **05**
- i) Power generated
- ii) Specific speed of turbine
- iii) Identify the type of turbine

SLR-BD-14

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Surveying and Geomatics (CIVPCC-03)

Day & Date: Tuesday 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The line joining points of equal elevation is known as a _____.
a) Horizontal line b) Contour line
c) Level line d) None

2) The vertical distance between Two adjacent contour lines is called a _____.
a) Contour gradient b) Vertical equivalent
c) Contour internal d) None

3) Balancing of traverse is done according to the _____.
a) Transit rule b) Primordial rule
c) Trapezoidal rule d) None

4) Levelling deals with measurement in _____.
a) Vertical plane b) Horizontal plane
c) Inclined plane d) All the above

5) Staff reading taken over a station whose elevation is known is called _____.
a) Back sight b) Fore sight
c) Intermediate sight d) None of above

6) A series of straight parallel and equally spaced contours represent ____.
a) Hills b) Ponds
c) Plane surface d) Desert

7) The usual longitudinal overlap in Aerial photogrammetry is _____.
a) 25% b) 30%
c) 50% d) 60%

8) The characteristics of Gales traverse table is that independent coordinates of all points are brought to the _____.

a) fourth quadrant b) first quadrant
c) third quadrant d) none

9) The Speed of Light is _____.

a) $3 \times 10^8 \text{ m/s}$ b) $2 \times 10^9 \text{ m/s}$
c) $3 \times 10^9 \text{ m/s}$ d) $2 \times 10^8 \text{ m/s}$

10) The distance in EDM is measured by _____.

a) Time taken for an electromagnetic wave to travel between two points and multiplying speed of wave
b) Frequency of wave
c) wave length
d) none of above

11) Total station can be used for _____.

a) Missing line measurement b) Remote elevation measurement
c) Slake out d) All of these

12) If θ be the RB of a line of length L then Latitude is given by _____.

a) $L \cos\theta$ b) $L \sin\theta$
c) $L \operatorname{cosec}\theta$ d) none

13) The Number of orbital planes and satellites in each orbits are respective _____.

a) 6, 4 b) 4, 6
c) 4, 3 d) 3, 4

14) Aerial photographs are _____.

a) Perspective projections b) Orthographic projection
c) Iso metric Projection d) Gnomonic Projection

SLR-BD-14

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Surveying and Geomatics (CIVPCC-03)

Day & Date: Tuesday 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section I, question no 2 is compulsory and solve any two questions from the remaining questions.
2) In Section II, question no 6 is compulsory and solve any two questions from the remaining questions.
3) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Explain with sketch construction and working of Auto level. **05**
b) Explain use of contour map. **05**

Q.3 **a)** Explain Reiteration method of measurement of Horizontal angle by using theodolite. **04**
b) The following data records in a Travers survey, where the length and bearing of last line were not recorded, compute the length and bearing of line DA. **05**

Line	Length (m)	Bering
AB	75.50	$30^0\,24^1$
BC	180.50	$110^0\,36^1$
CD	60.25	$210^0\,30^1$
DA	?	?

Q.4 **a)** Explain construction and use of total station. **04**
b) Explain with sketch construction and working of Tellurometer. **05**

Q.5 **a)** Explain the temporary adjustment and use of laser level and digital level. **05**
b) Explain the sources of error in theodolite, and how to minimize the error. **04**

Section – II

Q.6 **a)** Describe the three segments of GPS, with sketch. **05**
b) Describe the raster data structure & Vector data structure. **05**

Q.7	**a)**	The scale of an aerial photograph is 1cm = 100m.The photograph size is 20cm x 20cm. Determine the number of photographs required to cover an area of 100 sq km. if longitudinal overlap is 60 % and side overlap 30 %.	**05**
	b)	Explain with neat sketch Flight planning in photographic survey.	**04**
Q.8	**a)**	Describe the project survey for building lineout and layout.	**05**
	b)	Explain the Differential Global positioning system (DGPS).	**04**
Q.9	**a)**	Explain the advantages of Remote Sensing.	**05**
	b)	Describe the points, lines and area features in vector data structure.	**04**

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Surveying and Geomatics (CIVPCC-03)

Day & Date: Tuesday 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) The characteristics of Gales traverse table is that independent coordinates of all points are brought to the _____.
a) fourth quadrant b) first quadrant
c) third quadrant d) none

2) The Speed of Light is _____.
a) 3×10^8 m/s b) 2×10^9 m/s
c) 3×10^9 m/s d) 2×10^8 m/s

3) The distance in EDM is measured by _____.
a) Time taken for an electromagnetic wave to travel between two points and multiplying speed of wave
b) Frequency of wave
c) wave length
d) none of above

4) Total station can be used for _____.
a) Missing line measurement b) Remote elevation measurement
c) Slake out d) All of these

5) If θ be the RB of a line of length L then Latitude is given by _____.
a) $L \cos\theta$ b) $L \sin\theta$
c) $L \operatorname{cosec}\theta$ d) none

6) The Number of orbital planes and satellites in each orbits are respective _____.
a) 6, 4 b) 4, 6
c) 4, 3 d) 3, 4

7) Aerial photographs are _____.
a) Perspective projections b) Orthographic projection
c) Iso metric Projection d) Gnomonic Projection

8) The line joining points of equal elevation is known as a _____.
a) Horizontal line b) Contour line
c) Level line d) None

9) The vertical distance between Two adjacent contour lines is called a _____.
a) Contour gradient b) Vertical equivalent
c) Contour internal d) None

10) Balancing of traverse is done according to the _____.
a) Transit rule b) Primordial rule
c) Trapezoidal rule d) None

11) Levelling deals with measurement in _____.
a) Vertical plane b) Horizontal plane
c) Inclined plane d) All the above

12) Staff reading taken over a station whose elevation is known is called _____.
a) Back sight b) Fore sight
c) Intermediate sight d) None of above

13) A series of straight parallel and equally spaced contours represent ____.
a) Hills b) Ponds
c) Plane surface d) Desert

14) The usual longitudinal overlap in Aerial photogrammetry is _____.
a) 25% b) 30%
c) 50% d) 60%

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Surveying and Geomatics (CIVPCC-03)

Day & Date: Tuesday 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section I, question no 2 is compulsory and solve any two questions from the remaining questions.
2) In Section II, question no 6 is compulsory and solve any two questions from the remaining questions.
3) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Explain with sketch construction and working of Auto level. **05**
b) Explain use of contour map. **05**

Q.3 **a)** Explain Reiteration method of measurement of Horizontal angle by using theodolite. **04**
b) The following data records in a Travers survey, where the length and bearing of last line were not recorded, compute the length and bearing of line DA. **05**

Line	Length (m)	Bering
AB	75.50	$30^0\,24^1$
BC	180.50	$110^0\,36^1$
CD	60.25	$210^0\,30^1$
DA	?	?

Q.4 **a)** Explain construction and use of total station. **04**
b) Explain with sketch construction and working of Tellurometer. **05**

Q.5 **a)** Explain the temporary adjustment and use of laser level and digital level. **05**
b) Explain the sources of error in theodolite, and how to minimize the error. **04**

Section – II

Q.6 **a)** Describe the three segments of GPS, with sketch. **05**
b) Describe the raster data structure & Vector data structure. **05**

Q.7	**a)**	The scale of an aerial photograph is 1cm = 100m.The photograph size is 20cm x 20cm. Determine the number of photographs required to cover an area of 100 sq km. if longitudinal overlap is 60 % and side overlap 30 %.	**05**
	b)	Explain with neat sketch Flight planning in photographic survey.	**04**
Q.8	**a)**	Describe the project survey for building lineout and layout.	**05**
	b)	Explain the Differential Global positioning system (DGPS).	**04**
Q.9	**a)**	Explain the advantages of Remote Sensing.	**05**
	b)	Describe the points, lines and area features in vector data structure.	**04**

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Surveying and Geomatics (CIVPCC-03)

Day & Date: Tuesday 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Total station can be used for _____.
a) Missing line measurement b) Remote elevation measurement
c) Slake out d) All of these

2) If θ be the RB of a line of length L then Latitude is given by _____.
a) $L\cos\theta$ b) $L\sin\theta$
c) $L\,\mathrm{cosec}\,\theta$ d) none

3) The Number of orbital planes and satellites in each orbits are respective _____.
a) 6, 4 b) 4, 6
c) 4, 3 d) 3, 4

4) Aerial photographs are _____.
a) Perspective projections b) Orthographic projection
c) Iso metric Projection d) Gnomonic Projection

5) The line joining points of equal elevation is known as a _____.
a) Horizontal line b) Contour line
c) Level line d) None

6) The vertical distance between Two adjacent contour lines is called a _____.
a) Contour gradient b) Vertical equivalent
c) Contour internal d) None

7) Balancing of traverse is done according to the _____.
a) Transit rule b) Primordial rule
c) Trapezoidal rule d) None

8) Levelling deals with measurement in _____.

a) Vertical plane b) Horizontal plane
c) Inclined plane d) All the above

9) Staff reading taken over a station whose elevation is known is called _____.

a) Back sight b) Fore sight
c) Intermediate sight d) None of above

10) A series of straight parallel and equally spaced contours represent ____.

a) Hills b) Ponds
c) Plane surface d) Desert

11) The usual longitudinal overlap in Aerial photogrammetry is _____.

a) 25% b) 30%
c) 50% d) 60%

12) The characteristics of Gales traverse table is that independent coordinates of all points are brought to the _____.

a) fourth quadrant b) first quadrant
c) third quadrant d) none

13) The Speed of Light is _____.

a) 3×10^8 m/s b) 2×10^9 m/s
c) 3×10^9 m/s d) 2×10^8 m/s

14) The distance in EDM is measured by _____.

a) Time taken for an electromagnetic wave to travel between two points and multiplying speed of wave
b) Frequency of wave
c) wave length
d) none of above

SLR-BD-14

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Surveying and Geomatics (CIVPCC-03)

Day & Date: Tuesday 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section I, question no 2 is compulsory and solve any two questions from the remaining questions.
2) In Section II, question no 6 is compulsory and solve any two questions from the remaining questions.
3) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Explain with sketch construction and working of Auto level. **05**
b) Explain use of contour map. **05**

Q.3 **a)** Explain Reiteration method of measurement of Horizontal angle by using theodolite. **04**
b) The following data records in a Travers survey, where the length and bearing of last line were not recorded, compute the length and bearing of line DA. **05**

Line	Length (m)	Bering
AB	75.50	$30^0\,24^1$
BC	180.50	$110^0\,36^1$
CD	60.25	$210^0\,30^1$
DA	?	?

Q.4 **a)** Explain construction and use of total station. **04**
b) Explain with sketch construction and working of Tellurometer. **05**

Q.5 **a)** Explain the temporary adjustment and use of laser level and digital level. **05**
b) Explain the sources of error in theodolite, and how to minimize the error. **04**

Section – II

Q.6 **a)** Describe the three segments of GPS, with sketch. **05**
b) Describe the raster data structure & Vector data structure. **05**

Q.7	**a)**	The scale of an aerial photograph is 1cm = 100m.The photograph size is 20cm x 20cm. Determine the number of photographs required to cover an area of 100 sq km. if longitudinal overlap is 60 % and side overlap 30 %.	**05**
	b)	Explain with neat sketch Flight planning in photographic survey.	**04**
Q.8	**a)**	Describe the project survey for building lineout and layout.	**05**
	b)	Explain the Differential Global positioning system (DGPS).	**04**
Q.9	**a)**	Explain the advantages of Remote Sensing.	**05**
	b)	Describe the points, lines and area features in vector data structure.	**04**

SLR-BD-14

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Surveying and Geomatics (CIVPCC-03)

Day & Date: Tuesday 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) A series of straight parallel and equally spaced contours represent ____.
a) Hills b) Ponds
c) Plane surface d) Desert

2) The usual longitudinal overlap in Aerial photogrammetry is _____.
a) 25% b) 30%
c) 50% d) 60%

3) The characteristics of Gales traverse table is that independent coordinates of all points are brought to the _____.
a) fourth quadrant b) first quadrant
c) third quadrant d) none

4) The Speed of Light is _____.
a) 3×10^8 m/s b) 2×10^9 m/s
c) 3×10^9 m/s d) 2×10^8 m/s

5) The distance in EDM is measured by _____.
a) Time taken for an electromagnetic wave to travel between two points and multiplying speed of wave
b) Frequency of wave
c) wave length
d) none of above

6) Total station can be used for _____.
a) Missing line measurement b) Remote elevation measurement
c) Slake out d) All of these

7) If θ be the RB of a line of length L then Latitude is given by _____.
a) $L \cos\theta$ b) $L \sin\theta$
c) $L \operatorname{cosec}\theta$ d) none

8) The Number of orbital planes and satellites in each orbits are respective _____.

a) 6, 4 b) 4, 6
c) 4, 3 d) 3, 4

9) Aerial photographs are _____.

a) Perspective projections b) Orthographic projection
c) Iso metric Projection d) Gnomonic Projection

10) The line joining points of equal elevation is known as a _____.

a) Horizontal line b) Contour line
c) Level line d) None

11) The vertical distance between Two adjacent contour lines is called a _____.

a) Contour gradient b) Vertical equivalent
c) Contour internal d) None

12) Balancing of traverse is done according to the _____.

a) Transit rule b) Primordial rule
c) Trapezoidal rule d) None

13) Levelling deals with measurement in _____.

a) Vertical plane b) Horizontal plane
c) Inclined plane d) All the above

14) Staff reading taken over a station whose elevation is known is called _____.

a) Back sight b) Fore sight
c) Intermediate sight d) None of above

SLR-BD-14

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Surveying and Geomatics (CIVPCC-03)

Day & Date: Tuesday 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section I, question no 2 is compulsory and solve any two questions from the remaining questions.
2) In Section II, question no 6 is compulsory and solve any two questions from the remaining questions.
3) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Explain with sketch construction and working of Auto level. **05**
b) Explain use of contour map. **05**

Q.3 **a)** Explain Reiteration method of measurement of Horizontal angle by using theodolite. **04**
b) The following data records in a Travers survey, where the length and bearing of last line were not recorded, compute the length and bearing of line DA. **05**

Line	Length (m)	Bering
AB	75.50	$30^0\,24^1$
BC	180.50	$110^0\,36^1$
CD	60.25	$210^0\,30^1$
DA	?	?

Q.4 **a)** Explain construction and use of total station. **04**
b) Explain with sketch construction and working of Tellurometer. **05**

Q.5 **a)** Explain the temporary adjustment and use of laser level and digital level. **05**
b) Explain the sources of error in theodolite, and how to minimize the error. **04**

Section – II

Q.6 **a)** Describe the three segments of GPS, with sketch. **05**
b) Describe the raster data structure & Vector data structure. **05**

Q.7	**a)**	The scale of an aerial photograph is 1cm = 100m.The photograph size is 20cm x 20cm. Determine the number of photographs required to cover an area of 100 sq km. if longitudinal overlap is 60 % and side overlap 30 %.	**05**
	b)	Explain with neat sketch Flight planning in photographic survey.	**04**
Q.8	**a)**	Describe the project survey for building lineout and layout.	**05**
	b)	Explain the Differential Global positioning system (DGPS).	**04**
Q.9	**a)**	Explain the advantages of Remote Sensing.	**05**
	b)	Describe the points, lines and area features in vector data structure.	**04**

SLR-BD-15

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) If a linear differential equation with constant coefficients and r.h.s. equal to zero has a real root m_1 repeated Two times, then the corresponding part of the integral is _____.

a) $(c_1 + c_2)e^{m_1 X}$ b) $(c_1 + c_2 x)e^{m_1 X}$

c) $(c_1 x + c_2 x^2)e^{m_1 X}$ d) $(c_1 + c_2 x^3)e^{m_1 X}$

2) $\frac{1}{D-a} X$ is equal to _____.

a) $\int X e^{ax} dx$ b) $e^{ax} \int X . e^{-ax} dx$

c) $\int X e^{-ax} dx$ d) $e^{-ax} \int X e^{-ax} dx$

3) $\frac{1}{D+1}(\log x + \frac{1}{x})$ is equal to _____.

a) e^x b) 1

c) x d) $\log x$

4) The solution of $q = e^{-p}$ is _____.

a) $z = ax + by + c$ b) $z = a^x + b^y + c$

c) $z = ax + y^{-b} + c$ d) $z = ax + e^{-a} y + c$

5) The solution of the equation $pq = p + q$ is _____.

a) $z = ax + (a+1)y + c$

b) $z = (a+1)x + a(a-1)y + c$

c) $z = (a-1)x + a(a+1)y + c$

d) $z(a-1) = a(a-1)x + ay + c$

6) If μ_1', μ_2', μ_3', μ_4' are the first four moments of the distribution about certain number then fourth moment μ_4 of the distribution about the arithmetic mean is given by _____.

a) $\mu_4' + 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^4 + 3(\mu_1')^4$

b) $\mu_4' - 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^2 - 3(\mu_1')^4$

c) $\mu_4' + 4\mu_3'\mu_1' - 6\mu_2'(\mu_1')^4 - 3(\mu_1')^4$

d) $\mu_4' + 2\mu_3'\mu_1' + 6\mu_2'(\mu_1')^4 - 3(\mu_1')^4$

7) Coefficient of kurtosis β_2 is given by _____.

a) $\frac{\mu_4}{\mu_3}$ b) $\frac{\mu_4}{\mu_2^2}$

c) $\frac{\mu_3}{\mu_2^2}$ d) $\frac{\mu_4}{\mu_2^3}$

8) If value of x for normal distribution is 35, mean of normal distribution is 65 and standard deviation is 25 then standardized random variable is ___.

a) -1.5 b) -1.7

c) -1.2 d) -4

9) A continuous random variable has the following probability density function $f(x) = kx(1-x), 0 \le x \le 1$ then $k =$ _____.

a) 6 b) 2

c) 3 d) 5

10) The area under the standard normal curve from $z = -\infty$ to $z = 0$ is ___.

a) 1 b) ½

c) 3/2 d) 0

11) If X, Y denotes the deviations from their means and if $\sum X^2 = 40, \sum Y^2 = 100, \sum XY = 50,$ then $r =$ _____.

a) 0.63 b) 0.82

c) 0.91 d) 0.79

12) The line of regression of x and y is given by _____.

a) $x - \bar{x} = b_{xy}(y - \bar{y})$ b) $x - \bar{y} = b_{xy}(x - \bar{x})$

c) $x - \bar{x} = b_{xx}(y - \bar{y})$ d) $x - \bar{x} = b_{yx}(y - \bar{y})$

13) The following mistakes per page were found in a book.

No. of mistakes:	0	1	2	3	4
Pages:	211	90	19	5	0

Then χ^2 is _____.

a) 0.59 b) 0.069

c) 0.81 d) 0.79

14) The 't-statistic' is defined as _____.

a) $\frac{\bar{x}-\mu}{\sigma/\sqrt{n}}$ b) $\frac{\bar{x}-\mu}{s/\sqrt{n}}$

c) $\frac{\bar{x}-\mu}{\sigma/n}$ d) $\frac{\bar{x}-\mu}{s/n}$

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **09**

a) Find the Arithmetic mean, Median and standard deviation for the following frequency distribution.

x	5	9	12	15	20	24	30	35	42	49
f	3	6	8	8	9	10	8	7	6	2

b) Solve $(D^2 - 4D + 4)y = 8.x^2e^{2x}\sin 2x$

c) Solve $(D^2 + D + 1)y = \sin 2x$

d) Calculate Mode for the following frequency distribution.

C.I.	00-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency (f)	4	7	8	12	25	18	10

e) Solve $p^2q^3 = x^2y^3$

Q.3 Attempt any Three. **09**

a) Solve: $(2D + 1)^2y = 4e^{-x/2}$

b) Solve: $p + q = pqz$

c) Find Q_1, Q_2, Q_3 from the following data.
5,7,12,14,15,22,25,30,36,42,53

d) Solve $x(y - z)p + y(z - x)q = z(x - y)$

e) Solve $(D^3 - 3D + 2)y = x$

Q.4 Attempt any Two **10**

a) The first four moments of a distribution about the value 5 are 2,20,40 and 50. from the given information obtain the first four central moments, coefficient of skewness and kurtosis.

b) Solve the following differential equation by the method of separation of variables.
$\frac{\partial z}{\partial x} - 2\frac{\partial z}{\partial y} = z$ given that $z(x, 0) = 3e^{-5x}$

c) Solve: $(D^2 - D - 2)y = 2\log x + \frac{1}{x} + \frac{1}{x^2}$

Section – II

Q.5 Attempt any three of the following. **09**

a) Find the value of k if each of the following functions is a probability density function.

$$f(x) = \begin{cases} kx^2(1-x^3), & 0 \le x \le 1 \\ 0, & \text{otherwise} \end{cases}$$

b) The mean life time of 100 fluorescent light bulbs produced by a Company is computed to be 1570 Hrs. with S.D. of 120 Hrs. If μ is the mean lifetime of all the bulbs produced by the Company, Test the Hypothesis $\mu = 1600$ Hrs. Against the alternative Hypothesis $\mu \neq 1600$ Hrs. using 5% level of Significance.
(Given Expected value at 5% LOS is 1.96)

c) Calculate the coefficient of correlation between height of father and height of son from the following data.

Height of father	64	65	66	67	68	69	70
Height of son	66	67	65	68	70	68	71

d) Two independent random sample have the following data,
$\overline{x_1} = 110, \sigma_1 = 25, n_1 = 16$
$\overline{x_2} = 120, \sigma_2 = 30, n_2 = 9$
If σ_1 and σ_2 are the S. D. of the populations. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance. (The table value of t at $\alpha = 0.05$ for $v = 23$ degrees of freedom is 2.069)

e) If in a lot of 500 solenoids 25 are defective, find the probability that there will be 0, 1, 2 defective solenoids in a random sample of 20 solenoids.

Q.6 Attempt any three of the following. **09**

a) If two independent random samples of sizes 15 and 8 have respectively the following mean and population standard deviations, $\overline{x_1} = 980, \overline{x_2} = 1012; \sigma_1 = 75, \sigma_2 = 80$. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance.
(Given Expected value at 5% LOS with 21 DF is 2.080)

b) The number of telephone calls received by an operator in a ten-minute interval follows a Poisson distribution with mean 1. What is the probability of receiving (i) no call, (ii) less than four calls, in the interval? What is the most likely number of calls?

c) Calculate the equations of the lines of regression. Given
Mean of $x = 50.07$, S.D. of $x = 5.26$
Mean of $y = 9.98$, S.D. of $y = 2.59$
$r = 0.898$

d) In an intelligence test administered to 1000 children the mean score was, 42 with s.d. 24. Find the number of children (i) scoring more than 60 and (ii) between 20 and 40 assuming the distribution to be normal.
(Given: For S.N.V. z area from z = 0 to z = 0.75 is 0.2734, that between z = 0 and z = 0.9167 is 0.3202 and that between z = 0 to z = 0.08333 is 0.0332.)

e) Fit a Straight line $y = a + bx$ to the following data.

x	0	1	2	3	4	5
y	1	2	3	4.5	6	7.5

Q.7 Attempt any Two. **10**

a) Fit a Poisson's distribution to the following data :

X	0	1	2	3	4	Total
f	112	63	20	4	1	200

b) Obtain a second-degree curve to the following data.

Year	1965	1966	1967	1968	1969	1970	1971	1972
Profit (in Corers Rs.)	125	140	165	195	200	215	220	230

Also estimate the profit in 1973.

c) Ten school boys were given a test in Statistics and their scores were recorded. They were given a month's special coaching and a second test was given to them in the same subject at the end of the coaching period. Test if the marks given below give evidence to the fact that the students are benefitted by coaching.
Marks in test I: 70, 68, 56, 75, 80, 90, 68, 75, 56, 58
Marks in Test II: 68, 70, 52, 73, 75, 78, 80, 92, 54, 55
(Given that value of t_α at 5 % LOS for v = 9 degrees of freedom is 1.86 for one tailed test)

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) If value of x for normal distribution is 35, mean of normal distribution is 65 and standard deviation is 25 then standardized random variable is ___.
a) -1.5 b) -1.7
c) -1.2 d) -4

2) A continuous random variable has the following probability density function $f(x) = kx(1-x), 0 \le x \le 1$ then $k =$ _____.
a) 6 b) 2
c) 3 d) 5

3) The area under the standard normal curve from $z = -\infty$ to $z = 0$ is ___.
a) 1 b) ½
c) 3/2 d) 0

4) If X, Y denotes the deviations from their means and if $\sum X^2 = 40, \sum Y^2 = 100, \sum XY = 50,$ then $r =$ _____.
a) 0.63 b) 0.82
c) 0.91 d) 0.79

5) The line of regression of x and y is given by _____.
a) $x - \bar{x} = b_{xy}(y - \bar{y})$ b) $x - \bar{y} = b_{xy}(x - \bar{x})$
c) $x - \bar{x} = b_{xx}(y - \bar{y})$ d) $x - \bar{x} = b_{yx}(y - \bar{y})$

6) The following mistakes per page were found in a book.

No. of mistakes:	0	1	2	3	4
Pages:	211	90	19	5	0

Then χ^2 is _____.
a) 0.59 b) 0.069
c) 0.81 d) 0.79

7) The 't-statistic' is defined as _____.

a) $\frac{\bar{x}-\mu}{\sigma/\sqrt{n}}$ b) $\frac{\bar{x}-\mu}{s/\sqrt{n}}$

c) $\frac{\bar{x}-\mu}{\sigma/n}$ d) $\frac{\bar{x}-\mu}{s/n}$

8) If a linear differential equation with constant coefficients and r.h.s. equal to zero has a real root m_1 repeated Two times, then the corresponding part of the integral is _____.

a) $(c_1 + c_2)e^{m_1 X}$ b) $(c_1 + c_2 x)e^{m_1 X}$

c) $(c_1 x + c_2 x^2)e^{m_1 X}$ d) $(c_1 + c_2 x^3)e^{m_1 X}$

9) $\frac{1}{D-a}X$ is equal to _____.

a) $\int Xe^{ax}dx$ b) $e^{ax}\int X.e^{-ax}dx$

c) $\int Xe^{-ax}dx$ d) $e^{-ax}\int Xe^{-ax}dx$

10) $\frac{1}{D+1}(\log x + \frac{1}{x})$ is equal to _____.

a) e^x b) 1

c) x d) $\log x$

11) The solution of $q = e^{-p}$ is _____.

a) $z = ax + by + c$ b) $z = a^x + b^y + c$

c) $z = ax + y^{-b} + c$ d) $z = ax + e^{-a}y + c$

12) The solution of the equation $pq = p + q$ is _____.

a) $z = ax + (a+1)y + c$

b) $z = (a+1)x + a(a-1)y + c$

c) $z = (a-1)x + a(a+1)y + c$

d) $z(a-1) = a(a-1)x + ay + c$

13) If μ_1', μ_2', μ_3', μ_4' are the first four moments of the distribution about certain number then fourth moment μ_4 of the distribution about the arithmetic mean is given by _____.

a) $\mu_4' + 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^4 + 3(\mu_1')^4$

b) $\mu_4' - 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^2 - 3(\mu_1')^4$

c) $\mu_4' + 4\mu_3'\mu_1' - 6\mu_2'(\mu_1')^4 - 3(\mu_1')^4$

d) $\mu_4' + 2\mu_3'\mu_1' + 6\mu_2'(\mu_1')^4 - 3(\mu_1')^4$

14) Coefficient of kurtosis β_2 is given by _____.

a) $\frac{\mu_4}{\mu_3}$ b) $\frac{\mu_4}{\mu_2^2}$

c) $\frac{\mu_3}{\mu_2^2}$ d) $\frac{\mu_4}{\mu_2^3}$

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **09**

a) Find the Arithmetic mean, Median and standard deviation for the following frequency distribution.

x	5	9	12	15	20	24	30	35	42	49
f	3	6	8	8	9	10	8	7	6	2

b) Solve $(D^2 - 4D + 4)y = 8.x^2e^{2x}\sin 2x$

c) Solve $(D^2 + D + 1)y = \sin 2x$

d) Calculate Mode for the following frequency distribution.

C.I.	00-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency (f)	4	7	8	12	25	18	10

e) Solve $p^2q^3 = x^2y^3$

Q.3 Attempt any Three. **09**

a) Solve: $(2D + 1)^2y = 4e^{-x/2}$

b) Solve: $p + q = pqz$

c) Find Q_1, Q_2, Q_3 from the following data.
5,7,12,14,15,22,25,30,36,42,53

d) Solve $x(y - z)p + y(z - x)q = z(x - y)$

e) Solve $(D^3 - 3D + 2)y = x$

Q.4 Attempt any Two **10**

a) The first four moments of a distribution about the value 5 are 2,20,40 and 50. from the given information obtain the first four central moments, coefficient of skewness and kurtosis.

b) Solve the following differential equation by the method of separation of variables.
$\frac{\partial z}{\partial x} - 2\frac{\partial z}{\partial y} = z$ given that $z(x, 0) = 3e^{-5x}$

c) Solve: $(D^2 - D - 2)y = 2\log x + \frac{1}{x} + \frac{1}{x^2}$

Section – II

Q.5 Attempt any three of the following. **09**

a) Find the value of k if each of the following functions is a probability density function.

$$f(x) = \begin{cases} kx^2(1-x^3), & 0 \le x \le 1 \\ 0, & \text{otherwise} \end{cases}$$

b) The mean life time of 100 fluorescent light bulbs produced by a Company is computed to be 1570 Hrs. with S.D. of 120 Hrs. If μ is the mean lifetime of all the bulbs produced by the Company, Test the Hypothesis $\mu = 1600$ Hrs. Against the alternative Hypothesis $\mu \neq 1600$ Hrs. using 5% level of Significance.
(Given Expected value at 5% LOS is 1.96)

c) Calculate the coefficient of correlation between height of father and height of son from the following data.

Height of father	64	65	66	67	68	69	70
Height of son	66	67	65	68	70	68	71

d) Two independent random sample have the following data,
$\overline{x_1} = 110, \sigma_1 = 25, n_1 = 16$
$\overline{x_2} = 120, \sigma_2 = 30, n_2 = 9$
If σ_1 and σ_2 are the S. D. of the populations. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance. (The table value of t at $\alpha = 0.05$ for $v = 23$ degrees of freedom is 2.069)

e) If in a lot of 500 solenoids 25 are defective, find the probability that there will be 0, 1, 2 defective solenoids in a random sample of 20 solenoids.

Q.6 Attempt any three of the following. **09**

a) If two independent random samples of sizes 15 and 8 have respectively the following mean and population standard deviations, $\overline{x_1} = 980, \overline{x_2} = 1012; \sigma_1 = 75, \sigma_2 = 80$. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance.
(Given Expected value at 5% LOS with 21 DF is 2.080)

b) The number of telephone calls received by an operator in a ten-minute interval follows a Poisson distribution with mean 1. What is the probability of receiving (i) no call, (ii) less than four calls, in the interval? What is the most likely number of calls?

c) Calculate the equations of the lines of regression. Given
Mean of $x = 50.07$, S.D. of $x = 5.26$
Mean of $y = 9.98$, S.D. of $y = 2.59$
$r = 0.898$

d) In an intelligence test administered to 1000 children the mean score was, 42 with s.d. 24. Find the number of children (i) scoring more than 60 and (ii) between 20 and 40 assuming the distribution to be normal.
(Given: For S.N.V. z area from z = 0 to z = 0.75 is 0.2734, that between z = 0 and z = 0.9167 is 0.3202 and that between z = 0 to z = 0.08333 is 0.0332.)

e) Fit a Straight line $y = a + bx$ to the following data.

x	0	1	2	3	4	5
y	1	2	3	4.5	6	7.5

Q.7 Attempt any Two. **10**

a) Fit a Poisson's distribution to the following data :

X	0	1	2	3	4	Total
f	112	63	20	4	1	200

b) Obtain a second-degree curve to the following data.

Year	1965	1966	1967	1968	1969	1970	1971	1972
Profit (in Corers Rs.)	125	140	165	195	200	215	220	230

Also estimate the profit in 1973.

c) Ten school boys were given a test in Statistics and their scores were recorded. They were given a month's special coaching and a second test was given to them in the same subject at the end of the coaching period. Test if the marks given below give evidence to the fact that the students are benefitted by coaching.
Marks in test I: 70, 68, 56, 75, 80, 90, 68, 75, 56, 58
Marks in Test II: 68, 70, 52, 73, 75, 78, 80, 92, 54, 55
(Given that value of t_α at 5 % LOS for v = 9 degrees of freedom is 1.86 for one tailed test)

Seat No.		Set	R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) If X, Y denotes the deviations from their means and if $\sum X^2 = 40, \sum Y^2 = 100, \sum XY = 50,$ then $r =$ _____.
a) 0.63 b) 0.82
c) 0.91 d) 0.79

2) The line of regression of x and y is given by _____.
a) $x - \bar{x} = b_{xy}(y - \bar{y})$ b) $x - \bar{y} = b_{xy}(x - \bar{x})$
c) $x - \bar{x} = b_{xx}(y - \bar{y})$ d) $x - \bar{x} = b_{yx}(y - \bar{y})$

3) The following mistakes per page were found in a book.

No. of mistakes:	0	1	2	3	4
Pages:	211	90	19	5	0

Then χ^2 is _____.
a) 0.59 b) 0.069
c) 0.81 d) 0.79

4) The 't-statistic' is defined as _____.
a) $\frac{\bar{x}-\mu}{\sigma/\sqrt{n}}$ b) $\frac{\bar{x}-\mu}{s/\sqrt{n}}$
c) $\frac{\bar{x}-\mu}{\sigma/n}$ d) $\frac{\bar{x}-\mu}{s/n}$

5) If a linear differential equation with constant coefficients and r.h.s. equal to zero has a real root m_1 repeated Two times, then the corresponding part of the integral is _____.
a) $(c_1 + c_2)e^{m_1 X}$ b) $(c_1 + c_2 x)e^{m_1 X}$
c) $(c_1 x + c_2 x^2)e^{m_1 X}$ d) $(c_1 + c_2 x^3)e^{m_1 X}$

6) $\frac{1}{D-a}X$ is equal to _____.

a) $\int Xe^{ax}dx$ b) $e^{ax}\int X.e^{-ax}dx$

c) $\int Xe^{-ax}dx$ d) $e^{-ax}\int Xe^{-ax}dx$

7) $\frac{1}{D+1}(\log x+\frac{1}{x})$ is equal to _____.

a) e^x b) 1

c) x d) $\log x$

8) The solution of $q=e^{-p}$ is _____.

a) $z=ax+by+c$ b) $z=a^x+b^y+c$

c) $z=ax+y^{-b}+c$ d) $z=ax+e^{-a}y+c$

9) The solution of the equation $pq=p+q$ is _____.

a) $z=ax+(a+1)y+c$

b) $z=(a+1)x+a(a-1)y+c$

c) $z=(a-1)x+a(a+1)y+c$

d) $z(a-1)=a(a-1)x+ay+c$

10) If μ_1', μ_2', μ_3', μ_4' are the first four moments of the distribution about certain number then fourth moment μ_4 of the distribution about the arithmetic mean is given by _____.

a) $\mu_4'+4\mu_3'\mu_1'+6\mu_2'(\mu_1')^4+3(\mu_1')^4$

b) $\mu_4'-4\mu_3'\mu_1'+6\mu_2'(\mu_1')^2-3(\mu_1')^4$

c) $\mu_4'+4\mu_3'\mu_1'-6\mu_2'(\mu_1')^4-3(\mu_1')^4$

d) $\mu_4'+2\mu_3'\mu_1'+6\mu_2'(\mu_1')^4-3(\mu_1')^4$

11) Coefficient of kurtosis β_2 is given by _____.

a) $\frac{\mu_4}{\mu_3}$ b) $\frac{\mu_4}{\mu_2^2}$

c) $\frac{\mu_3}{\mu_2^2}$ d) $\frac{\mu_4}{\mu_2^3}$

12) If value of x for normal distribution is 35, mean of normal distribution is 65 and standard deviation is 25 then standardized random variable is ___.

a) -1.5 b) -1.7

c) -1.2 d) -4

13) A continuous random variable has the following probability density function $f(x)=kx(1-x),0\le x\le 1$ then $k=$ _____.

a) 6 b) 2

c) 3 d) 5

14) The area under the standard normal curve from $z = -\infty$ to $z = 0$ is ___.

a) 1 b) ½

c) 3/2 d) 0

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **09**

a) Find the Arithmetic mean, Median and standard deviation for the following frequency distribution.

x	5	9	12	15	20	24	30	35	42	49
f	3	6	8	8	9	10	8	7	6	2

b) Solve $(D^2 - 4D + 4)y = 8.x^2e^{2x}\sin 2x$

c) Solve $(D^2 + D + 1)y = \sin 2x$

d) Calculate Mode for the following frequency distribution.

C.I.	00-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency (f)	4	7	8	12	25	18	10

e) Solve $p^2q^3 = x^2y^3$

Q.3 Attempt any Three. **09**

a) Solve: $(2D + 1)^2y = 4e^{-x/2}$

b) Solve: $p + q = pqz$

c) Find Q_1, Q_2, Q_3 from the following data.
5,7,12,14,15,22,25,30,36,42,53

d) Solve $x(y - z)p + y(z - x)q = z(x - y)$

e) Solve $(D^3 - 3D + 2)y = x$

Q.4 Attempt any Two **10**

a) The first four moments of a distribution about the value 5 are 2,20,40 and 50. from the given information obtain the first four central moments, coefficient of skewness and kurtosis.

b) Solve the following differential equation by the method of separation of variables.
$\frac{\partial z}{\partial x} - 2\frac{\partial z}{\partial y} = z$ given that $z(x, 0) = 3e^{-5x}$

c) Solve: $(D^2 - D - 2)y = 2\log x + \frac{1}{x} + \frac{1}{x^2}$

Section – II

Q.5 Attempt any three of the following. **09**

a) Find the value of k if each of the following functions is a probability density function.

$$f(x) = \begin{cases} kx^2(1-x^3), & 0 \le x \le 1 \\ 0, & \text{otherwise} \end{cases}$$

b) The mean life time of 100 fluorescent light bulbs produced by a Company is computed to be 1570 Hrs. with S.D. of 120 Hrs. If μ is the mean lifetime of all the bulbs produced by the Company, Test the Hypothesis $\mu = 1600$ Hrs. Against the alternative Hypothesis $\mu \neq 1600$ Hrs. using 5% level of Significance.
(Given Expected value at 5% LOS is 1.96)

c) Calculate the coefficient of correlation between height of father and height of son from the following data.

Height of father	64	65	66	67	68	69	70
Height of son	66	67	65	68	70	68	71

d) Two independent random sample have the following data,
$\overline{x_1} = 110, \sigma_1 = 25, n_1 = 16$
$\overline{x_2} = 120, \sigma_2 = 30, n_2 = 9$
If σ_1 and σ_2 are the S. D. of the populations. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance. (The table value of t at $\alpha = 0.05$ for $v = 23$ degrees of freedom is 2.069)

e) If in a lot of 500 solenoids 25 are defective, find the probability that there will be 0, 1, 2 defective solenoids in a random sample of 20 solenoids.

Q.6 Attempt any three of the following. **09**

a) If two independent random samples of sizes 15 and 8 have respectively the following mean and population standard deviations, $\overline{x_1} = 980, \overline{x_2} = 1012; \sigma_1 = 75, \sigma_2 = 80$. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance.
(Given Expected value at 5% LOS with 21 DF is 2.080)

b) The number of telephone calls received by an operator in a ten-minute interval follows a Poisson distribution with mean 1. What is the probability of receiving (i) no call, (ii) less than four calls, in the interval? What is the most likely number of calls?

c) Calculate the equations of the lines of regression. Given
Mean of $x = 50.07$, S.D. of $x = 5.26$
Mean of $y = 9.98$, S.D. of $y = 2.59$
$r = 0.898$

d) In an intelligence test administered to 1000 children the mean score was, 42 with s.d. 24. Find the number of children (i) scoring more than 60 and (ii) between 20 and 40 assuming the distribution to be normal.
(Given: For S.N.V. z area from z = 0 to z = 0.75 is 0.2734, that between z = 0 and z = 0.9167 is 0.3202 and that between z = 0 to z = 0.08333 is 0.0332.)

e) Fit a Straight line $y = a + bx$ to the following data.

x	0	1	2	3	4	5
y	1	2	3	4.5	6	7.5

Q.7 Attempt any Two. **10**

a) Fit a Poisson's distribution to the following data :

X	0	1	2	3	4	Total
f	112	63	20	4	1	200

b) Obtain a second-degree curve to the following data.

Year	1965	1966	1967	1968	1969	1970	1971	1972
Profit (in Corers Rs.)	125	140	165	195	200	215	220	230

Also estimate the profit in 1973.

c) Ten school boys were given a test in Statistics and their scores were recorded. They were given a month's special coaching and a second test was given to them in the same subject at the end of the coaching period. Test if the marks given below give evidence to the fact that the students are benefitted by coaching.
Marks in test I: 70, 68, 56, 75, 80, 90, 68, 75, 56, 58
Marks in Test II: 68, 70, 52, 73, 75, 78, 80, 92, 54, 55
(Given that value of t_α at 5 % LOS for v = 9 degrees of freedom is 1.86 for one tailed test)

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) If $\mu_1', \mu_2', \mu_3', \mu_4'$ are the first four moments of the distribution about certain number then fourth moment μ_4 of the distribution about the arithmetic mean is given by _____.

a) $\mu_4' + 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^4 + 3(\mu_1')^4$

b) $\mu_4' - 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^2 - 3(\mu_1')^4$

c) $\mu_4' + 4\mu_3'\mu_1' - 6\mu_2'(\mu_1')^4 - 3(\mu_1')^4$

d) $\mu_4' + 2\mu_3'\mu_1' + 6\mu_2'(\mu_1')^4 - 3(\mu_1')^4$

2) Coefficient of kurtosis β_2 is given by _____.

a) $\frac{\mu_4}{\mu_3}$ b) $\frac{\mu_4}{\mu_2^2}$

c) $\frac{\mu_3}{\mu_2^2}$ d) $\frac{\mu_4}{\mu_2^3}$

3) If value of x for normal distribution is 35, mean of normal distribution is 65 and standard deviation is 25 then standardized random variable is ___.

a) -1.5 b) -1.7
c) -1.2 d) -4

4) A continuous random variable has the following probability density function $f(x) = kx(1-x), 0 \le x \le 1$ then $k =$ _____.

a) 6 b) 2
c) 3 d) 5

5) The area under the standard normal curve from $z = -\infty$ to $z = 0$ is ___.

a) 1 b) ½
c) 3/2 d) 0

6) If X, Y denotes the deviations from their means and if $\sum X^2 = 40, \sum Y^2 = 100, \sum XY = 50,$ then $r =$ _____.

a) 0.63 b) 0.82

c) 0.91 d) 0.79

7) The line of regression of x and y is given by _____.

a) $x - \bar{x} = b_{xy}(y - \bar{y})$ b) $x - \bar{y} = b_{xy}(x - \bar{x})$

c) $x - \bar{x} = b_{xx}(y - \bar{y})$ d) $x - \bar{x} = b_{yx}(y - \bar{y})$

8) The following mistakes per page were found in a book.

No. of mistakes:	0	1	2	3	4
Pages:	211	90	19	5	0

Then χ^2 is _____.

a) 0.59 b) 0.069

c) 0.81 d) 0.79

9) The 't-statistic' is defined as _____.

a) $\frac{\bar{x}-\mu}{\sigma/\sqrt{n}}$ b) $\frac{\bar{x}-\mu}{s/\sqrt{n}}$

c) $\frac{\bar{x}-\mu}{\sigma/n}$ d) $\frac{\bar{x}-\mu}{s/n}$

10) If a linear differential equation with constant coefficients and r.h.s. equal to zero has a real root m_1 repeated Two times, then the corresponding part of the integral is _____.

a) $(c_1 + c_2)e^{m_1 X}$ b) $(c_1 + c_2 x)e^{m_1 X}$

c) $(c_1 x + c_2 x^2)e^{m_1 X}$ d) $(c_1 + c_2 x^3)e^{m_1 X}$

11) $\frac{1}{D-a}X$ is equal to _____.

a) $\int Xe^{ax}dx$ b) $e^{ax}\int X.e^{-ax}dx$

c) $\int Xe^{-ax}dx$ d) $e^{-ax}\int Xe^{-ax}dx$

12) $\frac{1}{D+1}(\log x + \frac{1}{x})$ is equal to _____.

a) e^x b) 1

c) x d) $\log x$

13) The solution of $q = e^{-p}$ is _____.

a) $z = ax + by + c$ b) $z = a^x + b^y + c$

c) $z = ax + y^{-b} + c$ d) $z = ax + e^{-a}y + c$

14) The solution of the equation $pq = p + q$ is _____.

a) $z = ax + (a+1)y + c$

b) $z = (a+1)x + a(a-1)y + c$

c) $z = (a-1)x + a(a+1)y + c$

d) $z(a-1) = a(a-1)x + ay + c$

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **09**

a) Find the Arithmetic mean, Median and standard deviation for the following frequency distribution.

x	5	9	12	15	20	24	30	35	42	49
f	3	6	8	8	9	10	8	7	6	2

b) Solve $(D^2 - 4D + 4)y = 8.x^2e^{2x}\sin 2x$

c) Solve $(D^2 + D + 1)y = \sin 2x$

d) Calculate Mode for the following frequency distribution.

C.I.	00-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency (f)	4	7	8	12	25	18	10

e) Solve $p^2q^3 = x^2y^3$

Q.3 Attempt any Three. **09**

a) Solve: $(2D + 1)^2y = 4e^{-x/2}$

b) Solve: $p + q = pqz$

c) Find Q_1, Q_2, Q_3 from the following data.
5,7,12,14,15,22,25,30,36,42,53

d) Solve $x(y - z)p + y(z - x)q = z(x - y)$

e) Solve $(D^3 - 3D + 2)y = x$

Q.4 Attempt any Two **10**

a) The first four moments of a distribution about the value 5 are 2,20,40 and 50. from the given information obtain the first four central moments, coefficient of skewness and kurtosis.

b) Solve the following differential equation by the method of separation of variables.
$\frac{\partial z}{\partial x} - 2\frac{\partial z}{\partial y} = z$ given that $z(x, 0) = 3e^{-5x}$

c) Solve: $(D^2 - D - 2)y = 2\log x + \frac{1}{x} + \frac{1}{x^2}$

Section – II

Q.5 Attempt any three of the following. **09**

a) Find the value of k if each of the following functions is a probability density function.

$$f(x) = \begin{cases} kx^2(1-x^3), & 0 \le x \le 1 \\ 0, & \text{otherwise} \end{cases}$$

b) The mean life time of 100 fluorescent light bulbs produced by a Company is computed to be 1570 Hrs. with S.D. of 120 Hrs. If μ is the mean lifetime of all the bulbs produced by the Company, Test the Hypothesis $\mu = 1600$ Hrs. Against the alternative Hypothesis $\mu \neq 1600$ Hrs. using 5% level of Significance.
(Given Expected value at 5% LOS is 1.96)

c) Calculate the coefficient of correlation between height of father and height of son from the following data.

Height of father	64	65	66	67	68	69	70
Height of son	66	67	65	68	70	68	71

d) Two independent random sample have the following data,
$\overline{x_1} = 110, \sigma_1 = 25, n_1 = 16$
$\overline{x_2} = 120, \sigma_2 = 30, n_2 = 9$
If σ_1 and σ_2 are the S. D. of the populations. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance. (The table value of t at $\alpha = 0.05$ for $v = 23$ degrees of freedom is 2.069)

e) If in a lot of 500 solenoids 25 are defective, find the probability that there will be 0, 1, 2 defective solenoids in a random sample of 20 solenoids.

Q.6 Attempt any three of the following. **09**

a) If two independent random samples of sizes 15 and 8 have respectively the following mean and population standard deviations, $\overline{x_1} = 980, \overline{x_2} = 1012; \sigma_1 = 75, \sigma_2 = 80$. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance.
(Given Expected value at 5% LOS with 21 DF is 2.080)

b) The number of telephone calls received by an operator in a ten-minute interval follows a Poisson distribution with mean 1. What is the probability of receiving (i) no call, (ii) less than four calls, in the interval? What is the most likely number of calls?

c) Calculate the equations of the lines of regression. Given
Mean of $x = 50.07$, S.D. of $x = 5.26$
Mean of $y = 9.98$, S.D. of $y = 2.59$
$r = 0.898$

d) In an intelligence test administered to 1000 children the mean score was, 42 with s.d. 24. Find the number of children (i) scoring more than 60 and (ii) between 20 and 40 assuming the distribution to be normal.
(Given: For S.N.V. z area from z = 0 to z = 0.75 is 0.2734, that between z = 0 and z = 0.9167 is 0.3202 and that between z = 0 to z = 0.08333 is 0.0332.)

e) Fit a Straight line $y = a + bx$ to the following data.

x	0	1	2	3	4	5
y	1	2	3	4.5	6	7.5

Q.7 Attempt any Two. **10**

a) Fit a Poisson's distribution to the following data :

X	0	1	2	3	4	Total
f	112	63	20	4	1	200

b) Obtain a second-degree curve to the following data.

Year	1965	1966	1967	1968	1969	1970	1971	1972
Profit (in Corers Rs.)	125	140	165	195	200	215	220	230

Also estimate the profit in 1973.

c) Ten school boys were given a test in Statistics and their scores were recorded. They were given a month's special coaching and a second test was given to them in the same subject at the end of the coaching period. Test if the marks given below give evidence to the fact that the students are benefitted by coaching.
Marks in test I: 70, 68, 56, 75, 80, 90, 68, 75, 56, 58
Marks in Test II: 68, 70, 52, 73, 75, 78, 80, 92, 54, 55
(Given that value of t_α at 5 % LOS for v = 9 degrees of freedom is 1.86 for one tailed test)

SLR-BD-16

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which dimension of e-commerce enables commerce beyond the boundaries of the country?
a) Richness b) Interactivity
c) Global Reach d) Ubiquity

2) Which of the following describes the definition of electronic commerce?
a) Doing business
b) Sale and purchase of goods
c) Doing business electronically
d) All of the above mentioned

3) Which e-commerce model involves the sale of goods or services from businesses to the general public?
a) Business to Government b) Business to Consumer
c) Business to Business d) Consumer to Business

4) All of the following are major B2C business models except _____.
a) content provider b) industry consortium
c) transaction broker d) service provider

5) Which of the following advantage of E-commerce?
a) Ability to operate 24/7
b) Inability to personalize the shopping
c) Higher operational cost
d) Limited reach CO1 I

6) Which e-commerce transaction provides the benefits of eliminating the requirement of a middleman?

a) Business to Business b) Business to Government
c) Consumer to Business d) Business to Consumer

7) After completing an E-Commerce transaction, the seller and buyer should be provided an opportunity to _____ their transaction experience.

a) undo b) regret
c) provide rating for d) forget

8) Which of the following is a common digital marketing strategy used in E-commerce?

a) Search Engine Optimization (SEO)
b) Traditional print advertising
c) Cold-calling potential customers
d) Distributing flyers in local neighborhoods

9) Digital Cash has following characteristic _____.

a) Anonymity b) Security
c) Confidentiality d) All above

10) Which component of E-commerce ensures secure online transactions and customer data protection?

a) Payment gateways b) Shopping carts
c) Product catalogs d) Data warehouses

11) Which type of attack is a method of defeating a cryptographic scheme of trying a large number of possibilities?

a) Teardrop attack b) Brute force attack
c) Phlashing d) Smurf attack

12) What is the another name called PDoS?

a) Brute force attack b) Non technical attack
c) Phlashing d) Smurf attack

13) What does the term “data security” refer to in E-commerce?

a) The use of cookies to track customer behavior
b) The protection of customer data from unauthorized access and breaches
c) The analysis of customer browsing history for personalized recommendations
d) The process of categorizing customer data for marketing purposes

14) Which of the following is a characteristic of E-commerce marketplaces?

a) They only allow B2C transactions
b) They sell physical products exclusively
c) They are limited to a specific geographical area
d) Multiple sellers can list their products to reach a broader audience

SLR-BD-16

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve any four of the following. **16**

a) What is electronic commerce? Explain its applications?
b) Describe the web 2.0 in detail.
c) What do you mean by Supply Chain Execution Framework?
d) Discuss in brief virtual auction. Explain the differences between virtual auction and reverse auction.
e) Give the types of E payment methods. Explain in detail the EPS?

Q.3 Solve any two of the following. **12**

a) Define Electronic Data Interchange. What are the components of Electronic Data Interchange?
b) Explain in detail Business to consumer e-Commerce model.
c) What are the key technologies for B2B E-commerce? Explain architectural models of B2B E-commerce.

Section – II

Q.4 Solve any four of the following. **16**

a) What is the purpose of using social media in E-commerce marketing?
b) Explain technical malware attack method related to different services.
c) Explain E-Commerce micro payments in detail.
d) Explain SEO in detail.
e) Explain web advertising types in detail.

Q.5 Solve any two of the following. **12**

a) Define digital cash or e-cash. Explain with example how an online banking system works.
b) What are the different strategies to increase the sale?
c) What are the security challenges and protection measure available to any e business?

SLR-BD-16

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Which of the following is a common digital marketing strategy used in E-commerce?
a) Search Engine Optimization (SEO)
b) Traditional print advertising
c) Cold-calling potential customers
d) Distributing flyers in local neighborhoods

2) Digital Cash has following characteristic _____.
a) Anonymity b) Security
c) Confidentiality d) All above

3) Which component of E-commerce ensures secure online transactions and customer data protection?
a) Payment gateways b) Shopping carts
c) Product catalogs d) Data warehouses

4) Which type of attack is a method of defeating a cryptographic scheme of trying a large number of possibilities?
a) Teardrop attack b) Brute force attack
c) Phlashing d) Smurf attack

5) What is the another name called PDoS?
a) Brute force attack b) Non technical attack
c) Phlashing d) Smurf attack

6) What does the term “data security” refer to in E-commerce?
a) The use of cookies to track customer behavior
b) The protection of customer data from unauthorized access and breaches
c) The analysis of customer browsing history for personalized recommendations
d) The process of categorizing customer data for marketing purposes

7) Which of the following is a characteristic of E-commerce marketplaces?
a) They only allow B2C transactions
b) They sell physical products exclusively
c) They are limited to a specific geographical area
d) Multiple sellers can list their products to reach a broader audience

8) Which dimension of e-commerce enables commerce beyond the boundaries of the country?
a) Richness b) Interactivity
c) Global Reach d) Ubiquity

9) Which of the following describes the definition of electronic commerce?
a) Doing business
b) Sale and purchase of goods
c) Doing business electronically
d) All of the above mentioned

10) Which e-commerce model involves the sale of goods or services from businesses to the general public?
a) Business to Government b) Business to Consumer
c) Business to Business d) Consumer to Business

11) All of the following are major B2C business models except _____.
a) content provider b) industry consortium
c) transaction broker d) service provider

12) Which of the following advantage of E-commerce?
a) Ability to operate 24/7
b) Inability to personalize the shopping
c) Higher operational cost
d) Limited reach CO1 I

13) Which e-commerce transaction provides the benefits of eliminating the requirement of a middleman?
a) Business to Business b) Business to Government
c) Consumer to Business d) Business to Consumer

14) After completing an E-Commerce transaction, the seller and buyer should be provided an opportunity to _____ their transaction experience.
a) undo b) regret
c) provide rating for d) forget

SLR-BD-16

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve any four of the following. **16**

a) What is electronic commerce? Explain its applications?
b) Describe the web 2.0 in detail.
c) What do you mean by Supply Chain Execution Framework?
d) Discuss in brief virtual auction. Explain the differences between virtual auction and reverse auction.
e) Give the types of E payment methods. Explain in detail the EPS?

Q.3 Solve any two of the following. **12**

a) Define Electronic Data Interchange. What are the components of Electronic Data Interchange?
b) Explain in detail Business to consumer e-Commerce model.
c) What are the key technologies for B2B E-commerce? Explain architectural models of B2B E-commerce.

Section – II

Q.4 Solve any four of the following. **16**

a) What is the purpose of using social media in E-commerce marketing?
b) Explain technical malware attack method related to different services.
c) Explain E-Commerce micro payments in detail.
d) Explain SEO in detail.
e) Explain web advertising types in detail.

Q.5 Solve any two of the following. **12**

a) Define digital cash or e-cash. Explain with example how an online banking system works.
b) What are the different strategies to increase the sale?
c) What are the security challenges and protection measure available to any e business?

SLR-BD-16

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Which type of attack is a method of defeating a cryptographic scheme of trying a large number of possibilities?
a) Teardrop attack b) Brute force attack
c) Phlashing d) Smurf attack

2) What is the another name called PDoS?
a) Brute force attack b) Non technical attack
c) Phlashing d) Smurf attack

3) What does the term "data security" refer to in E-commerce?
a) The use of cookies to track customer behavior
b) The protection of customer data from unauthorized access and breaches
c) The analysis of customer browsing history for personalized recommendations
d) The process of categorizing customer data for marketing purposes

4) Which of the following is a characteristic of E-commerce marketplaces?
a) They only allow B2C transactions
b) They sell physical products exclusively
c) They are limited to a specific geographical area
d) Multiple sellers can list their products to reach a broader audience

5) Which dimension of e-commerce enables commerce beyond the boundaries of the country?
a) Richness b) Interactivity
c) Global Reach d) Ubiquity

6) Which of the following describes the definition of electronic commerce?
a) Doing business
b) Sale and purchase of goods
c) Doing business electronically
d) All of the above mentioned

7) Which e-commerce model involves the sale of goods or services from businesses to the general public?
a) Business to Government b) Business to Consumer
c) Business to Business d) Consumer to Business

8) All of the following are major B2C business models except _____.
a) content provider b) industry consortium
c) transaction broker d) service provider

9) Which of the following advantage of E-commerce?
a) Ability to operate 24/7
b) Inability to personalize the shopping
c) Higher operational cost
d) Limited reach CO1 I

10) Which e-commerce transaction provides the benefits of eliminating the requirement of a middleman?
a) Business to Business b) Business to Government
c) Consumer to Business d) Business to Consumer

11) After completing an E-Commerce transaction, the seller and buyer should be provided an opportunity to _____ their transaction experience.
a) undo b) regret
c) provide rating for d) forget

12) Which of the following is a common digital marketing strategy used in E-commerce?
a) Search Engine Optimization (SEO)
b) Traditional print advertising
c) Cold-calling potential customers
d) Distributing flyers in local neighborhoods

13) Digital Cash has following characteristic _____.
a) Anonymity b) Security
c) Confidentiality d) All above

14) Which component of E-commerce ensures secure online transactions and customer data protection?
a) Payment gateways b) Shopping carts
c) Product catalogs d) Data warehouses

SLR-BD-16

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve any four of the following. **16**

a) What is electronic commerce? Explain its applications?
b) Describe the web 2.0 in detail.
c) What do you mean by Supply Chain Execution Framework?
d) Discuss in brief virtual auction. Explain the differences between virtual auction and reverse auction.
e) Give the types of E payment methods. Explain in detail the EPS?

Q.3 Solve any two of the following. **12**

a) Define Electronic Data Interchange. What are the components of Electronic Data Interchange?
b) Explain in detail Business to consumer e-Commerce model.
c) What are the key technologies for B2B E-commerce? Explain architectural models of B2B E-commerce.

Section – II

Q.4 Solve any four of the following. **16**

a) What is the purpose of using social media in E-commerce marketing?
b) Explain technical malware attack method related to different services.
c) Explain E-Commerce micro payments in detail.
d) Explain SEO in detail.
e) Explain web advertising types in detail.

Q.5 Solve any two of the following. **12**

a) Define digital cash or e-cash. Explain with example how an online banking system works.
b) What are the different strategies to increase the sale?
c) What are the security challenges and protection measure available to any e business?

SLR-BD-16

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which e-commerce transaction provides the benefits of eliminating the requirement of a middleman?
a) Business to Business b) Business to Government
c) Consumer to Business d) Business to Consumer

2) After completing an E-Commerce transaction, the seller and buyer should be provided an opportunity to _____ their transaction experience.
a) undo b) regret
c) provide rating for d) forget

3) Which of the following is a common digital marketing strategy used in E-commerce?
a) Search Engine Optimization (SEO)
b) Traditional print advertising
c) Cold-calling potential customers
d) Distributing flyers in local neighborhoods

4) Digital Cash has following characteristic _____.
a) Anonymity b) Security
c) Confidentiality d) All above

5) Which component of E-commerce ensures secure online transactions and customer data protection?
a) Payment gateways b) Shopping carts
c) Product catalogs d) Data warehouses

6) Which type of attack is a method of defeating a cryptographic scheme of trying a large number of possibilities?
a) Teardrop attack b) Brute force attack
c) Phlashing d) Smurf attack

7) What is the another name called PDoS?
a) Brute force attack b) Non technical attack
c) Phlashing d) Smurf attack

8) What does the term “data security” refer to in E-commerce?
a) The use of cookies to track customer behavior
b) The protection of customer data from unauthorized access and breaches
c) The analysis of customer browsing history for personalized recommendations
d) The process of categorizing customer data for marketing purposes

9) Which of the following is a characteristic of E-commerce marketplaces?
a) They only allow B2C transactions
b) They sell physical products exclusively
c) They are limited to a specific geographical area
d) Multiple sellers can list their products to reach a broader audience

10) Which dimension of e-commerce enables commerce beyond the boundaries of the country?
a) Richness b) Interactivity
c) Global Reach d) Ubiquity

11) Which of the following describes the definition of electronic commerce?
a) Doing business
b) Sale and purchase of goods
c) Doing business electronically
d) All of the above mentioned

12) Which e-commerce model involves the sale of goods or services from businesses to the general public?
a) Business to Government b) Business to Consumer
c) Business to Business d) Consumer to Business

13) All of the following are major B2C business models except _____.
a) content provider b) industry consortium
c) transaction broker d) service provider

14) Which of the following advantage of E-commerce?
a) Ability to operate 24/7
b) Inability to personalize the shopping
c) Higher operational cost
d) Limited reach CO1 I

SLR-BD-16

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve any four of the following. **16**

a) What is electronic commerce? Explain its applications?
b) Describe the web 2.0 in detail.
c) What do you mean by Supply Chain Execution Framework?
d) Discuss in brief virtual auction. Explain the differences between virtual auction and reverse auction.
e) Give the types of E payment methods. Explain in detail the EPS?

Q.3 Solve any two of the following. **12**

a) Define Electronic Data Interchange. What are the components of Electronic Data Interchange?
b) Explain in detail Business to consumer e-Commerce model.
c) What are the key technologies for B2B E-commerce? Explain architectural models of B2B E-commerce.

Section – II

Q.4 Solve any four of the following. **16**

a) What is the purpose of using social media in E-commerce marketing?
b) Explain technical malware attack method related to different services.
c) Explain E-Commerce micro payments in detail.
d) Explain SEO in detail.
e) Explain web advertising types in detail.

Q.5 Solve any two of the following. **12**

a) Define digital cash or e-cash. Explain with example how an online banking system works.
b) What are the different strategies to increase the sale?
c) What are the security challenges and protection measure available to any e business?

SLR-BD-17

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The main focus of the humanities is: _____.
a) Scientific experiments
b) Human culture and expression
c) Market trends and economies
d) Medical advancements

2) Which of the following does not come under the humanities?
a) Philosophy b) Literature
c) Physics d) Art History

3) The main focus of social sciences is on:
a) The physical and natural world
b) Human society and social relationships
c) Ancient artifacts
d) Chemical compositions

4) The study of language structure and its evolution is called: _____.
a) Sociology b) Linguistics
c) Psychology d) Anthropology

5) Identify the key person in philosophy _____.
a) Isaac Newton b) Leonardo da Vinci
c) Aristotle d) Charles Darwin

6) The archaeology focuses on: _____.
a) Economic theories
b) The study of celestial bodies
c) Material remains of past societies
d) Genetic research

7) Which of the following disciplines deals with political systems and governance?

a) Economics b) Political Science
c) Sociology d) Cultural Studies

8) Sociology mainly focuses on: _____.

a) Artistic techniques
b) Social behaviour and societal structures
c) Social economics
d) Historical events

9) Which discipline studies the production, distribution, and consumption of goods and services?

a) Sociology b) Political Science
c) Economics d) History

10) In which ancient civilization did the term "democracy" originate?

a) Ancient Egypt b) Ancient Greece
c) Ancient Rome d) Mesopotamia

11) Identify the primary focus of ethics in philosophy _____.

a) Logic and reasoning b) Moral principles and conduct
c) Aesthetics and beauty d) Scientific discovery

12) Feminism primarily addresses issues related to: _____.

a) Economic inequality
b) Gender equality and women's rights
c) Political ideologies
d) Technological advancements

13) What is the fundamental problem of economics?

a) Production of goods b) Scarcity of resources
c) Inflation d) Trade barriers

14) Dr. Sigmund Freud is best known for his contributions to: _____.

a) Political science b) Psychoanalysis
c) Economic theory d) Structural linguistics

SLR-BD-17

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **12**

a) Explain the interdisciplinary nature of disciplines under humanities and social sciences.
b) Write a short note on: Scope of humanities.
c) Explain how perceptual processes shape human behaviour.
d) Write a short note on: Different aspects of perception.
e) Write a short note on: Major philosophical movements and their impact.

Q.3 Attempt any Two. **16**

a) Explain the advantages and disadvantages of democracy.
b) Explain major theories of psychology.
c) Explain how different psychological aspects affect social communication.

Section – II

Q.4 Attempt any Three. **12**

a) Write a short note on: Social Institutions.
b) Explain different elements of culture and society.
c) Write a short note on: Contributions of ancient civilizations to modern society.
d) How did industrial revolution contribute to technical advancements?
e) Write a short note on: Ethics in Engineering.

Q.5 Attempt any Two. **16**

a) What is industrialization? Explain the social and economic consequences of industrialization.
b) Describe different economic theories and thinkers.
c) Explain the technological innovations in 18^{th} & 19^{th} century.

SLR-BD-17

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Sociology mainly focuses on: _____.
a) Artistic techniques
b) Social behaviour and societal structures
c) Social economics
d) Historical events

2) Which discipline studies the production, distribution, and consumption of goods and services?
a) Sociology b) Political Science
c) Economics d) History

3) In which ancient civilization did the term "democracy" originate?
a) Ancient Egypt b) Ancient Greece
c) Ancient Rome d) Mesopotamia

4) Identify the primary focus of ethics in philosophy _____.
a) Logic and reasoning b) Moral principles and conduct
c) Aesthetics and beauty d) Scientific discovery

5) Feminism primarily addresses issues related to: _____.
a) Economic inequality
b) Gender equality and women's rights
c) Political ideologies
d) Technological advancements

6) What is the fundamental problem of economics?
a) Production of goods b) Scarcity of resources
c) Inflation d) Trade barriers

7) Dr. Sigmund Freud is best known for his contributions to: _____.
a) Political science b) Psychoanalysis
c) Economic theory d) Structural linguistics

8) The main focus of the humanities is: _____.
a) Scientific experiments
b) Human culture and expression
c) Market trends and economies
d) Medical advancements

9) Which of the following does not come under the humanities?
a) Philosophy b) Literature
c) Physics d) Art History

10) The main focus of social sciences is on:
a) The physical and natural world
b) Human society and social relationships
c) Ancient artifacts
d) Chemical compositions

11) The study of language structure and its evolution is called: _____.
a) Sociology b) Linguistics
c) Psychology d) Anthropology

12) Identify the key person in philosophy _____.
a) Isaac Newton b) Leonardo da Vinci
c) Aristotle d) Charles Darwin

13) The archaeology focuses on: _____.
a) Economic theories
b) The study of celestial bodies
c) Material remains of past societies
d) Genetic research

14) Which of the following disciplines deals with political systems and governance?
a) Economics b) Political Science
c) Sociology d) Cultural Studies

SLR-BD-17

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **12**

a) Explain the interdisciplinary nature of disciplines under humanities and social sciences.
b) Write a short note on: Scope of humanities.
c) Explain how perceptual processes shape human behaviour.
d) Write a short note on: Different aspects of perception.
e) Write a short note on: Major philosophical movements and their impact.

Q.3 Attempt any Two. **16**

a) Explain the advantages and disadvantages of democracy.
b) Explain major theories of psychology.
c) Explain how different psychological aspects affect social communication.

Section – II

Q.4 Attempt any Three. **12**

a) Write a short note on: Social Institutions.
b) Explain different elements of culture and society.
c) Write a short note on: Contributions of ancient civilizations to modern society.
d) How did industrial revolution contribute to technical advancements?
e) Write a short note on: Ethics in Engineering.

Q.5 Attempt any Two. **16**

a) What is industrialization? Explain the social and economic consequences of industrialization.
b) Describe different economic theories and thinkers.
c) Explain the technological innovations in 18^{th} & 19^{th} century.

SLR-BD-17

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Identify the primary focus of ethics in philosophy _____.
a) Logic and reasoning b) Moral principles and conduct
c) Aesthetics and beauty d) Scientific discovery

2) Feminism primarily addresses issues related to: _____.
a) Economic inequality
b) Gender equality and women's rights
c) Political ideologies
d) Technological advancements

3) What is the fundamental problem of economics?
a) Production of goods b) Scarcity of resources
c) Inflation d) Trade barriers

4) Dr. Sigmund Freud is best known for his contributions to: _____.
a) Political science b) Psychoanalysis
c) Economic theory d) Structural linguistics

5) The main focus of the humanities is: _____.
a) Scientific experiments
b) Human culture and expression
c) Market trends and economies
d) Medical advancements

6) Which of the following does not come under the humanities?
a) Philosophy b) Literature
c) Physics d) Art History

7) The main focus of social sciences is on:
a) The physical and natural world
b) Human society and social relationships
c) Ancient artifacts
d) Chemical compositions

8) The study of language structure and its evolution is called: _____.
a) Sociology b) Linguistics
c) Psychology d) Anthropology

9) Identify the key person in philosophy _____.
a) Isaac Newton b) Leonardo da Vinci
c) Aristotle d) Charles Darwin

10) The archaeology focuses on: _____.
a) Economic theories
b) The study of celestial bodies
c) Material remains of past societies
d) Genetic research

11) Which of the following disciplines deals with political systems and governance?
a) Economics b) Political Science
c) Sociology d) Cultural Studies

12) Sociology mainly focuses on: _____.
a) Artistic techniques
b) Social behaviour and societal structures
c) Social economics
d) Historical events

13) Which discipline studies the production, distribution, and consumption of goods and services?
a) Sociology b) Political Science
c) Economics d) History

14) In which ancient civilization did the term "democracy" originate?
a) Ancient Egypt b) Ancient Greece
c) Ancient Rome d) Mesopotamia

SLR-BD-17

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **12**

a) Explain the interdisciplinary nature of disciplines under humanities and social sciences.
b) Write a short note on: Scope of humanities.
c) Explain how perceptual processes shape human behaviour.
d) Write a short note on: Different aspects of perception.
e) Write a short note on: Major philosophical movements and their impact.

Q.3 Attempt any Two. **16**

a) Explain the advantages and disadvantages of democracy.
b) Explain major theories of psychology.
c) Explain how different psychological aspects affect social communication.

Section – II

Q.4 Attempt any Three. **12**

a) Write a short note on: Social Institutions.
b) Explain different elements of culture and society.
c) Write a short note on: Contributions of ancient civilizations to modern society.
d) How did industrial revolution contribute to technical advancements?
e) Write a short note on: Ethics in Engineering.

Q.5 Attempt any Two. **16**

a) What is industrialization? Explain the social and economic consequences of industrialization.
b) Describe different economic theories and thinkers.
c) Explain the technological innovations in 18^{th} & 19^{th} century.

SLR-BD-17

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The archaeology focuses on: _____.

a) Economic theories
b) The study of celestial bodies
c) Material remains of past societies
d) Genetic research

2) Which of the following disciplines deals with political systems and governance?

a) Economics b) Political Science
c) Sociology d) Cultural Studies

3) Sociology mainly focuses on: _____.

a) Artistic techniques
b) Social behaviour and societal structures
c) Social economics
d) Historical events

4) Which discipline studies the production, distribution, and consumption of goods and services?

a) Sociology b) Political Science
c) Economics d) History

5) In which ancient civilization did the term "democracy" originate?

a) Ancient Egypt b) Ancient Greece
c) Ancient Rome d) Mesopotamia

6) Identify the primary focus of ethics in philosophy _____.

a) Logic and reasoning b) Moral principles and conduct
c) Aesthetics and beauty d) Scientific discovery

7) Feminism primarily addresses issues related to: _____.
a) Economic inequality
b) Gender equality and women's rights
c) Political ideologies
d) Technological advancements

8) What is the fundamental problem of economics?
a) Production of goods
b) Scarcity of resources
c) Inflation
d) Trade barriers

9) Dr. Sigmund Freud is best known for his contributions to: _____.
a) Political science
b) Psychoanalysis
c) Economic theory
d) Structural linguistics

10) The main focus of the humanities is: _____.
a) Scientific experiments
b) Human culture and expression
c) Market trends and economies
d) Medical advancements

11) Which of the following does not come under the humanities?
a) Philosophy
b) Literature
c) Physics
d) Art History

12) The main focus of social sciences is on:
a) The physical and natural world
b) Human society and social relationships
c) Ancient artifacts
d) Chemical compositions

13) The study of language structure and its evolution is called: _____.
a) Sociology
b) Linguistics
c) Psychology
d) Anthropology

14) Identify the key person in philosophy _____.
a) Isaac Newton
b) Leonardo da Vinci
c) Aristotle
d) Charles Darwin

SLR-BD-17

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **12**

a) Explain the interdisciplinary nature of disciplines under humanities and social sciences.
b) Write a short note on: Scope of humanities.
c) Explain how perceptual processes shape human behaviour.
d) Write a short note on: Different aspects of perception.
e) Write a short note on: Major philosophical movements and their impact.

Q.3 Attempt any Two. **16**

a) Explain the advantages and disadvantages of democracy.
b) Explain major theories of psychology.
c) Explain how different psychological aspects affect social communication.

Section – II

Q.4 Attempt any Three. **12**

a) Write a short note on: Social Institutions.
b) Explain different elements of culture and society.
c) Write a short note on: Contributions of ancient civilizations to modern society.
d) How did industrial revolution contribute to technical advancements?
e) Write a short note on: Ethics in Engineering.

Q.5 Attempt any Two. **16**

a) What is industrialization? Explain the social and economic consequences of industrialization.
b) Describe different economic theories and thinkers.
c) Explain the technological innovations in 18^{th} & 19^{th} century.

SLR-BD-18

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ is defined as "the discipline dealing with what is good & bad & with moral duty & obligation".
a) Rule b) Organisation culture
c) Protocol d) Ethics

2) _____ involves establishing the amount of work to be done & the time when each element of the work will start.
a) Planning b) Routing
c) Scheduling d) Organizing

3) In _____ concept product enjoys the supreme importance.
a) Selling b) Marketing
c) Manufacturing d) Business

4) _____ are the greatest importance at the supervisory level.
a) Supervisory skills b) Human relation skills
c) Technical skills d) Planning skills

5) The responsibilities of the operations manager include _____.
a) Planning , organizing , staffing , procuring , and reviewing
b) Forecasting , designing , planning , organizing , and controlling
c) Forecasting , designing , operating , procuring , and reviewing
d) Planning , organizing , staffing , leading , and controlling
e) Designing & operating

6) Self-esteem, status affiliation with others, affection those come under _____ needs.
a) Basic b) Primary
c) Third level of d) Secondary

7) _____ is ability of individual or group to induce or influence the beliefs or action of other person or group.

a) Power b) Authority
c) Post d) Leadership

8) The basic objective of quality control in any organization is to _____.

a) Quality development, quality maintenance and quality improvement activities in organization
b) Achieve optimum cost
c) Achieve customer's satisfaction
d) Achieve all the above

9) Cost associated with defective products being shipped to the customers are called as _____.

a) Cost of internal failure b) Total cost of failure
c) Rejection cost d) Cost of external failure

10) For identification of vital few for the given data, the tool used is _____.

a) Cause-Effect diagram b) Scatter diagram
c) Pareto Analysis d) Check Sheet

11) Total quality management (TQM) mainly aims for _____.

a) Control for quality b) Usefulness of product
c) Customer satisfaction d) Cost control

12) The statistician who invented the control chart for use in industrial quality control was: _____.

a) Deming b) Taguchi
c) Pareto d) Shewhart
e) None of the above

13) The method of accepting or rejecting the lot is known as _____.

a) Lot sampling b) Acceptance sampling
c) Batch sampling d) Quality control

14) In double sampling plan, second sample is taken when the number of defectives _____.

a) > C1 but < C2 b) > C1
c) > C1 and C2 d) < C2

SLR-BD-18

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2	**a)**	Explain the Social responsibilities and ethics in management.	**07**
	b)	Explain decision making process with types of decision.	**07**
Q.3	**a)**	What is planning process? Explain steps in planning.	**07**
	b)	What is leadership? Explain any four styles.	**07**
Q.4	**a)**	Explain communication and Various types of communications.	**07**
	b)	What is motivation? Explain Maslow's theory of motivation.	**07**

Section – II

Q.5	**a)**	Define quality and state the Steps in quality control.	**07**
	b)	Explain Benchmarking with advantages and disadvantages.	**07**
Q.6	**a)**	Explain Deming Wheel with suitable example.	**07**
	b)	Explain the following as applied to quality control: 1) Appraisal costs 2) Prevention costs 3) Failure costs 4) Optimum costs	**07**

Q.7 **a)** In a manufacturing process the number of defectives found in the inspection of 20 lots of 100 samples is given below. **07**

1) Determine the control limit of P chart and state whether the process is in control or not.
2) Determine the new value of mean fraction defective if some points are out of control. Compute the corresponding control limits and state whether the process is still in control or not.

Lot No.	No. of defectives	Lot No.	No. of Defectives
1	5	11	7
2	4	12	6
3	3	13	3
4	5	14	5
5	4	15	4
6	6	16	2
7	9	17	8
8	15	18	7
9	11	19	6
10	6	20	4

b) Differentiate between single sampling plan & double sampling plan. **07**

SLR-BD-18

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) The basic objective of quality control in any organization is to _____.
a) Quality development, quality maintenance and quality improvement activities in organization
b) Achieve optimum cost
c) Achieve customer's satisfaction
d) Achieve all the above

2) Cost associated with defective products being shipped to the customers are called as _____.
a) Cost of internal failure b) Total cost of failure
c) Rejection cost d) Cost of external failure

3) For identification of vital few for the given data, the tool used is _____.
a) Cause-Effect diagram b) Scatter diagram
c) Pareto Analysis d) Check Sheet

4) Total quality management (TQM) mainly aims for _____.
a) Control for quality b) Usefulness of product
c) Customer satisfaction d) Cost control

5) The statistician who invented the control chart for use in industrial quality control was: _____.
a) Deming b) Taguchi
c) Pareto d) Shewhart
e) None of the above

6) The method of accepting or rejecting the lot is known as _____.
a) Lot sampling b) Acceptance sampling
c) Batch sampling d) Quality control

7) In double sampling plan, second sample is taken when the number of defectives _____.
a) > C1 but < C2 b) > C1
c) > C1 and C2 d) < C2

8) _____ is defined as “the discipline dealing with what is good & bad & with moral duty & obligation”.
a) Rule b) Organisation culture
c) Protocol d) Ethics

9) _____ involves establishing the amount of work to be done & the time when each element of the work will start.
a) Planning b) Routing
c) Scheduling d) Organizing

10) In _____ concept product enjoys the supreme importance.
a) Selling b) Marketing
c) Manufacturing d) Business

11) _____ are the greatest importance at the supervisory level.
a) Supervisory skills b) Human relation skills
c) Technical skills d) Planning skills

12) The responsibilities of the operations manager include _____.
a) Planning , organizing , staffing , procuring , and reviewing
b) Forecasting , designing , planning , organizing , and controlling
c) Forecasting , designing , operating , procuring , and reviewing
d) Planning , organizing , staffing , leading , and controlling
e) Designing & operating

13) Self-esteem, status affiliation with others, affection those come under _____ needs.
a) Basic b) Primary
c) Third level of d) Secondary

14) _____ is ability of individual or group to induce or influence the beliefs or action of other person or group.
a) Power b) Authority
c) Post d) Leadership

SLR-BD-18

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2	**a)**	Explain the Social responsibilities and ethics in management.	**07**
	b)	Explain decision making process with types of decision.	**07**
Q.3	**a)**	What is planning process? Explain steps in planning.	**07**
	b)	What is leadership? Explain any four styles.	**07**
Q.4	**a)**	Explain communication and Various types of communications.	**07**
	b)	What is motivation? Explain Maslow's theory of motivation.	**07**

Section – II

Q.5	**a)**	Define quality and state the Steps in quality control.	**07**
	b)	Explain Benchmarking with advantages and disadvantages.	**07**
Q.6	**a)**	Explain Deming Wheel with suitable example.	**07**
	b)	Explain the following as applied to quality control: 1) Appraisal costs 2) Prevention costs 3) Failure costs 4) Optimum costs	**07**

Q.7 **a)** In a manufacturing process the number of defectives found in the inspection of 20 lots of 100 samples is given below. **07**

1) Determine the control limit of P chart and state whether the process is in control or not.
2) Determine the new value of mean fraction defective if some points are out of control. Compute the corresponding control limits and state whether the process is still in control or not.

Lot No.	No. of defectives	Lot No.	No. of Defectives
1	5	11	7
2	4	12	6
3	3	13	3
4	5	14	5
5	4	15	4
6	6	16	2
7	9	17	8
8	15	18	7
9	11	19	6
10	6	20	4

b) Differentiate between single sampling plan & double sampling plan. **07**

Seat No.		Set	R

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Total quality management (TQM) mainly aims for _____.
a) Control for quality b) Usefulness of product
c) Customer satisfaction d) Cost control

2) The statistician who invented the control chart for use in industrial quality control was: _____.
a) Deming b) Taguchi
c) Pareto d) Shewhart
e) None of the above

3) The method of accepting or rejecting the lot is known as _____.
a) Lot sampling b) Acceptance sampling
c) Batch sampling d) Quality control

4) In double sampling plan, second sample is taken when the number of defectives _____.
a) > C1 but < C2 b) > C1
c) > C1 and C2 d) < C2

5) _____ is defined as "the discipline dealing with what is good & bad & with moral duty & obligation".
a) Rule b) Organisation culture
c) Protocol d) Ethics

6) _____ involves establishing the amount of work to be done & the time when each element of the work will start.
a) Planning b) Routing
c) Scheduling d) Organizing

7) In _____ concept product enjoys the supreme importance.
a) Selling b) Marketing
c) Manufacturing d) Business

8) _____ are the greatest importance at the supervisory level.
a) Supervisory skills b) Human relation skills
c) Technical skills d) Planning skills

9) The responsibilities of the operations manager include _____.
a) Planning , organizing , staffing , procuring , and reviewing
b) Forecasting , designing , planning , organizing , and controlling
c) Forecasting , designing , operating , procuring , and reviewing
d) Planning , organizing , staffing , leading , and controlling
e) Designing & operating

10) Self-esteem, status affiliation with others, affection those come under _____ needs.
a) Basic b) Primary
c) Third level of d) Secondary

11) _____ is ability of individual or group to induce or influence the beliefs or action of other person or group.
a) Power b) Authority
c) Post d) Leadership

12) The basic objective of quality control in any organization is to _____.
a) Quality development, quality maintenance and quality improvement activities in organization
b) Achieve optimum cost
c) Achieve customer's satisfaction
d) Achieve all the above

13) Cost associated with defective products being shipped to the customers are called as _____.
a) Cost of internal failure b) Total cost of failure
c) Rejection cost d) Cost of external failure

14) For identification of vital few for the given data, the tool used is _____.
a) Cause-Effect diagram b) Scatter diagram
c) Pareto Analysis d) Check Sheet

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2	**a)**	Explain the Social responsibilities and ethics in management.	**07**
	b)	Explain decision making process with types of decision.	**07**
Q.3	**a)**	What is planning process? Explain steps in planning.	**07**
	b)	What is leadership? Explain any four styles.	**07**
Q.4	**a)**	Explain communication and Various types of communications.	**07**
	b)	What is motivation? Explain Maslow's theory of motivation.	**07**

Section – II

Q.5	**a)**	Define quality and state the Steps in quality control.	**07**
	b)	Explain Benchmarking with advantages and disadvantages.	**07**
Q.6	**a)**	Explain Deming Wheel with suitable example.	**07**
	b)	Explain the following as applied to quality control: 1) Appraisal costs 2) Prevention costs 3) Failure costs 4) Optimum costs	**07**

Q.7 **a)** In a manufacturing process the number of defectives found in the inspection of 20 lots of 100 samples is given below. **07**

1) Determine the control limit of P chart and state whether the process is in control or not.
2) Determine the new value of mean fraction defective if some points are out of control. Compute the corresponding control limits and state whether the process is still in control or not.

Lot No.	No. of defectives	Lot No.	No. of Defectives
1	5	11	7
2	4	12	6
3	3	13	3
4	5	14	5
5	4	15	4
6	6	16	2
7	9	17	8
8	15	18	7
9	11	19	6
10	6	20	4

b) Differentiate between single sampling plan & double sampling plan. **07**

SLR-BD-18

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Self-esteem, status affiliation with others, affection those come under _____ needs.
a) Basic b) Primary
c) Third level of d) Secondary

2) _____ is ability of individual or group to induce or influence the beliefs or action of other person or group.
a) Power b) Authority
c) Post d) Leadership

3) The basic objective of quality control in any organization is to _____.
a) Quality development, quality maintenance and quality improvement activities in organization
b) Achieve optimum cost
c) Achieve customer's satisfaction
d) Achieve all the above

4) Cost associated with defective products being shipped to the customers are called as _____.
a) Cost of internal failure b) Total cost of failure
c) Rejection cost d) Cost of external failure

5) For identification of vital few for the given data, the tool used is _____.
a) Cause-Effect diagram b) Scatter diagram
c) Pareto Analysis d) Check Sheet

6) Total quality management (TQM) mainly aims for _____.
a) Control for quality b) Usefulness of product
c) Customer satisfaction d) Cost control

7) The statistician who invented the control chart for use in industrial quality control was: _____.

a) Deming b) Taguchi
c) Pareto d) Shewhart
e) None of the above

8) The method of accepting or rejecting the lot is known as _____.

a) Lot sampling b) Acceptance sampling
c) Batch sampling d) Quality control

9) In double sampling plan, second sample is taken when the number of defectives _____.

a) > C1 but < C2 b) > C1
c) > C1 and C2 d) < C2

10) _____ is defined as “the discipline dealing with what is good & bad & with moral duty & obligation”.

a) Rule b) Organisation culture
c) Protocol d) Ethics

11) _____ involves establishing the amount of work to be done & the time when each element of the work will start.

a) Planning b) Routing
c) Scheduling d) Organizing

12) In _____ concept product enjoys the supreme importance.

a) Selling b) Marketing
c) Manufacturing d) Business

13) _____ are the greatest importance at the supervisory level.

a) Supervisory skills b) Human relation skills
c) Technical skills d) Planning skills

14) The responsibilities of the operations manager include _____.

a) Planning , organizing , staffing , procuring , and reviewing
b) Forecasting , designing , planning , organizing , and controlling
c) Forecasting , designing , operating , procuring , and reviewing
d) Planning , organizing , staffing , leading , and controlling
e) Designing & operating

SLR-BD-18

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2	**a)**	Explain the Social responsibilities and ethics in management.	**07**
	b)	Explain decision making process with types of decision.	**07**
Q.3	**a)**	What is planning process? Explain steps in planning.	**07**
	b)	What is leadership? Explain any four styles.	**07**
Q.4	**a)**	Explain communication and Various types of communications.	**07**
	b)	What is motivation? Explain Maslow's theory of motivation.	**07**

Section – II

Q.5	**a)**	Define quality and state the Steps in quality control.	**07**
	b)	Explain Benchmarking with advantages and disadvantages.	**07**
Q.6	**a)**	Explain Deming Wheel with suitable example.	**07**
	b)	Explain the following as applied to quality control: 1) Appraisal costs 2) Prevention costs 3) Failure costs 4) Optimum costs	**07**

Q.7 **a)** In a manufacturing process the number of defectives found in the inspection of 20 lots of 100 samples is given below. **07**

1) Determine the control limit of P chart and state whether the process is in control or not.
2) Determine the new value of mean fraction defective if some points are out of control. Compute the corresponding control limits and state whether the process is still in control or not.

Lot No.	No. of defectives	Lot No.	No. of Defectives
1	5	11	7
2	4	12	6
3	3	13	3
4	5	14	5
5	4	15	4
6	6	16	2
7	9	17	8
8	15	18	7
9	11	19	6
10	6	20	4

b) Differentiate between single sampling plan & double sampling plan. **07**

SLR-BD-19

Seat No.	

Set P

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Laplace transform of $\int_0^t u^3 du =$_____.

a) $\frac{3}{s^5}$ b) $\frac{6}{s^5}$

c) $\frac{1}{s^5}$ d) $\frac{6}{s^4}$

2) If $L\{f(t)\} = \emptyset(s)$, then $L\{f(at)\} =$ _____.

a) $\emptyset\left(\frac{s}{a}\right)$ b) $\frac{1}{s}\emptyset\left(\frac{s}{a}\right)$

c) $\emptyset'\left(\frac{s}{a}\right)$ d) $\frac{1}{a}\emptyset\left(\frac{s}{a}\right)$

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

a) $\frac{1}{3}\sin 3t$ b) $\frac{1}{3}\cos 3t$

c) $\frac{1}{3}\cosh 3t$ d) $\frac{1}{3}\sinh 3t$

4) For $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 3y = 3e^{2x}$, the particular integral is _____.

a) $\frac{1}{15}e^{2x}$ b) $3e^{2x}$

c) $\frac{1}{5}e^{2x}$ d) $C_1e^{-x} + C_2e^{-2x}$

5) The general solution of the equation $(D^3 - 7D - 6)y = 0$ is _____.

a) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{-3x}$

b) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{3x}$

c) $y = c_1e^{-x} + c_2e^{-2x} + c_3e^{-3x}$

d) None of these

6) $z\{k\} =$_____ for $|z| > 1$

a) $\frac{z}{z-1}$ b) $\frac{1}{(z-1)^2}$

c) $\frac{z}{(z-1)^2}$ d) $\frac{z}{(z+1)^2}$

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

a) $f\left(\frac{a}{z}\right)$ b) $f\left(\frac{z}{a}\right)$

c) $\frac{1}{a}f\left(\frac{z}{a}\right)$ d) None

8) $Z\left\{\frac{1}{k!}\right\} =?$ for $k \geq 0$

a) e^z b) $e^{\frac{1}{z}}$

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

9) The Fourier sine transform of $f(x)$ is given by _____.

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

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

10) From the result $\int_{-\infty}^{\infty} \frac{\cos sx.\sin sk}{s} ds = \begin{cases} \pi & , \ |x| < k \\ 0 & , \ |x| > k \end{cases}$ we can deduce that $\int_0^{\infty} \frac{\sin sk}{s}\, ds =$ _____.

a) 0 b) 1

c) π d) $\frac{\pi}{2}$

11) The first real positive root of $x^3 = 6x - 4$ by Newton Raphson method near $x_0 = 1$ is _____.

a) 0.6667 b) 0.6

c) 0.4 d) 0.3

12) How many steps does the fourth-order Runge-Kutta method use?

a) Two steps b) Five steps

c) Four steps d) Three steps

13) In the interval $(0, a)$ the constant term in the Fourier series of $f(x) = \frac{a}{2} - x$ is _____.

a) 0 b) 1

c) $\frac{a^2}{2\pi}$ d) $\frac{a^2}{4\pi}$

14) Fourier series of $f(x) = x\ in(-\pi, \pi)$ will contain ____

a) No sine term b) No cosine term

c) Both cosine and sine term d) None of these

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any three **09**

a) Solve : $(D^2 + 4D + 5)y = -2\cos hx + 2^x$

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

c) Find Z-transform of $x_k = 2^k \cos(3k + 2)\,, k \geq 0$

d) Find Z-transform of $x_k = k^2 e^{-ak}, k \geq 0$

e) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{1}{s(s^2+4)}\right]$

Q.3 Attempt any three of the following. **09**

a) Evaluate by using Laplace transform $\int_0^\infty \left(\frac{e^{-t}-e^{-3t}}{t}\right) dt$

b) Find the inverse Z-transform of $f(k) = \begin{cases} 4^k, & k < 0 \\ 3^k, & k \geq 0 \end{cases}$

c) Find $Z\{e^{-3k}\sin 2k\}, k \geq 0$

d) Solve $(D^2 - 1)y = (1 + e^{-x})^2$

e) Find Laplace Transform of $\{t\cos 2t\}$

Q.4 Attempt any two **10**

a) Find the inverse Z-transform of $\frac{1}{(z-a)^2}$ if

1) $|z| < a$,
2) $|z| > a$,

b) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$

c) Solve $(D^2 - 6D + 13)y = e^{x\log 2} + 8e^{3x}\sin 4x$

Section – II

Q.5 Attempt any three **09**

a) Evaluate $\int_0^5 \frac{1}{4x+5} dx$ using $n = 5$ by Trapezoidal rule.

b) Evaluate $I = \int_0^2 e^{-x} dx$ by using the Simpson's 1/3rd rule given h= 0.5

c) Obtain half range cosine series $f(x) = x$ in $0 < x < 1$

d) Find the Fourier series expansion of $f(x) = x^2$ in $(-\pi, \pi)$

e) Find the Fourier transform of $f(x) = \begin{cases} \frac{1}{2\epsilon}, & |x| \leq \epsilon \\ 0, & |x| > \epsilon \end{cases}$

Q.6 Attempt any three **09**

a) Find f(x) if its Fourier sine transform e^{-as}

b) Find the Fourier cosine transform of

$f(x)$, if $f(x) = \begin{cases} 1, & 0 \leq x < 1 \\ 0, & x \geq 1 \end{cases}$

c) Find the Fourier series expansion of $f(x) = x$ in $(-\pi, \pi)$

d) Solve by Newton Raphson method $x^4 - x = 10$ correct to four decimal places. (perform two iterations only)

e) Find $\int_0^6 \frac{1}{1+x^2} dx\ n = 6$ using Simpson's 3/8th rule.

Q.7 Attempt any two. **10**

a) Find $\int_1^8 \frac{1}{1+x} dx\ h = 1$ by using Trapezoidal rule and Simpson's 1/3rd rule.

b) Find Fourier transform of

$f(x) = 1\ |x| < k$

$= 0\ |x| > k$ and

Hence evaluate i) $\int_{-\infty}^{\infty} \frac{\sin sk . \cos sk}{s} ds$ ii) $\int_{-\infty}^{\infty} \frac{sin\ ks}{s} ds$

c) Find the Fourier series expansion of the function $f(x) = e^{-\alpha x}$ in $(0, 2\pi)$

SLR-BD-19

Seat No.	

Set Q

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) $Z\left\{\frac{1}{k!}\right\} = ?$ for $k \geq 0$

a) e^z b) $e^{\frac{1}{z}}$

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

2) The Fourier sine transform of $f(x)$ is given by _____.

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

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

3) From the result $\int_{-\infty}^{\infty}\frac{\cos sx.\sin sk}{s}ds = \begin{cases}\pi & , \ |x| < k \\ 0 & , \ |x| > k\end{cases}$ we can deduce that $\int_0^{\infty}\frac{\sin sk}{s}\, ds =$ _____.

a) 0 b) 1

c) π d) $\frac{\pi}{2}$

4) The first real positive root of $x^3 = 6x - 4$ by Newton Raphson method near $x_0 = 1$ is _____.

a) 0.6667 b) 0.6

c) 0.4 d) 0.3

5) How many steps does the fourth-order Runge-Kutta method use?

a) Two steps b) Five steps

c) Four steps d) Three steps

6) In the interval $(0, a)$ the constant term in the Fourier series of $f(x) = \frac{a}{2} - x$ is _____.

a) 0 b) 1

c) $\frac{a^2}{2\pi}$ d) $\frac{a^2}{4\pi}$

7) Fourier series of $f(x) = x\ in(-\pi, \pi)$ will contain _____

a) No sine term b) No cosine term

c) Both cosine and sine term d) None of these

8) Laplace transform of $\int_0^t u^3 du =$_____.

a) $\frac{3}{s^5}$ b) $\frac{6}{s^5}$

c) $\frac{1}{s^5}$ d) $\frac{6}{s^4}$

9) If $L\{f(t)\} = \emptyset(s)$, then $L\{f(at)\} =$ _____.

a) $\emptyset\left(\frac{s}{a}\right)$ b) $\frac{1}{s}\emptyset\left(\frac{s}{a}\right)$

c) $\emptyset'\left(\frac{s}{a}\right)$ d) $\frac{1}{a}\emptyset\left(\frac{s}{a}\right)$

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

a) $\frac{1}{3}\sin 3t$ b) $\frac{1}{3}\cos 3t$

c) $\frac{1}{3}\cosh 3t$ d) $\frac{1}{3}\sinh 3t$

11) For $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 3y = 3e^{2x}$, the particular integral is _____.

a) $\frac{1}{15}e^{2x}$ b) $3e^{2x}$

c) $\frac{1}{5}e^{2x}$ d) $C_1e^{-x} + C_2e^{-2x}$

12) The general solution of the equation $(D^3 - 7D - 6)y = 0$ is _____.

a) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{-3x}$

b) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{3x}$

c) $y = c_1e^{-x} + c_2e^{-2x} + c_3e^{-3x}$

d) None of these

13) $z\{k\} =$_____ for $|z| > 1$

a) $\frac{z}{z-1}$ b) $\frac{1}{(z-1)^2}$

c) $\frac{z}{(z-1)^2}$ d) $\frac{z}{(z+1)^2}$

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

a) $f\left(\frac{a}{z}\right)$ b) $f\left(\frac{z}{a}\right)$

c) $\frac{1}{a} f\left(\frac{z}{a}\right)$ d) None

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any three **09**

a) Solve : $(D^2 + 4D + 5)y = -2\cos hx + 2^x$

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

c) Find Z-transform of $x_k = 2^k \cos(3k + 2)\,, k \geq 0$

d) Find Z-transform of $x_k = k^2 e^{-ak}, k \geq 0$

e) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{1}{s(s^2+4)}\right]$

Q.3 Attempt any three of the following. **09**

a) Evaluate by using Laplace transform $\int_0^\infty \left(\frac{e^{-t}-e^{-3t}}{t}\right) dt$

b) Find the inverse Z-transform of $f(k) = \begin{cases} 4^k, & k < 0 \\ 3^k, & k \geq 0 \end{cases}$

c) Find $Z\{e^{-3k}\sin 2k\}, k \geq 0$

d) Solve $(D^2 - 1)y = (1 + e^{-x})^2$

e) Find Laplace Transform of $\{t\cos 2t\}$

Q.4 Attempt any two **10**

a) Find the inverse Z-transform of $\frac{1}{(z-a)^2}$ if

1) $|z| < a$,
2) $|z| > a$,

b) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$

c) Solve $(D^2 - 6D + 13)y = e^{x\log 2} + 8e^{3x}\sin 4x$

Section – II

Q.5 Attempt any three **09**

a) Evaluate $\int_0^5 \frac{1}{4x+5} dx$ using $n = 5$ by Trapezoidal rule.

b) Evaluate $I = \int_0^2 e^{-x} dx$ by using the Simpson's 1/3rd rule given h= 0.5

c) Obtain half range cosine series $f(x) = x$ in $0 < x < 1$

d) Find the Fourier series expansion of $f(x) = x^2$ in $(-\pi, \pi)$

e) Find the Fourier transform of $f(x) = \begin{cases} \frac{1}{2\epsilon}, & |x| \leq \epsilon \\ 0, & |x| > \epsilon \end{cases}$

Q.6 Attempt any three **09**

a) Find f(x) if its Fourier sine transform e^{-as}

b) Find the Fourier cosine transform of

$f(x)$, if $f(x) = \begin{cases} 1, & 0 \leq x < 1 \\ 0, & x \geq 1 \end{cases}$

c) Find the Fourier series expansion of $f(x) = x$ in $(-\pi, \pi)$

d) Solve by Newton Raphson method $x^4 - x = 10$ correct to four decimal places. (perform two iterations only)

e) Find $\int_0^6 \frac{1}{1+x^2} dx \; n = 6$ using Simpson's 3/8th rule.

Q.7 Attempt any two. **10**

a) Find $\int_1^8 \frac{1}{1+x} dx \; h = 1$ by using Trapezoidal rule and Simpson's 1/3rd rule.

b) Find Fourier transform of

$f(x) = 1 \; |x| < k$

$= 0 \; |x| > k$ and

Hence evaluate i) $\int_{-\infty}^{\infty} \frac{\sin sk . \cos sk}{s} ds$ ii) $\int_{-\infty}^{\infty} \frac{\sin ks}{s} ds$

c) Find the Fourier series expansion of the function $f(x) = e^{-\alpha x}$ in $(0, 2\pi)$

Seat No.	

Set R

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) The first real positive root of $x^3 = 6x - 4$ by Newton Raphson method near $x_0 = 1$ is _____.

a) 0.6667 b) 0.6
c) 0.4 d) 0.3

2) How many steps does the fourth-order Runge-Kutta method use?

a) Two steps b) Five steps
c) Four steps d) Three steps

3) In the interval $(0, a)$ the constant term in the Fourier series of $f(x) = \frac{a}{2} - x$ is _____.

a) 0 b) 1
c) $\frac{a^2}{2\pi}$ d) $\frac{a^2}{4\pi}$

4) Fourier series of $f(x) = x\ in(-\pi, \pi)$ will contain ____

a) No sine term b) No cosine term
c) Both cosine and sine term d) None of these

5) Laplace transform of $\int_0^t u^3 du$ =_____.

a) $\frac{3}{s^5}$ b) $\frac{6}{s^5}$
c) $\frac{1}{s^5}$ d) $\frac{6}{s^4}$

6) If $L\{f(t)\} = \emptyset(s)$, then $L\{f(at)\} =$ _____.

a) $\emptyset\left(\frac{s}{a}\right)$ b) $\frac{1}{s}\emptyset\left(\frac{s}{a}\right)$

c) $\emptyset'\left(\frac{s}{a}\right)$ d) $\frac{1}{a}\emptyset\left(\frac{s}{a}\right)$

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

a) $\frac{1}{3}\sin 3t$ b) $\frac{1}{3}\cos 3t$

c) $\frac{1}{3}\cosh 3t$ d) $\frac{1}{3}\sinh 3t$

8) For $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 3y = 3e^{2x}$, the particular integral is _____.

a) $\frac{1}{15}e^{2x}$ b) $3e^{2x}$

c) $\frac{1}{5}e^{2x}$ d) $C_1e^{-x} + C_2e^{-2x}$

9) The general solution of the equation $(D^3 - 7D - 6)y = 0$ is _____.

a) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{-3x}$

b) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{3x}$

c) $y = c_1e^{-x} + c_2e^{-2x} + c_3e^{-3x}$

d) None of these

10) $z\{k\} =$_____ for $|z| > 1$

a) $\frac{z}{z-1}$ b) $\frac{1}{(z-1)^2}$

c) $\frac{z}{(z-1)^2}$ d) $\frac{z}{(z+1)^2}$

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

a) $f\left(\frac{a}{z}\right)$ b) $f\left(\frac{z}{a}\right)$

c) $\frac{1}{a}f\left(\frac{z}{a}\right)$ d) None

12) $Z\left\{\frac{1}{k!}\right\} =$? for $k \geq 0$

a) e^z b) $e^{\frac{1}{z}}$

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

13) The Fourier sine transform of $f(x)$ is given by _____.

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

b) $\int_{-\infty}^{\infty} f(x)\cos sx\ dx$

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

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

14) From the result $\int_{-\infty}^{\infty}\frac{\cos sx.\sin sk}{s}ds = \begin{cases}\pi & , \ |x| < k \\ 0 & , \ |x| > k\end{cases}$ we can deduce that $\int_{0}^{\infty}\frac{\sin sk}{s}\ ds =$ _____.

a) 0

b) 1

c) π

d) $\frac{\pi}{2}$

Seat No.	

Set R

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any three **09**

a) Solve : $(D^2 + 4D + 5)y = -2\cos hx + 2^x$

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

c) Find Z-transform of $x_k = 2^k \cos(3k + 2)\,, k \geq 0$

d) Find Z-transform of $x_k = k^2 e^{-ak}, k \geq 0$

e) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{1}{s(s^2+4)}\right]$

Q.3 Attempt any three of the following. **09**

a) Evaluate by using Laplace transform $\int_0^\infty \left(\frac{e^{-t}-e^{-3t}}{t}\right) dt$

b) Find the inverse Z-transform of $f(k) = \begin{cases} 4^k, & k < 0 \\ 3^k, & k \geq 0 \end{cases}$

c) Find $Z\{e^{-3k}\sin 2k\}, k \geq 0$

d) Solve $(D^2 - 1)y = (1 + e^{-x})^2$

e) Find Laplace Transform of $\{t\cos 2t\}$

Q.4 Attempt any two **10**

a) Find the inverse Z-transform of $\frac{1}{(z-a)^2}$ if

1) $|z| < a$,
2) $|z| > a$,

b) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$

c) Solve $(D^2 - 6D + 13)y = e^{x\log 2} + 8e^{3x}\sin 4x$

Section – II

Q.5 Attempt any three **09**

a) Evaluate $\int_0^5 \frac{1}{4x+5} dx$ using $n = 5$ by Trapezoidal rule.

b) Evaluate $I = \int_0^2 e^{-x} dx$ by using the Simpson's 1/3rd rule given h= 0.5

c) Obtain half range cosine series $f(x) = x$ in $0 < x < 1$

d) Find the Fourier series expansion of $f(x) = x^2$ in $(-\pi, \pi)$

e) Find the Fourier transform of $f(x) = \begin{cases} \frac{1}{2\epsilon}, & |x| \leq \epsilon \\ 0, & |x| > \epsilon \end{cases}$

Q.6 Attempt any three **09**

a) Find f(x) if its Fourier sine transform e^{-as}

b) Find the Fourier cosine transform of

$f(x)$, if $f(x) = \begin{cases} 1, & 0 \leq x < 1 \\ 0, & x \geq 1 \end{cases}$

c) Find the Fourier series expansion of $f(x) = x$ in $(-\pi, \pi)$

d) Solve by Newton Raphson method $x^4 - x = 10$ correct to four decimal places. (perform two iterations only)

e) Find $\int_0^6 \frac{1}{1+x^2} dx\ n = 6$ using Simpson's 3/8th rule.

Q.7 Attempt any two. **10**

a) Find $\int_1^8 \frac{1}{1+x} dx\ h = 1$ by using Trapezoidal rule and Simpson's 1/3rd rule.

b) Find Fourier transform of

$f(x) = 1\ |x| < k$

$= 0\ |x| > k$ and

Hence evaluate i) $\int_{-\infty}^{\infty} \frac{\sin sk . \cos sk}{s} ds$ ii) $\int_{-\infty}^{\infty} \frac{sin\ ks}{s} ds$

c) Find the Fourier series expansion of the function $f(x) = e^{-\alpha x}$ in $(0, 2\pi)$

Seat No.		Set	S

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) $z\{k\} =$_____ for $|z| > 1$

a) $\frac{z}{z-1}$ b) $\frac{1}{(z-1)^2}$

c) $\frac{z}{(z-1)^2}$ d) $\frac{z}{(z+1)^2}$

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

a) $f\left(\frac{a}{z}\right)$ b) $f\left(\frac{z}{a}\right)$

c) $\frac{1}{a} f\left(\frac{z}{a}\right)$ d) None

3) $Z\left\{\frac{1}{k!}\right\} =?$ for $k \geq 0$

a) e^z b) $e^{\frac{1}{z}}$

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

4) The Fourier sine transform of $f(x)$ is given by _____.

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

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

5) From the result $\int_{-\infty}^{\infty} \frac{\cos sx.\sin sk}{s} ds = \begin{cases} \pi & , \ |x| < k \\ 0 & , \ |x| > k \end{cases}$ we can deduce that $\int_0^{\infty} \frac{\sin sk}{s} \, ds =$ _____.

a) 0 b) 1

c) π d) $\frac{\pi}{2}$

6) The first real positive root of $x^3 = 6x - 4$ by Newton Raphson method near $x_0 = 1$ is _____.

a) 0.6667 b) 0.6

c) 0.4 d) 0.3

7) How many steps does the fourth-order Runge-Kutta method use?

a) Two steps b) Five steps

c) Four steps d) Three steps

8) In the interval $(0, a)$ the constant term in the Fourier series of $f(x) = \frac{a}{2} - x$ is _____.

a) 0 b) 1

c) $\frac{a^2}{2\pi}$ d) $\frac{a^2}{4\pi}$

9) Fourier series of $f(x) = x \ in(-\pi, \pi)$ will contain ____

a) No sine term b) No cosine term

c) Both cosine and sine term d) None of these

10) Laplace transform of $\int_0^t u^3 du =$_____.

a) $\frac{3}{s^5}$ b) $\frac{6}{s^5}$

c) $\frac{1}{s^5}$ d) $\frac{6}{s^4}$

11) If $L\{f(t)\} = \emptyset(s)$, then $L\{f(at)\} =$ _____.

a) $\emptyset\left(\frac{s}{a}\right)$ b) $\frac{1}{s}\emptyset\left(\frac{s}{a}\right)$

c) $\emptyset'\left(\frac{s}{a}\right)$ d) $\frac{1}{a}\emptyset\left(\frac{s}{a}\right)$

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

a) $\frac{1}{3}\sin 3t$ b) $\frac{1}{3}\cos 3t$

c) $\frac{1}{3}\cosh 3t$ d) $\frac{1}{3}\sinh 3t$

13) For $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 3y = 3e^{2x}$, the particular integral is _____.

a) $\frac{1}{15}e^{2x}$ b) $3e^{2x}$

c) $\frac{1}{5}e^{2x}$ d) $C_1e^{-x} + C_2e^{-2x}$

14) The general solution of the equation $(D^3 - 7D - 6)y = 0$ is _____.

a) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{-3x}$

b) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{3x}$

c) $y = c_1e^{-x} + c_2e^{-2x} + c_3e^{-3x}$

d) None of these

Seat No.	

Set **S**

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any three **09**

a) Solve : $(D^2 + 4D + 5)y = -2\cos hx + 2^x$

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

c) Find Z-transform of $x_k = 2^k \cos(3k + 2)\,, k \geq 0$

d) Find Z-transform of $x_k = k^2 e^{-ak}, k \geq 0$

e) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{1}{s(s^2+4)}\right]$

Q.3 Attempt any three of the following. **09**

a) Evaluate by using Laplace transform $\int_0^\infty \left(\frac{e^{-t}-e^{-3t}}{t}\right) dt$

b) Find the inverse Z-transform of $f(k) = \begin{cases} 4^k, & k < 0 \\ 3^k, & k \geq 0 \end{cases}$

c) Find $Z\{e^{-3k}\sin 2k\}, k \geq 0$

d) Solve $(D^2 - 1)y = (1 + e^{-x})^2$

e) Find Laplace Transform of $\{t\cos 2t\}$

Q.4 Attempt any two **10**

a) Find the inverse Z-transform of $\frac{1}{(z-a)^2}$ if

1) $|z| < a$,
2) $|z| > a$,

b) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$

c) Solve $(D^2 - 6D + 13)y = e^{x\log 2} + 8e^{3x}\sin 4x$

Section – II

Q.5 Attempt any three **09**

a) Evaluate $\int_0^5 \frac{1}{4x+5} dx$ using $n = 5$ by Trapezoidal rule.

b) Evaluate $I = \int_0^2 e^{-x} dx$ by using the Simpson's 1/3rd rule given h= 0.5

c) Obtain half range cosine series $f(x) = x$ in $0 < x < 1$

d) Find the Fourier series expansion of $f(x) = x^2$ in $(-\pi, \pi)$

e) Find the Fourier transform of $f(x) = \begin{cases} \frac{1}{2\epsilon}, & |x| \leq \epsilon \\ 0, & |x| > \epsilon \end{cases}$

Q.6 Attempt any three **09**

a) Find f(x) if its Fourier sine transform e^{-as}

b) Find the Fourier cosine transform of

$f(x)$, if $f(x) = \begin{cases} 1, & 0 \leq x < 1 \\ 0, & x \geq 1 \end{cases}$

c) Find the Fourier series expansion of $f(x) = x$ in $(-\pi, \pi)$

d) Solve by Newton Raphson method $x^4 - x = 10$ correct to four decimal places. (perform two iterations only)

e) Find $\int_0^6 \frac{1}{1+x^2} dx \; n = 6$ using Simpson's 3/8th rule.

Q.7 Attempt any two. **10**

a) Find $\int_1^8 \frac{1}{1+x} dx \; h = 1$ by using Trapezoidal rule and Simpson's 1/3rd rule.

b) Find Fourier transform of

$f(x) = 1 \; |x| < k$

$= 0 \; |x| > k$ and

Hence evaluate i) $\int_{-\infty}^{\infty} \frac{\sin sk . \cos sk}{s} ds$ ii) $\int_{-\infty}^{\infty} \frac{sin\, ks}{s} ds$

c) Find the Fourier series expansion of the function $f(x) = e^{-\alpha x}$ in $(0, 2\pi)$

SLR-BD-20

Seat No.		Set	P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is feedback in communication?
a) The process of encoding a message.
b) The process of transmitting the message.
c) The response or reaction to a message.
d) The process of decoding a message.

2) In the process of communication 'Encoding' means _____.
a) Using symbol to express an idea
b) Deciphering the message
c) Creating noise in the communication
d) Interpreting the meaning of message

3) Empathy refers to: _____.
a) Capacity to understand or feel what another person feels
b) Having better understanding of partner's emotions
c) The higher the likelihood of self harm
d) Getting what one wants out of the relationship

4) Repots, suggestions, appeals grievances etc. are examples of: _____.
a) Down ward communication
b) Upward communication
c) Horizontal communication
d) Informal communication

5) Informal communication is commonly known as: _____.
a) Down ward communication b) Upward communication
c) Horizontal communication d) Grapevine

6) _____ is not a communication barrier?
a) Language b) Culture
c) Habits d) Physical

7) Which of the following is NOT a component of communication?
a) Sender b) Message
c) Receiver d) Translator

8) Emotional Intelligence primarily refers to the ability to: _____.
a) Understand and manage one's own emotions and the emotions of others
b) Solve mathematical problems
c) Memorize large amounts of information
d) Make logical decisions without emotions

9) Time management can help reduce stress by: _____
a) Creating unnecessary pressure
b) Organizing tasks and prioritizing effectively
c) Avoiding responsibilities altogether
d) Increasing the workload

10) The term “self-regulation” in Emotional Intelligence means: _____.
a) Hiding your emotions from others
b) Controlling impulsive behaviours and adapting to changing circumstances
c) Ignoring your emotional responses
d) Following strict rules without considering emotions

11) What is the primary purpose of a job interview?
a) To test the candidate's academic knowledge
b) To compare the candidate's qualifications with others
c) To discuss salary expectations only
d) To assess the candidate’s suitability for the job role

12) What kind of information will you collect before going to an interview?
a) About the job you are applying for
b) About the company
c) About the work culture
d) All of the above

13) Which of the following is an effective stress management technique?
a) Procrastination
b) Deep breathing and relaxation exercises
c) Avoiding physical activity
d) Excessive multitasking

14) Which of the following is an important step to prepare for an interview?
a) Memorizing answers word for word
b) Arriving late to showcase confidence
c) Avoiding practice to appear natural
d) Researching the company and role

SLR-BD-20

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Two. **12**

a) Define human communication and explain importance of communication.
b) Explain in brief:
1) Personal Barrier
2) Social Barrier
c) Enlighten in a brief strategy to improve emotional intelligence.

Q.3 Attempt any Four. **16**

a) Explain importance of emotional intelligence.
b) State advantages and disadvantages of informal communication.
c) Describe different modes of communication.
d) Highlight role of social awareness as key factor of emotional intelligence.
e) Explain relationship management as key factor of emotional intelligence.

Section – II

Q.4 Attempt any Two. **12**

a) What is interview? Explain various steps in the process of interview.
b) Explain importance of time management.
c) Explain the four P's of effective presentation.

Q.5 Attempt any Four. **16**

a) Explain importance of stress management.
b) Explain various types of interviews.
c) Describe various strategies for effective time management.
d) Explain various strategies of stress management.
e) Write short note on: Non- verbal aspects of presentation.

SLR-BD-20

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Emotional Intelligence primarily refers to the ability to: _____.
a) Understand and manage one's own emotions and the emotions of others
b) Solve mathematical problems
c) Memorize large amounts of information
d) Make logical decisions without emotions

2) Time management can help reduce stress by: _____
a) Creating unnecessary pressure
b) Organizing tasks and prioritizing effectively
c) Avoiding responsibilities altogether
d) Increasing the workload

3) The term "self-regulation" in Emotional Intelligence means: _____.
a) Hiding your emotions from others
b) Controlling impulsive behaviours and adapting to changing circumstances
c) Ignoring your emotional responses
d) Following strict rules without considering emotions

4) What is the primary purpose of a job interview?
a) To test the candidate's academic knowledge
b) To compare the candidate's qualifications with others
c) To discuss salary expectations only
d) To assess the candidate's suitability for the job role

5) What kind of information will you collect before going to an interview?
a) About the job you are applying for
b) About the company
c) About the work culture
d) All of the above

6) Which of the following is an effective stress management technique?
a) Procrastination
b) Deep breathing and relaxation exercises
c) Avoiding physical activity
d) Excessive multitasking

7) Which of the following is an important step to prepare for an interview?
a) Memorizing answers word for word
b) Arriving late to showcase confidence
c) Avoiding practice to appear natural
d) Researching the company and role

8) What is feedback in communication?
a) The process of encoding a message.
b) The process of transmitting the message.
c) The response or reaction to a message.
d) The process of decoding a message.

9) In the process of communication 'Encoding' means _____.
a) Using symbol to express an idea
b) Deciphering the message
c) Creating noise in the communication
d) Interpreting the meaning of message

10) Empathy refers to: _____.
a) Capacity to understand or feel what another person feels
b) Having better understanding of partner's emotions
c) The higher the likelihood of self harm
d) Getting what one wants out of the relationship

11) Repots, suggestions, appeals grievances etc. are examples of: _____.
a) Down ward communication
b) Upward communication
c) Horizontal communication
d) Informal communication

12) Informal communication is commonly known as: _____.
a) Down ward communication b) Upward communication
c) Horizontal communication d) Grapevine

13) _____ is not a communication barrier?
a) Language b) Culture
c) Habits d) Physical

14) Which of the following is NOT a component of communication?
a) Sender b) Message
c) Receiver d) Translator

SLR-BD-20

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Two. **12**

a) Define human communication and explain importance of communication.
b) Explain in brief:
1) Personal Barrier
2) Social Barrier
c) Enlighten in a brief strategy to improve emotional intelligence.

Q.3 Attempt any Four. **16**

a) Explain importance of emotional intelligence.
b) State advantages and disadvantages of informal communication.
c) Describe different modes of communication.
d) Highlight role of social awareness as key factor of emotional intelligence.
e) Explain relationship management as key factor of emotional intelligence.

Section – II

Q.4 Attempt any Two. **12**

a) What is interview? Explain various steps in the process of interview.
b) Explain importance of time management.
c) Explain the four P's of effective presentation.

Q.5 Attempt any Four. **16**

a) Explain importance of stress management.
b) Explain various types of interviews.
c) Describe various strategies for effective time management.
d) Explain various strategies of stress management.
e) Write short note on: Non- verbal aspects of presentation.

SLR-BD-20

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the primary purpose of a job interview?
a) To test the candidate's academic knowledge
b) To compare the candidate's qualifications with others
c) To discuss salary expectations only
d) To assess the candidate's suitability for the job role

2) What kind of information will you collect before going to an interview?
a) About the job you are applying for
b) About the company
c) About the work culture
d) All of the above

3) Which of the following is an effective stress management technique?
a) Procrastination
b) Deep breathing and relaxation exercises
c) Avoiding physical activity
d) Excessive multitasking

4) Which of the following is an important step to prepare for an interview?
a) Memorizing answers word for word
b) Arriving late to showcase confidence
c) Avoiding practice to appear natural
d) Researching the company and role

5) What is feedback in communication?
a) The process of encoding a message.
b) The process of transmitting the message.
c) The response or reaction to a message.
d) The process of decoding a message.

6) In the process of communication 'Encoding' means _____.
a) Using symbol to express an idea
b) Deciphering the message
c) Creating noise in the communication
d) Interpreting the meaning of message

7) Empathy refers to: _____.
a) Capacity to understand or feel what another person feels
b) Having better understanding of partner's emotions
c) The higher the likelihood of self harm
d) Getting what one wants out of the relationship

8) Repots, suggestions, appeals grievances etc. are examples of: _____.
a) Down ward communication
b) Upward communication
c) Horizontal communication
d) Informal communication

9) Informal communication is commonly known as: _____.
a) Down ward communication b) Upward communication
c) Horizontal communication d) Grapevine

10) _____ is not a communication barrier?
a) Language b) Culture
c) Habits d) Physical

11) Which of the following is NOT a component of communication?
a) Sender b) Message
c) Receiver d) Translator

12) Emotional Intelligence primarily refers to the ability to: _____.
a) Understand and manage one's own emotions and the emotions of others
b) Solve mathematical problems
c) Memorize large amounts of information
d) Make logical decisions without emotions

13) Time management can help reduce stress by: _____
a) Creating unnecessary pressure
b) Organizing tasks and prioritizing effectively
c) Avoiding responsibilities altogether
d) Increasing the workload

14) The term "self-regulation" in Emotional Intelligence means: _____.
a) Hiding your emotions from others
b) Controlling impulsive behaviours and adapting to changing circumstances
c) Ignoring your emotional responses
d) Following strict rules without considering emotions

SLR-BD-20

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Two. **12**

a) Define human communication and explain importance of communication.
b) Explain in brief:
1) Personal Barrier
2) Social Barrier
c) Enlighten in a brief strategy to improve emotional intelligence.

Q.3 Attempt any Four. **16**

a) Explain importance of emotional intelligence.
b) State advantages and disadvantages of informal communication.
c) Describe different modes of communication.
d) Highlight role of social awareness as key factor of emotional intelligence.
e) Explain relationship management as key factor of emotional intelligence.

Section – II

Q.4 Attempt any Two. **12**

a) What is interview? Explain various steps in the process of interview.
b) Explain importance of time management.
c) Explain the four P's of effective presentation.

Q.5 Attempt any Four. **16**

a) Explain importance of stress management.
b) Explain various types of interviews.
c) Describe various strategies for effective time management.
d) Explain various strategies of stress management.
e) Write short note on: Non- verbal aspects of presentation.

SLR-BD-20

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ is not a communication barrier?
a) Language b) Culture
c) Habits d) Physical

2) Which of the following is NOT a component of communication?
a) Sender b) Message
c) Receiver d) Translator

3) Emotional Intelligence primarily refers to the ability to: _____.
a) Understand and manage one's own emotions and the emotions of others
b) Solve mathematical problems
c) Memorize large amounts of information
d) Make logical decisions without emotions

4) Time management can help reduce stress by: _____
a) Creating unnecessary pressure
b) Organizing tasks and prioritizing effectively
c) Avoiding responsibilities altogether
d) Increasing the workload

5) The term "self-regulation" in Emotional Intelligence means: _____.
a) Hiding your emotions from others
b) Controlling impulsive behaviours and adapting to changing circumstances
c) Ignoring your emotional responses
d) Following strict rules without considering emotions

6) What is the primary purpose of a job interview?
a) To test the candidate's academic knowledge
b) To compare the candidate's qualifications with others
c) To discuss salary expectations only
d) To assess the candidate's suitability for the job role

7) What kind of information will you collect before going to an interview?
a) About the job you are applying for
b) About the company
c) About the work culture
d) All of the above

8) Which of the following is an effective stress management technique?
a) Procrastination
b) Deep breathing and relaxation exercises
c) Avoiding physical activity
d) Excessive multitasking

9) Which of the following is an important step to prepare for an interview?
a) Memorizing answers word for word
b) Arriving late to showcase confidence
c) Avoiding practice to appear natural
d) Researching the company and role

10) What is feedback in communication?
a) The process of encoding a message.
b) The process of transmitting the message.
c) The response or reaction to a message.
d) The process of decoding a message.

11) In the process of communication 'Encoding' means _____.
a) Using symbol to express an idea
b) Deciphering the message
c) Creating noise in the communication
d) Interpreting the meaning of message

12) Empathy refers to: _____.
a) Capacity to understand or feel what another person feels
b) Having better understanding of partner's emotions
c) The higher the likelihood of self harm
d) Getting what one wants out of the relationship

13) Repots, suggestions, appeals grievances etc. are examples of: _____.
a) Down ward communication
b) Upward communication
c) Horizontal communication
d) Informal communication

14) Informal communication is commonly known as: _____.
a) Down ward communication b) Upward communication
c) Horizontal communication d) Grapevine

SLR-BD-20

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Two. **12**

a) Define human communication and explain importance of communication.
b) Explain in brief:
1) Personal Barrier
2) Social Barrier
c) Enlighten in a brief strategy to improve emotional intelligence.

Q.3 Attempt any Four. **16**

a) Explain importance of emotional intelligence.
b) State advantages and disadvantages of informal communication.
c) Describe different modes of communication.
d) Highlight role of social awareness as key factor of emotional intelligence.
e) Explain relationship management as key factor of emotional intelligence.

Section – II

Q.4 Attempt any Two. **12**

a) What is interview? Explain various steps in the process of interview.
b) Explain importance of time management.
c) Explain the four P's of effective presentation.

Q.5 Attempt any Four. **16**

a) Explain importance of stress management.
b) Explain various types of interviews.
c) Describe various strategies for effective time management.
d) Explain various strategies of stress management.
e) Write short note on: Non- verbal aspects of presentation.

SLR-BD-21

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is not a primary classification of engineering materials?
a) Metals b) Ceramics
c) Gases d) Polymers

2) Which property is most associated with metals?
a) High electrical conductivity b) High brittleness
c) Low melting point d) Low density

3) The Gibbs phase rule is given by:
a) $P + F = C - 1$ b) $P + F = C + 1$
c) $F = C - P + 2$ d) $F = C + P - 2$

4) Non-ferrous metals are primarily used for their:
a) High strength
b) High corrosion resistance and low density
c) Magnetic properties
d) Low melting point

5) In the eutectic transformation, liquid transforms into:
a) One solid phase b) Two solid phases
c) One liquid and one solid phase d) Three solid phases

6) Which of the following is a characteristic of brass alloy?
a) Primarily composed of copper and tin
b) Primarily composed of copper and zinc
c) Primarily composed, of copper and aluminum
d) Primarily composed of copper ana nickel

7) Bronze alloys are primarily composed of copper and:
a) Zinc b) Aluminum
c) Nickel d) Tin

8) Which of the following is an example of a thermoplastic polymer?
a) Bakelite b) Epoxy resin
c) Polystyrene d) Rubber

9) The ability of a polymer to return to its original shape after deformation is known as:
a) Ductility b) Elasticity
c) Malleability d) Toughness

10) Which of the following properties is enhanced by vulcanization of rubber?
a) High flexibility
b) Increased strength and resistance to wear
c) Decreased thermal stability
d) Decreased electrical resistance

11) Which of the following is NOT a characteristic of ceramic materials?
a) High melting points b) High electrical conductivity
c) Brittle nature d) Good wear resistance

12) Advanced ceramics are typically characterized by:
a) High ductility
b) Low strength
c) High thermal and electrical conductivity
d) High performance at high temperatures

13) Composite materials are widely used in the aerospace industry because they:
a) Are cost-effective and easily available
b) Provide high strength-to-weight ratio
c) Have low thermal resistance
d) Are magnetic in nature

14) Nanomaterials are commonly used in which of the following fields?
a) Drug delivery systems
b) Large-scale structural applications
c) Agricultural machinery
d) Waste disposal

SLR-BD-21

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two full questions from each section.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

SECTION – I

Q.2	**a)**	What are engineering materials, and how are they classified?	**07**
	b)	What is a phase diagram? Explain the different types of phase diagrams.	**07**
Q.3	**a)**	Discuss the phases present in the Fe-Fe_3C diagram at different compositions of carbon.	**07**
	b)	Discuss the composition and properties of plain carbon steels.	**07**
Q.4	**a)**	Discuss the composition and properties of brass and bronze.	**07**
	b)	Explain the properties and applications of Al-Cu alloys.	**07**

SECTION – II

Q.5	**a)**	Discuss the differences between thermoplastic and thermosetting polymers.	**07**
	b)	Explain how vulcanization is used to modify the physical properties of natural rubber.	**07**
Q.6	**a)**	What are ceramics, and what makes them different from metals and polymers?	**07**
	b)	Discuss the role of ceramics in the aerospace industry.	**07**
Q.7	**a)**	Explain the classification of composite materials.	**07**
	b)	Explain the role of nanomaterials in electronics and semiconductors.	**07**

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is an example of a thermoplastic polymer?
a) Bakelite b) Epoxy resin
c) Polystyrene d) Rubber

2) The ability of a polymer to return to its original shape after deformation is known as:
a) Ductility b) Elasticity
c) Malleability d) Toughness

3) Which of the following properties is enhanced by vulcanization of rubber?
a) High flexibility
b) Increased strength and resistance to wear
c) Decreased thermal stability
d) Decreased electrical resistance

4) Which of the following is NOT a characteristic of ceramic materials?
a) High melting points b) High electrical conductivity
c) Brittle nature d) Good wear resistance

5) Advanced ceramics are typically characterized by:
a) High ductility
b) Low strength
c) High thermal and electrical conductivity
d) High performance at high temperatures

6) Composite materials are widely used in the aerospace industry because they:
a) Are cost-effective and easily available
b) Provide high strength-to-weight ratio
c) Have low thermal resistance
d) Are magnetic in nature

7) Nanomaterials are commonly used in which of the following fields?
a) Drug delivery systems
b) Large-scale structural applications
c) Agricultural machinery
d) Waste disposal

8) Which of the following is not a primary classification of engineering materials?
a) Metals
b) Ceramics
c) Gases
d) Polymers

9) Which property is most associated with metals?
a) High electrical conductivity
b) High brittleness
c) Low melting point
d) Low density

10) The Gibbs phase rule is given by:
a) $\mathrm{P} + \mathrm{F} = \mathrm{C} - 1$
b) $\mathrm{P} + \mathrm{F} = \mathrm{C} + 1$
c) $\mathrm{F} = \mathrm{C} - \mathrm{P} + 2$
d) $\mathrm{F} = \mathrm{C} + \mathrm{P} - 2$

11) Non-ferrous metals are primarily used for their:
a) High strength
b) High corrosion resistance and low density
c) Magnetic properties
d) Low melting point

12) In the eutectic transformation, liquid transforms into:
a) One solid phase
b) Two solid phases
c) One liquid and one solid phase
d) Three solid phases

13) Which of the following is a characteristic of brass alloy?
a) Primarily composed of copper and tin
b) Primarily composed of copper and zinc
c) Primarily composed, of copper and aluminum
d) Primarily composed of copper ana nickel

14) Bronze alloys are primarily composed of copper and:
a) Zinc
b) Aluminum
c) Nickel
d) Tin

SLR-BD-21

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two full questions from each section.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

SECTION – I

Q.2	**a)**	What are engineering materials, and how are they classified?	**07**
	b)	What is a phase diagram? Explain the different types of phase diagrams.	**07**
Q.3	**a)**	Discuss the phases present in the Fe-Fe_3C diagram at different compositions of carbon.	**07**
	b)	Discuss the composition and properties of plain carbon steels.	**07**
Q.4	**a)**	Discuss the composition and properties of brass and bronze.	**07**
	b)	Explain the properties and applications of Al-Cu alloys.	**07**

SECTION – II

Q.5	**a)**	Discuss the differences between thermoplastic and thermosetting polymers.	**07**
	b)	Explain how vulcanization is used to modify the physical properties of natural rubber.	**07**
Q.6	**a)**	What are ceramics, and what makes them different from metals and polymers?	**07**
	b)	Discuss the role of ceramics in the aerospace industry.	**07**
Q.7	**a)**	Explain the classification of composite materials.	**07**
	b)	Explain the role of nanomaterials in electronics and semiconductors.	**07**

SLR-BD-21

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is NOT a characteristic of ceramic materials?
a) High melting points b) High electrical conductivity
c) Brittle nature d) Good wear resistance

2) Advanced ceramics are typically characterized by:
a) High ductility
b) Low strength
c) High thermal and electrical conductivity
d) High performance at high temperatures

3) Composite materials are widely used in the aerospace industry because they:
a) Are cost-effective and easily available
b) Provide high strength-to-weight ratio
c) Have low thermal resistance
d) Are magnetic in nature

4) Nanomaterials are commonly used in which of the following fields?
a) Drug delivery systems
b) Large-scale structural applications
c) Agricultural machinery
d) Waste disposal

5) Which of the following is not a primary classification of engineering materials?
a) Metals b) Ceramics
c) Gases d) Polymers

6) Which property is most associated with metals?
a) High electrical conductivity b) High brittleness
c) Low melting point d) Low density

7) The Gibbs phase rule is given by:
a) $P + F = C - 1$ b) $P + F = C + 1$
c) $F = C - P + 2$ d) $F = C + P - 2$

8) Non-ferrous metals are primarily used for their:
a) High strength
b) High corrosion resistance and low density
c) Magnetic properties
d) Low melting point

9) In the eutectic transformation, liquid transforms into:
a) One solid phase b) Two solid phases
c) One liquid and one solid phase d) Three solid phases

10) Which of the following is a characteristic of brass alloy?
a) Primarily composed of copper and tin
b) Primarily composed of copper and zinc
c) Primarily composed, of copper and aluminum
d) Primarily composed of copper ana nickel

11) Bronze alloys are primarily composed of copper and:
a) Zinc b) Aluminum
c) Nickel d) Tin

12) Which of the following is an example of a thermoplastic polymer?
a) Bakelite b) Epoxy resin
c) Polystyrene d) Rubber

13) The ability of a polymer to return to its original shape after deformation is known as:
a) Ductility b) Elasticity
c) Malleability d) Toughness

14) Which of the following properties is enhanced by vulcanization of rubber?
a) High flexibility
b) Increased strength and resistance to wear
c) Decreased thermal stability
d) Decreased electrical resistance

SLR-BD-21

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two full questions from each section.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

SECTION – I

Q.2	**a)**	What are engineering materials, and how are they classified?	**07**
	b)	What is a phase diagram? Explain the different types of phase diagrams.	**07**
Q.3	**a)**	Discuss the phases present in the Fe-Fe_3C diagram at different compositions of carbon.	**07**
	b)	Discuss the composition and properties of plain carbon steels.	**07**
Q.4	**a)**	Discuss the composition and properties of brass and bronze.	**07**
	b)	Explain the properties and applications of Al-Cu alloys.	**07**

SECTION – II

Q.5	**a)**	Discuss the differences between thermoplastic and thermosetting polymers.	**07**
	b)	Explain how vulcanization is used to modify the physical properties of natural rubber.	**07**
Q.6	**a)**	What are ceramics, and what makes them different from metals and polymers?	**07**
	b)	Discuss the role of ceramics in the aerospace industry.	**07**
Q.7	**a)**	Explain the classification of composite materials.	**07**
	b)	Explain the role of nanomaterials in electronics and semiconductors.	**07**

SLR-BD-21

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is a characteristic of brass alloy?
a) Primarily composed of copper and tin
b) Primarily composed of copper and zinc
c) Primarily composed, of copper and aluminum
d) Primarily composed of copper ana nickel

2) Bronze alloys are primarily composed of copper and:
a) Zinc b) Aluminum
c) Nickel d) Tin

3) Which of the following is an example of a thermoplastic polymer?
a) Bakelite b) Epoxy resin
c) Polystyrene d) Rubber

4) The ability of a polymer to return to its original shape after deformation is known as:
a) Ductility b) Elasticity
c) Malleability d) Toughness

5) Which of the following properties is enhanced by vulcanization of rubber?
a) High flexibility
b) Increased strength and resistance to wear
c) Decreased thermal stability
d) Decreased electrical resistance

6) Which of the following is NOT a characteristic of ceramic materials?
a) High melting points b) High electrical conductivity
c) Brittle nature d) Good wear resistance

7) Advanced ceramics are typically characterized by:
a) High ductility
b) Low strength
c) High thermal and electrical conductivity
d) High performance at high temperatures

8) Composite materials are widely used in the aerospace industry because they:
a) Are cost-effective and easily available
b) Provide high strength-to-weight ratio
c) Have low thermal resistance
d) Are magnetic in nature

9) Nanomaterials are commonly used in which of the following fields?
a) Drug delivery systems
b) Large-scale structural applications
c) Agricultural machinery
d) Waste disposal

10) Which of the following is not a primary classification of engineering materials?
a) Metals
b) Ceramics
c) Gases
d) Polymers

11) Which property is most associated with metals?
a) High electrical conductivity
b) High brittleness
c) Low melting point
d) Low density

12) The Gibbs phase rule is given by:
a) $\mathrm{P} + \mathrm{F} = \mathrm{C} - 1$
b) $\mathrm{P} + \mathrm{F} = \mathrm{C} + 1$
c) $\mathrm{F} = \mathrm{C} - \mathrm{P} + 2$
d) $\mathrm{F} = \mathrm{C} + \mathrm{P} - 2$

13) Non-ferrous metals are primarily used for their:
a) High strength
b) High corrosion resistance and low density
c) Magnetic properties
d) Low melting point

14) In the eutectic transformation, liquid transforms into:
a) One solid phase
b) Two solid phases
c) One liquid and one solid phase
d) Three solid phases

SLR-BD-21

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two full questions from each section.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

SECTION – I

Q.2	**a)**	What are engineering materials, and how are they classified?	**07**
	b)	What is a phase diagram? Explain the different types of phase diagrams.	**07**
Q.3	**a)**	Discuss the phases present in the Fe-Fe_3C diagram at different compositions of carbon.	**07**
	b)	Discuss the composition and properties of plain carbon steels.	**07**
Q.4	**a)**	Discuss the composition and properties of brass and bronze.	**07**
	b)	Explain the properties and applications of Al-Cu alloys.	**07**

SECTION – II

Q.5	**a)**	Discuss the differences between thermoplastic and thermosetting polymers.	**07**
	b)	Explain how vulcanization is used to modify the physical properties of natural rubber.	**07**
Q.6	**a)**	What are ceramics, and what makes them different from metals and polymers?	**07**
	b)	Discuss the role of ceramics in the aerospace industry.	**07**
Q.7	**a)**	Explain the classification of composite materials.	**07**
	b)	Explain the role of nanomaterials in electronics and semiconductors.	**07**

SLR-BD-22

Seat No.		Set	P

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the primary purpose of management?
a) To maximize profits
b) To achieve organizational goals efficiently
c) To manage resources effectively
d) To implement policies

2) Which approach emphasizes the interdependence of various organizational functions?
a) Classical Approach b) Systems Approach
c) Behavioral Approach d) Contingency Approach

3) What is NOT a function of managers?
a) Planning b) Organizing
c) Playing d) Controlling

4) Which of the following is a responsibility of managers regarding social responsibility?
a) Maximizing shareholder wealth
b) Ensuring employee satisfaction
c) Contributing to community welfare
d) Minimizing costs

5) What is the first step in the planning process?
a) Developing alternatives b) Setting objectives
c) Implementing plans d) Evaluating results

6) Which type of plan is designed to cover a short period?
a) Strategic Plan b) Tactical Plan
c) Operational Plan d) Contingency Plan

7) Which of the following is a part of the staffing function?
a) Budgeting b) Training
c) Planning d) Controlling

8) Which theory focuses on the hierarchy of needs to motivate employees?
a) Herzberg's Two-Factor Theory
b) McGregor's Theory X and Y
c) Maslow's Hierarchy of Needs
d) Adams' Equity Theory

9) What is the main purpose of controlling in management?
a) To set goals
b) To ensure that organizational activities are aligned with plans
c) To improve employee morale
d) To increase production

10) What type of costs includes costs associated with preventing defects?
a) Internal failure costs b) External failure costs
c) Appraisal costs d) Prevention costs

11) Which quality guru is known for his work in the field of quality improvement through statistical methods?
a) Philip Crosby b) W. Edwards Deming
c) Joseph Juran d) Kaoru Ishikawa

12) Which chart is used to monitor the mean of a process over time?
a) R-chart b) P-chart
c) C-chart d) X-bar chart

13) Acceptance sampling is primarily concerned with:
a) Evaluating the entire production process
b) Inspecting all items produced
c) Testing a sample to infer about the quality of the entire lot
d) Conducting customer satisfaction surveys

14) What is the primary goal of employee involvement in TQM?
a) To increase profits
b) To enhance product quality through teamwork and engagement
c) To reduce the number of employees
d) To focus solely on production output

SLR-BD-22

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section – I, Q. No. 3 is compulsory and attempt any two questions from the remaining questions.
1) In Section – II, Q. No. 6 is compulsory and attempt any two questions from the remaining questions.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.
4) Draw neat-labelled diagrams wherever necessary.
5) Use of log table and calculators is allowed.

Section – I

Q.2	**a)**	What are managerial skills and managerial roles?	**05**
	b)	Explain the Social responsibilities and ethics in management.	**04**
Q.3	**a)**	What is planning? Explain advantages and disadvantages of planning?	**05**
	b)	What are the types of organizations? Explain Problems with organizational level.	**05**
Q.4	**a)**	Define Leadership. Explain four extreme styles.	**05**
	b)	Discuss types of communication by taking suitable example.	**04**
Q.5	**Write short note on any three.**		**09**
	a)	Channel of distribution	
	b)	Functions of Managers	
	c)	Methods of Departmentation	
	d)	Explain Maslow's theory	
	e)	Decision making	

Section – II

Q.6	**a)**	Define productivity. How does material management impact the productivity of a manufacturing unit?	**05**
	b)	Explain how the production process is planned and controlled in batch production systems.	**05**

Q.7	**a)**	Describe the importance of supplier partnerships in Total Quality Management. What are the key aspects that define a successful supplier partnership?	**05**
	b)	Explain the concept of employee involvement in TQM. How does fostering employee participation contribute to improved quality and productivity?	**04**
Q.8	**a)**	Explain the importance of Training and Development in enhancing employee performance. How can training programs be aligned with organizational goals?	**05**
	b)	What are the objectives of Human Resource Management (HRM)? Discuss how HRM helps in managing employee relations and improving organizational efficiency.	**04**

Q.9 Write short note on any three. **09**

- **a)** Material Requirement Planning (MRP)
- **b)** Batch Production
- **c)** Factors to improve productivity
- **d)** Functions of Production Planning and Control (PPC)
- **e)** Mass Production - Advantages and Disadvantages

SLR-BD-22

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Which theory focuses on the hierarchy of needs to motivate employees?
a) Herzberg's Two-Factor Theory
b) McGregor's Theory X and Y
c) Maslow's Hierarchy of Needs
d) Adams' Equity Theory

2) What is the main purpose of controlling in management?
a) To set goals
b) To ensure that organizational activities are aligned with plans
c) To improve employee morale
d) To increase production

3) What type of costs includes costs associated with preventing defects?
a) Internal failure costs b) External failure costs
c) Appraisal costs d) Prevention costs

4) Which quality guru is known for his work in the field of quality improvement through statistical methods?
a) Philip Crosby b) W. Edwards Deming
c) Joseph Juran d) Kaoru Ishikawa

5) Which chart is used to monitor the mean of a process over time?
a) R-chart b) P-chart
c) C-chart d) X-bar chart

6) Acceptance sampling is primarily concerned with:
a) Evaluating the entire production process
b) Inspecting all items produced
c) Testing a sample to infer about the quality of the entire lot
d) Conducting customer satisfaction surveys

7) What is the primary goal of employee involvement in TQM?
a) To increase profits
b) To enhance product quality through teamwork and engagement
c) To reduce the number of employees
d) To focus solely on production output

8) What is the primary purpose of management?
a) To maximize profits
b) To achieve organizational goals efficiently
c) To manage resources effectively
d) To implement policies

9) Which approach emphasizes the interdependence of various organizational functions?
a) Classical Approach b) Systems Approach
c) Behavioral Approach d) Contingency Approach

10) What is NOT a function of managers?
a) Planning b) Organizing
c) Playing d) Controlling

11) Which of the following is a responsibility of managers regarding social responsibility?
a) Maximizing shareholder wealth
b) Ensuring employee satisfaction
c) Contributing to community welfare
d) Minimizing costs

12) What is the first step in the planning process?
a) Developing alternatives b) Setting objectives
c) Implementing plans d) Evaluating results

13) Which type of plan is designed to cover a short period?
a) Strategic Plan b) Tactical Plan
c) Operational Plan d) Contingency Plan

14) Which of the following is a part of the staffing function?
a) Budgeting b) Training
c) Planning d) Controlling

SLR-BD-22

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section – I, Q. No. 3 is compulsory and attempt any two questions from the remaining questions.
1) In Section – II, Q. No. 6 is compulsory and attempt any two questions from the remaining questions.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.
4) Draw neat-labelled diagrams wherever necessary.
5) Use of log table and calculators is allowed.

Section – I

Q.2	**a)**	What are managerial skills and managerial roles?	**05**
	b)	Explain the Social responsibilities and ethics in management.	**04**
Q.3	**a)**	What is planning? Explain advantages and disadvantages of planning?	**05**
	b)	What are the types of organizations? Explain Problems with organizational level.	**05**
Q.4	**a)**	Define Leadership. Explain four extreme styles.	**05**
	b)	Discuss types of communication by taking suitable example.	**04**
Q.5	**Write short note on any three.**		**09**
	a)	Channel of distribution	
	b)	Functions of Managers	
	c)	Methods of Departmentation	
	d)	Explain Maslow's theory	
	e)	Decision making	

Section – II

Q.6	**a)**	Define productivity. How does material management impact the productivity of a manufacturing unit?	**05**
	b)	Explain how the production process is planned and controlled in batch production systems.	**05**

Q.7	**a)**	Describe the importance of supplier partnerships in Total Quality Management. What are the key aspects that define a successful supplier partnership?	**05**
	b)	Explain the concept of employee involvement in TQM. How does fostering employee participation contribute to improved quality and productivity?	**04**
Q.8	**a)**	Explain the importance of Training and Development in enhancing employee performance. How can training programs be aligned with organizational goals?	**05**
	b)	What are the objectives of Human Resource Management (HRM)? Discuss how HRM helps in managing employee relations and improving organizational efficiency.	**04**

Q.9 Write short note on any three. **09**

- **a)** Material Requirement Planning (MRP)
- **b)** Batch Production
- **c)** Factors to improve productivity
- **d)** Functions of Production Planning and Control (PPC)
- **e)** Mass Production - Advantages and Disadvantages

SLR-BD-22

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which quality guru is known for his work in the field of quality improvement through statistical methods?
a) Philip Crosby b) W. Edwards Deming
c) Joseph Juran d) Kaoru Ishikawa

2) Which chart is used to monitor the mean of a process over time?
a) R-chart b) P-chart
c) C-chart d) X-bar chart

3) Acceptance sampling is primarily concerned with:
a) Evaluating the entire production process
b) Inspecting all items produced
c) Testing a sample to infer about the quality of the entire lot
d) Conducting customer satisfaction surveys

4) What is the primary goal of employee involvement in TQM?
a) To increase profits
b) To enhance product quality through teamwork and engagement
c) To reduce the number of employees
d) To focus solely on production output

5) What is the primary purpose of management?
a) To maximize profits
b) To achieve organizational goals efficiently
c) To manage resources effectively
d) To implement policies

6) Which approach emphasizes the interdependence of various organizational functions?

a) Classical Approach b) Systems Approach
c) Behavioral Approach d) Contingency Approach

7) What is NOT a function of managers?

a) Planning b) Organizing
c) Playing d) Controlling

8) Which of the following is a responsibility of managers regarding social responsibility?

a) Maximizing shareholder wealth
b) Ensuring employee satisfaction
c) Contributing to community welfare
d) Minimizing costs

9) What is the first step in the planning process?

a) Developing alternatives b) Setting objectives
c) Implementing plans d) Evaluating results

10) Which type of plan is designed to cover a short period?

a) Strategic Plan b) Tactical Plan
c) Operational Plan d) Contingency Plan

11) Which of the following is a part of the staffing function?

a) Budgeting b) Training
c) Planning d) Controlling

12) Which theory focuses on the hierarchy of needs to motivate employees?

a) Herzberg's Two-Factor Theory
b) McGregor's Theory X and Y
c) Maslow's Hierarchy of Needs
d) Adams' Equity Theory

13) What is the main purpose of controlling in management?

a) To set goals
b) To ensure that organizational activities are aligned with plans
c) To improve employee morale
d) To increase production

14) What type of costs includes costs associated with preventing defects?

a) Internal failure costs b) External failure costs
c) Appraisal costs d) Prevention costs

SLR-BD-22

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section – I, Q. No. 3 is compulsory and attempt any two questions from the remaining questions.
1) In Section – II, Q. No. 6 is compulsory and attempt any two questions from the remaining questions.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.
4) Draw neat-labelled diagrams wherever necessary.
5) Use of log table and calculators is allowed.

Section – I

Q.2	**a)**	What are managerial skills and managerial roles?	**05**
	b)	Explain the Social responsibilities and ethics in management.	**04**
Q.3	**a)**	What is planning? Explain advantages and disadvantages of planning?	**05**
	b)	What are the types of organizations? Explain Problems with organizational level.	**05**
Q.4	**a)**	Define Leadership. Explain four extreme styles.	**05**
	b)	Discuss types of communication by taking suitable example.	**04**

Q.5 Write short note on any three. **09**
a) Channel of distribution
b) Functions of Managers
c) Methods of Departmentation
d) Explain Maslow's theory
e) Decision making

Section – II

Q.6	**a)**	Define productivity. How does material management impact the productivity of a manufacturing unit?	**05**
	b)	Explain how the production process is planned and controlled in batch production systems.	**05**

Q.7	**a)**	Describe the importance of supplier partnerships in Total Quality Management. What are the key aspects that define a successful supplier partnership?	**05**
	b)	Explain the concept of employee involvement in TQM. How does fostering employee participation contribute to improved quality and productivity?	**04**
Q.8	**a)**	Explain the importance of Training and Development in enhancing employee performance. How can training programs be aligned with organizational goals?	**05**
	b)	What are the objectives of Human Resource Management (HRM)? Discuss how HRM helps in managing employee relations and improving organizational efficiency.	**04**

Q.9 Write short note on any three. **09**

- **a)** Material Requirement Planning (MRP)
- **b)** Batch Production
- **c)** Factors to improve productivity
- **d)** Functions of Production Planning and Control (PPC)
- **e)** Mass Production - Advantages and Disadvantages

SLR-BD-22

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which type of plan is designed to cover a short period?
a) Strategic Plan b) Tactical Plan
c) Operational Plan d) Contingency Plan

2) Which of the following is a part of the staffing function?
a) Budgeting b) Training
c) Planning d) Controlling

3) Which theory focuses on the hierarchy of needs to motivate employees?
a) Herzberg's Two-Factor Theory
b) McGregor's Theory X and Y
c) Maslow's Hierarchy of Needs
d) Adams' Equity Theory

4) What is the main purpose of controlling in management?
a) To set goals
b) To ensure that organizational activities are aligned with plans
c) To improve employee morale
d) To increase production

5) What type of costs includes costs associated with preventing defects?
a) Internal failure costs b) External failure costs
c) Appraisal costs d) Prevention costs

6) Which quality guru is known for his work in the field of quality improvement through statistical methods?
a) Philip Crosby b) W. Edwards Deming
c) Joseph Juran d) Kaoru Ishikawa

7) Which chart is used to monitor the mean of a process over time?
a) R-chart b) P-chart
c) C-chart d) X-bar chart

8) Acceptance sampling is primarily concerned with:
a) Evaluating the entire production process
b) Inspecting all items produced
c) Testing a sample to infer about the quality of the entire lot
d) Conducting customer satisfaction surveys

9) What is the primary goal of employee involvement in TQM?
a) To increase profits
b) To enhance product quality through teamwork and engagement
c) To reduce the number of employees
d) To focus solely on production output

10) What is the primary purpose of management?
a) To maximize profits
b) To achieve organizational goals efficiently
c) To manage resources effectively
d) To implement policies

11) Which approach emphasizes the interdependence of various organizational functions?
a) Classical Approach b) Systems Approach
c) Behavioral Approach d) Contingency Approach

12) What is NOT a function of managers?
a) Planning b) Organizing
c) Playing d) Controlling

13) Which of the following is a responsibility of managers regarding social responsibility?
a) Maximizing shareholder wealth
b) Ensuring employee satisfaction
c) Contributing to community welfare
d) Minimizing costs

14) What is the first step in the planning process?
a) Developing alternatives b) Setting objectives
c) Implementing plans d) Evaluating results

SLR-BD-22

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section – I, Q. No. 3 is compulsory and attempt any two questions from the remaining questions.
1) In Section – II, Q. No. 6 is compulsory and attempt any two questions from the remaining questions.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.
4) Draw neat-labelled diagrams wherever necessary.
5) Use of log table and calculators is allowed.

Section – I

Q.2	**a)**	What are managerial skills and managerial roles?	**05**
	b)	Explain the Social responsibilities and ethics in management.	**04**
Q.3	**a)**	What is planning? Explain advantages and disadvantages of planning?	**05**
	b)	What are the types of organizations? Explain Problems with organizational level.	**05**
Q.4	**a)**	Define Leadership. Explain four extreme styles.	**05**
	b)	Discuss types of communication by taking suitable example.	**04**

Q.5 Write short note on any three. **09**
a) Channel of distribution
b) Functions of Managers
c) Methods of Departmentation
d) Explain Maslow's theory
e) Decision making

Section – II

Q.6	**a)**	Define productivity. How does material management impact the productivity of a manufacturing unit?	**05**
	b)	Explain how the production process is planned and controlled in batch production systems.	**05**

Q.7	**a)**	Describe the importance of supplier partnerships in Total Quality Management. What are the key aspects that define a successful supplier partnership?	**05**
	b)	Explain the concept of employee involvement in TQM. How does fostering employee participation contribute to improved quality and productivity?	**04**
Q.8	**a)**	Explain the importance of Training and Development in enhancing employee performance. How can training programs be aligned with organizational goals?	**05**
	b)	What are the objectives of Human Resource Management (HRM)? Discuss how HRM helps in managing employee relations and improving organizational efficiency.	**04**

Q.9 Write short note on any three. **09**

- **a)** Material Requirement Planning (MRP)
- **b)** Batch Production
- **c)** Factors to improve productivity
- **d)** Functions of Production Planning and Control (PPC)
- **e)** Mass Production - Advantages and Disadvantages

SLR-BD-23

Seat No.	

Set P

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRONICS AND TELECOMMUNICATION ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The terms in SOP are called _____.
a) max terms b) min terms
c) mid terms d) sum terms

2) The number of cells in a K-map with n- variables.
a) 2n b) n^2
c) 2^n d) n

3) The logical sum of two or more logical product terms is called _____.
a) SOP b) POS
c) OR operation d) NAND operation

4) A Karnaugh map (K-map) is an abstract form of _____ diagram organized as a matrix of squares.
a) Venn Diagram b) Cycle Diagram
c) Block diagram d) Triangular Diagram

5) If A and B are the inputs of a half adder, the sum is given by _____.
a) A AND B b) A OR B
c) A XOR B d) A EX-NOR B

6) Let A and B is the input of a Subtractor, then the output will be _____.
a) A XOR B b) A AND B
c) A OR B d) A EX-NOR B

7) What is a multiplexer?

a) It is a type of decoder which decodes several inputs and gives one output
b) A multiplexer is a device which converts many signals into one
c) It takes one input and results into many output
d) It is a type of encoder which decodes several inputs and gives one output

8) A basic S-R flip-flop can be constructed by cross-coupling of which basic logic gates?

a) AND or OR gates
b) XOR or XNOR gates
c) NOR or NAND gates
d) AND or NOR gates

9) In S-R flip-flop, if Q = 0 the output is said to be _____.

a) Set
b) Reset
c) Previous state
d) Current state

10) A D-Flip flop is said to be transparent, when _____.

a) the output is Low
b) the output is High
c) the output follows clock
d) the output follows input

11) How many stable state/states present in flip-flop?

a) 1
b) 0
c) 2
d) 4

12) How many natural states will there be in a 4-bit ripple counter?

a) 4
b) 8
c) 16
d) 32

13) How many flip-flops are required to construct a decade counter?

a) 4
b) 8
c) 5
d) 10

14) A 4-bit counter has a maximum modulus of _____.

a) 3
b) 6
c) 8
d) 16

SLR-BD-23

Seat No.	

Set P

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRONICS AND TELECOMMUNICATION ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) Explain Standard representation of logic function.
b) Express Boolean function $F = xy + x'z$ as a product of Max-terms.
c) Explain Half Adder with logic diagram.
d) Explain 1:4 De-Multiplexer with truth Table and logic diagram.
e) Explain stepwise procedure for K-map solution.

Q.3 Attempt any two. **12**

a) Explain Binary to Gray conversion in details.
b) Explain Full Adder with suitable diagram
c) Solve using K Map -

$$F\ (A, B, C, D)\ = \sum (0, 2, 5, 7, 8, 10, 13, 15)$$

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic SR Flip-flop using logic gates.
b) Explain D-Flip-Flop with suitable diagram.
c) Differentiate between Synchronous and Asynchronous sequential circuit.
d) Explain PISO shift register.
e) Explain Race-Round condition. How this condition will overcome?

Q.5 Attempt any two. **12**

a) Design MOD-10 Counter.
b) Explain JK Flip flop with suitable diagram, and truth table.
c) Explain 4-bit UP/DOWN counter with suitable diagram.

SLR-BD-23

Seat No.	

Set Q

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRONICS AND TELECOMMUNICATION ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) A basic S-R flip-flop can be constructed by cross-coupling of which basic logic gates?
a) AND or OR gates b) XOR or XNOR gates
c) NOR or NAND gates d) AND or NOR gates

2) In S-R flip-flop, if Q = 0 the output is said to be _____.
a) Set b) Reset
c) Previous state d) Current state

3) A D-Flip flop is said to be transparent, when _____.
a) the output is Low b) the output is High
c) the output follows clock d) the output follows input

4) How many stable state/states present in flip-flop?
a) 1 b) 0
c) 2 d) 4

5) How many natural states will there be in a 4-bit ripple counter?
a) 4 b) 8
c) 16 d) 32

6) How many flip-flops are required to construct a decade counter?
a) 4 b) 8
c) 5 d) 10

7) A 4-bit counter has a maximum modulus of _____.
a) 3 b) 6
c) 8 d) 16

8) The terms in SOP are called _____.
a) max terms b) min terms
c) mid terms d) sum terms

9) The number of cells in a K-map with n- variables.
a) 2n b) n^2
c) 2^n d) n

10) The logical sum of two or more logical product terms is called _____.
a) SOP b) POS
c) OR operation d) NAND operation

11) A Karnaugh map (K-map) is an abstract form of _____ diagram organized as a matrix of squares.
a) Venn Diagram b) Cycle Diagram
c) Block diagram d) Triangular Diagram

12) If A and B are the inputs of a half adder, the sum is given by _____.
a) A AND B b) A OR B
c) A XOR B d) A EX-NOR B

13) Let A and B is the input of a Subtractor, then the output will be _____.
a) A XOR B b) A AND B
c) A OR B d) A EX-NOR B

14) What is a multiplexer?
a) It is a type of decoder which decodes several inputs and gives one output
b) A multiplexer is a device which converts many signals into one
c) It takes one input and results into many output
d) It is a type of encoder which decodes several inputs and gives one output

SLR-BD-23

Seat No.	

Set Q

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRONICS AND TELECOMMUNICATION ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) Explain Standard representation of logic function.
b) Express Boolean function $F = xy + x'z$ as a product of Max-terms.
c) Explain Half Adder with logic diagram.
d) Explain 1:4 De-Multiplexer with truth Table and logic diagram.
e) Explain stepwise procedure for K-map solution.

Q.3 Attempt any two. **12**

a) Explain Binary to Gray conversion in details.
b) Explain Full Adder with suitable diagram
c) Solve using K Map -

$$F\ (A, B, C, D)\ = \sum (0, 2, 5, 7, 8, 10, 13, 15)$$

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic SR Flip-flop using logic gates.
b) Explain D-Flip-Flop with suitable diagram.
c) Differentiate between Synchronous and Asynchronous sequential circuit.
d) Explain PISO shift register.
e) Explain Race-Round condition. How this condition will overcome?

Q.5 Attempt any two. **12**

a) Design MOD-10 Counter.
b) Explain JK Flip flop with suitable diagram, and truth table.
c) Explain 4-bit UP/DOWN counter with suitable diagram.

SLR-BD-23

Seat No.	

Set R

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRONICS AND TELECOMMUNICATION ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) How many stable state/states present in flip-flop?
a) 1 b) 0
c) 2 d) 4

2) How many natural states will there be in a 4-bit ripple counter?
a) 4 b) 8
c) 16 d) 32

3) How many flip-flops are required to construct a decade counter?
a) 4 b) 8
c) 5 d) 10

4) A 4-bit counter has a maximum modulus of _____.
a) 3 b) 6
c) 8 d) 16

5) The terms in SOP are called _____.
a) max terms b) min terms
c) mid terms d) sum terms

6) The number of cells in a K-map with n- variables.
a) 2n b) n^2
c) 2^n d) n

7) The logical sum of two or more logical product terms is called _____.
a) SOP b) POS
c) OR operation d) NAND operation

8) A Karnaugh map (K-map) is an abstract form of _____ diagram organized as a matrix of squares.

a) Venn Diagram b) Cycle Diagram
c) Block diagram d) Triangular Diagram

9) If A and B are the inputs of a half adder, the sum is given by _____.

a) A AND B b) A OR B
c) A XOR B d) A EX-NOR B

10) Let A and B is the input of a Subtractor, then the output will be _____.

a) A XOR B b) A AND B
c) A OR B d) A EX-NOR B

11) What is a multiplexer?

a) It is a type of decoder which decodes several inputs and gives one output
b) A multiplexer is a device which converts many signals into one
c) It takes one input and results into many output
d) It is a type of encoder which decodes several inputs and gives one output

12) A basic S-R flip-flop can be constructed by cross-coupling of which basic logic gates?

a) AND or OR gates b) XOR or XNOR gates
c) NOR or NAND gates d) AND or NOR gates

13) In S-R flip-flop, if Q = 0 the output is said to be _____.

a) Set b) Reset
c) Previous state d) Current state

14) A D-Flip flop is said to be transparent, when _____.

a) the output is Low b) the output is High
c) the output follows clock d) the output follows input

SLR-BD-23

Seat No.	

Set R

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRONICS AND TELECOMMUNICATION ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) Explain Standard representation of logic function.
b) Express Boolean function $F = xy + x'z$ as a product of Max-terms.
c) Explain Half Adder with logic diagram.
d) Explain 1:4 De-Multiplexer with truth Table and logic diagram.
e) Explain stepwise procedure for K-map solution.

Q.3 Attempt any two. **12**

a) Explain Binary to Gray conversion in details.
b) Explain Full Adder with suitable diagram
c) Solve using K Map -

$$F\ (A, B, C, D)\ = \sum (0, 2, 5, 7, 8, 10, 13, 15)$$

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic SR Flip-flop using logic gates.
b) Explain D-Flip-Flop with suitable diagram.
c) Differentiate between Synchronous and Asynchronous sequential circuit.
d) Explain PISO shift register.
e) Explain Race-Round condition. How this condition will overcome?

Q.5 Attempt any two. **12**

a) Design MOD-10 Counter.
b) Explain JK Flip flop with suitable diagram, and truth table.
c) Explain 4-bit UP/DOWN counter with suitable diagram.

SLR-BD-23

Seat No.		Set	S

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRONICS AND TELECOMMUNICATION ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Let A and B is the input of a Subtractor, then the output will be _____.
a) A XOR B b) A AND B
c) A OR B d) A EX-NOR B

2) What is a multiplexer?
a) It is a type of decoder which decodes several inputs and gives one output
b) A multiplexer is a device which converts many signals into one
c) It takes one input and results into many output
d) It is a type of encoder which decodes several inputs and gives one output

3) A basic S-R flip-flop can be constructed by cross-coupling of which basic logic gates?
a) AND or OR gates b) XOR or XNOR gates
c) NOR or NAND gates d) AND or NOR gates

4) In S-R flip-flop, if Q = 0 the output is said to be _____.
a) Set b) Reset
c) Previous state d) Current state

5) A D-Flip flop is said to be transparent, when _____.
a) the output is Low b) the output is High
c) the output follows clock d) the output follows input

6) How many stable state/states present in flip-flop?
a) 1 b) 0
c) 2 d) 4

7) How many natural states will there be in a 4-bit ripple counter?
a) 4 b) 8
c) 16 d) 32

8) How many flip-flops are required to construct a decade counter?
a) 4 b) 8
c) 5 d) 10

9) A 4-bit counter has a maximum modulus of _____.
a) 3 b) 6
c) 8 d) 16

10) The terms in SOP are called _____.
a) max terms b) min terms
c) mid terms d) sum terms

11) The number of cells in a K-map with n- variables.
a) 2n b) n^2
c) 2^n d) n

12) The logical sum of two or more logical product terms is called _____.
a) SOP b) POS
c) OR operation d) NAND operation

13) A Karnaugh map (K-map) is an abstract form of _____ diagram organized as a matrix of squares.
a) Venn Diagram b) Cycle Diagram
c) Block diagram d) Triangular Diagram

14) If A and B are the inputs of a half adder, the sum is given by _____.
a) A AND B b) A OR B
c) A XOR B d) A EX-NOR B

SLR-BD-23

Seat No.		Set	S

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRONICS AND TELECOMMUNICATION ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) Explain Standard representation of logic function.
b) Express Boolean function $F = xy + x'z$ as a product of Max-terms.
c) Explain Half Adder with logic diagram.
d) Explain 1:4 De-Multiplexer with truth Table and logic diagram.
e) Explain stepwise procedure for K-map solution.

Q.3 Attempt any two. **12**

a) Explain Binary to Gray conversion in details.
b) Explain Full Adder with suitable diagram
c) Solve using K Map -

$$F\ (A, B, C, D)\ = \sum (0, 2, 5, 7, 8, 10, 13, 15)$$

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic SR Flip-flop using logic gates.
b) Explain D-Flip-Flop with suitable diagram.
c) Differentiate between Synchronous and Asynchronous sequential circuit.
d) Explain PISO shift register.
e) Explain Race-Round condition. How this condition will overcome?

Q.5 Attempt any two. **12**

a) Design MOD-10 Counter.
b) Explain JK Flip flop with suitable diagram, and truth table.
c) Explain 4-bit UP/DOWN counter with suitable diagram.

SLR-BD-24

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Thermocouple generate output voltage according to _____.
a) Circuit parameters b) Humidity
c) Temperature d) Voltage

2) Sensor is a type of transducer.
a) True b) False

3) Which factor affects the least while selection of sensor?
a) Size b) Accuracy
c) Colour d) Durability

4) Which sensor should one prefer for accurate measurement of distance upto 1 meter?
a) Ultrasonic sensor b) Infrared sensor
c) PIR sensor d) Photoresistor sensor

5) IR sensors can't work in dark environment.
a) True b) False

6) Which sensor should be used for calculating humidity?
a) DHT11 b) LM335Z/NOPB
c) HC-SR04 d) MPX10DP

7) What is the primary purpose of a strain gauge?
a) Measure temperature
b) Measure pressure
c) Measure deformation or strain
d) Measure voltage

8) What is a Wheatstone bridge used for in the context of strain gauges?
a) To amplify the signal
b) To convert mechanical strain to a voltage output
c) To filter noise from the signal
d) To measure temperature

9) Signal conditioning is carried out in _____.
a) Transducer housing b) Processor
c) Network interface d) None of the mentioned

10) What principle does a thermocouple operate on?
a) Seebeck effect b) Peltier effect
c) Joule heating d) Hall effect

11) Which material is most commonly used in RTDs for temperature sensing?
a) Copper b) Aluminum
c) Platinum d) Nickel

12) What is the typical temperature range for standard RTDs?
a) -200 to 500 °C b) -50 to 200 °C
c) 0 to 100 °C d) -100 to 1000 °C

13) What type of electrode is commonly used in a pHsensor?
a) Reference electrode b) Glass electrode
c) Metal electrode d) Carbon electrode

14) What is the output of atypical pHsensor?
a) Voltage b) Resistance
c) Current d) Frequency

SLR-BD-24

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any Four. **16**

a) Define Motion Transducer. Explain different types of motion sensor with example.
b) Write a short note on sensor selection.
c) Define Sensor & Transducer. How do they differ from each other?
d) What is Calibration? With the help of block diagram explain procedure of calibration.
e) Explain concept of strain gauge & light intensity.
f) Describe concept of motion transducer in detail.

Q.3 Attempt any two. **12**

a) Discuss the classification of sensor based on Measurand. Provide the example of each type and their application.
b) State the working principle of LDR. Explain the construction & working of it. Also state advantages, disadvantages & application of it.
c) Write a note on:-
1) Temperature sensing
2) Light Intensity
3) Strain gauge
4) Magnetic field Sensor

Section – II

Q.4 Attempt any Four. **16**

a) With the help of neat sketch explain concept of LVDT.
b) Illustrate concept of ultrasonic sensor & Chemical sensor in detail
c) With the help of explain RTD.
d) With the help of neat sketch explain concept of RVDT.
e) Describe the concept of motion transducer.

Q.5 Attempt any two. **12**

a) With the help of neat sketch explain concept of AC Tachometer & DC Tachometer.

b) Define following concepts:

1) Humidity Sensor
2) Vibration Sensor
3) Gas Sensor

c) With the help of neat sketch explain Thermocouple & Thermistor.

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) What is a Wheatstone bridge used for in the context of strain gauges?
a) To amplify the signal
b) To convert mechanical strain to a voltage output
c) To filter noise from the signal
d) To measure temperature

2) Signal conditioning is carried out in _____.
a) Transducer housing b) Processor
c) Network interface d) None of the mentioned

3) What principle does a thermocouple operate on?
a) Seebeck effect b) Peltier effect
c) Joule heating d) Hall effect

4) Which material is most commonly used in RTDs for temperature sensing?
a) Copper b) Aluminum
c) Platinum d) Nickel

5) What is the typical temperature range for standard RTDs?
a) -200 to 500 °C b) -50 to 200 °C
c) 0 to 100 °C d) -100 to 1000 °C

6) What type of electrode is commonly used in a pHsensor?
a) Reference electrode b) Glass electrode
c) Metal electrode d) Carbon electrode

7) What is the output of atypical pHsensor?
a) Voltage b) Resistance
c) Current d) Frequency

8) Thermocouple generate output voltage according to _____.
a) Circuit parameters b) Humidity
c) Temperature d) Voltage

9) Sensor is a type of transducer.
a) True b) False

10) Which factor affects the least while selection of sensor?
a) Size b) Accuracy
c) Colour d) Durability

11) Which sensor should one prefer for accurate measurement of distance upto 1 meter?
a) Ultrasonic sensor b) Infrared sensor
c) PIR sensor d) Photoresistor sensor

12) IR sensors can't work in dark environment.
a) True b) False

13) Which sensor should be used for calculating humidity?
a) DHT11 b) LM335Z/NOPB
c) HC-SR04 d) MPX10DP

14) What is the primary purpose of a strain gauge?
a) Measure temperature
b) Measure pressure
c) Measure deformation or strain
d) Measure voltage

SLR-BD-24

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any Four. **16**

a) Define Motion Transducer. Explain different types of motion sensor with example.
b) Write a short note on sensor selection.
c) Define Sensor & Transducer. How do they differ from each other?
d) What is Calibration? With the help of block diagram explain procedure of calibration.
e) Explain concept of strain gauge & light intensity.
f) Describe concept of motion transducer in detail.

Q.3 Attempt any two. **12**

a) Discuss the classification of sensor based on Measurand. Provide the example of each type and their application.
b) State the working principle of LDR. Explain the construction & working of it. Also state advantages, disadvantages & application of it.
c) Write a note on:-
1) Temperature sensing
2) Light Intensity
3) Strain gauge
4) Magnetic field Sensor

Section – II

Q.4 Attempt any Four. **16**

a) With the help of neat sketch explain concept of LVDT.
b) Illustrate concept of ultrasonic sensor & Chemical sensor in detail
c) With the help of explain RTD.
d) With the help of neat sketch explain concept of RVDT.
e) Describe the concept of motion transducer.

Q.5 Attempt any two. **12**

a) With the help of neat sketch explain concept of AC Tachometer & DC Tachometer.

b) Define following concepts:

1) Humidity Sensor
2) Vibration Sensor
3) Gas Sensor

c) With the help of neat sketch explain Thermocouple & Thermistor.

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which material is most commonly used in RTDs for temperature sensing?
a) Copper b) Aluminum
c) Platinum d) Nickel

2) What is the typical temperature range for standard RTDs?
a) -200 to 500 °C b) -50 to 200 °C
c) 0 to 100 °C d) -100 to 1000 °C

3) What type of electrode is commonly used in a pHsensor?
a) Reference electrode b) Glass electrode
c) Metal electrode d) Carbon electrode

4) What is the output of atypical pHsensor?
a) Voltage b) Resistance
c) Current d) Frequency

5) Thermocouple generate output voltage according to _____.
a) Circuit parameters b) Humidity
c) Temperature d) Voltage

6) Sensor is a type of transducer.
a) True b) False

7) Which factor affects the least while selection of sensor?
a) Size b) Accuracy
c) Colour d) Durability

8) Which sensor should one prefer for accurate measurement of distance upto 1 meter?

a) Ultrasonic sensor
b) Infrared sensor
c) PIR sensor
d) Photoresistor sensor

9) IR sensors can't work in dark environment.

a) True
b) False

10) Which sensor should be used for calculating humidity?

a) DHT11
b) LM335Z/NOPB
c) HC-SR04
d) MPX10DP

11) What is the primary purpose of a strain gauge?

a) Measure temperature
b) Measure pressure
c) Measure deformation or strain
d) Measure voltage

12) What is a Wheatstone bridge used for in the context of strain gauges?

a) To amplify the signal
b) To convert mechanical strain to a voltage output
c) To filter noise from the signal
d) To measure temperature

13) Signal conditioning is carried out in _____.

a) Transducer housing
b) Processor
c) Network interface
d) None of the mentioned

14) What principle does a thermocouple operate on?

a) Seebeck effect
b) Peltier effect
c) Joule heating
d) Hall effect

SLR-BD-24

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any Four. **16**

a) Define Motion Transducer. Explain different types of motion sensor with example.
b) Write a short note on sensor selection.
c) Define Sensor & Transducer. How do they differ from each other?
d) What is Calibration? With the help of block diagram explain procedure of calibration.
e) Explain concept of strain gauge & light intensity.
f) Describe concept of motion transducer in detail.

Q.3 Attempt any two. **12**

a) Discuss the classification of sensor based on Measurand. Provide the example of each type and their application.
b) State the working principle of LDR. Explain the construction & working of it. Also state advantages, disadvantages & application of it.
c) Write a note on:-
1) Temperature sensing
2) Light Intensity
3) Strain gauge
4) Magnetic field Sensor

Section – II

Q.4 Attempt any Four. **16**

a) With the help of neat sketch explain concept of LVDT.
b) Illustrate concept of ultrasonic sensor & Chemical sensor in detail
c) With the help of explain RTD.
d) With the help of neat sketch explain concept of RVDT.
e) Describe the concept of motion transducer.

Q.5 Attempt any two. **12**

a) With the help of neat sketch explain concept of AC Tachometer & DC Tachometer.

b) Define following concepts:

1) Humidity Sensor
2) Vibration Sensor
3) Gas Sensor

c) With the help of neat sketch explain Thermocouple & Thermistor.

Seat No.	

Set | S

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which sensor should be used for calculating humidity?
a) DHT11 b) LM335Z/NOPB
c) HC-SR04 d) MPX10DP

2) What is the primary purpose of a strain gauge?
a) Measure temperature
b) Measure pressure
c) Measure deformation or strain
d) Measure voltage

3) What is a Wheatstone bridge used for in the context of strain gauges?
a) To amplify the signal
b) To convert mechanical strain to a voltage output
c) To filter noise from the signal
d) To measure temperature

4) Signal conditioning is carried out in _____.
a) Transducer housing b) Processor
c) Network interface d) None of the mentioned

5) What principle does a thermocouple operate on?
a) Seebeck effect b) Peltier effect
c) Joule heating d) Hall effect

6) Which material is most commonly used in RTDs for temperature sensing?
a) Copper b) Aluminum
c) Platinum d) Nickel

7) What is the typical temperature range for standard RTDs?
a) -200 to 500 °C b) -50 to 200 °C
c) 0 to 100 °C d) -100 to 1000 °C

8) What type of electrode is commonly used in a pHsensor?
a) Reference electrode b) Glass electrode
c) Metal electrode d) Carbon electrode

9) What is the output of atypical pHsensor?
a) Voltage b) Resistance
c) Current d) Frequency

10) Thermocouple generate output voltage according to _____.
a) Circuit parameters b) Humidity
c) Temperature d) Voltage

11) Sensor is a type of transducer.
a) True b) False

12) Which factor affects the least while selection of sensor?
a) Size b) Accuracy
c) Colour d) Durability

13) Which sensor should one prefer for accurate measurement of distance upto 1 meter?
a) Ultrasonic sensor b) Infrared sensor
c) PIR sensor d) Photoresistor sensor

14) IR sensors can't work in dark environment.
a) True b) False

SLR-BD-24

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any Four. **16**

a) Define Motion Transducer. Explain different types of motion sensor with example.
b) Write a short note on sensor selection.
c) Define Sensor & Transducer. How do they differ from each other?
d) What is Calibration? With the help of block diagram explain procedure of calibration.
e) Explain concept of strain gauge & light intensity.
f) Describe concept of motion transducer in detail.

Q.3 Attempt any two. **12**

a) Discuss the classification of sensor based on Measurand. Provide the example of each type and their application.
b) State the working principle of LDR. Explain the construction & working of it. Also state advantages, disadvantages & application of it.
c) Write a note on:-
1) Temperature sensing
2) Light Intensity
3) Strain gauge
4) Magnetic field Sensor

Section – II

Q.4 Attempt any Four. **16**

a) With the help of neat sketch explain concept of LVDT.
b) Illustrate concept of ultrasonic sensor & Chemical sensor in detail
c) With the help of explain RTD.
d) With the help of neat sketch explain concept of RVDT.
e) Describe the concept of motion transducer.

Q.5 Attempt any two. **12**

a) With the help of neat sketch explain concept of AC Tachometer & DC Tachometer.

b) Define following concepts:

1) Humidity Sensor
2) Vibration Sensor
3) Gas Sensor

c) With the help of neat sketch explain Thermocouple & Thermistor.

SLR-BD-25

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the output of print(3 * 4.5 // 2)?
a) 5 b) 6
c) 7 d) 8

2) Which data type is mutable in Python?
a) int b) float
c) tuple d) list

3) What is the primary purpose of the Python interpreter?
a) To convert Python code into machine code directly.
b) To compile Python code into a .exe file.
c) To interpret and execute Python code line by line.
d) To optimize Python code for faster execution.

4) How do you import a function myfunc from a module mymodule?
a) import mymodule .myfunc
b) from mymodule import myfunc
c) import myfunc from mymodule
d) from myfunc import mymodule

5) Which statement about tuples in Python is true?
a) Tuples can be modified after creation.
b) Tuples are indexed starting from 1.
c) Tuples use square brackets for element access.
d) Tuples are immutable.

6) Given s = 'Hello World!', what does s[1:5] evaluate to?
a) 'Hell' b) 'ello'
c) 'ello ' d) None of the above

7) Which keyword is used to handle exceptions in Python?

a) catch b) except
c) handle d) recover

8) What does the self parameter represent in Python class methods?

a) It refers to the current instance of the class.
b) It is used to denote private attributes.
c) It is used for method overloading.
d) It refers to the superclass.

9) What does the following code output?

```
class MyClass:
    def greet(self):
    return "Hello!"
obj = MyClass()
print(obj.greet())
```

a) Hello! b) greet
c) Error d) None

10) How do you open a file myfile.txt in read mode in Python?

a) file = open('myfile.txt', 'r')
b) file = open('myfile.txf)
c) file = open('myfile.txt', mode='read')
d) file = open('myfile.txt', mode='w')

11) Which Python library is used for numerical operations and array manipulations?

a) numpy b) math
c) scipy d) statistics

12) Which Python module is commonly used for writing unit tests?

a) unittest b) pytest
c) testing d) check

13) Which module is used to generate pseudo-random numbers in Python?

a) random b) numpy
c) math d) os

14) What is the default logging level in Python?

a) DEBUG b) INFO
c) WARNING d) ERROR

SLR-BD-25

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) What is python interpreter? Explain with neat diagram.
b) Differentiate between list and tuples in python.
c) Write a python program to check whether a given string is palindrome.
d) What are the class and objects in python? Explain with syntax and example.
e) What is exceptional handling in python? How it is implemented using try, except and finally block?

Q.3 Attempt any two. **12**

a) Illustrate following control structures and write syntax for each type of control structure.
1) Decision making statements
2) Iterative statements (Loop control statements)
3) Transfer statements
b) Explain string handling functions with syntax and example.
c) Explain inheritance in python with their types.

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic date and time types with syntax and example.
b) Differentiate between shallow copy and deep copy operations.
c) Write a python program to create a 2D Numpy array and perform basic operations like addition, subtraction, division and multiplication.
d) Implement a program to measure execution time of small code snippets.
e) Explain Logging facility in python with all levels of logging.

Q.5 Attempt any two. **12**

a) Explain mathematical functions and pseudo random functions with syntax and example.
b) Define data persistence and implement program for read & write operations on .csv file.
c) Explain the methods of testing and debugging in python. Explain unit test in python.

SLR-BD-25

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What does the self parameter represent in Python class methods?
a) It refers to the current instance of the class.
b) It is used to denote private attributes.
c) It is used for method overloading.
d) It refers to the superclass.

2) What does the following code output?

```
class MyClass:
    def greet(self):
    return "Hello!"
obj = MyClass()
print(obj.greet())
```

a) Hello! b) greet
c) Error d) None

3) How do you open a file myfile.txt in read mode in Python?
a) file = open('myfile.txt', 'r')
b) file = open('myfile.txf)
c) file = open('myfile.txt', mode='read')
d) file = open('myfile.txt', mode='w')

4) Which Python library is used for numerical operations and array manipulations?
a) numpy b) math
c) scipy d) statistics

5) Which Python module is commonly used for writing unit tests?
a) unittest b) pytest
c) testing d) check

6) Which module is used to generate pseudo-random numbers in Python?

a) random b) numpy
c) math d) os

7) What is the default logging level in Python?

a) DEBUG b) INFO
c) WARNING d) ERROR

8) What is the output of print(3 * 4.5 // 2)?

a) 5 b) 6
c) 7 d) 8

9) Which data type is mutable in Python?

a) int b) float
c) tuple d) list

10) What is the primary purpose of the Python interpreter?

a) To convert Python code into machine code directly.
b) To compile Python code into a .exe file.
c) To interpret and execute Python code line by line.
d) To optimize Python code for faster execution.

11) How do you import a function myfunc from a module mymodule?

a) import mymodule .myfunc
b) from mymodule import myfunc
c) import myfunc from mymodule
d) from myfunc import mymodule

12) Which statement about tuples in Python is true?

a) Tuples can be modified after creation.
b) Tuples are indexed starting from 1.
c) Tuples use square brackets for element access.
d) Tuples are immutable.

13) Given s = 'Hello World!', what does s[1:5] evaluate to?

a) 'Hell' b) 'ello'
c) 'ello ' d) None of the above

14) Which keyword is used to handle exceptions in Python?

a) catch b) except
c) handle d) recover

SLR-BD-25

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) What is python interpreter? Explain with neat diagram.
b) Differentiate between list and tuples in python.
c) Write a python program to check whether a given string is palindrome.
d) What are the class and objects in python? Explain with syntax and example.
e) What is exceptional handling in python? How it is implemented using try, except and finally block?

Q.3 Attempt any two. **12**

a) Illustrate following control structures and write syntax for each type of control structure.
1) Decision making statements
2) Iterative statements (Loop control statements)
3) Transfer statements
b) Explain string handling functions with syntax and example.
c) Explain inheritance in python with their types.

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic date and time types with syntax and example.
b) Differentiate between shallow copy and deep copy operations.
c) Write a python program to create a 2D Numpy array and perform basic operations like addition, subtraction, division and multiplication.
d) Implement a program to measure execution time of small code snippets.
e) Explain Logging facility in python with all levels of logging.

Q.5 Attempt any two. **12**

a) Explain mathematical functions and pseudo random functions with syntax and example.
b) Define data persistence and implement program for read & write operations on .csv file.
c) Explain the methods of testing and debugging in python. Explain unit test in python.

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which Python library is used for numerical operations and array manipulations?
a) numpy b) math
c) scipy d) statistics

2) Which Python module is commonly used for writing unit tests?
a) unittest b) pytest
c) testing d) check

3) Which module is used to generate pseudo-random numbers in Python?
a) random b) numpy
c) math d) os

4) What is the default logging level in Python?
a) DEBUG b) INFO
c) WARNING d) ERROR

5) What is the output of print(3 * 4.5 // 2)?
a) 5 b) 6
c) 7 d) 8

6) Which data type is mutable in Python?
a) int b) float
c) tuple d) list

7) What is the primary purpose of the Python interpreter?
a) To convert Python code into machine code directly.
b) To compile Python code into a .exe file.
c) To interpret and execute Python code line by line.
d) To optimize Python code for faster execution.

8) How do you import a function myfunc from a module mymodule?
a) import mymodule .myfunc
b) from mymodule import myfunc
c) import myfunc from mymodule
d) from myfunc import mymodule

9) Which statement about tuples in Python is true?
a) Tuples can be modified after creation.
b) Tuples are indexed starting from 1.
c) Tuples use square brackets for element access.
d) Tuples are immutable.

10) Given s = 'Hello World!', what does s[1:5] evaluate to?
a) 'Hell' b) 'ello'
c) 'ello ' d) None of the above

11) Which keyword is used to handle exceptions in Python?
a) catch b) except
c) handle d) recover

12) What does the self parameter represent in Python class methods?
a) It refers to the current instance of the class.
b) It is used to denote private attributes.
c) It is used for method overloading.
d) It refers to the superclass.

13) What does the following code output?

```
class MyClass:
    def greet(self):
    return "Hello!"
obj = MyClass()
print(obj.greet())
```

a) Hello! b) greet
c) Error d) None

14) How do you open a file myfile.txt in read mode in Python?
a) file = open('myfile.txt', 'r')
b) file = open('myfile.txf)
c) file = open('myfile.txt', mode='read')
d) file = open('myfile.txt', mode='w')

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) What is python interpreter? Explain with neat diagram.
b) Differentiate between list and tuples in python.
c) Write a python program to check whether a given string is palindrome.
d) What are the class and objects in python? Explain with syntax and example.
e) What is exceptional handling in python? How it is implemented using try, except and finally block?

Q.3 Attempt any two. **12**

a) Illustrate following control structures and write syntax for each type of control structure.
1) Decision making statements
2) Iterative statements (Loop control statements)
3) Transfer statements
b) Explain string handling functions with syntax and example.
c) Explain inheritance in python with their types.

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic date and time types with syntax and example.
b) Differentiate between shallow copy and deep copy operations.
c) Write a python program to create a 2D Numpy array and perform basic operations like addition, subtraction, division and multiplication.
d) Implement a program to measure execution time of small code snippets.
e) Explain Logging facility in python with all levels of logging.

Q.5 Attempt any two. **12**

a) Explain mathematical functions and pseudo random functions with syntax and example.
b) Define data persistence and implement program for read & write operations on .csv file.
c) Explain the methods of testing and debugging in python. Explain unit test in python.

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Given s = 'Hello World!', what does s[1:5] evaluate to?
a) 'Hell' b) 'ello'
c) 'ello ' d) None of the above

2) Which keyword is used to handle exceptions in Python?
a) catch b) except
c) handle d) recover

3) What does the self parameter represent in Python class methods?
a) It refers to the current instance of the class.
b) It is used to denote private attributes.
c) It is used for method overloading.
d) It refers to the superclass.

4) What does the following code output?

```
class MyClass:
    def greet(self):
    return "Hello!"
obj = MyClass()
print(obj.greet())
```

a) Hello! b) greet
c) Error d) None

5) How do you open a file myfile.txt in read mode in Python?
a) file = open('myfile.txt', 'r')
b) file = open('myfile.txf)
c) file = open('myfile.txt', mode='read')
d) file = open('myfile.txt', mode='w')

6) Which Python library is used for numerical operations and array manipulations?

a) numpy b) math
c) scipy d) statistics

7) Which Python module is commonly used for writing unit tests?

a) unittest b) pytest
c) testing d) check

8) Which module is used to generate pseudo-random numbers in Python?

a) random b) numpy
c) math d) os

9) What is the default logging level in Python?

a) DEBUG b) INFO
c) WARNING d) ERROR

10) What is the output of print(3 * 4.5 // 2)?

a) 5 b) 6
c) 7 d) 8

11) Which data type is mutable in Python?

a) int b) float
c) tuple d) list

12) What is the primary purpose of the Python interpreter?

a) To convert Python code into machine code directly.
b) To compile Python code into a .exe file.
c) To interpret and execute Python code line by line.
d) To optimize Python code for faster execution.

13) How do you import a function myfunc from a module mymodule?

a) import mymodule .myfunc
b) from mymodule import myfunc
c) import myfunc from mymodule
d) from myfunc import mymodule

14) Which statement about tuples in Python is true?

a) Tuples can be modified after creation.
b) Tuples are indexed starting from 1.
c) Tuples use square brackets for element access.
d) Tuples are immutable.

SLR-BD-25

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) What is python interpreter? Explain with neat diagram.
b) Differentiate between list and tuples in python.
c) Write a python program to check whether a given string is palindrome.
d) What are the class and objects in python? Explain with syntax and example.
e) What is exceptional handling in python? How it is implemented using try, except and finally block?

Q.3 Attempt any two. **12**

a) Illustrate following control structures and write syntax for each type of control structure.
1) Decision making statements
2) Iterative statements (Loop control statements)
3) Transfer statements
b) Explain string handling functions with syntax and example.
c) Explain inheritance in python with their types.

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic date and time types with syntax and example.
b) Differentiate between shallow copy and deep copy operations.
c) Write a python program to create a 2D Numpy array and perform basic operations like addition, subtraction, division and multiplication.
d) Implement a program to measure execution time of small code snippets.
e) Explain Logging facility in python with all levels of logging.

Q.5 Attempt any two. **12**

a) Explain mathematical functions and pseudo random functions with syntax and example.
b) Define data persistence and implement program for read & write operations on .csv file.
c) Explain the methods of testing and debugging in python. Explain unit test in python.

SLR-BD-26

Seat No.		Set	P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ model is good for well understood problems, short duration project, and automation of existing manual systems.
a) Waterfall b) Iterative enhancement
c) Prototyping d) Spiral

2) Software consists of ____.
a) Set of instructions + operating procedures
b) Set of programs
c) Programs + documentation + operating procedures
d) Programs + hardware manuals

3) SDLC is framework for ____
a) Requirement b) Design
c) Code & Test d) All of above

4) Black box testing is also called as ____.
a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

5) A detailed project schedule is never ____.
a) fixed b) variable
c) dynamic d) static

6) What is the sequence of maturity levels in CMM framework?
a) Initial, defined, repeatable, managed, and optimizing
b) Initial, defined, repeatable, optimizing, and managed
c) Initial, repeatable, defined, managed, and optimizing
d) Initial, repeatable, defined, optimizing, and managed

7) A ____ is logically separable part of program. It is a program unit that is discrete and identifiable with respect to compiling and loading.

a) Component b) Connector
c) Module d) None of above

8) Risk Management aims to ____ and then take action to minimize their effect on project.

a) Identify cost and estimation
b) Identify risks
c) Identify plan
d) All of above

9) The output of requirement process is ____

a) Validated SRS b) Validation
c) Problem analysis d) Verification

10) White Box Testing is also called as ____.

a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

11) Agile Software Development is depends on ____.

a) Incremental Development
b) Iterative Development
c) Linear Development
d) Both Incremental and Iterative Development

12) ____ is a first level of testing.

a) Unit testing b) Integration Testing
c) System Testing d) None of above

13) CMM means ____.

a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

14) Which of the following is/are characteristics of SRS?

a) Unambiguous b) Verifiable
c) Consistent d) All of above

SLR-BD-26

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Solve: (Any Four) **16**

a) Explain Prototype model.
b) What is SRS? Explain characteristics of SRS.
c) Explain Entity Relationship diagram in detail.
d) Write a short note on Function Oriented Design.
e) Explain characteristics of software process.

Q.3 Solve: (Any Two) **12**

a) Define DFD with all notations and levels. Draw Zero level DFD for Hotel Management System.
b) Draw and Explain waterfall model with its strength and weaknesses.
c) Write a short note on high level design & detailed design.

SECTION – II

Q.4 Solve: (Any Two) **16**

a) Compare White and Black box testing.
b) Explain equivalence partitioning technique of black box testing.
c) Explain CMM with diagram.
d) What are levels of testing? Explain Unit Testing in detail.
e) Write a short note on Agile Project Management.

Q.5 Solve: (Any Two) **12**

a) Explain top down & bottom-up effort estimation technique.
b) Explain Software Configuration Management Process.
c) What is Scrum? Explain in detail Scrum methodology.

SLR-BD-26

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Risk Management aims to ____ and then take action to minimize their effect on project.
a) Identify cost and estimation
b) Identify risks
c) Identify plan
d) All of above

2) The output of requirement process is ____
a) Validated SRS b) Validation
c) Problem analysis d) Verification

3) White Box Testing is also called as ____.
a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

4) Agile Software Development is depends on ____.
a) Incremental Development
b) Iterative Development
c) Linear Development
d) Both Incremental and Iterative Development

5) ____ is a first level of testing.
a) Unit testing b) Integration Testing
c) System Testing d) None of above

6) CMM means ____.
a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

7) Which of the following is/are characteristics of SRS?
a) Unambiguous b) Verifiable
c) Consistent d) All of above

8) ____ model is good for well understood problems, short duration project, and automation of existing manual systems.
a) Waterfall b) Iterative enhancement
c) Prototyping d) Spiral

9) Software consists of ____.
a) Set of instructions + operating procedures
b) Set of programs
c) Programs + documentation + operating procedures
d) Programs + hardware manuals

10) SDLC is framework for ____
a) Requirement b) Design
c) Code & Test d) All of above

11) Black box testing is also called as ____.
a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

12) A detailed project schedule is never ____.
a) fixed b) variable
c) dynamic d) static

13) What is the sequence of maturity levels in CMM framework?
a) Initial, defined, repeatable, managed, and optimizing
b) Initial, defined, repeatable, optimizing, and managed
c) Initial, repeatable, defined, managed, and optimizing
d) Initial, repeatable, defined, optimizing, and managed

14) A ____ is logically separable part of program. It is a program unit that is discrete and identifiable with respect to compiling and loading.
a) Component b) Connector
c) Module d) None of above

SLR-BD-26

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Solve: (Any Four) **16**

a) Explain Prototype model.
b) What is SRS? Explain characteristics of SRS.
c) Explain Entity Relationship diagram in detail.
d) Write a short note on Function Oriented Design.
e) Explain characteristics of software process.

Q.3 Solve: (Any Two) **12**

a) Define DFD with all notations and levels. Draw Zero level DFD for Hotel Management System.
b) Draw and Explain waterfall model with its strength and weaknesses.
c) Write a short note on high level design & detailed design.

SECTION – II

Q.4 Solve: (Any Two) **16**

a) Compare White and Black box testing.
b) Explain equivalence partitioning technique of black box testing.
c) Explain CMM with diagram.
d) What are levels of testing? Explain Unit Testing in detail.
e) Write a short note on Agile Project Management.

Q.5 Solve: (Any Two) **12**

a) Explain top down & bottom-up effort estimation technique.
b) Explain Software Configuration Management Process.
c) What is Scrum? Explain in detail Scrum methodology.

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Agile Software Development is depends on ____.
a) Incremental Development
b) Iterative Development
c) Linear Development
d) Both Incremental and Iterative Development

2) ____ is a first level of testing.
a) Unit testing b) Integration Testing
c) System Testing d) None of above

3) CMM means ____.
a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

4) Which of the following is/are characteristics of SRS?
a) Unambiguous b) Verifiable
c) Consistent d) All of above

5) ____ model is good for well understood problems, short duration project, and automation of existing manual systems.
a) Waterfall b) Iterative enhancement
c) Prototyping d) Spiral

6) Software consists of ____.
a) Set of instructions + operating procedures
b) Set of programs
c) Programs + documentation + operating procedures
d) Programs + hardware manuals

7) SDLC is framework for ____
a) Requirement b) Design
c) Code & Test d) All of above

8) Black box testing is also called as ____.
a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

9) A detailed project schedule is never ____.
a) fixed b) variable
c) dynamic d) static

10) What is the sequence of maturity levels in CMM framework?
a) Initial, defined, repeatable, managed, and optimizing
b) Initial, defined, repeatable, optimizing, and managed
c) Initial, repeatable, defined, managed, and optimizing
d) Initial, repeatable, defined, optimizing, and managed

11) A ____ is logically separable part of program. It is a program unit that is discrete and identifiable with respect to compiling and loading.
a) Component b) Connector
c) Module d) None of above

12) Risk Management aims to ____ and then take action to minimize their effect on project.
a) Identify cost and estimation
b) Identify risks
c) Identify plan
d) All of above

13) The output of requirement process is ____
a) Validated SRS b) Validation
c) Problem analysis d) Verification

14) White Box Testing is also called as ____.
a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

SLR-BD-26

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Solve: (Any Four) **16**

a) Explain Prototype model.
b) What is SRS? Explain characteristics of SRS.
c) Explain Entity Relationship diagram in detail.
d) Write a short note on Function Oriented Design.
e) Explain characteristics of software process.

Q.3 Solve: (Any Two) **12**

a) Define DFD with all notations and levels. Draw Zero level DFD for Hotel Management System.
b) Draw and Explain waterfall model with its strength and weaknesses.
c) Write a short note on high level design & detailed design.

SECTION – II

Q.4 Solve: (Any Two) **16**

a) Compare White and Black box testing.
b) Explain equivalence partitioning technique of black box testing.
c) Explain CMM with diagram.
d) What are levels of testing? Explain Unit Testing in detail.
e) Write a short note on Agile Project Management.

Q.5 Solve: (Any Two) **12**

a) Explain top down & bottom-up effort estimation technique.
b) Explain Software Configuration Management Process.
c) What is Scrum? Explain in detail Scrum methodology.

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the sequence of maturity levels in CMM framework?
a) Initial, defined, repeatable, managed, and optimizing
b) Initial, defined, repeatable, optimizing, and managed
c) Initial, repeatable, defined, managed, and optimizing
d) Initial, repeatable, defined, optimizing, and managed

2) A ____ is logically separable part of program. It is a program unit that is discrete and identifiable with respect to compiling and loading.
a) Component b) Connector
c) Module d) None of above

3) Risk Management aims to ____ and then take action to minimize their effect on project.
a) Identify cost and estimation
b) Identify risks
c) Identify plan
d) All of above

4) The output of requirement process is ____
a) Validated SRS b) Validation
c) Problem analysis d) Verification

5) White Box Testing is also called as ____.
a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

6) Agile Software Development is depends on ____.
a) Incremental Development
b) Iterative Development
c) Linear Development
d) Both Incremental and Iterative Development

7) ____ is a first level of testing.
a) Unit testing b) Integration Testing
c) System Testing d) None of above

8) CMM means ____.
a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

9) Which of the following is/are characteristics of SRS?
a) Unambiguous b) Verifiable
c) Consistent d) All of above

10) ____ model is good for well understood problems, short duration project, and automation of existing manual systems.
a) Waterfall b) Iterative enhancement
c) Prototyping d) Spiral

11) Software consists of ____.
a) Set of instructions + operating procedures
b) Set of programs
c) Programs + documentation + operating procedures
d) Programs + hardware manuals

12) SDLC is framework for ____
a) Requirement b) Design
c) Code & Test d) All of above

13) Black box testing is also called as ____.
a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

14) A detailed project schedule is never ____.
a) fixed b) variable
c) dynamic d) static

SLR-BD-26

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Solve: (Any Four) **16**

a) Explain Prototype model.
b) What is SRS? Explain characteristics of SRS.
c) Explain Entity Relationship diagram in detail.
d) Write a short note on Function Oriented Design.
e) Explain characteristics of software process.

Q.3 Solve: (Any Two) **12**

a) Define DFD with all notations and levels. Draw Zero level DFD for Hotel Management System.
b) Draw and Explain waterfall model with its strength and weaknesses.
c) Write a short note on high level design & detailed design.

SECTION – II

Q.4 Solve: (Any Two) **16**

a) Compare White and Black box testing.
b) Explain equivalence partitioning technique of black box testing.
c) Explain CMM with diagram.
d) What are levels of testing? Explain Unit Testing in detail.
e) Write a short note on Agile Project Management.

Q.5 Solve: (Any Two) **12**

a) Explain top down & bottom-up effort estimation technique.
b) Explain Software Configuration Management Process.
c) What is Scrum? Explain in detail Scrum methodology.

SLR-BD-27

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Which of the following is an advantage of electronic energy meters over induction-type meters?
a) Higher accuracy b) More moving parts
c) More expensive d) Require more maintenance

2) Moving iron instruments have _____.
a) Uniform scale b) Squared scale
c) Log scale d) Linear scale

3) Digital voltmeters convert _____.
a) Analog to digital signal b) Digital to analog signal
c) Current to voltage d) Resistance to voltage

4) In a separately excited DC motor, the field windings are _____.
a) Connected in series with the armature
b) Supplied from an independent source
c) Connected to the same supply as the armature
d) None of above

5) A single-phase induction motor is inherently _____.
a) Self-starting
b) Not self-starting
c) More efficient than a three-phase motor
d) Can operate on both AC and DC supplies

6) The synchronous speed of a synchronous generator is dependent on __.
a) Rotor size
b) Number of poles and frequency
c) Magnetic field strength
d) Load current

7) The synchronous generator operates at _____.
a) A variable speed
b) A constant speed
c) A speed proportional to the load
d) A speed inversely proportional to the load

8) What is the main advantage of a permanent magnet DC motor over a conventional DC motor?
a) No need for a field winding b) Higher efficiency at low speeds
c) Reduced cost of construction d) All of the above

9) Which of the following is an application of PMSMs?
a) Fans b) Electric vehicles
c) HVAC systems d) All of the above

10) What is the purpose of laminated cores in AC machines?
a) Reduce mechanical stress
b) Minimize eddy current losses
c) Increase the resistance of the windings
d) Improve heat dissipation

11) In energy-efficient AC motors, the stator windings are often made of _____.
a) Aluminum b) Copper
c) Steel d) Brass

12) Which of the following does not change in a transformer?
a) Current b) Voltage
c) Frequency d) All of the above

13) When a transformer is loaded, the primary current?
a) Increases b) Decreases
c) Remains constant d) Becomes zero

14) Open circuit test on transformers is conducted to determine _____.
a) hysteresis losses b) copper losses
c) core losses d) eddy current losses

SLR-BD-27

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) With neat sketch explain PMMC type instrument.
b) A 3-phase 500V motor load has a power factor of 0.4 two wattmeter connected to measure input. They show input to be 30 KW. Find the reading of each instrument.
c) With neat sketch explain the construction of DC machine.
d) What is the purpose of the auxiliary winding in a single-phase induction motor?
e) Explain the working principle of a synchronous generator.

Q.3 Attempt any two. **12**

a) Explain 1 - ø induction energy meter with neat diagram.
b) Explain the speed control techniques of separately excited dc motor.
c) Explain the principle of operation of 3ø induction motor. With the help of phasor diagram explain how rotating magnetic field is produced?

Section – II

Q.4 Attempt any Four. **16**

a) Explain with neat sketch construction of permanent magnet brushless DC motor.
b) Explain the principle of operation of a linear induction motor.
c) Discuss the techniques used to reduce iron losses in energy-efficient AC machines.
d) A 230/2300V transformer takes a no-load current of 6.5 A and absorbs 187W if the resistance of the primary is 0.6 Ω. Find.
1) the core loss
2) no load power factor
3) active component of current
4) magnetizing current
e) Derive the expression for saving of copper in autotransformer.

Q.5 Attempt any two. **12**

a) What are the applications of Synchronous Reluctance Motor? Explain with phasor diagram torque speed characteristics of Synchronous Reluctance Motor.

b) An energy-efficient AC motor has the following loss components:
Copper losses: 2 kW
Iron losses: 1.5 kW
Friction and windage losses: 0.5 kW
The input power is 25 kW. Calculate the efficiency of the motor.

c) With neat sketch explain open circuit and short circuit test of transformer. How equivalent circuit parameters and efficiency of a transformer are computed?

SLR-BD-27

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) What is the main advantage of a permanent magnet DC motor over a conventional DC motor?
a) No need for a field winding b) Higher efficiency at low speeds
c) Reduced cost of construction d) All of the above

2) Which of the following is an application of PMSMs?
a) Fans b) Electric vehicles
c) HVAC systems d) All of the above

3) What is the purpose of laminated cores in AC machines?
a) Reduce mechanical stress
b) Minimize eddy current losses
c) Increase the resistance of the windings
d) Improve heat dissipation

4) In energy-efficient AC motors, the stator windings are often made of _____.
a) Aluminum b) Copper
c) Steel d) Brass

5) Which of the following does not change in a transformer?
a) Current b) Voltage
c) Frequency d) All of the above

6) When a transformer is loaded, the primary current?
a) Increases b) Decreases
c) Remains constant d) Becomes zero

7) Open circuit test on transformers is conducted to determine _____.
a) hysteresis losses b) copper losses
c) core losses d) eddy current losses

8) Which of the following is an advantage of electronic energy meters over induction-type meters?
a) Higher accuracy b) More moving parts
c) More expensive d) Require more maintenance

9) Moving iron instruments have _____.
a) Uniform scale b) Squared scale
c) Log scale d) Linear scale

10) Digital voltmeters convert _____.
a) Analog to digital signal b) Digital to analog signal
c) Current to voltage d) Resistance to voltage

11) In a separately excited DC motor, the field windings are _____.
a) Connected in series with the armature
b) Supplied from an independent source
c) Connected to the same supply as the armature
d) None of above

12) A single-phase induction motor is inherently _____.
a) Self-starting
b) Not self-starting
c) More efficient than a three-phase motor
d) Can operate on both AC and DC supplies

13) The synchronous speed of a synchronous generator is dependent on __.
a) Rotor size
b) Number of poles and frequency
c) Magnetic field strength
d) Load current

14) The synchronous generator operates at _____.
a) A variable speed
b) A constant speed
c) A speed proportional to the load
d) A speed inversely proportional to the load

SLR-BD-27

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) With neat sketch explain PMMC type instrument.
b) A 3-phase 500V motor load has a power factor of 0.4 two wattmeter connected to measure input. They show input to be 30 KW. Find the reading of each instrument.
c) With neat sketch explain the construction of DC machine.
d) What is the purpose of the auxiliary winding in a single-phase induction motor?
e) Explain the working principle of a synchronous generator.

Q.3 Attempt any two. **12**

a) Explain 1 - ø induction energy meter with neat diagram.
b) Explain the speed control techniques of separately excited dc motor.
c) Explain the principle of operation of 3ø induction motor. With the help of phasor diagram explain how rotating magnetic field is produced?

Section – II

Q.4 Attempt any Four. **16**

a) Explain with neat sketch construction of permanent magnet brushless DC motor.
b) Explain the principle of operation of a linear induction motor.
c) Discuss the techniques used to reduce iron losses in energy-efficient AC machines.
d) A 230/2300V transformer takes a no-load current of 6.5 A and absorbs 187W if the resistance of the primary is 0.6 Ω. Find.
1) the core loss
2) no load power factor
3) active component of current
4) magnetizing current
e) Derive the expression for saving of copper in autotransformer.

Q.5 Attempt any two. **12**

a) What are the applications of Synchronous Reluctance Motor? Explain with phasor diagram torque speed characteristics of Synchronous Reluctance Motor.

b) An energy-efficient AC motor has the following loss components:
Copper losses: 2 kW
Iron losses: 1.5 kW
Friction and windage losses: 0.5 kW
The input power is 25 kW. Calculate the efficiency of the motor.

c) With neat sketch explain open circuit and short circuit test of transformer. How equivalent circuit parameters and efficiency of a transformer are computed?

SLR-BD-27

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) In energy-efficient AC motors, the stator windings are often made of _____.
a) Aluminum b) Copper
c) Steel d) Brass

2) Which of the following does not change in a transformer?
a) Current b) Voltage
c) Frequency d) All of the above

3) When a transformer is loaded, the primary current?
a) Increases b) Decreases
c) Remains constant d) Becomes zero

4) Open circuit test on transformers is conducted to determine _____.
a) hysteresis losses b) copper losses
c) core losses d) eddy current losses

5) Which of the following is an advantage of electronic energy meters over induction-type meters?
a) Higher accuracy b) More moving parts
c) More expensive d) Require more maintenance

6) Moving iron instruments have _____.
a) Uniform scale b) Squared scale
c) Log scale d) Linear scale

7) Digital voltmeters convert _____.
a) Analog to digital signal b) Digital to analog signal
c) Current to voltage d) Resistance to voltage

8) In a separately excited DC motor, the field windings are _____.
a) Connected in series with the armature
b) Supplied from an independent source
c) Connected to the same supply as the armature
d) None of above

9) A single-phase induction motor is inherently _____.
a) Self-starting
b) Not self-starting
c) More efficient than a three-phase motor
d) Can operate on both AC and DC supplies

10) The synchronous speed of a synchronous generator is dependent on __.
a) Rotor size
b) Number of poles and frequency
c) Magnetic field strength
d) Load current

11) The synchronous generator operates at _____.
a) A variable speed
b) A constant speed
c) A speed proportional to the load
d) A speed inversely proportional to the load

12) What is the main advantage of a permanent magnet DC motor over a conventional DC motor?
a) No need for a field winding b) Higher efficiency at low speeds
c) Reduced cost of construction d) All of the above

13) Which of the following is an application of PMSMs?
a) Fans b) Electric vehicles
c) HVAC systems d) All of the above

14) What is the purpose of laminated cores in AC machines?
a) Reduce mechanical stress
b) Minimize eddy current losses
c) Increase the resistance of the windings
d) Improve heat dissipation

SLR-BD-27

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) With neat sketch explain PMMC type instrument.
b) A 3-phase 500V motor load has a power factor of 0.4 two wattmeter connected to measure input. They show input to be 30 KW. Find the reading of each instrument.
c) With neat sketch explain the construction of DC machine.
d) What is the purpose of the auxiliary winding in a single-phase induction motor?
e) Explain the working principle of a synchronous generator.

Q.3 Attempt any two. **12**

a) Explain 1 - ø induction energy meter with neat diagram.
b) Explain the speed control techniques of separately excited dc motor.
c) Explain the principle of operation of 3ø induction motor. With the help of phasor diagram explain how rotating magnetic field is produced?

Section – II

Q.4 Attempt any Four. **16**

a) Explain with neat sketch construction of permanent magnet brushless DC motor.
b) Explain the principle of operation of a linear induction motor.
c) Discuss the techniques used to reduce iron losses in energy-efficient AC machines.
d) A 230/2300V transformer takes a no-load current of 6.5 A and absorbs 187W if the resistance of the primary is 0.6 Ω. Find.
1) the core loss
2) no load power factor
3) active component of current
4) magnetizing current
e) Derive the expression for saving of copper in autotransformer.

Q.5 Attempt any two. **12**

a) What are the applications of Synchronous Reluctance Motor? Explain with phasor diagram torque speed characteristics of Synchronous Reluctance Motor.

b) An energy-efficient AC motor has the following loss components:
Copper losses: 2 kW
Iron losses: 1.5 kW
Friction and windage losses: 0.5 kW
The input power is 25 kW. Calculate the efficiency of the motor.

c) With neat sketch explain open circuit and short circuit test of transformer. How equivalent circuit parameters and efficiency of a transformer are computed?

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) The synchronous speed of a synchronous generator is dependent on __.
a) Rotor size
b) Number of poles and frequency
c) Magnetic field strength
d) Load current

2) The synchronous generator operates at _____.
a) A variable speed
b) A constant speed
c) A speed proportional to the load
d) A speed inversely proportional to the load

3) What is the main advantage of a permanent magnet DC motor over a conventional DC motor?
a) No need for a field winding b) Higher efficiency at low speeds
c) Reduced cost of construction d) All of the above

4) Which of the following is an application of PMSMs?
a) Fans b) Electric vehicles
c) HVAC systems d) All of the above

5) What is the purpose of laminated cores in AC machines?
a) Reduce mechanical stress
b) Minimize eddy current losses
c) Increase the resistance of the windings
d) Improve heat dissipation

6) In energy-efficient AC motors, the stator windings are often made of _____.
a) Aluminum b) Copper
c) Steel d) Brass

7) Which of the following does not change in a transformer?
a) Current b) Voltage
c) Frequency d) All of the above

8) When a transformer is loaded, the primary current?
a) Increases b) Decreases
c) Remains constant d) Becomes zero

9) Open circuit test on transformers is conducted to determine _____.
a) hysteresis losses b) copper losses
c) core losses d) eddy current losses

10) Which of the following is an advantage of electronic energy meters over induction-type meters?
a) Higher accuracy b) More moving parts
c) More expensive d) Require more maintenance

11) Moving iron instruments have _____.
a) Uniform scale b) Squared scale
c) Log scale d) Linear scale

12) Digital voltmeters convert _____.
a) Analog to digital signal b) Digital to analog signal
c) Current to voltage d) Resistance to voltage

13) In a separately excited DC motor, the field windings are _____.
a) Connected in series with the armature
b) Supplied from an independent source
c) Connected to the same supply as the armature
d) None of above

14) A single-phase induction motor is inherently _____.
a) Self-starting
b) Not self-starting
c) More efficient than a three-phase motor
d) Can operate on both AC and DC supplies

SLR-BD-27

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) With neat sketch explain PMMC type instrument.
b) A 3-phase 500V motor load has a power factor of 0.4 two wattmeter connected to measure input. They show input to be 30 KW. Find the reading of each instrument.
c) With neat sketch explain the construction of DC machine.
d) What is the purpose of the auxiliary winding in a single-phase induction motor?
e) Explain the working principle of a synchronous generator.

Q.3 Attempt any two. **12**

a) Explain 1 - ø induction energy meter with neat diagram.
b) Explain the speed control techniques of separately excited dc motor.
c) Explain the principle of operation of 3ø induction motor. With the help of phasor diagram explain how rotating magnetic field is produced?

Section – II

Q.4 Attempt any Four. **16**

a) Explain with neat sketch construction of permanent magnet brushless DC motor.
b) Explain the principle of operation of a linear induction motor.
c) Discuss the techniques used to reduce iron losses in energy-efficient AC machines.
d) A 230/2300V transformer takes a no-load current of 6.5 A and absorbs 187W if the resistance of the primary is 0.6 Ω. Find.
1) the core loss
2) no load power factor
3) active component of current
4) magnetizing current
e) Derive the expression for saving of copper in autotransformer.

Q.5 Attempt any two. **12**

a) What are the applications of Synchronous Reluctance Motor? Explain with phasor diagram torque speed characteristics of Synchronous Reluctance Motor.

b) An energy-efficient AC motor has the following loss components:
Copper losses: 2 kW
Iron losses: 1.5 kW
Friction and windage losses: 0.5 kW
The input power is 25 kW. Calculate the efficiency of the motor.

c) With neat sketch explain open circuit and short circuit test of transformer. How equivalent circuit parameters and efficiency of a transformer are computed?

SLR-BD-28

Seat No.		Set	P

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is an electric vehicle?
a) Vehicle powered by gasoline
b) Vehicle powered by Electricity
c) Vehicle powered by Diesel
d) Vehicle powered by solar energy

2) What is the function of electric motor in an EV?
a) To charge the battery b) To power the wheels
c) To generate electricity d) To cool the vehicle

3) What is the purpose of battery management system (BMS) in an EV?
a) To monitor and control the battery's state of charge
b) To power the electric motor
c) To generate electricity
d) To cool the vehicle

4) What is the primary advantage of hybrid electric vehicle?
a) Increase driving range
b) Decreased operating cost
c) Reduced Greenhouse gas emissions
d) All of above

5) What type of battery is commonly used in Battery Electric Vehicles?
a) Lead -acid battery b) Nickel- metal hybrid battery
c) Lithium- ion battery d) All of above

6) Which is the types of electric vehicle charging?
a) Level one charging b) Level two charging
c) DC fast charging d) All of the above

7) Which of the following affects battery lifespan?
a) Depth of discharge (DOD) b) Temperature
c) Charging Frequency d) All of above

8) What type of fuel do Fuel Cell Electric Vehicles use?
a) Gasoline b) Diesel
c) Hydrogen d) Natural gas

9) What is the primary cause of battery degradation?
a) Overcharge b) Undercharge
c) Depth of discharge d) High temperature

10) How does battery storage system help in grid stability?
a) By supplying reactive power
b) By absorbing excess energy
c) By providing frequency regulation
d) All of above

11) Which of the following is the benefit of Electric Vehicles?
a) Zero emission b) Lower operating cost
c) Improved performance d) All of above

12) What is the purpose of power electronic controller in electric vehicle?
a) To regulate the flow of electrical energy
b) To monitor the vehicles speed
c) To control the onboard charger
d) To regulate the battery's state of charge

13) What is the purpose of equalization in battery Storage?
a) To balance cell voltage b) To increase battery capacity
c) To reduce charging time d) To improve discharge rate

14) What is the primary function of the on board charger in electric vehicle?
a) To charge the battery from an external power source
b) To convert AC power to DC power
c) To regulate battery's state of charge
d) To monitor the vehicles speed

SLR-BD-28

Seat No.	

Set P

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four **16**

a) State and explain challenges faced by Hybrid electric vehicle.
b) State and explain Economics and Environmental impacts of using electrical vehicles.
c) State and explain need of Electrical Vehicle.
d) State and Explain common part between ICE and EV drivetrain.
e) State and explain battery pack and battery management system.

Q.3 Attempt any two. **12**

a) State and explain major requirements of electrical vehicles.
b) State and explain types of electric vehicles in brief.
c) State and explain electric vehicle configuration in brief.

Section – II

Q.4 Attempt any Four. **16**

a) State and explain battery based energy storage system.
b) State and Explain components of HEVs drive train system.
c) State and explain alternative novel energy source solar photovoltaic cells, fuel cells, super capacitors and flywheels.
d) State and explain HEVs basic architecture.
e) Compare between Hybrid electric vehicle and Fuel cell electric vehicle.

Q.5 Attempt any two. **12**

a) State and explain overview of batteries and battery parameters, battery charging, regenerative braking.
b) State and Explain classification of HEVs: Conventional HEVs, Grid able HEVs.
c) State and explain fuel efficiency in HEV.

SLR-BD-28

Seat No.	

Set Q

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What type of fuel do Fuel Cell Electric Vehicles use?
a) Gasoline b) Diesel
c) Hydrogen d) Natural gas

2) What is the primary cause of battery degradation?
a) Overcharge b) Undercharge
c) Depth of discharge d) High temperature

3) How does battery storage system help in grid stability?
a) By supplying reactive power
b) By absorbing excess energy
c) By providing frequency regulation
d) All of above

4) Which of the following is the benefit of Electric Vehicles?
a) Zero emission b) Lower operating cost
c) Improved performance d) All of above

5) What is the purpose of power electronic controller in electric vehicle?
a) To regulate the flow of electrical energy
b) To monitor the vehicles speed
c) To control the onboard charger
d) To regulate the battery's state of charge

6) What is the purpose of equalization in battery Storage?
a) To balance cell voltage b) To increase battery capacity
c) To reduce charging time d) To improve discharge rate

7) What is the primary function of the on board charger in electric vehicle?
a) To charge the battery from an external power source
b) To convert AC power to DC power
c) To regulate battery's state of charge
d) To monitor the vehicles speed

8) What is an electric vehicle?
a) Vehicle powered by gasoline
b) Vehicle powered by Electricity
c) Vehicle powered by Diesel
d) Vehicle powered by solar energy

9) What is the function of electric motor in an EV?
a) To charge the battery b) To power the wheels
c) To generate electricity d) To cool the vehicle

10) What is the purpose of battery management system (BMS) in an EV?
a) To monitor and control the battery's state of charge
b) To power the electric motor
c) To generate electricity
d) To cool the vehicle

11) What is the primary advantage of hybrid electric vehicle?
a) Increase driving range
b) Decreased operating cost
c) Reduced Greenhouse gas emissions
d) All of above

12) What type of battery is commonly used in Battery Electric Vehicles?
a) Lead -acid battery b) Nickel- metal hybrid battery
c) Lithium- ion battery d) All of above

13) Which is the types of electric vehicle charging?
a) Level one charging b) Level two charging
c) DC fast charging d) All of the above

14) Which of the following affects battery lifespan?
a) Depth of discharge (DOD) b) Temperature
c) Charging Frequency d) All of above

SLR-BD-28

Seat No.	

Set Q

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four **16**

a) State and explain challenges faced by Hybrid electric vehicle.
b) State and explain Economics and Environmental impacts of using electrical vehicles.
c) State and explain need of Electrical Vehicle.
d) State and Explain common part between ICE and EV drivetrain.
e) State and explain battery pack and battery management system.

Q.3 Attempt any two. **12**

a) State and explain major requirements of electrical vehicles.
b) State and explain types of electric vehicles in brief.
c) State and explain electric vehicle configuration in brief.

Section – II

Q.4 Attempt any Four. **16**

a) State and explain battery based energy storage system.
b) State and Explain components of HEVs drive train system.
c) State and explain alternative novel energy source solar photovoltaic cells, fuel cells, super capacitors and flywheels.
d) State and explain HEVs basic architecture.
e) Compare between Hybrid electric vehicle and Fuel cell electric vehicle.

Q.5 Attempt any two. **12**

a) State and explain overview of batteries and battery parameters, battery charging, regenerative braking.
b) State and Explain classification of HEVs: Conventional HEVs, Grid able HEVs.
c) State and explain fuel efficiency in HEV.

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is the benefit of Electric Vehicles?
a) Zero emission b) Lower operating cost
c) Improved performance d) All of above

2) What is the purpose of power electronic controller in electric vehicle?
a) To regulate the flow of electrical energy
b) To monitor the vehicles speed
c) To control the onboard charger
d) To regulate the battery's state of charge

3) What is the purpose of equalization in battery Storage?
a) To balance cell voltage b) To increase battery capacity
c) To reduce charging time d) To improve discharge rate

4) What is the primary function of the on board charger in electric vehicle?
a) To charge the battery from an external power source
b) To convert AC power to DC power
c) To regulate battery's state of charge
d) To monitor the vehicles speed

5) What is an electric vehicle?
a) Vehicle powered by gasoline
b) Vehicle powered by Electricity
c) Vehicle powered by Diesel
d) Vehicle powered by solar energy

6) What is the function of electric motor in an EV?
a) To charge the battery b) To power the wheels
c) To generate electricity d) To cool the vehicle

7) What is the purpose of battery management system (BMS) in an EV?
a) To monitor and control the battery's state of charge
b) To power the electric motor
c) To generate electricity
d) To cool the vehicle

8) What is the primary advantage of hybrid electric vehicle?
a) Increase driving range
b) Decreased operating cost
c) Reduced Greenhouse gas emissions
d) All of above

9) What type of battery is commonly used in Battery Electric Vehicles?
a) Lead -acid battery b) Nickel- metal hybrid battery
c) Lithium- ion battery d) All of above

10) Which is the types of electric vehicle charging?
a) Level one charging b) Level two charging
c) DC fast charging d) All of the above

11) Which of the following affects battery lifespan?
a) Depth of discharge (DOD) b) Temperature
c) Charging Frequency d) All of above

12) What type of fuel do Fuel Cell Electric Vehicles use?
a) Gasoline b) Diesel
c) Hydrogen d) Natural gas

13) What is the primary cause of battery degradation?
a) Overcharge b) Undercharge
c) Depth of discharge d) High temperature

14) How does battery storage system help in grid stability?
a) By supplying reactive power
b) By absorbing excess energy
c) By providing frequency regulation
d) All of above

SLR-BD-28

Seat No.	

Set R

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four **16**

a) State and explain challenges faced by Hybrid electric vehicle.
b) State and explain Economics and Environmental impacts of using electrical vehicles.
c) State and explain need of Electrical Vehicle.
d) State and Explain common part between ICE and EV drivetrain.
e) State and explain battery pack and battery management system.

Q.3 Attempt any two. **12**

a) State and explain major requirements of electrical vehicles.
b) State and explain types of electric vehicles in brief.
c) State and explain electric vehicle configuration in brief.

Section – II

Q.4 Attempt any Four. **16**

a) State and explain battery based energy storage system.
b) State and Explain components of HEVs drive train system.
c) State and explain alternative novel energy source solar photovoltaic cells, fuel cells, super capacitors and flywheels.
d) State and explain HEVs basic architecture.
e) Compare between Hybrid electric vehicle and Fuel cell electric vehicle.

Q.5 Attempt any two. **12**

a) State and explain overview of batteries and battery parameters, battery charging, regenerative braking.
b) State and Explain classification of HEVs: Conventional HEVs, Grid able HEVs.
c) State and explain fuel efficiency in HEV.

SLR-BD-28

Seat No.		Set	S

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which is the types of electric vehicle charging?
a) Level one charging b) Level two charging
c) DC fast charging d) All of the above

2) Which of the following affects battery lifespan?
a) Depth of discharge (DOD) b) Temperature
c) Charging Frequency d) All of above

3) What type of fuel do Fuel Cell Electric Vehicles use?
a) Gasoline b) Diesel
c) Hydrogen d) Natural gas

4) What is the primary cause of battery degradation?
a) Overcharge b) Undercharge
c) Depth of discharge d) High temperature

5) How does battery storage system help in grid stability?
a) By supplying reactive power
b) By absorbing excess energy
c) By providing frequency regulation
d) All of above

6) Which of the following is the benefit of Electric Vehicles?
a) Zero emission b) Lower operating cost
c) Improved performance d) All of above

7) What is the purpose of power electronic controller in electric vehicle?
a) To regulate the flow of electrical energy
b) To monitor the vehicles speed
c) To control the onboard charger
d) To regulate the battery's state of charge

8) What is the purpose of equalization in battery Storage?
a) To balance cell voltage
b) To increase battery capacity
c) To reduce charging time
d) To improve discharge rate

9) What is the primary function of the on board charger in electric vehicle?
a) To charge the battery from an external power source
b) To convert AC power to DC power
c) To regulate battery's state of charge
d) To monitor the vehicles speed

10) What is an electric vehicle?
a) Vehicle powered by gasoline
b) Vehicle powered by Electricity
c) Vehicle powered by Diesel
d) Vehicle powered by solar energy

11) What is the function of electric motor in an EV?
a) To charge the battery
b) To power the wheels
c) To generate electricity
d) To cool the vehicle

12) What is the purpose of battery management system (BMS) in an EV?
a) To monitor and control the battery's state of charge
b) To power the electric motor
c) To generate electricity
d) To cool the vehicle

13) What is the primary advantage of hybrid electric vehicle?
a) Increase driving range
b) Decreased operating cost
c) Reduced Greenhouse gas emissions
d) All of above

14) What type of battery is commonly used in Battery Electric Vehicles?
a) Lead -acid battery
b) Nickel- metal hybrid battery
c) Lithium- ion battery
d) All of above

SLR-BD-28

Seat No.	

Set S

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four **16**

a) State and explain challenges faced by Hybrid electric vehicle.
b) State and explain Economics and Environmental impacts of using electrical vehicles.
c) State and explain need of Electrical Vehicle.
d) State and Explain common part between ICE and EV drivetrain.
e) State and explain battery pack and battery management system.

Q.3 Attempt any two. **12**

a) State and explain major requirements of electrical vehicles.
b) State and explain types of electric vehicles in brief.
c) State and explain electric vehicle configuration in brief.

Section – II

Q.4 Attempt any Four. **16**

a) State and explain battery based energy storage system.
b) State and Explain components of HEVs drive train system.
c) State and explain alternative novel energy source solar photovoltaic cells, fuel cells, super capacitors and flywheels.
d) State and explain HEVs basic architecture.
e) Compare between Hybrid electric vehicle and Fuel cell electric vehicle.

Q.5 Attempt any two. **12**

a) State and explain overview of batteries and battery parameters, battery charging, regenerative braking.
b) State and Explain classification of HEVs: Conventional HEVs, Grid able HEVs.
c) State and explain fuel efficiency in HEV.

SLR-BD-29

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Laws and Impact Assessment (CIVHON-01C)

Day & Date: Friday, 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which act provide levy from persons adhered to Water Act 1974.
a) Water Cess Act b) Air Act
c) PLC Act d) All of the above

2) Core values of ElA is/are _____.
a) Integrity b) Utility
c) Sustainability d) All of the above

3) According to PLI Act 1991, the inquiry of an application for relief is conducted by _____.
a) Senior Judge b) Collector
c) Police Commissioner d) C.E.O.

4) _____ enforces owner of industry to take out life insurance policies.
a) Water Cess Act
b) Environmental Protection Act
c) PLI Act
d) All of the above

5) Air Act is not applicable in _____.
a) Jammu and Kashmir b) Delhi
c) Punjab d) None of the above

6) Water Cess is collected by _____.
a) State Government b) Central Government
c) Local Authority d) All of the above

7) Objective of EIA report is to achieve _____ development.
a) Livable
b) Equitable
c) Sustainable
d) All of the above

8) Which act provides provision for affixing of water meters?
a) Water Cess Act
b) Water Act
c) Environmental Protection Act
d) All of the above

9) Which statement dictates the relation between functional unit and reference flows?
a) Reference flows indicates the amounts of input necessary to fulfill the amount of function specified by the functional unit
b) Reference flow provides the basis for functional unit determination
c) Reference flow has no correlation with functional unit
d) Reference flow is the functional unit multiplied by impact factor

10) Choose the correct option _____.
a) Consistency check ensures that all relevant information and data needed were available and used
b) Completeness check determines whether the assumptions, methods and data were aligned with the goals and scopes
c) The ISO standard is referred to identify the significant issues while interpreting results for a specific case
d) The interpretation of results ultimately reports the conclusions, recommendations and limitations of the study

11) Which of the following stage is not included in ISO-14040 framework for life cycle assessment?
a) Life Cycle Impact Assessment (LCIA)
b) Goal and Scope Definition
c) Life Cycle Enhancement (LCE)
d) Life Cycle Inventory (LCI)

12) Which of the below is an advantage of aggregated life cycle inventory database?
a) Possibility for contribution analysis
b) User-friendly
c) Possibility to adapt datasets
d) Possibility to create datasets

13) Which of the following is a common data issue in inventory analysis?
a) Lack of standardized templates for reporting
b) Difficulty in collecting accurate and complete data
c) Reuse of materials during the raw material acquisition stage
d) Increased waste management costs

14) In life cycle inventory analysis, which stage specifically focuses on the extraction and processing of resources for further production?

a) Use/Reuse/Maintenance stage
b) Recycle/Waste Management stage
c) Raw Material acquisition stage
d) Manufacturing stage

SLR-BD-29

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Laws and Impact Assessment (CIVHON-01C)

Day & Date: Friday, 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Q. No. 6 is compulsory in section II, and solve any two questions from the remaining.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2	**a)**	Relate the role of State Pollution Control Board in balancing the power in various state for improvement in pollution.	**05**
	b)	Demonstrate importance of various authorities in implementing Water Cess act 1977 in India.	**05**
Q.3	**a)**	Enumerate various core values and principles of EIA in detail.	**05**
	b)	Discuss importance of numerous elements in Checklist method of EIA methodology.	**04**
Q.4	**a)**	Interpret importance of numerous elements in Adhoc method of EIA methodology.	**05**
	b)	Examine in detail a Trippie Bottom Line approach as a tool for LCA.	**04**
Q.5	**a)**	Demonstrate numerous steps in conducting LCA of partially construction site?	**05**
	b)	Support how does LCA contribute to sustainable development and environmental management strategies in detail?	**04**

Section – II

Q.6	**a)**	Examine how does the WLPA, 1972 establish protected areas, wildlife sanctuaries, and national parks for the conservation of biodiversity?	**05**
	b)	Relate the role of regulatory authorities, such as the Central Pollution Control Board (CPCB) and State Pollution Control Boards (SPCBs), play in the implementation and enforcement of the Wate Act 1974?	**05**

Q.7	**a)**	Demonstrate numerous penalties or consequences determined for violations of the provisions of the EPA, 1986?	**05**
	b)	Enumerate how do the findings and recommendations of an EIA influence decision-making regarding the approval or rejection of proposed projects or developments.	**04**
Q.8	**a)**	Describe the environmental and socioeconomic impacts assessed during the construction stage, including resource use, media quality, health, and safety risks. How do these factors contribute to an integrated impact analysis?	**05**
	b)	Describe the unique considerations of the use, reuse, and maintenance stage in inventory analysis. How does this stage contribute to the overall environmental impact assessment?	**04**
Q.9	**a)**	Discuss how templates are used in inventory analysis to standardize data collection and reporting across different life cycle stages. Why is standardization important?	**05**
	b)	Explain the challenges specific to the recycling and waste management stage in inventory analysis. How do these challenges affect overall life cycle assessment results?	**04**

SLR-BD-29

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Laws and Impact Assessment (CIVHON-01C)

Day & Date: Friday, 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which act provides provision for affixing of water meters?
a) Water Cess Act
b) Water Act
c) Environmental Protection Act
d) All of the above

2) Which statement dictates the relation between functional unit and reference flows?
a) Reference flows indicates the amounts of input necessary to fulfill the amount of function specified by the functional unit
b) Reference flow provides the basis for functional unit determination
c) Reference flow has no correlation with functional unit
d) Reference flow is the functional unit multiplied by impact factor

3) Choose the correct option _____.
a) Consistency check ensures that all relevant information and data needed were available and used
b) Completeness check determines whether the assumptions, methods and data were aligned with the goals and scopes
c) The ISO standard is referred to identify the significant issues while interpreting results for a specific case
d) The interpretation of results ultimately reports the conclusions, recommendations and limitations of the study

4) Which of the following stage is not included in ISO-14040 framework for life cycle assessment?
a) Life Cycle Impact Assessment (LCIA)
b) Goal and Scope Definition
c) Life Cycle Enhancement (LCE)
d) Life Cycle Inventory (LCI)

5) Which of the below is an advantage of aggregated life cycle inventory database?
a) Possibility for contribution analysis
b) User-friendly
c) Possibility to adapt datasets
d) Possibility to create datasets

6) Which of the following is a common data issue in inventory analysis?
a) Lack of standardized templates for reporting
b) Difficulty in collecting accurate and complete data
c) Reuse of materials during the raw material acquisition stage
d) Increased waste management costs

7) In life cycle inventory analysis, which stage specifically focuses on the extraction and processing of resources for further production?
a) Use/Reuse/Maintenance stage
b) Recycle/Waste Management stage
c) Raw Material acquisition stage
d) Manufacturing stage

8) Which act provide levy from persons adhered to Water Act 1974.
a) Water Cess Act b) Air Act
c) PLC Act d) All of the above

9) Core values of ElA is/are _____.
a) Integrity b) Utility
c) Sustainability d) All of the above

10) According to PLI Act 1991, the inquiry of an application for relief is conducted by _____.
a) Senior Judge b) Collector
c) Police Commissioner d) C.E.O.

11) _____ enforces owner of industry to take out life insurance policies.
a) Water Cess Act
b) Environmental Protection Act
c) PLI Act
d) All of the above

12) Air Act is not applicable in _____.
a) Jammu and Kashmir b) Delhi
c) Punjab d) None of the above

13) Water Cess is collected by _____.

a) State Government
b) Central Government
c) Local Authority
d) All of the above

14) Objective of EIA report is to achieve _____ development.

a) Livable
b) Equitable
c) Sustainable
d) All of the above

SLR-BD-29

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Laws and Impact Assessment (CIVHON-01C)

Day & Date: Friday, 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Q. No. 6 is compulsory in section II, and solve any two questions from the remaining.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2	**a)**	Relate the role of State Pollution Control Board in balancing the power in various state for improvement in pollution.	**05**
	b)	Demonstrate importance of various authorities in implementing Water Cess act 1977 in India.	**05**
Q.3	**a)**	Enumerate various core values and principles of EIA in detail.	**05**
	b)	Discuss importance of numerous elements in Checklist method of EIA methodology.	**04**
Q.4	**a)**	Interpret importance of numerous elements in Adhoc method of EIA methodology.	**05**
	b)	Examine in detail a Trippie Bottom Line approach as a tool for LCA.	**04**
Q.5	**a)**	Demonstrate numerous steps in conducting LCA of partially construction site?	**05**
	b)	Support how does LCA contribute to sustainable development and environmental management strategies in detail?	**04**

Section – II

Q.6	**a)**	Examine how does the WLPA, 1972 establish protected areas, wildlife sanctuaries, and national parks for the conservation of biodiversity?	**05**
	b)	Relate the role of regulatory authorities, such as the Central Pollution Control Board (CPCB) and State Pollution Control Boards (SPCBs), play in the implementation and enforcement of the Wate Act 1974?	**05**

Q.7	**a)**	Demonstrate numerous penalties or consequences determined for violations of the provisions of the EPA, 1986?	**05**
	b)	Enumerate how do the findings and recommendations of an EIA influence decision-making regarding the approval or rejection of proposed projects or developments.	**04**
Q.8	**a)**	Describe the environmental and socioeconomic impacts assessed during the construction stage, including resource use, media quality, health, and safety risks. How do these factors contribute to an integrated impact analysis?	**05**
	b)	Describe the unique considerations of the use, reuse, and maintenance stage in inventory analysis. How does this stage contribute to the overall environmental impact assessment?	**04**
Q.9	**a)**	Discuss how templates are used in inventory analysis to standardize data collection and reporting across different life cycle stages. Why is standardization important?	**05**
	b)	Explain the challenges specific to the recycling and waste management stage in inventory analysis. How do these challenges affect overall life cycle assessment results?	**04**

SLR-BD-29

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Laws and Impact Assessment (CIVHON-01C)

Day & Date: Friday, 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which of the following stage is not included in ISO-14040 framework for life cycle assessment?
a) Life Cycle Impact Assessment (LCIA)
b) Goal and Scope Definition
c) Life Cycle Enhancement (LCE)
d) Life Cycle Inventory (LCI)

2) Which of the below is an advantage of aggregated life cycle inventory database?
a) Possibility for contribution analysis
b) User-friendly
c) Possibility to adapt datasets
d) Possibility to create datasets

3) Which of the following is a common data issue in inventory analysis?
a) Lack of standardized templates for reporting
b) Difficulty in collecting accurate and complete data
c) Reuse of materials during the raw material acquisition stage
d) Increased waste management costs

4) In life cycle inventory analysis, which stage specifically focuses on the extraction and processing of resources for further production?
a) Use/Reuse/Maintenance stage
b) Recycle/Waste Management stage
c) Raw Material acquisition stage
d) Manufacturing stage

5) Which act provide levy from persons adhered to Water Act 1974.
a) Water Cess Act b) Air Act
c) PLC Act d) All of the above

6) Core values of ElA is/are _____.
a) Integrity b) Utility
c) Sustainability d) All of the above

7) According to PLI Act 1991, the inquiry of an application for relief is conducted by _____.
a) Senior Judge b) Collector
c) Police Commissioner d) C.E.O.

8) _____ enforces owner of industry to take out life insurance policies.
a) Water Cess Act
b) Environmental Protection Act
c) PLI Act
d) All of the above

9) Air Act is not applicable in _____.
a) Jammu and Kashmir b) Delhi
c) Punjab d) None of the above

10) Water Cess is collected by _____.
a) State Government b) Central Government
c) Local Authority d) All of the above

11) Objective of EIA report is to achieve _____ development.
a) Livable b) Equitable
c) Sustainable d) All of the above

12) Which act provides provision for affixing of water meters?
a) Water Cess Act
b) Water Act
c) Environmental Protection Act
d) All of the above

13) Which statement dictates the relation between functional unit and reference flows?
a) Reference flows indicates the amounts of input necessary to fulfill the amount of function specified by the functional unit
b) Reference flow provides the basis for functional unit determination
c) Reference flow has no correlation with functional unit
d) Reference flow is the functional unit multiplied by impact factor

14) Choose the correct option _____.

a) Consistency check ensures that all relevant information and data needed were available and used
b) Completeness check determines whether the assumptions, methods and data were aligned with the goals and scopes
c) The ISO standard is referred to identify the significant issues while interpreting results for a specific case
d) The interpretation of results ultimately reports the conclusions, recommendations and limitations of the study

SLR-BD-29

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Laws and Impact Assessment (CIVHON-01C)

Day & Date: Friday, 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Q. No. 6 is compulsory in section II, and solve any two questions from the remaining.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2	**a)**	Relate the role of State Pollution Control Board in balancing the power in various state for improvement in pollution.	**05**
	b)	Demonstrate importance of various authorities in implementing Water Cess act 1977 in India.	**05**
Q.3	**a)**	Enumerate various core values and principles of EIA in detail.	**05**
	b)	Discuss importance of numerous elements in Checklist method of EIA methodology.	**04**
Q.4	**a)**	Interpret importance of numerous elements in Adhoc method of EIA methodology.	**05**
	b)	Examine in detail a Trippie Bottom Line approach as a tool for LCA.	**04**
Q.5	**a)**	Demonstrate numerous steps in conducting LCA of partially construction site?	**05**
	b)	Support how does LCA contribute to sustainable development and environmental management strategies in detail?	**04**

Section – II

Q.6	**a)**	Examine how does the WLPA, 1972 establish protected areas, wildlife sanctuaries, and national parks for the conservation of biodiversity?	**05**
	b)	Relate the role of regulatory authorities, such as the Central Pollution Control Board (CPCB) and State Pollution Control Boards (SPCBs), play in the implementation and enforcement of the Wate Act 1974?	**05**

Q.7	**a)**	Demonstrate numerous penalties or consequences determined for violations of the provisions of the EPA, 1986?	**05**
	b)	Enumerate how do the findings and recommendations of an EIA influence decision-making regarding the approval or rejection of proposed projects or developments.	**04**
Q.8	**a)**	Describe the environmental and socioeconomic impacts assessed during the construction stage, including resource use, media quality, health, and safety risks. How do these factors contribute to an integrated impact analysis?	**05**
	b)	Describe the unique considerations of the use, reuse, and maintenance stage in inventory analysis. How does this stage contribute to the overall environmental impact assessment?	**04**
Q.9	**a)**	Discuss how templates are used in inventory analysis to standardize data collection and reporting across different life cycle stages. Why is standardization important?	**05**
	b)	Explain the challenges specific to the recycling and waste management stage in inventory analysis. How do these challenges affect overall life cycle assessment results?	**04**

Seat No.	

Set **S**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Laws and Impact Assessment (CIVHON-01C)

Day & Date: Friday, 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Water Cess is collected by _____.
a) State Government b) Central Government
c) Local Authority d) All of the above

2) Objective of EIA report is to achieve _____ development.
a) Livable b) Equitable
c) Sustainable d) All of the above

3) Which act provides provision for affixing of water meters?
a) Water Cess Act
b) Water Act
c) Environmental Protection Act
d) All of the above

4) Which statement dictates the relation between functional unit and reference flows?
a) Reference flows indicates the amounts of input necessary to fulfill the amount of function specified by the functional unit
b) Reference flow provides the basis for functional unit determination
c) Reference flow has no correlation with functional unit
d) Reference flow is the functional unit multiplied by impact factor

5) Choose the correct option _____.

a) Consistency check ensures that all relevant information and data needed were available and used
b) Completeness check determines whether the assumptions, methods and data were aligned with the goals and scopes
c) The ISO standard is referred to identify the significant issues while interpreting results for a specific case
d) The interpretation of results ultimately reports the conclusions, recommendations and limitations of the study

6) Which of the following stage is not included in ISO-14040 framework for life cycle assessment?

a) Life Cycle Impact Assessment (LCIA)
b) Goal and Scope Definition
c) Life Cycle Enhancement (LCE)
d) Life Cycle Inventory (LCI)

7) Which of the below is an advantage of aggregated life cycle inventory database?

a) Possibility for contribution analysis
b) User-friendly
c) Possibility to adapt datasets
d) Possibility to create datasets

8) Which of the following is a common data issue in inventory analysis?

a) Lack of standardized templates for reporting
b) Difficulty in collecting accurate and complete data
c) Reuse of materials during the raw material acquisition stage
d) Increased waste management costs

9) In life cycle inventory analysis, which stage specifically focuses on the extraction and processing of resources for further production?

a) Use/Reuse/Maintenance stage
b) Recycle/Waste Management stage
c) Raw Material acquisition stage
d) Manufacturing stage

10) Which act provide levy from persons adhered to Water Act 1974.

a) Water Cess Act
b) Air Act
c) PLC Act
d) All of the above

11) Core values of ElA is/are _____.

a) Integrity
b) Utility
c) Sustainability
d) All of the above

12) According to PLI Act 1991, the inquiry of an application for relief is conducted by _____.

a) Senior Judge
b) Collector
c) Police Commissioner
d) C.E.O.

13) _____ enforces owner of industry to take out life insurance policies.

a) Water Cess Act
b) Environmental Protection Act
c) PLI Act
d) All of the above

14) Air Act is not applicable in _____.

a) Jammu and Kashmir
b) Delhi
c) Punjab
d) None of the above

SLR-BD-29

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Laws and Impact Assessment (CIVHON-01C)

Day & Date: Friday, 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Q. No. 6 is compulsory in section II, and solve any two questions from the remaining.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2	**a)**	Relate the role of State Pollution Control Board in balancing the power in various state for improvement in pollution.	**05**
	b)	Demonstrate importance of various authorities in implementing Water Cess act 1977 in India.	**05**
Q.3	**a)**	Enumerate various core values and principles of EIA in detail.	**05**
	b)	Discuss importance of numerous elements in Checklist method of EIA methodology.	**04**
Q.4	**a)**	Interpret importance of numerous elements in Adhoc method of EIA methodology.	**05**
	b)	Examine in detail a Trippie Bottom Line approach as a tool for LCA.	**04**
Q.5	**a)**	Demonstrate numerous steps in conducting LCA of partially construction site?	**05**
	b)	Support how does LCA contribute to sustainable development and environmental management strategies in detail?	**04**

Section – II

Q.6	**a)**	Examine how does the WLPA, 1972 establish protected areas, wildlife sanctuaries, and national parks for the conservation of biodiversity?	**05**
	b)	Relate the role of regulatory authorities, such as the Central Pollution Control Board (CPCB) and State Pollution Control Boards (SPCBs), play in the implementation and enforcement of the Wate Act 1974?	**05**

Q.7	**a)**	Demonstrate numerous penalties or consequences determined for violations of the provisions of the EPA, 1986?	**05**
	b)	Enumerate how do the findings and recommendations of an EIA influence decision-making regarding the approval or rejection of proposed projects or developments.	**04**
Q.8	**a)**	Describe the environmental and socioeconomic impacts assessed during the construction stage, including resource use, media quality, health, and safety risks. How do these factors contribute to an integrated impact analysis?	**05**
	b)	Describe the unique considerations of the use, reuse, and maintenance stage in inventory analysis. How does this stage contribute to the overall environmental impact assessment?	**04**
Q.9	**a)**	Discuss how templates are used in inventory analysis to standardize data collection and reporting across different life cycle stages. Why is standardization important?	**05**
	b)	Explain the challenges specific to the recycling and waste management stage in inventory analysis. How do these challenges affect overall life cycle assessment results?	**04**

SLR-BD-30

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Applications of Information Technology and Information systems
(CIVHON-01B)

Day & Date: Friday, 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. 14

1) Minimization problems are used for _____ computations.
a) Outgoings b) Loss
c) Manufacturing Cost d) All of above

2) GIS uses the information from which of the following sources?
a) Non-spatial information system
b) Spatial information system
c) Global information system
d) Position information system

3) Maintaining ____ level of inventory is the primary objective of different inventory models.
a) Maximum b) Minimum
c) Optimum d) None

4) In _____ inventory model, it is assumed that there is no uncertainty associated with demand.
a) Deterministic b) Probabilistic
c) Both a & b d) None

5) Every optimization problem has three components viz _____.
a) objective function, guided path, distribution
b) objective function, decision variables, guided path
c) objective function, decision variables, constraints
d) All of the above

6) In optimization of a design, the design objective could be simply to ____.
a) Minimize the cost of production
b) maximize the efficiency of production
c) a & b both
d) none

7) Graphical method for solution of linear problems is useful up to _____ variables only.
a) 0 b) 2
c) 4 d) 6

8) Information technology deals with _____.
a) Information b) Data
c) Knowledge d) All of these

9) Which software is primarily used for project scheduling and management in construction?
a) AutoCAD b) STAAD.Pro
c) MS Project (MSP) d) Revit

10) What does CAD stand for in the context of civil engineering?
a) Computer-Aided Drawing b) Computer-Assisted Design
c) Construction-Aided Design d) Computer-Aided Design

11) The 'Constraints' in an optimization problem represent _____.
a) The goals to be achieved
b) The variables that can be changed
c) The limitations or restrictions
d) The final solution

12) Which technology allows for overlaying digital information onto the real world?
a) Virtual Reality (VR)
b) 3D Printing
c) Augmented Reality (AR)
d) Geographic Information System (GIS)

13) What is a key benefit of using Building Information Modeling (BIM)?
a) Reduced material cost only
b) Faster concrete setting time
c) Improved collaboration and clash detection
d) Automated drone surveying

14) Linear Programming is a technique used for _____.
a) Resource allocation optimization
b) Structural analysis
c) Material testing
d) Surveying calculations

SLR-BD-30

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Applications of Information Technology and Information systems
(CIVHON-01B)

Day & Date: Friday, 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Q. No. 6 is compulsory in section II, and solve any two questions from the remaining.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 **a)** Which software are used in construction industry for different purposes? List at least four categories and one software example for each. **05**

b) What is an 'Information System' and how does it differ from 'Information Technology'? **05**

Q.3 Solve the following Linear programming problem using Graphical method. **09**
Minimize $Z = 3X_1 + 5X_2$
Subject to, $X_1 + 3X_2 \geq 3$
$X_1 + X_2 \geq 2$
$X_1, X_2 \geq 0$

Q.4 **a)** Explain the terms: **04**
i) Business and Information Management
ii) Computer Aided Cost Estimation

b) Describe the different types of inventory models (Deterministic vs Probabilistic). **05**

Q.5 **a)** Explain the concept of 'constraints' in Linear Programming Problems with examples relevant to civil engineering. **05**

b) Discuss two ways IT applications enhance communication on a construction project site. **04**

Section – II

Q.6	**a)**	What are the roles & responsibilities of the Project Manager?	**05**
	b)	What is meant by 'Automation' in the context of construction? Give two examples.	**05**
Q.7	**a)**	Explain in detail 3D Printing in construction, covering materials and process.	**05**
	b)	What is a Work Breakdown Structure (WBS) and why is it essential for project planning?	**04**
Q.8		Write short notes on: i) Applications of GIS in Infrastructure Management ii) Automated Highway Systems	**09**
Q.9		Discuss the benefits and challenges of implementing Building Information Modelling (BIM) in a typical civil engineering project in India.	**09**

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Applications of Information Technology and Information systems
(CIVHON-01B)

Day & Date: Friday, 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. **14**

1) Information technology deals with _____.
a) Information b) Data
c) Knowledge d) All of these

2) Which software is primarily used for project scheduling and management in construction?
a) AutoCAD b) STAAD.Pro
c) MS Project (MSP) d) Revit

3) What does CAD stand for in the context of civil engineering?
a) Computer-Aided Drawing b) Computer-Assisted Design
c) Construction-Aided Design d) Computer-Aided Design

4) The 'Constraints' in an optimization problem represent _____.
a) The goals to be achieved
b) The variables that can be changed
c) The limitations or restrictions
d) The final solution

5) Which technology allows for overlaying digital information onto the real world?
a) Virtual Reality (VR)
b) 3D Printing
c) Augmented Reality (AR)
d) Geographic Information System (GIS)

6) What is a key benefit of using Building Information Modeling (BIM)?
a) Reduced material cost only
b) Faster concrete setting time
c) Improved collaboration and clash detection
d) Automated drone surveying

7) Linear Programming is a technique used for _____.
a) Resource allocation optimization
b) Structural analysis
c) Material testing
d) Surveying calculations

8) Minimization problems are used for _____ computations.
a) Outgoings b) Loss
c) Manufacturing Cost d) All of above

9) GIS uses the information from which of the following sources?
a) Non-spatial information system
b) Spatial information system
c) Global information system
d) Position information system

10) Maintaining ____ level of inventory is the primary objective of different inventory models.
a) Maximum b) Minimum
c) Optimum d) None

11) In _____ inventory model, it is assumed that there is no uncertainty associated with demand.
a) Deterministic b) Probabilistic
c) Both a & b d) None

12) Every optimization problem has three components viz _____.
a) objective function, guided path, distribution
b) objective function, decision variables, guided path
c) objective function, decision variables, constraints
d) All of the above

13) In optimization of a design, the design objective could be simply to ____.
a) Minimize the cost of production
b) maximize the efficiency of production
c) a & b both
d) none

14) Graphical method for solution of linear problems is useful up to _____ variables only.
a) 0 b) 2
c) 4 d) 6

SLR-BD-30

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Applications of Information Technology and Information systems
(CIVHON-01B)

Day & Date: Friday, 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Q. No. 6 is compulsory in section II, and solve any two questions from the remaining.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 **a)** Which software are used in construction industry for different purposes? List at least four categories and one software example for each. **05**

b) What is an 'Information System' and how does it differ from 'Information Technology'? **05**

Q.3 Solve the following Linear programming problem using Graphical method. **09**
Minimize $Z = 3X_1 + 5X_2$
Subject to, $X_1 + 3X_2 \geq 3$
$X_1 + X_2 \geq 2$
$X_1, X_2 \geq 0$

Q.4 **a)** Explain the terms: **04**
i) Business and Information Management
ii) Computer Aided Cost Estimation

b) Describe the different types of inventory models (Deterministic vs Probabilistic). **05**

Q.5 **a)** Explain the concept of 'constraints' in Linear Programming Problems with examples relevant to civil engineering. **05**

b) Discuss two ways IT applications enhance communication on a construction project site. **04**

Section – II

Q.6	**a)**	What are the roles & responsibilities of the Project Manager?	**05**
	b)	What is meant by 'Automation' in the context of construction? Give two examples.	**05**
Q.7	**a)**	Explain in detail 3D Printing in construction, covering materials and process.	**05**
	b)	What is a Work Breakdown Structure (WBS) and why is it essential for project planning?	**04**
Q.8		Write short notes on: i) Applications of GIS in Infrastructure Management ii) Automated Highway Systems	**09**
Q.9		Discuss the benefits and challenges of implementing Building Information Modelling (BIM) in a typical civil engineering project in India.	**09**

SLR-BD-30

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Applications of Information Technology and Information systems
(CIVHON-01B)

Day & Date: Friday, 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. 14

1) The 'Constraints' in an optimization problem represent _____.
a) The goals to be achieved
b) The variables that can be changed
c) The limitations or restrictions
d) The final solution

2) Which technology allows for overlaying digital information onto the real world?
a) Virtual Reality (VR)
b) 3D Printing
c) Augmented Reality (AR)
d) Geographic Information System (GIS)

3) What is a key benefit of using Building Information Modeling (BIM)?
a) Reduced material cost only
b) Faster concrete setting time
c) Improved collaboration and clash detection
d) Automated drone surveying

4) Linear Programming is a technique used for _____.
a) Resource allocation optimization
b) Structural analysis
c) Material testing
d) Surveying calculations

5) Minimization problems are used for _____ computations.
a) Outgoings b) Loss
c) Manufacturing Cost d) All of above

6) GIS uses the information from which of the following sources?
a) Non-spatial information system
b) Spatial information system
c) Global information system
d) Position information system

7) Maintaining ____ level of inventory is the primary objective of different inventory models.
a) Maximum b) Minimum
c) Optimum d) None

8) In _____ inventory model, it is assumed that there is no uncertainty associated with demand.
a) Deterministic b) Probabilistic
c) Both a & b d) None

9) Every optimization problem has three components viz _____.
a) objective function, guided path, distribution
b) objective function, decision variables, guided path
c) objective function, decision variables, constraints
d) All of the above

10) In optimization of a design, the design objective could be simply to ____.
a) Minimize the cost of production
b) maximize the efficiency of production
c) a & b both
d) none

11) Graphical method for solution of linear problems is useful up to _____ variables only.
a) 0 b) 2
c) 4 d) 6

12) Information technology deals with _____.
a) Information b) Data
c) Knowledge d) All of these

13) Which software is primarily used for project scheduling and management in construction?
a) AutoCAD b) STAAD.Pro
c) MS Project (MSP) d) Revit

14) What does CAD stand for in the context of civil engineering?
a) Computer-Aided Drawing b) Computer-Assisted Design
c) Construction-Aided Design d) Computer-Aided Design

SLR-BD-30

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Applications of Information Technology and Information systems
(CIVHON-01B)

Day & Date: Friday, 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Q. No. 6 is compulsory in section II, and solve any two questions from the remaining.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 **a)** Which software are used in construction industry for different purposes? List at least four categories and one software example for each. **05**

b) What is an 'Information System' and how does it differ from 'Information Technology'? **05**

Q.3 Solve the following Linear programming problem using Graphical method. **09**
Minimize $Z = 3X_1 + 5X_2$
Subject to, $X_1 + 3X_2 \geq 3$
$X_1 + X_2 \geq 2$
$X_1, X_2 \geq 0$

Q.4 **a)** Explain the terms: **04**
i) Business and Information Management
ii) Computer Aided Cost Estimation

b) Describe the different types of inventory models (Deterministic vs Probabilistic). **05**

Q.5 **a)** Explain the concept of 'constraints' in Linear Programming Problems with examples relevant to civil engineering. **05**

b) Discuss two ways IT applications enhance communication on a construction project site. **04**

Section – II

Q.6	**a)**	What are the roles & responsibilities of the Project Manager?	**05**
	b)	What is meant by 'Automation' in the context of construction? Give two examples.	**05**
Q.7	**a)**	Explain in detail 3D Printing in construction, covering materials and process.	**05**
	b)	What is a Work Breakdown Structure (WBS) and why is it essential for project planning?	**04**
Q.8		Write short notes on: i) Applications of GIS in Infrastructure Management ii) Automated Highway Systems	**09**
Q.9		Discuss the benefits and challenges of implementing Building Information Modelling (BIM) in a typical civil engineering project in India.	**09**

SLR-BD-30

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Applications of Information Technology and Information systems
(CIVHON-01B)

Day & Date: Friday, 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the options. 14

1) In optimization of a design, the design objective could be simply to ____.
a) Minimize the cost of production
b) maximize the efficiency of production
c) a & b both
d) none

2) Graphical method for solution of linear problems is useful up to _____ variables only.
a) 0 b) 2
c) 4 d) 6

3) Information technology deals with _____.
a) Information b) Data
c) Knowledge d) All of these

4) Which software is primarily used for project scheduling and management in construction?
a) AutoCAD b) STAAD.Pro
c) MS Project (MSP) d) Revit

5) What does CAD stand for in the context of civil engineering?
a) Computer-Aided Drawing b) Computer-Assisted Design
c) Construction-Aided Design d) Computer-Aided Design

6) The 'Constraints' in an optimization problem represent _____.
a) The goals to be achieved
b) The variables that can be changed
c) The limitations or restrictions
d) The final solution

7) Which technology allows for overlaying digital information onto the real world?
a) Virtual Reality (VR)
b) 3D Printing
c) Augmented Reality (AR)
d) Geographic Information System (GIS)

8) What is a key benefit of using Building Information Modeling (BIM)?
a) Reduced material cost only
b) Faster concrete setting time
c) Improved collaboration and clash detection
d) Automated drone surveying

9) Linear Programming is a technique used for _____.
a) Resource allocation optimization
b) Structural analysis
c) Material testing
d) Surveying calculations

10) Minimization problems are used for _____ computations.
a) Outgoings b) Loss
c) Manufacturing Cost d) All of above

11) GIS uses the information from which of the following sources?
a) Non-spatial information system
b) Spatial information system
c) Global information system
d) Position information system

12) Maintaining ____ level of inventory is the primary objective of different inventory models.
a) Maximum b) Minimum
c) Optimum d) None

13) In _____ inventory model, it is assumed that there is no uncertainty associated with demand.
a) Deterministic b) Probabilistic
c) Both a & b d) None

14) Every optimization problem has three components viz _____.
a) objective function, guided path, distribution
b) objective function, decision variables, guided path
c) objective function, decision variables, constraints
d) All of the above

SLR-BD-30

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Applications of Information Technology and Information systems
(CIVHON-01B)

Day & Date: Friday, 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Q. No. 6 is compulsory in section II, and solve any two questions from the remaining.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 **a)** Which software are used in construction industry for different purposes? List at least four categories and one software example for each. **05**

b) What is an 'Information System' and how does it differ from 'Information Technology'? **05**

Q.3 Solve the following Linear programming problem using Graphical method. **09**
Minimize $Z = 3X_1 + 5X_2$
Subject to, $X_1 + 3X_2 \geq 3$
$X_1 + X_2 \geq 2$
$X_1, X_2 \geq 0$

Q.4 **a)** Explain the terms: **04**
i) Business and Information Management
ii) Computer Aided Cost Estimation

b) Describe the different types of inventory models (Deterministic vs Probabilistic). **05**

Q.5 **a)** Explain the concept of 'constraints' in Linear Programming Problems with examples relevant to civil engineering. **05**

b) Discuss two ways IT applications enhance communication on a construction project site. **04**

Section – II

Q.6	**a)**	What are the roles & responsibilities of the Project Manager?	**05**
	b)	What is meant by 'Automation' in the context of construction? Give two examples.	**05**
Q.7	**a)**	Explain in detail 3D Printing in construction, covering materials and process.	**05**
	b)	What is a Work Breakdown Structure (WBS) and why is it essential for project planning?	**04**
Q.8		Write short notes on: i) Applications of GIS in Infrastructure Management ii) Automated Highway Systems	**09**
Q.9		Discuss the benefits and challenges of implementing Building Information Modelling (BIM) in a typical civil engineering project in India.	**09**

SLR-BD-31

Seat No.		Set	P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Design Thinking (CIVHON-01A)

Day & Date: Friday,23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Design Thinking is a Linear Process. True or False?
a) True b) False

2) Which of the Following Represents the Correct Steps of the Design Thinking Process?
a) Understand > Draw > Ideate > Create > Test > Implement
b) Empathize > Define > Ideate > Prototype > Test > Implement
c) Empathize > Design > Implement > Produce > Test
d) Understand > Define > Ideate > Produce > Try

3) Once the problem is defined, the next step in the design thinking process is to _____.
a) Test b) Prototype
c) Ideate d) Empathize

4) Design Thinking Skills _____.
a) Emotional Intelligence b) Consensus Building
c) Both (a) and (b) d) None of these

5) Establishing the relative importance of customer need can be done only after _____.
a) Organizing data into a hierarchy of customer needs
b) Collecting raw data from customers
c) Reflecting on the results and the process of identifying customer need
d) None of the above

6) Focus groups are one of the methods for _____.
a) Interpreting raw data collected from customers
b) Organizing data into a hierarchy of customer needs
c) Gathering raw data from customers
d) Reflecting on the results and the process of identifying customer need

7) Which phase of the product development process is most associated with creativity and brainstorming?
a) Testing
b) Prototyping
c) Ideation
d) Marketing

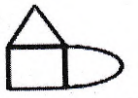
8) What is the role of prototyping in product development?
a) To finalize the product design
b) To visualize and test design ideas or replica of your product or model
c) To conduct market research
d) To increase production costs

9) What is an aspect of service design?
a) Resources to connect people and/or machines
b) Environmental
c) Process and experience
d) All of above

10) What is a service?
a) A provided way for performing a task
b) How the user interacts with a product
c) When a person helps the user buys something
d) A way to evaluate whether a task is achieved or not

11) Design Service Process dependencies should be kept to a _____.
a) Minimum
b) Maximum
c) Equal
d) None of above

12) Figure shows the conceptual drawing of a (n) _____ architecture.



a) Slot-modular
b) Bus-modular
c) Sectional-modular
d) Integral

13) Environmental impact that affect the product life cycle.
a) Global warming
b) Solid waste
c) Water pollution
d) All of These

14) Design for Environment (DFE) is a method to _____ environmental impact of product over its life cycle.
a) Maximize
b) Minimize
c) Equal
d) None of above

SLR-BD-31

Seat No.		Set	P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Design Thinking (CIVHON-01A)

Day & Date: Friday,23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Q. No. 6 is compulsory in section II, and solve any two questions from the remaining.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2	**a)**	How does design thinking differ from traditional approaches?	**06**
	b)	Enlist and Briefly Explain Various Design Thinking Skills?	**04**
Q.3	**a)**	What are the different goals of customer needs identification?	**04**
	b)	Explain the term identify the customer need. What are the different methods to identify the customer need and explain in brief?	**05**
Q.4	**a)**	What is Creativity? How is Creativity Applied Effectively in Problem-Solving?	**04**
	b)	What is Concept Generation? Explain the Five-Step Concept Generation Process with a Flow Diagram.	**05**
Q.5	**a)**	Enlist and briefly explain the various mindsets in Design thinking.	**04**
	b)	Explain the Term "Prototyping" and describe the various types of Prototypes.	**05**

Section – II

Q.6 Attempt following Question. (Any 2)

a)	What do you mean by Service Design? Explain Service Design in brief.	**05**
b)	Explain the concept of Product Development Framework.	**05**
c)	What are the different tools used in Service Design? Briefly explain each tool.	**05**

Q.7 Attempt following Question. (Any 3) **09**

a) What are the difference between Modular Product Architecture and Integral Product Architecture?

b) What is Financial Analysis? Explain it briefly along with its different needs.

c) Explain the term "Product Architecture" in brief.

d) Explain Modular Product Architecture and describe its different types with examples.

Q.8 Attempt following Question. (Any 3) **09**

a) What is the Spiral Product Development Process? Explain it briefly.

b) Draw and briefly explain the design for Environment Process.

c) What is the environmental impact over the Product Life Cycle?

d) What does the term "Design for Environment" mean, explain it in brief?

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Design Thinking (CIVHON-01A)

Day & Date: Friday,23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

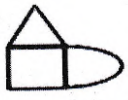
1) What is the role of prototyping in product development?
a) To finalize the product design
b) To visualize and test design ideas or replica of your product or model
c) To conduct market research
d) To increase production costs

2) What is an aspect of service design?
a) Resources to connect people and/or machines
b) Environmental
c) Process and experience
d) All of above

3) What is a service?
a) A provided way for performing a task
b) How the user interacts with a product
c) When a person helps the user buys something
d) A way to evaluate whether a task is achieved or not

4) Design Service Process dependencies should be kept to a _____.
a) Minimum b) Maximum
c) Equal d) None of above

5) Figure shows the conceptual drawing of a (n) _____ architecture.



a) Slot-modular b) Bus-modular
c) Sectional-modular d) Integral

6) Environmental impact that affect the product life cycle.
a) Global warming
b) Solid waste
c) Water pollution
d) All of These

7) Design for Environment (DFE) is a method to _____ environmental impact of product over its life cycle.
a) Maximize
b) Minimize
c) Equal
d) None of above

8) Design Thinking is a Linear Process. True or False?
a) True
b) False

9) Which of the Following Represents the Correct Steps of the Design Thinking Process?
a) Understand > Draw > Ideate > Create > Test > Implement
b) Empathize > Define > Ideate > Prototype > Test > Implement
c) Empathize > Design > Implement > Produce > Test
d) Understand > Define > Ideate > Produce > Try

10) Once the problem is defined, the next step in the design thinking process is to _____.
a) Test
b) Prototype
c) Ideate
d) Empathize

11) Design Thinking Skills _____.
a) Emotional Intelligence
b) Consensus Building
c) Both (a) and (b)
d) None of these

12) Establishing the relative importance of customer need can be done only after _____.
a) Organizing data into a hierarchy of customer needs
b) Collecting raw data from customers
c) Reflecting on the results and the process of identifying customer need
d) None of the above

13) Focus groups are one of the methods for _____.
a) Interpreting raw data collected from customers
b) Organizing data into a hierarchy of customer needs
c) Gathering raw data from customers
d) Reflecting on the results and the process of identifying customer need

14) Which phase of the product development process is most associated with creativity and brainstorming?
a) Testing
b) Prototyping
c) Ideation
d) Marketing

SLR-BD-31

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Design Thinking (CIVHON-01A)

Day & Date: Friday,23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Q. No. 6 is compulsory in section II, and solve any two questions from the remaining.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2	**a)**	How does design thinking differ from traditional approaches?	**06**
	b)	Enlist and Briefly Explain Various Design Thinking Skills?	**04**
Q.3	**a)**	What are the different goals of customer needs identification?	**04**
	b)	Explain the term identify the customer need. What are the different methods to identify the customer need and explain in brief?	**05**
Q.4	**a)**	What is Creativity? How is Creativity Applied Effectively in Problem-Solving?	**04**
	b)	What is Concept Generation? Explain the Five-Step Concept Generation Process with a Flow Diagram.	**05**
Q.5	**a)**	Enlist and briefly explain the various mindsets in Design thinking.	**04**
	b)	Explain the Term "Prototyping" and describe the various types of Prototypes.	**05**

Section – II

Q.6 Attempt following Question. (Any 2)

a)	What do you mean by Service Design? Explain Service Design in brief.	**05**
b)	Explain the concept of Product Development Framework.	**05**
c)	What are the different tools used in Service Design? Briefly explain each tool.	**05**

Q.7 Attempt following Question. (Any 3) **09**

a) What are the difference between Modular Product Architecture and Integral Product Architecture?

b) What is Financial Analysis? Explain it briefly along with its different needs.

c) Explain the term "Product Architecture" in brief.

d) Explain Modular Product Architecture and describe its different types with examples.

Q.8 Attempt following Question. (Any 3) **09**

a) What is the Spiral Product Development Process? Explain it briefly.

b) Draw and briefly explain the design for Environment Process.

c) What is the environmental impact over the Product Life Cycle?

d) What does the term "Design for Environment" mean, explain it in brief?

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Design Thinking (CIVHON-01A)

Day & Date: Friday,23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

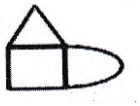
MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Design Service Process dependencies should be kept to a _____.
a) Minimum b) Maximum
c) Equal d) None of above

2) Figure shows the conceptual drawing of a (n) _____ architecture.



a) Slot-modular b) Bus-modular
c) Sectional-modular d) Integral

3) Environmental impact that affect the product life cycle.
a) Global warming b) Solid waste
c) Water pollution d) All of These

4) Design for Environment (DFE) is a method to _____ environmental impact of product over its life cycle.
a) Maximize b) Minimize
c) Equal d) None of above

5) Design Thinking is a Linear Process. True or False?
a) True b) False

6) Which of the Following Represents the Correct Steps of the Design Thinking Process?
a) Understand > Draw > Ideate > Create > Test > Implement
b) Empathize > Define > Ideate > Prototype > Test > Implement
c) Empathize > Design > Implement > Produce > Test
d) Understand > Define > Ideate > Produce > Try

7) Once the problem is defined, the next step in the design thinking process is to _____.

a) Test
b) Prototype
c) Ideate
d) Empathize

8) Design Thinking Skills _____.

a) Emotional Intelligence
b) Consensus Building
c) Both (a) and (b)
d) None of these

9) Establishing the relative importance of customer need can be done only after _____.

a) Organizing data into a hierarchy of customer needs
b) Collecting raw data from customers
c) Reflecting on the results and the process of identifying customer need
d) None of the above

10) Focus groups are one of the methods for _____.

a) Interpreting raw data collected from customers
b) Organizing data into a hierarchy of customer needs
c) Gathering raw data from customers
d) Reflecting on the results and the process of identifying customer need

11) Which phase of the product development process is most associated with creativity and brainstorming?

a) Testing
b) Prototyping
c) Ideation
d) Marketing

12) What is the role of prototyping in product development?

a) To finalize the product design
b) To visualize and test design ideas or replica of your product or model
c) To conduct market research
d) To increase production costs

13) What is an aspect of service design?

a) Resources to connect people and/or machines
b) Environmental
c) Process and experience
d) All of above

14) What is a service?

a) A provided way for performing a task
b) How the user interacts with a product
c) When a person helps the user buys something
d) A way to evaluate whether a task is achieved or not

SLR-BD-31

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Design Thinking (CIVHON-01A)

Day & Date: Friday,23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Q. No. 6 is compulsory in section II, and solve any two questions from the remaining.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2	**a)**	How does design thinking differ from traditional approaches?	**06**
	b)	Enlist and Briefly Explain Various Design Thinking Skills?	**04**
Q.3	**a)**	What are the different goals of customer needs identification?	**04**
	b)	Explain the term identify the customer need. What are the different methods to identify the customer need and explain in brief?	**05**
Q.4	**a)**	What is Creativity? How is Creativity Applied Effectively in Problem-Solving?	**04**
	b)	What is Concept Generation? Explain the Five-Step Concept Generation Process with a Flow Diagram.	**05**
Q.5	**a)**	Enlist and briefly explain the various mindsets in Design thinking.	**04**
	b)	Explain the Term "Prototyping" and describe the various types of Prototypes.	**05**

Section – II

Q.6 Attempt following Question. (Any 2)

a)	What do you mean by Service Design? Explain Service Design in brief.	**05**
b)	Explain the concept of Product Development Framework.	**05**
c)	What are the different tools used in Service Design? Briefly explain each tool.	**05**

Q.7 Attempt following Question. (Any 3) **09**

a) What are the difference between Modular Product Architecture and Integral Product Architecture?

b) What is Financial Analysis? Explain it briefly along with its different needs.

c) Explain the term "Product Architecture" in brief.

d) Explain Modular Product Architecture and describe its different types with examples.

Q.8 Attempt following Question. (Any 3) **09**

a) What is the Spiral Product Development Process? Explain it briefly.

b) Draw and briefly explain the design for Environment Process.

c) What is the environmental impact over the Product Life Cycle?

d) What does the term "Design for Environment" mean, explain it in brief?

SLR-BD-31

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Design Thinking (CIVHON-01A)

Day & Date: Friday,23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Focus groups are one of the methods for _____.
a) Interpreting raw data collected from customers
b) Organizing data into a hierarchy of customer needs
c) Gathering raw data from customers
d) Reflecting on the results and the process of identifying customer need

2) Which phase of the product development process is most associated with creativity and brainstorming?
a) Testing b) Prototyping
c) Ideation d) Marketing

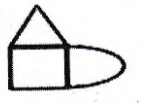
3) What is the role of prototyping in product development?
a) To finalize the product design
b) To visualize and test design ideas or replica of your product or model
c) To conduct market research
d) To increase production costs

4) What is an aspect of service design?
a) Resources to connect people and/or machines
b) Environmental
c) Process and experience
d) All of above

5) What is a service?
a) A provided way for performing a task
b) How the user interacts with a product
c) When a person helps the user buys something
d) A way to evaluate whether a task is achieved or not

6) Design Service Process dependencies should be kept to a _____.
a) Minimum b) Maximum
c) Equal d) None of above

7) Figure shows the conceptual drawing of a (n) _____ architecture.



a) Slot-modular b) Bus-modular
c) Sectional-modular d) Integral

8) Environmental impact that affect the product life cycle.
a) Global warming b) Solid waste
c) Water pollution d) All of These

9) Design for Environment (DFE) is a method to _____ environmental impact of product over its life cycle.
a) Maximize b) Minimize
c) Equal d) None of above

10) Design Thinking is a Linear Process. True or False?
a) True b) False

11) Which of the Following Represents the Correct Steps of the Design Thinking Process?
a) Understand > Draw > Ideate > Create > Test > Implement
b) Empathize > Define > Ideate > Prototype > Test > Implement
c) Empathize > Design > Implement > Produce > Test
d) Understand > Define > Ideate > Produce > Try

12) Once the problem is defined, the next step in the design thinking process is to _____.
a) Test b) Prototype
c) Ideate d) Empathize

13) Design Thinking Skills _____.
a) Emotional Intelligence b) Consensus Building
c) Both (a) and (b) d) None of these

14) Establishing the relative importance of customer need can be done only after _____.
a) Organizing data into a hierarchy of customer needs
b) Collecting raw data from customers
c) Reflecting on the results and the process of identifying customer need
d) None of the above

SLR-BD-31

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Design Thinking (CIVHON-01A)

Day & Date: Friday,23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Q. No. 6 is compulsory in section II, and solve any two questions from the remaining.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2	**a)**	How does design thinking differ from traditional approaches?	**06**
	b)	Enlist and Briefly Explain Various Design Thinking Skills?	**04**
Q.3	**a)**	What are the different goals of customer needs identification?	**04**
	b)	Explain the term identify the customer need. What are the different methods to identify the customer need and explain in brief?	**05**
Q.4	**a)**	What is Creativity? How is Creativity Applied Effectively in Problem-Solving?	**04**
	b)	What is Concept Generation? Explain the Five-Step Concept Generation Process with a Flow Diagram.	**05**
Q.5	**a)**	Enlist and briefly explain the various mindsets in Design thinking.	**04**
	b)	Explain the Term "Prototyping" and describe the various types of Prototypes.	**05**

Section – II

Q.6 Attempt following Question. (Any 2)

a)	What do you mean by Service Design? Explain Service Design in brief.	**05**
b)	Explain the concept of Product Development Framework.	**05**
c)	What are the different tools used in Service Design? Briefly explain each tool.	**05**

Q.7 Attempt following Question. (Any 3) **09**

a) What are the difference between Modular Product Architecture and Integral Product Architecture?

b) What is Financial Analysis? Explain it briefly along with its different needs.

c) Explain the term "Product Architecture" in brief.

d) Explain Modular Product Architecture and describe its different types with examples.

Q.8 Attempt following Question. (Any 3) **09**

a) What is the Spiral Product Development Process? Explain it briefly.

b) Draw and briefly explain the design for Environment Process.

c) What is the environmental impact over the Product Life Cycle?

d) What does the term "Design for Environment" mean, explain it in brief?

SLR-BD-32

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Railway Track Structure (CIVHON-01D)

Day & Date: Friday, 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentences. **14**

1) Which gauge is most used on Indian Railways?
a) Narrow Gauge b) Standard Gauge
c) Broad Gauge d) Meter Gauge

2) What is the purpose of the Long-Term Corporate Plan of Indian Railways?
a) To privatize the railway system completely
b) To ensure the financial autonomy of Indian Railways
c) To provide a roadmap for infrastructure, technology, and operational development
d) To reduce railway tariffs for passengers

3) Which type of survey is primarily used to estimate passenger and freight volumes for a proposed railway line?
a) Traffic Survey b) Preliminary Survey
c) Reconnaissance Survey d) Final Location Survey

4) What does a Preliminary Engineering-cum-Traffic Survey aim to achieve?
a) To determine the technical feasibility and cost estimates
b) To finalize the alignment of the railway line
c) To conduct land acquisition activities
d) To test soil conditions for track laying

5) What is the primary purpose of superelevation on a curve?
a) To allow higher permissible speeds
b) To prevent derailment by counteracting centrifugal force
c) To improve passenger comfort
d) All of the above

6) What is the term used for increasing the width of the gauge on curves to ensure safety and minimize wear and tear?
a) Extra clearance
b) Gauge widening
c) Grade Compensation
d) Superelevation

7) Which of the following is a key requirement for an ideal rail section?
a) High tensile strength and resistance to wear
b) Low weight to reduce manufacturing costs
c) Easy transportation and installation
d) Ability to withstand extreme weather conditions

8) What is the main advantage of concrete sleepers over wooden sleepers?
a) Greater durability and longer life span
b) Lower cost of production
c) Higher flexibility in track design
d) Easier to transport and install

9) What is one of the main causes of creep in railway tracks?
a) Excessive axle load
b) Friction between the wheel and rail
c) Temperature variations causing expansion and contraction
d) Lack of maintenance of fastenings

10) Which portion of the railway track is most susceptible to creep?
a) Gradient sections
b) Curves
c) Level crossings
d) Points and crossings

11) What is the purpose of grade compensation on curves?
a) To decrease the gradient for easier climbing
b) To counterbalance additional resistance caused by curvature
c) To improve visibility on sharp curves
d) To increase train speed on curves

12) What is the primary function of the ballast in railway track structure?
a) To provide stability to the track
b) To reduce vibration and noise
c) To support the weight of the train
d) All of the above

13) Which of the following is true regarding the inspection and maintenance of points and crossings?

a) Regular lubrication of all movable parts is unnecessary.
b) Broken switches and crossings can be ignored during inspection.
c) Frequent monitoring prevents derailments and ensures safe operation.
d) Worn-out parts must be reconditioned without following specifications

14) What is the standard slope for the formation of railway embankments to ensure stability?

a) 1:1 b) 2:1
c) 3:1 d) 4:1

SLR-BD-32

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Railway Track Structure (CIVHON-01D)

Day & Date: Friday, 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Q. No. 6 is compulsory in section II, and solve any two questions from the remaining.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Solve the following questions. **08**
a) Write the Plan of Indian Railways.
b) What are the different modes of Transport?

Q.3 Solve the following questions. **10**
a) What are the Modern Surveying techniques for Difficult Terrain?
b) Write the importance of surveying in construction of Railway line.

Q.4 Solve the following questions. **10**
a) Explain horizontal and Vertical curves.
b) What is Superelevation, Safe Speed on Curves?

Q.5 Solve the following questions. **10**
a) What are the Different Gauges on Indian Railways? Explain in detail.
e) What is the necessity for Geometric Design of curve in railway line?

Section – II

Q.6 Solve the following questions. **08**
a) What are the functions and requirements of Sleepers?
b) What are the Laboratory Tests for Physical Properties of Ballast?

Q.7 Solve the following questions. **10**
a) Write a note on Blanket and Blanketing Material.
b) Explain the methods and challenges involved in the execution of earthwork in embankments and cuttings for railway tracks.

Q.8 Solve the following questions. **10**

a) What are the cautions considered in inspection and maintenance of Points and Crossings?

b) What are the different types of railway curves, and how are they classified?

Q.8 Solve the following questions. **10**

a) What is the creep in rial, causes of Development of Creep?

b) What are Switches, Tongue Rails, Crossing, Angle of Crossing?

SLR-BD-32

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Railway Track Structure (CIVHON-01D)

Day & Date: Friday, 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentences. **14**

1) What is the main advantage of concrete sleepers over wooden sleepers?
a) Greater durability and longer life span
b) Lower cost of production
c) Higher flexibility in track design
d) Easier to transport and install

2) What is one of the main causes of creep in railway tracks?
a) Excessive axle load
b) Friction between the wheel and rail
c) Temperature variations causing expansion and contraction
d) Lack of maintenance of fastenings

3) Which portion of the railway track is most susceptible to creep?
a) Gradient sections b) Curves
c) Level crossings d) Points and crossings

4) What is the purpose of grade compensation on curves?
a) To decrease the gradient for easier climbing
b) To counterbalance additional resistance caused by curvature
c) To improve visibility on sharp curves
d) To increase train speed on curves

5) What is the primary function of the ballast in railway track structure?
a) To provide stability to the track
b) To reduce vibration and noise
c) To support the weight of the train
d) All of the above

6) Which of the following is true regarding the inspection and maintenance of points and crossings?
a) Regular lubrication of all movable parts is unnecessary.
b) Broken switches and crossings can be ignored during inspection.
c) Frequent monitoring prevents derailments and ensures safe operation.
d) Worn-out parts must be reconditioned without following specifications

7) What is the standard slope for the formation of railway embankments to ensure stability?
a) 1:1 b) 2:1
c) 3:1 d) 4:1

8) Which gauge is most used on Indian Railways?
a) Narrow Gauge b) Standard Gauge
c) Broad Gauge d) Meter Gauge

9) What is the purpose of the Long-Term Corporate Plan of Indian Railways?
a) To privatize the railway system completely
b) To ensure the financial autonomy of Indian Railways
c) To provide a roadmap for infrastructure, technology, and operational development
d) To reduce railway tariffs for passengers

10) Which type of survey is primarily used to estimate passenger and freight volumes for a proposed railway line?
a) Traffic Survey b) Preliminary Survey
c) Reconnaissance Survey d) Final Location Survey

11) What does a Preliminary Engineering-cum-Traffic Survey aim to achieve?
a) To determine the technical feasibility and cost estimates
b) To finalize the alignment of the railway line
c) To conduct land acquisition activities
d) To test soil conditions for track laying

12) What is the primary purpose of superelevation on a curve?
a) To allow higher permissible speeds
b) To prevent derailment by counteracting centrifugal force
c) To improve passenger comfort
d) All of the above

13) What is the term used for increasing the width of the gauge on curves to ensure safety and minimize wear and tear?
a) Extra clearance b) Gauge widening
c) Grade Compensation d) Superelevation

14) Which of the following is a key requirement for an ideal rail section?

a) High tensile strength and resistance to wear
b) Low weight to reduce manufacturing costs
c) Easy transportation and installation
d) Ability to withstand extreme weather conditions

SLR-BD-32

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Railway Track Structure (CIVHON-01D)

Day & Date: Friday, 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Q. No. 6 is compulsory in section II, and solve any two questions from the remaining.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Solve the following questions. **08**
a) Write the Plan of Indian Railways.
b) What are the different modes of Transport?

Q.3 Solve the following questions. **10**
a) What are the Modern Surveying techniques for Difficult Terrain?
b) Write the importance of surveying in construction of Railway line.

Q.4 Solve the following questions. **10**
a) Explain horizontal and Vertical curves.
b) What is Superelevation, Safe Speed on Curves?

Q.5 Solve the following questions. **10**
a) What are the Different Gauges on Indian Railways? Explain in detail.
e) What is the necessity for Geometric Design of curve in railway line?

Section – II

Q.6 Solve the following questions. **08**
a) What are the functions and requirements of Sleepers?
b) What are the Laboratory Tests for Physical Properties of Ballast?

Q.7 Solve the following questions. **10**
a) Write a note on Blanket and Blanketing Material.
b) Explain the methods and challenges involved in the execution of earthwork in embankments and cuttings for railway tracks.

Q.8 Solve the following questions. **10**

a) What are the cautions considered in inspection and maintenance of Points and Crossings?

b) What are the different types of railway curves, and how are they classified?

Q.8 Solve the following questions. **10**

a) What is the creep in rial, causes of Development of Creep?

b) What are Switches, Tongue Rails, Crossing, Angle of Crossing?

SLR-BD-32

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Railway Track Structure (CIVHON-01D)

Day & Date: Friday, 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentences. **14**

1) What is the purpose of grade compensation on curves?
a) To decrease the gradient for easier climbing
b) To counterbalance additional resistance caused by curvature
c) To improve visibility on sharp curves
d) To increase train speed on curves

2) What is the primary function of the ballast in railway track structure?
a) To provide stability to the track
b) To reduce vibration and noise
c) To support the weight of the train
d) All of the above

3) Which of the following is true regarding the inspection and maintenance of points and crossings?
a) Regular lubrication of all movable parts is unnecessary.
b) Broken switches and crossings can be ignored during inspection.
c) Frequent monitoring prevents derailments and ensures safe operation.
d) Worn-out parts must be reconditioned without following specifications

4) What is the standard slope for the formation of railway embankments to ensure stability?
a) 1:1 b) 2:1
c) 3:1 d) 4:1

5) Which gauge is most used on Indian Railways?
a) Narrow Gauge b) Standard Gauge
c) Broad Gauge d) Meter Gauge

6) What is the purpose of the Long-Term Corporate Plan of Indian Railways?
a) To privatize the railway system completely
b) To ensure the financial autonomy of Indian Railways
c) To provide a roadmap for infrastructure, technology, and operational development
d) To reduce railway tariffs for passengers

7) Which type of survey is primarily used to estimate passenger and freight volumes for a proposed railway line?
a) Traffic Survey
b) Preliminary Survey
c) Reconnaissance Survey
d) Final Location Survey

8) What does a Preliminary Engineering-cum-Traffic Survey aim to achieve?
a) To determine the technical feasibility and cost estimates
b) To finalize the alignment of the railway line
c) To conduct land acquisition activities
d) To test soil conditions for track laying

9) What is the primary purpose of superelevation on a curve?
a) To allow higher permissible speeds
b) To prevent derailment by counteracting centrifugal force
c) To improve passenger comfort
d) All of the above

10) What is the term used for increasing the width of the gauge on curves to ensure safety and minimize wear and tear?
a) Extra clearance
b) Gauge widening
c) Grade Compensation
d) Superelevation

11) Which of the following is a key requirement for an ideal rail section?
a) High tensile strength and resistance to wear
b) Low weight to reduce manufacturing costs
c) Easy transportation and installation
d) Ability to withstand extreme weather conditions

12) What is the main advantage of concrete sleepers over wooden sleepers?
a) Greater durability and longer life span
b) Lower cost of production
c) Higher flexibility in track design
d) Easier to transport and install

13) What is one of the main causes of creep in railway tracks?
a) Excessive axle load
b) Friction between the wheel and rail
c) Temperature variations causing expansion and contraction
d) Lack of maintenance of fastenings

14) Which portion of the railway track is most susceptible to creep?

a) Gradient sections
b) Curves
c) Level crossings
d) Points and crossings

SLR-BD-32

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Railway Track Structure (CIVHON-01D)

Day & Date: Friday, 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Q. No. 6 is compulsory in section II, and solve any two questions from the remaining.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Solve the following questions. **08**
a) Write the Plan of Indian Railways.
b) What are the different modes of Transport?

Q.3 Solve the following questions. **10**
a) What are the Modern Surveying techniques for Difficult Terrain?
b) Write the importance of surveying in construction of Railway line.

Q.4 Solve the following questions. **10**
a) Explain horizontal and Vertical curves.
b) What is Superelevation, Safe Speed on Curves?

Q.5 Solve the following questions. **10**
a) What are the Different Gauges on Indian Railways? Explain in detail.
e) What is the necessity for Geometric Design of curve in railway line?

Section – II

Q.6 Solve the following questions. **08**
a) What are the functions and requirements of Sleepers?
b) What are the Laboratory Tests for Physical Properties of Ballast?

Q.7 Solve the following questions. **10**
a) Write a note on Blanket and Blanketing Material.
b) Explain the methods and challenges involved in the execution of earthwork in embankments and cuttings for railway tracks.

Q.8 Solve the following questions. **10**

a) What are the cautions considered in inspection and maintenance of Points and Crossings?

b) What are the different types of railway curves, and how are they classified?

Q.8 Solve the following questions. **10**

a) What is the creep in rial, causes of Development of Creep?

b) What are Switches, Tongue Rails, Crossing, Angle of Crossing?

SLR-BD-32

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Railway Track Structure (CIVHON-01D)

Day & Date: Friday, 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentences. **14**

1) What is the term used for increasing the width of the gauge on curves to ensure safety and minimize wear and tear?
a) Extra clearance b) Gauge widening
c) Grade Compensation d) Superelevation

2) Which of the following is a key requirement for an ideal rail section?
a) High tensile strength and resistance to wear
b) Low weight to reduce manufacturing costs
c) Easy transportation and installation
d) Ability to withstand extreme weather conditions

3) What is the main advantage of concrete sleepers over wooden sleepers?
a) Greater durability and longer life span
b) Lower cost of production
c) Higher flexibility in track design
d) Easier to transport and install

4) What is one of the main causes of creep in railway tracks?
a) Excessive axle load
b) Friction between the wheel and rail
c) Temperature variations causing expansion and contraction
d) Lack of maintenance of fastenings

5) Which portion of the railway track is most susceptible to creep?
a) Gradient sections b) Curves
c) Level crossings d) Points and crossings

6) What is the purpose of grade compensation on curves?
a) To decrease the gradient for easier climbing
b) To counterbalance additional resistance caused by curvature
c) To improve visibility on sharp curves
d) To increase train speed on curves

7) What is the primary function of the ballast in railway track structure?
a) To provide stability to the track
b) To reduce vibration and noise
c) To support the weight of the train
d) All of the above

8) Which of the following is true regarding the inspection and maintenance of points and crossings?
a) Regular lubrication of all movable parts is unnecessary.
b) Broken switches and crossings can be ignored during inspection.
c) Frequent monitoring prevents derailments and ensures safe operation.
d) Worn-out parts must be reconditioned without following specifications

9) What is the standard slope for the formation of railway embankments to ensure stability?
a) 1:1 b) 2:1
c) 3:1 d) 4:1

10) Which gauge is most used on Indian Railways?
a) Narrow Gauge b) Standard Gauge
c) Broad Gauge d) Meter Gauge

11) What is the purpose of the Long-Term Corporate Plan of Indian Railways?
a) To privatize the railway system completely
b) To ensure the financial autonomy of Indian Railways
c) To provide a roadmap for infrastructure, technology, and operational development
d) To reduce railway tariffs for passengers

12) Which type of survey is primarily used to estimate passenger and freight volumes for a proposed railway line?
a) Traffic Survey b) Preliminary Survey
c) Reconnaissance Survey d) Final Location Survey

13) What does a Preliminary Engineering-cum-Traffic Survey aim to achieve?
a) To determine the technical feasibility and cost estimates
b) To finalize the alignment of the railway line
c) To conduct land acquisition activities
d) To test soil conditions for track laying

14) What is the primary purpose of superelevation on a curve?

a) To allow higher permissible speeds
b) To prevent derailment by counteracting centrifugal force
c) To improve passenger comfort
d) All of the above

SLR-BD-32

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Railway Track Structure (CIVHON-01D)

Day & Date: Friday, 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Q. No. 6 is compulsory in section II, and solve any two questions from the remaining.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Solve the following questions. **08**
a) Write the Plan of Indian Railways.
b) What are the different modes of Transport?

Q.3 Solve the following questions. **10**
a) What are the Modern Surveying techniques for Difficult Terrain?
b) Write the importance of surveying in construction of Railway line.

Q.4 Solve the following questions. **10**
a) Explain horizontal and Vertical curves.
b) What is Superelevation, Safe Speed on Curves?

Q.5 Solve the following questions. **10**
a) What are the Different Gauges on Indian Railways? Explain in detail.
e) What is the necessity for Geometric Design of curve in railway line?

Section – II

Q.6 Solve the following questions. **08**
a) What are the functions and requirements of Sleepers?
b) What are the Laboratory Tests for Physical Properties of Ballast?

Q.7 Solve the following questions. **10**
a) Write a note on Blanket and Blanketing Material.
b) Explain the methods and challenges involved in the execution of earthwork in embankments and cuttings for railway tracks.

Q.8 Solve the following questions. **10**

a) What are the cautions considered in inspection and maintenance of Points and Crossings?

b) What are the different types of railway curves, and how are they classified?

Q.8 Solve the following questions. **10**

a) What is the creep in rial, causes of Development of Creep?

b) What are Switches, Tongue Rails, Crossing, Angle of Crossing?

SLR-BD-33

Seat No.		Set	P

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Universal Human Values (VEC-01)

Day & Date: Saturday, 24-05-2025 Max. Marks: 50
Time: 03:00 PM To 4:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) Basic unit of human interaction is _____.
a) Family b) Society
c) Group d) None of the above

2) The Self(I) is the seer, _____.
a) Doer b) Enjoyer
c) Doer & Enjoyer d) None

3) PROSPERITY deals with _____.
a) Right understanding in the self
b) Fulfilment in relationship
c) Ensuring more than required physical facility
d) None

4) When we expect feelings from others for our happiness, it is a state of _____.
a) Swatantrata b) Partantrata
c) Prosperity d) None

5) For continuity of happiness, what is essential?
a) Right understanding in the Self
b) Right feeling and right thought in the Self
c) Recognition of needs, ensure more than required, make right utilisation of it
d) All the above

6) Right Understanding and Right Feeling is matter of _____.
a) Self b) Body
c) Both d) None

7) Acceptance of excellence in others is called _____.

a) Gratitude b) Reverence
c) Glory d) None of above

8) Self and _____ are different in nature, materiality, needs and activities.

a) Prosperity b) Right Understanding
c) Body d) None of above

9) _____ is assuming without knowing.

a) Knowing b) Assuming
c) Preconditioning d) Relationship

10) Imagination is combination of _____.

a) Desire & thought
b) Desire, thought & expectation
c) Expectation & thought
d) None of above

11) Following are the basic guidelines for value education except _____.

a) Universal b) Personal
c) Rational d) Natural

12) Natural acceptance and _____ are the two processes of knowing.

a) Self-Actualization b) Self-exploration
c) Self Evaluation d) Self control

13) Human Life is lived at four levels: Individual, Family, and Society and _____.

a) Nature b) Nurture
c) World d) Universe

14) Value education should not be based on dogmas or blind beliefs _____.

a) True b) False

15) Value of an entity is _____.

a) Physical Facility
b) Prosperity
c) Its participation in the larger order of which it is part
d) both a and b

16) _____ are as Basic Human Aspirations.

a) Money
b) Relationship without money
c) Physical Facility
d) Continuous Happiness and Prosperity

17) Please give the correct priority for Physical Facilities, Right Understanding and Relationship _____.

a) Physical Facilities, Right Understanding and Relationship
b) Relationship, Right Understanding and Physical Facilities
c) Right Understanding, Relationship and Physical Facilities
d) None of the above

18) Right Understanding in relationship lead to _____.

a) Mutual Happiness b) Mutual Prosperity
c) Both a and b d) All are wrong

19) SSDD stands for _____.

a) Sadhan Viheen Dukhi Daridra
b) Sadhan Sampan Dukhi Daridra
c) Sadhan Sampan Sukhi Samridha
d) None of the above

20) Natural acceptance does not change with _____.

a) Time b) Place
c) Beliefs d) All of above

21) Human being is co-existence of the _____ and the _____.

a) self, self b) body, body
c) self, body d) None

22) _____ is the feeling of responsibility for nurturing, protecting and right utilizing the body.

a) Swasthya b) Sanyam
c) Prosperity d) None

23) The _____ is an instrument of _____.

a) I, Body b) Body, I
c) Both a and b d) None

24) _____ is the information we get from the Body through the five sense organs.

a) Precondition b) Sensation
c) Natural acceptance d) None

25) Which of the following is NOT a response of the Self?

a) Knowing b) Assuming
c) Recognising d) Preconditioning

26) Needs of Body are quantitative whereas needs of Self are qualitative _____.

a) True b) False

27) Sah-astitva means _____.

a) Co-existence b) Co-operation
c) Cooption d) Corporate identity

28) Ensuring justice in the relationship, on the basis of values leads to _____ in society.

a) Fearlessness b) Confusion
c) Confidence d) Fear

29) _____ is the complete value in relationship.

a) Respect b) Love
c) Trust d) Glory

30) The feeling to nurture and protect the body of our relative is called _____.

a) Care b) Affection
c) Gratitude d) Respect

31) _____ is the feeling of acceptance for those who have made efforts for my excellence.

a) Reverence b) Glory
c) Gratitude d) Guidance

32) We all are similar at the level of our _____ but differ in our _____.

a) Competence, Intension b) Intension, Competence
c) Competence, Competence d) None

33) Abhay means _____.

a) Right understanding b) Trust and fearlessness
c) Prosperity d) Co-existance

34) All the units of nature can be classified into _____ orders.

a) Two b) Three
c) Four d) Six

35) Which of the following does not form an order in nature?

a) Bio b) Animal
c) Consciousness d) Human

36) According to quantity, which of the following is true for the orders in nature?

a) Bio order >> Physical order >> Animal order >> Human order
b) Animal order >> Bio order >> Physical order >> Human order
c) Physical order >> Bio order >> Animal order >> Human order
d) Physical order >> Animal order >> Bio order >> Human order

37) What is NOT acceptable naturally in the nature?

a) Enrichment of nature b) Pollution in nature
c) Protection of nature d) Right Utilization of nature

38) Which of the following is NOT a unit of physical order?

a) Soil b) Air
c) Tree d) Water

39) There is justice in relationship when there is _____.
a) Self-regulation b) Freedom
c) Mutual fulfillment d) None

40) Justice from family to world family leads to _____.
a) Powerful nation
b) Strong political ties between nations
c) Undivided society
d) Disruption of the family structure

41) _____ is and it exists between one self (I1) and other self (I2).
a) Body b) Relationship
c) Health d) All

42) Which of the following results from over-evaluation _____.
a) Ego b) Depression
c) Self-confidence d) Trust

43) Which of the following statement is true?
a) Intention of a human being is always doubtful
b) One's intension is always to make the other happy
c) Intension of a human keeps varying from time to time
d) Intension of a human being can never be understood

44) Feeling of relationship exist between _____.
a) Self and self b) Body and Body
c) Self and body d) None of the above

45) Which of the following is NOT one of the goals at the level of society?
a) Right Understanding b) Fearlessness
c) Madness for profit d) Prosperity

46) Intension of a human being is the same as _____.
a) Natural acceptance b) Competence
c) Thought d) Pre-conditioning

47) Harmony should be maintained in _____.
a) Between body and life b) Between self and body
c) Between self and society d) All of the above

48) If something is _____ to us without any force or compulsion, then it is often correct and does not change with time and people.
a) Not acceptable b) Completely acceptable
c) Naturally acceptable d) Less acceptable

49) Nurturing on the Body depends upon _____.
a) Ingestion b) Digestion
c) Excretion d) All of the above

50) Sensation is related to _____.

a) Body
b) Self 'I'
c) Both a and b
d) None of the above

SLR-BD-33

Seat No.		Set	Q

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Universal Human Values (VEC-01)

Day & Date: Saturday, 24-05-2025 Max. Marks: 50
Time: 03:00 PM To 4:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) _____ is the feeling of acceptance for those who have made efforts for my excellence.
a) Reverence b) Glory
c) Gratitude d) Guidance

2) We all are similar at the level of our _____ but differ in our _____.
a) Competence, Intension b) Intension, Competence
c) Competence, Competence d) None

3) Abhay means _____.
a) Right understanding b) Trust and fearlessness
c) Prosperity d) Co-existance

4) All the units of nature can be classified into _____ orders.
a) Two b) Three
c) Four d) Six

5) Which of the following does not form an order in nature?
a) Bio b) Animal
c) Consciousness d) Human

6) According to quantity, which of the following is true for the orders in nature?
a) Bio order >> Physical order >> Animal order >> Human order
b) Animal order >> Bio order >> Physical order >> Human order
c) Physical order >> Bio order >> Animal order >> Human order
d) Physical order >> Animal order >> Bio order >> Human order

7) What is NOT acceptable naturally in the nature?
a) Enrichment of nature b) Pollution in nature
c) Protection of nature d) Right Utilization of nature

8) Which of the following is NOT a unit of physical order?
a) Soil b) Air
c) Tree d) Water

9) There is justice in relationship when there is _____.
a) Self-regulation b) Freedom
c) Mutual fulfillment d) None

10) Justice from family to world family leads to _____.
a) Powerful nation
b) Strong political ties between nations
c) Undivided society
d) Disruption of the family structure

11) _____ is and it exists between one self (I1) and other self (I2).
a) Body b) Relationship
c) Health d) All

12) Which of the following results from over-evaluation _____.
a) Ego b) Depression
c) Self-confidence d) Trust

13) Which of the following statement is true?
a) Intention of a human being is always doubtful
b) One's intension is always to make the other happy
c) Intension of a human keeps varying from time to time
d) Intension of a human being can never be understood

14) Feeling of relationship exist between _____.
a) Self and self b) Body and Body
c) Self and body d) None of the above

15) Which of the following is NOT one of the goals at the level of society?
a) Right Understanding b) Fearlessness
c) Madness for profit d) Prosperity

16) Intension of a human being is the same as _____.
a) Natural acceptance b) Competence
c) Thought d) Pre-conditioning

17) Harmony should be maintained in _____.
a) Between body and life b) Between self and body
c) Between self and society d) All of the above

18) If something is _____ to us without any force or compulsion, then it is often correct and does not change with time and people.
a) Not acceptable b) Completely acceptable
c) Naturally acceptable d) Less acceptable

19) Nurturing on the Body depends upon _____.

a) Ingestion b) Digestion
c) Excretion d) All of the above

20) Sensation is related to _____.

a) Body b) Self 'I'
c) Both a and b d) None of the above

21) Basic unit of human interaction is _____.

a) Family b) Society
c) Group d) None of the above

22) The Self(I) is the seer, _____.

a) Doer b) Enjoyer
c) Doer & Enjoyer d) None

23) PROSPERITY deals with _____.

a) Right understanding in the self
b) Fulfilment in relationship
c) Ensuring more than required physical facility
d) None

24) When we expect feelings from others for our happiness, it is a state of _____.

a) Swatantrata b) Partantrata
c) Prosperity d) None

25) For continuity of happiness, what is essential?

a) Right understanding in the Self
b) Right feeling and right thought in the Self
c) Recognition of needs, ensure more than required, make right utilisation of it
d) All the above

26) Right Understanding and Right Feeling is matter of _____.

a) Self b) Body
c) Both d) None

27) Acceptance of excellence in others is called _____.

a) Gratitude b) Reverence
c) Glory d) None of above

28) Self and _____ are different in nature, materiality, needs and activities.

a) Prosperity b) Right Understanding
c) Body d) None of above

29) _____ is assuming without knowing.

a) Knowing b) Assuming
c) Preconditioning d) Relationship

30) Imagination is combination of _____.

a) Desire & thought
b) Desire, thought & expectation
c) Expectation & thought
d) None of above

31) Following are the basic guidelines for value education except _____.

a) Universal b) Personal
c) Rational d) Natural

32) Natural acceptance and _____ are the two processes of knowing.

a) Self-Actualization b) Self-exploration
c) Self Evaluation d) Self control

33) Human Life is lived at four levels: Individual, Family, and Society and _____.

a) Nature b) Nurture
c) World d) Universe

34) Value education should not be based on dogmas or blind beliefs _____.

a) True b) False

35) Value of an entity is _____.

a) Physical Facility
b) Prosperity
c) Its participation in the larger order of which it is part
d) both a and b

36) _____ are as Basic Human Aspirations.

a) Money
b) Relationship without money
c) Physical Facility
d) Continuous Happiness and Prosperity

37) Please give the correct priority for Physical Facilities, Right Understanding and Relationship _____.

a) Physical Facilities, Right Understanding and Relationship
b) Relationship, Right Understanding and Physical Facilities
c) Right Understanding, Relationship and Physical Facilities
d) None of the above

38) Right Understanding in relationship lead to _____.
a) Mutual Happiness b) Mutual Prosperity
c) Both a and b d) All are wrong

39) SSDD stands for _____.
a) Sadhan Viheen Dukhi Daridra
b) Sadhan Sampan Dukhi Daridra
c) Sadhan Sampan Sukhi Samridha
d) None of the above

40) Natural acceptance does not change with _____.
a) Time b) Place
c) Beliefs d) All of above

41) Human being is co-existence of the _____ and the _____.
a) self, self b) body, body
c) self, body d) None

42) _____ is the feeling of responsibility for nurturing, protecting and right utilizing the body.
a) Swasthya b) Sanyam
c) Prosperity d) None

43) The _____ is an instrument of _____.
a) I, Body b) Body, I
c) Both a and b d) None

44) _____ is the information we get from the Body through the five sense organs.
a) Precondition b) Sensation
c) Natural acceptance d) None

45) Which of the following is NOT a response of the Self?
a) Knowing b) Assuming
c) Recognising d) Preconditioning

46) Needs of Body are quantitative whereas needs of Self are qualitative _____.
a) True b) False

47) Sah-astitva means _____.
a) Co-existence b) Co-operation
c) Cooption d) Corporate identity

48) Ensuring justice in the relationship, on the basis of values leads to _____ in society.
a) Fearlessness b) Confusion
c) Confidence d) Fear

49) _____ is the complete value in relationship.

a) Respect b) Love

c) Trust d) Glory

50) The feeling to nurture and protect the body of our relative is called _____.

a) Care b) Affection

c) Gratitude d) Respect

SLR-BD-33

Seat No.		Set	R

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Universal Human Values (VEC-01)

Day & Date: Saturday, 24-05-2025 Max. Marks: 50
Time: 03:00 PM To 4:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) Following are the basic guidelines for value education except _____.
a) Universal b) Personal
c) Rational d) Natural

2) Natural acceptance and _____ are the two processes of knowing.
a) Self-Actualization b) Self-exploration
c) Self Evaluation d) Self control

3) Human Life is lived at four levels: Individual, Family, and Society and _____.
a) Nature b) Nurture
c) World d) Universe

4) Value education should not be based on dogmas or blind beliefs _____.
a) True b) False

5) Value of an entity is _____.
a) Physical Facility
b) Prosperity
c) Its participation in the larger order of which it is part
d) both a and b

6) _____ are as Basic Human Aspirations.
a) Money
b) Relationship without money
c) Physical Facility
d) Continuous Happiness and Prosperity

7) Please give the correct priority for Physical Facilities, Right Understanding and Relationship _____.

a) Physical Facilities, Right Understanding and Relationship
b) Relationship, Right Understanding and Physical Facilities
c) Right Understanding, Relationship and Physical Facilities
d) None of the above

8) Right Understanding in relationship lead to _____.

a) Mutual Happiness b) Mutual Prosperity
c) Both a and b d) All are wrong

9) SSDD stands for _____.

a) Sadhan Viheen Dukhi Daridra
b) Sadhan Sampan Dukhi Daridra
c) Sadhan Sampan Sukhi Samridha
d) None of the above

10) Natural acceptance does not change with _____.

a) Time b) Place
c) Beliefs d) All of above

11) Human being is co-existence of the _____ and the _____.

a) self, self b) body, body
c) self, body d) None

12) _____ is the feeling of responsibility for nurturing, protecting and right utilizing the body.

a) Swasthya b) Sanyam
c) Prosperity d) None

13) The _____ is an instrument of _____.

a) I, Body b) Body, I
c) Both a and b d) None

14) _____ is the information we get from the Body through the five sense organs.

a) Precondition b) Sensation
c) Natural acceptance d) None

15) Which of the following is NOT a response of the Self?

a) Knowing b) Assuming
c) Recognising d) Preconditioning

16) Needs of Body are quantitative whereas needs of Self are qualitative _____.

a) True b) False

17) Sah-astitva means _____.

a) Co-existence b) Co-operation
c) Cooption d) Corporate identity

18) Ensuring justice in the relationship, on the basis of values leads to _____ in society.

a) Fearlessness b) Confusion
c) Confidence d) Fear

19) _____ is the complete value in relationship.

a) Respect b) Love
c) Trust d) Glory

20) The feeling to nurture and protect the body of our relative is called _____.

a) Care b) Affection
c) Gratitude d) Respect

21) _____ is the feeling of acceptance for those who have made efforts for my excellence.

a) Reverence b) Glory
c) Gratitude d) Guidance

22) We all are similar at the level of our _____ but differ in our _____.

a) Competence, Intension b) Intension, Competence
c) Competence, Competence d) None

23) Abhay means _____.

a) Right understanding b) Trust and fearlessness
c) Prosperity d) Co-existance

24) All the units of nature can be classified into _____ orders.

a) Two b) Three
c) Four d) Six

25) Which of the following does not form an order in nature?

a) Bio b) Animal
c) Consciousness d) Human

26) According to quantity, which of the following is true for the orders in nature?

a) Bio order >> Physical order >> Animal order >> Human order
b) Animal order >> Bio order >> Physical order >> Human order
c) Physical order >> Bio order >> Animal order >> Human order
d) Physical order >> Animal order >> Bio order >> Human order

27) What is NOT acceptable naturally in the nature?

a) Enrichment of nature b) Pollution in nature
c) Protection of nature d) Right Utilization of nature

28) Which of the following is NOT a unit of physical order?

a) Soil b) Air
c) Tree d) Water

29) There is justice in relationship when there is _____.
a) Self-regulation b) Freedom
c) Mutual fulfillment d) None

30) Justice from family to world family leads to _____.
a) Powerful nation
b) Strong political ties between nations
c) Undivided society
d) Disruption of the family structure

31) _____ is and it exists between one self (I1) and other self (I2).
a) Body b) Relationship
c) Health d) All

32) Which of the following results from over-evaluation _____.
a) Ego b) Depression
c) Self-confidence d) Trust

33) Which of the following statement is true?
a) Intention of a human being is always doubtful
b) One's intension is always to make the other happy
c) Intension of a human keeps varying from time to time
d) Intension of a human being can never be understood

34) Feeling of relationship exist between _____.
a) Self and self b) Body and Body
c) Self and body d) None of the above

35) Which of the following is NOT one of the goals at the level of society?
a) Right Understanding b) Fearlessness
c) Madness for profit d) Prosperity

36) Intension of a human being is the same as _____.
a) Natural acceptance b) Competence
c) Thought d) Pre-conditioning

37) Harmony should be maintained in _____.
a) Between body and life b) Between self and body
c) Between self and society d) All of the above

38) If something is _____ to us without any force or compulsion, then it is often correct and does not change with time and people.
a) Not acceptable b) Completely acceptable
c) Naturally acceptable d) Less acceptable

39) Nurturing on the Body depends upon _____.
a) Ingestion b) Digestion
c) Excretion d) All of the above

40) Sensation is related to _____.

a) Body b) Self 'I'

c) Both a and b d) None of the above

41) Basic unit of human interaction is _____.

a) Family b) Society

c) Group d) None of the above

42) The Self(I) is the seer, _____.

a) Doer b) Enjoyer

c) Doer & Enjoyer d) None

43) PROSPERITY deals with _____.

a) Right understanding in the self

b) Fulfilment in relationship

c) Ensuring more than required physical facility

d) None

44) When we expect feelings from others for our happiness, it is a state of _____.

a) Swatantrata b) Partantrata

c) Prosperity d) None

45) For continuity of happiness, what is essential?

a) Right understanding in the Self

b) Right feeling and right thought in the Self

c) Recognition of needs, ensure more than required, make right utilisation of it

d) All the above

46) Right Understanding and Right Feeling is matter of _____.

a) Self b) Body

c) Both d) None

47) Acceptance of excellence in others is called _____.

a) Gratitude b) Reverence

c) Glory d) None of above

48) Self and _____ are different in nature, materiality, needs and activities.

a) Prosperity b) Right Understanding

c) Body d) None of above

49) _____ is assuming without knowing.

a) Knowing b) Assuming

c) Preconditioning d) Relationship

50) Imagination is combination of _____.

a) Desire & thought
b) Desire, thought & expectation
c) Expectation & thought
d) None of above

SLR-BD-33

Seat No.		Set	S

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Universal Human Values (VEC-01)

Day & Date: Saturday, 24-05-2025 Max. Marks: 50
Time: 03:00 PM To 4:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) _____ is and it exists between one self (I1) and other self (I2).
a) Body b) Relationship
c) Health d) All

2) Which of the following results from over-evaluation _____.
a) Ego b) Depression
c) Self-confidence d) Trust

3) Which of the following statement is true?
a) Intention of a human being is always doubtful
b) One's intension is always to make the other happy
c) Intension of a human keeps varying from time to time
d) Intension of a human being can never be understood

4) Feeling of relationship exist between _____.
a) Self and self b) Body and Body
c) Self and body d) None of the above

5) Which of the following is NOT one of the goals at the level of society?
a) Right Understanding b) Fearlessness
c) Madness for profit d) Prosperity

6) Intension of a human being is the same as _____.
a) Natural acceptance b) Competence
c) Thought d) Pre-conditioning

7) Harmony should be maintained in _____.
a) Between body and life b) Between self and body
c) Between self and society d) All of the above

8) If something is _____ to us without any force or compulsion, then it is often correct and does not change with time and people.

a) Not acceptable b) Completely acceptable
c) Naturally acceptable d) Less acceptable

9) Nurturing on the Body depends upon _____.

a) Ingestion b) Digestion
c) Excretion d) All of the above

10) Sensation is related to _____.

a) Body b) Self 'I'
c) Both a and b d) None of the above

11) Basic unit of human interaction is _____.

a) Family b) Society
c) Group d) None of the above

12) The Self(I) is the seer, _____.

a) Doer b) Enjoyer
c) Doer & Enjoyer d) None

13) PROSPERITY deals with _____.

a) Right understanding in the self
b) Fulfilment in relationship
c) Ensuring more than required physical facility
d) None

14) When we expect feelings from others for our happiness, it is a state of _____.

a) Swatantrata b) Partantrata
c) Prosperity d) None

15) For continuity of happiness, what is essential?

a) Right understanding in the Self
b) Right feeling and right thought in the Self
c) Recognition of needs, ensure more than required, make right utilisation of it
d) All the above

16) Right Understanding and Right Feeling is matter of _____.

a) Self b) Body
c) Both d) None

17) Acceptance of excellence in others is called _____.

a) Gratitude b) Reverence
c) Glory d) None of above

18) Self and _____ are different in nature, materiality, needs and activities.

a) Prosperity b) Right Understanding
c) Body d) None of above

19) _____ is assuming without knowing.

a) Knowing b) Assuming
c) Preconditioning d) Relationship

20) Imagination is combination of _____.

a) Desire & thought
b) Desire, thought & expectation
c) Expectation & thought
d) None of above

21) Following are the basic guidelines for value education except _____.

a) Universal b) Personal
c) Rational d) Natural

22) Natural acceptance and _____ are the two processes of knowing.

a) Self-Actualization b) Self-exploration
c) Self Evaluation d) Self control

23) Human Life is lived at four levels: Individual, Family, and Society and _____.

a) Nature b) Nurture
c) World d) Universe

24) Value education should not be based on dogmas or blind beliefs _____.

a) True b) False

25) Value of an entity is _____.

a) Physical Facility
b) Prosperity
c) Its participation in the larger order of which it is part
d) both a and b

26) _____ are as Basic Human Aspirations.

a) Money
b) Relationship without money
c) Physical Facility
d) Continuous Happiness and Prosperity

27) Please give the correct priority for Physical Facilities, Right Understanding and Relationship _____.

a) Physical Facilities, Right Understanding and Relationship
b) Relationship, Right Understanding and Physical Facilities
c) Right Understanding, Relationship and Physical Facilities
d) None of the above

28) Right Understanding in relationship lead to _____.

a) Mutual Happiness b) Mutual Prosperity
c) Both a and b d) All are wrong

29) SSDD stands for _____.

a) Sadhan Viheen Dukhi Daridra
b) Sadhan Sampan Dukhi Daridra
c) Sadhan Sampan Sukhi Samridha
d) None of the above

30) Natural acceptance does not change with _____.

a) Time b) Place
c) Beliefs d) All of above

31) Human being is co-existence of the _____ and the _____.

a) self, self b) body, body
c) self, body d) None

32) _____ is the feeling of responsibility for nurturing, protecting and right utilizing the body.

a) Swasthya b) Sanyam
c) Prosperity d) None

33) The _____ is an instrument of _____.

a) I, Body b) Body, I
c) Both a and b d) None

34) _____ is the information we get from the Body through the five sense organs.

a) Precondition b) Sensation
c) Natural acceptance d) None

35) Which of the following is NOT a response of the Self?

a) Knowing b) Assuming
c) Recognising d) Preconditioning

36) Needs of Body are quantitative whereas needs of Self are qualitative _____.

a) True b) False

37) Sah-astitva means _____.

a) Co-existence b) Co-operation
c) Cooption d) Corporate identity

38) Ensuring justice in the relationship, on the basis of values leads to _____ in society.

a) Fearlessness b) Confusion
c) Confidence d) Fear

39) _____ is the complete value in relationship.

a) Respect b) Love
c) Trust d) Glory

40) The feeling to nurture and protect the body of our relative is called _____.

a) Care b) Affection
c) Gratitude d) Respect

41) _____ is the feeling of acceptance for those who have made efforts for my excellence.

a) Reverence b) Glory
c) Gratitude d) Guidance

42) We all are similar at the level of our _____ but differ in our _____.

a) Competence, Intension b) Intension, Competence
c) Competence, Competence d) None

43) Abhay means _____.

a) Right understanding b) Trust and fearlessness
c) Prosperity d) Co-existance

44) All the units of nature can be classified into _____ orders.

a) Two b) Three
c) Four d) Six

45) Which of the following does not form an order in nature?

a) Bio b) Animal
c) Consciousness d) Human

46) According to quantity, which of the following is true for the orders in nature?

a) Bio order >> Physical order >> Animal order >> Human order
b) Animal order >> Bio order >> Physical order >> Human order
c) Physical order >> Bio order >> Animal order >> Human order
d) Physical order >> Animal order >> Bio order >> Human order

47) What is NOT acceptable naturally in the nature?

a) Enrichment of nature b) Pollution in nature
c) Protection of nature d) Right Utilization of nature

48) Which of the following is NOT a unit of physical order?

a) Soil b) Air
c) Tree d) Water

49) There is justice in relationship when there is _____.

a) Self-regulation b) Freedom

c) Mutual fulfillment d) None

50) Justice from family to world family leads to _____.

a) Powerful nation

b) Strong political ties between nations

c) Undivided society

d) Disruption of the family structure

Seat No.	

Set **P**

S.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2025
Surveying & Geomatics (BTN01301)

Day & Date: Saturday 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Global Positioning Service (GPS) uses 24 satellites in _____.
a) 9 Orbits b) 8 Orbits
c) 7 Orbits d) 6 Orbits

2) Global Positioning Service (GPS) is based on a principle called _____.
a) Transmission b) Trilateration
c) Obliteration d) Globalization

3) Major differences between Vector and Raster data models _____.
a) Vector and raster are same data models
b) Vector is continuous, whereas raster data model is discrete
c) Vector and raster both are discrete
d) Vector is discrete, whereas raster data model is continuous

4) Spatial referencing is the process of which of the following?
a) Combing attribute values with locational information
b) Referencing geo-relational tables
c) Computing the reference between items in databases
d) Establishing the topology of spatial objects

5) What is angle of intersection of a contour and ridge line?
a) 30° b) 0°
c) 180° d) 90°

6) Two contour lines of different elevations unite to form one line only in the case of _____.
a) Hills b) Vertical cliff
c) Horizontal cliff d) Overhanging Cliff

7) Among the following, which describes Stefan- Boltzmann formula?
a) $M = \sigma / T^4$ b) $M = \sigma - T^4$
c) $M = \sigma + T^4$ d) $M = \sigma^* T^4$

8) Which of the following cannot be done with the help of theodolite in surveying?
a) Laying off horizontal angles
b) Locating points on lines
c) Prolonging survey lines
d) Measuring horizontal distances

9) The distance in EDM is measured by _____.
a) Frequency of the wave b) Wave length
c) Phase difference d) Amplitude

10) Which of the following can be affected by atmospheric path disturbances?
a) Modern GPS surveying b) Conventional GPS
c) Absolute positioning d) Resection method

11) Geodimeter can be used for _____.
a) Day time observations b) Night observations
c) Both day-night observations d) None of these

12) The relation between velocity, wavelength and frequency can be given as _____.
a) $\lambda = c \ / \ r$ b) $\lambda = c/f$
c) $\lambda = c/h$ d) $\lambda = h^* c/f$

13) Total station can be used for _____.
a) Missing line measurement
b) Remote elevation measurement
c) Stake out
d) All of these

14) Flying height in Aerial Photogrammetry refers to _____.
a) Upper portion of the exposure station
b) Bottom of the exposure station
c) Depression of the exposure station
d) Elevation of the exposure station

Seat No.	

Set | P

S.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2025
Surveying & Geomatics (BTN01301)

Day & Date: Saturday 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Assume any suitable data wherever necessary.
2) Q.2 & Q.6 are Compulsory.
3) Solve any two questions out of Q.no. 3, 4 and 5.
4) Solve any two questions out of Q.no. 7, 8 and 9.

Section – I

Q.2 **a)** With the help of a diagram, describe the types of Contour. **05**
b) Discuss the temporary and permanent adjustments of Auto Level. **05**

Q.3 **a)** Describe indirect method of contouring. **04**
b) With a neat diagram explain reiteration method in theodolite. **05**

Q.4 **a)** Discuss the procedure for Stake out using a Total Station. **05**
b) With the help of a diagram, explain the working of Photo-theodolite. **04**

Q.5 **Define: (Any three)** **09**
a) Face Right observations.
b) Area calculation in Total Station.
c) Transiting the telescope.
d) EMR Spectrum.

Section – II

Q.6 **a)** Differentiate between Digitizer and Scanner. **05**
b) Classify the types of Platforms used in remote sensing & GIS. **05**

Q.7 **a)** What are the major Software components of GIS. **04**
b) With the help diagram, explain the process of Trilateration for GPS Navigation. **05**

Q.8 **Explain the Project Survey for**
a) Building **04**
b) Canal **05**

Q.9 **Define: (Any three)** **09**
a) Components of GPS.
b) Flight Planning.
c) Mirror Stereoscope.
d) Types of Sensors in Remote Sensing.

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2025
Surveying & Geomatics (BTN01301)

Day & Date: Saturday 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which of the following cannot be done with the help of theodolite in surveying?
a) Laying off horizontal angles
b) Locating points on lines
c) Prolonging survey lines
d) Measuring horizontal distances

2) The distance in EDM is measured by _____.
a) Frequency of the wave b) Wave length
c) Phase difference d) Amplitude

3) Which of the following can be affected by atmospheric path disturbances?
a) Modern GPS surveying b) Conventional GPS
c) Absolute positioning d) Resection method

4) Geodimeter can be used for _____.
a) Day time observations b) Night observations
c) Both day-night observations d) None of these

5) The relation between velocity, wavelength and frequency can be given as _____.
a) $\lambda = c \,/\, r$ b) $\lambda = c/f$
c) $\lambda = c/h$ d) $\lambda = h^{*}c/f$

6) Total station can be used for _____.
a) Missing line measurement
b) Remote elevation measurement
c) Stake out
d) All of these

7) Flying height in Aerial Photogrammetry refers to _____.
a) Upper portion of the exposure station
b) Bottom of the exposure station
c) Depression of the exposure station
d) Elevation of the exposure station

8) Global Positioning Service (GPS) uses 24 satellites in _____.
a) 9 Orbits b) 8 Orbits
c) 7 Orbits d) 6 Orbits

9) Global Positioning Service (GPS) is based on a principle called _____.
a) Transmission b) Trilateration
c) Obliteration d) Globalization

10) Major differences between Vector and Raster data models _____.
a) Vector and raster are same data models
b) Vector is continuous, whereas raster data model is discrete
c) Vector and raster both are discrete
d) Vector is discrete, whereas raster data model is continuous

11) Spatial referencing is the process of which of the following?
a) Combing attribute values with locational information
b) Referencing geo-relational tables
c) Computing the reference between items in databases
d) Establishing the topology of spatial objects

12) What is angle of intersection of a contour and ridge line?
a) 30° b) 0°
c) 180° d) 90°

13) Two contour lines of different elevations unite to form one line only in the case of _____.
a) Hills b) Vertical cliff
c) Horizontal cliff d) Overhanging Cliff

14) Among the following, which describes Stefan- Boltzmann formula?
a) $M = \sigma/T^4$ b) $M = \sigma - T^4$
c) $M = \sigma + T^4$ d) $M = \sigma^* T^4$

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2025
Surveying & Geomatics (BTN01301)

Day & Date: Saturday 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Assume any suitable data wherever necessary.
2) Q.2 & Q.6 are Compulsory.
3) Solve any two questions out of Q.no. 3, 4 and 5.
4) Solve any two questions out of Q.no. 7, 8 and 9.

Section – I

Q.2 **a)** With the help of a diagram, describe the types of Contour. **05**
b) Discuss the temporary and permanent adjustments of Auto Level. **05**

Q.3 **a)** Describe indirect method of contouring. **04**
b) With a neat diagram explain reiteration method in theodolite. **05**

Q.4 **a)** Discuss the procedure for Stake out using a Total Station. **05**
b) With the help of a diagram, explain the working of Photo-theodolite. **04**

Q.5 **Define: (Any three)** **09**
a) Face Right observations.
b) Area calculation in Total Station.
c) Transiting the telescope.
d) EMR Spectrum.

Section – II

Q.6 **a)** Differentiate between Digitizer and Scanner. **05**
b) Classify the types of Platforms used in remote sensing & GIS. **05**

Q.7 **a)** What are the major Software components of GIS. **04**
b) With the help diagram, explain the process of Trilateration for GPS Navigation. **05**

Q.8 **Explain the Project Survey for**
a) Building **04**
b) Canal **05**

Q.9 **Define: (Any three)** **09**
a) Components of GPS.
b) Flight Planning.
c) Mirror Stereoscope.
d) Types of Sensors in Remote Sensing.

Seat No.	

Set **R**

S.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2025
Surveying & Geomatics (BTN01301)

Day & Date: Saturday 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Geodimeter can be used for _____.
a) Day time observations b) Night observations
c) Both day-night observations d) None of these

2) The relation between velocity, wavelength and frequency can be given as _____.
a) $\lambda = c \,/\, r$ b) $\lambda = c/f$
c) $\lambda = c/h$ d) $\lambda = h^{*}c/f$

3) Total station can be used for _____.
a) Missing line measurement
b) Remote elevation measurement
c) Stake out
d) All of these

4) Flying height in Aerial Photogrammetry refers to _____.
a) Upper portion of the exposure station
b) Bottom of the exposure station
c) Depression of the exposure station
d) Elevation of the exposure station

5) Global Positioning Service (GPS) uses 24 satellites in _____.
a) 9 Orbits b) 8 Orbits
c) 7 Orbits d) 6 Orbits

6) Global Positioning Service (GPS) is based on a principle called _____.
a) Transmission b) Trilateration
c) Obliteration d) Globalization

7) Major differences between Vector and Raster data models _____.
a) Vector and raster are same data models
b) Vector is continuous, whereas raster data model is discrete
c) Vector and raster both are discrete
d) Vector is discrete, whereas raster data model is continuous

8) Spatial referencing is the process of which of the following?
a) Combing attribute values with locational information
b) Referencing geo-relational tables
c) Computing the reference between items in databases
d) Establishing the topology of spatial objects

9) What is angle of intersection of a contour and ridge line?
a) 30° b) 0°
c) 180° d) 90°

10) Two contour lines of different elevations unite to form one line only in the case of _____.
a) Hills b) Vertical cliff
c) Horizontal cliff d) Overhanging Cliff

11) Among the following, which describes Stefan- Boltzmann formula?
a) $M = \sigma/T^4$ b) $M = \sigma - T^4$
c) $M = \sigma + T^4$ d) $M = \sigma^* T^4$

12) Which of the following cannot be done with the help of theodolite in surveying?
a) Laying off horizontal angles
b) Locating points on lines
c) Prolonging survey lines
d) Measuring horizontal distances

13) The distance in EDM is measured by _____.
a) Frequency of the wave b) Wave length
c) Phase difference d) Amplitude

14) Which of the following can be affected by atmospheric path disturbances?
a) Modern GPS surveying b) Conventional GPS
c) Absolute positioning d) Resection method

Seat No.	

Set **R**

S.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2025
Surveying & Geomatics (BTN01301)

Day & Date: Saturday 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Assume any suitable data wherever necessary.
2) Q.2 & Q.6 are Compulsory.
3) Solve any two questions out of Q.no. 3, 4 and 5.
4) Solve any two questions out of Q.no. 7, 8 and 9.

Section – I

Q.2 **a)** With the help of a diagram, describe the types of Contour. **05**
b) Discuss the temporary and permanent adjustments of Auto Level. **05**

Q.3 **a)** Describe indirect method of contouring. **04**
b) With a neat diagram explain reiteration method in theodolite. **05**

Q.4 **a)** Discuss the procedure for Stake out using a Total Station. **05**
b) With the help of a diagram, explain the working of Photo-theodolite. **04**

Q.5 **Define: (Any three)** **09**
a) Face Right observations.
b) Area calculation in Total Station.
c) Transiting the telescope.
d) EMR Spectrum.

Section – II

Q.6 **a)** Differentiate between Digitizer and Scanner. **05**
b) Classify the types of Platforms used in remote sensing & GIS. **05**

Q.7 **a)** What are the major Software components of GIS. **04**
b) With the help diagram, explain the process of Trilateration for GPS Navigation. **05**

Q.8 **Explain the Project Survey for**
a) Building **04**
b) Canal **05**

Q.9 **Define: (Any three)** **09**
a) Components of GPS.
b) Flight Planning.
c) Mirror Stereoscope.
d) Types of Sensors in Remote Sensing.

Seat No.	

Set **S**

S.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2025
Surveying & Geomatics (BTN01301)

Day & Date: Saturday 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Two contour lines of different elevations unite to form one line only in the case of _____.
a) Hills b) Vertical cliff
c) Horizontal cliff d) Overhanging Cliff

2) Among the following, which describes Stefan- Boltzmann formula?
a) $M = \sigma/T^4$ b) $M = \sigma - T^4$
c) $M = \sigma + T^4$ d) $M = \sigma^* T^4$

3) Which of the following cannot be done with the help of theodolite in surveying?
a) Laying off horizontal angles
b) Locating points on lines
c) Prolonging survey lines
d) Measuring horizontal distances

4) The distance in EDM is measured by _____.
a) Frequency of the wave b) Wave length
c) Phase difference d) Amplitude

5) Which of the following can be affected by atmospheric path disturbances?
a) Modern GPS surveying b) Conventional GPS
c) Absolute positioning d) Resection method

6) Geodimeter can be used for _____.
a) Day time observations b) Night observations
c) Both day-night observations d) None of these

7) The relation between velocity, wavelength and frequency can be given as _____.

a) $\lambda = c \,/\, r$ b) $\lambda = c/f$

c) $\lambda = c/h$ d) $\lambda = h^{*}c/f$

8) Total station can be used for _____.

a) Missing line measurement
b) Remote elevation measurement
c) Stake out
d) All of these

9) Flying height in Aerial Photogrammetry refers to _____.

a) Upper portion of the exposure station
b) Bottom of the exposure station
c) Depression of the exposure station
d) Elevation of the exposure station

10) Global Positioning Service (GPS) uses 24 satellites in _____.

a) 9 Orbits b) 8 Orbits

c) 7 Orbits d) 6 Orbits

11) Global Positioning Service (GPS) is based on a principle called _____.

a) Transmission b) Trilateration

c) Obliteration d) Globalization

12) Major differences between Vector and Raster data models _____.

a) Vector and raster are same data models
b) Vector is continuous, whereas raster data model is discrete
c) Vector and raster both are discrete
d) Vector is discrete, whereas raster data model is continuous

13) Spatial referencing is the process of which of the following?

a) Combing attribute values with locational information
b) Referencing geo-relational tables
c) Computing the reference between items in databases
d) Establishing the topology of spatial objects

14) What is angle of intersection of a contour and ridge line?

a) 30° b) 0°

c) 180° d) 90°

Seat No.		Set	S

S.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2025
Surveying & Geomatics (BTN01301)

Day & Date: Saturday 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Assume any suitable data wherever necessary.
2) Q.2 & Q.6 are Compulsory.
3) Solve any two questions out of Q.no. 3, 4 and 5.
4) Solve any two questions out of Q.no. 7, 8 and 9.

Section – I

Q.2 **a)** With the help of a diagram, describe the types of Contour. **05**
b) Discuss the temporary and permanent adjustments of Auto Level. **05**

Q.3 **a)** Describe indirect method of contouring. **04**
b) With a neat diagram explain reiteration method in theodolite. **05**

Q.4 **a)** Discuss the procedure for Stake out using a Total Station. **05**
b) With the help of a diagram, explain the working of Photo-theodolite. **04**

Q.5 **Define: (Any three)** **09**
a) Face Right observations.
b) Area calculation in Total Station.
c) Transiting the telescope.
d) EMR Spectrum.

Section – II

Q.6 **a)** Differentiate between Digitizer and Scanner. **05**
b) Classify the types of Platforms used in remote sensing & GIS. **05**

Q.7 **a)** What are the major Software components of GIS. **04**
b) With the help diagram, explain the process of Trilateration for GPS Navigation. **05**

Q.8 **Explain the Project Survey for**
a) Building **04**
b) Canal **05**

Q.9 **Define: (Any three)** **09**
a) Components of GPS.
b) Flight Planning.
c) Mirror Stereoscope.
d) Types of Sensors in Remote Sensing.

SLR-BD-35

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fluid Mechanics and Fluid Machines (BTN01302)

Day & Date: Monday, 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Assume suitable data if necessary and state it clearly.
4) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Ideal fluid is fluid having _____.
a) viscosity b) compressible
c) both a and b d) none of these

2) Capillarity of fluid depends on _____.
a) diameter of capillary tube b) specific weight if fluid
c) surface tension of fluid d) all of these

3) For measurement of low pressure _____ is used.
a) inverted U tube manometer
b) Bourdon tube
c) inclined tube manometer
d) vertical single column manometer

4) An opening provided in the side of a tank or vessel such that the liquid surface in the tank is below the top edge of the opening is known as _____.
a) Weir b) Notch
c) Orifice d) Venturi meter

5) The error in discharge due to the error in the measurement of head over a rectangular notch or weir is given by _____.
a) $\frac{dQ}{Q} = \frac{1}{2}\frac{dH}{H}$ b) $\frac{dQ}{Q} = \frac{3}{2}\frac{dH}{H}$
c) $\frac{dQ}{Q} = \frac{3}{4}\frac{dH}{H}$ d) None of these

6) Venturi-meter is used for measurement of _____.
a) high pressure b) low pressure
c) negative pressure d) discharge

7) Manometers are used for measurement of _____.
a) discharge b) velocity
c) pressure d) viscosity

8) The ratio of average velocity to maximum velocity for steady laminar flow in circular pipe is _____.
a) 3/2 b) 2/3
c) 1/2 d) 2

9) Boundary layer separation is caused by _____.
a) Negative pressure gradient b) Positive pressure gradient
c) Zero pressure gradient d) None of the above

10) For high discharge the pumps are connected in _____.
a) Parallel b) Series
c) both and b d) none of these

11) An impulse turbine requires _____.
a) high head and small quantity of flow
b) low head and small quantity of flow
c) low head and high rate of flow
d) none of the above

12) When a steady jet impinges on a fixed inclined surface _____.
a) the flow is divided into parts proportional to the angle of inclination of the surface
b) no force is exerted by the jet on the vane
c) the momentum component is unchanged parallel to the surface
d) none of the above

13) Dimensional analysis is used to _____.
a) test the dimensional homogeneity of any equation of fluid motion
b) derive rational formulae for a flow phenomenon
c) derive equations expressed in terms of non-dimensional parameters
d) all of the above

14) If ‘n’ variables in a physical phenomenon contained ‘m’ fundamental dimensions, then the variables can be arranged into _____.
a) n dimensionless terms
b) m dimensionless terms
c) (n - m) dimensionless terms
d) (n + m) dimensionless terms

SLR-BD-35

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fluid Mechanics and Fluid Machines (BTN01302)

Day & Date: Monday, 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section - I, Q. 2 is compulsory and you must attempt any two questions from the remaining questions.
2) In Section - II, Q. 6 is compulsory and you must attempt any two questions from the remaining questions.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary and state it clearly.

Section – I

Q.2 **a)** Give the detailed classification of fluids. **05**
b) A fluid is placed in between two plates, and one of the plates is moving at 0.6 m/s which is at a distance of 0.02 mm from other plate which is fixed. If the force required to maintain the speed is 3N/m^2 determine viscosity of fluid. **05**

Q.3 **a)** Explain different types of pressures with neat sketch. **04**
b) A rectangular plane surface of dimensions 3 m width and 4 m depth lies in vertical plane in water. Determine the total pressure force and center of pressure on surface when it is immersed at 3.5 m from free water surface and 3 m dimension is parallel to the free water surface. **05**

Q.4 **a)** What are the different types fluid flows? Explain them. **04**
b) For a velocity function given by the equation $\Psi = 5x - 6y$. Determine the components of velocity and resultant velocity along with its direction. **05**

Q.5 **a)** Derive the expression for total time required to empty a reservoir/tank by triangular notch. **04**
b) What will be the length of rectangular weir if it discharges 0.582 m^3/s, at a head of 300mm and coefficient of discharge 0.6. **05**

Section – II

Q.6 **a)** Derive the expression for force exerted by a jet on station vertical plate. **05**

b) A hydraulic turbine is to be operated under a head of 25 m at 200 rpm and discharge of 9 cumec. If the efficiency of turbine is 90% determine specific speed of turbine, power generated and also state the type of turbine. **05**

Q.7 **a)** Define the terms: boundary layer thickness, displacement thickness, momentum thickness and energy thickness. **04**

b) A 10 cm diameter pipe suddenly enlarge to 20 cm diameter. Determine the discharge through the pipe if head loss due to sudden enlargement is 30 cm of water. **05**

Q.8 **a)** What is mean by repeating variables? How they are selected? **04**

b) The pressure difference ΔP in a pipe of diameter D and length L due to viscous flow depends upon the velocity V, Viscosity μ and density ρ, using Buckingham π method obtain expression for ΔP. **05**

Q.9 **a)** With neat sketch explain different components of centrifugal pump. **04**

b) A centrifugal pump has to discharge 0.3 m^3/s at 1500 rpm against a head of 22m. the impeller diameter is 250 mm and its width at outlet is 50 mm. If the manometric efficiency is 80% determine, vane angle at outlet periphery of impeller. **05**

SLR-BD-35

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fluid Mechanics and Fluid Machines (BTN01302)

Day & Date: Monday, 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Assume suitable data if necessary and state it clearly.
4) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The ratio of average velocity to maximum velocity for steady laminar flow in circular pipe is _____.
a) 3/2 b) 2/3
c) 1/2 d) 2

2) Boundary layer separation is caused by _____.
a) Negative pressure gradient b) Positive pressure gradient
c) Zero pressure gradient d) None of the above

3) For high discharge the pumps are connected in _____.
a) Parallel b) Series
c) both and b d) none of these

4) An impulse turbine requires _____.
a) high head and small quantity of flow
b) low head and small quantity of flow
c) low head and high rate of flow
d) none of the above

5) When a steady jet impinges on a fixed inclined surface _____.
a) the flow is divided into parts proportional to the angle of inclination of the surface
b) no force is exerted by the jet on the vane
c) the momentum component is unchanged parallel to the surface
d) none of the above

6) Dimensional analysis is used to _____.
a) test the dimensional homogeneity of any equation of fluid motion
b) derive rational formulae for a flow phenomenon
c) derive equations expressed in terms of non-dimensional parameters
d) all of the above

7) If 'n' variables in a physical phenomenon contained 'm' fundamental dimensions, then the variables can be arranged into _____.
a) n dimensionless terms
b) m dimensionless terms
c) (n - m) dimensionless terms
d) (n + m) dimensionless terms

8) Ideal fluid is fluid having _____.
a) viscosity
b) compressible
c) both a and b
d) none of these

9) Capillarity of fluid depends on _____.
a) diameter of capillary tube
b) specific weight if fluid
c) surface tension of fluid
d) all of these

10) For measurement of low pressure _____ is used.
a) inverted U tube manometer
b) Bourdon tube
c) inclined tube manometer
d) vertical single column manometer

11) An opening provided in the side of a tank or vessel such that the liquid surface in the tank is below the top edge of the opening is known as _____.
a) Weir
b) Notch
c) Orifice
d) Venturi meter

12) The error in discharge due to the error in the measurement of head over a rectangular notch or weir is given by _____.
a) $\frac{dQ}{Q} = \frac{1}{2}\frac{dH}{H}$
b) $\frac{dQ}{Q} = \frac{3}{2}\frac{dH}{H}$
c) $\frac{dQ}{Q} = \frac{3}{4}\frac{dH}{H}$
d) None of these

13) Venturi-meter is used for measurement of _____.
a) high pressure
b) low pressure
c) negative pressure
d) discharge

14) Manometers are used for measurement of _____.
a) discharge
b) velocity
c) pressure
d) viscosity

SLR-BD-35

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fluid Mechanics and Fluid Machines (BTN01302)

Day & Date: Monday, 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section - I, Q. 2 is compulsory and you must attempt any two questions from the remaining questions.
2) In Section - II, Q. 6 is compulsory and you must attempt any two questions from the remaining questions.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary and state it clearly.

Section – I

Q.2 **a)** Give the detailed classification of fluids. **05**
b) A fluid is placed in between two plates, and one of the plates is moving at 0.6 m/s which is at a distance of 0.02 mm from other plate which is fixed. If the force required to maintain the speed is 3N/m^2 determine viscosity of fluid. **05**

Q.3 **a)** Explain different types of pressures with neat sketch. **04**
b) A rectangular plane surface of dimensions 3 m width and 4 m depth lies in vertical plane in water. Determine the total pressure force and center of pressure on surface when it is immersed at 3.5 m from free water surface and 3 m dimension is parallel to the free water surface. **05**

Q.4 **a)** What are the different types fluid flows? Explain them. **04**
b) For a velocity function given by the equation $\Psi = 5x - 6y$. Determine the components of velocity and resultant velocity along with its direction. **05**

Q.5 **a)** Derive the expression for total time required to empty a reservoir/tank by triangular notch. **04**
b) What will be the length of rectangular weir if it discharges 0.582 m^3/s, at a head of 300mm and coefficient of discharge 0.6. **05**

Section – II

Q.6 **a)** Derive the expression for force exerted by a jet on station vertical plate. **05**

b) A hydraulic turbine is to be operated under a head of 25 m at 200 rpm and discharge of 9 cumec. If the efficiency of turbine is 90% determine specific speed of turbine, power generated and also state the type of turbine. **05**

Q.7 **a)** Define the terms: boundary layer thickness, displacement thickness, momentum thickness and energy thickness. **04**

b) A 10 cm diameter pipe suddenly enlarge to 20 cm diameter. Determine the discharge through the pipe if head loss due to sudden enlargement is 30 cm of water. **05**

Q.8 **a)** What is mean by repeating variables? How they are selected? **04**

b) The pressure difference ΔP in a pipe of diameter D and length L due to viscous flow depends upon the velocity V, Viscosity μ and density ρ, using Buckingham π method obtain expression for ΔP. **05**

Q.9 **a)** With neat sketch explain different components of centrifugal pump. **04**

b) A centrifugal pump has to discharge 0.3 m^3/s at 1500 rpm against a head of 22m. the impeller diameter is 250 mm and its width at outlet is 50 mm. If the manometric efficiency is 80% determine, vane angle at outlet periphery of impeller. **05**

SLR-BD-35

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fluid Mechanics and Fluid Machines (BTN01302)

Day & Date: Monday, 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Assume suitable data if necessary and state it clearly.
4) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) An impulse turbine requires _____.
a) high head and small quantity of flow
b) low head and small quantity of flow
c) low head and high rate of flow
d) none of the above

2) When a steady jet impinges on a fixed inclined surface _____.
a) the flow is divided into parts proportional to the angle of inclination of the surface
b) no force is exerted by the jet on the vane
c) the momentum component is unchanged parallel to the surface
d) none of the above

3) Dimensional analysis is used to _____.
a) test the dimensional homogeneity of any equation of fluid motion
b) derive rational formulae for a flow phenomenon
c) derive equations expressed in terms of non-dimensional parameters
d) all of the above

4) If 'n' variables in a physical phenomenon contained 'm' fundamental dimensions, then the variables can be arranged into _____.
a) n dimensionless terms
b) m dimensionless terms
c) (n - m) dimensionless terms
d) (n + m) dimensionless terms

5) Ideal fluid is fluid having _____.
a) viscosity b) compressible
c) both a and b d) none of these

6) Capillarity of fluid depends on _____.
a) diameter of capillary tube b) specific weight if fluid
c) surface tension of fluid d) all of these

7) For measurement of low pressure _____ is used.
a) inverted U tube manometer
b) Bourdon tube
c) inclined tube manometer
d) vertical single column manometer

8) An opening provided in the side of a tank or vessel such that the liquid surface in the tank is below the top edge of the opening is known as _____.
a) Weir b) Notch
c) Orifice d) Venturi meter

9) The error in discharge due to the error in the measurement of head over a rectangular notch or weir is given by _____.
a) $\frac{dQ}{Q} = \frac{1}{2}\frac{dH}{H}$ b) $\frac{dQ}{Q} = \frac{3}{2}\frac{dH}{H}$
c) $\frac{dQ}{Q} = \frac{3}{4}\frac{dH}{H}$ d) None of these

10) Venturi-meter is used for measurement of _____.
a) high pressure b) low pressure
c) negative pressure d) discharge

11) Manometers are used for measurement of _____.
a) discharge b) velocity
c) pressure d) viscosity

12) The ratio of average velocity to maximum velocity for steady laminar flow in circular pipe is _____.
a) 3/2 b) 2/3
c) 1/2 d) 2

13) Boundary layer separation is caused by _____.
a) Negative pressure gradient b) Positive pressure gradient
c) Zero pressure gradient d) None of the above

14) For high discharge the pumps are connected in _____.
a) Parallel b) Series
c) both and b d) none of these

SLR-BD-35

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fluid Mechanics and Fluid Machines (BTN01302)

Day & Date: Monday, 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section - I, Q. 2 is compulsory and you must attempt any two questions from the remaining questions.
2) In Section - II, Q. 6 is compulsory and you must attempt any two questions from the remaining questions.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary and state it clearly.

Section – I

Q.2 **a)** Give the detailed classification of fluids. **05**
b) A fluid is placed in between two plates, and one of the plates is moving at 0.6 m/s which is at a distance of 0.02 mm from other plate which is fixed. If the force required to maintain the speed is 3N/m^2 determine viscosity of fluid. **05**

Q.3 **a)** Explain different types of pressures with neat sketch. **04**
b) A rectangular plane surface of dimensions 3 m width and 4 m depth lies in vertical plane in water. Determine the total pressure force and center of pressure on surface when it is immersed at 3.5 m from free water surface and 3 m dimension is parallel to the free water surface. **05**

Q.4 **a)** What are the different types fluid flows? Explain them. **04**
b) For a velocity function given by the equation $\Psi = 5x - 6y$. Determine the components of velocity and resultant velocity along with its direction. **05**

Q.5 **a)** Derive the expression for total time required to empty a reservoir/tank by triangular notch. **04**
b) What will be the length of rectangular weir if it discharges 0.582 m^3/s, at a head of 300mm and coefficient of discharge 0.6. **05**

Section – II

Q.6 **a)** Derive the expression for force exerted by a jet on station vertical plate. **05**

b) A hydraulic turbine is to be operated under a head of 25 m at 200 rpm and discharge of 9 cumec. If the efficiency of turbine is 90% determine specific speed of turbine, power generated and also state the type of turbine. **05**

Q.7 **a)** Define the terms: boundary layer thickness, displacement thickness, momentum thickness and energy thickness. **04**

b) A 10 cm diameter pipe suddenly enlarge to 20 cm diameter. Determine the discharge through the pipe if head loss due to sudden enlargement is 30 cm of water. **05**

Q.8 **a)** What is mean by repeating variables? How they are selected? **04**

b) The pressure difference ΔP in a pipe of diameter D and length L due to viscous flow depends upon the velocity V, Viscosity μ and density ρ, using Buckingham π method obtain expression for ΔP. **05**

Q.9 **a)** With neat sketch explain different components of centrifugal pump. **04**

b) A centrifugal pump has to discharge 0.3 m^3/s at 1500 rpm against a head of 22m. the impeller diameter is 250 mm and its width at outlet is 50 mm. If the manometric efficiency is 80% determine, vane angle at outlet periphery of impeller. **05**

SLR-BD-35

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fluid Mechanics and Fluid Machines (BTN01302)

Day & Date: Monday, 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Assume suitable data if necessary and state it clearly.
4) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Venturi-meter is used for measurement of _____.
a) high pressure b) low pressure
c) negative pressure d) discharge

2) Manometers are used for measurement of _____.
a) discharge b) velocity
c) pressure d) viscosity

3) The ratio of average velocity to maximum velocity for steady laminar flow in circular pipe is _____.
a) 3/2 b) 2/3
c) 1/2 d) 2

4) Boundary layer separation is caused by _____.
a) Negative pressure gradient b) Positive pressure gradient
c) Zero pressure gradient d) None of the above

5) For high discharge the pumps are connected in _____.
a) Parallel b) Series
c) both and b d) none of these

6) An impulse turbine requires _____.
a) high head and small quantity of flow
b) low head and small quantity of flow
c) low head and high rate of flow
d) none of the above

7) When a steady jet impinges on a fixed inclined surface _____.
a) the flow is divided into parts proportional to the angle of inclination of the surface
b) no force is exerted by the jet on the vane
c) the momentum component is unchanged parallel to the surface
d) none of the above

8) Dimensional analysis is used to _____.
a) test the dimensional homogeneity of any equation of fluid motion
b) derive rational formulae for a flow phenomenon
c) derive equations expressed in terms of non-dimensional parameters
d) all of the above

9) If 'n' variables in a physical phenomenon contained 'm' fundamental dimensions, then the variables can be arranged into _____.
a) n dimensionless terms
b) m dimensionless terms
c) (n - m) dimensionless terms
d) (n + m) dimensionless terms

10) Ideal fluid is fluid having _____.
a) viscosity
b) compressible
c) both a and b
d) none of these

11) Capillarity of fluid depends on _____.
a) diameter of capillary tube
b) specific weight if fluid
c) surface tension of fluid
d) all of these

12) For measurement of low pressure _____ is used.
a) inverted U tube manometer
b) Bourdon tube
c) inclined tube manometer
d) vertical single column manometer

13) An opening provided in the side of a tank or vessel such that the liquid surface in the tank is below the top edge of the opening is known as _____.
a) Weir
b) Notch
c) Orifice
d) Venturi meter

14) The error in discharge due to the error in the measurement of head over a rectangular notch or weir is given by _____.
a) $\frac{dQ}{Q} = \frac{1}{2}\frac{dH}{H}$
b) $\frac{dQ}{Q} = \frac{3}{2}\frac{dH}{H}$
c) $\frac{dQ}{Q} = \frac{3}{4}\frac{dH}{H}$
d) None of these

SLR-BD-35

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fluid Mechanics and Fluid Machines (BTN01302)

Day & Date: Monday, 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section - I, Q. 2 is compulsory and you must attempt any two questions from the remaining questions.
2) In Section - II, Q. 6 is compulsory and you must attempt any two questions from the remaining questions.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary and state it clearly.

Section – I

Q.2 **a)** Give the detailed classification of fluids. **05**
b) A fluid is placed in between two plates, and one of the plates is moving at 0.6 m/s which is at a distance of 0.02 mm from other plate which is fixed. If the force required to maintain the speed is 3N/m^2 determine viscosity of fluid. **05**

Q.3 **a)** Explain different types of pressures with neat sketch. **04**
b) A rectangular plane surface of dimensions 3 m width and 4 m depth lies in vertical plane in water. Determine the total pressure force and center of pressure on surface when it is immersed at 3.5 m from free water surface and 3 m dimension is parallel to the free water surface. **05**

Q.4 **a)** What are the different types fluid flows? Explain them. **04**
b) For a velocity function given by the equation $\Psi = 5x - 6y$. Determine the components of velocity and resultant velocity along with its direction. **05**

Q.5 **a)** Derive the expression for total time required to empty a reservoir/tank by triangular notch. **04**
b) What will be the length of rectangular weir if it discharges 0.582 m^3/s, at a head of 300mm and coefficient of discharge 0.6. **05**

Section – II

Q.6 **a)** Derive the expression for force exerted by a jet on station vertical plate. **05**

b) A hydraulic turbine is to be operated under a head of 25 m at 200 rpm and discharge of 9 cumec. If the efficiency of turbine is 90% determine specific speed of turbine, power generated and also state the type of turbine. **05**

Q.7 **a)** Define the terms: boundary layer thickness, displacement thickness, momentum thickness and energy thickness. **04**

b) A 10 cm diameter pipe suddenly enlarge to 20 cm diameter. Determine the discharge through the pipe if head loss due to sudden enlargement is 30 cm of water. **05**

Q.8 **a)** What is mean by repeating variables? How they are selected? **04**

b) The pressure difference ΔP in a pipe of diameter D and length L due to viscous flow depends upon the velocity V, Viscosity μ and density ρ, using Buckingham π method obtain expression for ΔP. **05**

Q.9 **a)** With neat sketch explain different components of centrifugal pump. **04**

b) A centrifugal pump has to discharge 0.3 m^3/s at 1500 rpm against a head of 22m. the impeller diameter is 250 mm and its width at outlet is 50 mm. If the manometric efficiency is 80% determine, vane angle at outlet periphery of impeller. **05**

SLR-BD-36

Seat No.	

Set P

S.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2025

Concrete Technology, Material Testing & Evaluation (BTN01303)

Day & Date: Tuesday, 20-May-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The maximum % of chemical ingredient of cement if that of _____
a) Aluminia b) Silica
c) Gypsum d) Lime

2) Setting time of cement increases by adding ____.
a) Gypsum b) Calcium chloride
c) Hydrogen peroxide d) Sodium oxide

3) Slump test of concrete is a measure of its ____
a) compressive strength b) consistency
c) tensile strength d) all of the above

4) Excess vibration during compacting can lead to: ____
a) Bleeding b) Segregation
c) High strength d) Air bubbles

5) The strength and quality of concrete, depend upon _____
a) grading of aggregates b) surface area of aggregates
c) shape of aggregates d) all the above

6) Water cement ratio is ____.
a) weight of concrete to that of water
b) volume of concrete to that of water
c) weight of water to that of cement
d) both (a) and (b) of the above

7) Which is not use to make Portland Cement (PC)?
a) Calcareous Rocks b) Argillocalcareous Rocks
c) Argillaceous Rocks d) Sand

8) Air entrainment in the concrete increases ____.
a) Strength
b) Workability
c) The effects of temperature variations
d) The unit weight

9) Steam curing is adopted for: _____.
a) Walls b) Columns
c) Beams d) Precast structures

10) Increase in the moisture content in concrete ____
a) Reduces the strength
b) Increases the strength
c) Does not change the strength
d) All of the above

11) Setting time for cement is measured by _____
a) Vicat's Apparatus b) Le Chatelier's
c) Hygrometer d) None of these

12) Use of right quality fly ash, results in _____ of water demand for desired Slump.
a) increase b) retention
c) reduction d) none

13) Tensile test can be performed on ____.
a) Impact testing machine b) Universal testing machine
c) Rockwell Tester d) None

14) IS Provision for concrete mix design is given by ____.
a) IS 456-2000 b) IS 10262-2009
c) IS 383-1970 d) None

Seat No.	

Set **P**

S.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2025

Concrete Technology, Material Testing & Evaluation (BTN01303)

Day & Date: Tuesday, 20-May-2025 Max. Marks: 56

Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.
4) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2 Answer the following: (Any Seven) **28**

a) Write a brief note on Retarders and Accelerators.
b) What are Bogue's compounds? State their influence on cement strength.
c) Differentiate between "Segregation and Bleeding".
d) Write a note on bulking of Sand.
e) Enlist factor affecting workability of concrete & explain any Two.
f) Explain the manufacturing process of Cement by Wet Process with flow chart construction.
g) Write a note in compaction of concrete.
h) Write a note on Effect of W/C ratio on strength of Concrete.
i) Write a note on Plasticizers & Super plasticizers.
j) Write a note on Batching of concrete.

Section- II

Q.3 Answer the following: (Any Three) **12**

a) Quality Control of Concrete
b) Write a note of sulphate or chloride attack on concrete.
c) Factor affecting Creep of concrete
d) Tension test on mild Steel
e) Shrinkage Control

Q.4 Answer the following: (Any Two) **16**

a) Explain in detail Procedure of ACI method of Concrete Mix design.
b) Elaborate on steps followed in performing concrete mix design as per I.S. Method.
c) Explain is "High Strength Concrete and High-Performance Concrete." Discuss their advantages and disadvantages.
d) Which are the durability requirements of concrete as per I.S. 456-2000?

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2025

Concrete Technology, Material Testing & Evaluation (BTN01303)

Day & Date: Tuesday, 20-May-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Air entrainment in the concrete increases ____.
a) Strength
b) Workability
c) The effects of temperature variations
d) The unit weight

2) Steam curing is adopted for: _____.
a) Walls b) Columns
c) Beams d) Precast structures

3) Increase in the moisture content in concrete ____
a) Reduces the strength
b) Increases the strength
c) Does not change the strength
d) All of the above

4) Setting time for cement is measured by _____
a) Vicat's Apparatus b) Le Chatelier's
c) Hygrometer d) None of these

5) Use of right quality fly ash, results in _____ of water demand for desired Slump.
a) increase b) retention
c) reduction d) none

6) Tensile test can be performed on ____.
a) Impact testing machine b) Universal testing machine
c) Rockwell Tester d) None

7) IS Provision for concrete mix design is given by ____.
a) IS 456-2000 b) IS 10262-2009
c) IS 383-1970 d) None

8) The maximum % of chemical ingredient of cement if that of _____
a) Aluminia b) Silica
c) Gypsum d) Lime

9) Setting time of cement increases by adding ____.
a) Gypsum b) Calcium chloride
c) Hydrogen peroxide d) Sodium oxide

10) Slump test of concrete is a measure of its ____
a) compressive strength b) consistency
c) tensile strength d) all of the above

11) Excess vibration during compacting can lead to: ____
a) Bleeding b) Segregation
c) High strength d) Air bubbles

12) The strength and quality of concrete, depend upon _____
a) grading of aggregates b) surface area of aggregates
c) shape of aggregates d) all the above

13) Water cement ratio is ____.
a) weight of concrete to that of water
b) volume of concrete to that of water
c) weight of water to that of cement
d) both (a) and (b) of the above

14) Which is not use to make Portland Cement (PC)?
a) Calcareous Rocks b) Argillocalcareous Rocks
c) Argillaceous Rocks d) Sand

SLR-BD-36

Seat No.	

Set Q

S.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2025
Concrete Technology, Material Testing & Evaluation (BTN01303)

Day & Date: Tuesday, 20-May-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.
4) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2 Answer the following: (Any Seven) **28**

a) Write a brief note on Retarders and Accelerators.
b) What are Bogue's compounds? State their influence on cement strength.
c) Differentiate between "Segregation and Bleeding".
d) Write a note on bulking of Sand.
e) Enlist factor affecting workability of concrete & explain any Two.
f) Explain the manufacturing process of Cement by Wet Process with flow chart construction.
g) Write a note in compaction of concrete.
h) Write a note on Effect of W/C ratio on strength of Concrete.
i) Write a note on Plasticizers & Super plasticizers.
j) Write a note on Batching of concrete.

Section- II

Q.3 Answer the following: (Any Three) **12**

a) Quality Control of Concrete
b) Write a note of sulphate or chloride attack on concrete.
c) Factor affecting Creep of concrete
d) Tension test on mild Steel
e) Shrinkage Control

Q.4 Answer the following: (Any Two) **16**

a) Explain in detail Procedure of ACI method of Concrete Mix design.
b) Elaborate on steps followed in performing concrete mix design as per I.S. Method.
c) Explain is "High Strength Concrete and High-Performance Concrete." Discuss their advantages and disadvantages.
d) Which are the durability requirements of concrete as per I.S. 456-2000?

Seat No.	

Set R

S.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2025

Concrete Technology, Material Testing & Evaluation (BTN01303)

Day & Date: Tuesday, 20-May-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Setting time for cement is measured by _____
a) Vicat's Apparatus b) Le Chatelier's
c) Hygrometer d) None of these

2) Use of right quality fly ash, results in _____ of water demand for desired Slump.
a) increase b) retention
c) reduction d) none

3) Tensile test can be performed on ____.
a) Impact testing machine b) Universal testing machine
c) Rockwell Tester d) None

4) IS Provision for concrete mix design is given by ____.
a) IS 456-2000 b) IS 10262-2009
c) IS 383-1970 d) None

5) The maximum % of chemical ingredient of cement if that of _____
a) Aluminia b) Silica
c) Gypsum d) Lime

6) Setting time of cement increases by adding ____.
a) Gypsum b) Calcium chloride
c) Hydrogen peroxide d) Sodium oxide

7) Slump test of concrete is a measure of its ____
a) compressive strength b) consistency
c) tensile strength d) all of the above

8) Excess vibration during compacting can lead to: ____
a) Bleeding b) Segregation
c) High strength d) Air bubbles

9) The strength and quality of concrete, depend upon _____
a) grading of aggregates b) surface area of aggregates
c) shape of aggregates d) all the above

10) Water cement ratio is ____.
a) weight of concrete to that of water
b) volume of concrete to that of water
c) weight of water to that of cement
d) both (a) and (b) of the above

11) Which is not use to make Portland Cement (PC)?
a) Calcareous Rocks b) Argillocalcareous Rocks
c) Argillaceous Rocks d) Sand

12) Air entrainment in the concrete increases ____.
a) Strength
b) Workability
c) The effects of temperature variations
d) The unit weight

13) Steam curing is adopted for: _____.
a) Walls b) Columns
c) Beams d) Precast structures

14) Increase in the moisture content in concrete ____
a) Reduces the strength
b) Increases the strength
c) Does not change the strength
d) All of the above

Seat No.	

Set **R**

S.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS) Examination: March/April – 2025
Concrete Technology, Material Testing & Evaluation (BTN01303)

Day & Date: Tuesday, 20-May-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.
4) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2 Answer the following: (Any Seven) **28**

a) Write a brief note on Retarders and Accelerators.
b) What are Bogue's compounds? State their influence on cement strength.
c) Differentiate between "Segregation and Bleeding".
d) Write a note on bulking of Sand.
e) Enlist factor affecting workability of concrete & explain any Two.
f) Explain the manufacturing process of Cement by Wet Process with flow chart construction.
g) Write a note in compaction of concrete.
h) Write a note on Effect of W/C ratio on strength of Concrete.
i) Write a note on Plasticizers & Super plasticizers.
j) Write a note on Batching of concrete.

Section- II

Q.3 Answer the following: (Any Three) **12**

a) Quality Control of Concrete
b) Write a note of sulphate or chloride attack on concrete.
c) Factor affecting Creep of concrete
d) Tension test on mild Steel
e) Shrinkage Control

Q.4 Answer the following: (Any Two) **16**

a) Explain in detail Procedure of ACI method of Concrete Mix design.
b) Elaborate on steps followed in performing concrete mix design as per I.S. Method.
c) Explain is "High Strength Concrete and High-Performance Concrete." Discuss their advantages and disadvantages.
d) Which are the durability requirements of concrete as per I.S. 456-2000?

Seat No.		Set	S

S.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2025

Concrete Technology, Material Testing & Evaluation (BTN01303)

Day & Date: Tuesday, 20-May-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Water cement ratio is ____.
a) weight of concrete to that of water
b) volume of concrete to that of water
c) weight of water to that of cement
d) both (a) and (b) of the above

2) Which is not use to make Portland Cement (PC)?
a) Calcareous Rocks b) Argillocalcareous Rocks
c) Argillaceous Rocks d) Sand

3) Air entrainment in the concrete increases ____.
a) Strength
b) Workability
c) The effects of temperature variations
d) The unit weight

4) Steam curing is adopted for: _____.
a) Walls b) Columns
c) Beams d) Precast structures

5) Increase in the moisture content in concrete ____
a) Reduces the strength
b) Increases the strength
c) Does not change the strength
d) All of the above

6) Setting time for cement is measured by _____
a) Vicat's Apparatus b) Le Chatelier's
c) Hygrometer d) None of these

7) Use of right quality fly ash, results in _____ of water demand for desired Slump.

a) increase b) retention
c) reduction d) none

8) Tensile test can be performed on ____.

a) Impact testing machine b) Universal testing machine
c) Rockwell Tester d) None

9) IS Provision for concrete mix design is given by ____.

a) IS 456-2000 b) IS 10262-2009
c) IS 383-1970 d) None

10) The maximum % of chemical ingredient of cement if that of _____

a) Aluminia b) Silica
c) Gypsum d) Lime

11) Setting time of cement increases by adding ____.

a) Gypsum b) Calcium chloride
c) Hydrogen peroxide d) Sodium oxide

12) Slump test of concrete is a measure of its ____

a) compressive strength b) consistency
c) tensile strength d) all of the above

13) Excess vibration during compacting can lead to: ____

a) Bleeding b) Segregation
c) High strength d) Air bubbles

14) The strength and quality of concrete, depend upon _____

a) grading of aggregates b) surface area of aggregates
c) shape of aggregates d) all the above

SLR-BD-36

Seat No.	

Set S

S.Y. (B.Tech.) (Civil Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2025

Concrete Technology, Material Testing & Evaluation (BTN01303)

Day & Date: Tuesday, 20-May-2025 Max. Marks: 56

Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.
4) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2 Answer the following: (Any Seven) **28**

a) Write a brief note on Retarders and Accelerators.
b) What are Bogue's compounds? State their influence on cement strength.
c) Differentiate between "Segregation and Bleeding".
d) Write a note on bulking of Sand.
e) Enlist factor affecting workability of concrete & explain any Two.
f) Explain the manufacturing process of Cement by Wet Process with flow chart construction.
g) Write a note in compaction of concrete.
h) Write a note on Effect of W/C ratio on strength of Concrete.
i) Write a note on Plasticizers & Super plasticizers.
j) Write a note on Batching of concrete.

Section- II

Q.3 Answer the following: (Any Three) **12**

a) Quality Control of Concrete
b) Write a note of sulphate or chloride attack on concrete.
c) Factor affecting Creep of concrete
d) Tension test on mild Steel
e) Shrinkage Control

Q.4 Answer the following: (Any Two) **16**

a) Explain in detail Procedure of ACI method of Concrete Mix design.
b) Elaborate on steps followed in performing concrete mix design as per I.S. Method.
c) Explain is "High Strength Concrete and High-Performance Concrete." Discuss their advantages and disadvantages.
d) Which are the durability requirements of concrete as per I.S. 456-2000?

SLR-BD-37

Seat No.	

Set P

S.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Structural Mechanics - I (BTN01305)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) A rod, 120cm long and of diameter 3.0 cm is subjected to an axial pull of 18 kN. The stress in N/mn^2
a) 22.57 b) 23.47
c) 24.57 d) 25.47

2) The property of a material by which it can be drawn to a smaller section by applying a tensile load is called _____.
a) Elasticity b) Plasticity
c) Ductility d) Malleability

3) Which of the following is maximum in the principal Plane?
a) Normal stress b) Shear stress
c) shear strain d) None of the above

4) Principal stress is to the principal plane _____.
a) Tangential b) 45°
c) Normal d) 180°

5) The Maximum shear stress occurs at _____.
a) 30° b) 45°
c) 90° d) 180°

6) _____ is a Saint Venant theory.
a) Maximum shear stress theory
b) Maximum strain energy theory
c) Maximum principle strain theory
d) Distortion energy theory

7) Maximum shear stress theory is applicable to _____.
a) Ductile materials b) Brittle materials
c) Composite materials d) None

8) Bending moment on a section is maximum where shearing force is ____.
a) minimum b) maximum
c) equal d) zero

9) For a simply supported beam of span L, loaded with U.D.L. w/m over the whole span, the maximum B.M will be _____.
a) wL/4 b) $wL^2/8$
c) $wL^2/4$ d) $WwL^2/2$

10) What is the S.I. unit of sectional modulus?
a) mm^4 b) mm^3
c) mm^2 d) m

11) Shear stress variation is (a) Outermost fiber _____.
a) Linear b) Polynomial
c) Parabolic d) None

12) What The section modulus of a rectangular section about an axis through its C.G., is _____.
a) b/2 b) d/2
c) $bd^2/2$ d) $bd^2/6$

13) When a beam is subjected to a bending moment the bending stress in a layer is _____the distance from the neutral axis.
a) Independent of b) Directly proportional to
c) Inversely proportional to d) None of these

14) For drawing ILD, what value of test load is assumed?
a) 1 unit b) Arbitrary
c) Depends upon structure d) 0

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Structural Mechanics - I (BTN01305)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section I, Q. No. 2 is compulsory and solve any two questions from the remaining questions.
2) In Section I, Q. No. 6 is compulsory and solve any two questions from the remaining questions.
3) Figures to the right indicate full marks.
4) Make suitable assumptions if necessary and state them clearly.
5) Use of non-programable calculator is allowed.

Section – I

Q.2 A brass bar having cross sectional area is 1000 mm^2 is subjected to axial forces as shown in Fig. No. 1. Find the total elongation of the bar. Take E = $1.05X10^5$ N/mm^2 **10**

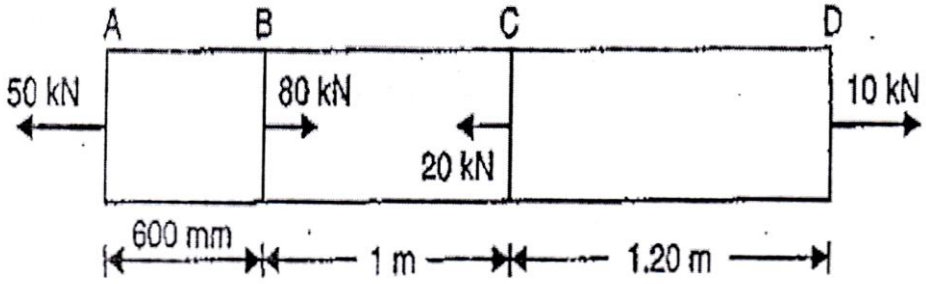


Fig. No. 1

Q.3 Find normal & tangential stresses and the resultant stresses and its obliquity on a plane at 30° to the axis of the minor stress. Take major principle stress as 120 N/mm^2 (Tensile) & minor principle stress as 60 N/mm^2 (Tensile) **09**

Q.4 A circular shaft transmits 60 kw at 2 Hz it is supported in bearings 3 m apart and at 1 m from one bearing, it carries a pulley exerting a transverse load of 36 kN on the shaft. Determine a suitable diameter for the shaft if. **09**
a) The maximum direct stress is not to exceed 100 N/mm^2
b) The maximum shear stress is not to exceed 50 N/mm^2

Q.5 A solid circular shaft of diameter 120mm carries bending moment and twisting moment of magnitudes 35 kN.m and 25 kN.m Find the major principal stress induced in the section and where does it develop. **09**

Section – II

Q.6 Draw SFD & BMD for beam as shown in fig. No. 2 below. **10**

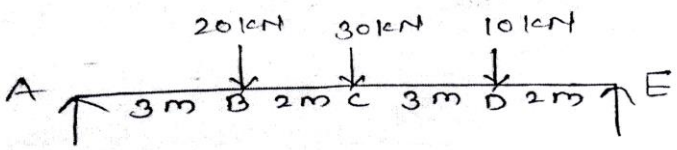


Fig. No. 2

Q.7 A rolled steel joist of I-section has the dimensions as shown in Fig. No. 3. The beam of I section carries a u.d.l of 40 kN/m is simply supported on a span of 10 m. Calculate the maximum stresses produced due to bending. **09**

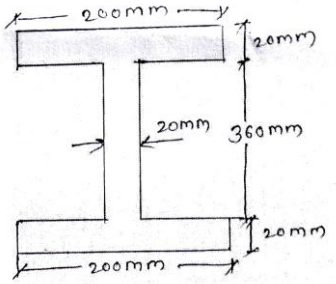


Fig. No. 3

Q.8 Draw the shear stress distribution diagram for the T-section shown in the fig. no.4 below. Take shear force of 1000 kN. **09**

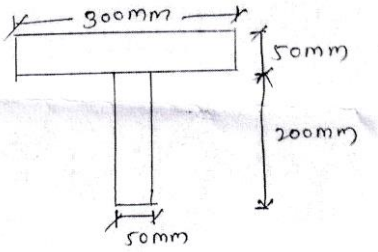


Fig. No. 4

Q.9 Two-wheel loads 8 kN and 20 kN spaced at 2 m apart move along the span of girder of span 16 m. Find the maximum BM that can occur at a section of 6 m from the left end. Any wheel load can lead the other. **09**

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Structural Mechanics - I (BTN01305)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Bending moment on a section is maximum where shearing force is ____.
a) minimum b) maximum
c) equal d) zero

2) For a simply supported beam of span L, loaded with U.D.L. w/m over the whole span, the maximum B.M will be _____.
a) wL/4 b) $wL^2/8$
c) $wL^2/4$ d) $WwL^2/2$

3) What is the S.I. unit of sectional modulus?
a) mm^4 b) mm^3
c) mm^2 d) m

4) Shear stress variation is (a) Outermost fiber _____.
a) Linear b) Polynomial
c) Parabolic d) None

5) What The section modulus of a rectangular section about an axis through its C.G., is _____.
a) b/2 b) d/2
c) $bd^2/2$ d) $bd^2/6$

6) When a beam is subjected to a bending moment the bending stress in a layer is _____the distance from the neutral axis.
a) Independent of b) Directly proportional to
c) Inversely proportional to d) None of these

7) For drawing ILD, what value of test load is assumed?
a) 1 unit b) Arbitrary
c) Depends upon structure d) 0

8) A rod, 120cm long and of diameter 3.0 cm is subjected to an axial pull of 18 kN. The stress in N/mn^2

a) 22.57 b) 23.47
c) 24.57 d) 25.47

9) The property of a material by which it can be drawn to a smaller section by applying a tensile load is called _____.

a) Elasticity b) Plasticity
c) Ductility d) Malleability

10) Which of the following is maximum in the principal Plane?

a) Normal stress b) Shear stress
c) shear strain d) None of the above

11) Principal stress is to the principal plane _____.

a) Tangential b) 45°
c) Normal d) 180°

12) The Maximum shear stress occurs at _____.

a) 30° b) 45°
c) 90° d) 180°

13) _____ is a Saint Venant theory.

a) Maximum shear stress theory
b) Maximum strain energy theory
c) Maximum principle strain theory
d) Distortion energy theory

14) Maximum shear stress theory is applicable to _____.

a) Ductile materials b) Brittle materials
c) Composite materials d) None

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Structural Mechanics - I (BTN01305)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section I, Q. No. 2 is compulsory and solve any two questions from the remaining questions.
2) In Section I, Q. No. 6 is compulsory and solve any two questions from the remaining questions.
3) Figures to the right indicate full marks.
4) Make suitable assumptions if necessary and state them clearly.
5) Use of non-programable calculator is allowed.

Section – I

Q.2 A brass bar having cross sectional area is 1000 mm^2 is subjected to axial forces as shown in Fig. No. 1. Find the total elongation of the bar. Take E = $1.05X10^5$ N/mm^2 **10**

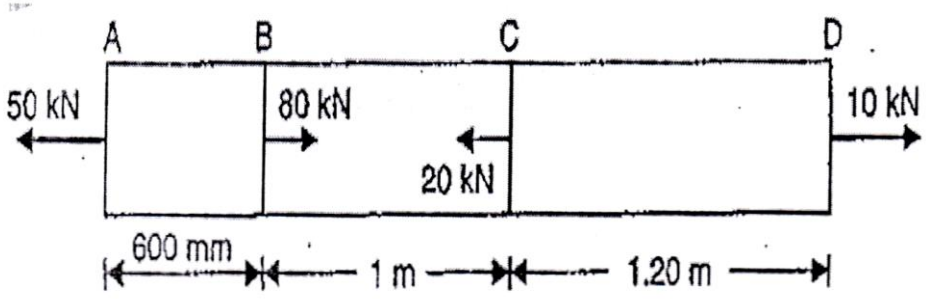


Fig. No. 1

Q.3 Find normal & tangential stresses and the resultant stresses and its obliquity on a plane at 30° to the axis of the minor stress. Take major principle stress as 120 N/mm^2 (Tensile) & minor principle stress as 60 N/mm^2 (Tensile) **09**

Q.4 A circular shaft transmits 60 kw at 2 Hz it is supported in bearings 3 m apart and at 1 m from one bearing, it carries a pulley exerting a transverse load of 36 kN on the shaft. Determine a suitable diameter for the shaft if. **09**
a) The maximum direct stress is not to exceed 100 N/mm^2
b) The maximum shear stress is not to exceed 50 N/mm^2

Q.5 A solid circular shaft of diameter 120mm carries bending moment and twisting moment of magnitudes 35 kN.m and 25 kN.m Find the major principal stress induced in the section and where does it develop. **09**

Section – II

Q.6 Draw SFD & BMD for beam as shown in fig. No. 2 below. **10**

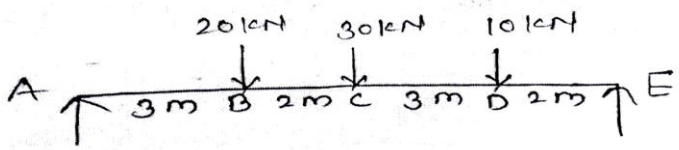


Fig. No. 2

Q.7 A rolled steel joist of I-section has the dimensions as shown in Fig. No. 3. The beam of I section carries a u.d.l of 40 kN/m is simply supported on a span of 10 m. Calculate the maximum stresses produced due to bending. **09**

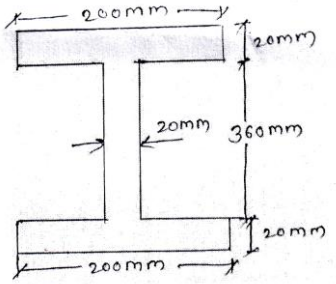


Fig. No. 3

Q.8 Draw the shear stress distribution diagram for the T-section shown in the fig. no.4 below. Take shear force of 1000 kN. **09**

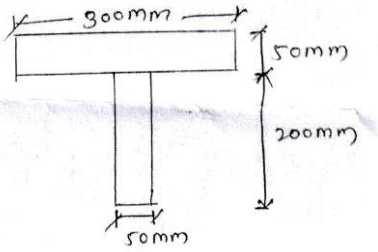


Fig. No. 4

Q.9 Two-wheel loads 8 kN and 20 kN spaced at 2 m apart move along the span of girder of span 16 m. Find the maximum BM that can occur at a section of 6 m from the left end. Any wheel load can lead the other. **09**

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Structural Mechanics - I (BTN01305)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Shear stress variation is (a) Outermost fiber _____.
a) Linear b) Polynomial
c) Parabolic d) None

2) What The section modulus of a rectangular section about an axis through its C.G., is _____.
a) b/2 b) d/2
c) $bd^2/2$ d) $bd^2/6$

3) When a beam is subjected to a bending moment the bending stress in a layer is _____the distance from the neutral axis.
a) Independent of b) Directly proportional to
c) Inversely proportional to d) None of these

4) For drawing ILD, what value of test load is assumed?
a) 1 unit b) Arbitrary
c) Depends upon structure d) 0

5) A rod, 120cm long and of diameter 3.0 cm is subjected to an axial pull of 18 kN. The stress in N/mn^2
a) 22.57 b) 23.47
c) 24.57 d) 25.47

6) The property of a material by which it can be drawn to a smaller section by applying a tensile load is called _____.
a) Elasticity b) Plasticity
c) Ductility d) Malleability

7) Which of the following is maximum in the principal Plane?
a) Normal stress b) Shear stress
c) shear strain d) None of the above

8) Principal stress is to the principal plane _____.
a) Tangential b) 45°
c) Normal d) 180°

9) The Maximum shear stress occurs at _____.
a) 30° b) 45°
c) 90° d) 180°

10) _____ is a Saint Venant theory.
a) Maximum shear stress theory
b) Maximum strain energy theory
c) Maximum principle strain theory
d) Distortion energy theory

11) Maximum shear stress theory is applicable to _____.
a) Ductile materials b) Brittle materials
c) Composite materials d) None

12) Bending moment on a section is maximum where shearing force is ____.
a) minimum b) maximum
c) equal d) zero

13) For a simply supported beam of span L, loaded with U.D.L. w/m over the whole span, the maximum B.M will be _____.
a) wL/4 b) $wL^2/8$
c) $wL^2/4$ d) $WwL^2/2$

14) What is the S.I. unit of sectional modulus?
a) mm^4 b) mm^3
c) mm^2 d) m

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Structural Mechanics - I (BTN01305)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section I, Q. No. 2 is compulsory and solve any two questions from the remaining questions.
2) In Section I, Q. No. 6 is compulsory and solve any two questions from the remaining questions.
3) Figures to the right indicate full marks.
4) Make suitable assumptions if necessary and state them clearly.
5) Use of non-programable calculator is allowed.

Section – I

Q.2 A brass bar having cross sectional area is 1000 mm^2 is subjected to axial forces as shown in Fig. No. 1. Find the total elongation of the bar. Take E = $1.05X10^5$ N/mm^2 **10**

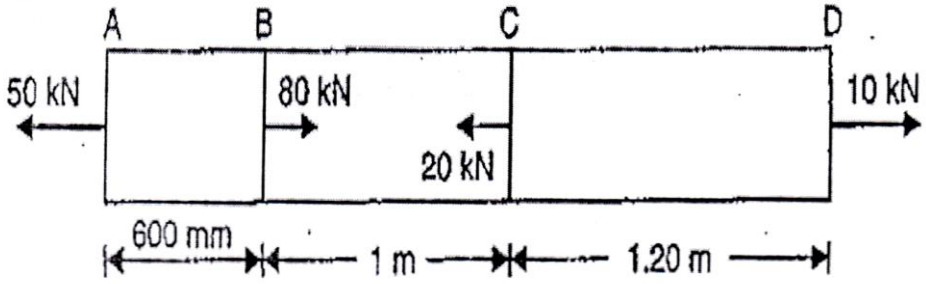


Fig. No. 1

Q.3 Find normal & tangential stresses and the resultant stresses and its obliquity on a plane at 30° to the axis of the minor stress. Take major principle stress as 120 N/mm^2 (Tensile) & minor principle stress as 60 N/mm^2 (Tensile) **09**

Q.4 A circular shaft transmits 60 kw at 2 Hz it is supported in bearings 3 m apart and at 1 m from one bearing, it carries a pulley exerting a transverse load of 36 kN on the shaft. Determine a suitable diameter for the shaft if. **09**
a) The maximum direct stress is not to exceed 100 N/mm^2
b) The maximum shear stress is not to exceed 50 N/mm^2

Q.5 A solid circular shaft of diameter 120mm carries bending moment and twisting moment of magnitudes 35 kN.m and 25 kN.m Find the major principal stress induced in the section and where does it develop. **09**

Section – II

Q.6 Draw SFD & BMD for beam as shown in fig. No. 2 below. **10**

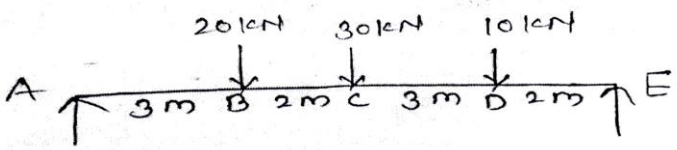


Fig. No. 2

Q.7 A rolled steel joist of I-section has the dimensions as shown in Fig. No. 3. The beam of I section carries a u.d.l of 40 kN/m is simply supported on a span of 10 m. Calculate the maximum stresses produced due to bending. **09**

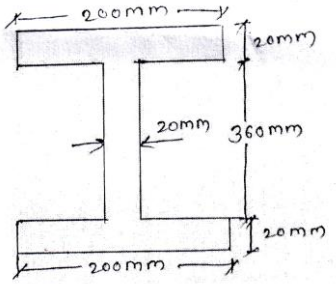


Fig. No. 3

Q.8 Draw the shear stress distribution diagram for the T-section shown in the fig. no.4 below. Take shear force of 1000 kN. **09**

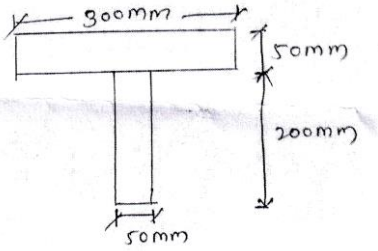


Fig. No. 4

Q.9 Two-wheel loads 8 kN and 20 kN spaced at 2 m apart move along the span of girder of span 16 m. Find the maximum BM that can occur at a section of 6 m from the left end. Any wheel load can lead the other. **09**

Seat No.		Set	S

S.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Structural Mechanics - I (BTN01305)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ is a Saint Venant theory.
a) Maximum shear stress theory
b) Maximum strain energy theory
c) Maximum principle strain theory
d) Distortion energy theory

2) Maximum shear stress theory is applicable to _____.
a) Ductile materials b) Brittle materials
c) Composite materials d) None

3) Bending moment on a section is maximum where shearing force is ____.
a) minimum b) maximum
c) equal d) zero

4) For a simply supported beam of span L, loaded with U.D.L. w/m over the whole span, the maximum B.M will be _____.
a) wL/4 b) $wL^2/8$
c) $wL^2/4$ d) $WwL^2/2$

5) What is the S.I. unit of sectional modulus?
a) mm^4 b) mm^3
c) mm^2 d) m

6) Shear stress variation is (a) Outermost fiber _____.
a) Linear b) Polynomial
c) Parabolic d) None

7) What The section modulus of a rectangular section about an axis through its C.G., is _____.
a) b/2 b) d/2
c) $bd^2/2$ d) $bd^2/6$

8) When a beam is subjected to a bending moment the bending stress in a layer is _____the distance from the neutral axis.

a) Independent of b) Directly proportional to
c) Inversely proportional to d) None of these

9) For drawing ILD, what value of test load is assumed?

a) 1 unit b) Arbitrary
c) Depends upon structure d) 0

10) A rod, 120cm long and of diameter 3.0 cm is subjected to an axial pull of 18 kN. The stress in N/mn^2

a) 22.57 b) 23.47
c) 24.57 d) 25.47

11) The property of a material by which it can be drawn to a smaller section by applying a tensile load is called _____.

a) Elasticity b) Plasticity
c) Ductility d) Malleability

12) Which of the following is maximum in the principal Plane?

a) Normal stress b) Shear stress
c) shear strain d) None of the above

13) Principal stress is to the principal plane _____.

a) Tangential b) 45°
c) Normal d) 180°

14) The Maximum shear stress occurs at _____.

a) 30° b) 45°
c) 90° d) 180°

Seat No.		Set	S

S.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Structural Mechanics - I (BTN01305)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section I, Q. No. 2 is compulsory and solve any two questions from the remaining questions.
2) In Section I, Q. No. 6 is compulsory and solve any two questions from the remaining questions.
3) Figures to the right indicate full marks.
4) Make suitable assumptions if necessary and state them clearly.
5) Use of non-programable calculator is allowed.

Section – I

Q.2 A brass bar having cross sectional area is 1000 mm^2 is subjected to axial forces as shown in Fig. No. 1. Find the total elongation of the bar. Take E = $1.05X10^5$ N/mm^2 **10**

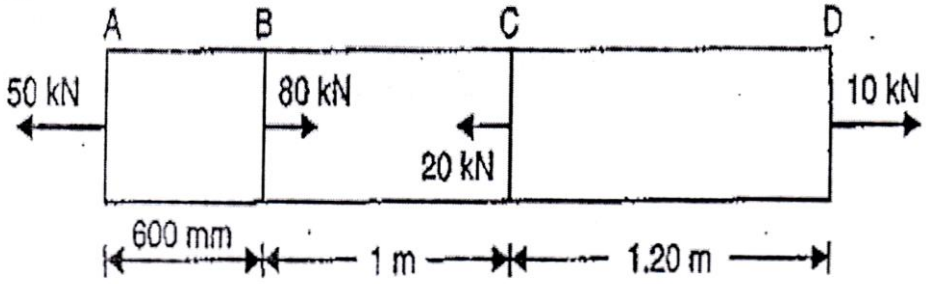


Fig. No. 1

Q.3 Find normal & tangential stresses and the resultant stresses and its obliquity on a plane at 30° to the axis of the minor stress. Take major principle stress as 120 N/mm^2 (Tensile) & minor principle stress as 60 N/mm^2 (Tensile) **09**

Q.4 A circular shaft transmits 60 kw at 2 Hz it is supported in bearings 3 m apart and at 1 m from one bearing, it carries a pulley exerting a transverse load of 36 kN on the shaft. Determine a suitable diameter for the shaft if. **09**
a) The maximum direct stress is not to exceed 100 N/mm^2
b) The maximum shear stress is not to exceed 50 N/mm^2

Q.5 A solid circular shaft of diameter 120mm carries bending moment and twisting moment of magnitudes 35 kN.m and 25 kN.m Find the major principal stress induced in the section and where does it develop. **09**

Section – II

Q.6 Draw SFD & BMD for beam as shown in fig. No. 2 below. **10**

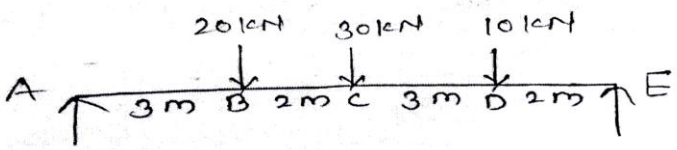


Fig. No. 2

Q.7 A rolled steel joist of I-section has the dimensions as shown in Fig. No. 3. The beam of I section carries a u.d.l of 40 kN/m is simply supported on a span of 10 m. Calculate the maximum stresses produced due to bending. **09**

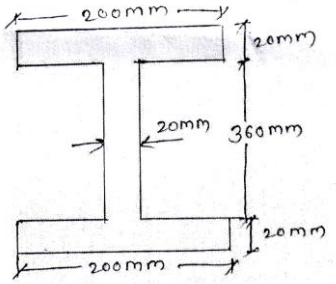


Fig. No. 3

Q.8 Draw the shear stress distribution diagram for the T-section shown in the fig. no.4 below. Take shear force of 1000 kN. **09**

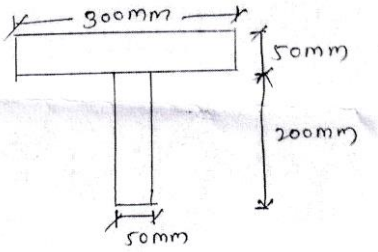


Fig. No. 4

Q.9 Two-wheel loads 8 kN and 20 kN spaced at 2 m apart move along the span of girder of span 16 m. Find the maximum BM that can occur at a section of 6 m from the left end. Any wheel load can lead the other. **09**

SLR-BD-38

Seat No.	

Set P

S.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Building Construction & Drawing (BTN01304)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 07:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume correct data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 State whether following statements are correct or incorrect. 14

1) If depth of footing is less than or equal to width of footing then it is called as shallow foundation.
2) Stile is part of door frame.
3) Landing width is equal to flight width of staircase.
4) Wall footing is provided in Load bearing structure.
5) Combined footing is provided for single column.
6) UCR is a type of stone masonry.
7) The switch boards are fixed at sill height in residential buildings.
8) Purpose to providing traps in drainage system to avoid entry foul gases in building.
9) Plastering is the process of covering rough surfaces of wall, column, and ceiling etc.
10) The term pointing is applied to the finishing of mortar joints in masonry.
11) Driers are used to accelerate the process of drying in painting.
12) The area of a both rooms shall not be less than 1.8 sq.m.
13) Roof sloping in two directions is called as hip roof.
14) A.C. sheets mean Asbestos Cement sheets.

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Building Construction & Drawing (BTN01304)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 07:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume correct data wherever necessary.

Section – I

Q.2 Write the answers for followings. **28**

a) Explain importance of through stone in stone masonry with neat sketch.
b) Write in detail requirements of building stone.
c) Draw neat sketches for any two of door hinges.
d) Explain system of Air - Conditioning in winter?
e) Draw neat labelled elevation of semi-circular arch.
f) Compare strap footing with combined footing with sketches
g) Draw a neat sketch of Gully Trap and Intercepting Trap.
h) Define following terms:
1) Queen Closer
2) King Closer
3) Closer
4) Bevelled closer
i) Draw labelled cross-section of fixing Vitrified tiles on RCC slab.
j) Enlist different types of doors and draw neat labelled elevation of anyone.

Section – II

Q.3 a) Draw to a scale of 1: 10, detailed section, front elevation and sectional elevation for framed T. W. Double leaf door half glazed and half panelled. Use following data (All dimensions are in mm): **14**
1) Clear operating = 1200 x 2100
2) Wood Section for frame = 100 x 75
3) Wood section for styles and rails = 100 x 40
4) Obscured Glass = 5 mm thick at top-side of shutter
5) Panel - 20 mm thick plywood
6) Show various fixtures at proper location.

OR

a) Draw to the scale of 1 :10 elevation and plan of alternate courses of 'L' shaped one brick and one and half brick thick brick wall in English bond.

Q.3 **b)** Design and draw to scale 1:30, plan and vertical section for quarter turn RCC stair for residential building. Use following data: **14**

1) Storey height = 3100 mm
2) Width of flight = 1000 mm
3) Railing - 50 mm thick RCC pardi
4) Reinforcement details not expected
5) Write step by step calculation on sheet with pencil only.

OR

b) Draw to scale 1:20 cross section of a RCC slab floor with ceramic tile flooring laid on cement mortar bed with cement float. Use following data and dimension.

1) RCC slab thickness = 150 mm
2) Cement mortar bed thickness = 30 mm
3) Cement float thickness = 02 mm
4) Ceramic tile thickness = 15 mm
5) Ceramic tile size in plan = 300x300 mm

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Building Construction & Drawing (BTN01304)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 07:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume correct data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 State whether following statements are correct or incorrect. 14

1) If depth of footing is less than or equal to width of footing then it is called as shallow foundation.
2) Stile is part of door frame.
3) Landing width is equal to flight width of staircase.
4) Wall footing is provided in Load bearing structure.
5) Combined footing is provided for single column.
6) UCR is a type of stone masonry.
7) The switch boards are fixed at sill height in residential buildings.
8) Purpose to providing traps in drainage system to avoid entry foul gases in building.
9) Plastering is the process of covering rough surfaces of wall, column, and ceiling etc.
10) The term pointing is applied to the finishing of mortar joints in masonry.
11) Driers are used to accelerate the process of drying in painting.
12) The area of a both rooms shall not be less than 1.8 sq.m.
13) Roof sloping in two directions is called as hip roof.
14) A.C. sheets mean Asbestos Cement sheets.

SLR-BD-38

Seat No.	

Set Q

S.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Building Construction & Drawing (BTN01304)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 07:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume correct data wherever necessary.

Section – I

Q.2 Write the answers for followings. **28**

a) Explain importance of through stone in stone masonry with neat sketch.
b) Write in detail requirements of building stone.
c) Draw neat sketches for any two of door hinges.
d) Explain system of Air - Conditioning in winter?
e) Draw neat labelled elevation of semi-circular arch.
f) Compare strap footing with combined footing with sketches
g) Draw a neat sketch of Gully Trap and Intercepting Trap.
h) Define following terms:
1) Queen Closer
2) King Closer
3) Closer
4) Bevelled closer
i) Draw labelled cross-section of fixing Vitrified tiles on RCC slab.
j) Enlist different types of doors and draw neat labelled elevation of anyone.

Section – II

Q.3 a) Draw to a scale of 1: 10, detailed section, front elevation and sectional elevation for framed T. W. Double leaf door half glazed and half panelled. Use following data (All dimensions are in mm): **14**
1) Clear operating = 1200 x 2100
2) Wood Section for frame = 100 x 75
3) Wood section for styles and rails = 100 x 40
4) Obscured Glass = 5 mm thick at top-side of shutter
5) Panel - 20 mm thick plywood
6) Show various fixtures at proper location.

OR

a) Draw to the scale of 1 :10 elevation and plan of alternate courses of 'L' shaped one brick and one and half brick thick brick wall in English bond.

Q.3 **b)** Design and draw to scale 1:30, plan and vertical section for quarter turn RCC stair for residential building. Use following data: **14**

1) Storey height = 3100 mm
2) Width of flight = 1000 mm
3) Railing - 50 mm thick RCC pardi
4) Reinforcement details not expected
5) Write step by step calculation on sheet with pencil only.

OR

b) Draw to scale 1:20 cross section of a RCC slab floor with ceramic tile flooring laid on cement mortar bed with cement float. Use following data and dimension.

1) RCC slab thickness = 150 mm
2) Cement mortar bed thickness = 30 mm
3) Cement float thickness = 02 mm
4) Ceramic tile thickness = 15 mm
5) Ceramic tile size in plan = 300x300 mm

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Building Construction & Drawing (BTN01304)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 07:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume correct data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 State whether following statements are correct or incorrect. 14

1) If depth of footing is less than or equal to width of footing then it is called as shallow foundation.
2) Stile is part of door frame.
3) Landing width is equal to flight width of staircase.
4) Wall footing is provided in Load bearing structure.
5) Combined footing is provided for single column.
6) UCR is a type of stone masonry.
7) The switch boards are fixed at sill height in residential buildings.
8) Purpose to providing traps in drainage system to avoid entry foul gases in building.
9) Plastering is the process of covering rough surfaces of wall, column, and ceiling etc.
10) The term pointing is applied to the finishing of mortar joints in masonry.
11) Driers are used to accelerate the process of drying in painting.
12) The area of a both rooms shall not be less than 1.8 sq.m.
13) Roof sloping in two directions is called as hip roof.
14) A.C. sheets mean Asbestos Cement sheets.

SLR-BD-38

Seat No.	

Set R

S.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Building Construction & Drawing (BTN01304)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 07:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume correct data wherever necessary.

Section – I

Q.2 Write the answers for followings. **28**

a) Explain importance of through stone in stone masonry with neat sketch.
b) Write in detail requirements of building stone.
c) Draw neat sketches for any two of door hinges.
d) Explain system of Air - Conditioning in winter?
e) Draw neat labelled elevation of semi-circular arch.
f) Compare strap footing with combined footing with sketches
g) Draw a neat sketch of Gully Trap and Intercepting Trap.
h) Define following terms:
1) Queen Closer
2) King Closer
3) Closer
4) Bevelled closer
i) Draw labelled cross-section of fixing Vitrified tiles on RCC slab.
j) Enlist different types of doors and draw neat labelled elevation of anyone.

Section – II

Q.3 a) Draw to a scale of 1: 10, detailed section, front elevation and sectional elevation for framed T. W. Double leaf door half glazed and half panelled. Use following data (All dimensions are in mm): **14**
1) Clear operating = 1200 x 2100
2) Wood Section for frame = 100 x 75
3) Wood section for styles and rails = 100 x 40
4) Obscured Glass = 5 mm thick at top-side of shutter
5) Panel - 20 mm thick plywood
6) Show various fixtures at proper location.

OR

a) Draw to the scale of 1 :10 elevation and plan of alternate courses of 'L' shaped one brick and one and half brick thick brick wall in English bond.

Q.3 **b)** Design and draw to scale 1:30, plan and vertical section for quarter turn RCC stair for residential building. Use following data: **14**

1) Storey height = 3100 mm
2) Width of flight = 1000 mm
3) Railing - 50 mm thick RCC pardi
4) Reinforcement details not expected
5) Write step by step calculation on sheet with pencil only.

OR

b) Draw to scale 1:20 cross section of a RCC slab floor with ceramic tile flooring laid on cement mortar bed with cement float. Use following data and dimension.

1) RCC slab thickness = 150 mm
2) Cement mortar bed thickness = 30 mm
3) Cement float thickness = 02 mm
4) Ceramic tile thickness = 15 mm
5) Ceramic tile size in plan = 300x300 mm

Seat No.		Set	S

S.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Building Construction & Drawing (BTN01304)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 07:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume correct data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 State whether following statements are correct or incorrect. 14

1) If depth of footing is less than or equal to width of footing then it is called as shallow foundation.
2) Stile is part of door frame.
3) Landing width is equal to flight width of staircase.
4) Wall footing is provided in Load bearing structure.
5) Combined footing is provided for single column.
6) UCR is a type of stone masonry.
7) The switch boards are fixed at sill height in residential buildings.
8) Purpose to providing traps in drainage system to avoid entry foul gases in building.
9) Plastering is the process of covering rough surfaces of wall, column, and ceiling etc.
10) The term pointing is applied to the finishing of mortar joints in masonry.
11) Driers are used to accelerate the process of drying in painting.
12) The area of a both rooms shall not be less than 1.8 sq.m.
13) Roof sloping in two directions is called as hip roof.
14) A.C. sheets mean Asbestos Cement sheets.

SLR-BD-38

Seat No.		Set	S

S.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Building Construction & Drawing (BTN01304)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 07:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume correct data wherever necessary.

Section – I

Q.2 Write the answers for followings. **28**

a) Explain importance of through stone in stone masonry with neat sketch.
b) Write in detail requirements of building stone.
c) Draw neat sketches for any two of door hinges.
d) Explain system of Air - Conditioning in winter?
e) Draw neat labelled elevation of semi-circular arch.
f) Compare strap footing with combined footing with sketches
g) Draw a neat sketch of Gully Trap and Intercepting Trap.
h) Define following terms:
1) Queen Closer
2) King Closer
3) Closer
4) Bevelled closer
i) Draw labelled cross-section of fixing Vitrified tiles on RCC slab.
j) Enlist different types of doors and draw neat labelled elevation of anyone.

Section – II

Q.3 a) Draw to a scale of 1: 10, detailed section, front elevation and sectional elevation for framed T. W. Double leaf door half glazed and half panelled. Use following data (All dimensions are in mm): **14**
1) Clear operating = 1200 x 2100
2) Wood Section for frame = 100 x 75
3) Wood section for styles and rails = 100 x 40
4) Obscured Glass = 5 mm thick at top-side of shutter
5) Panel - 20 mm thick plywood
6) Show various fixtures at proper location.

OR

a) Draw to the scale of 1 :10 elevation and plan of alternate courses of 'L' shaped one brick and one and half brick thick brick wall in English bond.

Q.3 **b)** Design and draw to scale 1:30, plan and vertical section for quarter turn RCC stair for residential building. Use following data: **14**

1) Storey height = 3100 mm
2) Width of flight = 1000 mm
3) Railing - 50 mm thick RCC pardi
4) Reinforcement details not expected
5) Write step by step calculation on sheet with pencil only.

OR

b) Draw to scale 1:20 cross section of a RCC slab floor with ceramic tile flooring laid on cement mortar bed with cement float. Use following data and dimension.

1) RCC slab thickness = 150 mm
2) Cement mortar bed thickness = 30 mm
3) Cement float thickness = 02 mm
4) Ceramic tile thickness = 15 mm
5) Ceramic tile size in plan = 300x300 mm

SLR-BD-39

Seat No.	

Set P

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Structural Mechanics-II (CIVPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 MCQs. **14**

1) The Eccentric Vertical Load generates _____
a) Only Direct Stress
b) Only Bending Stress
c) Combined Bending and Direct Stress
d) Shear Stress

2) The Section modulus of a rectangular section along of breadth b and depth d is _____
a) $db^2/4$ b) $db^2/8$
c) $bd^2/4$ d) $bd^2/6$

3) A column of length 'l' is hinged at the both ends, its equivalent length will be equals to _____
a) 21 b) 1
c) 0.51 d) 0.7071

4) The ratio of the effective length of a column and minimum radius of gyration of its cross-sectional area, is known _____
a) Buckling factor b) Slenderness ratio
c) Crippling factor d) None of these

5) In simply supported beams, deflection is zero at _____
a) Mid span b) Supports
c) Throughout d) Point of action of load

6) Unit of deflection is _____
a) kNm b) kN/m
c) Kn d) m

7) Fixed joint is replaced by _____ in conjugate beam.

a) Roller b) Pin
c) Free end d) Link

8) What is kinematic indeterminacy for the given figure considering axial deformation?

a) 0 b) 4
c) 6 d) 10

9) Flexibility matrix is always _____

a) symmetric b) non-symmetric
c) anti-symmetric d) depends upon loads applies

10) In moment distribution method, the sum of distribution factors of all the members meeting at any joint is always ____

a) Zero b) Less than 1
c) One d) Greater than 1

11) Fixed End Moment for a Fixed Beam Carrying a Central Point Load is _____

a) WL/8 b) WL/12
c) WL/2 d) WL/4

12) The Size of stiffness matrix is equals to _____

a) DSI b) DKI
c) DSI+DKI d) DSI-DKI

13) If a continuous beam ABC is simply supported at A, B and C, then the size of matrix in stiffness matrix method is _____

a) 3 x 2 b) 2 x 2
c) 2 x 3 d) 3 x 3

14) The moment distribution method in structural analysis can be treated as _____

a) Force method b) Displacement method
c) Flexibility method d) None of these

SLR-BD-39

Seat No.	

Set P

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Structural Mechanics-II (CIVPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In Section I, Q. No. 2 is compulsory and attempt any two questions from the remaining.
2) In Section II, Q. No. 6 is compulsory and attempt any two questions from the remaining.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed

SECTION – I

Q.2 Determine the maximum and minimum stresses at the base of dam. The masonry trapezoidal dam retains water on vertical face. The height of the dam is 5m and dam water level is upto 4.5m. Top width of the dam is 1m whereas bottom width is 3m. Take weight of water as 10kN/m^3 and masonry as 20kN/m^3. **10**

Q.3 A 2.0 m long column has a circular cross-section of 6 cm diameter. One of the ends of the column is fixed and other end is free. Taking factor of safety as 3, calculate the safe load using **09**
1) Rankine's formula with f_c = 550 N/mm^2 & Rankine's constant is 1/1600
2) Eulers formula with E = 1.3X10^5 N/mm^2

Q.4 A simply supported beam of length 4 m carries a point load of 3 kN at a distance of 1 m from each end. If E = 2 x 105 N/mm^2 and I =10 mm^2 for the beam, then using conjugate beam method determine: **09**
1) Slope at each end
2) Deflection under each load and at the centre.

Q.5 **a)** Find the kernel of circular section of diameter 'd'. **03**
b) Enlist different end conditions of columns and state their effective lengths. Draw neat sketches of effective lengths. **03**
c) Explain conjugate beam method. **03**

SECTION - II

Q.6 Analyze the frame as shown in Fig.No.1 by moment distribution method and draw bending moment diagram. **10**

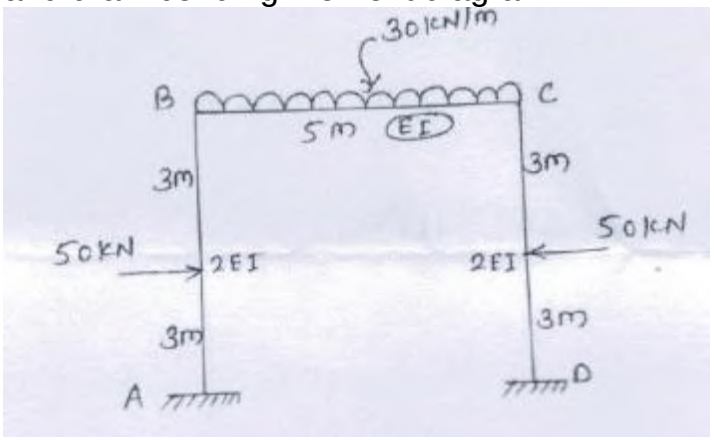


Fig.No.1

Q.7 Analyze the beam using flexibility method shown in Fig. No. 2 and draw bending moment diagram. **09**

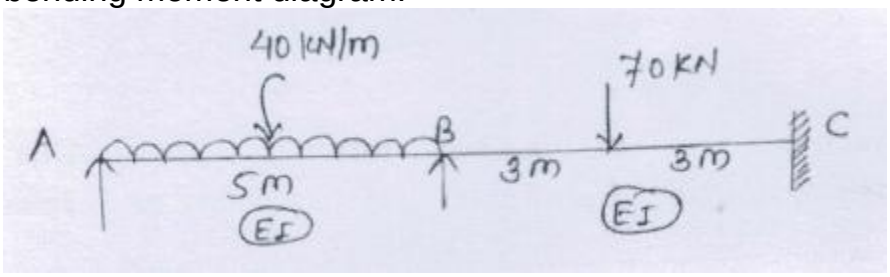


Fig.No.2

Q.8 Analyze the beam shown in Fig. No.3 by stiffness matrix method and draw bending moment diagram. **09**

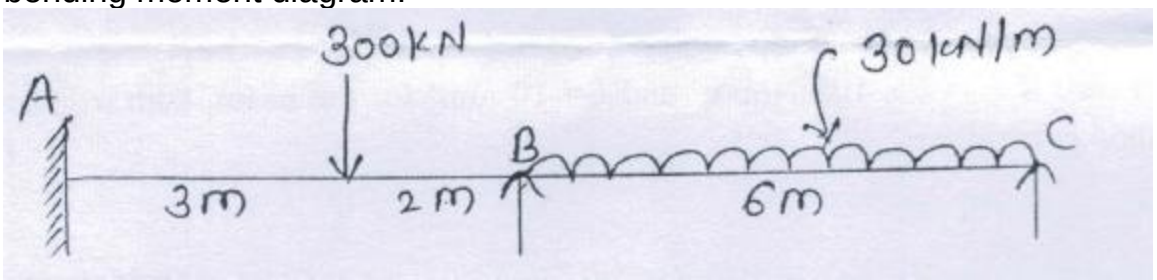


Fig.No.3

Q.9 Attempt the following questions.

a) Explain the difference between force method and displacement methods. **04**

b) Find the distribution factors of joint 'O' refer Fig. No. 4 **03**

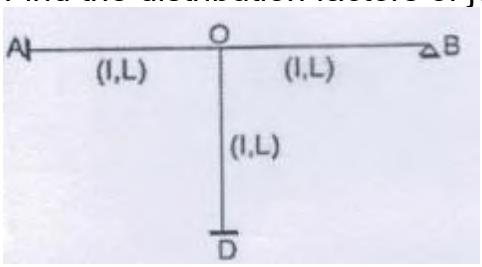


Fig.No.4

c) Find the DSI and DKI of truss by shown in Fig. No.5 **02**

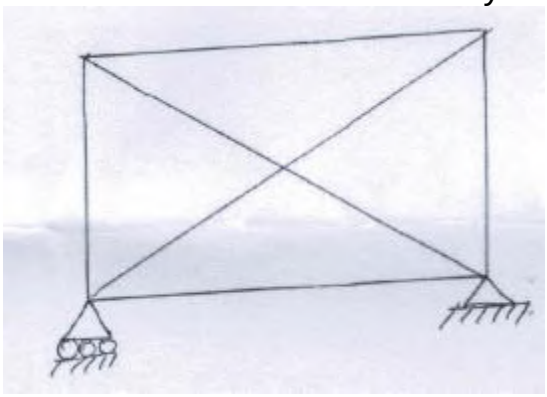


Fig.No.5

SLR-BD-39

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Structural Mechanics-II (CIVPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 MCQs. **14**

1) What is kinematic indeterminacy for the given figure considering axial deformation?

a) 0 b) 4
c) 6 d) 10

2) Flexibility matrix is always _____
a) symmetric b) non-symmetric
c) anti-symmetric d) depends upon loads applies

3) In moment distribution method, the sum of distribution factors of all the members meeting at any joint is always ____
a) Zero b) Less than 1
c) One d) Greater than 1

4) Fixed End Moment for a Fixed Beam Carrying a Central Point Load is _____
a) WL/8 b) WL/12
c) WL/2 d) WL/4

5) The Size of stiffness matrix is equals to _____
a) DSI b) DKI
c) DSI+DKI d) DSI-DKI

6) If a continuous beam ABC is simply supported at A, B and C, then the size of matrix in stiffness matrix method is _____

a) 3 x 2 b) 2 x 2
c) 2 x 3 d) 3 x 3

7) The moment distribution method in structural analysis can be treated as _____

a) Force method b) Displacement method
c) Flexibility method d) None of these

8) The Eccentric Vertical Load generates _____

a) Only Direct Stress
b) Only Bending Stress
c) Combined Bending and Direct Stress
d) Shear Stress

9) The Section modulus of a rectangular section along of breadth b and depth d is _____

a) $db^2/4$ b) $db^2/8$
c) $bd^2/4$ d) $bd^2/6$

10) A column of length 'l' is hinged at the both ends, its equivalent length will be equals to _____

a) 21 b) 1
c) 0.51 d) 0.7071

11) The ratio of the effective length of a column and minimum radius of gyration of its cross-sectional area, is known _____

a) Buckling factor b) Slenderness ratio
c) Crippling factor d) None of these

12) In simply supported beams, deflection is zero at _____

a) Mid span b) Supports
c) Throughout d) Point of action of load

13) Unit of deflection is _____

a) kNm b) kN/m
c) Kn d) m

14) Fixed joint is replaced by _____ in conjugate beam.

a) Roller b) Pin
c) Free end d) Link

SLR-BD-39

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Structural Mechanics-II (CIVPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In Section I, Q. No. 2 is compulsory and attempt any two questions from the remaining.
2) In Section II, Q. No. 6 is compulsory and attempt any two questions from the remaining.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed

SECTION – I

Q.2 Determine the maximum and minimum stresses at the base of dam. The masonry trapezoidal dam retains water on vertical face. The height of the dam is 5m and dam water level is upto 4.5m. Top width of the dam is 1m whereas bottom width is 3m. Take weight of water as 10kN/m^3 and masonry as 20kN/m^3. **10**

Q.3 A 2.0 m long column has a circular cross-section of 6 cm diameter. One of the ends of the column is fixed and other end is free. Taking factor of safety as 3, calculate the safe load using **09**
1) Rankine's formula with f_c = 550 N/mm^2 & Rankine's constant is 1/1600
2) Eulers formula with E = 1.3X10^5 N/mm^2

Q.4 A simply supported beam of length 4 m carries a point load of 3 kN at a distance of 1 m from each end. If E = 2 x 105 N/mm^2 and I =10 mm^2 for the beam, then using conjugate beam method determine: **09**
1) Slope at each end
2) Deflection under each load and at the centre.

Q.5 **a)** Find the kernel of circular section of diameter 'd'. **03**
b) Enlist different end conditions of columns and state their effective lengths. Draw neat sketches of effective lengths. **03**
c) Explain conjugate beam method. **03**

SECTION - II

Q.6 Analyze the frame as shown in Fig.No.1 by moment distribution method and draw bending moment diagram. **10**

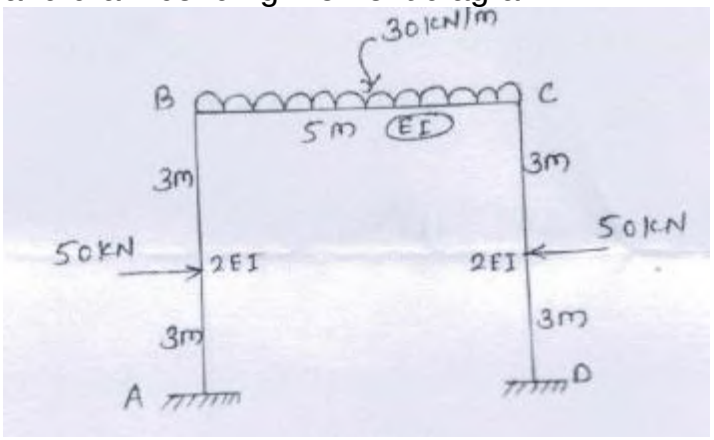


Fig.No.1

Q.7 Analyze the beam using flexibility method shown in Fig. No. 2 and draw bending moment diagram. **09**

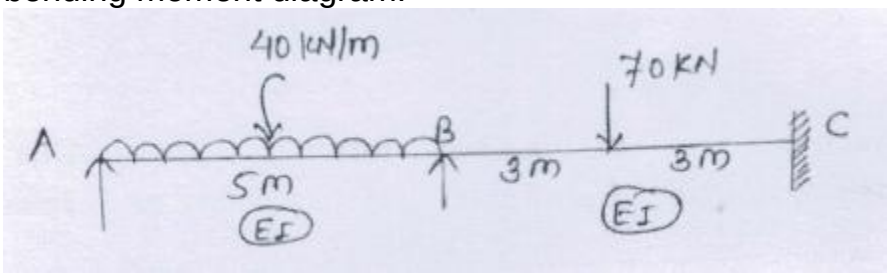


Fig.No.2

Q.8 Analyze the beam shown in Fig. No.3 by stiffness matrix method and draw bending moment diagram. **09**

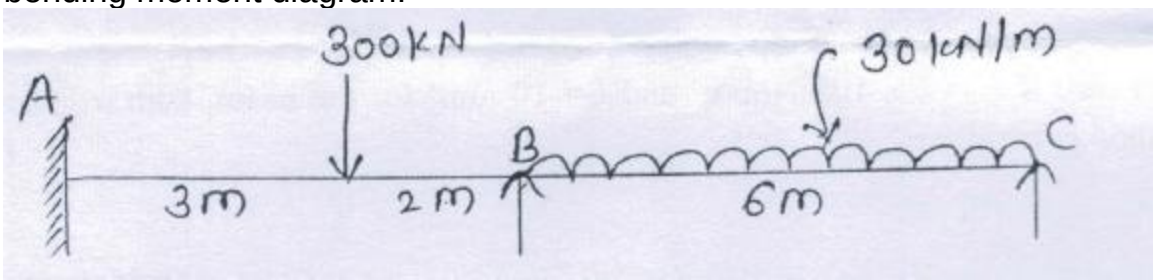


Fig.No.3

Q.9 Attempt the following questions.

a) Explain the difference between force method and displacement methods. **04**

b) Find the distribution factors of joint 'O' refer Fig. No. 4 **03**

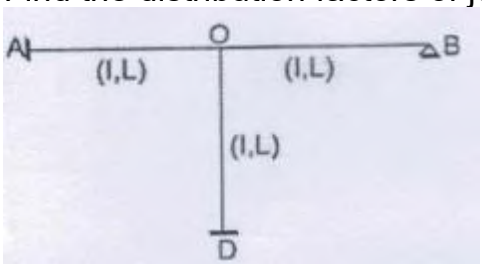


Fig.No.4

c) Find the DSI and DKI of truss by shown in Fig. No.5 **02**

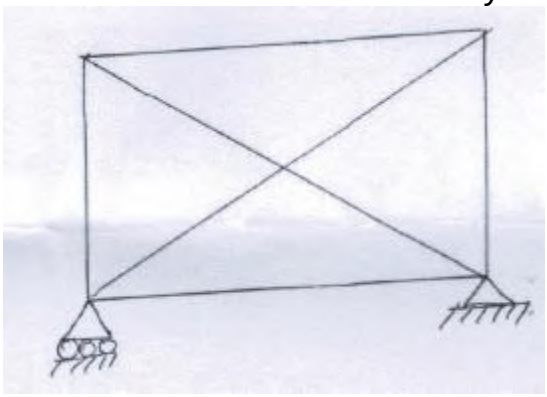


Fig.No.5

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Structural Mechanics-II (CIVPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 MCQs. **14**

1) Fixed End Moment for a Fixed Beam Carrying a Central Point Load is _____
a) WL/8 b) WL/12
c) WL/2 d) WL/4

2) The Size of stiffness matrix is equals to _____
a) DSI b) DKI
c) DSI+DKI d) DSI-DKI

3) If a continuous beam ABC is simply supported at A, B and C, then the size of matrix in stiffness matrix method is _____
a) 3 x 2 b) 2 x 2
c) 2 x 3 d) 3 x 3

4) The moment distribution method in structural analysis can be treated as _____
a) Force method b) Displacement method
c) Flexibility method d) None of these

5) The Eccentric Vertical Load generates _____
a) Only Direct Stress
b) Only Bending Stress
c) Combined Bending and Direct Stress
d) Shear Stress

6) The Section modulus of a rectangular section along of breadth b and depth d is _____
a) $db^2/4$ b) $db^2/8$
c) $bd^2/4$ d) $bd^2/6$

7) A column of length 'l' is hinged at the both ends, its equivalent length will be equals to _____

a) 21 b) 1
c) 0.51 d) 0.7071

8) The ratio of the effective length of a column and minimum radius of gyration of its cross-sectional area, is known _____

a) Buckling factor b) Slenderness ratio
c) Crippling factor d) None of these

9) In simply supported beams, deflection is zero at _____

a) Mid span b) Supports
c) Throughout d) Point of action of load

10) Unit of deflection is _____

a) kNm b) kN/m
c) Kn d) m

11) Fixed joint is replaced by _____ in conjugate beam.

a) Roller b) Pin
c) Free end d) Link

12) What is kinematic indeterminacy for the given figure considering axial deformation?

a) 0 b) 4
c) 6 d) 10

13) Flexibility matrix is always _____

a) symmetric b) non-symmetric
c) anti-symmetric d) depends upon loads applies

14) In moment distribution method, the sum of distribution factors of all the members meeting at any joint is always ____

a) Zero b) Less than 1
c) One d) Greater than 1

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Structural Mechanics-II (CIVPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In Section I, Q. No. 2 is compulsory and attempt any two questions from the remaining.
2) In Section II, Q. No. 6 is compulsory and attempt any two questions from the remaining.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed

SECTION – I

Q.2 Determine the maximum and minimum stresses at the base of dam. The masonry trapezoidal dam retains water on vertical face. The height of the dam is 5m and dam water level is upto 4.5m. Top width of the dam is 1m whereas bottom width is 3m. Take weight of water as 10kN/m^3 and masonry as 20kN/m^3. **10**

Q.3 A 2.0 m long column has a circular cross-section of 6 cm diameter. One of the ends of the column is fixed and other end is free. Taking factor of safety as 3, calculate the safe load using **09**
1) Rankine's formula with f_c = 550 N/mm^2 & Rankine's constant is 1/1600
2) Eulers formula with E = 1.3X10^5 N/mm^2

Q.4 A simply supported beam of length 4 m carries a point load of 3 kN at a distance of 1 m from each end. If E = 2 x 105 N/mm^2 and I =10 mm^2 for the beam, then using conjugate beam method determine: **09**
1) Slope at each end
2) Deflection under each load and at the centre.

Q.5 **a)** Find the kernel of circular section of diameter 'd'. **03**
b) Enlist different end conditions of columns and state their effective lengths. Draw neat sketches of effective lengths. **03**
c) Explain conjugate beam method. **03**

SECTION - II

Q.6 Analyze the frame as shown in Fig.No.1 by moment distribution method and draw bending moment diagram. **10**

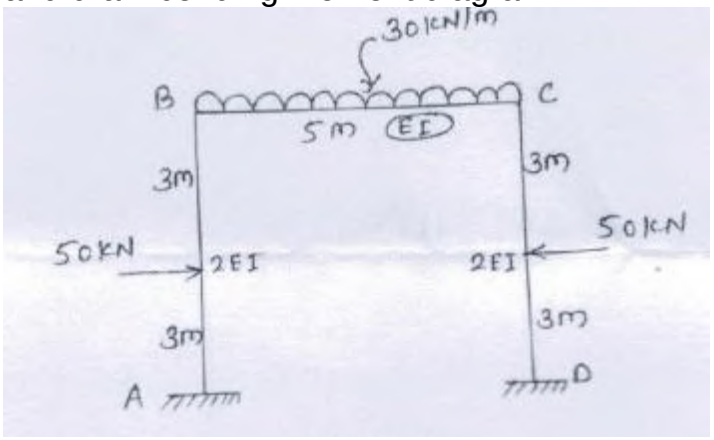


Fig.No.1

Q.7 Analyze the beam using flexibility method shown in Fig. No. 2 and draw bending moment diagram. **09**

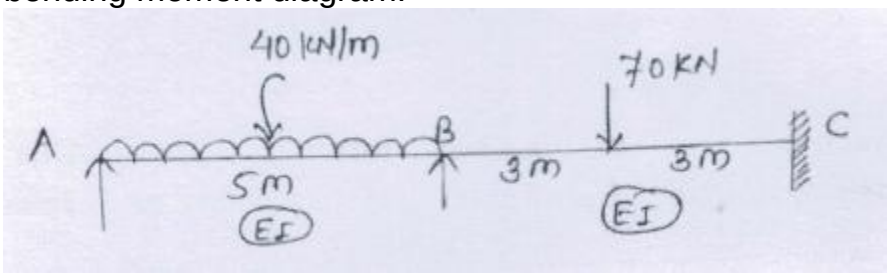


Fig.No.2

Q.8 Analyze the beam shown in Fig. No.3 by stiffness matrix method and draw bending moment diagram. **09**

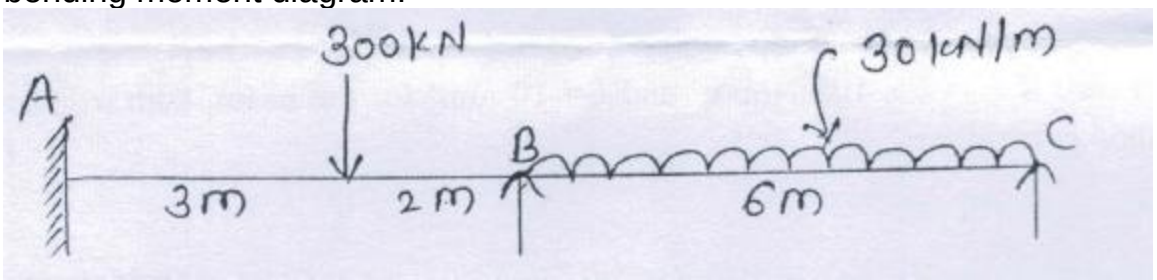


Fig.No.3

Q.9 Attempt the following questions.

a) Explain the difference between force method and displacement methods. **04**

b) Find the distribution factors of joint 'O' refer Fig. No. 4 **03**

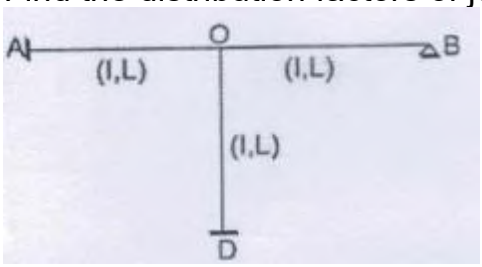


Fig.No.4

c) Find the DSI and DKI of truss by shown in Fig. No.5 **02**

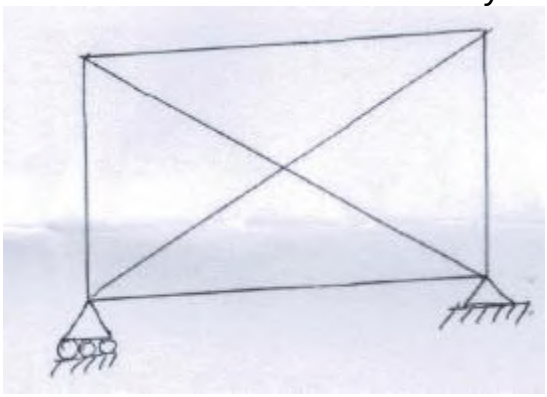


Fig.No.5

SLR-BD-39

Seat No.	

Set S

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Structural Mechanics-II (CIVPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 MCQs. **14**

1) Unit of deflection is _____
a) kNm b) kN/m
c) Kn d) m

2) Fixed joint is replaced by _____ in conjugate beam.
a) Roller b) Pin
c) Free end d) Link

3) What is kinematic indeterminacy for the given figure considering axial deformation?

a) 0 b) 4
c) 6 d) 10

4) Flexibility matrix is always _____
a) symmetric b) non-symmetric
c) anti-symmetric d) depends upon loads applies

5) In moment distribution method, the sum of distribution factors of all the members meeting at any joint is always ____
a) Zero b) Less than 1
c) One d) Greater than 1

6) Fixed End Moment for a Fixed Beam Carrying a Central Point Load is _____
a) WL/8 b) WL/12
c) WL/2 d) WL/4

7) The Size of stiffness matrix is equals to _____
a) DSI b) DKI
c) DSI+DKI d) DSI-DKI

8) If a continuous beam ABC is simply supported at A, B and C, then the size of matrix in stiffness matrix method is _____
a) 3 x 2 b) 2 x 2
c) 2 x 3 d) 3 x 3

9) The moment distribution method in structural analysis can be treated as _____
a) Force method b) Displacement method
c) Flexibility method d) None of these

10) The Eccentric Vertical Load generates _____
a) Only Direct Stress
b) Only Bending Stress
c) Combined Bending and Direct Stress
d) Shear Stress

11) The Section modulus of a rectangular section along of breadth b and depth d is _____
a) $db^2/4$ b) $db^2/8$
c) $bd^2/4$ d) $bd^2/6$

12) A column of length 'l' is hinged at the both ends, its equivalent length will be equals to _____
a) 21 b) 1
c) 0.51 d) 0.7071

13) The ratio of the effective length of a column and minimum radius of gyration of its cross-sectional area, is known _____
a) Buckling factor b) Slenderness ratio
c) Crippling factor d) None of these

14) In simply supported beams, deflection is zero at _____
a) Mid span b) Supports
c) Throughout d) Point of action of load

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Structural Mechanics-II (CIVPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In Section I, Q. No. 2 is compulsory and attempt any two questions from the remaining.
2) In Section II, Q. No. 6 is compulsory and attempt any two questions from the remaining.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed

SECTION – I

Q.2 Determine the maximum and minimum stresses at the base of dam. The masonry trapezoidal dam retains water on vertical face. The height of the dam is 5m and dam water level is upto 4.5m. Top width of the dam is 1m whereas bottom width is 3m. Take weight of water as 10kN/m^3 and masonry as 20kN/m^3. **10**

Q.3 A 2.0 m long column has a circular cross-section of 6 cm diameter. One of the ends of the column is fixed and other end is free. Taking factor of safety as 3, calculate the safe load using **09**
1) Rankine's formula with f_c = 550 N/mm^2 & Rankine's constant is 1/1600
2) Eulers formula with E = 1.3X10^5 N/mm^2

Q.4 A simply supported beam of length 4 m carries a point load of 3 kN at a distance of 1 m from each end. If E = 2 x 105 N/mm^2 and I =10 mm^2 for the beam, then using conjugate beam method determine: **09**
1) Slope at each end
2) Deflection under each load and at the centre.

Q.5 **a)** Find the kernel of circular section of diameter 'd'. **03**
b) Enlist different end conditions of columns and state their effective lengths. Draw neat sketches of effective lengths. **03**
c) Explain conjugate beam method. **03**

SECTION - II

Q.6 Analyze the frame as shown in Fig.No.1 by moment distribution method and draw bending moment diagram. **10**

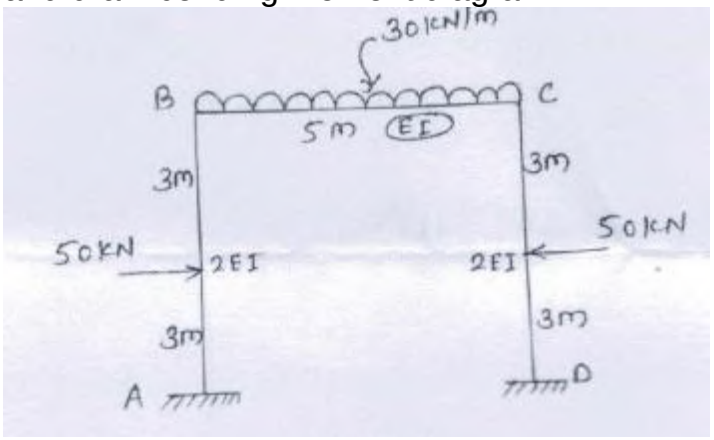


Fig.No.1

Q.7 Analyze the beam using flexibility method shown in Fig. No. 2 and draw bending moment diagram. **09**

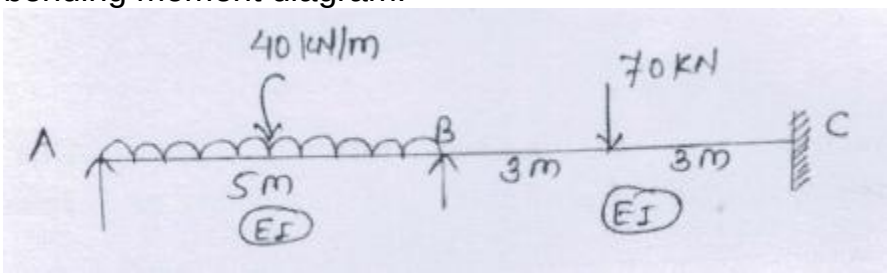


Fig.No.2

Q.8 Analyze the beam shown in Fig. No.3 by stiffness matrix method and draw bending moment diagram. **09**

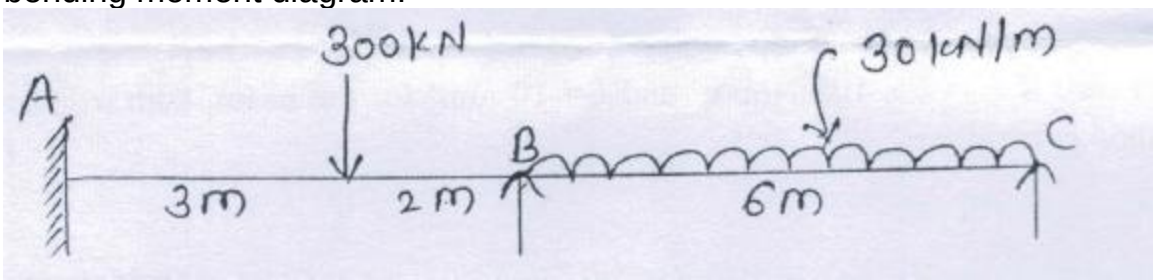


Fig.No.3

Q.9 Attempt the following questions.

a) Explain the difference between force method and displacement methods. **04**

b) Find the distribution factors of joint 'O' refer Fig. No. 4 **03**

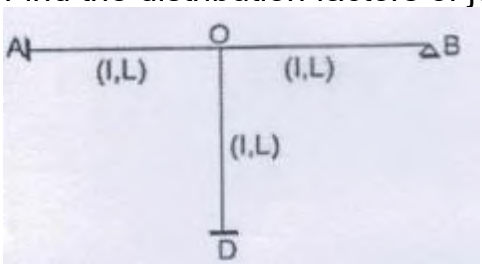


Fig.No.4

c) Find the DSI and DKI of truss by shown in Fig. No.5 **02**

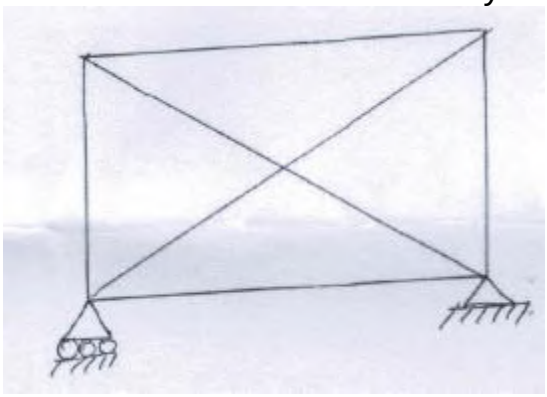


Fig.No.5

SLR-BD-40

Seat No.	

Set P

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Building and Infrastructure Planning (CIVPCC-05)

Day & Date: Wednesday 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ arrangement consists of a system of overhead pipe which are fixed in the ceiling of the roof.
a) Fire extinguishers b) Internal hydrants
c) Automatic sprinkler d) Water pipes

2) During fire, the human body can withstand temperature up to ____.
a) 150°C b) 120°C
c) 200°C d) 80°C

3) A _____ is defined at the upper most part of the building which is constructed in the form of a framework to give protection to the building against rain, heat, snow, wind, etc.
a) Roof b) Truss
c) Chajja d) Lintels

4) The lowest edge of the sloping surface of roof is called _____.
a) Ridge b) Rafters
c) Pitch d) Eaves

5) What is the minimum depth of water seal in floor trap?
a) 25 mm b) 50 mm
c) 75 mm d) 100 mm

6) Partially ventilated single stack system is the modified form of ____.
a) Single stack system and two-pipe system
b) Single stack system and one pipe system
c) One pipe system and two-pipe system
d) Two pipe system

7) _____ is a measure of quantity of sound energy.

a) Wavelength b) Frequency
c) Intensity d) Loudness

8) The speed of sound is taken as _____.

a) 340 m/s b) 3.40 m/s
c) 3400 m/s d) 0.34 m/s

9) Which of the following is NOT a factor affecting site selection for a building?

a) Topography b) Soil condition
c) Color of the building d) Accessibility

10) Which climatic zone in India is characterized by extreme temperatures in both summer and winter?

a) Warm and humid zone b) Composite zone
c) Hot and dry zone d) Cold zone

11) ____ system, the partial vacuum is created inside of the room by exhausting the vitiated inside air by fans or blowers.

a) Supply b) Plenum
c) Air conditioning d) Exhaust

12) Where people are working, there has to be ____ to cause proper ventilation of the premises.

a) Air change b) Humidity
c) Temperature d) Moisture

13) ____ is the Plastering defect which is particularly seen in case of plastered surfaces inside the building.

a) Softness b) Cracks
c) Peeling d) Blistering

14) ____ are cheaper varieties of paint.

a) Color wash b) Pointing
c) Distempers d) Acrylics

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Building and Infrastructure Planning (CIVPCC-05)

Day & Date: Wednesday 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

Section – I

Q.2 Attempt the following. (Any Seven) **28**

a) Write a note on site selection criteria for building.

b) What is the significance of sun path diagram in building planning?

c) List the basic climatic zones of India that effect building orientation?

d) Describe briefly the functional requirements of a good ventilation systems.

e) What do you understand by thermal insulation of building? Why is it necessary? Give its various advantages.

f) Explain the objective of lighting and Principles of Good lighting.

g) Explain various defects in plastering.

h) Enlist the good requirements of plaster.

i) Enlist the objectives, and good characteristics of painting.

Section – II

Q.3 Attempt the following. (Any Four) **28**

a) Enlist acoustical defects and describe any three of them.

b) Explain behavior of sound in closed space.

c) Write a note on Systems of Plumbing in details.

d) Write a note on factors for selection of flooring materials and explain its types in detail.

e) What is Fire resistant structures? Explain the characteristics of fire-resistant materials.

f) Explain in brief types of Fire load.

SLR-BD-40

Seat No.	

Set Q

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Building and Infrastructure Planning (CIVPCC-05)

Day & Date: Wednesday 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The speed of sound is taken as _____.
a) 340 m/s b) 3.40 m/s
c) 3400 m/s d) 0.34 m/s

2) Which of the following is NOT a factor affecting site selection for a building?
a) Topography b) Soil condition
c) Color of the building d) Accessibility

3) Which climatic zone in India is characterized by extreme temperatures in both summer and winter?
a) Warm and humid zone b) Composite zone
c) Hot and dry zone d) Cold zone

4) ____ system, the partial vacuum is created inside of the room by exhausting the vitiated inside air by fans or blowers.
a) Supply b) Plenum
c) Air conditioning d) Exhaust

5) Where people are working, there has to be ____ to cause proper ventilation of the premises.
a) Air change b) Humidity
c) Temperature d) Moisture

6) ____ is the Plastering defect which is particularly seen in case of plastered surfaces inside the building.
a) Softness b) Cracks
c) Peeling d) Blistering

7) ____ are cheaper varieties of paint.
a) Color wash b) Pointing
c) Distempers d) Acrylics

8) _____ arrangement consists of a system of overhead pipe which are fixed in the ceiling of the roof.
a) Fire extinguishers b) Internal hydrants
c) Automatic sprinkler d) Water pipes

9) During fire, the human body can withstand temperature up to ____.
a) 150°C b) 120°C
c) 200°C d) 80°C

10) A _____ is defined at the upper most part of the building which is constructed in the form of a framework to give protection to the building against rain, heat, snow, wind, etc.
a) Roof b) Truss
c) Chajja d) Lintels

11) The lowest edge of the sloping surface of roof is called _____.
a) Ridge b) Rafters
c) Pitch d) Eaves

12) What is the minimum depth of water seal in floor trap?
a) 25 mm b) 50 mm
c) 75 mm d) 100 mm

13) Partially ventilated single stack system is the modified form of ____.
a) Single stack system and two-pipe system
b) Single stack system and one pipe system
c) One pipe system and two-pipe system
d) Two pipe system

14) _____ is a measure of quantity of sound energy.
a) Wavelength b) Frequency
c) Intensity d) Loudness

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Building and Infrastructure Planning (CIVPCC-05)

Day & Date: Wednesday 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

Section – I

Q.2 Attempt the following. (Any Seven) **28**

a) Write a note on site selection criteria for building.

b) What is the significance of sun path diagram in building planning?

c) List the basic climatic zones of India that effect building orientation?

d) Describe briefly the functional requirements of a good ventilation systems.

e) What do you understand by thermal insulation of building? Why is it necessary? Give its various advantages.

f) Explain the objective of lighting and Principles of Good lighting.

g) Explain various defects in plastering.

h) Enlist the good requirements of plaster.

i) Enlist the objectives, and good characteristics of painting.

Section – II

Q.3 Attempt the following. (Any Four) **28**

a) Enlist acoustical defects and describe any three of them.

b) Explain behavior of sound in closed space.

c) Write a note on Systems of Plumbing in details.

d) Write a note on factors for selection of flooring materials and explain its types in detail.

e) What is Fire resistant structures? Explain the characteristics of fire-resistant materials.

f) Explain in brief types of Fire load.

SLR-BD-40

Seat No.	

Set R

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Building and Infrastructure Planning (CIVPCC-05)

Day & Date: Wednesday 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) ____ system, the partial vacuum is created inside of the room by exhausting the vitiated inside air by fans or blowers.
a) Supply b) Plenum
c) Air conditioning d) Exhaust

2) Where people are working, there has to be ____ to cause proper ventilation of the premises.
a) Air change b) Humidity
c) Temperature d) Moisture

3) ____ is the Plastering defect which is particularly seen in case of plastered surfaces inside the building.
a) Softness b) Cracks
c) Peeling d) Blistering

4) ____ are cheaper varieties of paint.
a) Color wash b) Pointing
c) Distempers d) Acrylics

5) _____ arrangement consists of a system of overhead pipe which are fixed in the ceiling of the roof.
a) Fire extinguishers b) Internal hydrants
c) Automatic sprinkler d) Water pipes

6) During fire, the human body can withstand temperature up to ____.
a) 150°C b) 120°C
c) 200°C d) 80°C

7) A _____ is defined at the upper most part of the building which is constructed in the form of a framework to give protection to the building against rain, heat, snow, wind, etc.

a) Roof b) Truss
c) Chajja d) Lintels

8) The lowest edge of the sloping surface of roof is called _____.

a) Ridge b) Rafters
c) Pitch d) Eaves

9) What is the minimum depth of water seal in floor trap?

a) 25 mm b) 50 mm
c) 75 mm d) 100 mm

10) Partially ventilated single stack system is the modified form of ____.

a) Single stack system and two-pipe system
b) Single stack system and one pipe system
c) One pipe system and two-pipe system
d) Two pipe system

11) _____ is a measure of quantity of sound energy.

a) Wavelength b) Frequency
c) Intensity d) Loudness

12) The speed of sound is taken as _____.

a) 340 m/s b) 3.40 m/s
c) 3400 m/s d) 0.34 m/s

13) Which of the following is NOT a factor affecting site selection for a building?

a) Topography b) Soil condition
c) Color of the building d) Accessibility

14) Which climatic zone in India is characterized by extreme temperatures in both summer and winter?

a) Warm and humid zone b) Composite zone
c) Hot and dry zone d) Cold zone

SLR-BD-40

Seat No.	

Set R

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Building and Infrastructure Planning (CIVPCC-05)

Day & Date: Wednesday 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

Section – I

Q.2 Attempt the following. (Any Seven) **28**

a) Write a note on site selection criteria for building.

b) What is the significance of sun path diagram in building planning?

c) List the basic climatic zones of India that effect building orientation?

d) Describe briefly the functional requirements of a good ventilation systems.

e) What do you understand by thermal insulation of building? Why is it necessary? Give its various advantages.

f) Explain the objective of lighting and Principles of Good lighting.

g) Explain various defects in plastering.

h) Enlist the good requirements of plaster.

i) Enlist the objectives, and good characteristics of painting.

Section – II

Q.3 Attempt the following. (Any Four) **28**

a) Enlist acoustical defects and describe any three of them.

b) Explain behavior of sound in closed space.

c) Write a note on Systems of Plumbing in details.

d) Write a note on factors for selection of flooring materials and explain its types in detail.

e) What is Fire resistant structures? Explain the characteristics of fire-resistant materials.

f) Explain in brief types of Fire load.

SLR-BD-40

Seat No.	

Set S

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Building and Infrastructure Planning (CIVPCC-05)

Day & Date: Wednesday 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Partially ventilated single stack system is the modified form of ____.
a) Single stack system and two-pipe system
b) Single stack system and one pipe system
c) One pipe system and two-pipe system
d) Two pipe system

2) _____ is a measure of quantity of sound energy.
a) Wavelength b) Frequency
c) Intensity d) Loudness

3) The speed of sound is taken as _____.
a) 340 m/s b) 3.40 m/s
c) 3400 m/s d) 0.34 m/s

4) Which of the following is NOT a factor affecting site selection for a building?
a) Topography b) Soil condition
c) Color of the building d) Accessibility

5) Which climatic zone in India is characterized by extreme temperatures in both summer and winter?
a) Warm and humid zone b) Composite zone
c) Hot and dry zone d) Cold zone

6) ____ system, the partial vacuum is created inside of the room by exhausting the vitiated inside air by fans or blowers.
a) Supply b) Plenum
c) Air conditioning d) Exhaust

7) Where people are working, there has to be ____ to cause proper ventilation of the premises.

a) Air change b) Humidity
c) Temperature d) Moisture

8) ____ is the Plastering defect which is particularly seen in case of plastered surfaces inside the building.

a) Softness b) Cracks
c) Peeling d) Blistering

9) ____ are cheaper varieties of paint.

a) Color wash b) Pointing
c) Distempers d) Acrylics

10) _____ arrangement consists of a system of overhead pipe which are fixed in the ceiling of the roof.

a) Fire extinguishers b) Internal hydrants
c) Automatic sprinkler d) Water pipes

11) During fire, the human body can withstand temperature up to ____.

a) 150°C b) 120°C
c) 200°C d) 80°C

12) A _____ is defined at the upper most part of the building which is constructed in the form of a framework to give protection to the building against rain, heat, snow, wind, etc.

a) Roof b) Truss
c) Chajja d) Lintels

13) The lowest edge of the sloping surface of roof is called _____.

a) Ridge b) Rafters
c) Pitch d) Eaves

14) What is the minimum depth of water seal in floor trap?

a) 25 mm b) 50 mm
c) 75 mm d) 100 mm

SLR-BD-40

Seat No.	

Set S

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Building and Infrastructure Planning (CIVPCC-05)

Day & Date: Wednesday 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

Section – I

Q.2 Attempt the following. (Any Seven) **28**

a) Write a note on site selection criteria for building.

b) What is the significance of sun path diagram in building planning?

c) List the basic climatic zones of India that effect building orientation?

d) Describe briefly the functional requirements of a good ventilation systems.

e) What do you understand by thermal insulation of building? Why is it necessary? Give its various advantages.

f) Explain the objective of lighting and Principles of Good lighting.

g) Explain various defects in plastering.

h) Enlist the good requirements of plaster.

i) Enlist the objectives, and good characteristics of painting.

Section – II

Q.3 Attempt the following. (Any Four) **28**

a) Enlist acoustical defects and describe any three of them.

b) Explain behavior of sound in closed space.

c) Write a note on Systems of Plumbing in details.

d) Write a note on factors for selection of flooring materials and explain its types in detail.

e) What is Fire resistant structures? Explain the characteristics of fire-resistant materials.

f) Explain in brief types of Fire load.

SLR-BD-41

Seat No.	

Set P

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Engineering (CIVPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.
5) Use of non- programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) What is the primary purpose of assessing water quality?
a) To determine water quantity
b) To identify water sources
c) To ensure water is safe for consumption
d) To calculate water demand

2) Which parameter measures the amount of oxygen required to break down organic matter?
a) pH b) Turbidity
c) BOD d) COD

3) What is the benefit of using tube settlers in sedimentation tanks?
a) Increased detention time b) Reduced settling velocity
c) Increased settling area d) Decreased water quality

4) Which of the following factors affects disinfection efficiency?
a) Contact time b) Disinfectant dose
c) Water temperature d) All of the above

5) What is break-point chlorination?
a) Adding chlorine to water to kill pathogens
b) Adding chlorine to water to remove suspended solids
c) Adding chlorine to water until free chlorine residual appears
d) Removing chlorine from water

6) Which of the following methods can be used for defluoridation?
a) Ion-exchange process b) Reverse osmosis
c) Activated alumina d) All of the above

7) Which method of water distribution uses elevated tanks to provide water pressure?

a) Direct Pumping System b) Overhead Tank System
c) Hydro-Pneumatic System d) Dead End System

8) Which of the following appurtenances is used to prevent backflow?

a) Check valve b) Gate valve
c) Globe valve d) Ball valve

9) What type of sewer carries both sanitary sewage and stormwater?

a) Sanitary sewer b) Stormwater sewer
c) Combined sewer d) Separate sewer

10) What is the typical BOD5 (Biochemical Oxygen Demand) range for untreated domestic wastewater?

a) 100-200 mg/L b) 200-400 mg/L
c) 400-600 mg/L d) 600-800 mg/L

11) What is the primary factor that determines the efficiency of a trickling filter?

a) Hydraulic loading rate b) Organic loading rate
c) Media type and size d) All of the above

12) What is the effect of increasing the hydraulic retention time (HRT) in an activated sludge process?

a) Increased BOD removal efficiency
b) Decreased sludge production
c) Increased oxygen demand
d) All of the above

13) What does the DO sag curve represent?

a) The variation of dissolved oxygen levels with time
b) The variation of BOD with distance downstream
c) The variation of dissolved oxygen levels with distance downstream
d) The variation of flow rate with distance downstream

14) In which reactor design do microorganisms form dense granules, allowing for efficient treatment of wastewater with high organic loads?

a) UASB reactor b) Anaerobic baffled reactor
c) Fluidized bed reactor d) Fixed bed reactor

SLR-BD-41

Seat No.	

Set P

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Engineering (CIVPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In section – I, Q.2 is compulsory and solve any Two question from remaining questions (Q. No. 3, 4 & 5).
2) In Section – II, Q.6 is compulsory and solve any Two question from remaining questions from (Q. No. 7, 8 & 9).
3) Figures to the right indicate full marks.
4) Make suitable assumptions, if required and mention it clearly.
5) Use of non- programmable calculator is allowed.

Section – I

Q.2 **a)** Find the population of a city in 2051 by Incremental Increase Method. The data is given below. **06**

Year	1961	1971	1981	1991	2001	2011
Population	50,000	65,000	70,000	82,000	1,10,000	2,12,000

b) Calculate the all four fire demand for the same city having population of year 2051 for above given question (Q. No. 2 A). **04**

Q.3 **a)** Explain working principle of rapid sand filter with neat sketch. **05**
b) Explain the necessity of aeration in water treatment. Describe different methods of aeration. **04**

Q.4 **a)** Describe the different methods of distributing water in a water supply system. **05**
b) What are the types of distribution reservoir? **04**

Q.5 **a)** Write down standards for the following parameters for water (Permissible and acceptable limit). **05**
1) pH
2) Turbidity
3) Chloride
4) Hardness
5) MPN

b) Explain the horizontal flow type sedimentation tank with neat sketch. **04**

Section – II

Q.6 **a)** Under what circumstances pumping stations are provided? Discuss in details. What are problems associated with sewage pumping? Draw a sketch of a typical sewage pumping station. **06**

b) Write short notes on: Types of sewers. **04**

Q.7 **a)** Draw complete and neat sketch of Activated Sludge treatment plant and discuss each part. **05**

b) Explain Principle and operation of waste stabilization pond. **04**

Q.8 **a)** The data of river and wastewater is as follows. **05**

Parameter	Waste water	River
BOD_5	250 mg/lit	5 mg/lit
DO	0 mg/lit	9.1 mg/lit
Flow	3 m^3/sec	35 m^3/sec

The deoxygenation constant is 0.10 per day and reoxygenation constant is 0.30 per day to the base 10. The saturation DO is 9.2 mg/lit. Find DO at the end of 5 days.

b) Discuss the zones of pollution in stream with the help of diagram. **04**

Q.9 **a)** Explain Up flow Anaerobic Sludge Blanket (UASB) with neat sketch. **05**

b) Write a note on Moving Bed Biofilm Reactor (MBBR). **04**

SLR-BD-41

Seat No.	

Set Q

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Engineering (CIVPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.
5) Use of non- programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following appurtenances is used to prevent backflow?
a) Check valve b) Gate valve
c) Globe valve d) Ball valve

2) What type of sewer carries both sanitary sewage and stormwater?
a) Sanitary sewer b) Stormwater sewer
c) Combined sewer d) Separate sewer

3) What is the typical BOD5 (Biochemical Oxygen Demand) range for untreated domestic wastewater?
a) 100-200 mg/L b) 200-400 mg/L
c) 400-600 mg/L d) 600-800 mg/L

4) What is the primary factor that determines the efficiency of a trickling filter?
a) Hydraulic loading rate b) Organic loading rate
c) Media type and size d) All of the above

5) What is the effect of increasing the hydraulic retention time (HRT) in an activated sludge process?
a) Increased BOD removal efficiency
b) Decreased sludge production
c) Increased oxygen demand
d) All of the above

6) What does the DO sag curve represent?
a) The variation of dissolved oxygen levels with time
b) The variation of BOD with distance downstream
c) The variation of dissolved oxygen levels with distance downstream
d) The variation of flow rate with distance downstream

7) In which reactor design do microorganisms form dense granules, allowing for efficient treatment of wastewater with high organic loads?
a) UASB reactor b) Anaerobic baffled reactor
c) Fluidized bed reactor d) Fixed bed reactor

8) What is the primary purpose of assessing water quality?
a) To determine water quantity
b) To identify water sources
c) To ensure water is safe for consumption
d) To calculate water demand

9) Which parameter measures the amount of oxygen required to break down organic matter?
a) pH b) Turbidity
c) BOD d) COD

10) What is the benefit of using tube settlers in sedimentation tanks?
a) Increased detention time b) Reduced settling velocity
c) Increased settling area d) Decreased water quality

11) Which of the following factors affects disinfection efficiency?
a) Contact time b) Disinfectant dose
c) Water temperature d) All of the above

12) What is break-point chlorination?
a) Adding chlorine to water to kill pathogens
b) Adding chlorine to water to remove suspended solids
c) Adding chlorine to water until free chlorine residual appears
d) Removing chlorine from water

13) Which of the following methods can be used for defluoridation?
a) Ion-exchange process b) Reverse osmosis
c) Activated alumina d) All of the above

14) Which method of water distribution uses elevated tanks to provide water pressure?
a) Direct Pumping System b) Overhead Tank System
c) Hydro-Pneumatic System d) Dead End System

Seat No.	

Set Q

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Engineering (CIVPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In section – I, Q.2 is compulsory and solve any Two question from remaining questions (Q. No. 3, 4 & 5).
2) In Section – II, Q.6 is compulsory and solve any Two question from remaining questions from (Q. No. 7, 8 & 9).
3) Figures to the right indicate full marks.
4) Make suitable assumptions, if required and mention it clearly.
5) Use of non- programmable calculator is allowed.

Section – I

Q.2 **a)** Find the population of a city in 2051 by Incremental Increase Method. The data is given below. **06**

Year	1961	1971	1981	1991	2001	2011
Population	50,000	65,000	70,000	82,000	1,10,000	2,12,000

b) Calculate the all four fire demand for the same city having population of year 2051 for above given question (Q. No. 2 A). **04**

Q.3 **a)** Explain working principle of rapid sand filter with neat sketch. **05**
b) Explain the necessity of aeration in water treatment. Describe different methods of aeration. **04**

Q.4 **a)** Describe the different methods of distributing water in a water supply system. **05**
b) What are the types of distribution reservoir? **04**

Q.5 **a)** Write down standards for the following parameters for water (Permissible and acceptable limit). **05**
1) pH
2) Turbidity
3) Chloride
4) Hardness
5) MPN

b) Explain the horizontal flow type sedimentation tank with neat sketch. **04**

Section – II

Q.6 **a)** Under what circumstances pumping stations are provided? Discuss in details. What are problems associated with sewage pumping? Draw a sketch of a typical sewage pumping station. **06**

b) Write short notes on: Types of sewers. **04**

Q.7 **a)** Draw complete and neat sketch of Activated Sludge treatment plant and discuss each part. **05**

b) Explain Principle and operation of waste stabilization pond. **04**

Q.8 **a)** The data of river and wastewater is as follows. **05**

Parameter	Waste water	River
BOD_5	250 mg/lit	5 mg/lit
DO	0 mg/lit	9.1 mg/lit
Flow	3 m^3/sec	35 m^3/sec

The deoxygenation constant is 0.10 per day and reoxygenation constant is 0.30 per day to the base 10. The saturation DO is 9.2 mg/lit. Find DO at the end of 5 days.

b) Discuss the zones of pollution in stream with the help of diagram. **04**

Q.9 **a)** Explain Up flow Anaerobic Sludge Blanket (UASB) with neat sketch. **05**

b) Write a note on Moving Bed Biofilm Reactor (MBBR). **04**

SLR-BD-41

Seat No.	

Set R

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Engineering (CIVPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.
5) Use of non- programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) What is the primary factor that determines the efficiency of a trickling filter?
a) Hydraulic loading rate b) Organic loading rate
c) Media type and size d) All of the above

2) What is the effect of increasing the hydraulic retention time (HRT) in an activated sludge process?
a) Increased BOD removal efficiency
b) Decreased sludge production
c) Increased oxygen demand
d) All of the above

3) What does the DO sag curve represent?
a) The variation of dissolved oxygen levels with time
b) The variation of BOD with distance downstream
c) The variation of dissolved oxygen levels with distance downstream
d) The variation of flow rate with distance downstream

4) In which reactor design do microorganisms form dense granules, allowing for efficient treatment of wastewater with high organic loads?
a) UASB reactor b) Anaerobic baffled reactor
c) Fluidized bed reactor d) Fixed bed reactor

5) What is the primary purpose of assessing water quality?
a) To determine water quantity
b) To identify water sources
c) To ensure water is safe for consumption
d) To calculate water demand

6) Which parameter measures the amount of oxygen required to break down organic matter?

a) pH b) Turbidity
c) BOD d) COD

7) What is the benefit of using tube settlers in sedimentation tanks?

a) Increased detention time b) Reduced settling velocity
c) Increased settling area d) Decreased water quality

8) Which of the following factors affects disinfection efficiency?

a) Contact time b) Disinfectant dose
c) Water temperature d) All of the above

9) What is break-point chlorination?

a) Adding chlorine to water to kill pathogens
b) Adding chlorine to water to remove suspended solids
c) Adding chlorine to water until free chlorine residual appears
d) Removing chlorine from water

10) Which of the following methods can be used for defluoridation?

a) Ion-exchange process b) Reverse osmosis
c) Activated alumina d) All of the above

11) Which method of water distribution uses elevated tanks to provide water pressure?

a) Direct Pumping System b) Overhead Tank System
c) Hydro-Pneumatic System d) Dead End System

12) Which of the following appurtenances is used to prevent backflow?

a) Check valve b) Gate valve
c) Globe valve d) Ball valve

13) What type of sewer carries both sanitary sewage and stormwater?

a) Sanitary sewer b) Stormwater sewer
c) Combined sewer d) Separate sewer

14) What is the typical BOD5 (Biochemical Oxygen Demand) range for untreated domestic wastewater?

a) 100-200 mg/L b) 200-400 mg/L
c) 400-600 mg/L d) 600-800 mg/L

Seat No.	

Set R

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Engineering (CIVPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In section – I, Q.2 is compulsory and solve any Two question from remaining questions (Q. No. 3, 4 & 5).
2) In Section – II, Q.6 is compulsory and solve any Two question from remaining questions from (Q. No. 7, 8 & 9).
3) Figures to the right indicate full marks.
4) Make suitable assumptions, if required and mention it clearly.
5) Use of non- programmable calculator is allowed.

Section – I

Q.2 **a)** Find the population of a city in 2051 by Incremental Increase Method. The data is given below. **06**

Year	1961	1971	1981	1991	2001	2011
Population	50,000	65,000	70,000	82,000	1,10,000	2,12,000

b) Calculate the all four fire demand for the same city having population of year 2051 for above given question (Q. No. 2 A). **04**

Q.3 **a)** Explain working principle of rapid sand filter with neat sketch. **05**
b) Explain the necessity of aeration in water treatment. Describe different methods of aeration. **04**

Q.4 **a)** Describe the different methods of distributing water in a water supply system. **05**
b) What are the types of distribution reservoir? **04**

Q.5 **a)** Write down standards for the following parameters for water (Permissible and acceptable limit). **05**
1) pH
2) Turbidity
3) Chloride
4) Hardness
5) MPN

b) Explain the horizontal flow type sedimentation tank with neat sketch. **04**

Section – II

Q.6 **a)** Under what circumstances pumping stations are provided? Discuss in details. What are problems associated with sewage pumping? Draw a sketch of a typical sewage pumping station. **06**

b) Write short notes on: Types of sewers. **04**

Q.7 **a)** Draw complete and neat sketch of Activated Sludge treatment plant and discuss each part. **05**

b) Explain Principle and operation of waste stabilization pond. **04**

Q.8 **a)** The data of river and wastewater is as follows. **05**

Parameter	Waste water	River
BOD_5	250 mg/lit	5 mg/lit
DO	0 mg/lit	9.1 mg/lit
Flow	3 m^3/sec	35 m^3/sec

The deoxygenation constant is 0.10 per day and reoxygenation constant is 0.30 per day to the base 10. The saturation DO is 9.2 mg/lit. Find DO at the end of 5 days.

b) Discuss the zones of pollution in stream with the help of diagram. **04**

Q.9 **a)** Explain Up flow Anaerobic Sludge Blanket (UASB) with neat sketch. **05**

b) Write a note on Moving Bed Biofilm Reactor (MBBR). **04**

SLR-BD-41

Seat No.		Set	S

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Engineering (CIVPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.
5) Use of non- programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following methods can be used for defluoridation?
a) Ion-exchange process b) Reverse osmosis
c) Activated alumina d) All of the above

2) Which method of water distribution uses elevated tanks to provide water pressure?
a) Direct Pumping System b) Overhead Tank System
c) Hydro-Pneumatic System d) Dead End System

3) Which of the following appurtenances is used to prevent backflow?
a) Check valve b) Gate valve
c) Globe valve d) Ball valve

4) What type of sewer carries both sanitary sewage and stormwater?
a) Sanitary sewer b) Stormwater sewer
c) Combined sewer d) Separate sewer

5) What is the typical BOD5 (Biochemical Oxygen Demand) range for untreated domestic wastewater?
a) 100-200 mg/L b) 200-400 mg/L
c) 400-600 mg/L d) 600-800 mg/L

6) What is the primary factor that determines the efficiency of a trickling filter?
a) Hydraulic loading rate b) Organic loading rate
c) Media type and size d) All of the above

7) What is the effect of increasing the hydraulic retention time (HRT) in an activated sludge process?
a) Increased BOD removal efficiency
b) Decreased sludge production
c) Increased oxygen demand
d) All of the above

8) What does the DO sag curve represent?
a) The variation of dissolved oxygen levels with time
b) The variation of BOD with distance downstream
c) The variation of dissolved oxygen levels with distance downstream
d) The variation of flow rate with distance downstream

9) In which reactor design do microorganisms form dense granules, allowing for efficient treatment of wastewater with high organic loads?
a) UASB reactor
b) Anaerobic baffled reactor
c) Fluidized bed reactor
d) Fixed bed reactor

10) What is the primary purpose of assessing water quality?
a) To determine water quantity
b) To identify water sources
c) To ensure water is safe for consumption
d) To calculate water demand

11) Which parameter measures the amount of oxygen required to break down organic matter?
a) pH
b) Turbidity
c) BOD
d) COD

12) What is the benefit of using tube settlers in sedimentation tanks?
a) Increased detention time
b) Reduced settling velocity
c) Increased settling area
d) Decreased water quality

13) Which of the following factors affects disinfection efficiency?
a) Contact time
b) Disinfectant dose
c) Water temperature
d) All of the above

14) What is break-point chlorination?
a) Adding chlorine to water to kill pathogens
b) Adding chlorine to water to remove suspended solids
c) Adding chlorine to water until free chlorine residual appears
d) Removing chlorine from water

Seat No.	

Set S

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Engineering (CIVPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In section – I, Q.2 is compulsory and solve any Two question from remaining questions (Q. No. 3, 4 & 5).
2) In Section – II, Q.6 is compulsory and solve any Two question from remaining questions from (Q. No. 7, 8 & 9).
3) Figures to the right indicate full marks.
4) Make suitable assumptions, if required and mention it clearly.
5) Use of non- programmable calculator is allowed.

Section – I

Q.2 **a)** Find the population of a city in 2051 by Incremental Increase Method. The data is given below. **06**

Year	1961	1971	1981	1991	2001	2011
Population	50,000	65,000	70,000	82,000	1,10,000	2,12,000

b) Calculate the all four fire demand for the same city having population of year 2051 for above given question (Q. No. 2 A). **04**

Q.3 **a)** Explain working principle of rapid sand filter with neat sketch. **05**
b) Explain the necessity of aeration in water treatment. Describe different methods of aeration. **04**

Q.4 **a)** Describe the different methods of distributing water in a water supply system. **05**
b) What are the types of distribution reservoir? **04**

Q.5 **a)** Write down standards for the following parameters for water (Permissible and acceptable limit). **05**
1) pH
2) Turbidity
3) Chloride
4) Hardness
5) MPN

b) Explain the horizontal flow type sedimentation tank with neat sketch. **04**

Section – II

Q.6 **a)** Under what circumstances pumping stations are provided? Discuss in details. What are problems associated with sewage pumping? Draw a sketch of a typical sewage pumping station. **06**

b) Write short notes on: Types of sewers. **04**

Q.7 **a)** Draw complete and neat sketch of Activated Sludge treatment plant and discuss each part. **05**

b) Explain Principle and operation of waste stabilization pond. **04**

Q.8 **a)** The data of river and wastewater is as follows. **05**

Parameter	Waste water	River
BOD_5	250 mg/lit	5 mg/lit
DO	0 mg/lit	9.1 mg/lit
Flow	3 m^3/sec	35 m^3/sec

The deoxygenation constant is 0.10 per day and reoxygenation constant is 0.30 per day to the base 10. The saturation DO is 9.2 mg/lit. Find DO at the end of 5 days.

b) Discuss the zones of pollution in stream with the help of diagram. **04**

Q.9 **a)** Explain Up flow Anaerobic Sludge Blanket (UASB) with neat sketch. **05**

b) Write a note on Moving Bed Biofilm Reactor (MBBR). **04**

SLR-BD-42

Seat No.	

Set P

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Innovation can be best described as: _____
a) A new idea only
b) The process of creating value through ideas
c) Invention
d) None of the above

2) Entrepreneurship is primarily related to: _____
a) Administration b) Risk-taking
c) Planning d) None of these

3) Which of the following is not an entrepreneurial competency?
a) Innovation b) Leadership
c) Laziness d) Decision making

4) An entrepreneur operates: _____
a) Outside the organization b) Within an existing company
c) As a freelancer d) None

5) "Push" type innovation comes from: _____
a) Market needs b) Customer demands
c) Internal ideas d) Suppliers

6) Agile management promotes: _____
a) Linear process b) Flexibility and iteration
c) Bureaucracy d) None

7) Blue Ocean strategy refers to: _____
a) Competing in existing markets
b) Creating new market space
c) Losing market share
d) None

8) Which of these is not a barrier to innovation?
a) Risk-taking culture b) Resistance to change
c) Lack of resources d) Poor leadership

9) The shifting composition of the economy refers to: _____
a) Stable industries b) Changing business models
c) Static job roles d) None

10) Lean start-up encourages: _____
a) High upfront investment b) Rapid prototyping
c) Formal structure d) None

11) Legal considerations for entrepreneurs include: _____
a) Taxation b) IP protection
c) Contracts d) All of these

12) One of the seven sources of innovation is: _____
a) Competitor's failure b) Demographics
c) Inflation d) GDP

13) Entrepreneurial opportunity recognition is: _____
a) Unimportant b) Intuition-based only
c) Structured process d) Not taught

14) Six Thinking Hats is a method for: _____
a) Innovation testing b) Decision-making
c) Funding d) Legal advice

SLR-BD-42

Seat No.	

Set P

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 All questions are compulsory.

a) Define innovation. Explain its relationship with entrepreneurship. **06**
b) Distinguish between Entrepreneur, Manager, and Intrapreneur. **04**

Q.3 Solve any three questions.

a) Explain classification of innovation. **06**
b) Describe the economic theories of entrepreneurship. **06**
c) Discuss need and importance of Entrepreneurship Development. **06**
d) Describe sources of innovation with examples. **06**
e) Explain Agile management and NUF test in innovation. **06**

Section – II

Q.4 All questions are compulsory.

a) Explain the purpose and process of innovation. **06**
b) What are the needs for continuous learning in innovation? **04**

Q.6 Solve any three questions.

a) Explain different types of innovative strategies. **06**
b) Describe Red Ocean vs Blue Ocean strategies. **06**
c) List barriers to innovation and explain with examples. **06**
d) Explain the entrepreneurial process and opportunity recognition. **06**
e) Write short note on Lean start-up methodology. **06**

SLR-BD-42

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of these is not a barrier to innovation?
a) Risk-taking culture b) Resistance to change
c) Lack of resources d) Poor leadership

2) The shifting composition of the economy refers to: _____
a) Stable industries b) Changing business models
c) Static job roles d) None

3) Lean start-up encourages: _____
a) High upfront investment b) Rapid prototyping
c) Formal structure d) None

4) Legal considerations for entrepreneurs include: _____
a) Taxation b) IP protection
c) Contracts d) All of these

5) One of the seven sources of innovation is: _____
a) Competitor's failure b) Demographics
c) Inflation d) GDP

6) Entrepreneurial opportunity recognition is: _____
a) Unimportant b) Intuition-based only
c) Structured process d) Not taught

7) Six Thinking Hats is a method for: _____
a) Innovation testing b) Decision-making
c) Funding d) Legal advice

8) Innovation can be best described as: _____
   a) A new idea only
   b) The process of creating value through ideas
   c) Invention
   d) None of the above

9) Entrepreneurship is primarily related to: _____
   a) Administration
   b) Risk-taking
   c) Planning
   d) None of these

10) Which of the following is not an entrepreneurial competency?
   a) Innovation
   b) Leadership
   c) Laziness
   d) Decision making

11) An entrepreneur operates: _____
   a) Outside the organization
   b) Within an existing company
   c) As a freelancer
   d) None

12) "Push" type innovation comes from: _____
   a) Market needs
   b) Customer demands
   c) Internal ideas
   d) Suppliers

13) Agile management promotes: _____
   a) Linear process
   b) Flexibility and iteration
   c) Bureaucracy
   d) None

14) Blue Ocean strategy refers to: _____
   a) Competing in existing markets
   b) Creating new market space
   c) Losing market share
   d) None

SLR-BD-42

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 All questions are compulsory.

a) Define innovation. Explain its relationship with entrepreneurship. **06**
b) Distinguish between Entrepreneur, Manager, and Intrapreneur. **04**

Q.3 Solve any three questions.

a) Explain classification of innovation. **06**
b) Describe the economic theories of entrepreneurship. **06**
c) Discuss need and importance of Entrepreneurship Development. **06**
d) Describe sources of innovation with examples. **06**
e) Explain Agile management and NUF test in innovation. **06**

Section – II

Q.4 All questions are compulsory.

a) Explain the purpose and process of innovation. **06**
b) What are the needs for continuous learning in innovation? **04**

Q.6 Solve any three questions.

a) Explain different types of innovative strategies. **06**
b) Describe Red Ocean vs Blue Ocean strategies. **06**
c) List barriers to innovation and explain with examples. **06**
d) Explain the entrepreneurial process and opportunity recognition. **06**
e) Write short note on Lean start-up methodology. **06**

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Legal considerations for entrepreneurs include: _____
a) Taxation b) IP protection
c) Contracts d) All of these

2) One of the seven sources of innovation is: _____
a) Competitor's failure b) Demographics
c) Inflation d) GDP

3) Entrepreneurial opportunity recognition is: _____
a) Unimportant b) Intuition-based only
c) Structured process d) Not taught

4) Six Thinking Hats is a method for: _____
a) Innovation testing b) Decision-making
c) Funding d) Legal advice

5) Innovation can be best described as: _____
a) A new idea only
b) The process of creating value through ideas
c) Invention
d) None of the above

6) Entrepreneurship is primarily related to: _____
a) Administration b) Risk-taking
c) Planning d) None of these

7) Which of the following is not an entrepreneurial competency?
a) Innovation b) Leadership
c) Laziness d) Decision making

8) An entrepreneur operates: _____
a) Outside the organization
b) Within an existing company
c) As a freelancer
d) None

9) "Push" type innovation comes from: _____
a) Market needs
b) Customer demands
c) Internal ideas
d) Suppliers

10) Agile management promotes: _____
a) Linear process
b) Flexibility and iteration
c) Bureaucracy
d) None

11) Blue Ocean strategy refers to: _____
a) Competing in existing markets
b) Creating new market space
c) Losing market share
d) None

12) Which of these is not a barrier to innovation?
a) Risk-taking culture
b) Resistance to change
c) Lack of resources
d) Poor leadership

13) The shifting composition of the economy refers to: _____
a) Stable industries
b) Changing business models
c) Static job roles
d) None

14) Lean start-up encourages: _____
a) High upfront investment
b) Rapid prototyping
c) Formal structure
d) None

SLR-BD-42

Seat No.	

Set R

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 All questions are compulsory.

a) Define innovation. Explain its relationship with entrepreneurship. **06**
b) Distinguish between Entrepreneur, Manager, and Intrapreneur. **04**

Q.3 Solve any three questions.

a) Explain classification of innovation. **06**
b) Describe the economic theories of entrepreneurship. **06**
c) Discuss need and importance of Entrepreneurship Development. **06**
d) Describe sources of innovation with examples. **06**
e) Explain Agile management and NUF test in innovation. **06**

Section – II

Q.4 All questions are compulsory.

a) Explain the purpose and process of innovation. **06**
b) What are the needs for continuous learning in innovation? **04**

Q.6 Solve any three questions.

a) Explain different types of innovative strategies. **06**
b) Describe Red Ocean vs Blue Ocean strategies. **06**
c) List barriers to innovation and explain with examples. **06**
d) Explain the entrepreneurial process and opportunity recognition. **06**
e) Write short note on Lean start-up methodology. **06**

SLR-BD-42

Seat No.	

Set S

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Agile management promotes: _____
a) Linear process b) Flexibility and iteration
c) Bureaucracy d) None

2) Blue Ocean strategy refers to: _____
a) Competing in existing markets
b) Creating new market space
c) Losing market share
d) None

3) Which of these is not a barrier to innovation?
a) Risk-taking culture b) Resistance to change
c) Lack of resources d) Poor leadership

4) The shifting composition of the economy refers to: _____
a) Stable industries b) Changing business models
c) Static job roles d) None

5) Lean start-up encourages: _____
a) High upfront investment b) Rapid prototyping
c) Formal structure d) None

6) Legal considerations for entrepreneurs include: _____
a) Taxation b) IP protection
c) Contracts d) All of these

7) One of the seven sources of innovation is: _____
a) Competitor's failure b) Demographics
c) Inflation d) GDP

8) Entrepreneurial opportunity recognition is: _____
a) Unimportant
b) Intuition-based only
c) Structured process
d) Not taught

9) Six Thinking Hats is a method for: _____
a) Innovation testing
b) Decision-making
c) Funding
d) Legal advice

10) Innovation can be best described as: _____
a) A new idea only
b) The process of creating value through ideas
c) Invention
d) None of the above

11) Entrepreneurship is primarily related to: _____
a) Administration
b) Risk-taking
c) Planning
d) None of these

12) Which of the following is not an entrepreneurial competency?
a) Innovation
b) Leadership
c) Laziness
d) Decision making

13) An entrepreneur operates: _____
a) Outside the organization
b) Within an existing company
c) As a freelancer
d) None

14) "Push" type innovation comes from: _____
a) Market needs
b) Customer demands
c) Internal ideas
d) Suppliers

SLR-BD-42

Seat No.	

Set S

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 All questions are compulsory.

a) Define innovation. Explain its relationship with entrepreneurship. **06**
b) Distinguish between Entrepreneur, Manager, and Intrapreneur. **04**

Q.3 Solve any three questions.

a) Explain classification of innovation. **06**
b) Describe the economic theories of entrepreneurship. **06**
c) Discuss need and importance of Entrepreneurship Development. **06**
d) Describe sources of innovation with examples. **06**
e) Explain Agile management and NUF test in innovation. **06**

Section – II

Q.4 All questions are compulsory.

a) Explain the purpose and process of innovation. **06**
b) What are the needs for continuous learning in innovation? **04**

Q.6 Solve any three questions.

a) Explain different types of innovative strategies. **06**
b) Describe Red Ocean vs Blue Ocean strategies. **06**
c) List barriers to innovation and explain with examples. **06**
d) Explain the entrepreneurial process and opportunity recognition. **06**
e) Write short note on Lean start-up methodology. **06**

SLR-BD-43

Seat No.		Set	P

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) The Occupational Health and Safety Management System (OHSMS) primarily aims to: _____
a) Increase industrial profits
b) Reduce energy consumption
c) Ensure worker safety and reduce health risks in workplaces
d) Promote environmental tourism

2) In-situ conservation refers to: _____
a) Conservation of species in zoos
b) Conservation using biotechnology
c) Conservation in gene banks
d) Conservation of species in their natural habitats

3) Carbon footprint is a measure of: _____
a) Land occupied by forests
b) Energy consumption in a home
c) Greenhouse gas emissions by an activity or person
d) Amount of carbon in plants

4) The main goal of sustainability is to: _____
a) Meet present needs without compromising future needs
b) Increase profit only
c) Eliminate economic development
d) Promote urbanization

5) Which of the following is an example of hazardous waste?
a) Expired medicines b) Plastic bottles
c) Food scraps d) Paper waste

6) Biodiversity hotspots in India include: _____
a) Eastern Ghats and Indo-Gangetic Plain
b) Western Ghats and the Himalayas
c) Thar Desert and Sundarbans only
d) Deccan Plateau and Indo-Gangetic Basin

7) The 3R concept stands for: _____
a) Reuse, Reduce, Rebuild
b) Reduce, Reuse, Recycle
c) Replace, Reuse, Restore
d) Recycle, Recover, Rebuild

8) The ISO 14000 Series deals with: _____
a) Energy-efficient building design
b) Environmental Management Systems
c) Industrial Safety Standards
d) Economic Performance Indicators

9) Which of the following is a non-conventional source of energy?
a) Coal
b) Natural Gas
c) Wind
d) Diesel

10) The main goal of a circular economy is to: _____
a) Increase fossil fuel usage
b) Promote single-use products
c) Minimize waste and resource use
d) Maximize profit only

11) The first step in preparing an Environmental Impact Assessment (EIA) report is: _____
a) Cost-benefit analysis
b) Monitoring
c) Screening
d) Public hearing

12) Which of the following is not a principle of Environmental Management?
a) Polluter pays
b) Sustainability
c) Preventive action
d) Maximum profit generation

13) Cost-Benefit Analysis (CBA) in environmental policies is used to: _____
a) Maximize pollution
b) Evaluate environmental legislation
c) Compare environmental costs with economic benefits
d) Promote industrialization

14) An ecosystem consists of: _____
a) Living organisms only
b) Non-living components only
c) Living organisms and their physical environment
d) Plants and animals only

SLR-BD-43

Seat No.		Set	P

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following **12**

a) Define the term "environment". Discuss the scope and importance of environmental studies. Why is there a need for public awareness?
b) Describe the causes and effects of air and water pollution. Suggest two preventive measures for each.
c) Define sustainability. Discuss any two major challenges in achieving sustainable development.

Q.3 Attempt Any Two **10**

a) What are hazardous wastes and e-wastes? How should they be managed?
b) What are carbon credits and carbon footprints? Explain with examples.
c) List any two Millennium Development Goals (MDGs). Mention one environmental protocol.

Q.4 Write short notes on any two of the following: **06**

a) Genetic diversity
b) India as a mega-diversity nation
c) In-situ and Ex-situ conservation

Section – II

Q.5 Write short notes on any two of the following: **10**

a) ISO 14000 Series
b) Sustainable Habitat - Green Buildings
c) Non-conventional energy sources

Q.6 Attempt the following **10**

a) Define Environmental Management. Discuss its nature, scope, and components.
b) Define the 3R concept and explain how it supports the zero waste approach.

Q.7 Attempt any two **08**

a) Define Environmental Management. Discuss its nature, scope, and components.

b) What is Environmental Policy Analysis? Distinguish between macro-level and micro-level analysis.

c) Outline the steps involved in the Environmental Impact Assessment (EIA) process.

SLR-BD-43

Seat No.		Set	Q

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) The ISO 14000 Series deals with: _____
a) Energy-efficient building design
b) Environmental Management Systems
c) Industrial Safety Standards
d) Economic Performance Indicators

2) Which of the following is a non-conventional source of energy?
a) Coal b) Natural Gas
c) Wind d) Diesel

3) The main goal of a circular economy is to: _____
a) Increase fossil fuel usage
b) Promote single-use products
c) Minimize waste and resource use
d) Maximize profit only

4) The first step in preparing an Environmental Impact Assessment (EIA) report is: _____
a) Cost-benefit analysis b) Monitoring
c) Screening d) Public hearing

5) Which of the following is not a principle of Environmental Management?
a) Polluter pays b) Sustainability
c) Preventive action d) Maximum profit generation

6) Cost-Benefit Analysis (CBA) in environmental policies is used to: _____
a) Maximize pollution
b) Evaluate environmental legislation
c) Compare environmental costs with economic benefits
d) Promote industrialization

7) An ecosystem consists of: _____
a) Living organisms only
b) Non-living components only
c) Living organisms and their physical environment
d) Plants and animals only

8) The Occupational Health and Safety Management System (OHSMS) primarily aims to: _____
a) Increase industrial profits
b) Reduce energy consumption
c) Ensure worker safety and reduce health risks in workplaces
d) Promote environmental tourism

9) In-situ conservation refers to: _____
a) Conservation of species in zoos
b) Conservation using biotechnology
c) Conservation in gene banks
d) Conservation of species in their natural habitats

10) Carbon footprint is a measure of: _____
a) Land occupied by forests
b) Energy consumption in a home
c) Greenhouse gas emissions by an activity or person
d) Amount of carbon in plants

11) The main goal of sustainability is to: _____
a) Meet present needs without compromising future needs
b) Increase profit only
c) Eliminate economic development
d) Promote urbanization

12) Which of the following is an example of hazardous waste?
a) Expired medicines b) Plastic bottles
c) Food scraps d) Paper waste

13) Biodiversity hotspots in India include: _____
a) Eastern Ghats and Indo-Gangetic Plain
b) Western Ghats and the Himalayas
c) Thar Desert and Sundarbans only
d) Deccan Plateau and Indo-Gangetic Basin

14) The 3R concept stands for: _____
a) Reuse, Reduce, Rebuild b) Reduce, Reuse, Recycle
c) Replace, Reuse, Restore d) Recycle, Recover, Rebuild

SLR-BD-43

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following **12**

a) Define the term "environment". Discuss the scope and importance of environmental studies. Why is there a need for public awareness?
b) Describe the causes and effects of air and water pollution. Suggest two preventive measures for each.
c) Define sustainability. Discuss any two major challenges in achieving sustainable development.

Q.3 Attempt Any Two **10**

a) What are hazardous wastes and e-wastes? How should they be managed?
b) What are carbon credits and carbon footprints? Explain with examples.
c) List any two Millennium Development Goals (MDGs). Mention one environmental protocol.

Q.4 Write short notes on any two of the following: **06**

a) Genetic diversity
b) India as a mega-diversity nation
c) In-situ and Ex-situ conservation

Section – II

Q.5 Write short notes on any two of the following: **10**

a) ISO 14000 Series
b) Sustainable Habitat - Green Buildings
c) Non-conventional energy sources

Q.6 Attempt the following **10**

a) Define Environmental Management. Discuss its nature, scope, and components.
b) Define the 3R concept and explain how it supports the zero waste approach.

Q.7 Attempt any two **08**

a) Define Environmental Management. Discuss its nature, scope, and components.

b) What is Environmental Policy Analysis? Distinguish between macro-level and micro-level analysis.

c) Outline the steps involved in the Environmental Impact Assessment (EIA) process.

Seat No.	

Set R

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) The first step in preparing an Environmental Impact Assessment (EIA) report is: _____
a) Cost-benefit analysis b) Monitoring
c) Screening d) Public hearing

2) Which of the following is not a principle of Environmental Management?
a) Polluter pays b) Sustainability
c) Preventive action d) Maximum profit generation

3) Cost-Benefit Analysis (CBA) in environmental policies is used to: _____
a) Maximize pollution
b) Evaluate environmental legislation
c) Compare environmental costs with economic benefits
d) Promote industrialization

4) An ecosystem consists of: _____
a) Living organisms only
b) Non-living components only
c) Living organisms and their physical environment
d) Plants and animals only

5) The Occupational Health and Safety Management System (OHSMS) primarily aims to: _____
a) Increase industrial profits
b) Reduce energy consumption
c) Ensure worker safety and reduce health risks in workplaces
d) Promote environmental tourism

6) In-situ conservation refers to: _____
a) Conservation of species in zoos
b) Conservation using biotechnology
c) Conservation in gene banks
d) Conservation of species in their natural habitats

7) Carbon footprint is a measure of: _____
a) Land occupied by forests
b) Energy consumption in a home
c) Greenhouse gas emissions by an activity or person
d) Amount of carbon in plants

8) The main goal of sustainability is to: _____
a) Meet present needs without compromising future needs
b) Increase profit only
c) Eliminate economic development
d) Promote urbanization

9) Which of the following is an example of hazardous waste?
a) Expired medicines b) Plastic bottles
c) Food scraps d) Paper waste

10) Biodiversity hotspots in India include: _____
a) Eastern Ghats and Indo-Gangetic Plain
b) Western Ghats and the Himalayas
c) Thar Desert and Sundarbans only
d) Deccan Plateau and Indo-Gangetic Basin

11) The 3R concept stands for: _____
a) Reuse, Reduce, Rebuild b) Reduce, Reuse, Recycle
c) Replace, Reuse, Restore d) Recycle, Recover, Rebuild

12) The ISO 14000 Series deals with: _____
a) Energy-efficient building design
b) Environmental Management Systems
c) Industrial Safety Standards
d) Economic Performance Indicators

13) Which of the following is a non-conventional source of energy?
a) Coal b) Natural Gas
c) Wind d) Diesel

14) The main goal of a circular economy is to: _____
a) Increase fossil fuel usage
b) Promote single-use products
c) Minimize waste and resource use
d) Maximize profit only

SLR-BD-43

Seat No.		Set	R

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following **12**

a) Define the term "environment". Discuss the scope and importance of environmental studies. Why is there a need for public awareness?
b) Describe the causes and effects of air and water pollution. Suggest two preventive measures for each.
c) Define sustainability. Discuss any two major challenges in achieving sustainable development.

Q.3 Attempt Any Two **10**

a) What are hazardous wastes and e-wastes? How should they be managed?
b) What are carbon credits and carbon footprints? Explain with examples.
c) List any two Millennium Development Goals (MDGs). Mention one environmental protocol.

Q.4 Write short notes on any two of the following: **06**

a) Genetic diversity
b) India as a mega-diversity nation
c) In-situ and Ex-situ conservation

Section – II

Q.5 Write short notes on any two of the following: **10**

a) ISO 14000 Series
b) Sustainable Habitat - Green Buildings
c) Non-conventional energy sources

Q.6 Attempt the following **10**

a) Define Environmental Management. Discuss its nature, scope, and components.
b) Define the 3R concept and explain how it supports the zero waste approach.

Q.7 Attempt any two **08**

a) Define Environmental Management. Discuss its nature, scope, and components.

b) What is Environmental Policy Analysis? Distinguish between macro-level and micro-level analysis.

c) Outline the steps involved in the Environmental Impact Assessment (EIA) process.

SLR-BD-43

Seat No.		Set	S

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) Biodiversity hotspots in India include: _____
a) Eastern Ghats and Indo-Gangetic Plain
b) Western Ghats and the Himalayas
c) Thar Desert and Sundarbans only
d) Deccan Plateau and Indo-Gangetic Basin

2) The 3R concept stands for: _____
a) Reuse, Reduce, Rebuild b) Reduce, Reuse, Recycle
c) Replace, Reuse, Restore d) Recycle, Recover, Rebuild

3) The ISO 14000 Series deals with: _____
a) Energy-efficient building design
b) Environmental Management Systems
c) Industrial Safety Standards
d) Economic Performance Indicators

4) Which of the following is a non-conventional source of energy?
a) Coal b) Natural Gas
c) Wind d) Diesel

5) The main goal of a circular economy is to: _____
a) Increase fossil fuel usage
b) Promote single-use products
c) Minimize waste and resource use
d) Maximize profit only

6) The first step in preparing an Environmental Impact Assessment (EIA) report is: _____
a) Cost-benefit analysis b) Monitoring
c) Screening d) Public hearing

7) Which of the following is not a principle of Environmental Management?
a) Polluter pays
b) Sustainability
c) Preventive action
d) Maximum profit generation

8) Cost-Benefit Analysis (CBA) in environmental policies is used to: _____
a) Maximize pollution
b) Evaluate environmental legislation
c) Compare environmental costs with economic benefits
d) Promote industrialization

9) An ecosystem consists of: _____
a) Living organisms only
b) Non-living components only
c) Living organisms and their physical environment
d) Plants and animals only

10) The Occupational Health and Safety Management System (OHSMS) primarily aims to: _____
a) Increase industrial profits
b) Reduce energy consumption
c) Ensure worker safety and reduce health risks in workplaces
d) Promote environmental tourism

11) In-situ conservation refers to: _____
a) Conservation of species in zoos
b) Conservation using biotechnology
c) Conservation in gene banks
d) Conservation of species in their natural habitats

12) Carbon footprint is a measure of: _____
a) Land occupied by forests
b) Energy consumption in a home
c) Greenhouse gas emissions by an activity or person
d) Amount of carbon in plants

13) The main goal of sustainability is to: _____
a) Meet present needs without compromising future needs
b) Increase profit only
c) Eliminate economic development
d) Promote urbanization

14) Which of the following is an example of hazardous waste?
a) Expired medicines
b) Plastic bottles
c) Food scraps
d) Paper waste

SLR-BD-43

Seat No.		Set	S

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following **12**

a) Define the term "environment". Discuss the scope and importance of environmental studies. Why is there a need for public awareness?
b) Describe the causes and effects of air and water pollution. Suggest two preventive measures for each.
c) Define sustainability. Discuss any two major challenges in achieving sustainable development.

Q.3 Attempt Any Two **10**

a) What are hazardous wastes and e-wastes? How should they be managed?
b) What are carbon credits and carbon footprints? Explain with examples.
c) List any two Millennium Development Goals (MDGs). Mention one environmental protocol.

Q.4 Write short notes on any two of the following: **06**

a) Genetic diversity
b) India as a mega-diversity nation
c) In-situ and Ex-situ conservation

Section – II

Q.5 Write short notes on any two of the following: **10**

a) ISO 14000 Series
b) Sustainable Habitat - Green Buildings
c) Non-conventional energy sources

Q.6 Attempt the following **10**

a) Define Environmental Management. Discuss its nature, scope, and components.
b) Define the 3R concept and explain how it supports the zero waste approach.

Q.7 Attempt any two **08**

a) Define Environmental Management. Discuss its nature, scope, and components.

b) What is Environmental Policy Analysis? Distinguish between macro-level and micro-level analysis.

c) Outline the steps involved in the Environmental Impact Assessment (EIA) process.

SLR-BD-44

Seat No.	

Set P

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which is the primary advantage of using solar energy power generation?
a) Low initial coast
b) Reduce environmental impact
c) Do not require large area
d) Simple storage method

2) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

3) Which of the following common application of solar energy?
a) Generating electricity
b) Heating water
c) Providing power for electronic device
d) All of the above

4) Passive solar energy refers to trapping the Suns energy _____.
a) Using mechanical devices
b) without using mechanical devices
c) Using chemical
d) Incineration

5) The process or digestion taking place in the presence of air is called as _____.
a) Aerobic digestion b) Anaerobic digestion
c) Hydrolysis d) None of these

6) Which type of renewable energy resources generate low power energy?

a) Biomass b) Solar
c) Wind d) All of the above

7) In wind turbine gear box is used to _____.

a) Step up the speed b) Reduce the speed
c) shut down d) None of these

8) Geothermal energy present _____ of the earth.

a) Rotation b) Exterior
c) North side d) Interior

9) Biogas is the gaseous fuel which is obtained from biomass by means of _____ fermentation.

a) Aerobic b) Anaerobic
c) Constant d) None of the above

10) _____ is produced by blending of vegetable oil.

a) CNG b) Methane gas
c) Biofuel d) Biodisel

11) Availability of Solar energy on the earth surface is _____MW.

a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

12) Energy is _____ of substance or a body to do work.

a) Obesity b) Power
c) Capacity d) None of the above

13) Wind energy used from _____ years ago.

a) 3000 b) 2000
c) 6000 d) 5000

14) The major source of the Geothermal energy is _____.

a) Water b) Hot water reservoir
c) Oil d) Gas

SLR-BD-44

Seat No.	

Set P

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Attempt any Four **16**

a) Explain advantages of biomass energy.
b) Explain in detail scope of renewable energy.
c) What is biomass energy and explain resources of biomass energy.
d) Write a note on applications of solar energy.
e) Explain function of biogas digester.
f) Write a note on aerobic and anaerobic digestion.

Q.3 Attempt any two. **12**

a) Explain Solar photovoltaic technology.
b) Explain Basic components of wind energy conversion system.
c) Explain in detail advantages and disadvantages of renewable energy.
d) Explain in detail advantage and disadvantage of Solar energy.

Section – II

Q.4 Attempt any Four. **16**

a) Write a note on wave energy.
b) Merits and demerits of hydropower energy.
c) Explain specifications of energy storage devices.
d) Main parts of hydropower station.
e) Importance of tidal energy.
f) Importance of energy storage devices

Q.5 Attempt any two. **12**

a) Write a note on potential of wave energy in India.
b) Explain different methods of energy storage.
c) Explain with neat diagram hydropower plant.
d) Explain in detail ocean thermal energy conversion (OTEC).

SLR-BD-44

Seat No.	

Set Q

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Geothermal energy present _____ of the earth.
a) Rotation b) Exterior
c) North side d) Interior

2) Biogas is the gaseous fuel which is obtained from biomass by means of _____ fermentation.
a) Aerobic b) Anaerobic
c) Constant d) None of the above

3) _____ is produced by blending of vegetable oil.
a) CNG b) Methane gas
c) Biofuel d) Biodisel

4) Availability of Solar energy on the earth surface is _____MW.
a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

5) Energy is _____ of substance or a body to do work.
a) Obesity b) Power
c) Capacity d) None of the above

6) Wind energy used from _____ years ago.
a) 3000 b) 2000
c) 6000 d) 5000

7) The major source of the Geothermal energy is _____.
a) Water b) Hot water reservoir
c) Oil d) Gas

8) Which is the primary advantage of using solar energy power generation?
a) Low initial coast
b) Reduce environmental impact
c) Do not require large area
d) Simple storage method

9) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

10) Which of the following common application of solar energy?
a) Generating electricity
b) Heating water
c) Providing power for electronic device
d) All of the above

11) Passive solar energy refers to trapping the Suns energy _____.
a) Using mechanical devices
b) without using mechanical devices
c) Using chemical
d) Incineration

12) The process or digestion taking place in the presence of air is called as _____.
a) Aerobic digestion b) Anaerobic digestion
c) Hydrolysis d) None of these

13) Which type of renewable energy resources generate low power energy?
a) Biomass b) Solar
c) Wind d) All of the above

14) In wind turbine gear box is used to _____.
a) Step up the speed b) Reduce the speed
c) shut down d) None of these

SLR-BD-44

Seat No.	

Set Q

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Attempt any Four **16**

a) Explain advantages of biomass energy.
b) Explain in detail scope of renewable energy.
c) What is biomass energy and explain resources of biomass energy.
d) Write a note on applications of solar energy.
e) Explain function of biogas digester.
f) Write a note on aerobic and anaerobic digestion.

Q.3 Attempt any two. **12**

a) Explain Solar photovoltaic technology.
b) Explain Basic components of wind energy conversion system.
c) Explain in detail advantages and disadvantages of renewable energy.
d) Explain in detail advantage and disadvantage of Solar energy.

Section – II

Q.4 Attempt any Four. **16**

a) Write a note on wave energy.
b) Merits and demerits of hydropower energy.
c) Explain specifications of energy storage devices.
d) Main parts of hydropower station.
e) Importance of tidal energy.
f) Importance of energy storage devices

Q.5 Attempt any two. **12**

a) Write a note on potential of wave energy in India.
b) Explain different methods of energy storage.
c) Explain with neat diagram hydropower plant.
d) Explain in detail ocean thermal energy conversion (OTEC).

Seat No.	

Set **R**

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Availability of Solar energy on the earth surface is _____MW.
a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

2) Energy is _____ of substance or a body to do work.
a) Obesity b) Power
c) Capacity d) None of the above

3) Wind energy used from _____ years ago.
a) 3000 b) 2000
c) 6000 d) 5000

4) The major source of the Geothermal energy is _____.
a) Water b) Hot water reservoir
c) Oil d) Gas

5) Which is the primary advantage of using solar energy power generation?
a) Low initial coast
b) Reduce environmental impact
c) Do not require large area
d) Simple storage method

6) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

7) Which of the following common application of solar energy?
a) Generating electricity
b) Heating water
c) Providing power for electronic device
d) All of the above

8) Passive solar energy refers to trapping the Suns energy _____.
a) Using mechanical devices
b) without using mechanical devices
c) Using chemical
d) Incineration

9) The process or digestion taking place in the presence of air is called as _____.
a) Aerobic digestion
b) Anaerobic digestion
c) Hydrolysis
d) None of these

10) Which type of renewable energy resources generate low power energy?
a) Biomass
b) Solar
c) Wind
d) All of the above

11) In wind turbine gear box is used to _____.
a) Step up the speed
b) Reduce the speed
c) shut down
d) None of these

12) Geothermal energy present _____ of the earth.
a) Rotation
b) Exterior
c) North side
d) Interior

13) Biogas is the gaseous fuel which is obtained from biomass by means of _____ fermentation.
a) Aerobic
b) Anaerobic
c) Constant
d) None of the above

14) _____ is produced by blending of vegetable oil.
a) CNG
b) Methane gas
c) Biofuel
d) Biodisel

SLR-BD-44

Seat No.	

Set R

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Attempt any Four **16**

a) Explain advantages of biomass energy.
b) Explain in detail scope of renewable energy.
c) What is biomass energy and explain resources of biomass energy.
d) Write a note on applications of solar energy.
e) Explain function of biogas digester.
f) Write a note on aerobic and anaerobic digestion.

Q.3 Attempt any two. **12**

a) Explain Solar photovoltaic technology.
b) Explain Basic components of wind energy conversion system.
c) Explain in detail advantages and disadvantages of renewable energy.
d) Explain in detail advantage and disadvantage of Solar energy.

Section – II

Q.4 Attempt any Four. **16**

a) Write a note on wave energy.
b) Merits and demerits of hydropower energy.
c) Explain specifications of energy storage devices.
d) Main parts of hydropower station.
e) Importance of tidal energy.
f) Importance of energy storage devices

Q.5 Attempt any two. **12**

a) Write a note on potential of wave energy in India.
b) Explain different methods of energy storage.
c) Explain with neat diagram hydropower plant.
d) Explain in detail ocean thermal energy conversion (OTEC).

Seat No.	

Set **S**

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which type of renewable energy resources generate low power energy?
a) Biomass b) Solar
c) Wind d) All of the above

2) In wind turbine gear box is used to _____.
a) Step up the speed b) Reduce the speed
c) shut down d) None of these

3) Geothermal energy present _____ of the earth.
a) Rotation b) Exterior
c) North side d) Interior

4) Biogas is the gaseous fuel which is obtained from biomass by means of _____ fermentation.
a) Aerobic b) Anaerobic
c) Constant d) None of the above

5) _____ is produced by blending of vegetable oil.
a) CNG b) Methane gas
c) Biofuel d) Biodisel

6) Availability of Solar energy on the earth surface is _____MW.
a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

7) Energy is _____ of substance or a body to do work.
a) Obesity b) Power
c) Capacity d) None of the above

8) Wind energy used from _____ years ago.
a) 3000 b) 2000
c) 6000 d) 5000

9) The major source of the Geothermal energy is _____.
a) Water b) Hot water reservoir
c) Oil d) Gas

10) Which is the primary advantage of using solar energy power generation?
a) Low initial coast
b) Reduce environmental impact
c) Do not require large area
d) Simple storage method

11) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

12) Which of the following common application of solar energy?
a) Generating electricity
b) Heating water
c) Providing power for electronic device
d) All of the above

13) Passive solar energy refers to trapping the Suns energy _____.
a) Using mechanical devices
b) without using mechanical devices
c) Using chemical
d) Incineration

14) The process or digestion taking place in the presence of air is called as _____.
a) Aerobic digestion b) Anaerobic digestion
c) Hydrolysis d) None of these

SLR-BD-44

Seat No.	

Set S

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Attempt any Four **16**

a) Explain advantages of biomass energy.
b) Explain in detail scope of renewable energy.
c) What is biomass energy and explain resources of biomass energy.
d) Write a note on applications of solar energy.
e) Explain function of biogas digester.
f) Write a note on aerobic and anaerobic digestion.

Q.3 Attempt any two. **12**

a) Explain Solar photovoltaic technology.
b) Explain Basic components of wind energy conversion system.
c) Explain in detail advantages and disadvantages of renewable energy.
d) Explain in detail advantage and disadvantage of Solar energy.

Section – II

Q.4 Attempt any Four. **16**

a) Write a note on wave energy.
b) Merits and demerits of hydropower energy.
c) Explain specifications of energy storage devices.
d) Main parts of hydropower station.
e) Importance of tidal energy.
f) Importance of energy storage devices

Q.5 Attempt any two. **12**

a) Write a note on potential of wave energy in India.
b) Explain different methods of energy storage.
c) Explain with neat diagram hydropower plant.
d) Explain in detail ocean thermal energy conversion (OTEC).

SLR-BD-45

Seat No.	

Set P

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Draw neat diagrams whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) An instrument transformer is used to extend the range of _____.
a) induction instrument b) electrostatic instrument
c) moving coil instrument d) any of the above

2) The internal resistance of an ammeter should be _____.
a) Very small b) Medium
c) High d) Infinity

3) The smallest change which a sensor can detect is termed: _____
a) Accuracy b) Precision
c) Resolution d) Scale

4) Sensor effectiveness depends on _____ parameter.
a) Sensitivity b) Radiation
c) Restively d) All the above

5) The desirable static characteristics of a measuring system are _____
a) accuracy and drift
b) accuracy, sensitivity and reproducibility
c) drift and dead zone
d) static error

6) A _____ device prevents the oscillation of the moving system and enables the latter to reach its final position quickly.
a) Deflecting b) Controlling
c) Damping d) any of the above

7) _____ is an instrument which measures the insulation resistance of an electric circuit relative to earth and one another.
a) Tangent galvanometer
b) Megger
c) Current transformer
d) None of the above

8) Which of the following is a key characteristic of a sensor?
a) It can only measure temperature
b) It is an active component
c) It converts physical parameters into an electrical signal
d) Il requires no external power

9) Which of the following is a type of magnetic sensor?
a) Thermistor
b) Strain gauge
c) Hall effect sensor
d) LVDT

10) Typical conversion speed of ADC is _____
a) Less than 1 μs
b) Less than 100 μs
c) Less than 500 μs
d) Greater than 1000 μs

11) What is signal conditioning?
a) To analyze any signal
b) Conversion or modification is referred to as conditioning
c) Conversion from analog to digital is signal conditioning
d) Conversion from digital to analog is signal conditioning

12) Touch screen devices use which sensor?
a) Touch sensor
b) Temperature sensor
c) Humidity sensor
d) Pressure sensor

13) ENOB in ADC stand for _____
a) Effective number of bytes
b) Effective number of bits
c) Effective nibble baud
d) None of the mentioned

14) A simple bridge circuit consists of a network of _____
a) 3 resistance arms
b) 2 resistance arms
c) 4 resistance arms
d) 6 resistance arms

SLR-BD-45

Seat No.	

Set P

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt any four of the following: 16

a) Define standard & explain types of standards.
b) Define the following characteristics
1) Linearity 2) Accuracy 3) Repeatability 4) Sensitivity
c) Derive the expression for unknown capacitance with phasor diagram by using Schering Bridge.
d) Write difference between Current Transformer and Potential Transformer.
e) Explain working of digital storage oscilloscope with suitable block diagram.

Q.3 Attempt any two of the following: 12

a) Illustrate and derive the torque equation for a Moving iron instrument with neat diagram.
b) Draw the equivalent circuit and phasor diagram of a CT. Derive the expressions for ratio and phase angle errors.
c) Explain digital ramp type and dual slope integrating type digital voltmeter.

Section – II

Q.4 Attempt any four of the following: 16

a) Explain the principle of working of Hall effect sensor.
b) Explain different types of temperature sensor with details.
c) Discuss Classification of sensor and explain active and passive sensor.
d) State and explain the methods of data transmission.
e) State and Explain the Modes of Heat transfer.

Q.5 Attempt any two of the following: 12

a) Stale the sensors used for Velocity and Acceleration application and explain any one of them.
b) Slate and explain the sensors used for occupancy and motion detector application.
c) Define the temperature and explain the thermal properties of material.

SLR-BD-45

Seat No.	

Set Q

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Draw neat diagrams whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. 14

1) Which of the following is a key characteristic of a sensor?
a) It can only measure temperature
b) It is an active component
c) It converts physical parameters into an electrical signal
d) Il requires no external power

2) Which of the following is a type of magnetic sensor?
a) Thermistor b) Strain gauge
c) Hall effect sensor d) LVDT

3) Typical conversion speed of ADC is _____
a) Less than 1 μs b) Less than 100 μs
c) Less than 500 μs d) Greater than 1000 μs

4) What is signal conditioning?
a) To analyze any signal
b) Conversion or modification is referred to as conditioning
c) Conversion from analog to digital is signal conditioning
d) Conversion from digital to analog is signal conditioning

5) Touch screen devices use which sensor?
a) Touch sensor b) Temperature sensor
c) Humidity sensor d) Pressure sensor

6) ENOB in ADC stand for _____
a) Effective number of bytes b) Effective number of bits
c) Effective nibble baud d) None of the mentioned

7) A simple bridge circuit consists of a network of _____
a) 3 resistance arms b) 2 resistance arms
c) 4 resistance arms d) 6 resistance arms

8) An instrument transformer is used to extend the range of _____.
a) induction instrument b) electrostatic instrument
c) moving coil instrument d) any of the above

9) The internal resistance of an ammeter should be _____.
a) Very small b) Medium
c) High d) Infinity

10) The smallest change which a sensor can detect is termed: _____
a) Accuracy b) Precision
c) Resolution d) Scale

11) Sensor effectiveness depends on _____ parameter.
a) Sensitivity b) Radiation
c) Restively d) All the above

12) The desirable static characteristics of a measuring system are _____
a) accuracy and drift
b) accuracy, sensitivity and reproducibility
c) drift and dead zone
d) static error

13) A _____ device prevents the oscillation of the moving system and enables the latter to reach its final position quickly.
a) Deflecting b) Controlling
c) Damping d) any of the above

14) _____ is an instrument which measures the insulation resistance of an electric circuit relative to earth and one another.
a) Tangent galvanometer
b) Megger
c) Current transformer
d) None of the above

SLR-BD-45

Seat No.	

Set Q

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt any four of the following: 16

a) Define standard & explain types of standards.
b) Define the following characteristics
1) Linearity 2) Accuracy 3) Repeatability 4) Sensitivity
c) Derive the expression for unknown capacitance with phasor diagram by using Schering Bridge.
d) Write difference between Current Transformer and Potential Transformer.
e) Explain working of digital storage oscilloscope with suitable block diagram.

Q.3 Attempt any two of the following: 12

a) Illustrate and derive the torque equation for a Moving iron instrument with neat diagram.
b) Draw the equivalent circuit and phasor diagram of a CT. Derive the expressions for ratio and phase angle errors.
c) Explain digital ramp type and dual slope integrating type digital voltmeter.

Section – II

Q.4 Attempt any four of the following: 16

a) Explain the principle of working of Hall effect sensor.
b) Explain different types of temperature sensor with details.
c) Discuss Classification of sensor and explain active and passive sensor.
d) State and explain the methods of data transmission.
e) State and Explain the Modes of Heat transfer.

Q.5 Attempt any two of the following: 12

a) Stale the sensors used for Velocity and Acceleration application and explain any one of them.
b) Slate and explain the sensors used for occupancy and motion detector application.
c) Define the temperature and explain the thermal properties of material.

SLR-BD-45

Seat No.	

Set R

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Draw neat diagrams whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. 14

1) What is signal conditioning?
a) To analyze any signal
b) Conversion or modification is referred to as conditioning
c) Conversion from analog to digital is signal conditioning
d) Conversion from digital to analog is signal conditioning

2) Touch screen devices use which sensor?
a) Touch sensor b) Temperature sensor
c) Humidity sensor d) Pressure sensor

3) ENOB in ADC stand for _____
a) Effective number of bytes b) Effective number of bits
c) Effective nibble baud d) None of the mentioned

4) A simple bridge circuit consists of a network of _____
a) 3 resistance arms b) 2 resistance arms
c) 4 resistance arms d) 6 resistance arms

5) An instrument transformer is used to extend the range of _____.
a) induction instrument b) electrostatic instrument
c) moving coil instrument d) any of the above

6) The internal resistance of an ammeter should be _____.
a) Very small b) Medium
c) High d) Infinity

7) The smallest change which a sensor can detect is termed: _____
a) Accuracy b) Precision
c) Resolution d) Scale

8) Sensor effectiveness depends on _____ parameter.
a) Sensitivity b) Radiation
c) Restively d) All the above

9) The desirable static characteristics of a measuring system are _____
a) accuracy and drift
b) accuracy, sensitivity and reproducibility
c) drift and dead zone
d) static error

10) A _____ device prevents the oscillation of the moving system and enables the latter to reach its final position quickly.
a) Deflecting b) Controlling
c) Damping d) any of the above

11) _____ is an instrument which measures the insulation resistance of an electric circuit relative to earth and one another.
a) Tangent galvanometer
b) Megger
c) Current transformer
d) None of the above

12) Which of the following is a key characteristic of a sensor?
a) It can only measure temperature
b) It is an active component
c) It converts physical parameters into an electrical signal
d) Il requires no external power

13) Which of the following is a type of magnetic sensor?
a) Thermistor b) Strain gauge
c) Hall effect sensor d) LVDT

14) Typical conversion speed of ADC is _____
a) Less than 1 μs b) Less than 100 μs
c) Less than 500 μs d) Greater than 1000 μs

SLR-BD-45

Seat No.	

Set R

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt any four of the following: 16

a) Define standard & explain types of standards.
b) Define the following characteristics
1) Linearity 2) Accuracy 3) Repeatability 4) Sensitivity
c) Derive the expression for unknown capacitance with phasor diagram by using Schering Bridge.
d) Write difference between Current Transformer and Potential Transformer.
e) Explain working of digital storage oscilloscope with suitable block diagram.

Q.3 Attempt any two of the following: 12

a) Illustrate and derive the torque equation for a Moving iron instrument with neat diagram.
b) Draw the equivalent circuit and phasor diagram of a CT. Derive the expressions for ratio and phase angle errors.
c) Explain digital ramp type and dual slope integrating type digital voltmeter.

Section – II

Q.4 Attempt any four of the following: 16

a) Explain the principle of working of Hall effect sensor.
b) Explain different types of temperature sensor with details.
c) Discuss Classification of sensor and explain active and passive sensor.
d) State and explain the methods of data transmission.
e) State and Explain the Modes of Heat transfer.

Q.5 Attempt any two of the following: 12

a) Stale the sensors used for Velocity and Acceleration application and explain any one of them.
b) Slate and explain the sensors used for occupancy and motion detector application.
c) Define the temperature and explain the thermal properties of material.

SLR-BD-45

Seat No.	

Set S

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Draw neat diagrams whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) A _____ device prevents the oscillation of the moving system and enables the latter to reach its final position quickly.
a) Deflecting b) Controlling
c) Damping d) any of the above

2) _____ is an instrument which measures the insulation resistance of an electric circuit relative to earth and one another.
a) Tangent galvanometer
b) Megger
c) Current transformer
d) None of the above

3) Which of the following is a key characteristic of a sensor?
a) It can only measure temperature
b) It is an active component
c) It converts physical parameters into an electrical signal
d) Il requires no external power

4) Which of the following is a type of magnetic sensor?
a) Thermistor b) Strain gauge
c) Hall effect sensor d) LVDT

5) Typical conversion speed of ADC is _____
a) Less than 1 μs b) Less than 100 μs
c) Less than 500 μs d) Greater than 1000 μs

6) What is signal conditioning?
a) To analyze any signal
b) Conversion or modification is referred to as conditioning
c) Conversion from analog to digital is signal conditioning
d) Conversion from digital to analog is signal conditioning

7) Touch screen devices use which sensor?
a) Touch sensor b) Temperature sensor
c) Humidity sensor d) Pressure sensor

8) ENOB in ADC stand for _____
a) Effective number of bytes b) Effective number of bits
c) Effective nibble baud d) None of the mentioned

9) A simple bridge circuit consists of a network of _____
a) 3 resistance arms b) 2 resistance arms
c) 4 resistance arms d) 6 resistance arms

10) An instrument transformer is used to extend the range of _____.
a) induction instrument b) electrostatic instrument
c) moving coil instrument d) any of the above

11) The internal resistance of an ammeter should be _____.
a) Very small b) Medium
c) High d) Infinity

12) The smallest change which a sensor can detect is termed: _____
a) Accuracy b) Precision
c) Resolution d) Scale

13) Sensor effectiveness depends on _____ parameter.
a) Sensitivity b) Radiation
c) Restively d) All the above

14) The desirable static characteristics of a measuring system are _____
a) accuracy and drift
b) accuracy, sensitivity and reproducibility
c) drift and dead zone
d) static error

SLR-BD-45

Seat No.		Set	S

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt any four of the following: 16

a) Define standard & explain types of standards.
b) Define the following characteristics
1) Linearity 2) Accuracy 3) Repeatability 4) Sensitivity
c) Derive the expression for unknown capacitance with phasor diagram by using Schering Bridge.
d) Write difference between Current Transformer and Potential Transformer.
e) Explain working of digital storage oscilloscope with suitable block diagram.

Q.3 Attempt any two of the following: 12

a) Illustrate and derive the torque equation for a Moving iron instrument with neat diagram.
b) Draw the equivalent circuit and phasor diagram of a CT. Derive the expressions for ratio and phase angle errors.
c) Explain digital ramp type and dual slope integrating type digital voltmeter.

Section – II

Q.4 Attempt any four of the following: 16

a) Explain the principle of working of Hall effect sensor.
b) Explain different types of temperature sensor with details.
c) Discuss Classification of sensor and explain active and passive sensor.
d) State and explain the methods of data transmission.
e) State and Explain the Modes of Heat transfer.

Q.5 Attempt any two of the following: 12

a) Stale the sensors used for Velocity and Acceleration application and explain any one of them.
b) Slate and explain the sensors used for occupancy and motion detector application.
c) Define the temperature and explain the thermal properties of material.

SLR-BD-46

Seat No.		Set	P

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) Linear programming deals with the optimization of a function of variables is, known as _____
a) Subjective function b) Objective function
c) Combined Equation d) None of these

2) What is the condition of Balance Assignment Problem?
a) Σ Demand$=\Sigma$ Supply
b) No. of rows $>$ No. of column
c) No. of rows $<$ No. of column
d) No. of rows $=$ No. of columns

3) EOQ means: _____
a) Economic Offering Quantity b) Empty Order Quantity
c) Economic Order Quantity d) Economic Order Quality

4) In ABC analysis, high monitoring and control are required for: _____
a) A class items b) B class items
c) C class items d) All of these

5) Graphical method, simplex method, and transportation method are concerned with _____.
a) Break-even analysis b) Value analysis
c) Linear programming d) Queueing theory

6) The cost of keeping items in inventory is called _____
a) Set up cost b) Holding cost
c) Shortage cost d) None of these

7) Dual of the Dual is _____
a) Dual b) Primal
c) Zero d) Infinity

8) At the Break-Even Point _____
a) Profit > Loss
b) Profit < Loss
c) Profit = Loss
d) None of these

9) The PERT in project management means Program Evaluation and _____ Technique.
a) Resource
b) Reconciliation
c) Reconsideration
d) Review

10) _____ Stock is the lower limit of stock below which the stock should not be allowed to fall.
a) Maximum
b) Average
c) Safety
d) Standard

11) Optimization Means _____.
a) Maximization
b) Minimization
c) Minimization or Maximization
d) Mean of Minimization & Maximization

12) A feasible solution to LPP _____.
a) Must satisfy all the constraints simultaneously
b) Need not satisfy all the constraints
c) Must be a corner point of feasible region
d) Must optimize the objective function

13) In a project network, the critical path _____.
a) May be the shortest path
b) Is the longest path
c) May be the longest path
d) Is the shortest path

14) The inventory carrying costs are also called as _____.
a) Procurement costs
b) Set-up costs
c) Storage costs
d) None of the above

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt Any Three. **24**

a) Using Graphical method, Solve

Maximize $Z = 10X_1 + 8X_2$
Subject to, $2X_1 + X_2 \leq 40;$
$2X_1 + 3X_2 \leq 80;$
$0 \leq X_1; 0 \leq X_2$

b) Solve the following assignment model for minimum processing time.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Find the initial basic feasible solution by Least Cost Method.

	W1	W2	W3	W4	Supply
F1	48	60	56	58	140
F2	45	55	53	60	260
F3	50	65	60	62	360
F4	52	64	55	61	220
Demand	200	320	250	210	

d) What are the different Limitations & Applications of 'Operation Research'?
e) How do you solve unbalanced transportation problem? What are different methods to solve Transportation Model? Explain in details.

Q.3 Answer any one. **04**

a) What is LPP? What are different components of LPP?
b) How assignment model is useful in practical life?

Section – II

Q.4 Attempt Any Three. **24**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/- Find economic order quantity and number of orders to be placed per month?

b) Write a note various types inventory cost.

c) Draw network, find out CP & PD. Calculate All floats of each non-critical Activity.

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Immediate Predecessor	-	-	-	B	A	A	B	C,D	C,D	E	F,G,H	F,G,H	I	J,K
Time in Months	2	6	4	3	6	8	3	7	2	5	4	3	13	7

d) A small project consists of seven activities. The time estimates in weeks of different activities are given below. Find out probability of completing the project in 18 weeks.

Activity	Estimated Time		
	to	tm	tp
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

Probability Factor	Probability
0	50%
1	84.13%
2	97.72%
3	99.87%

e) Explain Sequencing Problem Technique. What are its Different Elements, also elaborate its assumptions.

Q.3 Attempt Any One. **04**

a) What is EOQ? What is its important?

b) Distinguish between CPM & PERT (At least 4 points)

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) At the Break-Even Point _____
a) Profit > Loss b) Profit < Loss
c) Profit = Loss d) None of these

2) The PERT in project management means Program Evaluation and _____ Technique.
a) Resource b) Reconciliation
c) Reconsideration d) Review

3) _____ Stock is the lower limit of stock below which the stock should not be allowed to fall.
a) Maximum b) Average
c) Safety d) Standard

4) Optimization Means _____.
a) Maximization
b) Minimization
c) Minimization or Maximization
d) Mean of Minimization & Maximization

5) A feasible solution to LPP _____.
a) Must satisfy all the constraints simultaneously
b) Need not satisfy all the constraints
c) Must be a corner point of feasible region
d) Must optimize the objective function

6) In a project network, the critical path _____.
a) May be the shortest path b) Is the longest path
c) May be the longest path d) Is the shortest path

7) The inventory carrying costs are also called as _____.
a) Procurement costs b) Set-up costs
c) Storage costs d) None of the above

8) Linear programming deals with the optimization of a function of variables is, known as _____
a) Subjective function b) Objective function
c) Combined Equation d) None of these

9) What is the condition of Balance Assignment Problem?
a) Σ Demand= Σ Supply
b) No. of rows > No. of column
c) No. of rows < No. of column
d) No. of rows = No. of columns

10) EOQ means: _____
a) Economic Offering Quantity b) Empty Order Quantity
c) Economic Order Quantity d) Economic Order Quality

11) In ABC analysis, high monitoring and control are required for: _____
a) A class items b) B class items
c) C class items d) All of these

12) Graphical method, simplex method, and transportation method are concerned with _____.
a) Break-even analysis b) Value analysis
c) Linear programming d) Queueing theory

13) The cost of keeping items in inventory is called _____
a) Set up cost b) Holding cost
c) Shortage cost d) None of these

14) Dual of the Dual is _____
a) Dual b) Primal
c) Zero d) Infinity

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt Any Three. **24**

a) Using Graphical method, Solve

Maximize $Z = 10X_1 + 8X_2$
Subject to, $2X_1 + X_2 \leq 40;$
$2X_1 + 3X_2 \leq 80;$
$0 \leq X_1; 0 \leq X_2$

b) Solve the following assignment model for minimum processing time.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Find the initial basic feasible solution by Least Cost Method.

	W1	W2	W3	W4	Supply
F1	48	60	56	58	140
F2	45	55	53	60	260
F3	50	65	60	62	360
F4	52	64	55	61	220
Demand	200	320	250	210	

d) What are the different Limitations & Applications of 'Operation Research'?
e) How do you solve unbalanced transportation problem? What are different methods to solve Transportation Model? Explain in details.

Q.3 Answer any one. **04**

a) What is LPP? What are different components of LPP?
b) How assignment model is useful in practical life?

Section – II

Q.4 Attempt Any Three. **24**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/- Find economic order quantity and number of orders to be placed per month?

b) Write a note various types inventory cost.

c) Draw network, find out CP & PD. Calculate All floats of each non-critical Activity.

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Immediate Predecessor	-	-	-	B	A	A	B	C,D	C,D	E	F,G,H	F,G,H	I	J,K
Time in Months	2	6	4	3	6	8	3	7	2	5	4	3	13	7

d) A small project consists of seven activities. The time estimates in weeks of different activities are given below. Find out probability of completing the project in 18 weeks.

Activity	Estimated Time		
	to	tm	tp
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

Probability Factor	Probability
0	50%
1	84.13%
2	97.72%
3	99.87%

e) Explain Sequencing Problem Technique. What are its Different Elements, also elaborate its assumptions.

Q.3 Attempt Any One. **04**

a) What is EOQ? What is its important?

b) Distinguish between CPM & PERT (At least 4 points)

Seat No.	

Set R

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Optimization Means _____.
a) Maximization
b) Minimization
c) Minimization or Maximization
d) Mean of Minimization & Maximization

2) A feasible solution to LPP _____.
a) Must satisfy all the constraints simultaneously
b) Need not satisfy all the constraints
c) Must be a corner point of feasible region
d) Must optimize the objective function

3) In a project network, the critical path _____.
a) May be the shortest path b) Is the longest path
c) May be the longest path d) Is the shortest path

4) The inventory carrying costs are also called as _____.
a) Procurement costs b) Set-up costs
c) Storage costs d) None of the above

5) Linear programming deals with the optimization of a function of variables is, known as _____
a) Subjective function b) Objective function
c) Combined Equation d) None of these

6) What is the condition of Balance Assignment Problem?
a) Σ Demand$=\Sigma$ Supply
b) No. of rows $>$ No. of column
c) No. of rows $<$ No. of column
d) No. of rows $=$ No. of columns

7) EOQ means: _____

a) Economic Offering Quantity b) Empty Order Quantity
c) Economic Order Quantity d) Economic Order Quality

8) In ABC analysis, high monitoring and control are required for: _____

a) A class items b) B class items
c) C class items d) All of these

9) Graphical method, simplex method, and transportation method are concerned with _____.

a) Break-even analysis b) Value analysis
c) Linear programming d) Queueing theory

10) The cost of keeping items in inventory is called _____

a) Set up cost b) Holding cost
c) Shortage cost d) None of these

11) Dual of the Dual is _____

a) Dual b) Primal
c) Zero d) Infinity

12) At the Break-Even Point _____

a) Profit > Loss b) Profit < Loss
c) Profit = Loss d) None of these

13) The PERT in project management means Program Evaluation and _____ Technique.

a) Resource b) Reconciliation
c) Reconsideration d) Review

14) _____ Stock is the lower limit of stock below which the stock should not be allowed to fall.

a) Maximum b) Average
c) Safety d) Standard

Seat No.	

Set R

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt Any Three. **24**

a) Using Graphical method, Solve

Maximize $Z = 10X_1 + 8X_2$
Subject to, $2X_1 + X_2 \leq 40;$
$2X_1 + 3X_2 \leq 80;$
$0 \leq X_1; 0 \leq X_2$

b) Solve the following assignment model for minimum processing time.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Find the initial basic feasible solution by Least Cost Method.

	W1	W2	W3	W4	Supply
F1	48	60	56	58	140
F2	45	55	53	60	260
F3	50	65	60	62	360
F4	52	64	55	61	220
Demand	200	320	250	210	

d) What are the different Limitations & Applications of 'Operation Research'?
e) How do you solve unbalanced transportation problem? What are different methods to solve Transportation Model? Explain in details.

Q.3 Answer any one. **04**

a) What is LPP? What are different components of LPP?
b) How assignment model is useful in practical life?

Section – II

Q.4 Attempt Any Three. **24**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/- Find economic order quantity and number of orders to be placed per month?

b) Write a note various types inventory cost.

c) Draw network, find out CP & PD. Calculate All floats of each non-critical Activity.

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Immediate Predecessor	-	-	-	B	A	A	B	C,D	C,D	E	F,G,H	F,G,H	I	J,K
Time in Months	2	6	4	3	6	8	3	7	2	5	4	3	13	7

d) A small project consists of seven activities. The time estimates in weeks of different activities are given below. Find out probability of completing the project in 18 weeks.

Activity	Estimated Time		
	to	tm	tp
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

Probability Factor	Probability
0	50%
1	84.13%
2	97.72%
3	99.87%

e) Explain Sequencing Problem Technique. What are its Different Elements, also elaborate its assumptions.

Q.3 Attempt Any One. **04**

a) What is EOQ? What is its important?

b) Distinguish between CPM & PERT (At least 4 points)

Seat No.		Set	S

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) The cost of keeping items in inventory is called _____
a) Set up cost b) Holding cost
c) Shortage cost d) None of these

2) Dual of the Dual is _____
a) Dual b) Primal
c) Zero d) Infinity

3) At the Break-Even Point _____
a) Profit > Loss b) Profit < Loss
c) Profit = Loss d) None of these

4) The PERT in project management means Program Evaluation and _____ Technique.
a) Resource b) Reconciliation
c) Reconsideration d) Review

5) _____ Stock is the lower limit of stock below which the stock should not be allowed to fall.
a) Maximum b) Average
c) Safety d) Standard

6) Optimization Means _____.
a) Maximization
b) Minimization
c) Minimization or Maximization
d) Mean of Minimization & Maximization

7) A feasible solution to LPP _____.
a) Must satisfy all the constraints simultaneously
b) Need not satisfy all the constraints
c) Must be a corner point of feasible region
d) Must optimize the objective function

8) In a project network, the critical path _____.
a) May be the shortest path b) Is the longest path
c) May be the longest path d) Is the shortest path

9) The inventory carrying costs are also called as _____.
a) Procurement costs b) Set-up costs
c) Storage costs d) None of the above

10) Linear programming deals with the optimization of a function of variables is, known as _____
a) Subjective function b) Objective function
c) Combined Equation d) None of these

11) What is the condition of Balance Assignment Problem?
a) Σ Demand= Σ Supply
b) No. of rows > No. of column
c) No. of rows < No. of column
d) No. of rows = No. of columns

12) EOQ means: _____
a) Economic Offering Quantity b) Empty Order Quantity
c) Economic Order Quantity d) Economic Order Quality

13) In ABC analysis, high monitoring and control are required for: _____
a) A class items b) B class items
c) C class items d) All of these

14) Graphical method, simplex method, and transportation method are concerned with _____.
a) Break-even analysis b) Value analysis
c) Linear programming d) Queueing theory

Seat No.	

Set S

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt Any Three. **24**

a) Using Graphical method, Solve

Maximize $Z = 10X_1 + 8X_2$
Subject to, $2X_1 + X_2 \leq 40;$
$2X_1 + 3X_2 \leq 80;$
$0 \leq X_1; 0 \leq X_2$

b) Solve the following assignment model for minimum processing time.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Find the initial basic feasible solution by Least Cost Method.

	W1	W2	W3	W4	Supply
F1	48	60	56	58	140
F2	45	55	53	60	260
F3	50	65	60	62	360
F4	52	64	55	61	220
Demand	200	320	250	210	

d) What are the different Limitations & Applications of 'Operation Research'?
e) How do you solve unbalanced transportation problem? What are different methods to solve Transportation Model? Explain in details.

Q.3 Answer any one. **04**

a) What is LPP? What are different components of LPP?
b) How assignment model is useful in practical life?

Section – II

Q.4 Attempt Any Three. **24**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/- Find economic order quantity and number of orders to be placed per month?

b) Write a note various types inventory cost.

c) Draw network, find out CP & PD. Calculate All floats of each non-critical Activity.

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Immediate Predecessor	-	-	-	B	A	A	B	C,D	C,D	E	F,G,H	F,G,H	I	J,K
Time in Months	2	6	4	3	6	8	3	7	2	5	4	3	13	7

d) A small project consists of seven activities. The time estimates in weeks of different activities are given below. Find out probability of completing the project in 18 weeks.

Activity	Estimated Time		
	to	tm	tp
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

Probability Factor	Probability
0	50%
1	84.13%
2	97.72%
3	99.87%

e) Explain Sequencing Problem Technique. What are its Different Elements, also elaborate its assumptions.

Q.3 Attempt Any One. **04**

a) What is EOQ? What is its important?

b) Distinguish between CPM & PERT (At least 4 points)

SLR-BD-47

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) A transcendental equation is an equation that involves _____.
a) Only algebraic terms
b) Only transcendental functions
c) Both algebraic and transcendental functions
d) Linear terms only

2) The interval in which a real root of the equation $x^3 - 2x - 5 = 0$ lies is _____.
a) $(1,2)$ b) $(0,1)$
c) $(2,3)$ d) $(3,4)$

3) The Gauss-Seidel method is used for solving _____.
a) Nonlinear equations
b) Systems of linear equations
c) Ordinary differential equations
d) Partial differential equations

4) Which of the following is a disadvantage of the Gauss-Jacobi method?
a) It converges faster than most direct methods
b) It requires a large number of iterations for a good approximation
c) It cannot be used for systems with more than two equations
d) It works only for symmetric systems

5) The use of Romberg's method is _____.
a) To solve simultaneous linear equation
b) To find root of linear equation
c) To evaluate definite integration
d) To find the Eigen values

6) The order of convergence of Newton-Raphson method is _____.

a) 1 b) 2

c) $\sqrt{2}$ d) 1.6

7) Power Method is used to find _____.

a) Negative Eigen Value b) Largest Eigen value

c) Positive Eigen Value d) None of these

8) To find the Numerically largest Eigen value using iterative Method we use the equation _____.

a) $A = \lambda X$ b) $AX = X$

c) $X = \lambda X$ d) $AX = \lambda X$

9) If $\frac{dy}{dx} = x - y$ and $y(0) = 1$ then by Picard's method the value of $y_1(1)$ is _____.

a) 0.905 b) 1.905

c) 2.905 d) none

10) Runge-Kutta method is self-starting method _____.

a) true d) false

c) we can't say d) none

11) If the data is equally spaced and interpolation is near the beginning of the data then _____ Interpolation formula is used.

a) Newton's backward difference

b) Newton's divided difference

c) Newton's forward difference

d) Lagrange's

12) The process of finding the value inside the interval (x_0, x_n) is called ___.

a) Interpolation b) Extrapolation

c) Iterative d) polynomial equation

13) Using Newton-Raphson method the first approximation to the root of the equation $x^4 - x - 10 = 0$ near to $x_0 = 2$ is _____.

a) 1.671 b) 2.271

c) 2.071 d) 1.871

14) To apply Simpson's one-third rule the number of sub-intervals must be _____.

a) Even b) Odd

c) Multiple of 3 d) Multiple of 6

SLR-BD-47

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any three. **09**

a) Find the double root of the equation $x^3 - 5.4x^2 + 9.24x - 5.096 = 0$ given that it is nearer to 1.5.

b) Solve the system of equations by Jacobi's iterative method (perform 3 iterations) $27x + 6y - z = 85,\ 6x + 15y + 2z = 72,\ x + y + 54z = 110$

c) Find positive real root of the equation $x \sin x + \cos x = 0$ using Newton Raphson method correct to 3 decimal places.

d) Solve the system of equation by using Gauss-Elimination method. $x + 4y - z = -5, x + y - 6z = -12, -3x - y - z = 4$

e) Solve $\frac{dy}{dx} = -xy$ with $x_0 = 0\ ,\ y_0 = 1$ using Picard's method upto 3rd approximation.

Q.3 Answer any three. **09**

a) Solve $\frac{dy}{dx} = x + y$ with $x_0 = 0\ , y_0 = 1$ using Range kutta forth order method and find approximate value of y when $x = 0.2$

b) Solve $\frac{dy}{dx} = 1 + xy$ with $y(0) = 1$ using Picard's method take first approximation and find y for $x = 0.1$

c) Solve by Gauss Seidel Method, the equations $20x + y - 2z = 17, 3x + 20y - z = -18, 2x - 3y + 20z = 25$ Perform 3 iteration.

d) Find the value of $\sqrt{5}$ using newton's iterative formula. Perform 3 iteration.

e) Find the positive root of $f(x) = 2x^3 - 3x - 6$ by Newton's Raphson method perform 3 iteration.

Q.4 Answer any two. **10**

a) Perform 2-iteration by Newton's Raphson Method to Solve the non-linear equation $x = x^2 + y^2,\ y = x^2 - y^2$ Take initial approximation $x_0 = 0.8, y_0 = 0.4$

b) Solve the system of equation by LU decomposition Method $3x + 2y + 7z = 4,\quad 2x + 3y + z = 5,\quad 3x + 4y + z = 7$

c) Solve differential equation $\frac{dy}{dx} = 1 + xz,\ \frac{dz}{dx} = -xy$ for $x = 0.3$ using 4th order Runge-Kutta Method Initial Values are $x = 0,\ y = 0,\ z = 1$

Section – II

Q.5 Answer any Three. **09**

a) Evaluate the integral $\int_0^1 \frac{x^2}{1+x^3}\,dx$ using Simpson's $\frac{1}{3}$rd rule, Take $h = 0.25$

b) Determine the largest Eigen value and corresponding Eigen vector of the matrix $\begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$ by using power method perform three iteration.

c) Use Trapezoidal Rule to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as 0.5

d) Using Newton's divided difference formula, find the value of $f(2)$. Given the following table.

x	4	5	7	10	11	13
$f(x)$	48	100	294	900	1210	2028

e) Construct Newton's Forward interpolation polynomial for the following data:

x	4	6	8	10
y	1	3	8	16

Hence find the value of y for $x = 5$

Q.6 Answer any Three. **09**

a) Solve the integral $\int_0^{1/2} \frac{1}{\sqrt{1-x^2}}\,dx$ using Weddle's rule Taking $n = 6$

b) Solve $\int_3^5 \frac{4}{(2x^2)}\,dx$ Using Gauss Formula for $n = 2$ and $n = 3$.

c) Find all Eigen values and Eigen vectors of the following matrix by using Gauss Jacobi's Method. $\begin{bmatrix} 2 & 3 \\ 3 & 2 \end{bmatrix}$

d) Solve $\int_0^6 \frac{dx}{1+x^2}$ by using Simpsons 3/8th rule take $h = 1$

e) Using Newton's Backward formula, find the value of $f(2)$ if

x	1	1.4	1.8	2.2
$f(x)$	3.49	4.82	5.96	6.5

Q.7 Answer any two. **10**

a) Find the largest eigen value and the corresponding eigen vector of the matrix:

$\begin{bmatrix} 25 & 1 & 2 \\ 1 & 3 & 0 \\ 2 & 0 & -4 \end{bmatrix}$ by using power method

Take $[1 \quad 0 \quad 0]^r$ as initial eigen vector (perform 5 iterations)

b) Use Romberg's method to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as $0.5, 0.25, 0.125$

c) Given the Values

x	5	7	11	13	17
$f(x)$	150	392	1452	2366	5202

Evaluate $f(9)$,using Lagrange's Formula.

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) To find the Numerically largest Eigen value using iterative Method we use the equation _____.
a) $A = \lambda X$ b) $AX = X$
c) $X = \lambda X$ d) $AX = \lambda X$

2) If $\frac{dy}{dx} = x - y$ and $y(0) = 1$ then by Picard's method the value of $y_1(1)$ is _____.
a) 0.905 b) 1.905
c) 2.905 d) none

3) Runge-Kutta method is self-starting method _____.
a) true d) false
c) we can't say d) none

4) If the data is equally spaced and interpolation is near the beginning of the data then _____ Interpolation formula is used.
a) Newton's backward difference
b) Newton's divided difference
c) Newton's forward difference
d) Lagrange's

5) The process of finding the value inside the interval (x_0, x_n) is called ___.
a) Interpolation b) Extrapolation
c) Iterative d) polynomial equation

6) Using Newton-Raphson method the first approximation to the root of the equation $x^4 - x - 10 = 0$ near to $x_0 = 2$ is _____.
a) 1.671 b) 2.271
c) 2.071 d) 1.871

7) To apply Simpson's one-third rule the number of sub-intervals must be _____.
a) Even b) Odd
c) Multiple of 3 d) Multiple of 6

8) A transcendental equation is an equation that involves _____.
a) Only algebraic terms
b) Only transcendental functions
c) Both algebraic and transcendental functions
d) Linear terms only

9) The interval in which a real root of the equation $x^3 - 2x - 5 = 0$ lies is _____.
a) $(1,2)$ b) $(0,1)$
c) $(2,3)$ d) $(3,4)$

10) The Gauss-Seidel method is used for solving _____.
a) Nonlinear equations
b) Systems of linear equations
c) Ordinary differential equations
d) Partial differential equations

11) Which of the following is a disadvantage of the Gauss-Jacobi method?
a) It converges faster than most direct methods
b) It requires a large number of iterations for a good approximation
c) It cannot be used for systems with more than two equations
d) It works only for symmetric systems

12) The use of Romberg's method is _____.
a) To solve simultaneous linear equation
b) To find root of linear equation
c) To evaluate definite integration
d) To find the Eigen values

13) The order of convergence of Newton-Raphson method is _____.
a) 1 b) 2
c) $\sqrt{2}$ d) 1.6

14) Power Method is used to find _____.
a) Negative Eigen Value b) Largest Eigen value
c) Positive Eigen Value d) None of these

SLR-BD-47

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any three. **09**

a) Find the double root of the equation $x^3 - 5.4x^2 + 9.24x - 5.096 = 0$ given that it is nearer to 1.5.

b) Solve the system of equations by Jacobi's iterative method (perform 3 iterations) $27x + 6y - z = 85,\ 6x + 15y + 2z = 72,\ x + y + 54z = 110$

c) Find positive real root of the equation $x \sin x + \cos x = 0$ using Newton Raphson method correct to 3 decimal places.

d) Solve the system of equation by using Gauss-Elimination method. $x + 4y - z = -5, x + y - 6z = -12, -3x - y - z = 4$

e) Solve $\frac{dy}{dx} = -xy$ with $x_0 = 0\ ,\ y_0 = 1$ using Picard's method upto 3rd approximation.

Q.3 Answer any three. **09**

a) Solve $\frac{dy}{dx} = x + y$ with $x_0 = 0\ , y_0 = 1$ using Range kutta forth order method and find approximate value of y when $x = 0.2$

b) Solve $\frac{dy}{dx} = 1 + xy$ with $y(0) = 1$ using Picard's method take first approximation and find y for $x = 0.1$

c) Solve by Gauss Seidel Method, the equations $20x + y - 2z = 17, 3x + 20y - z = -18, 2x - 3y + 20z = 25$ Perform 3 iteration.

d) Find the value of $\sqrt{5}$ using newton's iterative formula. Perform 3 iteration.

e) Find the positive root of $f(x) = 2x^3 - 3x - 6$ by Newton's Raphson method perform 3 iteration.

Q.4 Answer any two. **10**

a) Perform 2-iteration by Newton's Raphson Method to Solve the non-linear equation $x = x^2 + y^2,\ y = x^2 - y^2$ Take initial approximation $x_0 = 0.8, y_0 = 0.4$

b) Solve the system of equation by LU decomposition Method $3x + 2y + 7z = 4,\quad 2x + 3y + z = 5,\quad 3x + 4y + z = 7$

c) Solve differential equation $\frac{dy}{dx} = 1 + xz,\ \frac{dz}{dx} = -xy$ for $x = 0.3$ using 4th order Runge-Kutta Method Initial Values are $x = 0,\ y = 0,\ z = 1$

Section – II

Q.5 Answer any Three. **09**

a) Evaluate the integral $\int_0^1 \frac{x^2}{1+x^3}\,dx$ using Simpson's $\frac{1}{3}$rd rule, Take $h = 0.25$

b) Determine the largest Eigen value and corresponding Eigen vector of the matrix $\begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$ by using power method perform three iteration.

c) Use Trapezoidal Rule to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as 0.5

d) Using Newton's divided difference formula, find the value of $f(2)$. Given the following table.

x	4	5	7	10	11	13
$f(x)$	48	100	294	900	1210	2028

e) Construct Newton's Forward interpolation polynomial for the following data:

x	4	6	8	10
y	1	3	8	16

Hence find the value of y for $x = 5$

Q.6 Answer any Three. **09**

a) Solve the integral $\int_0^{1/2} \frac{1}{\sqrt{1-x^2}}\,dx$ using Weddle's rule Taking $n = 6$

b) Solve $\int_3^5 \frac{4}{(2x^2)}\,dx$ Using Gauss Formula for $n = 2$ and $n = 3$.

c) Find all Eigen values and Eigen vectors of the following matrix by using Gauss Jacobi's Method. $\begin{bmatrix} 2 & 3 \\ 3 & 2 \end{bmatrix}$

d) Solve $\int_0^6 \frac{dx}{1+x^2}$ by using Simpsons 3/8th rule take $h = 1$

e) Using Newton's Backward formula, find the value of $f(2)$ if

x	1	1.4	1.8	2.2
$f(x)$	3.49	4.82	5.96	6.5

Q.7 Answer any two. **10**

a) Find the largest eigen value and the corresponding eigen vector of the matrix:

$\begin{bmatrix} 25 & 1 & 2 \\ 1 & 3 & 0 \\ 2 & 0 & -4 \end{bmatrix}$ by using power method

Take $[1 \quad 0 \quad 0]^r$ as initial eigen vector (perform 5 iterations)

b) Use Romberg's method to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as $0.5, 0.25, 0.125$

c) Given the Values

x	5	7	11	13	17
$f(x)$	150	392	1452	2366	5202

Evaluate $f(9)$,using Lagrange's Formula.

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) If the data is equally spaced and interpolation is near the beginning of the data then _____ Interpolation formula is used.
a) Newton's backward difference
b) Newton's divided difference
c) Newton's forward difference
d) Lagrange's

2) The process of finding the value inside the interval (x_0, x_n) is called ___.
a) Interpolation b) Extrapolation
c) Iterative d) polynomial equation

3) Using Newton-Raphson method the first approximation to the root of the equation $x^4 - x - 10 = 0$ near to $x_0 = 2$ is _____.
a) 1.671 b) 2.271
c) 2.071 d) 1.871

4) To apply Simpson's one-third rule the number of sub-intervals must be _____.
a) Even b) Odd
c) Multiple of 3 d) Multiple of 6

5) A transcendental equation is an equation that involves _____.
a) Only algebraic terms
b) Only transcendental functions
c) Both algebraic and transcendental functions
d) Linear terms only

6) The interval in which a real root of the equation $x^3 - 2x - 5 = 0$ lies is _____.

a) $(1,2)$ b) $(0,1)$
c) $(2,3)$ d) $(3,4)$

7) The Gauss-Seidel method is used for solving _____.

a) Nonlinear equations
b) Systems of linear equations
c) Ordinary differential equations
d) Partial differential equations

8) Which of the following is a disadvantage of the Gauss-Jacobi method?

a) It converges faster than most direct methods
b) It requires a large number of iterations for a good approximation
c) It cannot be used for systems with more than two equations
d) It works only for symmetric systems

9) The use of Romberg's method is _____.

a) To solve simultaneous linear equation
b) To find root of linear equation
c) To evaluate definite integration
d) To find the Eigen values

10) The order of convergence of Newton-Raphson method is _____.

a) 1 b) 2
c) $\sqrt{2}$ d) 1.6

11) Power Method is used to find _____.

a) Negative Eigen Value b) Largest Eigen value
c) Positive Eigen Value d) None of these

12) To find the Numerically largest Eigen value using iterative Method we use the equation _____.

a) $A = \lambda X$ b) $AX = X$
c) $X = \lambda X$ d) $AX = \lambda X$

13) If $\frac{dy}{dx} = x - y$ and $y(0) = 1$ then by Picard's method the value of $y_1(1)$ is _____.

a) 0.905 b) 1.905
c) 2.905 d) none

14) Runge-Kutta method is self-starting method _____.

a) true d) false
c) we can't say d) none

SLR-BD-47

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any three. **09**

a) Find the double root of the equation $x^3 - 5.4x^2 + 9.24x - 5.096 = 0$ given that it is nearer to 1.5.

b) Solve the system of equations by Jacobi's iterative method (perform 3 iterations) $27x + 6y - z = 85,\ 6x + 15y + 2z = 72,\ x + y + 54z = 110$

c) Find positive real root of the equation $x \sin x + \cos x = 0$ using Newton Raphson method correct to 3 decimal places.

d) Solve the system of equation by using Gauss-Elimination method. $x + 4y - z = -5, x + y - 6z = -12, -3x - y - z = 4$

e) Solve $\frac{dy}{dx} = -xy$ with $x_0 = 0\ ,\ y_0 = 1$ using Picard's method upto 3rd approximation.

Q.3 Answer any three. **09**

a) Solve $\frac{dy}{dx} = x + y$ with $x_0 = 0\ , y_0 = 1$ using Range kutta forth order method and find approximate value of y when $x = 0.2$

b) Solve $\frac{dy}{dx} = 1 + xy$ with $y(0) = 1$ using Picard's method take first approximation and find y for $x = 0.1$

c) Solve by Gauss Seidel Method, the equations $20x + y - 2z = 17, 3x + 20y - z = -18, 2x - 3y + 20z = 25$ Perform 3 iteration.

d) Find the value of $\sqrt{5}$ using newton's iterative formula. Perform 3 iteration.

e) Find the positive root of $f(x) = 2x^3 - 3x - 6$ by Newton's Raphson method perform 3 iteration.

Q.4 Answer any two. **10**

a) Perform 2-iteration by Newton's Raphson Method to Solve the non-linear equation $x = x^2 + y^2,\ y = x^2 - y^2$ Take initial approximation $x_0 = 0.8, y_0 = 0.4$

b) Solve the system of equation by LU decomposition Method $3x + 2y + 7z = 4,\quad 2x + 3y + z = 5,\quad 3x + 4y + z = 7$

c) Solve differential equation $\frac{dy}{dx} = 1 + xz,\ \frac{dz}{dx} = -xy$ for $x = 0.3$ using 4th order Runge-Kutta Method Initial Values are $x = 0,\ y = 0,\ z = 1$

Section – II

Q.5 Answer any Three. **09**

a) Evaluate the integral $\int_0^1 \frac{x^2}{1+x^3}\,dx$ using Simpson's $\frac{1}{3}$rd rule, Take $h = 0.25$

b) Determine the largest Eigen value and corresponding Eigen vector of the matrix $\begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$ by using power method perform three iteration.

c) Use Trapezoidal Rule to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as 0.5

d) Using Newton's divided difference formula, find the value of $f(2)$. Given the following table.

x	4	5	7	10	11	13
$f(x)$	48	100	294	900	1210	2028

e) Construct Newton's Forward interpolation polynomial for the following data:

x	4	6	8	10
y	1	3	8	16

Hence find the value of y for $x = 5$

Q.6 Answer any Three. **09**

a) Solve the integral $\int_0^{1/2} \frac{1}{\sqrt{1-x^2}}\,dx$ using Weddle's rule Taking $n = 6$

b) Solve $\int_3^5 \frac{4}{(2x^2)}\,dx$ Using Gauss Formula for $n = 2$ and $n = 3$.

c) Find all Eigen values and Eigen vectors of the following matrix by using Gauss Jacobi's Method. $\begin{bmatrix} 2 & 3 \\ 3 & 2 \end{bmatrix}$

d) Solve $\int_0^6 \frac{dx}{1+x^2}$ by using Simpsons 3/8th rule take $h = 1$

e) Using Newton's Backward formula, find the value of $f(2)$ if

x	1	1.4	1.8	2.2
$f(x)$	3.49	4.82	5.96	6.5

Q.7 Answer any two. **10**

a) Find the largest eigen value and the corresponding eigen vector of the matrix:

$\begin{bmatrix} 25 & 1 & 2 \\ 1 & 3 & 0 \\ 2 & 0 & -4 \end{bmatrix}$ by using power method

Take $[1 \quad 0 \quad 0]^r$ as initial eigen vector (perform 5 iterations)

b) Use Romberg's method to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as $0.5, 0.25, 0.125$

c) Given the Values

x	5	7	11	13	17
$f(x)$	150	392	1452	2366	5202

Evaluate $f(9)$,using Lagrange's Formula.

SLR-BD-47

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The order of convergence of Newton-Raphson method is _____.
a) 1 b) 2
c) $\sqrt{2}$ d) 1.6

2) Power Method is used to find _____.
a) Negative Eigen Value b) Largest Eigen value
c) Positive Eigen Value d) None of these

3) To find the Numerically largest Eigen value using iterative Method we use the equation _____.
a) $A = \lambda X$ b) $AX = X$
c) $X = \lambda X$ d) $AX = \lambda X$

4) If $\frac{dy}{dx} = x - y$ and $y(0) = 1$ then by Picard's method the value of $y_1(1)$ is _____.
a) 0.905 b) 1.905
c) 2.905 d) none

5) Runge-Kutta method is self-starting method _____.
a) true d) false
c) we can't say d) none

6) If the data is equally spaced and interpolation is near the beginning of the data then _____ Interpolation formula is used.
a) Newton's backward difference
b) Newton's divided difference
c) Newton's forward difference
d) Lagrange's

7) The process of finding the value inside the interval (x_0, x_n) is called ___.
a) Interpolation b) Extrapolation
c) Iterative d) polynomial equation

8) Using Newton-Raphson method the first approximation to the root of the equation $x^4 - x - 10 = 0$ near to $x_0 = 2$ is _____.
a) 1.671 b) 2.271
c) 2.071 d) 1.871

9) To apply Simpson's one-third rule the number of sub-intervals must be _____.
a) Even b) Odd
c) Multiple of 3 d) Multiple of 6

10) A transcendental equation is an equation that involves _____.
a) Only algebraic terms
b) Only transcendental functions
c) Both algebraic and transcendental functions
d) Linear terms only

11) The interval in which a real root of the equation $x^3 - 2x - 5 = 0$ lies is _____.
a) $(1,2)$ b) $(0,1)$
c) $(2,3)$ d) $(3,4)$

12) The Gauss-Seidel method is used for solving _____.
a) Nonlinear equations
b) Systems of linear equations
c) Ordinary differential equations
d) Partial differential equations

13) Which of the following is a disadvantage of the Gauss-Jacobi method?
a) It converges faster than most direct methods
b) It requires a large number of iterations for a good approximation
c) It cannot be used for systems with more than two equations
d) It works only for symmetric systems

14) The use of Romberg's method is _____.
a) To solve simultaneous linear equation
b) To find root of linear equation
c) To evaluate definite integration
d) To find the Eigen values

SLR-BD-47

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any three. **09**

a) Find the double root of the equation $x^3 - 5.4x^2 + 9.24x - 5.096 = 0$ given that it is nearer to 1.5.

b) Solve the system of equations by Jacobi's iterative method (perform 3 iterations) $27x + 6y - z = 85,\ 6x + 15y + 2z = 72,\ x + y + 54z = 110$

c) Find positive real root of the equation $x \sin x + \cos x = 0$ using Newton Raphson method correct to 3 decimal places.

d) Solve the system of equation by using Gauss-Elimination method. $x + 4y - z = -5, x + y - 6z = -12, -3x - y - z = 4$

e) Solve $\frac{dy}{dx} = -xy$ with $x_0 = 0\ ,\ y_0 = 1$ using Picard's method upto 3rd approximation.

Q.3 Answer any three. **09**

a) Solve $\frac{dy}{dx} = x + y$ with $x_0 = 0\ , y_0 = 1$ using Range kutta forth order method and find approximate value of y when $x = 0.2$

b) Solve $\frac{dy}{dx} = 1 + xy$ with $y(0) = 1$ using Picard's method take first approximation and find y for $x = 0.1$

c) Solve by Gauss Seidel Method, the equations $20x + y - 2z = 17, 3x + 20y - z = -18, 2x - 3y + 20z = 25$ Perform 3 iteration.

d) Find the value of $\sqrt{5}$ using newton's iterative formula. Perform 3 iteration.

e) Find the positive root of $f(x) = 2x^3 - 3x - 6$ by Newton's Raphson method perform 3 iteration.

Q.4 Answer any two. **10**

a) Perform 2-iteration by Newton's Raphson Method to Solve the non-linear equation $x = x^2 + y^2,\ y = x^2 - y^2$ Take initial approximation $x_0 = 0.8, y_0 = 0.4$

b) Solve the system of equation by LU decomposition Method $3x + 2y + 7z = 4,\quad 2x + 3y + z = 5,\quad 3x + 4y + z = 7$

c) Solve differential equation $\frac{dy}{dx} = 1 + xz,\ \frac{dz}{dx} = -xy$ for $x = 0.3$ using 4th order Runge-Kutta Method Initial Values are $x = 0,\ y = 0,\ z = 1$

Section – II

Q.5 Answer any Three. **09**

a) Evaluate the integral $\int_0^1 \frac{x^2}{1+x^3}\,dx$ using Simpson's $\frac{1}{3}$rd rule, Take $h = 0.25$

b) Determine the largest Eigen value and corresponding Eigen vector of the matrix $\begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$ by using power method perform three iteration.

c) Use Trapezoidal Rule to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as 0.5

d) Using Newton's divided difference formula, find the value of $f(2)$. Given the following table.

x	4	5	7	10	11	13
$f(x)$	48	100	294	900	1210	2028

e) Construct Newton's Forward interpolation polynomial for the following data:

x	4	6	8	10
y	1	3	8	16

Hence find the value of y for $x = 5$

Q.6 Answer any Three. **09**

a) Solve the integral $\int_0^{1/2} \frac{1}{\sqrt{1-x^2}}\,dx$ using Weddle's rule Taking $n = 6$

b) Solve $\int_3^5 \frac{4}{(2x^2)}\,dx$ Using Gauss Formula for $n = 2$ and $n = 3$.

c) Find all Eigen values and Eigen vectors of the following matrix by using Gauss Jacobi's Method. $\begin{bmatrix} 2 & 3 \\ 3 & 2 \end{bmatrix}$

d) Solve $\int_0^6 \frac{dx}{1+x^2}$ by using Simpsons 3/8th rule take $h = 1$

e) Using Newton's Backward formula, find the value of $f(2)$ if

x	1	1.4	1.8	2.2
$f(x)$	3.49	4.82	5.96	6.5

Q.7 Answer any two. **10**

a) Find the largest eigen value and the corresponding eigen vector of the matrix:

$\begin{bmatrix} 25 & 1 & 2 \\ 1 & 3 & 0 \\ 2 & 0 & -4 \end{bmatrix}$ by using power method

Take $[1 \quad 0 \quad 0]^r$ as initial eigen vector (perform 5 iterations)

b) Use Romberg's method to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as $0.5, 0.25, 0.125$

c) Given the Values

x	5	7	11	13	17
$f(x)$	150	392	1452	2366	5202

Evaluate $f(9)$,using Lagrange's Formula.

SLR-BD-48

Seat No.		Set	P

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) In communication, _____ is the person who receives and decodes the message.
a) Sender b) Receiver
c) Driver d) Cleaner

2) Which among the following is not a manmade channel of communication?
a) Telephone b) Cell phone
c) Fax d) Air

3) Communication is the part of _____ skills.
a) Rough b) Soft
c) Hard d) Short

4) Which among the following are the barriers to communication?
a) Physical b) Mechanical
c) Psychological d) All of above

5) To overcome language barrier, which of the ways should not be followed?
a) Easy and understandable words should be used.
b) Jokes should be told to the audience.
c) The language of audience should be used.
d) Non-verbal ways should be used to the extent possible.

6) Which of the following is not among 7Cs?
a) Conciseness b) Completeness
c) Clarity d) Charity

7) Posters fall under _____ communication.
a) oral b) visual
c) written d) spoken

8) On the _____ it is possible to get immediate feedback.
a) letter b) e-mail
c) fax d) telephone

9) The response to a sender's message is called as _____.
a) Reply b) Feedback
c) Answer d) None of the above

10) _____ is the soul of communication.
a) Sender b) Receiver
c) Message d) Feedback

11) Which of these is not an element of non-verbal communication?
a) Personal appearance b) Posture
c) Eye contact d) Name of the speaker

12) Telephonic conversation is a form of: _____
a) verbal communication b) non-verbal communication
c) visual communication d) Written

13) To give a good presentation, full rehearsal is: _____
a) Optional b) Necessary
c) Useless d) Audience based

14) Which of the following is not an advantage of oral presentation?
a) Flexibility b) Scope for body language
c) Expensive d) Time-saving

SLR-BD-48

Seat No.	

Set P

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Three. **12**

a) Explain how communication is necessary for business.
b) What is feedback? Explain its necessity in communication.
c) Write short note on: Different channels of communication.
d) Explain language barriers to communication with the ways to overcome them.
e) Explain language as a tool of communication.

Q.3 Attempt Any Four. **16**

a) Explain seven C's of effective communication.
b) Explain various types of barriers to communication and the ways to overcome them.
c) What is oral communication? Explain its advantages.
d) Explain various steps in the process of communication.
e) What is written communication? Explain its benefits.

Section – II

Q.4 Attempt Any Three. **12**

a) Explain the difference between formal and informal communication.
b) Explain vertical communication with its types.
c) Explain farewell speech by the departing person, with an example
d) Explain the speech for vote of thanks, with an example.
e) Write short note on: Non- verbal aspects of presentation.

Q.5 Attempt Any Four. **16**

a) Explain the structure of a business letter with its various components.
b) Explain the steps in the process of presentation.
c) You had purchased some furniture items from a vendor. Afterwards you found that the furniture items are in a damaged condition. Write a letter of complaint and ask for replacement.
d) Explain four P's of effective presentations.
e) You are in need of some computer hardware parts. Prepare a letter placing order to the supplier. Specify the terms and conditions of purchase.

Seat No.		Set	Q

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) On the _____ it is possible to get immediate feedback.
a) letter b) e-mail
c) fax d) telephone

2) The response to a sender's message is called as _____.
a) Reply b) Feedback
c) Answer d) None of the above

3) _____ is the soul of communication.
a) Sender b) Receiver
c) Message d) Feedback

4) Which of these is not an element of non-verbal communication?
a) Personal appearance b) Posture
c) Eye contact d) Name of the speaker

5) Telephonic conversation is a form of: _____
a) verbal communication b) non-verbal communication
c) visual communication d) Written

6) To give a good presentation, full rehearsal is: _____
a) Optional b) Necessary
c) Useless d) Audience based

7) Which of the following is not an advantage of oral presentation?
a) Flexibility b) Scope for body language
c) Expensive d) Time-saving

8) In communication, _____ is the person who receives and decodes the message.
a) Sender b) Receiver
c) Driver d) Cleaner

9) Which among the following is not a manmade channel of communication?
a) Telephone b) Cell phone
c) Fax d) Air

10) Communication is the part of _____ skills.
a) Rough b) Soft
c) Hard d) Short

11) Which among the following are the barriers to communication?
a) Physical b) Mechanical
c) Psychological d) All of above

12) To overcome language barrier, which of the ways should not be followed?
a) Easy and understandable words should be used.
b) Jokes should be told to the audience.
c) The language of audience should be used.
d) Non-verbal ways should be used to the extent possible.

13) Which of the following is not among 7Cs?
a) Conciseness b) Completeness
c) Clarity d) Charity

14) Posters fall under _____ communication.
a) oral b) visual
c) written d) spoken

SLR-BD-48

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Three. **12**

a) Explain how communication is necessary for business.
b) What is feedback? Explain its necessity in communication.
c) Write short note on: Different channels of communication.
d) Explain language barriers to communication with the ways to overcome them.
e) Explain language as a tool of communication.

Q.3 Attempt Any Four. **16**

a) Explain seven C's of effective communication.
b) Explain various types of barriers to communication and the ways to overcome them.
c) What is oral communication? Explain its advantages.
d) Explain various steps in the process of communication.
e) What is written communication? Explain its benefits.

Section – II

Q.4 Attempt Any Three. **12**

a) Explain the difference between formal and informal communication.
b) Explain vertical communication with its types.
c) Explain farewell speech by the departing person, with an example
d) Explain the speech for vote of thanks, with an example.
e) Write short note on: Non- verbal aspects of presentation.

Q.5 Attempt Any Four. **16**

a) Explain the structure of a business letter with its various components.
b) Explain the steps in the process of presentation.
c) You had purchased some furniture items from a vendor. Afterwards you found that the furniture items are in a damaged condition. Write a letter of complaint and ask for replacement.
d) Explain four P's of effective presentations.
e) You are in need of some computer hardware parts. Prepare a letter placing order to the supplier. Specify the terms and conditions of purchase.

Seat No.		Set	R

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Which of these is not an element of non-verbal communication?
a) Personal appearance b) Posture
c) Eye contact d) Name of the speaker

2) Telephonic conversation is a form of: _____
a) verbal communication b) non-verbal communication
c) visual communication d) Written

3) To give a good presentation, full rehearsal is: _____
a) Optional b) Necessary
c) Useless d) Audience based

4) Which of the following is not an advantage of oral presentation?
a) Flexibility b) Scope for body language
c) Expensive d) Time-saving

5) In communication, _____ is the person who receives and decodes the message.
a) Sender b) Receiver
c) Driver d) Cleaner

6) Which among the following is not a manmade channel of communication?
a) Telephone b) Cell phone
c) Fax d) Air

7) Communication is the part of _____ skills.
a) Rough b) Soft
c) Hard d) Short

8) Which among the following are the barriers to communication?
a) Physical b) Mechanical
c) Psychological d) All of above

9) To overcome language barrier, which of the ways should not be followed?
a) Easy and understandable words should be used.
b) Jokes should be told to the audience.
c) The language of audience should be used.
d) Non-verbal ways should be used to the extent possible.

10) Which of the following is not among 7Cs?
a) Conciseness b) Completeness
c) Clarity d) Charity

11) Posters fall under _____ communication.
a) oral b) visual
c) written d) spoken

12) On the _____ it is possible to get immediate feedback.
a) letter b) e-mail
c) fax d) telephone

13) The response to a sender's message is called as _____.
a) Reply b) Feedback
c) Answer d) None of the above

14) _____ is the soul of communication.
a) Sender b) Receiver
c) Message d) Feedback

SLR-BD-48

Seat No.	

Set R

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Three. **12**

a) Explain how communication is necessary for business.
b) What is feedback? Explain its necessity in communication.
c) Write short note on: Different channels of communication.
d) Explain language barriers to communication with the ways to overcome them.
e) Explain language as a tool of communication.

Q.3 Attempt Any Four. **16**

a) Explain seven C's of effective communication.
b) Explain various types of barriers to communication and the ways to overcome them.
c) What is oral communication? Explain its advantages.
d) Explain various steps in the process of communication.
e) What is written communication? Explain its benefits.

Section – II

Q.4 Attempt Any Three. **12**

a) Explain the difference between formal and informal communication.
b) Explain vertical communication with its types.
c) Explain farewell speech by the departing person, with an example
d) Explain the speech for vote of thanks, with an example.
e) Write short note on: Non- verbal aspects of presentation.

Q.5 Attempt Any Four. **16**

a) Explain the structure of a business letter with its various components.
b) Explain the steps in the process of presentation.
c) You had purchased some furniture items from a vendor. Afterwards you found that the furniture items are in a damaged condition. Write a letter of complaint and ask for replacement.
d) Explain four P's of effective presentations.
e) You are in need of some computer hardware parts. Prepare a letter placing order to the supplier. Specify the terms and conditions of purchase.

Seat No.		Set	S

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) Which of the following is not among 7Cs?
a) Conciseness b) Completeness
c) Clarity d) Charity

2) Posters fall under _____ communication.
a) oral b) visual
c) written d) spoken

3) On the _____ it is possible to get immediate feedback.
a) letter b) e-mail
c) fax d) telephone

4) The response to a sender's message is called as _____.
a) Reply b) Feedback
c) Answer d) None of the above

5) _____ is the soul of communication.
a) Sender b) Receiver
c) Message d) Feedback

6) Which of these is not an element of non-verbal communication?
a) Personal appearance b) Posture
c) Eye contact d) Name of the speaker

7) Telephonic conversation is a form of: _____
a) verbal communication b) non-verbal communication
c) visual communication d) Written

8) To give a good presentation, full rehearsal is: _____
a) Optional b) Necessary
c) Useless d) Audience based

9) Which of the following is not an advantage of oral presentation?
a) Flexibility b) Scope for body language
c) Expensive d) Time-saving

10) In communication, _____ is the person who receives and decodes the message.
a) Sender b) Receiver
c) Driver d) Cleaner

11) Which among the following is not a manmade channel of communication?
a) Telephone b) Cell phone
c) Fax d) Air

12) Communication is the part of _____ skills.
a) Rough b) Soft
c) Hard d) Short

13) Which among the following are the barriers to communication?
a) Physical b) Mechanical
c) Psychological d) All of above

14) To overcome language barrier, which of the ways should not be followed?
a) Easy and understandable words should be used.
b) Jokes should be told to the audience.
c) The language of audience should be used.
d) Non-verbal ways should be used to the extent possible.

SLR-BD-48

Seat No.		Set	S

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Three. **12**

a) Explain how communication is necessary for business.
b) What is feedback? Explain its necessity in communication.
c) Write short note on: Different channels of communication.
d) Explain language barriers to communication with the ways to overcome them.
e) Explain language as a tool of communication.

Q.3 Attempt Any Four. **16**

a) Explain seven C's of effective communication.
b) Explain various types of barriers to communication and the ways to overcome them.
c) What is oral communication? Explain its advantages.
d) Explain various steps in the process of communication.
e) What is written communication? Explain its benefits.

Section – II

Q.4 Attempt Any Three. **12**

a) Explain the difference between formal and informal communication.
b) Explain vertical communication with its types.
c) Explain farewell speech by the departing person, with an example
d) Explain the speech for vote of thanks, with an example.
e) Write short note on: Non- verbal aspects of presentation.

Q.5 Attempt Any Four. **16**

a) Explain the structure of a business letter with its various components.
b) Explain the steps in the process of presentation.
c) You had purchased some furniture items from a vendor. Afterwards you found that the furniture items are in a damaged condition. Write a letter of complaint and ask for replacement.
d) Explain four P's of effective presentations.
e) You are in need of some computer hardware parts. Prepare a letter placing order to the supplier. Specify the terms and conditions of purchase.

SLR-BD-49

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) An entrepreneur is best described as: _____.
a) A manager b) A risk taker
c) A consumer d) A government official

2) Innovation contributes to the economy by: _____.
a) Creating jobs and new markets
b) Limiting technological growth
c) Increasing taxes only
d) Promoting monopolies

3) The entrepreneurial journey begins with: _____.
a) Launching a website b) Registering a business
c) Idea generation d) Finding a supplier

4) Which of the following is not a leadership theory?
a) Trait theory b) Behavioral theory
c) Structure theory d) Contingency theory

5) A flat organizational structure is characterized by: _____.
a) Many layers of management
b) Centralized control
c) Few hierarchical levels
d) Complex chains of command

6) Agile project management is suitable for: _____.
a) Static and unchanging projects
b) Innovative and dynamic projects
c) Government tenders
d) Predictable production

7) Seed funding refers to: _____.
a) Investment after IPO
b) Government pension schemes
c) Early-stage capital for startups
d) Tax planning

8) Risk management includes: _____.
a) Ignoring failures
b) Avoiding innovation
c) Identifying, assessing, and mitigating risks
d) Hiring friends only

9) Guerrilla marketing is characterized by: _____.
a) Large budget campaigns
b) Expensive celebrity endorsements
c) Creative and unconventional promotion
d) Full-page newspaper ads

10) Retention in customer relationship means: _____.
a) Losing customers quickly b) Maintaining customer loyalty
c) Cold calling d) Increasing prices suddenly

11) Cash flow refers to: _____.
a) Money spent on marketing b) Total debts incurred
c) Inflow and outflow of cash d) Discounts offered to customers

12) Burn rate is: _____.
a) Speed of market entry b) Rate of cash consumption
c) Value of sales revenue d) None of the above

13) Scaling a startup means: _____.
a) Downsizing workforce
b) Reducing marketing spend
c) Growing operations to handle more demand
d) Launching fewer products

14) Sustainable entrepreneurship includes: _____.
a) Ignoring social impact
b) Maximizing profits only
c) Balancing profit with environmental/social goals
d) Selling only eco-friendly products

SLR-BD-49

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

Section – I

Q.2 All questions are compulsory

a)	Define "Enterprise," "Entrepreneur," and "Innovation." Explain how they are interrelated in business development.	**06**
b)	Explain the key theories of entrepreneurship (economic, psychological, and sociological).	**04**

Q.3 Solve any three questions.

a)	Discuss current trends in innovation and entrepreneurship.	**06**
b)	Describe different types of businesses and entrepreneurship.	**06**
c)	Explain the entrepreneurial journey with its key steps.	**06**
d)	What are the challenges in innovation and how can they be overcome?	**06**
e)	Explain the impact of organizational structure on company performance.	**06**

Section – II

Q.4 All questions are compulsory

a)	Explain budgeting and funding sources for innovation projects.	**06**
b)	What is calculated risk? How is it different from general risk-taking?	**04**

Q.5 Solve any three questions.

a)	Describe guerrilla marketing with a real-life example.	**06**
b)	Explain customer acquisition, retention, and repetition with examples.	**06**
c)	Define cash flow and burn rate. Why are they critical for a startup?	**06**
d)	Discuss sustainable entrepreneurship practices.	**06**
e)	What are scaling-up strategies? How do startups expand?	**06**

SLR-BD-49

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Risk management includes: _____.
a) Ignoring failures
b) Avoiding innovation
c) Identifying, assessing, and mitigating risks
d) Hiring friends only

2) Guerrilla marketing is characterized by: _____.
a) Large budget campaigns
b) Expensive celebrity endorsements
c) Creative and unconventional promotion
d) Full-page newspaper ads

3) Retention in customer relationship means: _____.
a) Losing customers quickly b) Maintaining customer loyalty
c) Cold calling d) Increasing prices suddenly

4) Cash flow refers to: _____.
a) Money spent on marketing b) Total debts incurred
c) Inflow and outflow of cash d) Discounts offered to customers

5) Burn rate is: _____.
a) Speed of market entry b) Rate of cash consumption
c) Value of sales revenue d) None of the above

6) Scaling a startup means: _____.
a) Downsizing workforce
b) Reducing marketing spend
c) Growing operations to handle more demand
d) Launching fewer products

7) Sustainable entrepreneurship includes: _____.
a) Ignoring social impact
b) Maximizing profits only
c) Balancing profit with environmental/social goals
d) Selling only eco-friendly products

8) An entrepreneur is best described as: _____.
a) A manager
b) A risk taker
c) A consumer
d) A government official

9) Innovation contributes to the economy by: _____.
a) Creating jobs and new markets
b) Limiting technological growth
c) Increasing taxes only
d) Promoting monopolies

10) The entrepreneurial journey begins with: _____.
a) Launching a website
b) Registering a business
c) Idea generation
d) Finding a supplier

11) Which of the following is not a leadership theory?
a) Trait theory
b) Behavioral theory
c) Structure theory
d) Contingency theory

12) A flat organizational structure is characterized by: _____.
a) Many layers of management
b) Centralized control
c) Few hierarchical levels
d) Complex chains of command

13) Agile project management is suitable for: _____.
a) Static and unchanging projects
b) Innovative and dynamic projects
c) Government tenders
d) Predictable production

14) Seed funding refers to: _____.
a) Investment after IPO
b) Government pension schemes
c) Early-stage capital for startups
d) Tax planning

SLR-BD-49

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

Section – I

Q.2 All questions are compulsory

a)	Define "Enterprise," "Entrepreneur," and "Innovation." Explain how they are interrelated in business development.	**06**
b)	Explain the key theories of entrepreneurship (economic, psychological, and sociological).	**04**

Q.3 Solve any three questions.

a)	Discuss current trends in innovation and entrepreneurship.	**06**
b)	Describe different types of businesses and entrepreneurship.	**06**
c)	Explain the entrepreneurial journey with its key steps.	**06**
d)	What are the challenges in innovation and how can they be overcome?	**06**
e)	Explain the impact of organizational structure on company performance.	**06**

Section – II

Q.4 All questions are compulsory

a)	Explain budgeting and funding sources for innovation projects.	**06**
b)	What is calculated risk? How is it different from general risk-taking?	**04**

Q.5 Solve any three questions.

a)	Describe guerrilla marketing with a real-life example.	**06**
b)	Explain customer acquisition, retention, and repetition with examples.	**06**
c)	Define cash flow and burn rate. Why are they critical for a startup?	**06**
d)	Discuss sustainable entrepreneurship practices.	**06**
e)	What are scaling-up strategies? How do startups expand?	**06**

SLR-BD-49

Seat No.	

Set R

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Cash flow refers to: _____.
a) Money spent on marketing b) Total debts incurred
c) Inflow and outflow of cash d) Discounts offered to customers

2) Burn rate is: _____.
a) Speed of market entry b) Rate of cash consumption
c) Value of sales revenue d) None of the above

3) Scaling a startup means: _____.
a) Downsizing workforce
b) Reducing marketing spend
c) Growing operations to handle more demand
d) Launching fewer products

4) Sustainable entrepreneurship includes: _____.
a) Ignoring social impact
b) Maximizing profits only
c) Balancing profit with environmental/social goals
d) Selling only eco-friendly products

5) An entrepreneur is best described as: _____.
a) A manager b) A risk taker
c) A consumer d) A government official

6) Innovation contributes to the economy by: _____.
a) Creating jobs and new markets
b) Limiting technological growth
c) Increasing taxes only
d) Promoting monopolies

7) The entrepreneurial journey begins with: _____.
a) Launching a website b) Registering a business
c) Idea generation d) Finding a supplier

8) Which of the following is not a leadership theory?
a) Trait theory b) Behavioral theory
c) Structure theory d) Contingency theory

9) A flat organizational structure is characterized by: _____.
a) Many layers of management
b) Centralized control
c) Few hierarchical levels
d) Complex chains of command

10) Agile project management is suitable for: _____.
a) Static and unchanging projects
b) Innovative and dynamic projects
c) Government tenders
d) Predictable production

11) Seed funding refers to: _____.
a) Investment after IPO
b) Government pension schemes
c) Early-stage capital for startups
d) Tax planning

12) Risk management includes: _____.
a) Ignoring failures
b) Avoiding innovation
c) Identifying, assessing, and mitigating risks
d) Hiring friends only

13) Guerrilla marketing is characterized by: _____.
a) Large budget campaigns
b) Expensive celebrity endorsements
c) Creative and unconventional promotion
d) Full-page newspaper ads

14) Retention in customer relationship means: _____.
a) Losing customers quickly b) Maintaining customer loyalty
c) Cold calling d) Increasing prices suddenly

SLR-BD-49

Seat No.	

Set R

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

Section – I

Q.2 All questions are compulsory

a)	Define "Enterprise," "Entrepreneur," and "Innovation." Explain how they are interrelated in business development.	**06**
b)	Explain the key theories of entrepreneurship (economic, psychological, and sociological).	**04**

Q.3 Solve any three questions.

a)	Discuss current trends in innovation and entrepreneurship.	**06**
b)	Describe different types of businesses and entrepreneurship.	**06**
c)	Explain the entrepreneurial journey with its key steps.	**06**
d)	What are the challenges in innovation and how can they be overcome?	**06**
e)	Explain the impact of organizational structure on company performance.	**06**

Section – II

Q.4 All questions are compulsory

a)	Explain budgeting and funding sources for innovation projects.	**06**
b)	What is calculated risk? How is it different from general risk-taking?	**04**

Q.5 Solve any three questions.

a)	Describe guerrilla marketing with a real-life example.	**06**
b)	Explain customer acquisition, retention, and repetition with examples.	**06**
c)	Define cash flow and burn rate. Why are they critical for a startup?	**06**
d)	Discuss sustainable entrepreneurship practices.	**06**
e)	What are scaling-up strategies? How do startups expand?	**06**

SLR-BD-49

Seat No.	

Set S

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Agile project management is suitable for: _____.
a) Static and unchanging projects
b) Innovative and dynamic projects
c) Government tenders
d) Predictable production

2) Seed funding refers to: _____.
a) Investment after IPO
b) Government pension schemes
c) Early-stage capital for startups
d) Tax planning

3) Risk management includes: _____.
a) Ignoring failures
b) Avoiding innovation
c) Identifying, assessing, and mitigating risks
d) Hiring friends only

4) Guerrilla marketing is characterized by: _____.
a) Large budget campaigns
b) Expensive celebrity endorsements
c) Creative and unconventional promotion
d) Full-page newspaper ads

5) Retention in customer relationship means: _____.
a) Losing customers quickly b) Maintaining customer loyalty
c) Cold calling d) Increasing prices suddenly

6) Cash flow refers to: _____.
a) Money spent on marketing
b) Total debts incurred
c) Inflow and outflow of cash
d) Discounts offered to customers

7) Burn rate is: _____.
a) Speed of market entry
b) Rate of cash consumption
c) Value of sales revenue
d) None of the above

8) Scaling a startup means: _____.
a) Downsizing workforce
b) Reducing marketing spend
c) Growing operations to handle more demand
d) Launching fewer products

9) Sustainable entrepreneurship includes: _____.
a) Ignoring social impact
b) Maximizing profits only
c) Balancing profit with environmental/social goals
d) Selling only eco-friendly products

10) An entrepreneur is best described as: _____.
a) A manager
b) A risk taker
c) A consumer
d) A government official

11) Innovation contributes to the economy by: _____.
a) Creating jobs and new markets
b) Limiting technological growth
c) Increasing taxes only
d) Promoting monopolies

12) The entrepreneurial journey begins with: _____.
a) Launching a website
b) Registering a business
c) Idea generation
d) Finding a supplier

13) Which of the following is not a leadership theory?
a) Trait theory
b) Behavioral theory
c) Structure theory
d) Contingency theory

14) A flat organizational structure is characterized by: _____.
a) Many layers of management
b) Centralized control
c) Few hierarchical levels
d) Complex chains of command

SLR-BD-49

Seat No.		Set	S

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

Section – I

Q.2 All questions are compulsory

a)	Define "Enterprise," "Entrepreneur," and "Innovation." Explain how they are interrelated in business development.	**06**
b)	Explain the key theories of entrepreneurship (economic, psychological, and sociological).	**04**

Q.3 Solve any three questions.

a)	Discuss current trends in innovation and entrepreneurship.	**06**
b)	Describe different types of businesses and entrepreneurship.	**06**
c)	Explain the entrepreneurial journey with its key steps.	**06**
d)	What are the challenges in innovation and how can they be overcome?	**06**
e)	Explain the impact of organizational structure on company performance.	**06**

Section – II

Q.4 All questions are compulsory

a)	Explain budgeting and funding sources for innovation projects.	**06**
b)	What is calculated risk? How is it different from general risk-taking?	**04**

Q.5 Solve any three questions.

a)	Describe guerrilla marketing with a real-life example.	**06**
b)	Explain customer acquisition, retention, and repetition with examples.	**06**
c)	Define cash flow and burn rate. Why are they critical for a startup?	**06**
d)	Discuss sustainable entrepreneurship practices.	**06**
e)	What are scaling-up strategies? How do startups expand?	**06**

SLR-BD-49

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) An entrepreneur is best described as: _____.
a) A manager b) A risk taker
c) A consumer d) A government official

2) Innovation contributes to the economy by: _____.
a) Creating jobs and new markets
b) Limiting technological growth
c) Increasing taxes only
d) Promoting monopolies

3) The entrepreneurial journey begins with: _____.
a) Launching a website b) Registering a business
c) Idea generation d) Finding a supplier

4) Which of the following is not a leadership theory?
a) Trait theory b) Behavioral theory
c) Structure theory d) Contingency theory

5) A flat organizational structure is characterized by: _____.
a) Many layers of management
b) Centralized control
c) Few hierarchical levels
d) Complex chains of command

6) Agile project management is suitable for: _____.
a) Static and unchanging projects
b) Innovative and dynamic projects
c) Government tenders
d) Predictable production

7) Seed funding refers to: _____.
a) Investment after IPO
b) Government pension schemes
c) Early-stage capital for startups
d) Tax planning

8) Risk management includes: _____.
a) Ignoring failures
b) Avoiding innovation
c) Identifying, assessing, and mitigating risks
d) Hiring friends only

9) Guerrilla marketing is characterized by: _____.
a) Large budget campaigns
b) Expensive celebrity endorsements
c) Creative and unconventional promotion
d) Full-page newspaper ads

10) Retention in customer relationship means: _____.
a) Losing customers quickly
b) Maintaining customer loyalty
c) Cold calling
d) Increasing prices suddenly

11) Cash flow refers to: _____.
a) Money spent on marketing
b) Total debts incurred
c) Inflow and outflow of cash
d) Discounts offered to customers

12) Burn rate is: _____.
a) Speed of market entry
b) Rate of cash consumption
c) Value of sales revenue
d) None of the above

13) Scaling a startup means: _____.
a) Downsizing workforce
b) Reducing marketing spend
c) Growing operations to handle more demand
d) Launching fewer products

14) Sustainable entrepreneurship includes: _____.
a) Ignoring social impact
b) Maximizing profits only
c) Balancing profit with environmental/social goals
d) Selling only eco-friendly products

SLR-BD-49

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

Section – I

Q.2 All questions are compulsory

a)	Define "Enterprise," "Entrepreneur," and "Innovation." Explain how they are interrelated in business development.	**06**
b)	Explain the key theories of entrepreneurship (economic, psychological, and sociological).	**04**

Q.3 Solve any three questions.

a)	Discuss current trends in innovation and entrepreneurship.	**06**
b)	Describe different types of businesses and entrepreneurship.	**06**
c)	Explain the entrepreneurial journey with its key steps.	**06**
d)	What are the challenges in innovation and how can they be overcome?	**06**
e)	Explain the impact of organizational structure on company performance.	**06**

Section – II

Q.4 All questions are compulsory

a)	Explain budgeting and funding sources for innovation projects.	**06**
b)	What is calculated risk? How is it different from general risk-taking?	**04**

Q.5 Solve any three questions.

a)	Describe guerrilla marketing with a real-life example.	**06**
b)	Explain customer acquisition, retention, and repetition with examples.	**06**
c)	Define cash flow and burn rate. Why are they critical for a startup?	**06**
d)	Discuss sustainable entrepreneurship practices.	**06**
e)	What are scaling-up strategies? How do startups expand?	**06**

SLR-BD-49

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Risk management includes: _____.
a) Ignoring failures
b) Avoiding innovation
c) Identifying, assessing, and mitigating risks
d) Hiring friends only

2) Guerrilla marketing is characterized by: _____.
a) Large budget campaigns
b) Expensive celebrity endorsements
c) Creative and unconventional promotion
d) Full-page newspaper ads

3) Retention in customer relationship means: _____.
a) Losing customers quickly b) Maintaining customer loyalty
c) Cold calling d) Increasing prices suddenly

4) Cash flow refers to: _____.
a) Money spent on marketing b) Total debts incurred
c) Inflow and outflow of cash d) Discounts offered to customers

5) Burn rate is: _____.
a) Speed of market entry b) Rate of cash consumption
c) Value of sales revenue d) None of the above

6) Scaling a startup means: _____.
a) Downsizing workforce
b) Reducing marketing spend
c) Growing operations to handle more demand
d) Launching fewer products

7) Sustainable entrepreneurship includes: _____.
a) Ignoring social impact
b) Maximizing profits only
c) Balancing profit with environmental/social goals
d) Selling only eco-friendly products

8) An entrepreneur is best described as: _____.
a) A manager
b) A risk taker
c) A consumer
d) A government official

9) Innovation contributes to the economy by: _____.
a) Creating jobs and new markets
b) Limiting technological growth
c) Increasing taxes only
d) Promoting monopolies

10) The entrepreneurial journey begins with: _____.
a) Launching a website
b) Registering a business
c) Idea generation
d) Finding a supplier

11) Which of the following is not a leadership theory?
a) Trait theory
b) Behavioral theory
c) Structure theory
d) Contingency theory

12) A flat organizational structure is characterized by: _____.
a) Many layers of management
b) Centralized control
c) Few hierarchical levels
d) Complex chains of command

13) Agile project management is suitable for: _____.
a) Static and unchanging projects
b) Innovative and dynamic projects
c) Government tenders
d) Predictable production

14) Seed funding refers to: _____.
a) Investment after IPO
b) Government pension schemes
c) Early-stage capital for startups
d) Tax planning

SLR-BD-49

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

Section – I

Q.2 All questions are compulsory

a)	Define "Enterprise," "Entrepreneur," and "Innovation." Explain how they are interrelated in business development.	**06**
b)	Explain the key theories of entrepreneurship (economic, psychological, and sociological).	**04**

Q.3 Solve any three questions.

a)	Discuss current trends in innovation and entrepreneurship.	**06**
b)	Describe different types of businesses and entrepreneurship.	**06**
c)	Explain the entrepreneurial journey with its key steps.	**06**
d)	What are the challenges in innovation and how can they be overcome?	**06**
e)	Explain the impact of organizational structure on company performance.	**06**

Section – II

Q.4 All questions are compulsory

a)	Explain budgeting and funding sources for innovation projects.	**06**
b)	What is calculated risk? How is it different from general risk-taking?	**04**

Q.5 Solve any three questions.

a)	Describe guerrilla marketing with a real-life example.	**06**
b)	Explain customer acquisition, retention, and repetition with examples.	**06**
c)	Define cash flow and burn rate. Why are they critical for a startup?	**06**
d)	Discuss sustainable entrepreneurship practices.	**06**
e)	What are scaling-up strategies? How do startups expand?	**06**

SLR-BD-49

Seat No.	

Set R

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Cash flow refers to: _____.
a) Money spent on marketing b) Total debts incurred
c) Inflow and outflow of cash d) Discounts offered to customers

2) Burn rate is: _____.
a) Speed of market entry b) Rate of cash consumption
c) Value of sales revenue d) None of the above

3) Scaling a startup means: _____.
a) Downsizing workforce
b) Reducing marketing spend
c) Growing operations to handle more demand
d) Launching fewer products

4) Sustainable entrepreneurship includes: _____.
a) Ignoring social impact
b) Maximizing profits only
c) Balancing profit with environmental/social goals
d) Selling only eco-friendly products

5) An entrepreneur is best described as: _____.
a) A manager b) A risk taker
c) A consumer d) A government official

6) Innovation contributes to the economy by: _____.
a) Creating jobs and new markets
b) Limiting technological growth
c) Increasing taxes only
d) Promoting monopolies

7) The entrepreneurial journey begins with: _____.
a) Launching a website b) Registering a business
c) Idea generation d) Finding a supplier

8) Which of the following is not a leadership theory?
a) Trait theory b) Behavioral theory
c) Structure theory d) Contingency theory

9) A flat organizational structure is characterized by: _____.
a) Many layers of management
b) Centralized control
c) Few hierarchical levels
d) Complex chains of command

10) Agile project management is suitable for: _____.
a) Static and unchanging projects
b) Innovative and dynamic projects
c) Government tenders
d) Predictable production

11) Seed funding refers to: _____.
a) Investment after IPO
b) Government pension schemes
c) Early-stage capital for startups
d) Tax planning

12) Risk management includes: _____.
a) Ignoring failures
b) Avoiding innovation
c) Identifying, assessing, and mitigating risks
d) Hiring friends only

13) Guerrilla marketing is characterized by: _____.
a) Large budget campaigns
b) Expensive celebrity endorsements
c) Creative and unconventional promotion
d) Full-page newspaper ads

14) Retention in customer relationship means: _____.
a) Losing customers quickly b) Maintaining customer loyalty
c) Cold calling d) Increasing prices suddenly

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

Section – I

Q.2 All questions are compulsory

a)	Define "Enterprise," "Entrepreneur," and "Innovation." Explain how they are interrelated in business development.	**06**
b)	Explain the key theories of entrepreneurship (economic, psychological, and sociological).	**04**

Q.3 Solve any three questions.

a)	Discuss current trends in innovation and entrepreneurship.	**06**
b)	Describe different types of businesses and entrepreneurship.	**06**
c)	Explain the entrepreneurial journey with its key steps.	**06**
d)	What are the challenges in innovation and how can they be overcome?	**06**
e)	Explain the impact of organizational structure on company performance.	**06**

Section – II

Q.4 All questions are compulsory

a)	Explain budgeting and funding sources for innovation projects.	**06**
b)	What is calculated risk? How is it different from general risk-taking?	**04**

Q.5 Solve any three questions.

a)	Describe guerrilla marketing with a real-life example.	**06**
b)	Explain customer acquisition, retention, and repetition with examples.	**06**
c)	Define cash flow and burn rate. Why are they critical for a startup?	**06**
d)	Discuss sustainable entrepreneurship practices.	**06**
e)	What are scaling-up strategies? How do startups expand?	**06**

SLR-BD-49

Seat No.	

Set S

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Agile project management is suitable for: _____.
a) Static and unchanging projects
b) Innovative and dynamic projects
c) Government tenders
d) Predictable production

2) Seed funding refers to: _____.
a) Investment after IPO
b) Government pension schemes
c) Early-stage capital for startups
d) Tax planning

3) Risk management includes: _____.
a) Ignoring failures
b) Avoiding innovation
c) Identifying, assessing, and mitigating risks
d) Hiring friends only

4) Guerrilla marketing is characterized by: _____.
a) Large budget campaigns
b) Expensive celebrity endorsements
c) Creative and unconventional promotion
d) Full-page newspaper ads

5) Retention in customer relationship means: _____.
a) Losing customers quickly b) Maintaining customer loyalty
c) Cold calling d) Increasing prices suddenly

6) Cash flow refers to: _____.
a) Money spent on marketing
b) Total debts incurred
c) Inflow and outflow of cash
d) Discounts offered to customers

7) Burn rate is: _____.
a) Speed of market entry
b) Rate of cash consumption
c) Value of sales revenue
d) None of the above

8) Scaling a startup means: _____.
a) Downsizing workforce
b) Reducing marketing spend
c) Growing operations to handle more demand
d) Launching fewer products

9) Sustainable entrepreneurship includes: _____.
a) Ignoring social impact
b) Maximizing profits only
c) Balancing profit with environmental/social goals
d) Selling only eco-friendly products

10) An entrepreneur is best described as: _____.
a) A manager
b) A risk taker
c) A consumer
d) A government official

11) Innovation contributes to the economy by: _____.
a) Creating jobs and new markets
b) Limiting technological growth
c) Increasing taxes only
d) Promoting monopolies

12) The entrepreneurial journey begins with: _____.
a) Launching a website
b) Registering a business
c) Idea generation
d) Finding a supplier

13) Which of the following is not a leadership theory?
a) Trait theory
b) Behavioral theory
c) Structure theory
d) Contingency theory

14) A flat organizational structure is characterized by: _____.
a) Many layers of management
b) Centralized control
c) Few hierarchical levels
d) Complex chains of command

SLR-BD-49

Seat No.		Set	S

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

Section – I

Q.2 All questions are compulsory

a)	Define "Enterprise," "Entrepreneur," and "Innovation." Explain how they are interrelated in business development.	**06**
b)	Explain the key theories of entrepreneurship (economic, psychological, and sociological).	**04**

Q.3 Solve any three questions.

a)	Discuss current trends in innovation and entrepreneurship.	**06**
b)	Describe different types of businesses and entrepreneurship.	**06**
c)	Explain the entrepreneurial journey with its key steps.	**06**
d)	What are the challenges in innovation and how can they be overcome?	**06**
e)	Explain the impact of organizational structure on company performance.	**06**

Section – II

Q.4 All questions are compulsory

a)	Explain budgeting and funding sources for innovation projects.	**06**
b)	What is calculated risk? How is it different from general risk-taking?	**04**

Q.5 Solve any three questions.

a)	Describe guerrilla marketing with a real-life example.	**06**
b)	Explain customer acquisition, retention, and repetition with examples.	**06**
c)	Define cash flow and burn rate. Why are they critical for a startup?	**06**
d)	Discuss sustainable entrepreneurship practices.	**06**
e)	What are scaling-up strategies? How do startups expand?	**06**

SLR-BD-49

Seat No.	

Set P

S.Y. (B.Tech.)(Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) An entrepreneur is best described as: _____.
a) A manager b) A risk taker
c) A consumer d) A government official

2) Innovation contributes to the economy by: _____.
a) Creating jobs and new markets
b) Limiting technological growth
c) Increasing taxes only
d) Promoting monopolies

3) The entrepreneurial journey begins with: _____.
a) Launching a website b) Registering a business
c) Idea generation d) Finding a supplier

4) Which of the following is not a leadership theory?
a) Trait theory b) Behavioral theory
c) Structure theory d) Contingency theory

5) A flat organizational structure is characterized by: _____.
a) Many layers of management
b) Centralized control
c) Few hierarchical levels
d) Complex chains of command

6) Agile project management is suitable for: _____.
a) Static and unchanging projects
b) Innovative and dynamic projects
c) Government tenders
d) Predictable production

7) Seed funding refers to: _____.
a) Investment after IPO
b) Government pension schemes
c) Early-stage capital for startups
d) Tax planning

8) Risk management includes: _____.
a) Ignoring failures
b) Avoiding innovation
c) Identifying, assessing, and mitigating risks
d) Hiring friends only

9) Guerrilla marketing is characterized by: _____.
a) Large budget campaigns
b) Expensive celebrity endorsements
c) Creative and unconventional promotion
d) Full-page newspaper ads

10) Retention in customer relationship means: _____.
a) Losing customers quickly
b) Maintaining customer loyalty
c) Cold calling
d) Increasing prices suddenly

11) Cash flow refers to: _____.
a) Money spent on marketing
b) Total debts incurred
c) Inflow and outflow of cash
d) Discounts offered to customers

12) Burn rate is: _____.
a) Speed of market entry
b) Rate of cash consumption
c) Value of sales revenue
d) None of the above

13) Scaling a startup means: _____.
a) Downsizing workforce
b) Reducing marketing spend
c) Growing operations to handle more demand
d) Launching fewer products

14) Sustainable entrepreneurship includes: _____.
a) Ignoring social impact
b) Maximizing profits only
c) Balancing profit with environmental/social goals
d) Selling only eco-friendly products

SLR-BD-49

Seat No.	

Set P

S.Y. (B.Tech.)(Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

Section – I

Q.2 All questions are compulsory

a)	Define "Enterprise," "Entrepreneur," and "Innovation." Explain how they are interrelated in business development.	**06**
b)	Explain the key theories of entrepreneurship (economic, psychological, and sociological).	**04**

Q.3 Solve any three questions.

a)	Discuss current trends in innovation and entrepreneurship.	**06**
b)	Describe different types of businesses and entrepreneurship.	**06**
c)	Explain the entrepreneurial journey with its key steps.	**06**
d)	What are the challenges in innovation and how can they be overcome?	**06**
e)	Explain the impact of organizational structure on company performance.	**06**

Section – II

Q.4 All questions are compulsory

a)	Explain budgeting and funding sources for innovation projects.	**06**
b)	What is calculated risk? How is it different from general risk-taking?	**04**

Q.5 Solve any three questions.

a)	Describe guerrilla marketing with a real-life example.	**06**
b)	Explain customer acquisition, retention, and repetition with examples.	**06**
c)	Define cash flow and burn rate. Why are they critical for a startup?	**06**
d)	Discuss sustainable entrepreneurship practices.	**06**
e)	What are scaling-up strategies? How do startups expand?	**06**

SLR-BD-49

Seat No.	

Set Q

S.Y. (B.Tech.)(Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Risk management includes: _____.
a) Ignoring failures
b) Avoiding innovation
c) Identifying, assessing, and mitigating risks
d) Hiring friends only

2) Guerrilla marketing is characterized by: _____.
a) Large budget campaigns
b) Expensive celebrity endorsements
c) Creative and unconventional promotion
d) Full-page newspaper ads

3) Retention in customer relationship means: _____.
a) Losing customers quickly b) Maintaining customer loyalty
c) Cold calling d) Increasing prices suddenly

4) Cash flow refers to: _____.
a) Money spent on marketing b) Total debts incurred
c) Inflow and outflow of cash d) Discounts offered to customers

5) Burn rate is: _____.
a) Speed of market entry b) Rate of cash consumption
c) Value of sales revenue d) None of the above

6) Scaling a startup means: _____.
a) Downsizing workforce
b) Reducing marketing spend
c) Growing operations to handle more demand
d) Launching fewer products

7) Sustainable entrepreneurship includes: _____.
a) Ignoring social impact
b) Maximizing profits only
c) Balancing profit with environmental/social goals
d) Selling only eco-friendly products

8) An entrepreneur is best described as: _____.
a) A manager
b) A risk taker
c) A consumer
d) A government official

9) Innovation contributes to the economy by: _____.
a) Creating jobs and new markets
b) Limiting technological growth
c) Increasing taxes only
d) Promoting monopolies

10) The entrepreneurial journey begins with: _____.
a) Launching a website
b) Registering a business
c) Idea generation
d) Finding a supplier

11) Which of the following is not a leadership theory?
a) Trait theory
b) Behavioral theory
c) Structure theory
d) Contingency theory

12) A flat organizational structure is characterized by: _____.
a) Many layers of management
b) Centralized control
c) Few hierarchical levels
d) Complex chains of command

13) Agile project management is suitable for: _____.
a) Static and unchanging projects
b) Innovative and dynamic projects
c) Government tenders
d) Predictable production

14) Seed funding refers to: _____.
a) Investment after IPO
b) Government pension schemes
c) Early-stage capital for startups
d) Tax planning

SLR-BD-49

Seat No.	

Set Q

S.Y. (B.Tech.)(Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

Section – I

Q.2 All questions are compulsory

a)	Define "Enterprise," "Entrepreneur," and "Innovation." Explain how they are interrelated in business development.	**06**
b)	Explain the key theories of entrepreneurship (economic, psychological, and sociological).	**04**

Q.3 Solve any three questions.

a)	Discuss current trends in innovation and entrepreneurship.	**06**
b)	Describe different types of businesses and entrepreneurship.	**06**
c)	Explain the entrepreneurial journey with its key steps.	**06**
d)	What are the challenges in innovation and how can they be overcome?	**06**
e)	Explain the impact of organizational structure on company performance.	**06**

Section – II

Q.4 All questions are compulsory

a)	Explain budgeting and funding sources for innovation projects.	**06**
b)	What is calculated risk? How is it different from general risk-taking?	**04**

Q.5 Solve any three questions.

a)	Describe guerrilla marketing with a real-life example.	**06**
b)	Explain customer acquisition, retention, and repetition with examples.	**06**
c)	Define cash flow and burn rate. Why are they critical for a startup?	**06**
d)	Discuss sustainable entrepreneurship practices.	**06**
e)	What are scaling-up strategies? How do startups expand?	**06**

Seat No.	

Set **R**

S.Y. (B.Tech.)(Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Cash flow refers to: _____.
a) Money spent on marketing b) Total debts incurred
c) Inflow and outflow of cash d) Discounts offered to customers

2) Burn rate is: _____.
a) Speed of market entry b) Rate of cash consumption
c) Value of sales revenue d) None of the above

3) Scaling a startup means: _____.
a) Downsizing workforce
b) Reducing marketing spend
c) Growing operations to handle more demand
d) Launching fewer products

4) Sustainable entrepreneurship includes: _____.
a) Ignoring social impact
b) Maximizing profits only
c) Balancing profit with environmental/social goals
d) Selling only eco-friendly products

5) An entrepreneur is best described as: _____.
a) A manager b) A risk taker
c) A consumer d) A government official

6) Innovation contributes to the economy by: _____.
a) Creating jobs and new markets
b) Limiting technological growth
c) Increasing taxes only
d) Promoting monopolies

7) The entrepreneurial journey begins with: _____.
a) Launching a website b) Registering a business
c) Idea generation d) Finding a supplier

8) Which of the following is not a leadership theory?
a) Trait theory b) Behavioral theory
c) Structure theory d) Contingency theory

9) A flat organizational structure is characterized by: _____.
a) Many layers of management
b) Centralized control
c) Few hierarchical levels
d) Complex chains of command

10) Agile project management is suitable for: _____.
a) Static and unchanging projects
b) Innovative and dynamic projects
c) Government tenders
d) Predictable production

11) Seed funding refers to: _____.
a) Investment after IPO
b) Government pension schemes
c) Early-stage capital for startups
d) Tax planning

12) Risk management includes: _____.
a) Ignoring failures
b) Avoiding innovation
c) Identifying, assessing, and mitigating risks
d) Hiring friends only

13) Guerrilla marketing is characterized by: _____.
a) Large budget campaigns
b) Expensive celebrity endorsements
c) Creative and unconventional promotion
d) Full-page newspaper ads

14) Retention in customer relationship means: _____.
a) Losing customers quickly b) Maintaining customer loyalty
c) Cold calling d) Increasing prices suddenly

SLR-BD-49

Seat No.	

Set R

S.Y. (B.Tech.)(Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

Section – I

Q.2 All questions are compulsory

a)	Define "Enterprise," "Entrepreneur," and "Innovation." Explain how they are interrelated in business development.	**06**
b)	Explain the key theories of entrepreneurship (economic, psychological, and sociological).	**04**

Q.3 Solve any three questions.

a)	Discuss current trends in innovation and entrepreneurship.	**06**
b)	Describe different types of businesses and entrepreneurship.	**06**
c)	Explain the entrepreneurial journey with its key steps.	**06**
d)	What are the challenges in innovation and how can they be overcome?	**06**
e)	Explain the impact of organizational structure on company performance.	**06**

Section – II

Q.4 All questions are compulsory

a)	Explain budgeting and funding sources for innovation projects.	**06**
b)	What is calculated risk? How is it different from general risk-taking?	**04**

Q.5 Solve any three questions.

a)	Describe guerrilla marketing with a real-life example.	**06**
b)	Explain customer acquisition, retention, and repetition with examples.	**06**
c)	Define cash flow and burn rate. Why are they critical for a startup?	**06**
d)	Discuss sustainable entrepreneurship practices.	**06**
e)	What are scaling-up strategies? How do startups expand?	**06**

SLR-BD-49

Seat No.	

Set S

S.Y. (B.Tech.)(Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Agile project management is suitable for: _____.
a) Static and unchanging projects
b) Innovative and dynamic projects
c) Government tenders
d) Predictable production

2) Seed funding refers to: _____.
a) Investment after IPO
b) Government pension schemes
c) Early-stage capital for startups
d) Tax planning

3) Risk management includes: _____.
a) Ignoring failures
b) Avoiding innovation
c) Identifying, assessing, and mitigating risks
d) Hiring friends only

4) Guerrilla marketing is characterized by: _____.
a) Large budget campaigns
b) Expensive celebrity endorsements
c) Creative and unconventional promotion
d) Full-page newspaper ads

5) Retention in customer relationship means: _____.
a) Losing customers quickly b) Maintaining customer loyalty
c) Cold calling d) Increasing prices suddenly

6) Cash flow refers to: _____.
a) Money spent on marketing
b) Total debts incurred
c) Inflow and outflow of cash
d) Discounts offered to customers

7) Burn rate is: _____.
a) Speed of market entry
b) Rate of cash consumption
c) Value of sales revenue
d) None of the above

8) Scaling a startup means: _____.
a) Downsizing workforce
b) Reducing marketing spend
c) Growing operations to handle more demand
d) Launching fewer products

9) Sustainable entrepreneurship includes: _____.
a) Ignoring social impact
b) Maximizing profits only
c) Balancing profit with environmental/social goals
d) Selling only eco-friendly products

10) An entrepreneur is best described as: _____.
a) A manager
b) A risk taker
c) A consumer
d) A government official

11) Innovation contributes to the economy by: _____.
a) Creating jobs and new markets
b) Limiting technological growth
c) Increasing taxes only
d) Promoting monopolies

12) The entrepreneurial journey begins with: _____.
a) Launching a website
b) Registering a business
c) Idea generation
d) Finding a supplier

13) Which of the following is not a leadership theory?
a) Trait theory
b) Behavioral theory
c) Structure theory
d) Contingency theory

14) A flat organizational structure is characterized by: _____.
a) Many layers of management
b) Centralized control
c) Few hierarchical levels
d) Complex chains of command

SLR-BD-49

Seat No.		Set	S

S.Y. (B.Tech.)(Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

Section – I

Q.2 All questions are compulsory

a)	Define "Enterprise," "Entrepreneur," and "Innovation." Explain how they are interrelated in business development.	**06**
b)	Explain the key theories of entrepreneurship (economic, psychological, and sociological).	**04**

Q.3 Solve any three questions.

a)	Discuss current trends in innovation and entrepreneurship.	**06**
b)	Describe different types of businesses and entrepreneurship.	**06**
c)	Explain the entrepreneurial journey with its key steps.	**06**
d)	What are the challenges in innovation and how can they be overcome?	**06**
e)	Explain the impact of organizational structure on company performance.	**06**

Section – II

Q.4 All questions are compulsory

a)	Explain budgeting and funding sources for innovation projects.	**06**
b)	What is calculated risk? How is it different from general risk-taking?	**04**

Q.5 Solve any three questions.

a)	Describe guerrilla marketing with a real-life example.	**06**
b)	Explain customer acquisition, retention, and repetition with examples.	**06**
c)	Define cash flow and burn rate. Why are they critical for a startup?	**06**
d)	Discuss sustainable entrepreneurship practices.	**06**
e)	What are scaling-up strategies? How do startups expand?	**06**

SLR-BD-49

Seat No.	

Set P

S.Y. (B.Tech.)(Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) An entrepreneur is best described as: _____.
a) A manager b) A risk taker
c) A consumer d) A government official

2) Innovation contributes to the economy by: _____.
a) Creating jobs and new markets
b) Limiting technological growth
c) Increasing taxes only
d) Promoting monopolies

3) The entrepreneurial journey begins with: _____.
a) Launching a website b) Registering a business
c) Idea generation d) Finding a supplier

4) Which of the following is not a leadership theory?
a) Trait theory b) Behavioral theory
c) Structure theory d) Contingency theory

5) A flat organizational structure is characterized by: _____.
a) Many layers of management
b) Centralized control
c) Few hierarchical levels
d) Complex chains of command

6) Agile project management is suitable for: _____.
a) Static and unchanging projects
b) Innovative and dynamic projects
c) Government tenders
d) Predictable production

7) Seed funding refers to: _____.
a) Investment after IPO
b) Government pension schemes
c) Early-stage capital for startups
d) Tax planning

8) Risk management includes: _____.
a) Ignoring failures
b) Avoiding innovation
c) Identifying, assessing, and mitigating risks
d) Hiring friends only

9) Guerrilla marketing is characterized by: _____.
a) Large budget campaigns
b) Expensive celebrity endorsements
c) Creative and unconventional promotion
d) Full-page newspaper ads

10) Retention in customer relationship means: _____.
a) Losing customers quickly
b) Maintaining customer loyalty
c) Cold calling
d) Increasing prices suddenly

11) Cash flow refers to: _____.
a) Money spent on marketing
b) Total debts incurred
c) Inflow and outflow of cash
d) Discounts offered to customers

12) Burn rate is: _____.
a) Speed of market entry
b) Rate of cash consumption
c) Value of sales revenue
d) None of the above

13) Scaling a startup means: _____.
a) Downsizing workforce
b) Reducing marketing spend
c) Growing operations to handle more demand
d) Launching fewer products

14) Sustainable entrepreneurship includes: _____.
a) Ignoring social impact
b) Maximizing profits only
c) Balancing profit with environmental/social goals
d) Selling only eco-friendly products

SLR-BD-49

Seat No.		Set	P

S.Y. (B.Tech.)(Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

Section – I

Q.2 All questions are compulsory

a)	Define "Enterprise," "Entrepreneur," and "Innovation." Explain how they are interrelated in business development.	**06**
b)	Explain the key theories of entrepreneurship (economic, psychological, and sociological).	**04**

Q.3 Solve any three questions.

a)	Discuss current trends in innovation and entrepreneurship.	**06**
b)	Describe different types of businesses and entrepreneurship.	**06**
c)	Explain the entrepreneurial journey with its key steps.	**06**
d)	What are the challenges in innovation and how can they be overcome?	**06**
e)	Explain the impact of organizational structure on company performance.	**06**

Section – II

Q.4 All questions are compulsory

a)	Explain budgeting and funding sources for innovation projects.	**06**
b)	What is calculated risk? How is it different from general risk-taking?	**04**

Q.5 Solve any three questions.

a)	Describe guerrilla marketing with a real-life example.	**06**
b)	Explain customer acquisition, retention, and repetition with examples.	**06**
c)	Define cash flow and burn rate. Why are they critical for a startup?	**06**
d)	Discuss sustainable entrepreneurship practices.	**06**
e)	What are scaling-up strategies? How do startups expand?	**06**

Seat No.	

Set **Q**

S.Y. (B.Tech.)(Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Risk management includes: _____.
a) Ignoring failures
b) Avoiding innovation
c) Identifying, assessing, and mitigating risks
d) Hiring friends only

2) Guerrilla marketing is characterized by: _____.
a) Large budget campaigns
b) Expensive celebrity endorsements
c) Creative and unconventional promotion
d) Full-page newspaper ads

3) Retention in customer relationship means: _____.
a) Losing customers quickly b) Maintaining customer loyalty
c) Cold calling d) Increasing prices suddenly

4) Cash flow refers to: _____.
a) Money spent on marketing b) Total debts incurred
c) Inflow and outflow of cash d) Discounts offered to customers

5) Burn rate is: _____.
a) Speed of market entry b) Rate of cash consumption
c) Value of sales revenue d) None of the above

6) Scaling a startup means: _____.
a) Downsizing workforce
b) Reducing marketing spend
c) Growing operations to handle more demand
d) Launching fewer products

7) Sustainable entrepreneurship includes: _____.
a) Ignoring social impact
b) Maximizing profits only
c) Balancing profit with environmental/social goals
d) Selling only eco-friendly products

8) An entrepreneur is best described as: _____.
a) A manager
b) A risk taker
c) A consumer
d) A government official

9) Innovation contributes to the economy by: _____.
a) Creating jobs and new markets
b) Limiting technological growth
c) Increasing taxes only
d) Promoting monopolies

10) The entrepreneurial journey begins with: _____.
a) Launching a website
b) Registering a business
c) Idea generation
d) Finding a supplier

11) Which of the following is not a leadership theory?
a) Trait theory
b) Behavioral theory
c) Structure theory
d) Contingency theory

12) A flat organizational structure is characterized by: _____.
a) Many layers of management
b) Centralized control
c) Few hierarchical levels
d) Complex chains of command

13) Agile project management is suitable for: _____.
a) Static and unchanging projects
b) Innovative and dynamic projects
c) Government tenders
d) Predictable production

14) Seed funding refers to: _____.
a) Investment after IPO
b) Government pension schemes
c) Early-stage capital for startups
d) Tax planning

SLR-BD-49

Seat No.	

Set Q

S.Y. (B.Tech.)(Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

Section – I

Q.2 All questions are compulsory

a) Define "Enterprise," "Entrepreneur," and "Innovation." Explain how they are interrelated in business development. **06**

b) Explain the key theories of entrepreneurship (economic, psychological, and sociological). **04**

Q.3 Solve any three questions.

a) Discuss current trends in innovation and entrepreneurship. **06**

b) Describe different types of businesses and entrepreneurship. **06**

c) Explain the entrepreneurial journey with its key steps. **06**

d) What are the challenges in innovation and how can they be overcome? **06**

e) Explain the impact of organizational structure on company performance. **06**

Section – II

Q.4 All questions are compulsory

a) Explain budgeting and funding sources for innovation projects. **06**

b) What is calculated risk? How is it different from general risk-taking? **04**

Q.5 Solve any three questions.

a) Describe guerrilla marketing with a real-life example. **06**

b) Explain customer acquisition, retention, and repetition with examples. **06**

c) Define cash flow and burn rate. Why are they critical for a startup? **06**

d) Discuss sustainable entrepreneurship practices. **06**

e) What are scaling-up strategies? How do startups expand? **06**

Seat No.	

Set R

S.Y. (B.Tech.)(Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Cash flow refers to: _____.
a) Money spent on marketing b) Total debts incurred
c) Inflow and outflow of cash d) Discounts offered to customers

2) Burn rate is: _____.
a) Speed of market entry b) Rate of cash consumption
c) Value of sales revenue d) None of the above

3) Scaling a startup means: _____.
a) Downsizing workforce
b) Reducing marketing spend
c) Growing operations to handle more demand
d) Launching fewer products

4) Sustainable entrepreneurship includes: _____.
a) Ignoring social impact
b) Maximizing profits only
c) Balancing profit with environmental/social goals
d) Selling only eco-friendly products

5) An entrepreneur is best described as: _____.
a) A manager b) A risk taker
c) A consumer d) A government official

6) Innovation contributes to the economy by: _____.
a) Creating jobs and new markets
b) Limiting technological growth
c) Increasing taxes only
d) Promoting monopolies

7) The entrepreneurial journey begins with: _____.
a) Launching a website b) Registering a business
c) Idea generation d) Finding a supplier

8) Which of the following is not a leadership theory?
a) Trait theory b) Behavioral theory
c) Structure theory d) Contingency theory

9) A flat organizational structure is characterized by: _____.
a) Many layers of management
b) Centralized control
c) Few hierarchical levels
d) Complex chains of command

10) Agile project management is suitable for: _____.
a) Static and unchanging projects
b) Innovative and dynamic projects
c) Government tenders
d) Predictable production

11) Seed funding refers to: _____.
a) Investment after IPO
b) Government pension schemes
c) Early-stage capital for startups
d) Tax planning

12) Risk management includes: _____.
a) Ignoring failures
b) Avoiding innovation
c) Identifying, assessing, and mitigating risks
d) Hiring friends only

13) Guerrilla marketing is characterized by: _____.
a) Large budget campaigns
b) Expensive celebrity endorsements
c) Creative and unconventional promotion
d) Full-page newspaper ads

14) Retention in customer relationship means: _____.
a) Losing customers quickly b) Maintaining customer loyalty
c) Cold calling d) Increasing prices suddenly

SLR-BD-49

Seat No.	

Set R

S.Y. (B.Tech.)(Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

Section – I

Q.2 All questions are compulsory

a) Define "Enterprise," "Entrepreneur," and "Innovation." Explain how they are interrelated in business development. **06**

b) Explain the key theories of entrepreneurship (economic, psychological, and sociological). **04**

Q.3 Solve any three questions.

a) Discuss current trends in innovation and entrepreneurship. **06**

b) Describe different types of businesses and entrepreneurship. **06**

c) Explain the entrepreneurial journey with its key steps. **06**

d) What are the challenges in innovation and how can they be overcome? **06**

e) Explain the impact of organizational structure on company performance. **06**

Section – II

Q.4 All questions are compulsory

a) Explain budgeting and funding sources for innovation projects. **06**

b) What is calculated risk? How is it different from general risk-taking? **04**

Q.5 Solve any three questions.

a) Describe guerrilla marketing with a real-life example. **06**

b) Explain customer acquisition, retention, and repetition with examples. **06**

c) Define cash flow and burn rate. Why are they critical for a startup? **06**

d) Discuss sustainable entrepreneurship practices. **06**

e) What are scaling-up strategies? How do startups expand? **06**

SLR-BD-49

Seat No.	

Set S

S.Y. (B.Tech.)(Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Agile project management is suitable for: _____.
a) Static and unchanging projects
b) Innovative and dynamic projects
c) Government tenders
d) Predictable production

2) Seed funding refers to: _____.
a) Investment after IPO
b) Government pension schemes
c) Early-stage capital for startups
d) Tax planning

3) Risk management includes: _____.
a) Ignoring failures
b) Avoiding innovation
c) Identifying, assessing, and mitigating risks
d) Hiring friends only

4) Guerrilla marketing is characterized by: _____.
a) Large budget campaigns
b) Expensive celebrity endorsements
c) Creative and unconventional promotion
d) Full-page newspaper ads

5) Retention in customer relationship means: _____.
a) Losing customers quickly b) Maintaining customer loyalty
c) Cold calling d) Increasing prices suddenly

6) Cash flow refers to: _____.
a) Money spent on marketing
b) Total debts incurred
c) Inflow and outflow of cash
d) Discounts offered to customers

7) Burn rate is: _____.
a) Speed of market entry
b) Rate of cash consumption
c) Value of sales revenue
d) None of the above

8) Scaling a startup means: _____.
a) Downsizing workforce
b) Reducing marketing spend
c) Growing operations to handle more demand
d) Launching fewer products

9) Sustainable entrepreneurship includes: _____.
a) Ignoring social impact
b) Maximizing profits only
c) Balancing profit with environmental/social goals
d) Selling only eco-friendly products

10) An entrepreneur is best described as: _____.
a) A manager
b) A risk taker
c) A consumer
d) A government official

11) Innovation contributes to the economy by: _____.
a) Creating jobs and new markets
b) Limiting technological growth
c) Increasing taxes only
d) Promoting monopolies

12) The entrepreneurial journey begins with: _____.
a) Launching a website
b) Registering a business
c) Idea generation
d) Finding a supplier

13) Which of the following is not a leadership theory?
a) Trait theory
b) Behavioral theory
c) Structure theory
d) Contingency theory

14) A flat organizational structure is characterized by: _____.
a) Many layers of management
b) Centralized control
c) Few hierarchical levels
d) Complex chains of command

SLR-BD-49

Seat No.		Set	S

S.Y. (B.Tech.)(Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

Section – I

Q.2 All questions are compulsory

a) Define "Enterprise," "Entrepreneur," and "Innovation." Explain how they are interrelated in business development. **06**

b) Explain the key theories of entrepreneurship (economic, psychological, and sociological). **04**

Q.3 Solve any three questions.

a) Discuss current trends in innovation and entrepreneurship. **06**

b) Describe different types of businesses and entrepreneurship. **06**

c) Explain the entrepreneurial journey with its key steps. **06**

d) What are the challenges in innovation and how can they be overcome? **06**

e) Explain the impact of organizational structure on company performance. **06**

Section – II

Q.4 All questions are compulsory

a) Explain budgeting and funding sources for innovation projects. **06**

b) What is calculated risk? How is it different from general risk-taking? **04**

Q.5 Solve any three questions.

a) Describe guerrilla marketing with a real-life example. **06**

b) Explain customer acquisition, retention, and repetition with examples. **06**

c) Define cash flow and burn rate. Why are they critical for a startup? **06**

d) Discuss sustainable entrepreneurship practices. **06**

e) What are scaling-up strategies? How do startups expand? **06**

SLR-BD-49

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) An entrepreneur is best described as: _____.
a) A manager b) A risk taker
c) A consumer d) A government official

2) Innovation contributes to the economy by: _____.
a) Creating jobs and new markets
b) Limiting technological growth
c) Increasing taxes only
d) Promoting monopolies

3) The entrepreneurial journey begins with: _____.
a) Launching a website b) Registering a business
c) Idea generation d) Finding a supplier

4) Which of the following is not a leadership theory?
a) Trait theory b) Behavioral theory
c) Structure theory d) Contingency theory

5) A flat organizational structure is characterized by: _____.
a) Many layers of management
b) Centralized control
c) Few hierarchical levels
d) Complex chains of command

6) Agile project management is suitable for: _____.
a) Static and unchanging projects
b) Innovative and dynamic projects
c) Government tenders
d) Predictable production

7) Seed funding refers to: _____.
a) Investment after IPO
b) Government pension schemes
c) Early-stage capital for startups
d) Tax planning

8) Risk management includes: _____.
a) Ignoring failures
b) Avoiding innovation
c) Identifying, assessing, and mitigating risks
d) Hiring friends only

9) Guerrilla marketing is characterized by: _____.
a) Large budget campaigns
b) Expensive celebrity endorsements
c) Creative and unconventional promotion
d) Full-page newspaper ads

10) Retention in customer relationship means: _____.
a) Losing customers quickly b) Maintaining customer loyalty
c) Cold calling d) Increasing prices suddenly

11) Cash flow refers to: _____.
a) Money spent on marketing b) Total debts incurred
c) Inflow and outflow of cash d) Discounts offered to customers

12) Burn rate is: _____.
a) Speed of market entry b) Rate of cash consumption
c) Value of sales revenue d) None of the above

13) Scaling a startup means: _____.
a) Downsizing workforce
b) Reducing marketing spend
c) Growing operations to handle more demand
d) Launching fewer products

14) Sustainable entrepreneurship includes: _____.
a) Ignoring social impact
b) Maximizing profits only
c) Balancing profit with environmental/social goals
d) Selling only eco-friendly products

SLR-BD-49

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

Section – I

Q.2 All questions are compulsory

a)	Define "Enterprise," "Entrepreneur," and "Innovation." Explain how they are interrelated in business development.	**06**
b)	Explain the key theories of entrepreneurship (economic, psychological, and sociological).	**04**

Q.3 Solve any three questions.

a)	Discuss current trends in innovation and entrepreneurship.	**06**
b)	Describe different types of businesses and entrepreneurship.	**06**
c)	Explain the entrepreneurial journey with its key steps.	**06**
d)	What are the challenges in innovation and how can they be overcome?	**06**
e)	Explain the impact of organizational structure on company performance.	**06**

Section – II

Q.4 All questions are compulsory

a)	Explain budgeting and funding sources for innovation projects.	**06**
b)	What is calculated risk? How is it different from general risk-taking?	**04**

Q.5 Solve any three questions.

a)	Describe guerrilla marketing with a real-life example.	**06**
b)	Explain customer acquisition, retention, and repetition with examples.	**06**
c)	Define cash flow and burn rate. Why are they critical for a startup?	**06**
d)	Discuss sustainable entrepreneurship practices.	**06**
e)	What are scaling-up strategies? How do startups expand?	**06**

SLR-BD-49

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Risk management includes: _____.
a) Ignoring failures
b) Avoiding innovation
c) Identifying, assessing, and mitigating risks
d) Hiring friends only

2) Guerrilla marketing is characterized by: _____.
a) Large budget campaigns
b) Expensive celebrity endorsements
c) Creative and unconventional promotion
d) Full-page newspaper ads

3) Retention in customer relationship means: _____.
a) Losing customers quickly b) Maintaining customer loyalty
c) Cold calling d) Increasing prices suddenly

4) Cash flow refers to: _____.
a) Money spent on marketing b) Total debts incurred
c) Inflow and outflow of cash d) Discounts offered to customers

5) Burn rate is: _____.
a) Speed of market entry b) Rate of cash consumption
c) Value of sales revenue d) None of the above

6) Scaling a startup means: _____.
a) Downsizing workforce
b) Reducing marketing spend
c) Growing operations to handle more demand
d) Launching fewer products

7) Sustainable entrepreneurship includes: _____.
a) Ignoring social impact
b) Maximizing profits only
c) Balancing profit with environmental/social goals
d) Selling only eco-friendly products

8) An entrepreneur is best described as: _____.
a) A manager
b) A risk taker
c) A consumer
d) A government official

9) Innovation contributes to the economy by: _____.
a) Creating jobs and new markets
b) Limiting technological growth
c) Increasing taxes only
d) Promoting monopolies

10) The entrepreneurial journey begins with: _____.
a) Launching a website
b) Registering a business
c) Idea generation
d) Finding a supplier

11) Which of the following is not a leadership theory?
a) Trait theory
b) Behavioral theory
c) Structure theory
d) Contingency theory

12) A flat organizational structure is characterized by: _____.
a) Many layers of management
b) Centralized control
c) Few hierarchical levels
d) Complex chains of command

13) Agile project management is suitable for: _____.
a) Static and unchanging projects
b) Innovative and dynamic projects
c) Government tenders
d) Predictable production

14) Seed funding refers to: _____.
a) Investment after IPO
b) Government pension schemes
c) Early-stage capital for startups
d) Tax planning

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

Section – I

Q.2 All questions are compulsory

a)	Define "Enterprise," "Entrepreneur," and "Innovation." Explain how they are interrelated in business development.	**06**
b)	Explain the key theories of entrepreneurship (economic, psychological, and sociological).	**04**

Q.3 Solve any three questions.

a)	Discuss current trends in innovation and entrepreneurship.	**06**
b)	Describe different types of businesses and entrepreneurship.	**06**
c)	Explain the entrepreneurial journey with its key steps.	**06**
d)	What are the challenges in innovation and how can they be overcome?	**06**
e)	Explain the impact of organizational structure on company performance.	**06**

Section – II

Q.4 All questions are compulsory

a)	Explain budgeting and funding sources for innovation projects.	**06**
b)	What is calculated risk? How is it different from general risk-taking?	**04**

Q.5 Solve any three questions.

a)	Describe guerrilla marketing with a real-life example.	**06**
b)	Explain customer acquisition, retention, and repetition with examples.	**06**
c)	Define cash flow and burn rate. Why are they critical for a startup?	**06**
d)	Discuss sustainable entrepreneurship practices.	**06**
e)	What are scaling-up strategies? How do startups expand?	**06**

SLR-BD-49

Seat No.	

Set R

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Cash flow refers to: _____.
a) Money spent on marketing b) Total debts incurred
c) Inflow and outflow of cash d) Discounts offered to customers

2) Burn rate is: _____.
a) Speed of market entry b) Rate of cash consumption
c) Value of sales revenue d) None of the above

3) Scaling a startup means: _____.
a) Downsizing workforce
b) Reducing marketing spend
c) Growing operations to handle more demand
d) Launching fewer products

4) Sustainable entrepreneurship includes: _____.
a) Ignoring social impact
b) Maximizing profits only
c) Balancing profit with environmental/social goals
d) Selling only eco-friendly products

5) An entrepreneur is best described as: _____.
a) A manager b) A risk taker
c) A consumer d) A government official

6) Innovation contributes to the economy by: _____.
a) Creating jobs and new markets
b) Limiting technological growth
c) Increasing taxes only
d) Promoting monopolies

7) The entrepreneurial journey begins with: _____.
a) Launching a website b) Registering a business
c) Idea generation d) Finding a supplier

8) Which of the following is not a leadership theory?
a) Trait theory b) Behavioral theory
c) Structure theory d) Contingency theory

9) A flat organizational structure is characterized by: _____.
a) Many layers of management
b) Centralized control
c) Few hierarchical levels
d) Complex chains of command

10) Agile project management is suitable for: _____.
a) Static and unchanging projects
b) Innovative and dynamic projects
c) Government tenders
d) Predictable production

11) Seed funding refers to: _____.
a) Investment after IPO
b) Government pension schemes
c) Early-stage capital for startups
d) Tax planning

12) Risk management includes: _____.
a) Ignoring failures
b) Avoiding innovation
c) Identifying, assessing, and mitigating risks
d) Hiring friends only

13) Guerrilla marketing is characterized by: _____.
a) Large budget campaigns
b) Expensive celebrity endorsements
c) Creative and unconventional promotion
d) Full-page newspaper ads

14) Retention in customer relationship means: _____.
a) Losing customers quickly b) Maintaining customer loyalty
c) Cold calling d) Increasing prices suddenly

SLR-BD-49

Seat No.	

Set R

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

Section – I

Q.2 All questions are compulsory

a)	Define "Enterprise," "Entrepreneur," and "Innovation." Explain how they are interrelated in business development.	**06**
b)	Explain the key theories of entrepreneurship (economic, psychological, and sociological).	**04**

Q.3 Solve any three questions.

a)	Discuss current trends in innovation and entrepreneurship.	**06**
b)	Describe different types of businesses and entrepreneurship.	**06**
c)	Explain the entrepreneurial journey with its key steps.	**06**
d)	What are the challenges in innovation and how can they be overcome?	**06**
e)	Explain the impact of organizational structure on company performance.	**06**

Section – II

Q.4 All questions are compulsory

a)	Explain budgeting and funding sources for innovation projects.	**06**
b)	What is calculated risk? How is it different from general risk-taking?	**04**

Q.5 Solve any three questions.

a)	Describe guerrilla marketing with a real-life example.	**06**
b)	Explain customer acquisition, retention, and repetition with examples.	**06**
c)	Define cash flow and burn rate. Why are they critical for a startup?	**06**
d)	Discuss sustainable entrepreneurship practices.	**06**
e)	What are scaling-up strategies? How do startups expand?	**06**

SLR-BD-49

Seat No.	

Set S

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Agile project management is suitable for: _____.
a) Static and unchanging projects
b) Innovative and dynamic projects
c) Government tenders
d) Predictable production

2) Seed funding refers to: _____.
a) Investment after IPO
b) Government pension schemes
c) Early-stage capital for startups
d) Tax planning

3) Risk management includes: _____.
a) Ignoring failures
b) Avoiding innovation
c) Identifying, assessing, and mitigating risks
d) Hiring friends only

4) Guerrilla marketing is characterized by: _____.
a) Large budget campaigns
b) Expensive celebrity endorsements
c) Creative and unconventional promotion
d) Full-page newspaper ads

5) Retention in customer relationship means: _____.
a) Losing customers quickly b) Maintaining customer loyalty
c) Cold calling d) Increasing prices suddenly

6) Cash flow refers to: _____.
a) Money spent on marketing
b) Total debts incurred
c) Inflow and outflow of cash
d) Discounts offered to customers

7) Burn rate is: _____.
a) Speed of market entry
b) Rate of cash consumption
c) Value of sales revenue
d) None of the above

8) Scaling a startup means: _____.
a) Downsizing workforce
b) Reducing marketing spend
c) Growing operations to handle more demand
d) Launching fewer products

9) Sustainable entrepreneurship includes: _____.
a) Ignoring social impact
b) Maximizing profits only
c) Balancing profit with environmental/social goals
d) Selling only eco-friendly products

10) An entrepreneur is best described as: _____.
a) A manager
b) A risk taker
c) A consumer
d) A government official

11) Innovation contributes to the economy by: _____.
a) Creating jobs and new markets
b) Limiting technological growth
c) Increasing taxes only
d) Promoting monopolies

12) The entrepreneurial journey begins with: _____.
a) Launching a website
b) Registering a business
c) Idea generation
d) Finding a supplier

13) Which of the following is not a leadership theory?
a) Trait theory
b) Behavioral theory
c) Structure theory
d) Contingency theory

14) A flat organizational structure is characterized by: _____.
a) Many layers of management
b) Centralized control
c) Few hierarchical levels
d) Complex chains of command

SLR-BD-49

Seat No.		Set	S

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Entrepreneurship, Leadership and Management (CIVMDM-02A)

Day & Date: Thursday,05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

Section – I

Q.2 All questions are compulsory

a) Define "Enterprise," "Entrepreneur," and "Innovation." Explain how they are interrelated in business development. **06**

b) Explain the key theories of entrepreneurship (economic, psychological, and sociological). **04**

Q.3 Solve any three questions.

a) Discuss current trends in innovation and entrepreneurship. **06**

b) Describe different types of businesses and entrepreneurship. **06**

c) Explain the entrepreneurial journey with its key steps. **06**

d) What are the challenges in innovation and how can they be overcome? **06**

e) Explain the impact of organizational structure on company performance. **06**

Section – II

Q.4 All questions are compulsory

a) Explain budgeting and funding sources for innovation projects. **06**

b) What is calculated risk? How is it different from general risk-taking? **04**

Q.5 Solve any three questions.

a) Describe guerrilla marketing with a real-life example. **06**

b) Explain customer acquisition, retention, and repetition with examples. **06**

c) Define cash flow and burn rate. Why are they critical for a startup? **06**

d) Discuss sustainable entrepreneurship practices. **06**

e) What are scaling-up strategies? How do startups expand? **06**

SLR-BD-50

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options **14**

1) One of the concrete technical aspects defining urban is ____
a) Population size b) Cultural heritage
c) Historical significance d) Natural resources

2) One of the definitions of urban planning according to scholars is ____
a) The study of rural areas
b) The discipline of designing and regulating space
c) The process of agricultural development
d) The management of natural resources

3) The first step in the physical planning process is ____
a) Survey and data collection
b) Identification of the problems and needs of the area
c) Formulation of alternative strategies
d) Implementation of the plan

4) What is a characteristic of a city?
a) It is primarily focused on agriculture
b) It has a small population density
c) It is a politically autonomous settlement
d) It is a temporary settlement

5) The natural factors that can force populations to move to cities ____
a) Economic opportunities
b) Environmental and climatic changes
c) Historical events
d) Urban planning

6) What is a major cause of urbanization related to employment?
a) Rural-urban transformation b) Increased agricultural jobs
c) Decline in industrial jobs d) Higher birth rates

7) What is a potential risk associated with urban growth?
a) Lower crime rates
b) Higher chances of disasters and resource loss
c) Improved infrastructure
d) Increased agricultural output

8) The one of the administrative measures for urban renewal is ____
a) To demolish all buildings
b) To restore the area to its original functions
c) To build new skyscrapers
d) To increase traffic congestion

9) The relevance of urban design in planning and architecture is to ____
a) create aesthetically pleasing environments
b) focus solely on economic development
c) ignore community needs
d) only concern with transportation

10) What does urban design help to inform?
a) Land use planning b) Only transportation systems
c) Only economic policies d) Only aesthetic policies

11) What does the concept of legibility refer to?
a) The aesthetic appeal of a city
b) The ease of understanding the layout of a place
c) The number of buildings in a city
d) The historical significance of urban areas

12) What are the three main types of urban form aspects?
a) Density, grain, and spatial pattern
b) Height, width, and depth
c) colour, shape, and size
d) Population, traffic, and land use

13) Urban aesthetics refer to ____
a) The visual and sensory experiences created by urban design
b) The economic status of a city
c) The historical significance of urban areas
d) The geographical layout of a town

14) What does the Economic Survey classify workers by?
a) Nature of employment b) Age
c) Education level d) Housing status

SLR-BD-50

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch wherever necessary.

Section – I

Q.2 Solve any four. **16**

a) Describe the concentric zone model.
b) Explain density control in detail
c) Explain the urban concentrations factors.
d) Explain the urban settlements.
e) Describe why cities are complex and adaptive with key features.
f) Describe the positive impacts of city growth.

Q.3 Solve any two. **12**

a) Describe the cities' role in national development.
b) Describe the essential characteristics of a city or town.
c) Describe levels of an urban planning or forms of planning.

Section – II

Q.4 Solve any four. **16**

a) Describe in detail an urban renewal.
b) Explain in detail need for an urban design.
c) Describe in detail with sketch vista and skyline.
d) Describe in detail the public realm.
e) Describe about survey for an urban design.
f) Describe about an urban design scheme.

Q.5 Solve any two. **12**

a) Explain relevance of an urban design in planning and an architecture.
b) Describe in detail elements of city by Kevin Lynch with sketches.
c) Describe in detail contents of an aesthetic plan.

SLR-BD-50

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options **14**

1) The one of the administrative measures for urban renewal is ____
a) To demolish all buildings
b) To restore the area to its original functions
c) To build new skyscrapers
d) To increase traffic congestion

2) The relevance of urban design in planning and architecture is to ____
a) create aesthetically pleasing environments
b) focus solely on economic development
c) ignore community needs
d) only concern with transportation

3) What does urban design help to inform?
a) Land use planning b) Only transportation systems
c) Only economic policies d) Only aesthetic policies

4) What does the concept of legibility refer to?
a) The aesthetic appeal of a city
b) The ease of understanding the layout of a place
c) The number of buildings in a city
d) The historical significance of urban areas

5) What are the three main types of urban form aspects?
a) Density, grain, and spatial pattern
b) Height, width, and depth
c) colour, shape, and size
d) Population, traffic, and land use

6) Urban aesthetics refer to ____
a) The visual and sensory experiences created by urban design
b) The economic status of a city
c) The historical significance of urban areas
d) The geographical layout of a town

7) What does the Economic Survey classify workers by?
a) Nature of employment b) Age
c) Education level d) Housing status

8) One of the concrete technical aspects defining urban is ____
a) Population size b) Cultural heritage
c) Historical significance d) Natural resources

9) One of the definitions of urban planning according to scholars is ____
a) The study of rural areas
b) The discipline of designing and regulating space
c) The process of agricultural development
d) The management of natural resources

10) The first step in the physical planning process is ____
a) Survey and data collection
b) Identification of the problems and needs of the area
c) Formulation of alternative strategies
d) Implementation of the plan

11) What is a characteristic of a city?
a) It is primarily focused on agriculture
b) It has a small population density
c) It is a politically autonomous settlement
d) It is a temporary settlement

12) The natural factors that can force populations to move to cities ____
a) Economic opportunities
b) Environmental and climatic changes
c) Historical events
d) Urban planning

13) What is a major cause of urbanization related to employment?
a) Rural-urban transformation b) Increased agricultural jobs
c) Decline in industrial jobs d) Higher birth rates

14) What is a potential risk associated with urban growth?
a) Lower crime rates
b) Higher chances of disasters and resource loss
c) Improved infrastructure
d) Increased agricultural output

SLR-BD-50

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch wherever necessary.

Section – I

Q.2 Solve any four. **16**

a) Describe the concentric zone model.
b) Explain density control in detail
c) Explain the urban concentrations factors.
d) Explain the urban settlements.
e) Describe why cities are complex and adaptive with key features.
f) Describe the positive impacts of city growth.

Q.3 Solve any two. **12**

a) Describe the cities' role in national development.
b) Describe the essential characteristics of a city or town.
c) Describe levels of an urban planning or forms of planning.

Section – II

Q.4 Solve any four. **16**

a) Describe in detail an urban renewal.
b) Explain in detail need for an urban design.
c) Describe in detail with sketch vista and skyline.
d) Describe in detail the public realm.
e) Describe about survey for an urban design.
f) Describe about an urban design scheme.

Q.5 Solve any two. **12**

a) Explain relevance of an urban design in planning and an architecture.
b) Describe in detail elements of city by Kevin Lynch with sketches.
c) Describe in detail contents of an aesthetic plan.

SLR-BD-50

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options **14**

1) What does the concept of legibility refer to?
a) The aesthetic appeal of a city
b) The ease of understanding the layout of a place
c) The number of buildings in a city
d) The historical significance of urban areas

2) What are the three main types of urban form aspects?
a) Density, grain, and spatial pattern
b) Height, width, and depth
c) colour, shape, and size
d) Population, traffic, and land use

3) Urban aesthetics refer to ____
a) The visual and sensory experiences created by urban design
b) The economic status of a city
c) The historical significance of urban areas
d) The geographical layout of a town

4) What does the Economic Survey classify workers by?
a) Nature of employment b) Age
c) Education level d) Housing status

5) One of the concrete technical aspects defining urban is ____
a) Population size b) Cultural heritage
c) Historical significance d) Natural resources

6) One of the definitions of urban planning according to scholars is ____
a) The study of rural areas
b) The discipline of designing and regulating space
c) The process of agricultural development
d) The management of natural resources

7) The first step in the physical planning process is ____
a) Survey and data collection
b) Identification of the problems and needs of the area
c) Formulation of alternative strategies
d) Implementation of the plan

8) What is a characteristic of a city?
a) It is primarily focused on agriculture
b) It has a small population density
c) It is a politically autonomous settlement
d) It is a temporary settlement

9) The natural factors that can force populations to move to cities ____
a) Economic opportunities
b) Environmental and climatic changes
c) Historical events
d) Urban planning

10) What is a major cause of urbanization related to employment?
a) Rural-urban transformation b) Increased agricultural jobs
c) Decline in industrial jobs d) Higher birth rates

11) What is a potential risk associated with urban growth?
a) Lower crime rates
b) Higher chances of disasters and resource loss
c) Improved infrastructure
d) Increased agricultural output

12) The one of the administrative measures for urban renewal is ____
a) To demolish all buildings
b) To restore the area to its original functions
c) To build new skyscrapers
d) To increase traffic congestion

13) The relevance of urban design in planning and architecture is to ____
a) create aesthetically pleasing environments
b) focus solely on economic development
c) ignore community needs
d) only concern with transportation

14) What does urban design help to inform?
a) Land use planning b) Only transportation systems
c) Only economic policies d) Only aesthetic policies

SLR-BD-50

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch wherever necessary.

Section – I

Q.2 Solve any four. **16**

a) Describe the concentric zone model.
b) Explain density control in detail
c) Explain the urban concentrations factors.
d) Explain the urban settlements.
e) Describe why cities are complex and adaptive with key features.
f) Describe the positive impacts of city growth.

Q.3 Solve any two. **12**

a) Describe the cities' role in national development.
b) Describe the essential characteristics of a city or town.
c) Describe levels of an urban planning or forms of planning.

Section – II

Q.4 Solve any four. **16**

a) Describe in detail an urban renewal.
b) Explain in detail need for an urban design.
c) Describe in detail with sketch vista and skyline.
d) Describe in detail the public realm.
e) Describe about survey for an urban design.
f) Describe about an urban design scheme.

Q.5 Solve any two. **12**

a) Explain relevance of an urban design in planning and an architecture.
b) Describe in detail elements of city by Kevin Lynch with sketches.
c) Describe in detail contents of an aesthetic plan.

SLR-BD-50

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options **14**

1) What is a major cause of urbanization related to employment?
a) Rural-urban transformation b) Increased agricultural jobs
c) Decline in industrial jobs d) Higher birth rates

2) What is a potential risk associated with urban growth?
a) Lower crime rates
b) Higher chances of disasters and resource loss
c) Improved infrastructure
d) Increased agricultural output

3) The one of the administrative measures for urban renewal is ____
a) To demolish all buildings
b) To restore the area to its original functions
c) To build new skyscrapers
d) To increase traffic congestion

4) The relevance of urban design in planning and architecture is to ____
a) create aesthetically pleasing environments
b) focus solely on economic development
c) ignore community needs
d) only concern with transportation

5) What does urban design help to inform?
a) Land use planning b) Only transportation systems
c) Only economic policies d) Only aesthetic policies

6) What does the concept of legibility refer to?
a) The aesthetic appeal of a city
b) The ease of understanding the layout of a place
c) The number of buildings in a city
d) The historical significance of urban areas

7) What are the three main types of urban form aspects?
a) Density, grain, and spatial pattern
b) Height, width, and depth
c) colour, shape, and size
d) Population, traffic, and land use

8) Urban aesthetics refer to ____
a) The visual and sensory experiences created by urban design
b) The economic status of a city
c) The historical significance of urban areas
d) The geographical layout of a town

9) What does the Economic Survey classify workers by?
a) Nature of employment b) Age
c) Education level d) Housing status

10) One of the concrete technical aspects defining urban is ____
a) Population size b) Cultural heritage
c) Historical significance d) Natural resources

11) One of the definitions of urban planning according to scholars is ____
a) The study of rural areas
b) The discipline of designing and regulating space
c) The process of agricultural development
d) The management of natural resources

12) The first step in the physical planning process is ____
a) Survey and data collection
b) Identification of the problems and needs of the area
c) Formulation of alternative strategies
d) Implementation of the plan

13) What is a characteristic of a city?
a) It is primarily focused on agriculture
b) It has a small population density
c) It is a politically autonomous settlement
d) It is a temporary settlement

14) The natural factors that can force populations to move to cities ____
a) Economic opportunities
b) Environmental and climatic changes
c) Historical events
d) Urban planning

SLR-BD-50

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch wherever necessary.

Section – I

Q.2 Solve any four. **16**

a) Describe the concentric zone model.
b) Explain density control in detail
c) Explain the urban concentrations factors.
d) Explain the urban settlements.
e) Describe why cities are complex and adaptive with key features.
f) Describe the positive impacts of city growth.

Q.3 Solve any two. **12**

a) Describe the cities' role in national development.
b) Describe the essential characteristics of a city or town.
c) Describe levels of an urban planning or forms of planning.

Section – II

Q.4 Solve any four. **16**

a) Describe in detail an urban renewal.
b) Explain in detail need for an urban design.
c) Describe in detail with sketch vista and skyline.
d) Describe in detail the public realm.
e) Describe about survey for an urban design.
f) Describe about an urban design scheme.

Q.5 Solve any two. **12**

a) Explain relevance of an urban design in planning and an architecture.
b) Describe in detail elements of city by Kevin Lynch with sketches.
c) Describe in detail contents of an aesthetic plan.

SLR-BD-50

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options 14

1) One of the concrete technical aspects defining urban is ____
a) Population size b) Cultural heritage
c) Historical significance d) Natural resources

2) One of the definitions of urban planning according to scholars is ____
a) The study of rural areas
b) The discipline of designing and regulating space
c) The process of agricultural development
d) The management of natural resources

3) The first step in the physical planning process is ____
a) Survey and data collection
b) Identification of the problems and needs of the area
c) Formulation of alternative strategies
d) Implementation of the plan

4) What is a characteristic of a city?
a) It is primarily focused on agriculture
b) It has a small population density
c) It is a politically autonomous settlement
d) It is a temporary settlement

5) The natural factors that can force populations to move to cities ____
a) Economic opportunities
b) Environmental and climatic changes
c) Historical events
d) Urban planning

6) What is a major cause of urbanization related to employment?
a) Rural-urban transformation b) Increased agricultural jobs
c) Decline in industrial jobs d) Higher birth rates

7) What is a potential risk associated with urban growth?
a) Lower crime rates
b) Higher chances of disasters and resource loss
c) Improved infrastructure
d) Increased agricultural output

8) The one of the administrative measures for urban renewal is ____
a) To demolish all buildings
b) To restore the area to its original functions
c) To build new skyscrapers
d) To increase traffic congestion

9) The relevance of urban design in planning and architecture is to ____
a) create aesthetically pleasing environments
b) focus solely on economic development
c) ignore community needs
d) only concern with transportation

10) What does urban design help to inform?
a) Land use planning b) Only transportation systems
c) Only economic policies d) Only aesthetic policies

11) What does the concept of legibility refer to?
a) The aesthetic appeal of a city
b) The ease of understanding the layout of a place
c) The number of buildings in a city
d) The historical significance of urban areas

12) What are the three main types of urban form aspects?
a) Density, grain, and spatial pattern
b) Height, width, and depth
c) colour, shape, and size
d) Population, traffic, and land use

13) Urban aesthetics refer to ____
a) The visual and sensory experiences created by urban design
b) The economic status of a city
c) The historical significance of urban areas
d) The geographical layout of a town

14) What does the Economic Survey classify workers by?
a) Nature of employment b) Age
c) Education level d) Housing status

SLR-BD-50

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch wherever necessary.

Section – I

Q.2 Solve any four. **16**

a) Describe the concentric zone model.
b) Explain density control in detail
c) Explain the urban concentrations factors.
d) Explain the urban settlements.
e) Describe why cities are complex and adaptive with key features.
f) Describe the positive impacts of city growth.

Q.3 Solve any two. **12**

a) Describe the cities' role in national development.
b) Describe the essential characteristics of a city or town.
c) Describe levels of an urban planning or forms of planning.

Section – II

Q.4 Solve any four. **16**

a) Describe in detail an urban renewal.
b) Explain in detail need for an urban design.
c) Describe in detail with sketch vista and skyline.
d) Describe in detail the public realm.
e) Describe about survey for an urban design.
f) Describe about an urban design scheme.

Q.5 Solve any two. **12**

a) Explain relevance of an urban design in planning and an architecture.
b) Describe in detail elements of city by Kevin Lynch with sketches.
c) Describe in detail contents of an aesthetic plan.

SLR-BD-50

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options **14**

1) The one of the administrative measures for urban renewal is ____
a) To demolish all buildings
b) To restore the area to its original functions
c) To build new skyscrapers
d) To increase traffic congestion

2) The relevance of urban design in planning and architecture is to ____
a) create aesthetically pleasing environments
b) focus solely on economic development
c) ignore community needs
d) only concern with transportation

3) What does urban design help to inform?
a) Land use planning b) Only transportation systems
c) Only economic policies d) Only aesthetic policies

4) What does the concept of legibility refer to?
a) The aesthetic appeal of a city
b) The ease of understanding the layout of a place
c) The number of buildings in a city
d) The historical significance of urban areas

5) What are the three main types of urban form aspects?
a) Density, grain, and spatial pattern
b) Height, width, and depth
c) colour, shape, and size
d) Population, traffic, and land use

6) Urban aesthetics refer to ____
a) The visual and sensory experiences created by urban design
b) The economic status of a city
c) The historical significance of urban areas
d) The geographical layout of a town

7) What does the Economic Survey classify workers by?
a) Nature of employment b) Age
c) Education level d) Housing status

8) One of the concrete technical aspects defining urban is ____
a) Population size b) Cultural heritage
c) Historical significance d) Natural resources

9) One of the definitions of urban planning according to scholars is ____
a) The study of rural areas
b) The discipline of designing and regulating space
c) The process of agricultural development
d) The management of natural resources

10) The first step in the physical planning process is ____
a) Survey and data collection
b) Identification of the problems and needs of the area
c) Formulation of alternative strategies
d) Implementation of the plan

11) What is a characteristic of a city?
a) It is primarily focused on agriculture
b) It has a small population density
c) It is a politically autonomous settlement
d) It is a temporary settlement

12) The natural factors that can force populations to move to cities ____
a) Economic opportunities
b) Environmental and climatic changes
c) Historical events
d) Urban planning

13) What is a major cause of urbanization related to employment?
a) Rural-urban transformation b) Increased agricultural jobs
c) Decline in industrial jobs d) Higher birth rates

14) What is a potential risk associated with urban growth?
a) Lower crime rates
b) Higher chances of disasters and resource loss
c) Improved infrastructure
d) Increased agricultural output

SLR-BD-50

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch wherever necessary.

Section – I

Q.2 Solve any four. **16**

a) Describe the concentric zone model.
b) Explain density control in detail
c) Explain the urban concentrations factors.
d) Explain the urban settlements.
e) Describe why cities are complex and adaptive with key features.
f) Describe the positive impacts of city growth.

Q.3 Solve any two. **12**

a) Describe the cities' role in national development.
b) Describe the essential characteristics of a city or town.
c) Describe levels of an urban planning or forms of planning.

Section – II

Q.4 Solve any four. **16**

a) Describe in detail an urban renewal.
b) Explain in detail need for an urban design.
c) Describe in detail with sketch vista and skyline.
d) Describe in detail the public realm.
e) Describe about survey for an urban design.
f) Describe about an urban design scheme.

Q.5 Solve any two. **12**

a) Explain relevance of an urban design in planning and an architecture.
b) Describe in detail elements of city by Kevin Lynch with sketches.
c) Describe in detail contents of an aesthetic plan.

SLR-BD-50

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options **14**

1) What does the concept of legibility refer to?
a) The aesthetic appeal of a city
b) The ease of understanding the layout of a place
c) The number of buildings in a city
d) The historical significance of urban areas

2) What are the three main types of urban form aspects?
a) Density, grain, and spatial pattern
b) Height, width, and depth
c) colour, shape, and size
d) Population, traffic, and land use

3) Urban aesthetics refer to ____
a) The visual and sensory experiences created by urban design
b) The economic status of a city
c) The historical significance of urban areas
d) The geographical layout of a town

4) What does the Economic Survey classify workers by?
a) Nature of employment b) Age
c) Education level d) Housing status

5) One of the concrete technical aspects defining urban is ____
a) Population size b) Cultural heritage
c) Historical significance d) Natural resources

6) One of the definitions of urban planning according to scholars is ____
a) The study of rural areas
b) The discipline of designing and regulating space
c) The process of agricultural development
d) The management of natural resources

7) The first step in the physical planning process is ____
a) Survey and data collection
b) Identification of the problems and needs of the area
c) Formulation of alternative strategies
d) Implementation of the plan

8) What is a characteristic of a city?
a) It is primarily focused on agriculture
b) It has a small population density
c) It is a politically autonomous settlement
d) It is a temporary settlement

9) The natural factors that can force populations to move to cities ____
a) Economic opportunities
b) Environmental and climatic changes
c) Historical events
d) Urban planning

10) What is a major cause of urbanization related to employment?
a) Rural-urban transformation b) Increased agricultural jobs
c) Decline in industrial jobs d) Higher birth rates

11) What is a potential risk associated with urban growth?
a) Lower crime rates
b) Higher chances of disasters and resource loss
c) Improved infrastructure
d) Increased agricultural output

12) The one of the administrative measures for urban renewal is ____
a) To demolish all buildings
b) To restore the area to its original functions
c) To build new skyscrapers
d) To increase traffic congestion

13) The relevance of urban design in planning and architecture is to ____
a) create aesthetically pleasing environments
b) focus solely on economic development
c) ignore community needs
d) only concern with transportation

14) What does urban design help to inform?
a) Land use planning b) Only transportation systems
c) Only economic policies d) Only aesthetic policies

SLR-BD-50

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch wherever necessary.

Section – I

Q.2 Solve any four. **16**

a) Describe the concentric zone model.
b) Explain density control in detail
c) Explain the urban concentrations factors.
d) Explain the urban settlements.
e) Describe why cities are complex and adaptive with key features.
f) Describe the positive impacts of city growth.

Q.3 Solve any two. **12**

a) Describe the cities' role in national development.
b) Describe the essential characteristics of a city or town.
c) Describe levels of an urban planning or forms of planning.

Section – II

Q.4 Solve any four. **16**

a) Describe in detail an urban renewal.
b) Explain in detail need for an urban design.
c) Describe in detail with sketch vista and skyline.
d) Describe in detail the public realm.
e) Describe about survey for an urban design.
f) Describe about an urban design scheme.

Q.5 Solve any two. **12**

a) Explain relevance of an urban design in planning and an architecture.
b) Describe in detail elements of city by Kevin Lynch with sketches.
c) Describe in detail contents of an aesthetic plan.

SLR-BD-50

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options **14**

1) What is a major cause of urbanization related to employment?
a) Rural-urban transformation b) Increased agricultural jobs
c) Decline in industrial jobs d) Higher birth rates

2) What is a potential risk associated with urban growth?
a) Lower crime rates
b) Higher chances of disasters and resource loss
c) Improved infrastructure
d) Increased agricultural output

3) The one of the administrative measures for urban renewal is ____
a) To demolish all buildings
b) To restore the area to its original functions
c) To build new skyscrapers
d) To increase traffic congestion

4) The relevance of urban design in planning and architecture is to ____
a) create aesthetically pleasing environments
b) focus solely on economic development
c) ignore community needs
d) only concern with transportation

5) What does urban design help to inform?
a) Land use planning b) Only transportation systems
c) Only economic policies d) Only aesthetic policies

6) What does the concept of legibility refer to?
a) The aesthetic appeal of a city
b) The ease of understanding the layout of a place
c) The number of buildings in a city
d) The historical significance of urban areas

7) What are the three main types of urban form aspects?
a) Density, grain, and spatial pattern
b) Height, width, and depth
c) colour, shape, and size
d) Population, traffic, and land use

8) Urban aesthetics refer to ____
a) The visual and sensory experiences created by urban design
b) The economic status of a city
c) The historical significance of urban areas
d) The geographical layout of a town

9) What does the Economic Survey classify workers by?
a) Nature of employment b) Age
c) Education level d) Housing status

10) One of the concrete technical aspects defining urban is ____
a) Population size b) Cultural heritage
c) Historical significance d) Natural resources

11) One of the definitions of urban planning according to scholars is ____
a) The study of rural areas
b) The discipline of designing and regulating space
c) The process of agricultural development
d) The management of natural resources

12) The first step in the physical planning process is ____
a) Survey and data collection
b) Identification of the problems and needs of the area
c) Formulation of alternative strategies
d) Implementation of the plan

13) What is a characteristic of a city?
a) It is primarily focused on agriculture
b) It has a small population density
c) It is a politically autonomous settlement
d) It is a temporary settlement

14) The natural factors that can force populations to move to cities ____
a) Economic opportunities
b) Environmental and climatic changes
c) Historical events
d) Urban planning

SLR-BD-50

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch wherever necessary.

Section – I

Q.2 Solve any four. **16**

a) Describe the concentric zone model.
b) Explain density control in detail
c) Explain the urban concentrations factors.
d) Explain the urban settlements.
e) Describe why cities are complex and adaptive with key features.
f) Describe the positive impacts of city growth.

Q.3 Solve any two. **12**

a) Describe the cities' role in national development.
b) Describe the essential characteristics of a city or town.
c) Describe levels of an urban planning or forms of planning.

Section – II

Q.4 Solve any four. **16**

a) Describe in detail an urban renewal.
b) Explain in detail need for an urban design.
c) Describe in detail with sketch vista and skyline.
d) Describe in detail the public realm.
e) Describe about survey for an urban design.
f) Describe about an urban design scheme.

Q.5 Solve any two. **12**

a) Explain relevance of an urban design in planning and an architecture.
b) Describe in detail elements of city by Kevin Lynch with sketches.
c) Describe in detail contents of an aesthetic plan.

SLR-BD-50

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options **14**

1) One of the concrete technical aspects defining urban is ____
a) Population size b) Cultural heritage
c) Historical significance d) Natural resources

2) One of the definitions of urban planning according to scholars is ____
a) The study of rural areas
b) The discipline of designing and regulating space
c) The process of agricultural development
d) The management of natural resources

3) The first step in the physical planning process is ____
a) Survey and data collection
b) Identification of the problems and needs of the area
c) Formulation of alternative strategies
d) Implementation of the plan

4) What is a characteristic of a city?
a) It is primarily focused on agriculture
b) It has a small population density
c) It is a politically autonomous settlement
d) It is a temporary settlement

5) The natural factors that can force populations to move to cities ____
a) Economic opportunities
b) Environmental and climatic changes
c) Historical events
d) Urban planning

6) What is a major cause of urbanization related to employment?
a) Rural-urban transformation b) Increased agricultural jobs
c) Decline in industrial jobs d) Higher birth rates

7) What is a potential risk associated with urban growth?
a) Lower crime rates
b) Higher chances of disasters and resource loss
c) Improved infrastructure
d) Increased agricultural output

8) The one of the administrative measures for urban renewal is ____
a) To demolish all buildings
b) To restore the area to its original functions
c) To build new skyscrapers
d) To increase traffic congestion

9) The relevance of urban design in planning and architecture is to ____
a) create aesthetically pleasing environments
b) focus solely on economic development
c) ignore community needs
d) only concern with transportation

10) What does urban design help to inform?
a) Land use planning b) Only transportation systems
c) Only economic policies d) Only aesthetic policies

11) What does the concept of legibility refer to?
a) The aesthetic appeal of a city
b) The ease of understanding the layout of a place
c) The number of buildings in a city
d) The historical significance of urban areas

12) What are the three main types of urban form aspects?
a) Density, grain, and spatial pattern
b) Height, width, and depth
c) colour, shape, and size
d) Population, traffic, and land use

13) Urban aesthetics refer to ____
a) The visual and sensory experiences created by urban design
b) The economic status of a city
c) The historical significance of urban areas
d) The geographical layout of a town

14) What does the Economic Survey classify workers by?
a) Nature of employment b) Age
c) Education level d) Housing status

SLR-BD-50

Seat No.		Set	P

S.Y. (B.Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch wherever necessary.

Section – I

Q.2 Solve any four. **16**

a) Describe the concentric zone model.
b) Explain density control in detail
c) Explain the urban concentrations factors.
d) Explain the urban settlements.
e) Describe why cities are complex and adaptive with key features.
f) Describe the positive impacts of city growth.

Q.3 Solve any two. **12**

a) Describe the cities' role in national development.
b) Describe the essential characteristics of a city or town.
c) Describe levels of an urban planning or forms of planning.

Section – II

Q.4 Solve any four. **16**

a) Describe in detail an urban renewal.
b) Explain in detail need for an urban design.
c) Describe in detail with sketch vista and skyline.
d) Describe in detail the public realm.
e) Describe about survey for an urban design.
f) Describe about an urban design scheme.

Q.5 Solve any two. **12**

a) Explain relevance of an urban design in planning and an architecture.
b) Describe in detail elements of city by Kevin Lynch with sketches.
c) Describe in detail contents of an aesthetic plan.

SLR-BD-50

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options **14**

1) The one of the administrative measures for urban renewal is ____
a) To demolish all buildings
b) To restore the area to its original functions
c) To build new skyscrapers
d) To increase traffic congestion

2) The relevance of urban design in planning and architecture is to ____
a) create aesthetically pleasing environments
b) focus solely on economic development
c) ignore community needs
d) only concern with transportation

3) What does urban design help to inform?
a) Land use planning b) Only transportation systems
c) Only economic policies d) Only aesthetic policies

4) What does the concept of legibility refer to?
a) The aesthetic appeal of a city
b) The ease of understanding the layout of a place
c) The number of buildings in a city
d) The historical significance of urban areas

5) What are the three main types of urban form aspects?
a) Density, grain, and spatial pattern
b) Height, width, and depth
c) colour, shape, and size
d) Population, traffic, and land use

6) Urban aesthetics refer to ____
a) The visual and sensory experiences created by urban design
b) The economic status of a city
c) The historical significance of urban areas
d) The geographical layout of a town

7) What does the Economic Survey classify workers by?
a) Nature of employment b) Age
c) Education level d) Housing status

8) One of the concrete technical aspects defining urban is ____
a) Population size b) Cultural heritage
c) Historical significance d) Natural resources

9) One of the definitions of urban planning according to scholars is ____
a) The study of rural areas
b) The discipline of designing and regulating space
c) The process of agricultural development
d) The management of natural resources

10) The first step in the physical planning process is ____
a) Survey and data collection
b) Identification of the problems and needs of the area
c) Formulation of alternative strategies
d) Implementation of the plan

11) What is a characteristic of a city?
a) It is primarily focused on agriculture
b) It has a small population density
c) It is a politically autonomous settlement
d) It is a temporary settlement

12) The natural factors that can force populations to move to cities ____
a) Economic opportunities
b) Environmental and climatic changes
c) Historical events
d) Urban planning

13) What is a major cause of urbanization related to employment?
a) Rural-urban transformation b) Increased agricultural jobs
c) Decline in industrial jobs d) Higher birth rates

14) What is a potential risk associated with urban growth?
a) Lower crime rates
b) Higher chances of disasters and resource loss
c) Improved infrastructure
d) Increased agricultural output

SLR-BD-50

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch wherever necessary.

Section – I

Q.2 Solve any four. **16**

a) Describe the concentric zone model.
b) Explain density control in detail
c) Explain the urban concentrations factors.
d) Explain the urban settlements.
e) Describe why cities are complex and adaptive with key features.
f) Describe the positive impacts of city growth.

Q.3 Solve any two. **12**

a) Describe the cities' role in national development.
b) Describe the essential characteristics of a city or town.
c) Describe levels of an urban planning or forms of planning.

Section – II

Q.4 Solve any four. **16**

a) Describe in detail an urban renewal.
b) Explain in detail need for an urban design.
c) Describe in detail with sketch vista and skyline.
d) Describe in detail the public realm.
e) Describe about survey for an urban design.
f) Describe about an urban design scheme.

Q.5 Solve any two. **12**

a) Explain relevance of an urban design in planning and an architecture.
b) Describe in detail elements of city by Kevin Lynch with sketches.
c) Describe in detail contents of an aesthetic plan.

SLR-BD-50

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options 14

1) What does the concept of legibility refer to?
a) The aesthetic appeal of a city
b) The ease of understanding the layout of a place
c) The number of buildings in a city
d) The historical significance of urban areas

2) What are the three main types of urban form aspects?
a) Density, grain, and spatial pattern
b) Height, width, and depth
c) colour, shape, and size
d) Population, traffic, and land use

3) Urban aesthetics refer to ____
a) The visual and sensory experiences created by urban design
b) The economic status of a city
c) The historical significance of urban areas
d) The geographical layout of a town

4) What does the Economic Survey classify workers by?
a) Nature of employment b) Age
c) Education level d) Housing status

5) One of the concrete technical aspects defining urban is ____
a) Population size b) Cultural heritage
c) Historical significance d) Natural resources

6) One of the definitions of urban planning according to scholars is ____
a) The study of rural areas
b) The discipline of designing and regulating space
c) The process of agricultural development
d) The management of natural resources

7) The first step in the physical planning process is ____
a) Survey and data collection
b) Identification of the problems and needs of the area
c) Formulation of alternative strategies
d) Implementation of the plan

8) What is a characteristic of a city?
a) It is primarily focused on agriculture
b) It has a small population density
c) It is a politically autonomous settlement
d) It is a temporary settlement

9) The natural factors that can force populations to move to cities ____
a) Economic opportunities
b) Environmental and climatic changes
c) Historical events
d) Urban planning

10) What is a major cause of urbanization related to employment?
a) Rural-urban transformation b) Increased agricultural jobs
c) Decline in industrial jobs d) Higher birth rates

11) What is a potential risk associated with urban growth?
a) Lower crime rates
b) Higher chances of disasters and resource loss
c) Improved infrastructure
d) Increased agricultural output

12) The one of the administrative measures for urban renewal is ____
a) To demolish all buildings
b) To restore the area to its original functions
c) To build new skyscrapers
d) To increase traffic congestion

13) The relevance of urban design in planning and architecture is to ____
a) create aesthetically pleasing environments
b) focus solely on economic development
c) ignore community needs
d) only concern with transportation

14) What does urban design help to inform?
a) Land use planning b) Only transportation systems
c) Only economic policies d) Only aesthetic policies

SLR-BD-50

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch wherever necessary.

Section – I

Q.2 Solve any four. **16**

a) Describe the concentric zone model.
b) Explain density control in detail
c) Explain the urban concentrations factors.
d) Explain the urban settlements.
e) Describe why cities are complex and adaptive with key features.
f) Describe the positive impacts of city growth.

Q.3 Solve any two. **12**

a) Describe the cities' role in national development.
b) Describe the essential characteristics of a city or town.
c) Describe levels of an urban planning or forms of planning.

Section – II

Q.4 Solve any four. **16**

a) Describe in detail an urban renewal.
b) Explain in detail need for an urban design.
c) Describe in detail with sketch vista and skyline.
d) Describe in detail the public realm.
e) Describe about survey for an urban design.
f) Describe about an urban design scheme.

Q.5 Solve any two. **12**

a) Explain relevance of an urban design in planning and an architecture.
b) Describe in detail elements of city by Kevin Lynch with sketches.
c) Describe in detail contents of an aesthetic plan.

SLR-BD-50

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options **14**

1) What is a major cause of urbanization related to employment?
a) Rural-urban transformation b) Increased agricultural jobs
c) Decline in industrial jobs d) Higher birth rates

2) What is a potential risk associated with urban growth?
a) Lower crime rates
b) Higher chances of disasters and resource loss
c) Improved infrastructure
d) Increased agricultural output

3) The one of the administrative measures for urban renewal is ____
a) To demolish all buildings
b) To restore the area to its original functions
c) To build new skyscrapers
d) To increase traffic congestion

4) The relevance of urban design in planning and architecture is to ____
a) create aesthetically pleasing environments
b) focus solely on economic development
c) ignore community needs
d) only concern with transportation

5) What does urban design help to inform?
a) Land use planning b) Only transportation systems
c) Only economic policies d) Only aesthetic policies

6) What does the concept of legibility refer to?
a) The aesthetic appeal of a city
b) The ease of understanding the layout of a place
c) The number of buildings in a city
d) The historical significance of urban areas

7) What are the three main types of urban form aspects?
a) Density, grain, and spatial pattern
b) Height, width, and depth
c) colour, shape, and size
d) Population, traffic, and land use

8) Urban aesthetics refer to ____
a) The visual and sensory experiences created by urban design
b) The economic status of a city
c) The historical significance of urban areas
d) The geographical layout of a town

9) What does the Economic Survey classify workers by?
a) Nature of employment b) Age
c) Education level d) Housing status

10) One of the concrete technical aspects defining urban is ____
a) Population size b) Cultural heritage
c) Historical significance d) Natural resources

11) One of the definitions of urban planning according to scholars is ____
a) The study of rural areas
b) The discipline of designing and regulating space
c) The process of agricultural development
d) The management of natural resources

12) The first step in the physical planning process is ____
a) Survey and data collection
b) Identification of the problems and needs of the area
c) Formulation of alternative strategies
d) Implementation of the plan

13) What is a characteristic of a city?
a) It is primarily focused on agriculture
b) It has a small population density
c) It is a politically autonomous settlement
d) It is a temporary settlement

14) The natural factors that can force populations to move to cities ____
a) Economic opportunities
b) Environmental and climatic changes
c) Historical events
d) Urban planning

SLR-BD-50

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch wherever necessary.

Section – I

Q.2 Solve any four. **16**

a) Describe the concentric zone model.
b) Explain density control in detail
c) Explain the urban concentrations factors.
d) Explain the urban settlements.
e) Describe why cities are complex and adaptive with key features.
f) Describe the positive impacts of city growth.

Q.3 Solve any two. **12**

a) Describe the cities' role in national development.
b) Describe the essential characteristics of a city or town.
c) Describe levels of an urban planning or forms of planning.

Section – II

Q.4 Solve any four. **16**

a) Describe in detail an urban renewal.
b) Explain in detail need for an urban design.
c) Describe in detail with sketch vista and skyline.
d) Describe in detail the public realm.
e) Describe about survey for an urban design.
f) Describe about an urban design scheme.

Q.5 Solve any two. **12**

a) Explain relevance of an urban design in planning and an architecture.
b) Describe in detail elements of city by Kevin Lynch with sketches.
c) Describe in detail contents of an aesthetic plan.

SLR-BD-50

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options **14**

1) One of the concrete technical aspects defining urban is ____
a) Population size b) Cultural heritage
c) Historical significance d) Natural resources

2) One of the definitions of urban planning according to scholars is ____
a) The study of rural areas
b) The discipline of designing and regulating space
c) The process of agricultural development
d) The management of natural resources

3) The first step in the physical planning process is ____
a) Survey and data collection
b) Identification of the problems and needs of the area
c) Formulation of alternative strategies
d) Implementation of the plan

4) What is a characteristic of a city?
a) It is primarily focused on agriculture
b) It has a small population density
c) It is a politically autonomous settlement
d) It is a temporary settlement

5) The natural factors that can force populations to move to cities ____
a) Economic opportunities
b) Environmental and climatic changes
c) Historical events
d) Urban planning

6) What is a major cause of urbanization related to employment?
a) Rural-urban transformation b) Increased agricultural jobs
c) Decline in industrial jobs d) Higher birth rates

7) What is a potential risk associated with urban growth?
a) Lower crime rates
b) Higher chances of disasters and resource loss
c) Improved infrastructure
d) Increased agricultural output

8) The one of the administrative measures for urban renewal is ____
a) To demolish all buildings
b) To restore the area to its original functions
c) To build new skyscrapers
d) To increase traffic congestion

9) The relevance of urban design in planning and architecture is to ____
a) create aesthetically pleasing environments
b) focus solely on economic development
c) ignore community needs
d) only concern with transportation

10) What does urban design help to inform?
a) Land use planning b) Only transportation systems
c) Only economic policies d) Only aesthetic policies

11) What does the concept of legibility refer to?
a) The aesthetic appeal of a city
b) The ease of understanding the layout of a place
c) The number of buildings in a city
d) The historical significance of urban areas

12) What are the three main types of urban form aspects?
a) Density, grain, and spatial pattern
b) Height, width, and depth
c) colour, shape, and size
d) Population, traffic, and land use

13) Urban aesthetics refer to ____
a) The visual and sensory experiences created by urban design
b) The economic status of a city
c) The historical significance of urban areas
d) The geographical layout of a town

14) What does the Economic Survey classify workers by?
a) Nature of employment b) Age
c) Education level d) Housing status

SLR-BD-50

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch wherever necessary.

Section – I

Q.2 Solve any four. **16**

a) Describe the concentric zone model.
b) Explain density control in detail
c) Explain the urban concentrations factors.
d) Explain the urban settlements.
e) Describe why cities are complex and adaptive with key features.
f) Describe the positive impacts of city growth.

Q.3 Solve any two. **12**

a) Describe the cities' role in national development.
b) Describe the essential characteristics of a city or town.
c) Describe levels of an urban planning or forms of planning.

Section – II

Q.4 Solve any four. **16**

a) Describe in detail an urban renewal.
b) Explain in detail need for an urban design.
c) Describe in detail with sketch vista and skyline.
d) Describe in detail the public realm.
e) Describe about survey for an urban design.
f) Describe about an urban design scheme.

Q.5 Solve any two. **12**

a) Explain relevance of an urban design in planning and an architecture.
b) Describe in detail elements of city by Kevin Lynch with sketches.
c) Describe in detail contents of an aesthetic plan.

SLR-BD-50

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options **14**

1) The one of the administrative measures for urban renewal is ____
a) To demolish all buildings
b) To restore the area to its original functions
c) To build new skyscrapers
d) To increase traffic congestion

2) The relevance of urban design in planning and architecture is to ____
a) create aesthetically pleasing environments
b) focus solely on economic development
c) ignore community needs
d) only concern with transportation

3) What does urban design help to inform?
a) Land use planning b) Only transportation systems
c) Only economic policies d) Only aesthetic policies

4) What does the concept of legibility refer to?
a) The aesthetic appeal of a city
b) The ease of understanding the layout of a place
c) The number of buildings in a city
d) The historical significance of urban areas

5) What are the three main types of urban form aspects?
a) Density, grain, and spatial pattern
b) Height, width, and depth
c) colour, shape, and size
d) Population, traffic, and land use

6) Urban aesthetics refer to ____
a) The visual and sensory experiences created by urban design
b) The economic status of a city
c) The historical significance of urban areas
d) The geographical layout of a town

7) What does the Economic Survey classify workers by?
a) Nature of employment b) Age
c) Education level d) Housing status

8) One of the concrete technical aspects defining urban is ____
a) Population size b) Cultural heritage
c) Historical significance d) Natural resources

9) One of the definitions of urban planning according to scholars is ____
a) The study of rural areas
b) The discipline of designing and regulating space
c) The process of agricultural development
d) The management of natural resources

10) The first step in the physical planning process is ____
a) Survey and data collection
b) Identification of the problems and needs of the area
c) Formulation of alternative strategies
d) Implementation of the plan

11) What is a characteristic of a city?
a) It is primarily focused on agriculture
b) It has a small population density
c) It is a politically autonomous settlement
d) It is a temporary settlement

12) The natural factors that can force populations to move to cities ____
a) Economic opportunities
b) Environmental and climatic changes
c) Historical events
d) Urban planning

13) What is a major cause of urbanization related to employment?
a) Rural-urban transformation b) Increased agricultural jobs
c) Decline in industrial jobs d) Higher birth rates

14) What is a potential risk associated with urban growth?
a) Lower crime rates
b) Higher chances of disasters and resource loss
c) Improved infrastructure
d) Increased agricultural output

SLR-BD-50

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch wherever necessary.

Section – I

Q.2 Solve any four. **16**

a) Describe the concentric zone model.
b) Explain density control in detail
c) Explain the urban concentrations factors.
d) Explain the urban settlements.
e) Describe why cities are complex and adaptive with key features.
f) Describe the positive impacts of city growth.

Q.3 Solve any two. **12**

a) Describe the cities' role in national development.
b) Describe the essential characteristics of a city or town.
c) Describe levels of an urban planning or forms of planning.

Section – II

Q.4 Solve any four. **16**

a) Describe in detail an urban renewal.
b) Explain in detail need for an urban design.
c) Describe in detail with sketch vista and skyline.
d) Describe in detail the public realm.
e) Describe about survey for an urban design.
f) Describe about an urban design scheme.

Q.5 Solve any two. **12**

a) Explain relevance of an urban design in planning and an architecture.
b) Describe in detail elements of city by Kevin Lynch with sketches.
c) Describe in detail contents of an aesthetic plan.

SLR-BD-50

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options **14**

1) What does the concept of legibility refer to?
a) The aesthetic appeal of a city
b) The ease of understanding the layout of a place
c) The number of buildings in a city
d) The historical significance of urban areas

2) What are the three main types of urban form aspects?
a) Density, grain, and spatial pattern
b) Height, width, and depth
c) colour, shape, and size
d) Population, traffic, and land use

3) Urban aesthetics refer to ____
a) The visual and sensory experiences created by urban design
b) The economic status of a city
c) The historical significance of urban areas
d) The geographical layout of a town

4) What does the Economic Survey classify workers by?
a) Nature of employment b) Age
c) Education level d) Housing status

5) One of the concrete technical aspects defining urban is ____
a) Population size b) Cultural heritage
c) Historical significance d) Natural resources

6) One of the definitions of urban planning according to scholars is ____
a) The study of rural areas
b) The discipline of designing and regulating space
c) The process of agricultural development
d) The management of natural resources

7) The first step in the physical planning process is ____
a) Survey and data collection
b) Identification of the problems and needs of the area
c) Formulation of alternative strategies
d) Implementation of the plan

8) What is a characteristic of a city?
a) It is primarily focused on agriculture
b) It has a small population density
c) It is a politically autonomous settlement
d) It is a temporary settlement

9) The natural factors that can force populations to move to cities ____
a) Economic opportunities
b) Environmental and climatic changes
c) Historical events
d) Urban planning

10) What is a major cause of urbanization related to employment?
a) Rural-urban transformation b) Increased agricultural jobs
c) Decline in industrial jobs d) Higher birth rates

11) What is a potential risk associated with urban growth?
a) Lower crime rates
b) Higher chances of disasters and resource loss
c) Improved infrastructure
d) Increased agricultural output

12) The one of the administrative measures for urban renewal is ____
a) To demolish all buildings
b) To restore the area to its original functions
c) To build new skyscrapers
d) To increase traffic congestion

13) The relevance of urban design in planning and architecture is to ____
a) create aesthetically pleasing environments
b) focus solely on economic development
c) ignore community needs
d) only concern with transportation

14) What does urban design help to inform?
a) Land use planning b) Only transportation systems
c) Only economic policies d) Only aesthetic policies

SLR-BD-50

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch wherever necessary.

Section – I

Q.2 Solve any four. **16**

a) Describe the concentric zone model.
b) Explain density control in detail
c) Explain the urban concentrations factors.
d) Explain the urban settlements.
e) Describe why cities are complex and adaptive with key features.
f) Describe the positive impacts of city growth.

Q.3 Solve any two. **12**

a) Describe the cities' role in national development.
b) Describe the essential characteristics of a city or town.
c) Describe levels of an urban planning or forms of planning.

Section – II

Q.4 Solve any four. **16**

a) Describe in detail an urban renewal.
b) Explain in detail need for an urban design.
c) Describe in detail with sketch vista and skyline.
d) Describe in detail the public realm.
e) Describe about survey for an urban design.
f) Describe about an urban design scheme.

Q.5 Solve any two. **12**

a) Explain relevance of an urban design in planning and an architecture.
b) Describe in detail elements of city by Kevin Lynch with sketches.
c) Describe in detail contents of an aesthetic plan.

SLR-BD-50

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options **14**

1) What is a major cause of urbanization related to employment?
a) Rural-urban transformation b) Increased agricultural jobs
c) Decline in industrial jobs d) Higher birth rates

2) What is a potential risk associated with urban growth?
a) Lower crime rates
b) Higher chances of disasters and resource loss
c) Improved infrastructure
d) Increased agricultural output

3) The one of the administrative measures for urban renewal is ____
a) To demolish all buildings
b) To restore the area to its original functions
c) To build new skyscrapers
d) To increase traffic congestion

4) The relevance of urban design in planning and architecture is to ____
a) create aesthetically pleasing environments
b) focus solely on economic development
c) ignore community needs
d) only concern with transportation

5) What does urban design help to inform?
a) Land use planning b) Only transportation systems
c) Only economic policies d) Only aesthetic policies

6) What does the concept of legibility refer to?
a) The aesthetic appeal of a city
b) The ease of understanding the layout of a place
c) The number of buildings in a city
d) The historical significance of urban areas

7) What are the three main types of urban form aspects?
a) Density, grain, and spatial pattern
b) Height, width, and depth
c) colour, shape, and size
d) Population, traffic, and land use

8) Urban aesthetics refer to ____
a) The visual and sensory experiences created by urban design
b) The economic status of a city
c) The historical significance of urban areas
d) The geographical layout of a town

9) What does the Economic Survey classify workers by?
a) Nature of employment b) Age
c) Education level d) Housing status

10) One of the concrete technical aspects defining urban is ____
a) Population size b) Cultural heritage
c) Historical significance d) Natural resources

11) One of the definitions of urban planning according to scholars is ____
a) The study of rural areas
b) The discipline of designing and regulating space
c) The process of agricultural development
d) The management of natural resources

12) The first step in the physical planning process is ____
a) Survey and data collection
b) Identification of the problems and needs of the area
c) Formulation of alternative strategies
d) Implementation of the plan

13) What is a characteristic of a city?
a) It is primarily focused on agriculture
b) It has a small population density
c) It is a politically autonomous settlement
d) It is a temporary settlement

14) The natural factors that can force populations to move to cities ____
a) Economic opportunities
b) Environmental and climatic changes
c) Historical events
d) Urban planning

SLR-BD-50

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch wherever necessary.

Section – I

Q.2 Solve any four. **16**

a) Describe the concentric zone model.
b) Explain density control in detail
c) Explain the urban concentrations factors.
d) Explain the urban settlements.
e) Describe why cities are complex and adaptive with key features.
f) Describe the positive impacts of city growth.

Q.3 Solve any two. **12**

a) Describe the cities' role in national development.
b) Describe the essential characteristics of a city or town.
c) Describe levels of an urban planning or forms of planning.

Section – II

Q.4 Solve any four. **16**

a) Describe in detail an urban renewal.
b) Explain in detail need for an urban design.
c) Describe in detail with sketch vista and skyline.
d) Describe in detail the public realm.
e) Describe about survey for an urban design.
f) Describe about an urban design scheme.

Q.5 Solve any two. **12**

a) Explain relevance of an urban design in planning and an architecture.
b) Describe in detail elements of city by Kevin Lynch with sketches.
c) Describe in detail contents of an aesthetic plan.

SLR-BD-50

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options 14

1) One of the concrete technical aspects defining urban is ____
a) Population size b) Cultural heritage
c) Historical significance d) Natural resources

2) One of the definitions of urban planning according to scholars is ____
a) The study of rural areas
b) The discipline of designing and regulating space
c) The process of agricultural development
d) The management of natural resources

3) The first step in the physical planning process is ____
a) Survey and data collection
b) Identification of the problems and needs of the area
c) Formulation of alternative strategies
d) Implementation of the plan

4) What is a characteristic of a city?
a) It is primarily focused on agriculture
b) It has a small population density
c) It is a politically autonomous settlement
d) It is a temporary settlement

5) The natural factors that can force populations to move to cities ____
a) Economic opportunities
b) Environmental and climatic changes
c) Historical events
d) Urban planning

6) What is a major cause of urbanization related to employment?
a) Rural-urban transformation b) Increased agricultural jobs
c) Decline in industrial jobs d) Higher birth rates

7) What is a potential risk associated with urban growth?
a) Lower crime rates
b) Higher chances of disasters and resource loss
c) Improved infrastructure
d) Increased agricultural output

8) The one of the administrative measures for urban renewal is ____
a) To demolish all buildings
b) To restore the area to its original functions
c) To build new skyscrapers
d) To increase traffic congestion

9) The relevance of urban design in planning and architecture is to ____
a) create aesthetically pleasing environments
b) focus solely on economic development
c) ignore community needs
d) only concern with transportation

10) What does urban design help to inform?
a) Land use planning b) Only transportation systems
c) Only economic policies d) Only aesthetic policies

11) What does the concept of legibility refer to?
a) The aesthetic appeal of a city
b) The ease of understanding the layout of a place
c) The number of buildings in a city
d) The historical significance of urban areas

12) What are the three main types of urban form aspects?
a) Density, grain, and spatial pattern
b) Height, width, and depth
c) colour, shape, and size
d) Population, traffic, and land use

13) Urban aesthetics refer to ____
a) The visual and sensory experiences created by urban design
b) The economic status of a city
c) The historical significance of urban areas
d) The geographical layout of a town

14) What does the Economic Survey classify workers by?
a) Nature of employment b) Age
c) Education level d) Housing status

SLR-BD-50

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch wherever necessary.

Section – I

Q.2 Solve any four. **16**

a) Describe the concentric zone model.
b) Explain density control in detail
c) Explain the urban concentrations factors.
d) Explain the urban settlements.
e) Describe why cities are complex and adaptive with key features.
f) Describe the positive impacts of city growth.

Q.3 Solve any two. **12**

a) Describe the cities' role in national development.
b) Describe the essential characteristics of a city or town.
c) Describe levels of an urban planning or forms of planning.

Section – II

Q.4 Solve any four. **16**

a) Describe in detail an urban renewal.
b) Explain in detail need for an urban design.
c) Describe in detail with sketch vista and skyline.
d) Describe in detail the public realm.
e) Describe about survey for an urban design.
f) Describe about an urban design scheme.

Q.5 Solve any two. **12**

a) Explain relevance of an urban design in planning and an architecture.
b) Describe in detail elements of city by Kevin Lynch with sketches.
c) Describe in detail contents of an aesthetic plan.

SLR-BD-50

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options **14**

1) The one of the administrative measures for urban renewal is ____
a) To demolish all buildings
b) To restore the area to its original functions
c) To build new skyscrapers
d) To increase traffic congestion

2) The relevance of urban design in planning and architecture is to ____
a) create aesthetically pleasing environments
b) focus solely on economic development
c) ignore community needs
d) only concern with transportation

3) What does urban design help to inform?
a) Land use planning b) Only transportation systems
c) Only economic policies d) Only aesthetic policies

4) What does the concept of legibility refer to?
a) The aesthetic appeal of a city
b) The ease of understanding the layout of a place
c) The number of buildings in a city
d) The historical significance of urban areas

5) What are the three main types of urban form aspects?
a) Density, grain, and spatial pattern
b) Height, width, and depth
c) colour, shape, and size
d) Population, traffic, and land use

6) Urban aesthetics refer to ____
a) The visual and sensory experiences created by urban design
b) The economic status of a city
c) The historical significance of urban areas
d) The geographical layout of a town

7) What does the Economic Survey classify workers by?
a) Nature of employment b) Age
c) Education level d) Housing status

8) One of the concrete technical aspects defining urban is ____
a) Population size b) Cultural heritage
c) Historical significance d) Natural resources

9) One of the definitions of urban planning according to scholars is ____
a) The study of rural areas
b) The discipline of designing and regulating space
c) The process of agricultural development
d) The management of natural resources

10) The first step in the physical planning process is ____
a) Survey and data collection
b) Identification of the problems and needs of the area
c) Formulation of alternative strategies
d) Implementation of the plan

11) What is a characteristic of a city?
a) It is primarily focused on agriculture
b) It has a small population density
c) It is a politically autonomous settlement
d) It is a temporary settlement

12) The natural factors that can force populations to move to cities ____
a) Economic opportunities
b) Environmental and climatic changes
c) Historical events
d) Urban planning

13) What is a major cause of urbanization related to employment?
a) Rural-urban transformation b) Increased agricultural jobs
c) Decline in industrial jobs d) Higher birth rates

14) What is a potential risk associated with urban growth?
a) Lower crime rates
b) Higher chances of disasters and resource loss
c) Improved infrastructure
d) Increased agricultural output

SLR-BD-50

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch wherever necessary.

Section – I

Q.2 Solve any four. **16**

a) Describe the concentric zone model.
b) Explain density control in detail
c) Explain the urban concentrations factors.
d) Explain the urban settlements.
e) Describe why cities are complex and adaptive with key features.
f) Describe the positive impacts of city growth.

Q.3 Solve any two. **12**

a) Describe the cities' role in national development.
b) Describe the essential characteristics of a city or town.
c) Describe levels of an urban planning or forms of planning.

Section – II

Q.4 Solve any four. **16**

a) Describe in detail an urban renewal.
b) Explain in detail need for an urban design.
c) Describe in detail with sketch vista and skyline.
d) Describe in detail the public realm.
e) Describe about survey for an urban design.
f) Describe about an urban design scheme.

Q.5 Solve any two. **12**

a) Explain relevance of an urban design in planning and an architecture.
b) Describe in detail elements of city by Kevin Lynch with sketches.
c) Describe in detail contents of an aesthetic plan.

SLR-BD-50

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options 14

1) What does the concept of legibility refer to?
a) The aesthetic appeal of a city
b) The ease of understanding the layout of a place
c) The number of buildings in a city
d) The historical significance of urban areas

2) What are the three main types of urban form aspects?
a) Density, grain, and spatial pattern
b) Height, width, and depth
c) colour, shape, and size
d) Population, traffic, and land use

3) Urban aesthetics refer to ____
a) The visual and sensory experiences created by urban design
b) The economic status of a city
c) The historical significance of urban areas
d) The geographical layout of a town

4) What does the Economic Survey classify workers by?
a) Nature of employment b) Age
c) Education level d) Housing status

5) One of the concrete technical aspects defining urban is ____
a) Population size b) Cultural heritage
c) Historical significance d) Natural resources

6) One of the definitions of urban planning according to scholars is ____
a) The study of rural areas
b) The discipline of designing and regulating space
c) The process of agricultural development
d) The management of natural resources

7) The first step in the physical planning process is ____
a) Survey and data collection
b) Identification of the problems and needs of the area
c) Formulation of alternative strategies
d) Implementation of the plan

8) What is a characteristic of a city?
a) It is primarily focused on agriculture
b) It has a small population density
c) It is a politically autonomous settlement
d) It is a temporary settlement

9) The natural factors that can force populations to move to cities ____
a) Economic opportunities
b) Environmental and climatic changes
c) Historical events
d) Urban planning

10) What is a major cause of urbanization related to employment?
a) Rural-urban transformation b) Increased agricultural jobs
c) Decline in industrial jobs d) Higher birth rates

11) What is a potential risk associated with urban growth?
a) Lower crime rates
b) Higher chances of disasters and resource loss
c) Improved infrastructure
d) Increased agricultural output

12) The one of the administrative measures for urban renewal is ____
a) To demolish all buildings
b) To restore the area to its original functions
c) To build new skyscrapers
d) To increase traffic congestion

13) The relevance of urban design in planning and architecture is to ____
a) create aesthetically pleasing environments
b) focus solely on economic development
c) ignore community needs
d) only concern with transportation

14) What does urban design help to inform?
a) Land use planning b) Only transportation systems
c) Only economic policies d) Only aesthetic policies

SLR-BD-50

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch wherever necessary.

Section – I

Q.2 Solve any four. **16**

a) Describe the concentric zone model.
b) Explain density control in detail
c) Explain the urban concentrations factors.
d) Explain the urban settlements.
e) Describe why cities are complex and adaptive with key features.
f) Describe the positive impacts of city growth.

Q.3 Solve any two. **12**

a) Describe the cities' role in national development.
b) Describe the essential characteristics of a city or town.
c) Describe levels of an urban planning or forms of planning.

Section – II

Q.4 Solve any four. **16**

a) Describe in detail an urban renewal.
b) Explain in detail need for an urban design.
c) Describe in detail with sketch vista and skyline.
d) Describe in detail the public realm.
e) Describe about survey for an urban design.
f) Describe about an urban design scheme.

Q.5 Solve any two. **12**

a) Explain relevance of an urban design in planning and an architecture.
b) Describe in detail elements of city by Kevin Lynch with sketches.
c) Describe in detail contents of an aesthetic plan.

SLR-BD-50

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options **14**

1) What is a major cause of urbanization related to employment?
a) Rural-urban transformation b) Increased agricultural jobs
c) Decline in industrial jobs d) Higher birth rates

2) What is a potential risk associated with urban growth?
a) Lower crime rates
b) Higher chances of disasters and resource loss
c) Improved infrastructure
d) Increased agricultural output

3) The one of the administrative measures for urban renewal is ____
a) To demolish all buildings
b) To restore the area to its original functions
c) To build new skyscrapers
d) To increase traffic congestion

4) The relevance of urban design in planning and architecture is to ____
a) create aesthetically pleasing environments
b) focus solely on economic development
c) ignore community needs
d) only concern with transportation

5) What does urban design help to inform?
a) Land use planning b) Only transportation systems
c) Only economic policies d) Only aesthetic policies

6) What does the concept of legibility refer to?
a) The aesthetic appeal of a city
b) The ease of understanding the layout of a place
c) The number of buildings in a city
d) The historical significance of urban areas

7) What are the three main types of urban form aspects?
a) Density, grain, and spatial pattern
b) Height, width, and depth
c) colour, shape, and size
d) Population, traffic, and land use

8) Urban aesthetics refer to ____
a) The visual and sensory experiences created by urban design
b) The economic status of a city
c) The historical significance of urban areas
d) The geographical layout of a town

9) What does the Economic Survey classify workers by?
a) Nature of employment b) Age
c) Education level d) Housing status

10) One of the concrete technical aspects defining urban is ____
a) Population size b) Cultural heritage
c) Historical significance d) Natural resources

11) One of the definitions of urban planning according to scholars is ____
a) The study of rural areas
b) The discipline of designing and regulating space
c) The process of agricultural development
d) The management of natural resources

12) The first step in the physical planning process is ____
a) Survey and data collection
b) Identification of the problems and needs of the area
c) Formulation of alternative strategies
d) Implementation of the plan

13) What is a characteristic of a city?
a) It is primarily focused on agriculture
b) It has a small population density
c) It is a politically autonomous settlement
d) It is a temporary settlement

14) The natural factors that can force populations to move to cities ____
a) Economic opportunities
b) Environmental and climatic changes
c) Historical events
d) Urban planning

SLR-BD-50

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Urban Planning and Design (CIVMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch wherever necessary.

Section – I

Q.2 Solve any four. **16**

a) Describe the concentric zone model.
b) Explain density control in detail
c) Explain the urban concentrations factors.
d) Explain the urban settlements.
e) Describe why cities are complex and adaptive with key features.
f) Describe the positive impacts of city growth.

Q.3 Solve any two. **12**

a) Describe the cities' role in national development.
b) Describe the essential characteristics of a city or town.
c) Describe levels of an urban planning or forms of planning.

Section – II

Q.4 Solve any four. **16**

a) Describe in detail an urban renewal.
b) Explain in detail need for an urban design.
c) Describe in detail with sketch vista and skyline.
d) Describe in detail the public realm.
e) Describe about survey for an urban design.
f) Describe about an urban design scheme.

Q.5 Solve any two. **12**

a) Explain relevance of an urban design in planning and an architecture.
b) Describe in detail elements of city by Kevin Lynch with sketches.
c) Describe in detail contents of an aesthetic plan.

SLR-BD-51

Seat No.	

Set P

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Managing Innovation and Entrepreneurship (CIVHON-02A)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Who is considered the father of modern entrepreneurship theory?
a) Peter Drucker b) Joseph Schumpeter
c) Steve Jobs d) Elon Musk

2) Which of the following is not an entrepreneurial competency?
a) Innovation b) Risk taking
c) Delegation d) Procrastination

3) Purposeful innovation aims to: _____
a) Copy existing products b) Increase production only
c) Create customer value d) Avoid competition

4) Which of the following is not among Drucker's 7 sources of innovation?
a) Unexpected occurrences b) Industry trends
c) Incongruities d) Demographics

5) The innovation process starts with: _____
a) Commercialization b) Brainstorming
c) Idea generation d) Market research

6) Planning is considered _____ with innovation in entrepreneurship.
a) Compatible b) Irrelevant
c) Incompatible d) Essential

7) Which of the following strategies helps in introducing innovation?
a) Routine planning b) Budget allocation
c) Market differentiation d) Employee orientation

8) The need for achievement in entrepreneurship is best described by: ____
a) Motivation to make profits
b) Desire to be famous
c) Inner urge to achieve goals
d) External rewards

9) nAch is related to: _____
a) Financial success
b) Need for Achievement
c) National Achievement
d) None of the above

10) Continuous learning in entrepreneurship implies: _____
a) Attending more meetings
b) Regular assessments
c) Lifelong updating of skills
d) Starting multiple businesses

11) Which of the following best defines international entrepreneurship?
a) Export only business
b) Domestic expansion
c) Global business ventures
d) Outsourcing work

12) Strategic issues in international entrepreneurship include: _____
a) Tax filing
b) Product returns
c) Market entry, alliances, IP
d) Daily operations

13) Ethics in international entrepreneurship requires: _____
a) Hiding losses
b) Transparency and fair trade
c) Higher taxes
d) None of the above

14) Problem identification involves: _____
a) Avoiding issues
b) Recognizing the root cause
c) Hiring a manager
d) Launching new products

SLR-BD-51

Seat No.	

Set P

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Managing Innovation and Entrepreneurship (CIVHON-02A)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

Section – I

Q.2 All questions are compulsory.

a) Explain the evolution of entrepreneurship from economic theory. **06**
b) Define innovation and explain any two sources of innovation. **04**

Q.3 Solve any three questions.

a) Describe the key competencies required for successful entrepreneurship. **06**
b) Explain the shift in the economy and its impact on innovation. **06**
c) Explain the role of strategy in introducing innovation in a company. **06**
d) What are the challenges in combining planning with innovation? **06**
e) Illustrate with examples how innovation and entrepreneurship go hand in hand. **06**

Section – II

Q.4 All questions are compulsory.

a) Explain the concept of entrepreneurial motivation with the help of the nAch story. **06**
b) Write a short note on the need for continuous learning in entrepreneurship. **04**

Q.5 Solve any three questions.

a) Discuss the nature and concepts of international entrepreneurship. **06**
b) What are the ethical considerations in international entrepreneurship? **06**
c) Explain the importance of innovation in problem-solving. **06**
d) How does diversification contribute to entrepreneurial growth? **06**
e) Illustrate the process of problem identification with a suitable example. **06**

SLR-BD-51

Seat No.		Set	Q

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Managing Innovation and Entrepreneurship (CIVHON-02A)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer: 14

1) The need for achievement in entrepreneurship is best described by: ____
a) Motivation to make profits
b) Desire to be famous
c) Inner urge to achieve goals
d) External rewards

2) nAch is related to: _____
a) Financial success b) Need for Achievement
c) National Achievement d) None of the above

3) Continuous learning in entrepreneurship implies: _____
a) Attending more meetings b) Regular assessments
c) Lifelong updating of skills d) Starting multiple businesses

4) Which of the following best defines international entrepreneurship?
a) Export only business b) Domestic expansion
c) Global business ventures d) Outsourcing work

5) Strategic issues in international entrepreneurship include: _____
a) Tax filing b) Product returns
c) Market entry, alliances, IP d) Daily operations

6) Ethics in international entrepreneurship requires: _____
a) Hiding losses b) Transparency and fair trade
c) Higher taxes d) None of the above

7) Problem identification involves: _____
a) Avoiding issues b) Recognizing the root cause
c) Hiring a manager d) Launching new products

8) Who is considered the father of modern entrepreneurship theory?
a) Peter Drucker b) Joseph Schumpeter
c) Steve Jobs d) Elon Musk

9) Which of the following is not an entrepreneurial competency?
a) Innovation b) Risk taking
c) Delegation d) Procrastination

10) Purposeful innovation aims to: _____
a) Copy existing products b) Increase production only
c) Create customer value d) Avoid competition

11) Which of the following is not among Drucker's 7 sources of innovation?
a) Unexpected occurrences b) Industry trends
c) Incongruities d) Demographics

12) The innovation process starts with: _____
a) Commercialization b) Brainstorming
c) Idea generation d) Market research

13) Planning is considered _____ with innovation in entrepreneurship.
a) Compatible b) Irrelevant
c) Incompatible d) Essential

14) Which of the following strategies helps in introducing innovation?
a) Routine planning b) Budget allocation
c) Market differentiation d) Employee orientation

SLR-BD-51

Seat No.	

Set Q

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Managing Innovation and Entrepreneurship (CIVHON-02A)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

Section – I

Q.2 All questions are compulsory.

a) Explain the evolution of entrepreneurship from economic theory. **06**
b) Define innovation and explain any two sources of innovation. **04**

Q.3 Solve any three questions.

a) Describe the key competencies required for successful entrepreneurship. **06**
b) Explain the shift in the economy and its impact on innovation. **06**
c) Explain the role of strategy in introducing innovation in a company. **06**
d) What are the challenges in combining planning with innovation? **06**
e) Illustrate with examples how innovation and entrepreneurship go hand in hand. **06**

Section – II

Q.4 All questions are compulsory.

a) Explain the concept of entrepreneurial motivation with the help of the nAch story. **06**
b) Write a short note on the need for continuous learning in entrepreneurship. **04**

Q.5 Solve any three questions.

a) Discuss the nature and concepts of international entrepreneurship. **06**
b) What are the ethical considerations in international entrepreneurship? **06**
c) Explain the importance of innovation in problem-solving. **06**
d) How does diversification contribute to entrepreneurial growth? **06**
e) Illustrate the process of problem identification with a suitable example. **06**

SLR-BD-51

Seat No.	

Set R

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Managing Innovation and Entrepreneurship (CIVHON-02A)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer: 14

1) Which of the following best defines international entrepreneurship?
a) Export only business b) Domestic expansion
c) Global business ventures d) Outsourcing work

2) Strategic issues in international entrepreneurship include: _____
a) Tax filing b) Product returns
c) Market entry, alliances, IP d) Daily operations

3) Ethics in international entrepreneurship requires: _____
a) Hiding losses b) Transparency and fair trade
c) Higher taxes d) None of the above

4) Problem identification involves: _____
a) Avoiding issues b) Recognizing the root cause
c) Hiring a manager d) Launching new products

5) Who is considered the father of modern entrepreneurship theory?
a) Peter Drucker b) Joseph Schumpeter
c) Steve Jobs d) Elon Musk

6) Which of the following is not an entrepreneurial competency?
a) Innovation b) Risk taking
c) Delegation d) Procrastination

7) Purposeful innovation aims to: _____
a) Copy existing products b) Increase production only
c) Create customer value d) Avoid competition

8) Which of the following is not among Drucker's 7 sources of innovation?

a) Unexpected occurrences b) Industry trends
c) Incongruities d) Demographics

9) The innovation process starts with: _____

a) Commercialization b) Brainstorming
c) Idea generation d) Market research

10) Planning is considered _____ with innovation in entrepreneurship.

a) Compatible b) Irrelevant
c) Incompatible d) Essential

11) Which of the following strategies helps in introducing innovation?

a) Routine planning b) Budget allocation
c) Market differentiation d) Employee orientation

12) The need for achievement in entrepreneurship is best described by: ____

a) Motivation to make profits
b) Desire to be famous
c) Inner urge to achieve goals
d) External rewards

13) nAch is related to: _____

a) Financial success b) Need for Achievement
c) National Achievement d) None of the above

14) Continuous learning in entrepreneurship implies: _____

a) Attending more meetings b) Regular assessments
c) Lifelong updating of skills d) Starting multiple businesses

SLR-BD-51

Seat No.	

Set R

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Managing Innovation and Entrepreneurship (CIVHON-02A)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

Section – I

Q.2 All questions are compulsory.

a) Explain the evolution of entrepreneurship from economic theory. **06**
b) Define innovation and explain any two sources of innovation. **04**

Q.3 Solve any three questions.

a) Describe the key competencies required for successful entrepreneurship. **06**
b) Explain the shift in the economy and its impact on innovation. **06**
c) Explain the role of strategy in introducing innovation in a company. **06**
d) What are the challenges in combining planning with innovation? **06**
e) Illustrate with examples how innovation and entrepreneurship go hand in hand. **06**

Section – II

Q.4 All questions are compulsory.

a) Explain the concept of entrepreneurial motivation with the help of the nAch story. **06**
b) Write a short note on the need for continuous learning in entrepreneurship. **04**

Q.5 Solve any three questions.

a) Discuss the nature and concepts of international entrepreneurship. **06**
b) What are the ethical considerations in international entrepreneurship? **06**
c) Explain the importance of innovation in problem-solving. **06**
d) How does diversification contribute to entrepreneurial growth? **06**
e) Illustrate the process of problem identification with a suitable example. **06**

SLR-BD-51

Seat No.		Set	S

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Managing Innovation and Entrepreneurship (CIVHON-02A)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer: 14

1) Planning is considered _____ with innovation in entrepreneurship.
a) Compatible b) Irrelevant
c) Incompatible d) Essential

2) Which of the following strategies helps in introducing innovation?
a) Routine planning b) Budget allocation
c) Market differentiation d) Employee orientation

3) The need for achievement in entrepreneurship is best described by: ____
a) Motivation to make profits
b) Desire to be famous
c) Inner urge to achieve goals
d) External rewards

4) nAch is related to: _____
a) Financial success b) Need for Achievement
c) National Achievement d) None of the above

5) Continuous learning in entrepreneurship implies: _____
a) Attending more meetings b) Regular assessments
c) Lifelong updating of skills d) Starting multiple businesses

6) Which of the following best defines international entrepreneurship?
a) Export only business b) Domestic expansion
c) Global business ventures d) Outsourcing work

7) Strategic issues in international entrepreneurship include: _____
a) Tax filing b) Product returns
c) Market entry, alliances, IP d) Daily operations

8) Ethics in international entrepreneurship requires: _____
a) Hiding losses b) Transparency and fair trade
c) Higher taxes d) None of the above

9) Problem identification involves: _____
a) Avoiding issues b) Recognizing the root cause
c) Hiring a manager d) Launching new products

10) Who is considered the father of modern entrepreneurship theory?
a) Peter Drucker b) Joseph Schumpeter
c) Steve Jobs d) Elon Musk

11) Which of the following is not an entrepreneurial competency?
a) Innovation b) Risk taking
c) Delegation d) Procrastination

12) Purposeful innovation aims to: _____
a) Copy existing products b) Increase production only
c) Create customer value d) Avoid competition

13) Which of the following is not among Drucker's 7 sources of innovation?
a) Unexpected occurrences b) Industry trends
c) Incongruities d) Demographics

14) The innovation process starts with: _____
a) Commercialization b) Brainstorming
c) Idea generation d) Market research

SLR-BD-51

Seat No.		Set	S

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Managing Innovation and Entrepreneurship (CIVHON-02A)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.

Section – I

Q.2 All questions are compulsory.

a) Explain the evolution of entrepreneurship from economic theory. **06**
b) Define innovation and explain any two sources of innovation. **04**

Q.3 Solve any three questions.

a) Describe the key competencies required for successful entrepreneurship. **06**
b) Explain the shift in the economy and its impact on innovation. **06**
c) Explain the role of strategy in introducing innovation in a company. **06**
d) What are the challenges in combining planning with innovation? **06**
e) Illustrate with examples how innovation and entrepreneurship go hand in hand. **06**

Section – II

Q.4 All questions are compulsory.

a) Explain the concept of entrepreneurial motivation with the help of the nAch story. **06**
b) Write a short note on the need for continuous learning in entrepreneurship. **04**

Q.5 Solve any three questions.

a) Discuss the nature and concepts of international entrepreneurship. **06**
b) What are the ethical considerations in international entrepreneurship? **06**
c) Explain the importance of innovation in problem-solving. **06**
d) How does diversification contribute to entrepreneurial growth? **06**
e) Illustrate the process of problem identification with a suitable example. **06**

SLR-BD-52

Seat No.		Set	P

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Planning and Design of Rural Roads (CIVHON-02B)

Day & Date: Monday, 09-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever needed & mention it clearly.
5) Draw neat sketches wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Intermediate sight distance is defined as the stopping sight distance.
a) Three time b) one time
c) Twice d) Four time

2) Transition curve is provided at both ends of _____ Curve.
a) Horizontal b) vertical
c) widening d) None of the above

3) What is the Side slope (H: V) for rural Roads when the condition is Embankment in silty/sandy/gravelly soil?
a) 2.5:1 to 3:1 b) 2:1
c) 1:1 to 0.5:1 d) 1/12:1 to 1/16:1

4) The required value of camber is dependent on the type of and rainfall.
a) Pavement b) Embankment
c) Rural d) None of these

5) The maximum super elevation on hill roads should not exceed ____
a) 7% b) 8%
c) 9% d) 10%

6) The type of transition Curve that is generally provided on hill road is _____.
a) Circular b) Cubic parabola
c) Lemniscate spiral d) Spiral

7) The Type of transition Curve that is generally provided on hill road is ____

a) Circular
b) Cubic parabola
c) Lemniscate spiral
d) Spiral

8) The sight distance is measured along the middle of the _____.

a) Inner lane
b) Outer lane
c) Middle lane
d) None of these

9) Minimum thickness of the base of a flexible pavement is _____.

a) 15 cm
b) 20 cm
c) 10 cm
d) 5 cm

10) Which of the following it NOT a critical parameter to control cracking and rutting in a flexible pavement?

a) Tensile strain near the surface close to the edge of the wheel
b) Vertical sub-base strain
c) Vertical subgrade strain
d) Tensile strain at the bottom of bituminous layer

11) What is normally the primary objective of a Self Help Group (SHG)?

a) To provide micro-finance to groups
b) To improve technology of farming
c) To provide high quality seeds
d) To provide education needs

12) The interface treatment provided to plug in the voids of porous surfaces and to bond loose particles in bituminous pavements is called: ____

a) Tack coat
b) Prime coat
c) Seal coat
d) Surface dressing

13) Causeways are the type of _____.

a) Cross drainage structure
b) side drains
c) Sub-surface drainage structure
d) Jelly drains

14) The see page flow is present in _____.

a) Surface drainage
b) Sub surface drainage
c) Camber
d) Cross slope

Seat No.	

Set P

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Planning and Design of Rural Roads (CIVHON-02B)

Day & Date: Monday, 09-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed & mention it clearly.
4) Draw neat sketches wherever necessary.

Section – I

Q.2 Solve any two of the following. **14**

a) Write short note on *''Planning Database in Rural Roads'*.
b) Explain in detail *'Road alignment and Surveys'* in rural roads.
c) Enlist and explain various factors affecting geometric design of roads.

Q.3 Solve any two of the followings. **14**

a) On two way traffic road, speed of overtaking vehicle is 65 kmph and overtaken vehicle is 45 kmph. If average acceleration is 0.92 m/sec^2 and reaction time is 2.5 seconds, calculate Overtaking Sight Distance (OSD).
b) What are the various *'Design parameters'* for Pavement design in Rural Roads?
c) CBR test is performed on flexible pavement and load verses penetration table is shown below, an initial traffic of 30 CVPD, with a growth rate of 6 per cent per annum for a location having annual rainfall of 1200mm. The design life is 10 years. Determine the pavement thickness.

Penetration	0	0.5	1	1.5	2	2.5	3	4	5	7.5	10	12.5
Load (kg)	0	8	26	43	63	75	84	105	114	135	151	165

Section – II

Q.4 Solve any two of the following. **14**

a) Explain the requirements of surface drain; road side drains, shoulder drains, catch water drains.
b) Explain Standard designs of culverts.
c) Explain Construction of *fly ash embankments.*

Q.5 Solve any two of the followings. **14**

a) Explain *quality control in construction.*
b) Explain maintenance of paved roads.
c) Explain the concept of *'Rehabilitation'*

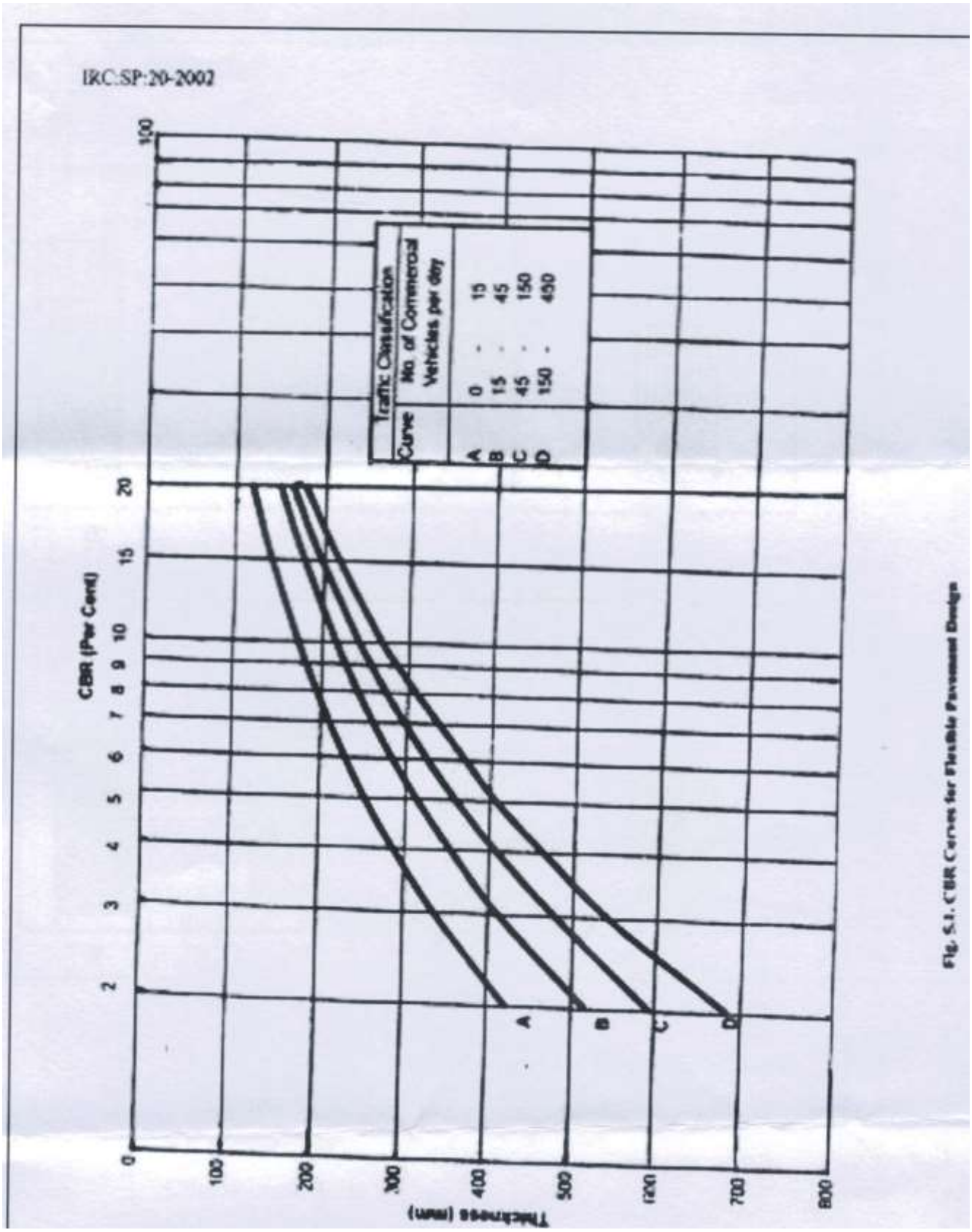
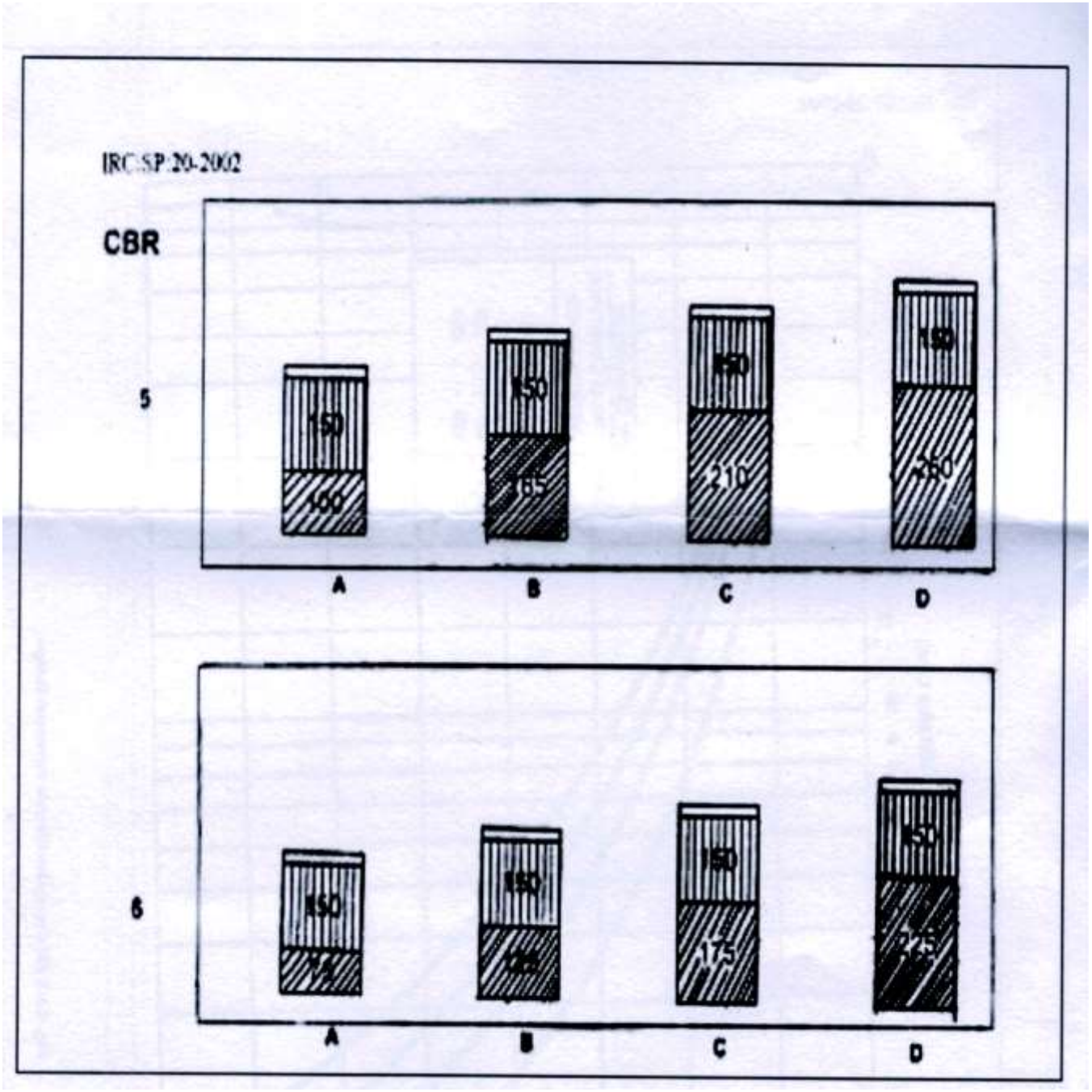


Fig. 5.1. CBR Curves for Flexible Pavement Design


IRC:SP:20-2002
CBR
5
150
100
150
165
150
210
150
260
A
B
C
D
6
150
150
150
175
150
225
A
B
C
D

SLR-BD-52

Seat No.		Set	Q

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Planning and Design of Rural Roads (CIVHON-02B)

Day & Date: Monday, 09-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever needed & mention it clearly.
5) Draw neat sketches wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The sight distance is measured along the middle of the _____.
a) Inner lane b) Outer lane
c) Middle lane d) None of these

2) Minimum thickness of the base of a flexible pavement is _____.
a) 15 cm b) 20 cm
c) 10 cm d) 5 cm

3) Which of the following it NOT a critical parameter to control cracking and rutting in a flexible pavement?
a) Tensile strain near the surface close to the edge of the wheel
b) Vertical sub-base strain
c) Vertical subgrade strain
d) Tensile strain at the bottom of bituminous layer

4) What is normally the primary objective of a Self Help Group (SHG)?
a) To provide micro-finance to groups
b) To improve technology of farming
c) To provide high quality seeds
d) To provide education needs

5) The interface treatment provided to plug in the voids of porous surfaces and to bond loose particles in bituminous pavements is called: ____
a) Tack coat b) Prime coat
c) Seal coat d) Surface dressing

6) Causeways are the type of _____.
a) Cross drainage structure
b) side drains
c) Sub-surface drainage structure
d) Jelly drains

7) The see page flow is present in _____.
a) Surface drainage b) Sub surface drainage
c) Camber d) Cross slope

8) Intermediate sight distance is defined as the stopping sight distance.
a) Three time b) one time
c) Twice d) Four time

9) Transition curve is provided at both ends of _____ Curve.
a) Horizontal b) vertical
c) widening d) None of the above

10) What is the Side slope (H: V) for rural Roads when the condition is Embankment in silty/sandy/gravelly soil?
a) 2.5:1 to 3:1 b) 2:1
c) 1:1 to 0.5:1 d) 1/12:1 to 1/16:1

11) The required value of camber is dependent on the type of and rainfall.
a) Pavement b) Embankment
c) Rural d) None of these

12) The maximum super elevation on hill roads should not exceed ____
a) 7% b) 8%
c) 9% d) 10%

13) The type of transition Curve that is generally provided on hill road is _____.
a) Circular b) Cubic parabola
c) Lemniscate spiral d) Spiral

14) The Type of transition Curve that is generally provided on hill road is ____
a) Circular b) Cubic parabola
c) Lemniscate spiral d) Spiral

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Planning and Design of Rural Roads (CIVHON-02B)

Day & Date: Monday, 09-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed & mention it clearly.
4) Draw neat sketches wherever necessary.

Section – I

Q.2 Solve any two of the following. **14**

a) Write short note on *''Planning Database in Rural Roads'*.
b) Explain in detail *'Road alignment and Surveys'* in rural roads.
c) Enlist and explain various factors affecting geometric design of roads.

Q.3 Solve any two of the followings. **14**

a) On two way traffic road, speed of overtaking vehicle is 65 kmph and overtaken vehicle is 45 kmph. If average acceleration is 0.92 m/sec^2 and reaction time is 2.5 seconds, calculate Overtaking Sight Distance (OSD).
b) What are the various *'Design parameters'* for Pavement design in Rural Roads?
c) CBR test is performed on flexible pavement and load verses penetration table is shown below, an initial traffic of 30 CVPD, with a growth rate of 6 per cent per annum for a location having annual rainfall of 1200mm. The design life is 10 years. Determine the pavement thickness.

Penetration	0	0.5	1	1.5	2	2.5	3	4	5	7.5	10	12.5
Load (kg)	0	8	26	43	63	75	84	105	114	135	151	165

Section – II

Q.4 Solve any two of the following. **14**

a) Explain the requirements of surface drain; road side drains, shoulder drains, catch water drains.
b) Explain Standard designs of culverts.
c) Explain Construction of *fly ash embankments.*

Q.5 Solve any two of the followings. **14**

a) Explain *quality control in construction.*
b) Explain maintenance of paved roads.
c) Explain the concept of *'Rehabilitation'*

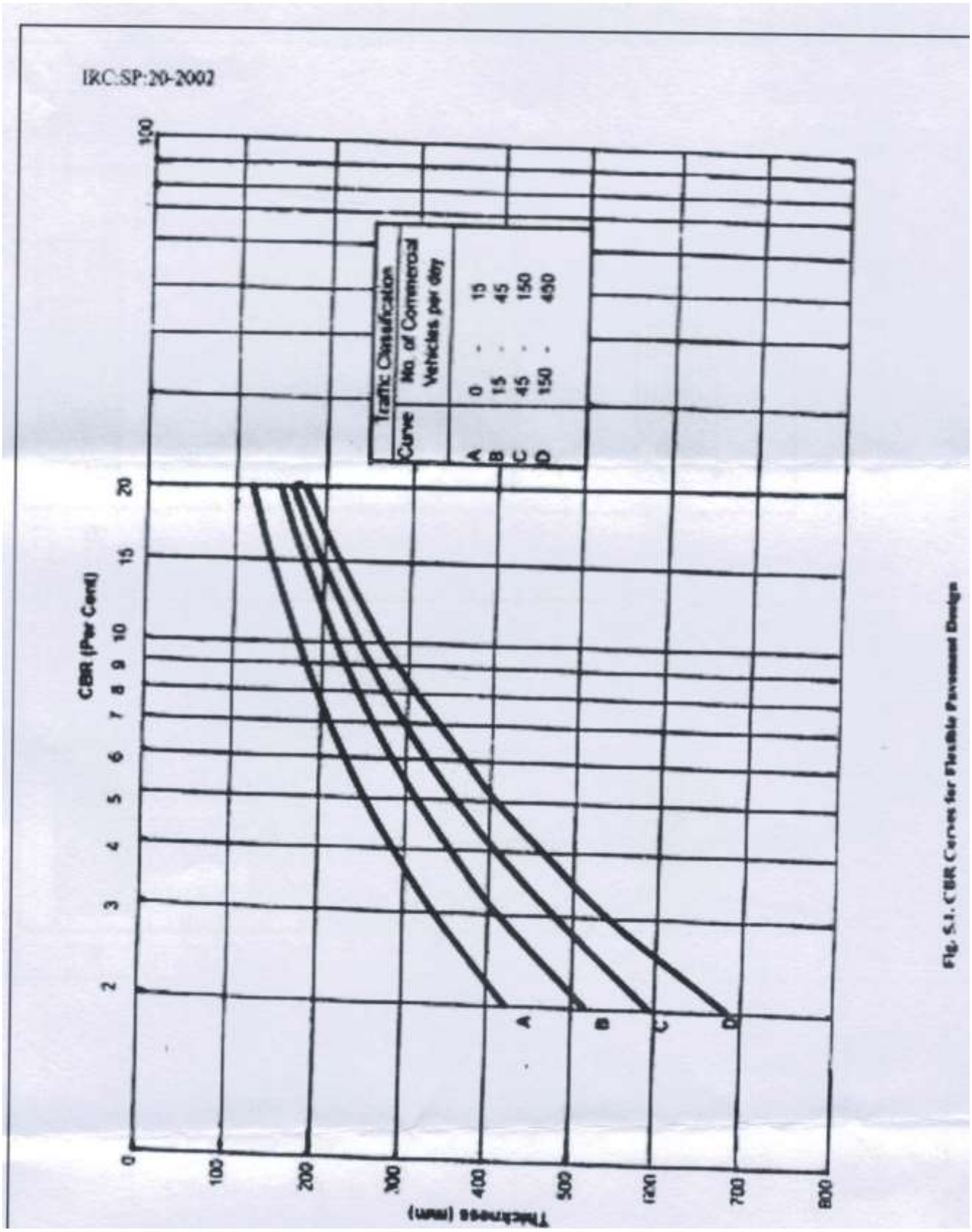
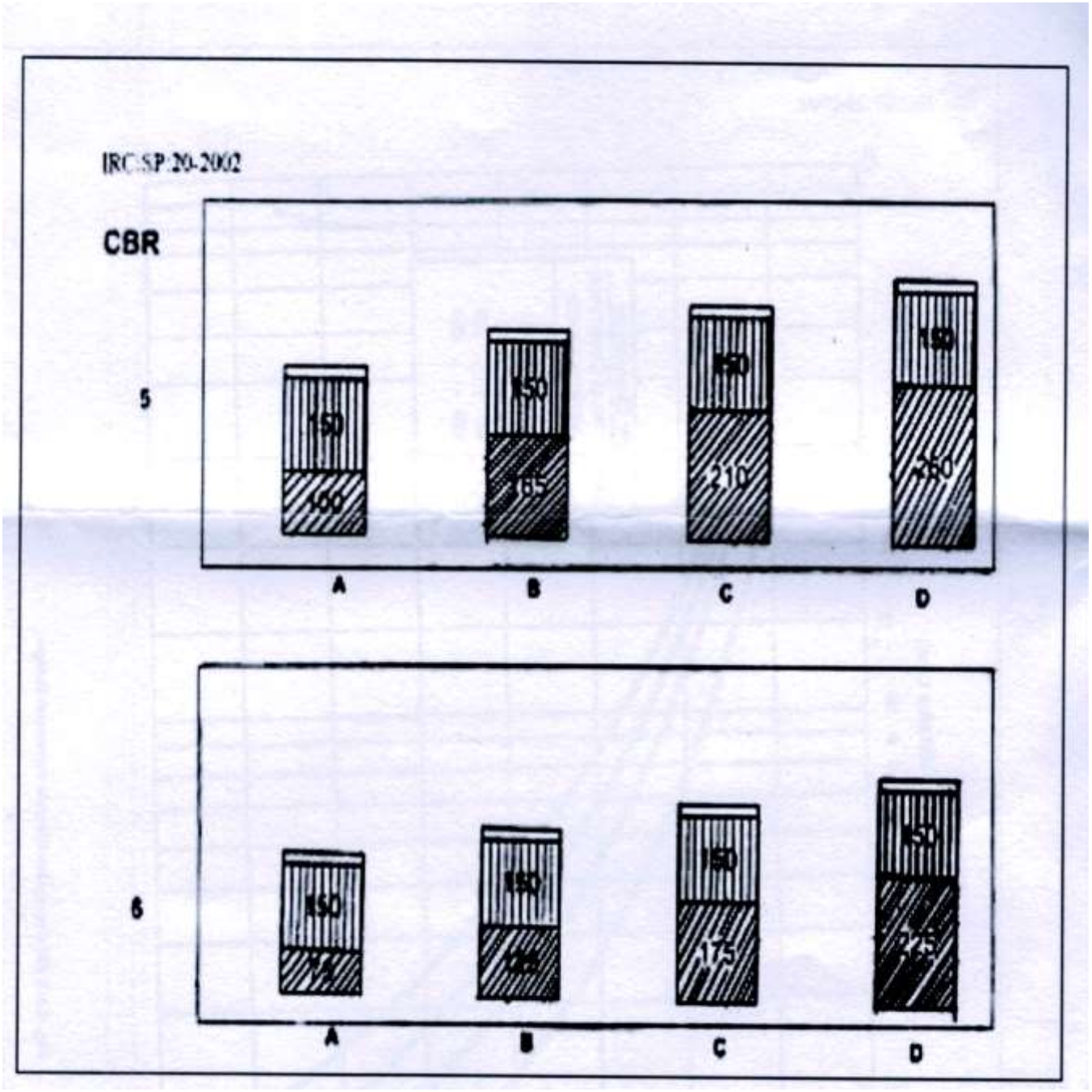


Fig. 5.1. CBR Curves for Flexible Pavement Design


IRC:SP:20-2002
CBR
5
150
100
150
165
150
210
150
260
A
B
C
D
6
150
150
150
175
150
225
A
B
C
D

SLR-BD-52

Seat No.	

Set R

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Planning and Design of Rural Roads (CIVHON-02B)

Day & Date: Monday, 09-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever needed & mention it clearly.
5) Draw neat sketches wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) What is normally the primary objective of a Self Help Group (SHG)?
a) To provide micro-finance to groups
b) To improve technology of farming
c) To provide high quality seeds
d) To provide education needs

2) The interface treatment provided to plug in the voids of porous surfaces and to bond loose particles in bituminous pavements is called: ____
a) Tack coat b) Prime coat
c) Seal coat d) Surface dressing

3) Causeways are the type of _____.
a) Cross drainage structure
b) side drains
c) Sub-surface drainage structure
d) Jelly drains

4) The see page flow is present in _____.
a) Surface drainage b) Sub surface drainage
c) Camber d) Cross slope

5) Intermediate sight distance is defined as the stopping sight distance.
a) Three time b) one time
c) Twice d) Four time

6) Transition curve is provided at both ends of _____ Curve.
a) Horizontal b) vertical
c) widening d) None of the above

7) What is the Side slope (H: V) for rural Roads when the condition is Embankment in silty/sandy/gravelly soil?

a) 2.5:1 to 3:1 b) 2:1
c) 1:1 to 0.5:1 d) 1/12:1 to 1/16:1

8) The required value of camber is dependent on the type of and rainfall.

a) Pavement b) Embankment
c) Rural d) None of these

9) The maximum super elevation on hill roads should not exceed ____

a) 7% b) 8%
c) 9% d) 10%

10) The type of transition Curve that is generally provided on hill road is _____.

a) Circular b) Cubic parabola
c) Lemniscate spiral d) Spiral

11) The Type of transition Curve that is generally provided on hill road is ____

a) Circular b) Cubic parabola
c) Lemniscate spiral d) Spiral

12) The sight distance is measured along the middle of the _____.

a) Inner lane b) Outer lane
c) Middle lane d) None of these

13) Minimum thickness of the base of a flexible pavement is _____.

a) 15 cm b) 20 cm
c) 10 cm d) 5 cm

14) Which of the following it NOT a critical parameter to control cracking and rutting in a flexible pavement?

a) Tensile strain near the surface close to the edge of the wheel
b) Vertical sub-base strain
c) Vertical subgrade strain
d) Tensile strain at the bottom of bituminous layer

SLR-BD-52

Seat No.	

Set R

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Planning and Design of Rural Roads (CIVHON-02B)

Day & Date: Monday, 09-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed & mention it clearly.
4) Draw neat sketches wherever necessary.

Section – I

Q.2 Solve any two of the following. **14**

a) Write short note on *''Planning Database in Rural Roads'*.
b) Explain in detail *'Road alignment and Surveys'* in rural roads.
c) Enlist and explain various factors affecting geometric design of roads.

Q.3 Solve any two of the followings. **14**

a) On two way traffic road, speed of overtaking vehicle is 65 kmph and overtaken vehicle is 45 kmph. If average acceleration is 0.92 m/sec^2 and reaction time is 2.5 seconds, calculate Overtaking Sight Distance (OSD).
b) What are the various *'Design parameters'* for Pavement design in Rural Roads?
c) CBR test is performed on flexible pavement and load verses penetration table is shown below, an initial traffic of 30 CVPD, with a growth rate of 6 per cent per annum for a location having annual rainfall of 1200mm. The design life is 10 years. Determine the pavement thickness.

Penetration	0	0.5	1	1.5	2	2.5	3	4	5	7.5	10	12.5
Load (kg)	0	8	26	43	63	75	84	105	114	135	151	165

Section – II

Q.4 Solve any two of the following. **14**

a) Explain the requirements of surface drain; road side drains, shoulder drains, catch water drains.
b) Explain Standard designs of culverts.
c) Explain Construction of *fly ash embankments.*

Q.5 Solve any two of the followings. **14**

a) Explain *quality control in construction.*
b) Explain maintenance of paved roads.
c) Explain the concept of *'Rehabilitation'*

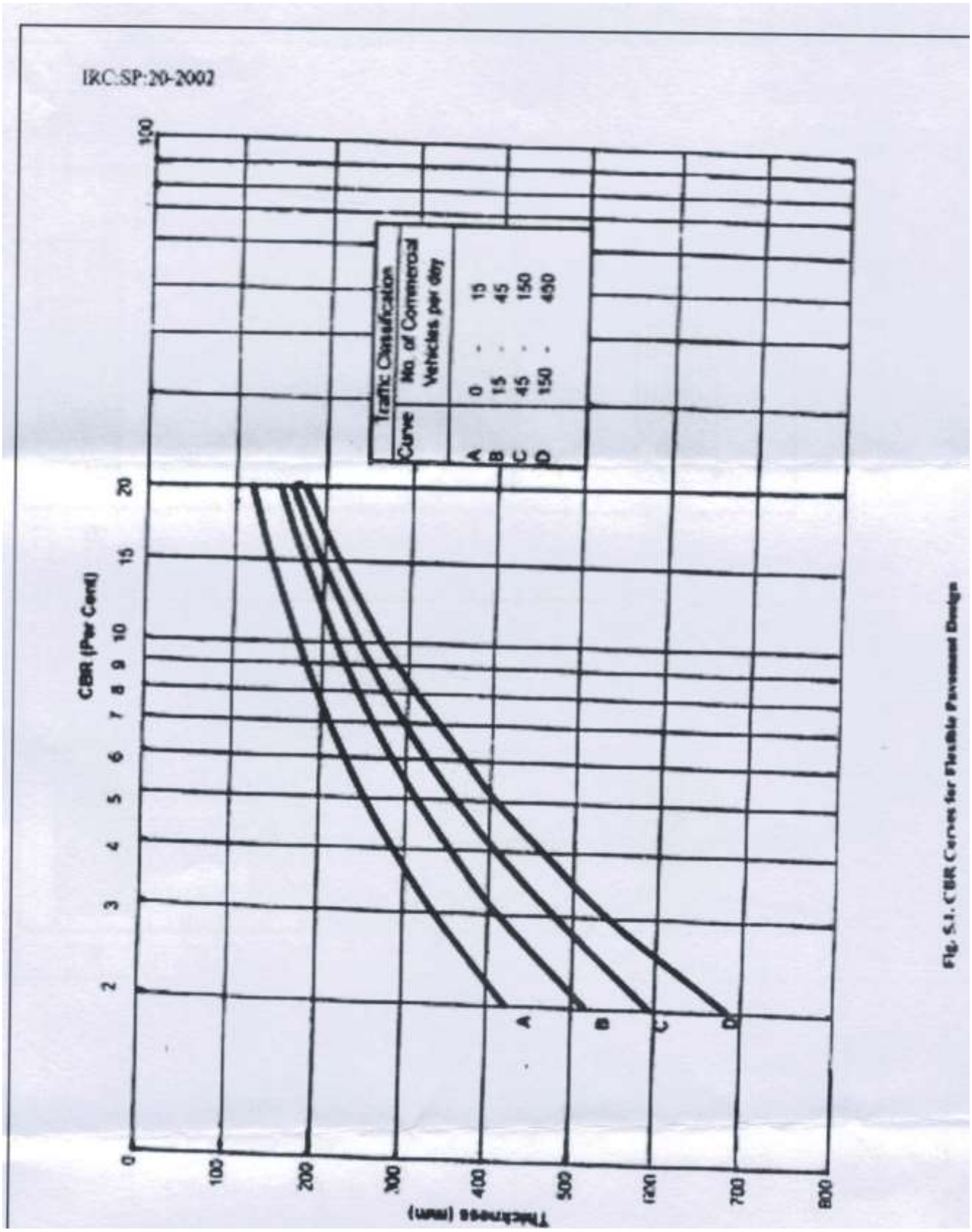
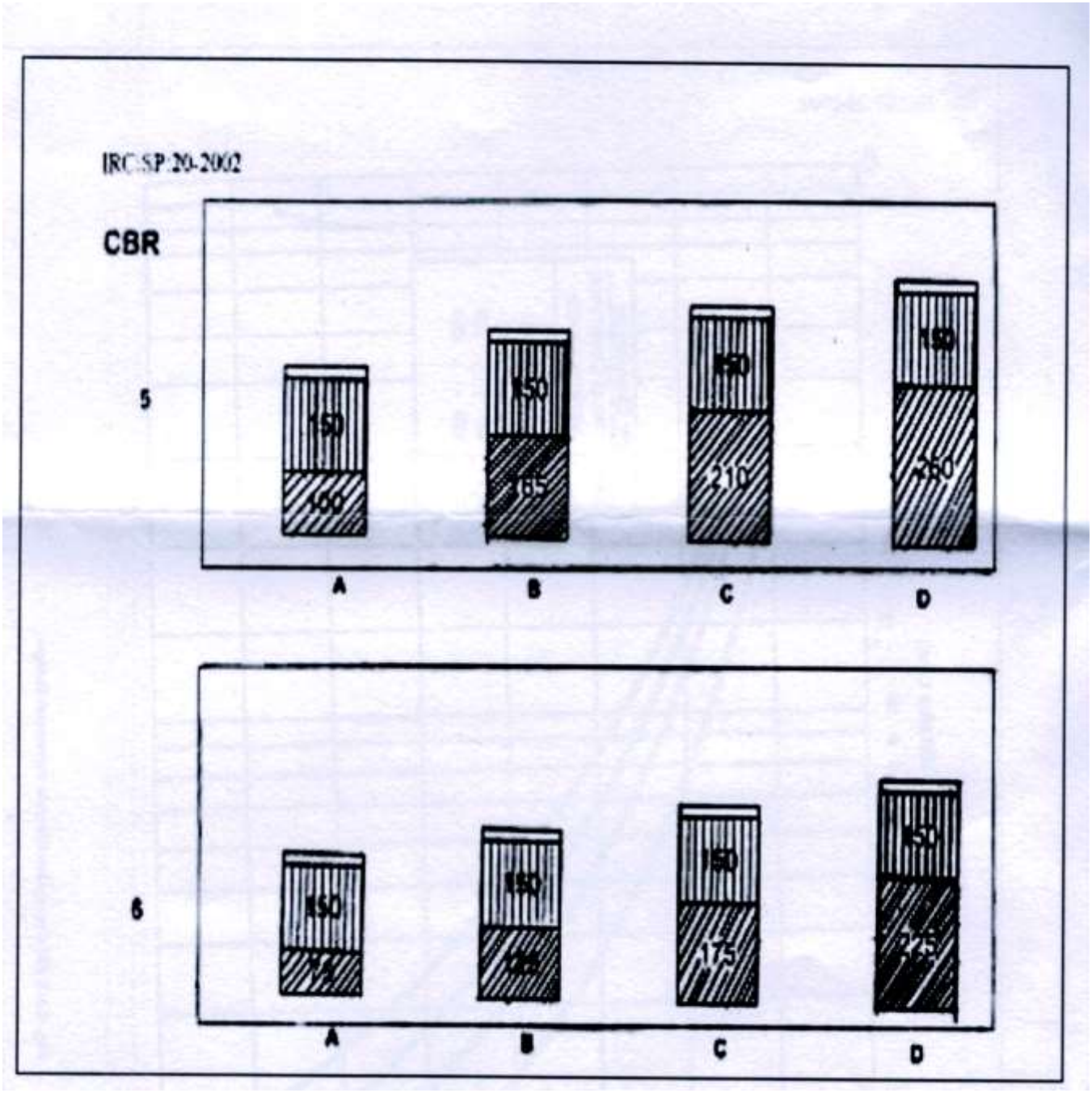


Fig. 5.1. CBR Curves for Flexible Pavement Design


IRC:SP:20-2002
CBR
5
150
100
150
165
150
210
150
260
A
B
C
D
6
150
150
150
175
150
225
A
B
C
D

SLR-BD-52

Seat No.		Set	S

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Planning and Design of Rural Roads (CIVHON-02B)

Day & Date: Monday, 09-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever needed & mention it clearly.
5) Draw neat sketches wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The type of transition Curve that is generally provided on hill road is _____.
a) Circular b) Cubic parabola
c) Lemniscate spiral d) Spiral

2) The Type of transition Curve that is generally provided on hill road is ____
a) Circular b) Cubic parabola
c) Lemniscate spiral d) Spiral

3) The sight distance is measured along the middle of the _____.
a) Inner lane b) Outer lane
c) Middle lane d) None of these

4) Minimum thickness of the base of a flexible pavement is _____.
a) 15 cm b) 20 cm
c) 10 cm d) 5 cm

5) Which of the following it NOT a critical parameter to control cracking and rutting in a flexible pavement?
a) Tensile strain near the surface close to the edge of the wheel
b) Vertical sub-base strain
c) Vertical subgrade strain
d) Tensile strain at the bottom of bituminous layer

6) What is normally the primary objective of a Self Help Group (SHG)?
a) To provide micro-finance to groups
b) To improve technology of farming
c) To provide high quality seeds
d) To provide education needs

7) The interface treatment provided to plug in the voids of porous surfaces and to bond loose particles in bituminous pavements is called: ____
a) Tack coat
b) Prime coat
c) Seal coat
d) Surface dressing

8) Causeways are the type of _____.
a) Cross drainage structure
b) side drains
c) Sub-surface drainage structure
d) Jelly drains

9) The see page flow is present in _____.
a) Surface drainage
b) Sub surface drainage
c) Camber
d) Cross slope

10) Intermediate sight distance is defined as the stopping sight distance.
a) Three time
b) one time
c) Twice
d) Four time

11) Transition curve is provided at both ends of _____ Curve.
a) Horizontal
b) vertical
c) widening
d) None of the above

12) What is the Side slope (H: V) for rural Roads when the condition is Embankment in silty/sandy/gravelly soil?
a) 2.5:1 to 3:1
b) 2:1
c) 1:1 to 0.5:1
d) 1/12:1 to 1/16:1

13) The required value of camber is dependent on the type of and rainfall.
a) Pavement
b) Embankment
c) Rural
d) None of these

14) The maximum super elevation on hill roads should not exceed ____
a) 7%
b) 8%
c) 9%
d) 10%

Seat No.		Set	S

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Planning and Design of Rural Roads (CIVHON-02B)

Day & Date: Monday, 09-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever needed & mention it clearly.
4) Draw neat sketches wherever necessary.

Section – I

Q.2 Solve any two of the following. **14**

a) Write short note on *''Planning Database in Rural Roads'*.
b) Explain in detail *'Road alignment and Surveys'* in rural roads.
c) Enlist and explain various factors affecting geometric design of roads.

Q.3 Solve any two of the followings. **14**

a) On two way traffic road, speed of overtaking vehicle is 65 kmph and overtaken vehicle is 45 kmph. If average acceleration is 0.92 m/sec^2 and reaction time is 2.5 seconds, calculate Overtaking Sight Distance (OSD).
b) What are the various *'Design parameters'* for Pavement design in Rural Roads?
c) CBR test is performed on flexible pavement and load verses penetration table is shown below, an initial traffic of 30 CVPD, with a growth rate of 6 per cent per annum for a location having annual rainfall of 1200mm. The design life is 10 years. Determine the pavement thickness.

Penetration	0	0.5	1	1.5	2	2.5	3	4	5	7.5	10	12.5
Load (kg)	0	8	26	43	63	75	84	105	114	135	151	165

Section – II

Q.4 Solve any two of the following. **14**

a) Explain the requirements of surface drain; road side drains, shoulder drains, catch water drains.
b) Explain Standard designs of culverts.
c) Explain Construction of *fly ash embankments.*

Q.5 Solve any two of the followings. **14**

a) Explain *quality control in construction.*
b) Explain maintenance of paved roads.
c) Explain the concept of *'Rehabilitation'*

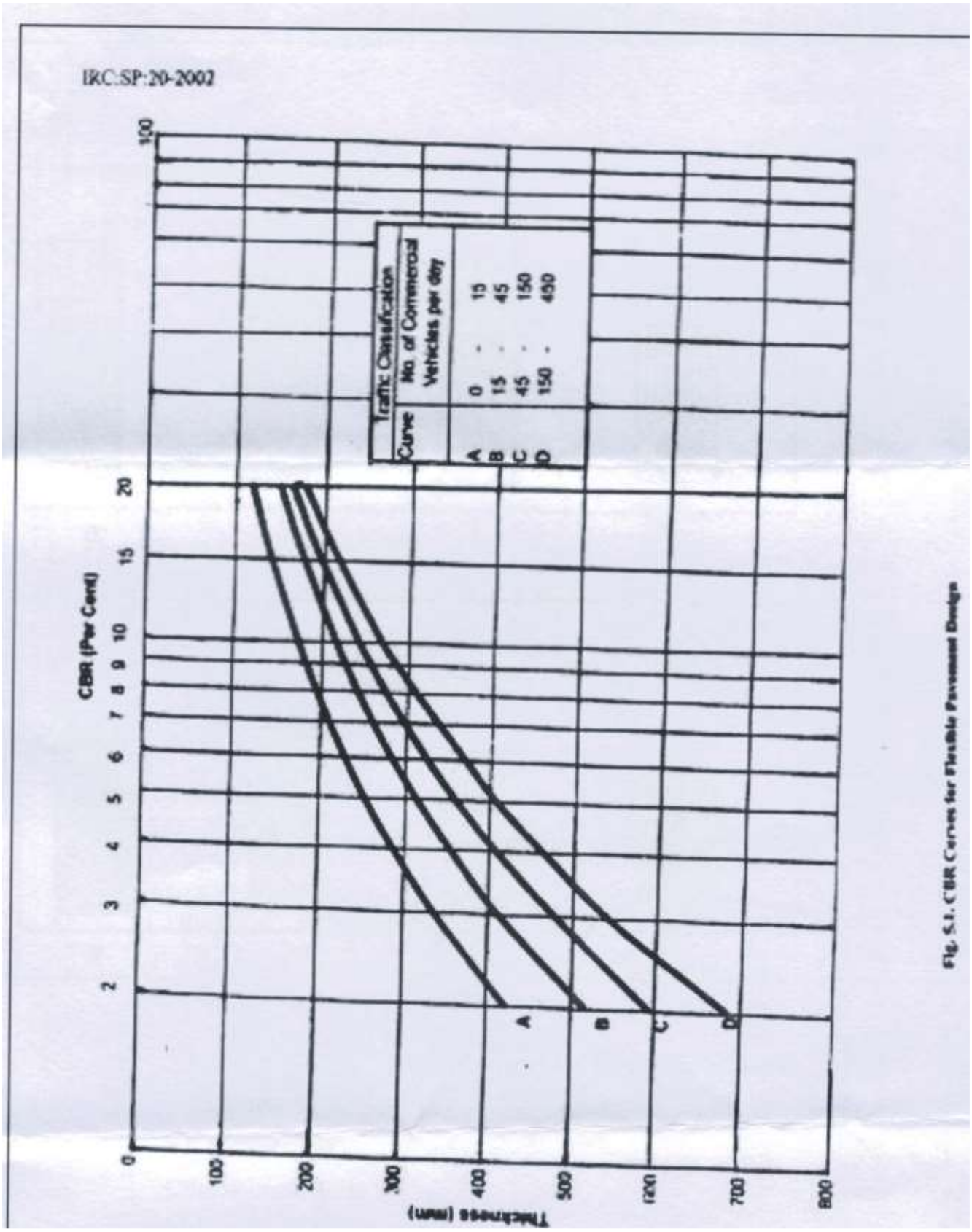
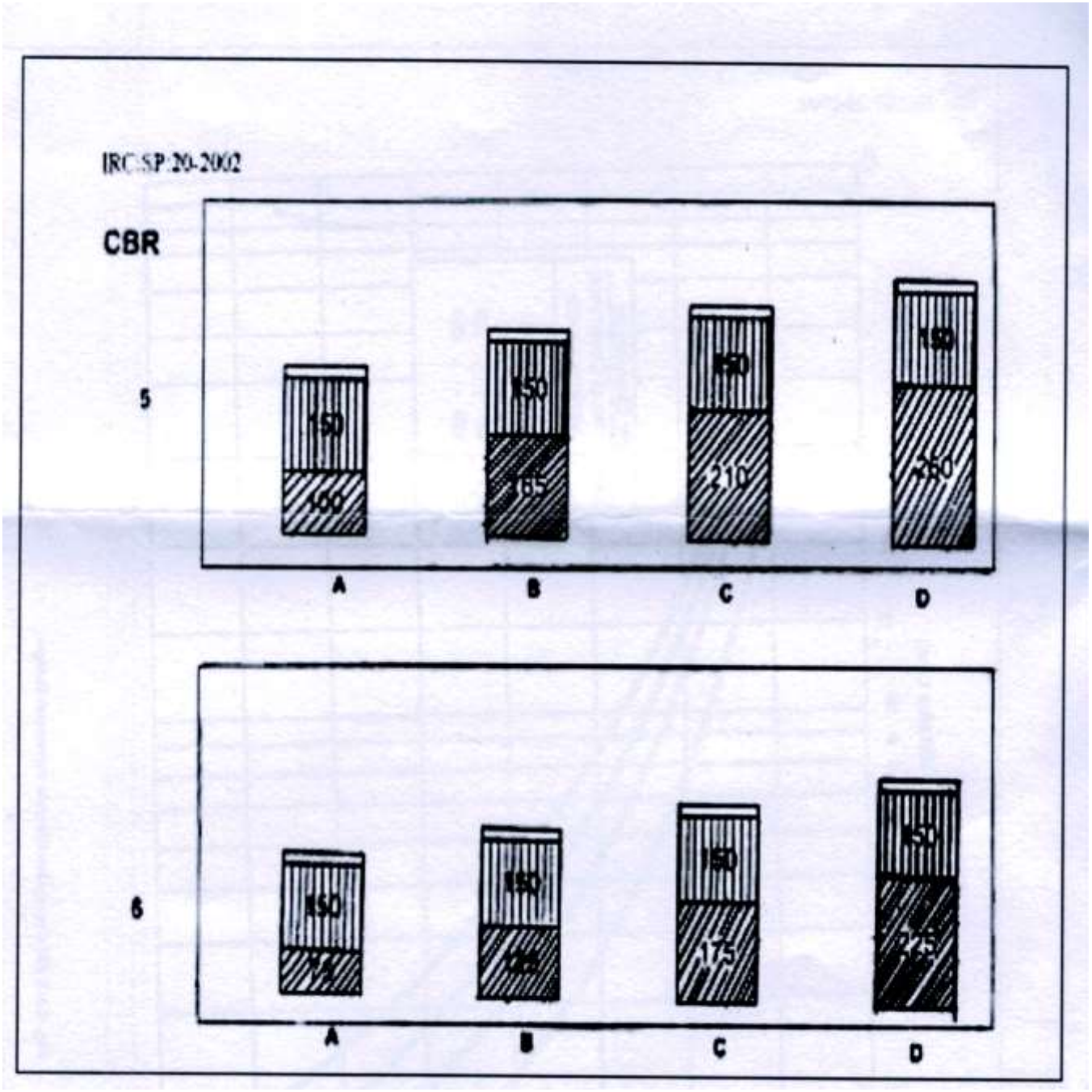


Fig. 5.1. CBR Curves for Flexible Pavement Design


IRC:SP:20-2002
CBR
5
150
100
150
165
150
210
150
260
A
B
C
D
6
150
75
150
150
175
150
225
A
B
C
D

SLR-BD-54

Seat No.	

Set P

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Elevated structures in Railway (CIVHON-02D)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The ideal location for a railway bridge is: _____
a) Upstream of river bends
b) On a sharp meander
c) On a straight reach of the river
d) In a delta region

2) Hydrological investigation includes _____
a) Soil classification b) River cross-sectional survey
c) Flood discharge estimation d) Construction methods

3) What does the term "setting out" in bridge construction refer to?
a) Pouring concrete
b) Fixing bearings
c) Establishing the position of piers and abutments
d) Painting steel girders

4) Which structure transfers loads from superstructure to the foundation?
a) Deck b) Bearing
c) Pier d) Handrail

5) Which component of a girder primarily resists bending moments?
a) Web b) Bottom flange
c) Top flange d) Both b and c

6) Biaxial bending in gantry girders occurs due to _____
a) Wind pressure b) Unsymmetrical loading
c) Eccentric crane loads d) Torsional twist

7) During bridge inspection, a crack width of more than 0.3 mm in concrete indicates: _____

a) Normal condition
b) Minor damage
c) Moderate damage
d) Severe distress

8) Which of the following is a non-destructive testing method used during bridge inspection?

a) Core cutting
b) Rebound hammer
c) Slump test
d) Cube crushing

9) Which test is not directly related to compaction control in embankments?

a) Sand replacement test
b) Nuclear density test
c) Dynamic cone penetrometer test
d) Slump test

10) What does a structural drawing typically include?

a) Plumbing details
b) Load calculations
c) Reinforcement details
d) Electrical layout

11) What is the typical material used for superstructure of road over bridges?

a) Timber
b) Aluminum
c) Steel or RCC
d) Plastic

12) Which document formally invites contractors to submit bids for a project?

a) Request for Information (RFI)
b) Notice Inviting Tender (NIT)
c) Letter of Intent (LOI)
d) Memorandum of Understanding (MoU)

13) Arbitration in construction contracts is preferred over litigation because: _____

a) It is more expensive
b) It is a public process
c) It offers a faster resolution
d) It always favours the contractor

14) FIDIC conditions of contract are primarily used for _____

a) Domestic residential projects
b) International construction projects
c) Small-scale renovations
d) Agricultural land leases

SLR-BD-54

Seat No.	

Set P

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Elevated structures in Railway (CIVHON-02D)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining. Question no. 6 is compulsory in section II, and solve any two questions from the remaining
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

Section – I

Q.2	**a)**	Give the classification of rivers based on topography and explain any two types.	**05**
	b)	Compare the Driven piles and Cast-in-situ piles.	**05**
Q.3	**a)**	Explain how excavation for pier foundation in dry condition is done.	**05**
	b)	Trace the evolution of loading standards in Indian railway bridge design.	**04**
Q.4	**a)**	Describe the various components of a girder used in steel railway bridges.	**05**
	b)	What hydrological data is required for bridge site investigation?	**04**
Q.5	**a)**	Explain types of Pile foundation based on the method of construction.	**05**
	b)	Explain various types of Girder bridges with neat sketch.	**04**

Section – II

Q.6	**a)**	Write short note on Abutments and Piers inspection.	**05**
	b)	Enlist various tests of compaction. Explain any two.	**05**
Q.7	**a)**	Define approaches in Railway Bridge. Discuss their components with neat labelling.	**05**
	b)	What is tender document? Enlist documents to be attached with tender document.	**04**
Q.8	**a)**	What are Special Conditions of Contract (SCC)? Mention its key elements.	**04**
	b)	Write note on maintenance of Steel Girder bridges.	**05**
Q.9	**a)**	Write a note on Arbitration.	**04**
	b)	Define a railway embankment. Give its objectives.	**05**

SLR-BD-54

Seat No.	

Set Q

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Elevated structures in Railway (CIVHON-02D)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Which of the following is a non-destructive testing method used during bridge inspection?
a) Core cutting b) Rebound hammer
c) Slump test d) Cube crushing

2) Which test is not directly related to compaction control in embankments?
a) Sand replacement test
b) Nuclear density test
c) Dynamic cone penetrometer test
d) Slump test

3) What does a structural drawing typically include?
a) Plumbing details b) Load calculations
c) Reinforcement details d) Electrical layout

4) What is the typical material used for superstructure of road over bridges?
a) Timber b) Aluminum
c) Steel or RCC d) Plastic

5) Which document formally invites contractors to submit bids for a project?
a) Request for Information (RFI)
b) Notice Inviting Tender (NIT)
c) Letter of Intent (LOI)
d) Memorandum of Understanding (MoU)

6) Arbitration in construction contracts is preferred over litigation because: _____
a) It is more expensive
b) It is a public process
c) It offers a faster resolution
d) It always favours the contractor

7) FIDIC conditions of contract are primarily used for _____
a) Domestic residential projects
b) International construction projects
c) Small-scale renovations
d) Agricultural land leases

8) The ideal location for a railway bridge is: _____
a) Upstream of river bends
b) On a sharp meander
c) On a straight reach of the river
d) In a delta region

9) Hydrological investigation includes _____
a) Soil classification
b) River cross-sectional survey
c) Flood discharge estimation
d) Construction methods

10) What does the term "setting out" in bridge construction refer to?
a) Pouring concrete
b) Fixing bearings
c) Establishing the position of piers and abutments
d) Painting steel girders

11) Which structure transfers loads from superstructure to the foundation?
a) Deck
b) Bearing
c) Pier
d) Handrail

12) Which component of a girder primarily resists bending moments?
a) Web
b) Bottom flange
c) Top flange
d) Both b and c

13) Biaxial bending in gantry girders occurs due to _____
a) Wind pressure
b) Unsymmetrical loading
c) Eccentric crane loads
d) Torsional twist

14) During bridge inspection, a crack width of more than 0.3 mm in concrete indicates: _____
a) Normal condition
b) Minor damage
c) Moderate damage
d) Severe distress

SLR-BD-54

Seat No.	

Set Q

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Elevated structures in Railway (CIVHON-02D)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining. Question no. 6 is compulsory in section II, and solve any two questions from the remaining
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

Section – I

Q.2	**a)**	Give the classification of rivers based on topography and explain any two types.	**05**
	b)	Compare the Driven piles and Cast-in-situ piles.	**05**
Q.3	**a)**	Explain how excavation for pier foundation in dry condition is done.	**05**
	b)	Trace the evolution of loading standards in Indian railway bridge design.	**04**
Q.4	**a)**	Describe the various components of a girder used in steel railway bridges.	**05**
	b)	What hydrological data is required for bridge site investigation?	**04**
Q.5	**a)**	Explain types of Pile foundation based on the method of construction.	**05**
	b)	Explain various types of Girder bridges with neat sketch.	**04**

Section – II

Q.6	**a)**	Write short note on Abutments and Piers inspection.	**05**
	b)	Enlist various tests of compaction. Explain any two.	**05**
Q.7	**a)**	Define approaches in Railway Bridge. Discuss their components with neat labelling.	**05**
	b)	What is tender document? Enlist documents to be attached with tender document.	**04**
Q.8	**a)**	What are Special Conditions of Contract (SCC)? Mention its key elements.	**04**
	b)	Write note on maintenance of Steel Girder bridges.	**05**
Q.9	**a)**	Write a note on Arbitration.	**04**
	b)	Define a railway embankment. Give its objectives.	**05**

SLR-BD-54

Seat No.	

Set R

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Elevated structures in Railway (CIVHON-02D)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) What is the typical material used for superstructure of road over bridges?
a) Timber b) Aluminum
c) Steel or RCC d) Plastic

2) Which document formally invites contractors to submit bids for a project?
a) Request for Information (RFI)
b) Notice Inviting Tender (NIT)
c) Letter of Intent (LOI)
d) Memorandum of Understanding (MoU)

3) Arbitration in construction contracts is preferred over litigation because: _____
a) It is more expensive
b) It is a public process
c) It offers a faster resolution
d) It always favours the contractor

4) FIDIC conditions of contract are primarily used for _____
a) Domestic residential projects
b) International construction projects
c) Small-scale renovations
d) Agricultural land leases

5) The ideal location for a railway bridge is: _____
a) Upstream of river bends
b) On a sharp meander
c) On a straight reach of the river
d) In a delta region

6) Hydrological investigation includes _____
a) Soil classification b) River cross-sectional survey
c) Flood discharge estimation d) Construction methods

7) What does the term "setting out" in bridge construction refer to?
a) Pouring concrete
b) Fixing bearings
c) Establishing the position of piers and abutments
d) Painting steel girders

8) Which structure transfers loads from superstructure to the foundation?
a) Deck b) Bearing
c) Pier d) Handrail

9) Which component of a girder primarily resists bending moments?
a) Web b) Bottom flange
c) Top flange d) Both b and c

10) Biaxial bending in gantry girders occurs due to _____
a) Wind pressure b) Unsymmetrical loading
c) Eccentric crane loads d) Torsional twist

11) During bridge inspection, a crack width of more than 0.3 mm in concrete indicates: _____
a) Normal condition b) Minor damage
c) Moderate damage d) Severe distress

12) Which of the following is a non-destructive testing method used during bridge inspection?
a) Core cutting b) Rebound hammer
c) Slump test d) Cube crushing

13) Which test is not directly related to compaction control in embankments?
a) Sand replacement test
b) Nuclear density test
c) Dynamic cone penetrometer test
d) Slump test

14) What does a structural drawing typically include?
a) Plumbing details b) Load calculations
c) Reinforcement details d) Electrical layout

SLR-BD-54

Seat No.	

Set R

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Elevated structures in Railway (CIVHON-02D)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining. Question no. 6 is compulsory in section II, and solve any two questions from the remaining
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

Section – I

Q.2	**a)**	Give the classification of rivers based on topography and explain any two types.	**05**
	b)	Compare the Driven piles and Cast-in-situ piles.	**05**
Q.3	**a)**	Explain how excavation for pier foundation in dry condition is done.	**05**
	b)	Trace the evolution of loading standards in Indian railway bridge design.	**04**
Q.4	**a)**	Describe the various components of a girder used in steel railway bridges.	**05**
	b)	What hydrological data is required for bridge site investigation?	**04**
Q.5	**a)**	Explain types of Pile foundation based on the method of construction.	**05**
	b)	Explain various types of Girder bridges with neat sketch.	**04**

Section – II

Q.6	**a)**	Write short note on Abutments and Piers inspection.	**05**
	b)	Enlist various tests of compaction. Explain any two.	**05**
Q.7	**a)**	Define approaches in Railway Bridge. Discuss their components with neat labelling.	**05**
	b)	What is tender document? Enlist documents to be attached with tender document.	**04**
Q.8	**a)**	What are Special Conditions of Contract (SCC)? Mention its key elements.	**04**
	b)	Write note on maintenance of Steel Girder bridges.	**05**
Q.9	**a)**	Write a note on Arbitration.	**04**
	b)	Define a railway embankment. Give its objectives.	**05**

SLR-BD-54

Seat No.		Set	S

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Elevated structures in Railway (CIVHON-02D)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and state it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Biaxial bending in gantry girders occurs due to _____
a) Wind pressure b) Unsymmetrical loading
c) Eccentric crane loads d) Torsional twist

2) During bridge inspection, a crack width of more than 0.3 mm in concrete indicates: _____
a) Normal condition b) Minor damage
c) Moderate damage d) Severe distress

3) Which of the following is a non-destructive testing method used during bridge inspection?
a) Core cutting b) Rebound hammer
c) Slump test d) Cube crushing

4) Which test is not directly related to compaction control in embankments?
a) Sand replacement test
b) Nuclear density test
c) Dynamic cone penetrometer test
d) Slump test

5) What does a structural drawing typically include?
a) Plumbing details b) Load calculations
c) Reinforcement details d) Electrical layout

6) What is the typical material used for superstructure of road over bridges?
a) Timber b) Aluminum
c) Steel or RCC d) Plastic

7) Which document formally invites contractors to submit bids for a project?
a) Request for Information (RFI)
b) Notice Inviting Tender (NIT)
c) Letter of Intent (LOI)
d) Memorandum of Understanding (MoU)

8) Arbitration in construction contracts is preferred over litigation because: _____
a) It is more expensive
b) It is a public process
c) It offers a faster resolution
d) It always favours the contractor

9) FIDIC conditions of contract are primarily used for _____
a) Domestic residential projects
b) International construction projects
c) Small-scale renovations
d) Agricultural land leases

10) The ideal location for a railway bridge is: _____
a) Upstream of river bends
b) On a sharp meander
c) On a straight reach of the river
d) In a delta region

11) Hydrological investigation includes _____
a) Soil classification b) River cross-sectional survey
c) Flood discharge estimation d) Construction methods

12) What does the term "setting out" in bridge construction refer to?
a) Pouring concrete
b) Fixing bearings
c) Establishing the position of piers and abutments
d) Painting steel girders

13) Which structure transfers loads from superstructure to the foundation?
a) Deck b) Bearing
c) Pier d) Handrail

14) Which component of a girder primarily resists bending moments?
a) Web b) Bottom flange
c) Top flange d) Both b and c

SLR-BD-54

Seat No.		Set	S

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Elevated structures in Railway (CIVHON-02D)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining. Question no. 6 is compulsory in section II, and solve any two questions from the remaining
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.

Section – I

Q.2	**a)**	Give the classification of rivers based on topography and explain any two types.	**05**
	b)	Compare the Driven piles and Cast-in-situ piles.	**05**
Q.3	**a)**	Explain how excavation for pier foundation in dry condition is done.	**05**
	b)	Trace the evolution of loading standards in Indian railway bridge design.	**04**
Q.4	**a)**	Describe the various components of a girder used in steel railway bridges.	**05**
	b)	What hydrological data is required for bridge site investigation?	**04**
Q.5	**a)**	Explain types of Pile foundation based on the method of construction.	**05**
	b)	Explain various types of Girder bridges with neat sketch.	**04**

Section – II

Q.6	**a)**	Write short note on Abutments and Piers inspection.	**05**
	b)	Enlist various tests of compaction. Explain any two.	**05**
Q.7	**a)**	Define approaches in Railway Bridge. Discuss their components with neat labelling.	**05**
	b)	What is tender document? Enlist documents to be attached with tender document.	**04**
Q.8	**a)**	What are Special Conditions of Contract (SCC)? Mention its key elements.	**04**
	b)	Write note on maintenance of Steel Girder bridges.	**05**
Q.9	**a)**	Write a note on Arbitration.	**04**
	b)	Define a railway embankment. Give its objectives.	**05**

SLR-BD-55

Seat No.	

Set P

S.Y. (B.Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Engineering - I (BTN01401)

Day & Date: Monday, 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non- programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the alternatives. 14

1) Total water requirement of a city is generally assessed on the basis of _____
a) Maximum hourly demand
b) Maximum daily demand + fire demand
c) Average daily demand + fire demand
d) Greater of (a) and (b)

2) The suitable method for forecasting population for a young and a rapidly developing city is _____
a) Arithmetic mean method
b) Geometric mean method
c) Comparative graphical method
d) None of these

3) As compared to the geometrical increase method of forecasting population, the arithmetical increase method gives _____
a) lesser value
b) higher value
c) equal value
d) may vary, as it may depend on the population figures.

4) The settling velocity of inorganic particles in a sedimentation tank of a water treatment plant is governed by _____
a) Darcy law b) Stokes law
c) Dupuits law d) None

5) Per capita water demand is defined as the litres of water consumed daily by each person. Naturally it has to be some average value, over a period of time. Over how much period the averaging is done here _____

a) 24 hours b) One years
c) 10 years d) 35 years

6) The multiplying factor, as applied to obtain the maximum daily water demand, in relation to the average i.e. per capita daily demand, i.e.

a) 1.5 b) 1.8
c) 2.0 d) 2.7

7) Which source of water, among the following, is not a surface source?

a) River b) Well
c) Lake d) Ocean

8) The economical diameter of pumping mains is given by formula _____

a) $D = 0.97$ to $01.22\sqrt{Q}$ b) $Q = 0.97\sqrt{D}$
c) $V = \frac{Q}{A}$ d) None

9) Head loss due to friction in pipe by Darcy's equation is given by formula _____

a) $V = 0.85\,CHR^{0.63}$ b) $H_F = \frac{n^2V^2L}{R^{413}}S$
c) $H_F = \frac{F^1LV^2}{2gd}$ d) None

10) For finding chloride content from water sample. The indicator used for titration is _____

a) Methyl orange b) Potassium chromate
c) Ethyl dimen tetra acid d) Phenolphthalein indicator

11) Cleaning of slow sand filter is done by _____

a) back washing b) Scraping and removal of sand
c) Any one of above d) None

12) Air binding phenomenon in rapid sand filters may occurs due to _____

a) Excessive negative pressure b) mud ball formation
c) higher turbidity in the effluent d) low temperature

13) The suitable layout for a water supply distribution, for an irregularly grown town is, _____

a) ring system b) grid iron system
c) dead end system d) radial system

14) The chances for contamination of water are less in ____

a) continuous system b) intermittent system
c) combined system d) None

SLR-BD-55

Seat No.	

Set P

S.Y. (B.Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Engineering - I (BTN01401)

Day & Date: Monday, 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) In Section - I Q.No. 2 is compulsory and solve any TWO Questions from remaining questions (Q. No.3, 4 and 5)
2) In Section - II, Q.No. 6 is compulsory and solve any TWO Questions from (Q. No.7, 8 and 9)
3) Figures to the right indicates full marks.
4) Use of non-Programmable calculator is allowed.

Section – I

Q.2 Attempt the following **06**

a) Find the population on 2000 by Geometrical increase method

Year	1930	1940	1950	1960	1970
Population	25000	28000	34000	42000	47000

b) Explain the factors affecting per capita demand. **04**

Q.3 Attempt the following

a) Explain with neat sketch various sources of water supply. **04**

b) Settling tank is designed for an overflow rate of 4000 lit/m^2/hour. What percentage of particles of diameter a) 0.05 mm b) 0.02 mm will be removed in this tank at 10°C. **05**

Q.4 Attempt the following

a) Explain with sketch Tube settler. **04**

b) Find the setting velocity of discrete particle in water under conditions when Reynolds number is less than 0.5 .The diameter and specific gravity of particle is $5x10^{-3}$ cm & 2.65 respectively. Water temp is 20° c & kinematic viscosity of water at 20° c = $1.01x10^{-2}$ cm^2/sec. **05**

Q.5 Attempt the following

a) Draw layout of water treatment plant and explain each unit. **05**

b) Explain the various forces acting on pressure pipes. **04**

Section – II

Q.6 Attempt the following

a) Explain with neat sketch construction and working of rapid sand Filter. **06**

b) Explain with graph Break point chlorination. **04**

Q.7 Attempt the following

a) Enlist layout of water distribution system and explain with neat sketch Dead end system. **05**

b) Write short note on Reverse osmosis. **04**

Q.8 Attempt the following

a) Explain with sketch Desalination by Electro dialysis method. **04**

b) A town with a population of 1 million has a continuous water supply. Average supply is 270 lpcd, the water being supplied by direct pumping. The total supply of 270 lpcd is phased as follows. **05**

Time	lpc
5 AM to 11 AM	90
11 AM to 3 PM	54
3 PM to 9 PM	81
9 PM to 12 midnight	27
12 Midnight to 5 AM	18

Water is supplied from treatment plant at a uniform rate of 11.25 million litres per hour, for all 24 hours. Find the capacity of reservoir required for distribution of water. Assume no loss or drawl from trunk main.

Q.9 Write short note on (Any Three) **09**

a) Jar test

b) Maintenance of distribution system

c) Corrosion and its control

d) Thrust block design

e) River intake

SLR-BD-55

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Engineering - I (BTN01401)

Day & Date: Monday, 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non- programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the alternatives. 14

1) The economical diameter of pumping mains is given by formula _____
a) $D = 0.97$ to $01.22\sqrt{Q}$ b) $Q = 0.97\sqrt{D}$
c) $V = \frac{Q}{A}$ d) None

2) Head loss due to friction in pipe by Darcy's equation is given by formula _____
a) $V = 0.85\,CHR^{0.63}$ b) $H_F = \frac{n^2V^2L}{R^{413}}s$
c) $H_F = \frac{F^1LV^2}{2gd}$ d) None

3) For finding chloride content from water sample. The indicator used for titration is _____
a) Methyl orange b) Potassium chromate
c) Ethyl dimen tetra acid d) Phenolphthalein indicator

4) Cleaning of slow sand filter is done by _____
a) back washing b) Scraping and removal of sand
c) Any one of above d) None

5) Air binding phenomenon in rapid sand filters may occurs due to _____
a) Excessive negative pressure b) mud ball formation
c) higher turbidity in the effluent d) low temperature

6) The suitable layout for a water supply distribution, for an irregularly grown town is, _____
a) ring system b) grid iron system
c) dead end system d) radial system

7) The chances for contamination of water are less in ____
a) continuous system b) intermittent system
c) combined system d) None

8) Total water requirement of a city is generally assessed on the basis of _____
a) Maximum hourly demand
b) Maximum daily demand + fire demand
c) Average daily demand + fire demand
d) Greater of (a) and (b)

9) The suitable method for forecasting population for a young and a rapidly developing city is _____
a) Arithmetic mean method
b) Geometric mean method
c) Comparative graphical method
d) None of these

10) As compared to the geometrical increase method of forecasting population, the arithmetical increase method gives _____
a) lesser value
b) higher value
c) equal value
d) may vary, as it may depend on the population figures.

11) The settling velocity of inorganic particles in a sedimentation tank of a water treatment plant is governed by _____
a) Darcy law b) Stokes law
c) Dupuits law d) None

12) Per capita water demand is defined as the litres of water consumed daily by each person. Naturally it has to be some average value, over a period of time. Over how much period the averaging is done here _____
a) 24 hours b) One years
c) 10 years d) 35 years

13) The multiplying factor, as applied to obtain the maximum daily water demand, in relation to the average i.e. per capita daily demand, i.e.
a) 1.5 b) 1.8
c) 2.0 d) 2.7

14) Which source of water, among the following, is not a surface source?
a) River b) Well
c) Lake d) Ocean

SLR-BD-55

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Engineering - I (BTN01401)

Day & Date: Monday, 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) In Section - I Q.No. 2 is compulsory and solve any TWO Questions from remaining questions (Q. No.3, 4 and 5)
2) In Section - II, Q.No. 6 is compulsory and solve any TWO Questions from (Q. No.7, 8 and 9)
3) Figures to the right indicates full marks.
4) Use of non-Programmable calculator is allowed.

Section – I

Q.2 Attempt the following **06**

a) Find the population on 2000 by Geometrical increase method

Year	1930	1940	1950	1960	1970
Population	25000	28000	34000	42000	47000

b) Explain the factors affecting per capita demand. **04**

Q.3 Attempt the following

a) Explain with neat sketch various sources of water supply. **04**

b) Settling tank is designed for an overflow rate of 4000 lit/m^2/hour. **05**
What percentage of particles of diameter a) 0.05 mm b) 0.02 mm will be removed in this tank at 10°C.

Q.4 Attempt the following

a) Explain with sketch Tube settler. **04**

b) Find the setting velocity of discrete particle in water under conditions when Reynolds number is less than 0.5 .The diameter and specific gravity of particle is $5x10^{-3}$ cm & 2.65 respectively. Water temp is 20° c & kinematic viscosity of water at 20° c = $1.01x10^{-2}$ cm^2/sec. **05**

Q.5 Attempt the following

a) Draw layout of water treatment plant and explain each unit. **05**

b) Explain the various forces acting on pressure pipes. **04**

Section – II

Q.6 Attempt the following

a) Explain with neat sketch construction and working of rapid sand Filter. **06**

b) Explain with graph Break point chlorination. **04**

Q.7 Attempt the following

a) Enlist layout of water distribution system and explain with neat sketch Dead end system. **05**

b) Write short note on Reverse osmosis. **04**

Q.8 Attempt the following

a) Explain with sketch Desalination by Electro dialysis method. **04**

b) A town with a population of 1 million has a continuous water supply. Average supply is 270 lpcd, the water being supplied by direct pumping. The total supply of 270 lpcd is phased as follows. **05**

Time	lpc
5 AM to 11 AM	90
11 AM to 3 PM	54
3 PM to 9 PM	81
9 PM to 12 midnight	27
12 Midnight to 5 AM	18

Water is supplied from treatment plant at a uniform rate of 11.25 million litres per hour, for all 24 hours. Find the capacity of reservoir required for distribution of water. Assume no loss or drawl from trunk main.

Q.9 Write short note on (Any Three) **09**

a) Jar test

b) Maintenance of distribution system

c) Corrosion and its control

d) Thrust block design

e) River intake

SLR-BD-55

Seat No.	

Set R

S.Y. (B.Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Engineering - I (BTN01401)

Day & Date: Monday, 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non- programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the alternatives. 14

1) Cleaning of slow sand filter is done by _____
a) back washing b) Scraping and removal of sand
c) Any one of above d) None

2) Air binding phenomenon in rapid sand filters may occurs due to _____
a) Excessive negative pressure b) mud ball formation
c) higher turbidity in the effluent d) low temperature

3) The suitable layout for a water supply distribution, for an irregularly grown town is, _____
a) ring system b) grid iron system
c) dead end system d) radial system

4) The chances for contamination of water are less in ____
a) continuous system b) intermittent system
c) combined system d) None

5) Total water requirement of a city is generally assessed on the basis of _____
a) Maximum hourly demand
b) Maximum daily demand + fire demand
c) Average daily demand + fire demand
d) Greater of (a) and (b)

6) The suitable method for forecasting population for a young and a rapidly developing city is _____
a) Arithmetic mean method
b) Geometric mean method
c) Comparative graphical method
d) None of these

7) As compared to the geometrical increase method of forecasting population, the arithmetical increase method gives _____
a) lesser value
b) higher value
c) equal value
d) may vary, as it may depend on the population figures.

8) The settling velocity of inorganic particles in a sedimentation tank of a water treatment plant is governed by _____
a) Darcy law b) Stokes law
c) Dupuits law d) None

9) Per capita water demand is defined as the litres of water consumed daily by each person. Naturally it has to be some average value, over a period of time. Over how much period the averaging is done here _____
a) 24 hours b) One years
c) 10 years d) 35 years

10) The multiplying factor, as applied to obtain the maximum daily water demand, in relation to the average i.e. per capita daily demand, i.e.
a) 1.5 b) 1.8
c) 2.0 d) 2.7

11) Which source of water, among the following, is not a surface source?
a) River b) Well
c) Lake d) Ocean

12) The economical diameter of pumping mains is given by formula _____
a) $D = 0.97$ to $01.22\sqrt{Q}$ b) $Q = 0.97\sqrt{D}$
c) $V = \frac{Q}{A}$ d) None

13) Head loss due to friction in pipe by Darcy's equation is given by formula _____
a) $V = 0.85\, CHR^{0.63}$ b) $H_F = \frac{n^2V^2L}{R^{413}}S$
c) $H_F = \frac{F^1LV^2}{2gd}$ d) None

14) For finding chloride content from water sample. The indicator used for titration is _____
a) Methyl orange b) Potassium chromate
c) Ethyl dimen tetra acid d) Phenolphthalein indicator

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Engineering - I (BTN01401)

Day & Date: Monday, 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) In Section - I Q.No. 2 is compulsory and solve any TWO Questions from remaining questions (Q. No.3, 4 and 5)
2) In Section - II, Q.No. 6 is compulsory and solve any TWO Questions from (Q. No.7, 8 and 9)
3) Figures to the right indicates full marks.
4) Use of non-Programmable calculator is allowed.

Section – I

Q.2 Attempt the following **06**

a) Find the population on 2000 by Geometrical increase method

Year	1930	1940	1950	1960	1970
Population	25000	28000	34000	42000	47000

b) Explain the factors affecting per capita demand. **04**

Q.3 Attempt the following

a) Explain with neat sketch various sources of water supply. **04**

b) Settling tank is designed for an overflow rate of 4000 lit/m^2/hour. What percentage of particles of diameter a) 0.05 mm b) 0.02 mm will be removed in this tank at 10°C. **05**

Q.4 Attempt the following

a) Explain with sketch Tube settler. **04**

b) Find the setting velocity of discrete particle in water under conditions when Reynolds number is less than 0.5 .The diameter and specific gravity of particle is $5x10^{-3}$ cm & 2.65 respectively. Water temp is 20° c & kinematic viscosity of water at 20° c = $1.01x10^{-2}$ cm^2/sec. **05**

Q.5 Attempt the following

a) Draw layout of water treatment plant and explain each unit. **05**

b) Explain the various forces acting on pressure pipes. **04**

Section – II

Q.6 Attempt the following

a) Explain with neat sketch construction and working of rapid sand Filter. **06**

b) Explain with graph Break point chlorination. **04**

Q.7 Attempt the following

a) Enlist layout of water distribution system and explain with neat sketch Dead end system. **05**

b) Write short note on Reverse osmosis. **04**

Q.8 Attempt the following

a) Explain with sketch Desalination by Electro dialysis method. **04**

b) A town with a population of 1 million has a continuous water supply. Average supply is 270 lpcd, the water being supplied by direct pumping. The total supply of 270 lpcd is phased as follows. **05**

Time	lpc
5 AM to 11 AM	90
11 AM to 3 PM	54
3 PM to 9 PM	81
9 PM to 12 midnight	27
12 Midnight to 5 AM	18

Water is supplied from treatment plant at a uniform rate of 11.25 million litres per hour, for all 24 hours. Find the capacity of reservoir required for distribution of water. Assume no loss or drawl from trunk main.

Q.9 Write short note on (Any Three) **09**

a) Jar test

b) Maintenance of distribution system

c) Corrosion and its control

d) Thrust block design

e) River intake

SLR-BD-55

Seat No.	

Set S

S.Y. (B.Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Engineering - I (BTN01401)

Day & Date: Monday, 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non- programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the alternatives. 14

1) The multiplying factor, as applied to obtain the maximum daily water demand, in relation to the average i.e. per capita daily demand, i.e.
a) 1.5 b) 1.8
c) 2.0 d) 2.7

2) Which source of water, among the following, is not a surface source?
a) River b) Well
c) Lake d) Ocean

3) The economical diameter of pumping mains is given by formula _____
a) $D = 0.97$ to $01.22\sqrt{Q}$ b) $Q = 0.97\sqrt{D}$
c) $V = \frac{Q}{A}$ d) None

4) Head loss due to friction in pipe by Darcy's equation is given by formula _____
a) $V = 0.85\,CHR^{0.63}$ b) $H_F = \frac{n^2V^2L}{R^{413}}s$
c) $H_F = \frac{F^1LV^2}{2gd}$ d) None

5) For finding chloride content from water sample. The indicator used for titration is _____
a) Methyl orange b) Potassium chromate
c) Ethyl dimen tetra acid d) Phenolphthalein indicator

6) Cleaning of slow sand filter is done by _____
a) back washing b) Scraping and removal of sand
c) Any one of above d) None

7) Air binding phenomenon in rapid sand filters may occurs due to _____
a) Excessive negative pressure b) mud ball formation
c) higher turbidity in the effluent d) low temperature

8) The suitable layout for a water supply distribution, for an irregularly grown town is, _____
a) ring system b) grid iron system
c) dead end system d) radial system

9) The chances for contamination of water are less in ____
a) continuous system b) intermittent system
c) combined system d) None

10) Total water requirement of a city is generally assessed on the basis of _____
a) Maximum hourly demand
b) Maximum daily demand + fire demand
c) Average daily demand + fire demand
d) Greater of (a) and (b)

11) The suitable method for forecasting population for a young and a rapidly developing city is _____
a) Arithmetic mean method
b) Geometric mean method
c) Comparative graphical method
d) None of these

12) As compared to the geometrical increase method of forecasting population, the arithmetical increase method gives _____
a) lesser value
b) higher value
c) equal value
d) may vary, as it may depend on the population figures.

13) The settling velocity of inorganic particles in a sedimentation tank of a water treatment plant is governed by _____
a) Darcy law b) Stokes law
c) Dupuits law d) None

14) Per capita water demand is defined as the litres of water consumed daily by each person. Naturally it has to be some average value, over a period of time. Over how much period the averaging is done here _____
a) 24 hours b) One years
c) 10 years d) 35 years

Seat No.		Set	S

S.Y. (B.Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Engineering - I (BTN01401)

Day & Date: Monday, 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) In Section - I Q.No. 2 is compulsory and solve any TWO Questions from remaining questions (Q. No.3, 4 and 5)
2) In Section - II, Q.No. 6 is compulsory and solve any TWO Questions from (Q. No.7, 8 and 9)
3) Figures to the right indicates full marks.
4) Use of non-Programmable calculator is allowed.

Section – I

Q.2 Attempt the following **06**

a) Find the population on 2000 by Geometrical increase method

Year	1930	1940	1950	1960	1970
Population	25000	28000	34000	42000	47000

b) Explain the factors affecting per capita demand. **04**

Q.3 Attempt the following

a) Explain with neat sketch various sources of water supply. **04**

b) Settling tank is designed for an overflow rate of 4000 lit/m^2/hour. **05**
What percentage of particles of diameter a) 0.05 mm b) 0.02 mm will be removed in this tank at 10°C.

Q.4 Attempt the following

a) Explain with sketch Tube settler. **04**

b) Find the setting velocity of discrete particle in water under conditions when Reynolds number is less than 0.5 .The diameter and specific gravity of particle is $5x10^{-3}$ cm & 2.65 respectively. Water temp is 20° c & kinematic viscosity of water at 20° c = $1.01x10^{-2}$ cm^2/sec. **05**

Q.5 Attempt the following

a) Draw layout of water treatment plant and explain each unit. **05**

b) Explain the various forces acting on pressure pipes. **04**

Section – II

Q.6 Attempt the following

a) Explain with neat sketch construction and working of rapid sand Filter. **06**

b) Explain with graph Break point chlorination. **04**

Q.7 Attempt the following

a) Enlist layout of water distribution system and explain with neat sketch Dead end system. **05**

b) Write short note on Reverse osmosis. **04**

Q.8 Attempt the following

a) Explain with sketch Desalination by Electro dialysis method. **04**

b) A town with a population of 1 million has a continuous water supply. Average supply is 270 lpcd, the water being supplied by direct pumping. The total supply of 270 lpcd is phased as follows. **05**

Time	lpc
5 AM to 11 AM	90
11 AM to 3 PM	54
3 PM to 9 PM	81
9 PM to 12 midnight	27
12 Midnight to 5 AM	18

Water is supplied from treatment plant at a uniform rate of 11.25 million litres per hour, for all 24 hours. Find the capacity of reservoir required for distribution of water. Assume no loss or drawl from trunk main.

Q.9 Write short note on (Any Three) **09**

a) Jar test

b) Maintenance of distribution system

c) Corrosion and its control

d) Thrust block design

e) River intake

SLR-BD-56

Seat No.	

Set P

S. Y. (B. Tech) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Building Planning & Design (BTN01402)

Day & Date: Wednesday 28-05-2025 Max. Marks: 35
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each Question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever needed and mention it clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:07

Q.1 Choose the correct alternative from the options given below. 07

1) For kitchen cum dining room the minimum area should be _____.
a) 5 sq. m b) 9.5 sq. m
c) 6 sq. m d) 15 sq. m

2) For built-up area calculations _____ is drawn on the building permission drawing.
a) Terrace plan b) Plan
c) Site plan d) Block plan

3) If object is on picture plane, then the size perspective will be _____.
a) enlarged b) reduced
c) remains same d) all of the above

4) For Bedroom Aspect it needs at _____.
a) E-aspect b) S-aspect
c) SW-aspect d) W-aspect

5) The green building process can be applied to which of these?
a) buildings b) materials
c) interiors d) all of above

6) The earthing wire should have _____.
a) high resistance b) medium resistance
c) negligible resistance d) any of the above

7) Combining two or more plots as a single plot is called _____.
a) Amalgamation b) Frontage
c) Bifurcation d) Building setback

SLR-BD-56

Seat No.	

Set P

S. Y. (B. Tech) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Building Planning & Design (BTN01402)

Day & Date: Wednesday 28-05-2025 Max. Marks: 28
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever needed and mention it clearly.

Section – I

Q.2 Attempt the following. (Any Two) **08**

a) Enlist and explain the in brief "Principles of Building Planning" with neat sketch.
b) Discuss site selection criteria for a residential building.
c) What is Orientation? Explain with sketch about "Orientations of building for various part of India on basis of climatic conditions."
d) Write a note on "Occupancy Certificate."

Q.3 Attempt the following. (Any One) **06**

a) What are the significances of various certificates in building permission?
b) Explain the importance of AUTOCAD and describe any four commands of CAD.

Section – II

Q.4 Attempt the following. (Any Two) **08**

a) What is "Green Building"? Explain in brief.
b) Explain Concept and Design of Rain Water Harvesting.
c) Write a note on "Low-cost Housing"
d) Explain in brief "types of fire load."

Q.5 Attempt the following. (Any One) **06**

a) Explain reverberation and reverberation time using Sabine's formula.
b) Enlist and explain in short materials available for "Sound Insulation."

SLR-BD-56

Seat No.	

Set Q

S. Y. (B. Tech) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Building Planning & Design (BTN01402)

Day & Date: Wednesday 28-05-2025 Max. Marks: 35
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each Question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever needed and mention it clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:07

Q.1 Choose the correct alternative from the options given below. 07

1) The green building process can be applied to which of these?
a) buildings b) materials
c) interiors d) all of above

2) The earthing wire should have _____.
a) high resistance b) medium resistance
c) negligible resistance d) any of the above

3) Combining two or more plots as a single plot is called _____.
a) Amalgamation b) Frontage
c) Bifurcation d) Building setback

4) For kitchen cum dining room the minimum area should be _____.
a) 5 sq. m b) 9.5 sq. m
c) 6 sq. m d) 15 sq. m

5) For built-up area calculations _____ is drawn on the building permission drawing.
a) Terrace plan b) Plan
c) Site plan d) Block plan

6) If object is on picture plane, then the size perspective will be _____.
a) enlarged b) reduced
c) remains same d) all of the above

7) For Bedroom Aspect it needs at _____.
a) E-aspect b) S-aspect
c) SW-aspect d) W-aspect

SLR-BD-56

Seat No.	

Set Q

S. Y. (B. Tech) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Building Planning & Design (BTN01402)

Day & Date: Wednesday 28-05-2025 Max. Marks: 28
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever needed and mention it clearly.

Section – I

Q.2 Attempt the following. (Any Two) **08**

a) Enlist and explain the in brief "Principles of Building Planning" with neat sketch.
b) Discuss site selection criteria for a residential building.
c) What is Orientation? Explain with sketch about "Orientations of building for various part of India on basis of climatic conditions."
d) Write a note on "Occupancy Certificate."

Q.3 Attempt the following. (Any One) **06**

a) What are the significances of various certificates in building permission?
b) Explain the importance of AUTOCAD and describe any four commands of CAD.

Section – II

Q.4 Attempt the following. (Any Two) **08**

a) What is "Green Building"? Explain in brief.
b) Explain Concept and Design of Rain Water Harvesting.
c) Write a note on "Low-cost Housing"
d) Explain in brief "types of fire load."

Q.5 Attempt the following. (Any One) **06**

a) Explain reverberation and reverberation time using Sabine's formula.
b) Enlist and explain in short materials available for "Sound Insulation."

SLR-BD-56

Seat No.	

Set R

S. Y. (B. Tech) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Building Planning & Design (BTN01402)

Day & Date: Wednesday 28-05-2025 Max. Marks: 35
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each Question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever needed and mention it clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:07

Q.1 Choose the correct alternative from the options given below. 07

1) If object is on picture plane, then the size perspective will be _____.
a) enlarged b) reduced
c) remains same d) all of the above

2) For Bedroom Aspect it needs at _____.
a) E-aspect b) S-aspect
c) SW-aspect d) W-aspect

3) The green building process can be applied to which of these?
a) buildings b) materials
c) interiors d) all of above

4) The earthing wire should have _____.
a) high resistance b) medium resistance
c) negligible resistance d) any of the above

5) Combining two or more plots as a single plot is called _____.
a) Amalgamation b) Frontage
c) Bifurcation d) Building setback

6) For kitchen cum dining room the minimum area should be _____.
a) 5 sq. m b) 9.5 sq. m
c) 6 sq. m d) 15 sq. m

7) For built-up area calculations _____ is drawn on the building permission drawing.
a) Terrace plan b) Plan
c) Site plan d) Block plan

SLR-BD-56

Seat No.	

Set R

S. Y. (B. Tech) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Building Planning & Design (BTN01402)

Day & Date: Wednesday 28-05-2025 Max. Marks: 28
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever needed and mention it clearly.

Section – I

Q.2 Attempt the following. (Any Two) **08**

a) Enlist and explain the in brief "Principles of Building Planning" with neat sketch.
b) Discuss site selection criteria for a residential building.
c) What is Orientation? Explain with sketch about "Orientations of building for various part of India on basis of climatic conditions."
d) Write a note on "Occupancy Certificate."

Q.3 Attempt the following. (Any One) **06**

a) What are the significances of various certificates in building permission?
b) Explain the importance of AUTOCAD and describe any four commands of CAD.

Section – II

Q.4 Attempt the following. (Any Two) **08**

a) What is "Green Building"? Explain in brief.
b) Explain Concept and Design of Rain Water Harvesting.
c) Write a note on "Low-cost Housing"
d) Explain in brief "types of fire load."

Q.5 Attempt the following. (Any One) **06**

a) Explain reverberation and reverberation time using Sabine's formula.
b) Enlist and explain in short materials available for "Sound Insulation."

SLR-BD-56

Seat No.		Set	S

S. Y. (B. Tech) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Building Planning & Design (BTN01402)

Day & Date: Wednesday 28-05-2025 Max. Marks: 35
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each Question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data whenever needed and mention it clearly.

MCQ/Objective Type Questions

Duration: 20 Minutes Marks:07

Q.1 Choose the correct alternative from the options given below. **07**

1) Combining two or more plots as a single plot is called _____.
a) Amalgamation b) Frontage
c) Bifurcation d) Building setback

2) For kitchen cum dining room the minimum area should be _____.
a) 5 sq. m b) 9.5 sq. m
c) 6 sq. m d) 15 sq. m

3) For built-up area calculations _____ is drawn on the building permission drawing.
a) Terrace plan b) Plan
c) Site plan d) Block plan

4) If object is on picture plane, then the size perspective will be _____.
a) enlarged b) reduced
c) remains same d) all of the above

5) For Bedroom Aspect it needs at _____.
a) E-aspect b) S-aspect
c) SW-aspect d) W-aspect

6) The green building process can be applied to which of these?
a) buildings b) materials
c) interiors d) all of above

7) The earthing wire should have _____.
a) high resistance b) medium resistance
c) negligible resistance d) any of the above

SLR-BD-56

Seat No.	

Set S

S. Y. (B. Tech) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Building Planning & Design (BTN01402)

Day & Date: Wednesday 28-05-2025 Max. Marks: 28
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data whenever needed and mention it clearly.

Section – I

Q.2 Attempt the following. (Any Two) **08**

a) Enlist and explain the in brief "Principles of Building Planning" with neat sketch.
b) Discuss site selection criteria for a residential building.
c) What is Orientation? Explain with sketch about "Orientations of building for various part of India on basis of climatic conditions."
d) Write a note on "Occupancy Certificate."

Q.3 Attempt the following. (Any One) **06**

a) What are the significances of various certificates in building permission?
b) Explain the importance of AUTOCAD and describe any four commands of CAD.

Section – II

Q.4 Attempt the following. (Any Two) **08**

a) What is "Green Building"? Explain in brief.
b) Explain Concept and Design of Rain Water Harvesting.
c) Write a note on "Low-cost Housing"
d) Explain in brief "types of fire load."

Q.5 Attempt the following. (Any One) **06**

a) Explain reverberation and reverberation time using Sabine's formula.
b) Enlist and explain in short materials available for "Sound Insulation."

SLR-BD-57

Seat No.	

Set P

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Structural Mechanics - II (BTN01403)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

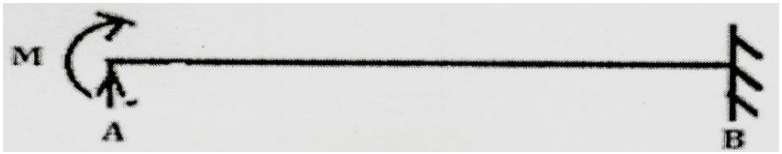
1) A three hinged parabolic arch is subjected to load w at distance L/4 from left support. The rise of the crown is 4m, span is 20 m & w is 80 kN. The horizontal thrust is _____.
a) 40 KN b) 25 KN
c) 80 KN d) 50 KN

2) The size of stiffness matrix equals to _____.
a) DSI b) DKI
c) DSI+DKI d) DSI-DKI

3) Which one of the fallowing doesn't fall under category of force method?
a) Consistent deformation method
b) Flexibility method
c) Stiffness method
d) Energy method

4) Three hinged arch is _____ structure.
a) Determinate b) Indeterminate
c) Both a & b d) All of the above

5) Carryover Moment at end B due to moment M applied at end A for the given beam is _____.



a) +M b) -M
c) +M/2 d) -M/2

6) In moment distribution method, the sum of distribution factors of all the members meeting at any joint is always _____.

a) Zero b) 1
c) Greater than 1 d) less than 1

7) Degree of kinematic indeterminacy of a pin-jointed plane frame is given by _____.

a) 2j – r b) j – 2r
c) 3j – r d) 2j + r

8) Calculate the self-weight of rectangular dam 22 m high and 8 m wide. It contains water up to the height of 20 m. Consider the specific weight of masonary as 250 kN/m^3

a) 3560 kN b) 4400 kN
c) 5432 kN d) 5680 kN

9) Euler's critical load for a column of length 1, moment of inertia 1, modulus of elasticity E and both ends are hinged is given by _____.

a) $\Pi^2 \mathrm{EI}/l^2$ b) $\Pi^2 \mathrm{EI}/4l^2$
c) $\Pi^2 \mathrm{EI}/2l^2$ d) $4\Pi^2 \mathrm{EI}/l^2$

10) An electric pole is 6.5 m high from the ground level. Its effective length for design purpose will be _____.

a) 6.5 m b) 3.25 m
c) 13.0 m d) 12.0 m

11) Bending moment at any section in conjugate beam gives _____ in actual beam.

a) slope b) curvature
c) deflection d) bending moment

12) Deflection of a simply supported beam when subjected to central point load is _____.

a) Wl/16 EI b) Wl^2/16 EI
c) Wl^3/48 EI d) $5Wl^4$/384 EI

13) The central part in the cross section of column joining the points of e-limit such that, it loads acts within this part, there will be no tension induced in the column. This central part is known as _____ of the section.

a) Core b) Eccentricity
c) Kernel d) Both a and c

14) The Eccentric Vertical Load generates _____.

a) Only Direct Stress
b) Only Bending Stress
c) Combined Bending and Direct Stress
d) Shear Stress

Seat No.	

Set P

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Structural Mechanics - II (BTN01403)

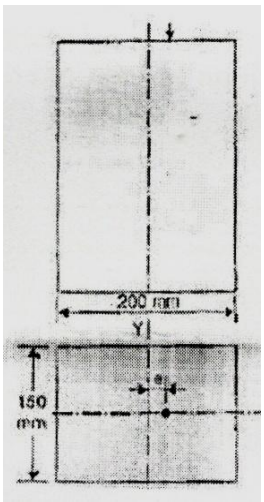
Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 2 and Q. No. 6 are compulsory.
2) Slove any two from Q. No. 3 to Q. No. 5 and Q. No.7 to Q. No. 9 questions from each section.
3) Non programmable calculator are allowed.
4) Draw neat sketch's where required and Assume suitable data if required and state it clearly.

Section – I

Q.2 **a)** Find the kernel of circular section of diameter 'd'. **03**

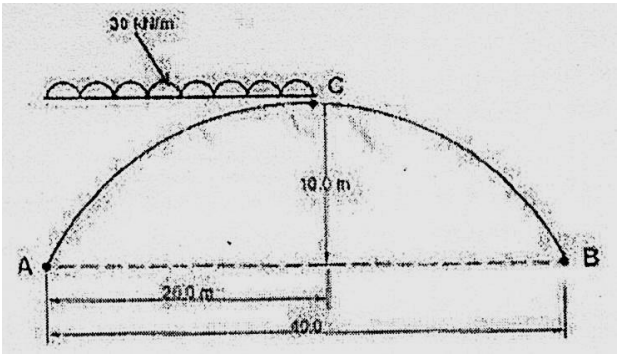
b) A rectangular column of width 200 mm and thickness 150 mm is as shown in fig. -1. The minimum stresses on the section is given zero then find the eccentricity of the point load 240 kN acting on the rectangular column. Also calculate the corresponding maximum stress on the section. **07**



Q.3 Hollow C.I Column whose outside diameter is 200 mm has a thickness of 20mm. It is 4.5m Long and is fixed at both end. Calculate safe load by Rankine's formula using a factor of safety 4. Calculate Eulers and Rankine's Critical Load. For C.I take $\sigma c = 550\ \mathrm{N/mm^2}$ and $\alpha = 1/1600$ and $\mathrm{E} = 8 \times 10^4\ \mathrm{N/mm^2}$. **09**

Q.4 Determine the maximum and minimum stresses at the base of a hollow circular chimney of height 20 m with external diameter 4 m and internal diameter 2 m. The chimney is subjected to a horizontal wind pressure of intensity 1 kN/m^2. The specific weight of the material of chimney is 22 kN/m^3. **09**

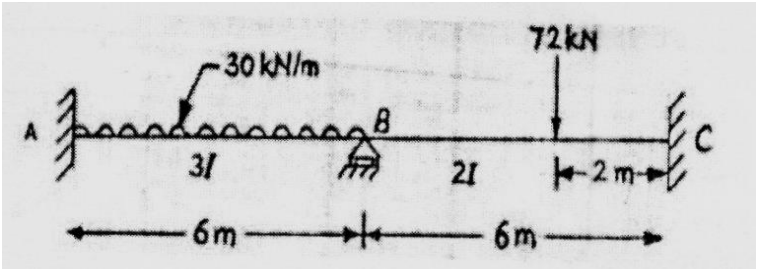
Q.5 A three hinged arch has a span of 40 m & a rise of 10 m carries udl of 30 kN/m on the left half of its span. Determine the horizontal thrust and support reactions. **09**



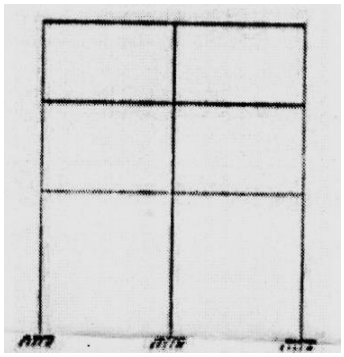
Section – II

Q.6 **a)** Explain the difference between force method and displacement methods. **03**

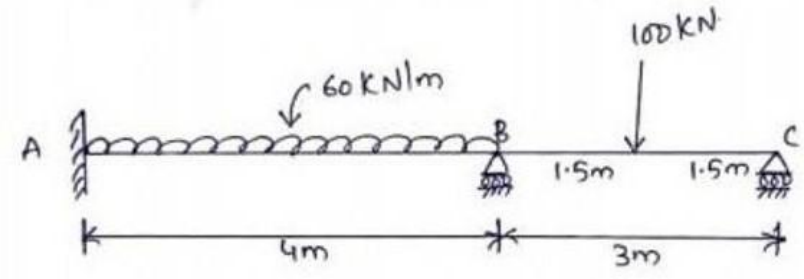
b) Analyze the continuous beam as shown in fig. by moment distribution method and draw bending moment and shear force diagrams. **07**



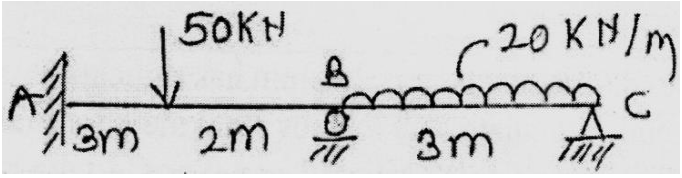
Q.7 **a)** Determine the degree of static and kinematic indeterminacy of the frame shown in fig. **02**



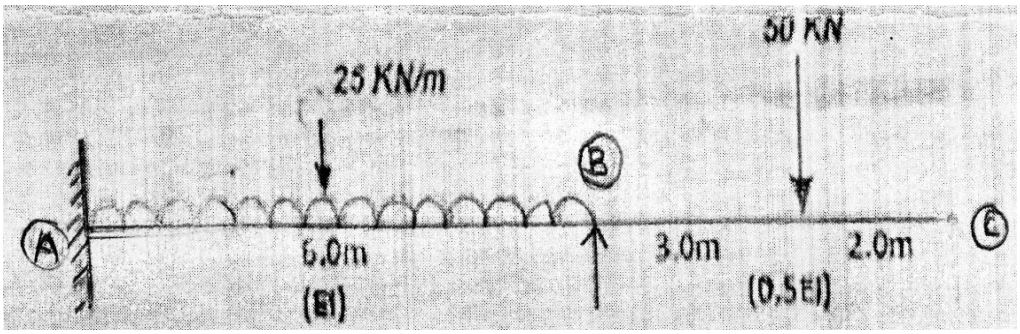
b) Analyze the continuous beam as shown in fig. by flexibility method. Take EI constant throughout. **07**



Q.8 Analyze the continuous beam as shown in fig. by stiffness matrix method. **09**



Q.9 Analyze the beam as shown in fig. by moment distribution method. **09**



Seat No.	

Set **Q**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Structural Mechanics - II (BTN01403)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Calculate the self-weight of rectangular dam 22 m high and 8 m wide. It contains water up to the height of 20 m. Consider the specific weight of masonary as 250 kN/m^3

a) 3560 kN b) 4400 kN
c) 5432 kN d) 5680 kN

2) Euler's critical load for a column of length 1, moment of inertia 1, modulus of elasticity E and both ends are hinged is given by _____.

a) $\Pi^2 \mathrm{EI}/l^2$ b) $\Pi^2 \mathrm{EI}/4l^2$
c) $\Pi^2 \mathrm{EI}/2l^2$ d) $4\Pi^2 \mathrm{EI}/l^2$

3) An electric pole is 6.5 m high from the ground level. Its effective length for design purpose will be _____.

a) 6.5 m b) 3.25 m
c) 13.0 m d) 12.0 m

4) Bending moment at any section in conjugate beam gives _____ in actual beam.

a) slope b) curvature
c) deflection d) bending moment

5) Deflection of a simply supported beam when subjected to central point load is _____.

a) WI/16 EI b) WI^2/16 EI
c) WI^3/48 EI d) 5WI^4/384 EI

6) The central part in the cross section of column joining the points of e-limit such that, it loads acts within this part, there will be no tension induced in the column. This central part is known as _____ of the section.

a) Core b) Eccentricity
c) Kernel d) Both a and c

7) The Eccentric Vertical Load generates _____.

a) Only Direct Stress
b) Only Bending Stress
c) Combined Bending and Direct Stress
d) Shear Stress

8) A three hinged parabolic arch is subjected to load w at distance L/4 from left support. The rise of the crown is 4m, span is 20 m & w is 80 kN. The horizontal thrust is _____.

a) 40 KN b) 25 KN
c) 80 KN d) 50 KN

9) The size of stiffness matrix equals to _____.

a) DSI b) DKI
c) DSI+DKI d) DSI-DKI

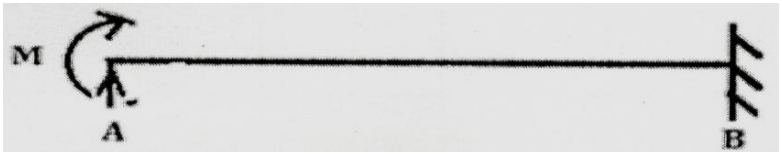
10) Which one of the fallowing doesn't fall under category of force method?

a) Consistent deformation method
b) Flexibility method
c) Stiffness method
d) Energy method

11) Three hinged arch is _____ structure.

a) Determinate b) Indeterminate
c) Both a & b d) All of the above

12) Carryover Moment at end B due to moment M applied at end A for the given beam is _____.



a) +M b) -M
c) +M/2 d) -M/2

13) In moment distribution method, the sum of distribution factors of all the members meeting at any joint is always _____.

a) Zero b) 1
c) Greater than 1 d) less than 1

14) Degree of kinematic indeterminacy of a pin-jointed plane frame is given by _____.

a) 2j – r
b) j – 2r
c) 3j – r
d) 2j + r

Seat No.	

Set **Q**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Structural Mechanics - II (BTN01403)

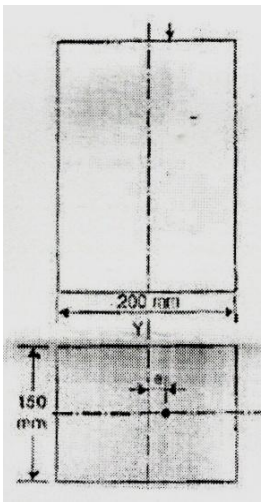
Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 2 and Q. No. 6 are compulsory.
2) Slove any two from Q. No. 3 to Q. No. 5 and Q. No.7 to Q. No. 9 questions from each section.
3) Non programmable calculator are allowed.
4) Draw neat sketch's where required and Assume suitable data if required and state it clearly.

Section – I

Q.2 **a)** Find the kernel of circular section of diameter 'd'. **03**

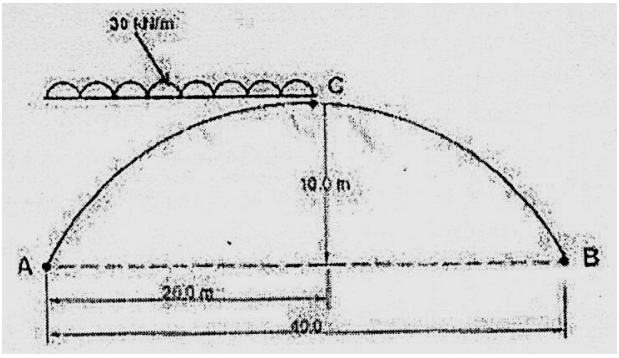
b) A rectangular column of width 200 mm and thickness 150 mm is as shown in fig. -1. The minimum stresses on the section is given zero then find the eccentricity of the point load 240 kN acting on the rectangular column. Also calculate the corresponding maximum stress on the section. **07**



Q.3 Hollow C.I Column whose outside diameter is 200 mm has a thickness of 20mm. It is 4.5m Long and is fixed at both end. Calculate safe load by Rankine's formula using a factor of safety 4. Calculate Eulers and Rankine's Critical Load. For C.I take $\sigma c = 550\ \mathrm{N/mm^2}$ and $\alpha = 1/1600$ and $\mathrm{E} = 8 \times 10^4\ \mathrm{N/mm^2}$. **09**

Q.4 Determine the maximum and minimum stresses at the base of a hollow circular chimney of height 20 m with external diameter 4 m and internal diameter 2 m. The chimney is subjected to a horizontal wind pressure of intensity 1 kN/m^2. The specific weight of the material of chimney is 22 kN/m^3. **09**

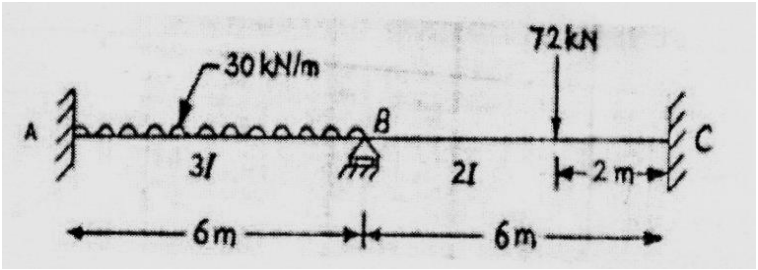
Q.5 A three hinged arch has a span of 40 m & a rise of 10 m carries udl of 30 kN/m on the left half of its span. Determine the horizontal thrust and support reactions. **09**



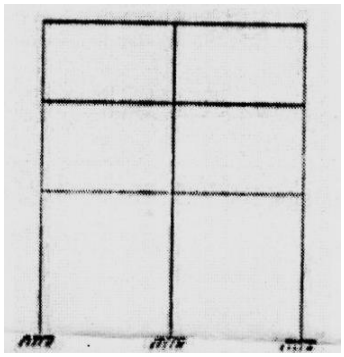
Section – II

Q.6 **a)** Explain the difference between force method and displacement methods. **03**

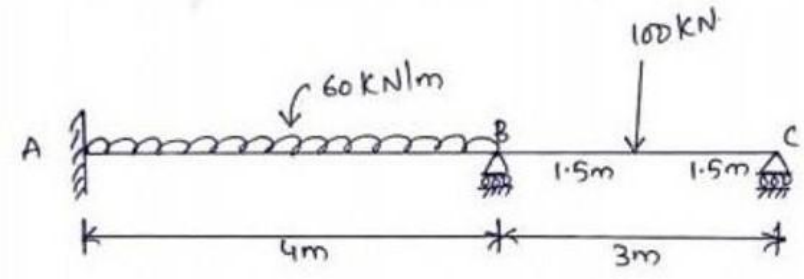
b) Analyze the continuous beam as shown in fig. by moment distribution method and draw bending moment and shear force diagrams. **07**



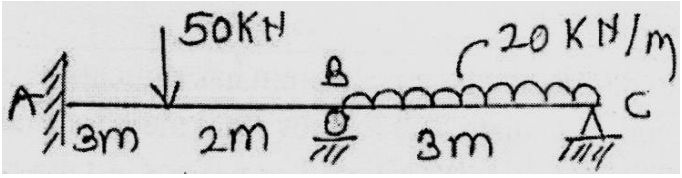
Q.7 **a)** Determine the degree of static and kinematic indeterminacy of the frame shown in fig. **02**



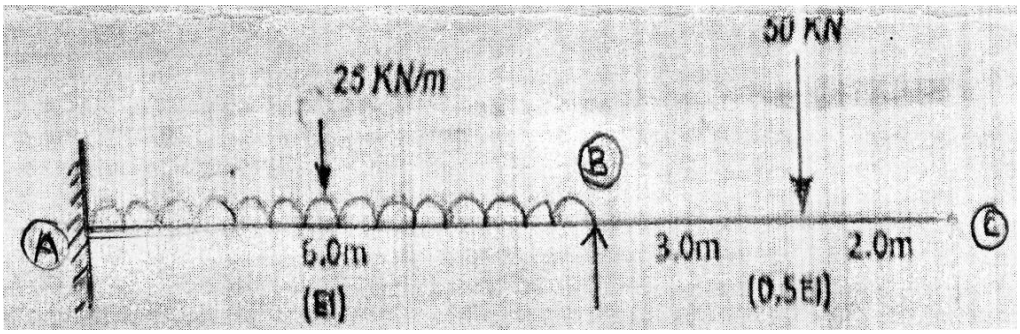
b) Analyze the continuous beam as shown in fig. by flexibility method. Take EI constant throughout. **07**



Q.8 Analyze the continuous beam as shown in fig. by stiffness matrix method. **09**



Q.9 Analyze the beam as shown in fig. by moment distribution method. **09**



SLR-BD-57

Seat No.	

Set R

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Structural Mechanics - II (BTN01403)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Bending moment at any section in conjugate beam gives _____ in actual beam.
a) slope b) curvature
c) deflection d) bending moment

2) Deflection of a simply supported beam when subjected to central point load is _____.
a) Wl/16 EI b) $Wl^2/16$ EI
c) $Wl^3/48$ EI d) $5Wl^4/384$ EI

3) The central part in the cross section of column joining the points of e-limit such that, it loads acts within this part, there will be no tension induced in the column. This central part is known as _____ of the section.
a) Core b) Eccentricity
c) Kernel d) Both a and c

4) The Eccentric Vertical Load generates _____.
a) Only Direct Stress
b) Only Bending Stress
c) Combined Bending and Direct Stress
d) Shear Stress

5) A three hinged parabolic arch is subjected to load w at distance L/4 from left support. The rise of the crown is 4m, span is 20 m & w is 80 kN. The horizontal thrust is _____.
a) 40 KN b) 25 KN
c) 80 KN d) 50 KN

6) The size of stiffness matrix equals to _____.

a) DSI b) DKI
c) DSI+DKI d) DSI-DKI

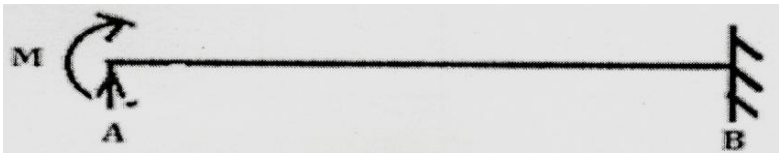
7) Which one of the fallowing doesn't fall under category of force method?

a) Consistent deformation method
b) Flexibility method
c) Stiffness method
d) Energy method

8) Three hinged arch is _____ structure.

a) Determinate b) Indeterminate
c) Both a & b d) All of the above

9) Carryover Moment at end B due to moment M applied at end A for the given beam is _____.



a) +M b) -M
c) +M/2 d) -M/2

10) In moment distribution method, the sum of distribution factors of all the members meeting at any joint is always _____.

a) Zero b) 1
c) Greater than 1 d) less than 1

11) Degree of kinematic indeterminacy of a pin-jointed plane frame is given by _____.

a) 2j – r b) j – 2r
c) 3j – r d) 2j + r

12) Calculate the self-weight of rectangular dam 22 m high and 8 m wide. It contains water up to the height of 20 m. Consider the specific weight of masonary as 250 kN/m^3

a) 3560 kN b) 4400 kN
c) 5432 kN d) 5680 kN

13) Euler's critical load for a column of length 1, moment of inertia 1, modulus of elasticity E and both ends are hinged is given by _____.

a) $\Pi^2 \mathrm{EI}/l^2$ b) $\Pi^2 \mathrm{EI}/4l^2$
c) $\Pi^2 \mathrm{EI}/2l^2$ d) $4\Pi^2 \mathrm{EI}/l^2$

14) An electric pole is 6.5 m high from the ground level. Its effective length for design purpose will be _____.

a) 6.5 m b) 3.25 m
c) 13.0 m d) 12.0 m

Seat No.	

Set **R**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Structural Mechanics - II (BTN01403)

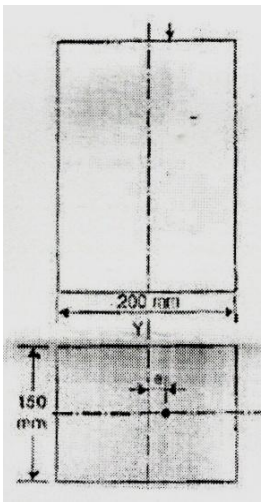
Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 2 and Q. No. 6 are compulsory.
2) Slove any two from Q. No. 3 to Q. No. 5 and Q. No.7 to Q. No. 9 questions from each section.
3) Non programmable calculator are allowed.
4) Draw neat sketch's where required and Assume suitable data if required and state it clearly.

Section – I

Q.2 **a)** Find the kernel of circular section of diameter 'd'. **03**

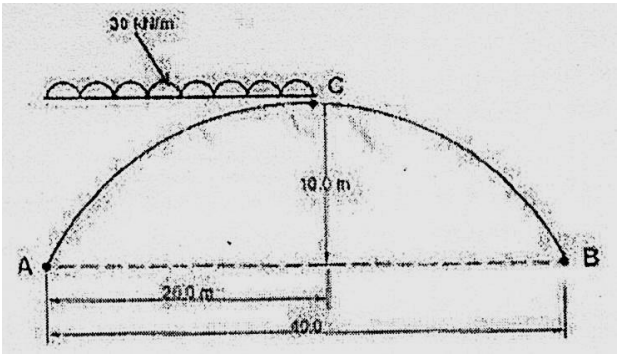
b) A rectangular column of width 200 mm and thickness 150 mm is as shown in fig. -1. The minimum stresses on the section is given zero then find the eccentricity of the point load 240 kN acting on the rectangular column. Also calculate the corresponding maximum stress on the section. **07**



Q.3 Hollow C.I Column whose outside diameter is 200 mm has a thickness of 20mm. It is 4.5m Long and is fixed at both end. Calculate safe load by Rankine's formula using a factor of safety 4. Calculate Eulers and Rankine's Critical Load. For C.I take $\sigma c = 550\ \mathrm{N/mm^2}$ and $\alpha = 1/1600$ and $\mathrm{E} = 8 \times 10^4\ \mathrm{N/mm^2}$. **09**

Q.4 Determine the maximum and minimum stresses at the base of a hollow circular chimney of height 20 m with external diameter 4 m and internal diameter 2 m. The chimney is subjected to a horizontal wind pressure of intensity 1 kN/m^2. The specific weight of the material of chimney is 22 kN/m^3. **09**

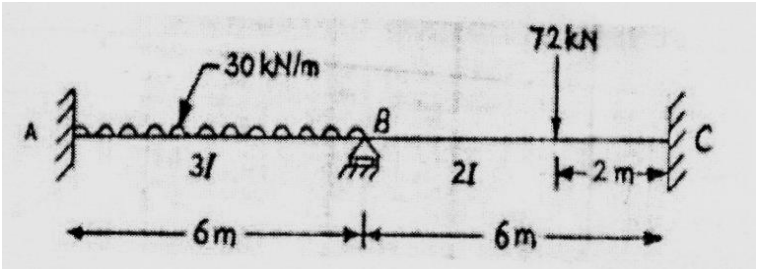
Q.5 A three hinged arch has a span of 40 m & a rise of 10 m carries udl of 30 kN/m on the left half of its span. Determine the horizontal thrust and support reactions. **09**



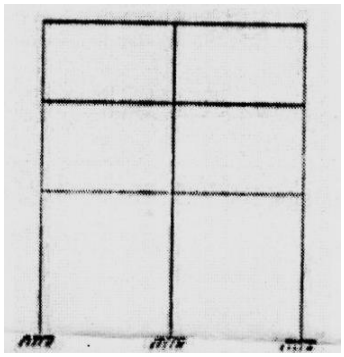
Section – II

Q.6 **a)** Explain the difference between force method and displacement methods. **03**

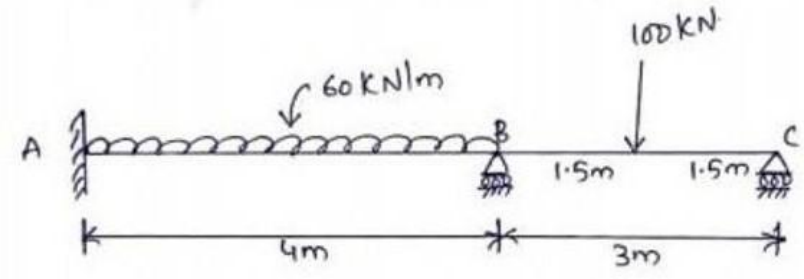
b) Analyze the continuous beam as shown in fig. by moment distribution method and draw bending moment and shear force diagrams. **07**



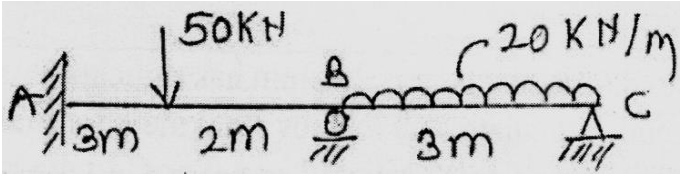
Q.7 **a)** Determine the degree of static and kinematic indeterminacy of the frame shown in fig. **02**



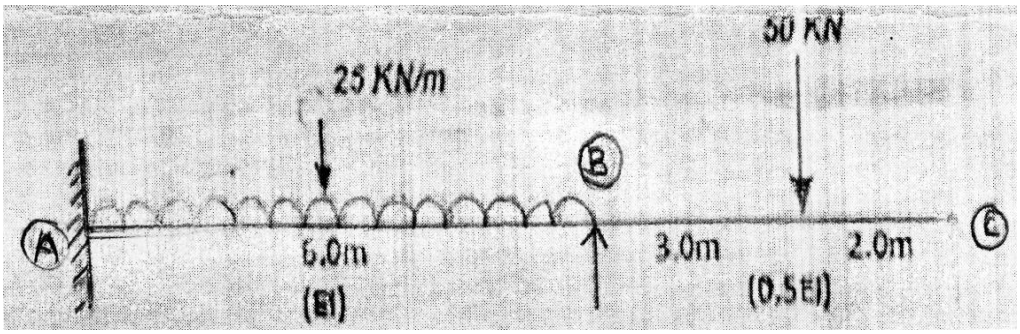
b) Analyze the continuous beam as shown in fig. by flexibility method. Take EI constant throughout. **07**



Q.8 Analyze the continuous beam as shown in fig. by stiffness matrix method. **09**



Q.9 Analyze the beam as shown in fig. by moment distribution method. **09**



SLR-BD-57

Seat No.	

Set S

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Structural Mechanics - II (BTN01403)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) In moment distribution method, the sum of distribution factors of all the members meeting at any joint is always _____.
a) Zero b) 1
c) Greater than 1 d) less than 1

2) Degree of kinematic indeterminacy of a pin-jointed plane frame is given by _____.
a) 2j – r b) j – 2r
c) 3j – r d) 2j + r

3) Calculate the self-weight of rectangular dam 22 m high and 8 m wide. It contains water up to the height of 20 m. Consider the specific weight of masonary as 250 kN/m^3
a) 3560 kN b) 4400 kN
c) 5432 kN d) 5680 kN

4) Euler's critical load for a column of length 1, moment of inertia 1, modulus of elasticity E and both ends are hinged is given by _____.
a) $\Pi^2 EI/l^2$ b) $\Pi^2 EI/4l^2$
c) $\Pi^2 EI/2l^2$ d) $4\Pi^2 EI/l^2$

5) An electric pole is 6.5 m high from the ground level. Its effective length for design purpose will be _____.
a) 6.5 m b) 3.25 m
c) 13.0 m d) 12.0 m

6) Bending moment at any section in conjugate beam gives _____ in actual beam.

a) slope b) curvature
c) deflection d) bending moment

7) Deflection of a simply supported beam when subjected to central point load is _____.

a) WI/16 EI b) WI^2/16 EI
c) WI^3/48 EI d) $5WI^4$/384 EI

8) The central part in the cross section of column joining the points of e-limit such that, it loads acts within this part, there will be no tension induced in the column. This central part is known as _____ of the section.

a) Core b) Eccentricity
c) Kernel d) Both a and c

9) The Eccentric Vertical Load generates _____.

a) Only Direct Stress
b) Only Bending Stress
c) Combined Bending and Direct Stress
d) Shear Stress

10) A three hinged parabolic arch is subjected to load w at distance L/4 from left support. The rise of the crown is 4m, span is 20 m & w is 80 kN. The horizontal thrust is _____.

a) 40 KN b) 25 KN
c) 80 KN d) 50 KN

11) The size of stiffness matrix equals to _____.

a) DSI b) DKI
c) DSI+DKI d) DSI-DKI

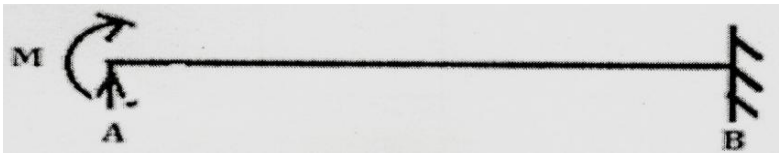
12) Which one of the fallowing doesn't fall under category of force method?

a) Consistent deformation method
b) Flexibility method
c) Stiffness method
d) Energy method

13) Three hinged arch is _____ structure.

a) Determinate b) Indeterminate
c) Both a & b d) All of the above

14) Carryover Moment at end B due to moment M applied at end A for the given beam is _____.



a) +M
b) -M
c) +M/2
d) -M/2

Seat No.	

Set **S**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Structural Mechanics - II (BTN01403)

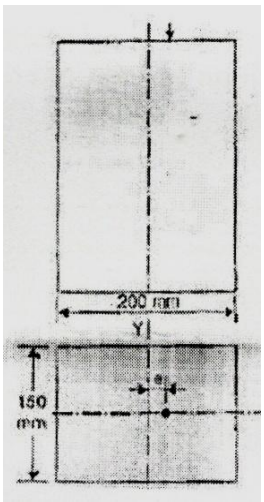
Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 2 and Q. No. 6 are compulsory.
2) Slove any two from Q. No. 3 to Q. No. 5 and Q. No.7 to Q. No. 9 questions from each section.
3) Non programmable calculator are allowed.
4) Draw neat sketch's where required and Assume suitable data if required and state it clearly.

Section – I

Q.2 **a)** Find the kernel of circular section of diameter 'd'. **03**

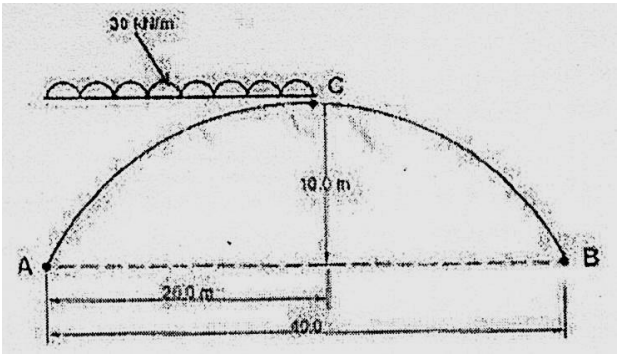
b) A rectangular column of width 200 mm and thickness 150 mm is as shown in fig. -1. The minimum stresses on the section is given zero then find the eccentricity of the point load 240 kN acting on the rectangular column. Also calculate the corresponding maximum stress on the section. **07**



Q.3 Hollow C.I Column whose outside diameter is 200 mm has a thickness of 20mm. It is 4.5m Long and is fixed at both end. Calculate safe load by Rankine's formula using a factor of safety 4. Calculate Eulers and Rankine's Critical Load. For C.I take $\sigma c = 550\ \mathrm{N/mm^2}$ and $\alpha = 1/1600$ and $\mathrm{E} = 8 \times 10^4\ \mathrm{N/mm^2}$. **09**

Q.4 Determine the maximum and minimum stresses at the base of a hollow circular chimney of height 20 m with external diameter 4 m and internal diameter 2 m. The chimney is subjected to a horizontal wind pressure of intensity 1 kN/m^2. The specific weight of the material of chimney is 22 kN/m^3. **09**

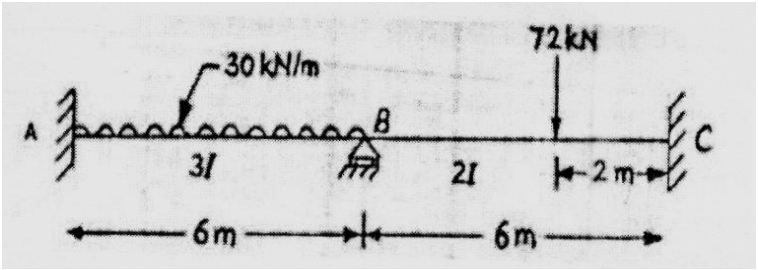
Q.5 A three hinged arch has a span of 40 m & a rise of 10 m carries udl of 30 kN/m on the left half of its span. Determine the horizontal thrust and support reactions. **09**



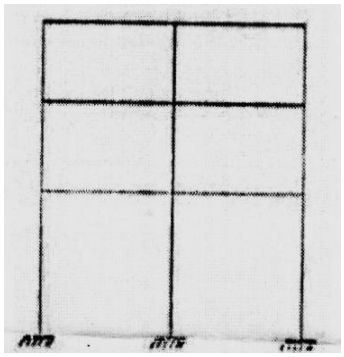
Section – II

Q.6 **a)** Explain the difference between force method and displacement methods. **03**

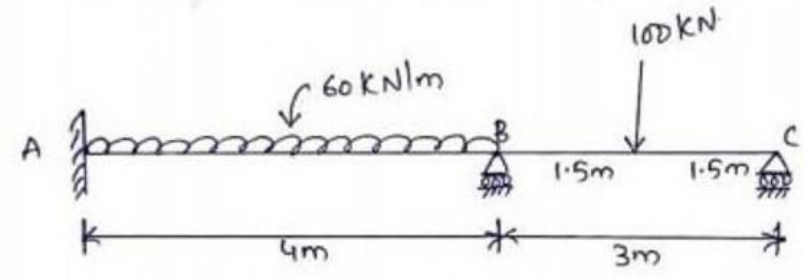
b) Analyze the continuous beam as shown in fig. by moment distribution method and draw bending moment and shear force diagrams. **07**



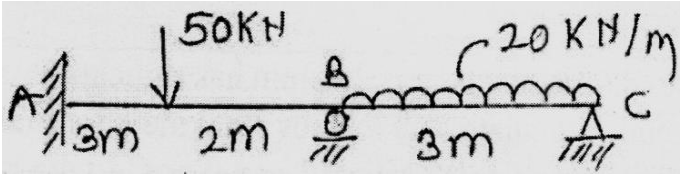
Q.7 **a)** Determine the degree of static and kinematic indeterminacy of the frame shown in fig. **02**



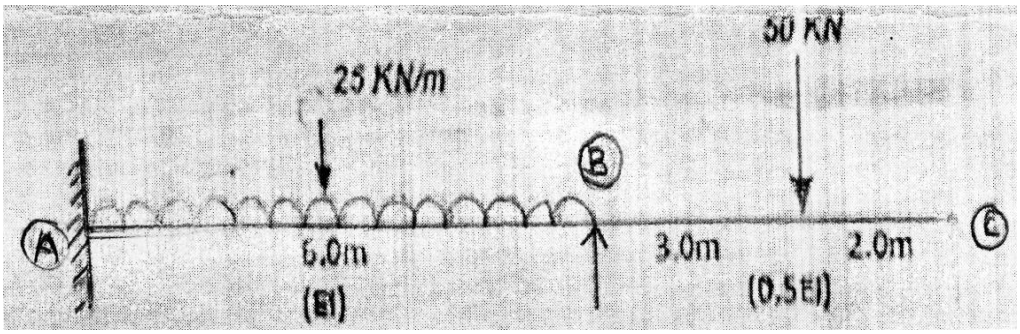
b) Analyze the continuous beam as shown in fig. by flexibility method. Take EI constant throughout. **07**



Q.8 Analyze the continuous beam as shown in fig. by stiffness matrix method. **09**



Q.9 Analyze the beam as shown in fig. by moment distribution method. **09**



SLR-BD-58

Seat No.	

Set P

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Engineering Geology (BTN01405)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly)
5) Draw neat and labeled diagrams wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Granite is igneous _____ rock
a) plutonic, acidic b) hypabyssal, acidic
c) plutonic, basic d) volcanic, basic

2) Composition of Core of the earth _____
a) Ni and Fe b) Si and Al
c) Fe and Mg d) Si and Mg

3) Which of the following physical feature is formed at interface of river and ocean?
a) river capture b) river terrace
c) rejuvenation d) delta

4) Cross bedding structure is commonly found in _____
a) sandstone b) granite
c) marble d) basalt

5) Which of the following statement is True?
a) Sill - discordant intrusion
b) Laccolith - discordant intrusion
c) Dyke - discordant intrusion
d) Phacolith - discordant intrusion

6) Thermal/ contact metamorphism is due to influence of _____
a) directed pressure b) uniform pressure
c) temperature d) Chemical fluids

7) Biotite mineral has_____
a) Fibrous form, 1 set cleavage
b) Foliated form, 2 set cleavage
c) Foliated form, 1 set cleavage
d) 4 hardness, 4 set cleavage

8) RQD is_____
a) Rock Quantity Designation
b) Rock Quality Designation
c) Rock Quantum Designation
d) Rock Quality Determination

9) Which of the following are main causes of land sliding?
a) Heavy rainfall b) Steep slope
c) Loose rocks d) All the above

10) Which of the following is a direct method of geological investigation?
a) Electric resistivity b) core drilling
c) magnetic d) gravity

11) The most desirable condition for dam is presence of_____
a) upstream dipping beds b) vertical beds
c) Joints d) downstream dipping beds

12) The color of building stone mainly depends upon _____
a) texture b) mineral composition
c) structure d) none of these

13) Which of the following represent Artesian well?
a) perched b) unconfined
c) confined d) all of these

14) High porosity is represented by _____
a) granite b) quartzite
c) compact basalt d) shale

Seat No.		Set	P

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Engineering Geology (BTN01405)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions (if necessary and state them clearly).
4) Draw neat and labeled diagram wherever necessary

Section – I

Q.2	**a)**	Define Fold. Describe Symmetrical and Asymmetrical folds.	**06**
	b)	Define Hardness. Describe Moh's Scale of Hardness of minerals.	**06**
		OR	
Q.3	**a)**	Describe Vesicular and Amygdaloidal structures of igneous rocks.	**06**
	b)	Define Weathering. Describe any two types of chemical weathering.	**06**
Q.4		Explain in detail - Internal Structure of the Earth.	**07**
		OR	
Q.5		Define Unconformity. Explain three types of Unconformities.	**07**
Q.6		**Write notes on (Any Three)**	**09**
	a)	Granulose structure	
	b)	Reverse Fault	
	c)	Types of Lava	
	d)	Luster of Minerals	
	e)	Branches of Geology	

Section – II

Q.7	**a)**	Define aquifer. Describe confined & perched aquifers.	**06**
	b)	Define Landslides. Describe any two types of Landslides.	**06**
		OR	
Q.8	**a)**	What are building stones? Add a note on crushing strength and Porosity of building stones.	**06**
	b)	Define earthquake. Explain characteristics of any two types of seismic waves.	**06**
Q.9		Define Reservoir. Explain desirable and undesirable conditions on inclined beds at reservoir site.	**07**
		OR	
Q.10		Define Dam. Explain dams on Anticline and Syncline folds.	**07**

Q.11 Write note on (Any Three) **09**

a) Granite as a building stone
b) Seismograph
c) Electric resistivity method
d) Silting process
e) Focus and Epicenter of earthquake

SLR-BD-58

Seat No.	

Set Q

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Engineering Geology (BTN01405)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly)
5) Draw neat and labeled diagrams wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) RQD is_____
a) Rock Quantity Designation
b) Rock Quality Designation
c) Rock Quantum Designation
d) Rock Quality Determination

2) Which of the following are main causes of land sliding?
a) Heavy rainfall b) Steep slope
c) Loose rocks d) All the above

3) Which of the following is a direct method of geological investigation?
a) Electric resistivity b) core drilling
c) magnetic d) gravity

4) The most desirable condition for dam is presence of_____
a) upstream dipping beds b) vertical beds
c) Joints d) downstream dipping beds

5) The color of building stone mainly depends upon _____
a) texture b) mineral composition
c) structure d) none of these

6) Which of the following represent Artesian well?
a) perched b) unconfined
c) confined d) all of these

7) High porosity is represented by _____
a) granite b) quartzite
c) compact basalt d) shale

8) Granite is igneous _____ rock
a) plutonic, acidic
b) hypabyssal, acidic
c) plutonic, basic
d) volcanic, basic

9) Composition of Core of the earth _____
a) Ni and Fe
b) Si and Al
c) Fe and Mg
d) Si and Mg

10) Which of the following physical feature is formed at interface of river and ocean?
a) river capture
b) river terrace
c) rejuvenation
d) delta

11) Cross bedding structure is commonly found in _____
a) sandstone
b) granite
c) marble
d) basalt

12) Which of the following statement is True?
a) Sill - discordant intrusion
b) Laccolith - discordant intrusion
c) Dyke - discordant intrusion
d) Phacolith - discordant intrusion

13) Thermal/ contact metamorphism is due to influence of _____
a) directed pressure
b) uniform pressure
c) temperature
d) Chemical fluids

14) Biotite mineral has_____
a) Fibrous form, 1 set cleavage
b) Foliated form, 2 set cleavage
c) Foliated form, 1 set cleavage
d) 4 hardness, 4 set cleavage

Seat No.		Set	Q

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Engineering Geology (BTN01405)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions (if necessary and state them clearly).
4) Draw neat and labeled diagram wherever necessary

Section – I

Q.2	**a)**	Define Fold. Describe Symmetrical and Asymmetrical folds.	**06**
	b)	Define Hardness. Describe Moh's Scale of Hardness of minerals.	**06**
		OR	
Q.3	**a)**	Describe Vesicular and Amygdaloidal structures of igneous rocks.	**06**
	b)	Define Weathering. Describe any two types of chemical weathering.	**06**
Q.4		Explain in detail - Internal Structure of the Earth.	**07**
		OR	
Q.5		Define Unconformity. Explain three types of Unconformities.	**07**
Q.6		**Write notes on (Any Three)**	**09**
	a)	Granulose structure	
	b)	Reverse Fault	
	c)	Types of Lava	
	d)	Luster of Minerals	
	e)	Branches of Geology	

Section – II

Q.7	**a)**	Define aquifer. Describe confined & perched aquifers.	**06**
	b)	Define Landslides. Describe any two types of Landslides.	**06**
		OR	
Q.8	**a)**	What are building stones? Add a note on crushing strength and Porosity of building stones.	**06**
	b)	Define earthquake. Explain characteristics of any two types of seismic waves.	**06**
Q.9		Define Reservoir. Explain desirable and undesirable conditions on inclined beds at reservoir site.	**07**
		OR	
Q.10		Define Dam. Explain dams on Anticline and Syncline folds.	**07**

Q.11 Write note on (Any Three) **09**

a) Granite as a building stone
b) Seismograph
c) Electric resistivity method
d) Silting process
e) Focus and Epicenter of earthquake

Seat No.	

Set R

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Engineering Geology (BTN01405)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly)
5) Draw neat and labeled diagrams wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The most desirable condition for dam is presence of_____
a) upstream dipping beds b) vertical beds
c) Joints d) downstream dipping beds

2) The color of building stone mainly depends upon _____
a) texture b) mineral composition
c) structure d) none of these

3) Which of the following represent Artesian well?
a) perched b) unconfined
c) confined d) all of these

4) High porosity is represented by _____
a) granite b) quartzite
c) compact basalt d) shale

5) Granite is igneous _____ rock
a) plutonic, acidic b) hypabyssal, acidic
c) plutonic, basic d) volcanic, basic

6) Composition of Core of the earth _____
a) Ni and Fe b) Si and Al
c) Fe and Mg d) Si and Mg

7) Which of the following physical feature is formed at interface of river and ocean?
a) river capture b) river terrace
c) rejuvenation d) delta

8) Cross bedding structure is commonly found in _____
a) sandstone b) granite
c) marble d) basalt

9) Which of the following statement is True?
a) Sill - discordant intrusion
b) Laccolith - discordant intrusion
c) Dyke - discordant intrusion
d) Phacolith - discordant intrusion

10) Thermal/ contact metamorphism is due to influence of _____
a) directed pressure b) uniform pressure
c) temperature d) Chemical fluids

11) Biotite mineral has_____
a) Fibrous form, 1 set cleavage
b) Foliated form, 2 set cleavage
c) Foliated form, 1 set cleavage
d) 4 hardness, 4 set cleavage

12) RQD is_____
a) Rock Quantity Designation
b) Rock Quality Designation
c) Rock Quantum Designation
d) Rock Quality Determination

13) Which of the following are main causes of land sliding?
a) Heavy rainfall b) Steep slope
c) Loose rocks d) All the above

14) Which of the following is a direct method of geological investigation?
a) Electric resistivity b) core drilling
c) magnetic d) gravity

SLR-BD-58

Seat No.	

Set R

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Engineering Geology (BTN01405)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions (if necessary and state them clearly).
4) Draw neat and labeled diagram wherever necessary

Section – I

Q.2	**a)**	Define Fold. Describe Symmetrical and Asymmetrical folds.	**06**
	b)	Define Hardness. Describe Moh's Scale of Hardness of minerals.	**06**
		OR	
Q.3	**a)**	Describe Vesicular and Amygdaloidal structures of igneous rocks.	**06**
	b)	Define Weathering. Describe any two types of chemical weathering.	**06**
Q.4		Explain in detail - Internal Structure of the Earth.	**07**
		OR	
Q.5		Define Unconformity. Explain three types of Unconformities.	**07**
Q.6		**Write notes on (Any Three)**	**09**
	a)	Granulose structure	
	b)	Reverse Fault	
	c)	Types of Lava	
	d)	Luster of Minerals	
	e)	Branches of Geology	

Section – II

Q.7	**a)**	Define aquifer. Describe confined & perched aquifers.	**06**
	b)	Define Landslides. Describe any two types of Landslides.	**06**
		OR	
Q.8	**a)**	What are building stones? Add a note on crushing strength and Porosity of building stones.	**06**
	b)	Define earthquake. Explain characteristics of any two types of seismic waves.	**06**
Q.9		Define Reservoir. Explain desirable and undesirable conditions on inclined beds at reservoir site.	**07**
		OR	
Q.10		Define Dam. Explain dams on Anticline and Syncline folds.	**07**

Q.11 Write note on (Any Three) **09**

a) Granite as a building stone
b) Seismograph
c) Electric resistivity method
d) Silting process
e) Focus and Epicenter of earthquake

SLR-BD-58

Seat No.	

Set S

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Engineering Geology (BTN01405)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly)
5) Draw neat and labeled diagrams wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Thermal/ contact metamorphism is due to influence of _____
a) directed pressure b) uniform pressure
c) temperature d) Chemical fluids

2) Biotite mineral has_____
a) Fibrous form, 1 set cleavage
b) Foliated form, 2 set cleavage
c) Foliated form, 1 set cleavage
d) 4 hardness, 4 set cleavage

3) RQD is_____
a) Rock Quantity Designation
b) Rock Quality Designation
c) Rock Quantum Designation
d) Rock Quality Determination

4) Which of the following are main causes of land sliding?
a) Heavy rainfall b) Steep slope
c) Loose rocks d) All the above

5) Which of the following is a direct method of geological investigation?
a) Electric resistivity b) core drilling
c) magnetic d) gravity

6) The most desirable condition for dam is presence of_____
a) upstream dipping beds b) vertical beds
c) Joints d) downstream dipping beds

7) The color of building stone mainly depends upon _____
a) texture b) mineral composition
c) structure d) none of these

8) Which of the following represent Artesian well?
a) perched b) unconfined
c) confined d) all of these

9) High porosity is represented by _____
a) granite b) quartzite
c) compact basalt d) shale

10) Granite is igneous _____ rock
a) plutonic, acidic b) hypabyssal, acidic
c) plutonic, basic d) volcanic, basic

11) Composition of Core of the earth _____
a) Ni and Fe b) Si and Al
c) Fe and Mg d) Si and Mg

12) Which of the following physical feature is formed at interface of river and ocean?
a) river capture b) river terrace
c) rejuvenation d) delta

13) Cross bedding structure is commonly found in _____
a) sandstone b) granite
c) marble d) basalt

14) Which of the following statement is True?
a) Sill - discordant intrusion
b) Laccolith - discordant intrusion
c) Dyke - discordant intrusion
d) Phacolith - discordant intrusion

SLR-BD-58

Seat No.		Set	S

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Engineering Geology (BTN01405)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions (if necessary and state them clearly).
4) Draw neat and labeled diagram wherever necessary

Section – I

Q.2	**a)**	Define Fold. Describe Symmetrical and Asymmetrical folds.	**06**
	b)	Define Hardness. Describe Moh's Scale of Hardness of minerals.	**06**
		OR	
Q.3	**a)**	Describe Vesicular and Amygdaloidal structures of igneous rocks.	**06**
	b)	Define Weathering. Describe any two types of chemical weathering.	**06**
Q.4		Explain in detail - Internal Structure of the Earth.	**07**
		OR	
Q.5		Define Unconformity. Explain three types of Unconformities.	**07**
Q.6		**Write notes on (Any Three)**	**09**
	a)	Granulose structure	
	b)	Reverse Fault	
	c)	Types of Lava	
	d)	Luster of Minerals	
	e)	Branches of Geology	

Section – II

Q.7	**a)**	Define aquifer. Describe confined & perched aquifers.	**06**
	b)	Define Landslides. Describe any two types of Landslides.	**06**
		OR	
Q.8	**a)**	What are building stones? Add a note on crushing strength and Porosity of building stones.	**06**
	b)	Define earthquake. Explain characteristics of any two types of seismic waves.	**06**
Q.9		Define Reservoir. Explain desirable and undesirable conditions on inclined beds at reservoir site.	**07**
		OR	
Q.10		Define Dam. Explain dams on Anticline and Syncline folds.	**07**

Q.11 Write note on (Any Three) **09**

a) Granite as a building stone
b) Seismograph
c) Electric resistivity method
d) Silting process
e) Focus and Epicenter of earthquake

SLR-BD-59

Seat No.		Set	P

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Engineering Mathematics - III (BTN01404)

Day & Date: Thursday 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The Particular integral of $(D^3 - D^2)y = x$ is _____.

a) $\frac{x^3}{6} + \frac{x^2}{2}$ b) $\frac{-x^3}{6} + \frac{x^2}{2}$

c) $\frac{-x^3}{6} - \frac{x^2}{2}$ d) $\frac{x^3}{6} - \frac{x^2}{2}$

2) In the interval (0,2) the constant term in the Fourier series of $f(x) = x$ is _____.

a) 0 b) π

c) 1 d) 2

3) $L[e^t t^3]$ is _____.

a) $\frac{6}{(s-1)^4}$ b) $\frac{6}{s(s-1)^4}$

c) $\frac{1}{(s-1)^4}$ d) $\frac{1}{s(s-1)^4}$

4) In a Poisson's distribution such that $P(x = 2) = P(x = 3)$ then the mean of distribution is _____.

a) 2 b) 3

c) 2/3 d) 3/2

5) $L^{-1}\left[\frac{(s^2-1)^2}{s^5}\right]$ is _____.

a) $1 - t^2 + \frac{t^4}{24}$ b) $1 - t^2 + \frac{t^3}{24}$

c) $-1 - t^2 + \frac{t^4}{24}$ d) $-1 + t^2 + \frac{t^4}{24}$

6) The value of correlation coefficient r lies between _____.

a) -1 and 1 b) $-\infty$ and ∞

c) 0 and ∞ d) none of these

7) For binomial distribution the mean is 2 and standard deviation is 1. Hence the value of n is equal to _____.

a) 2 b) 4

c) 3 d) 1

8) Fourier series of $f(x) = x\ in\ (-\pi, \pi)$ will contain _____.

a) No sine term b) No cosine term

c) Both cosine and sine term d) None of these

9) The solution of a partial differential equation $p + q = z$ is _____.

a) $f(xy, y \log z\ ) = 0$ b) $f(x + y, y + \log z\ ) = 0$

c) $f(x - y, y - \log z\ ) = 0$ d) $f(x + y, y - \log z\ ) = 0$

10) The solution of $(D^2 - 4)y = 0$ is _____.

a) $C_1 e^{2x} + C_2 e^{-2x}$

b) 0

c) $(C_1 x + C_2)e^{-2x}$

d) $C_1 e^{2x} + C_2 e^{-2x} + (C_3 \cos 2x + C_4 \sin 2x)$

11) The solution of a partial differential equation $q = e^{-p}$ is _____.

a) $z = ax + by + c$ b) $z = ax + e^{-a}y + c$

c) $z = ax + e^{a}y + c$ d) $z = ax + y^{-b} + c$

12) The solution of a partial differential equation $p + q = z$ is _____.

a) $f(xy, y \log z) = 0$ b) $f(x + y, y + \log z) = 0$

c) $f(x - y, y - \log z) = 0$ d) $f(x + y, y - \log z) = 0$

13) The solution of a partial differential equation $xp + yq = z$ is _____.

a) $f(x^2, y^2) = 0$ b) $f(x, y) = 0$

c) $f(xz, yz) = 0$ d) $f\left(\frac{x}{y}, \frac{y}{z}\right) = 0$

14) The condition for expansion of function in Fourier series are known as _____.

a) Harmonic b) Riemann

c) Periodic d) Dirichlet

Seat No.	

Set **P**

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Engineering Mathematics - III (BTN01404)

Day & Date: Thursday 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any THREE of the following. **09**

a) Solve $(D^4 - 16)y = \sin 2x$

b) Solve $x^2 \frac{d^2y}{dx^2} + x\frac{dy}{dx} + y = x^2$

c) Solve $p^2 - q^2 = x - y$

d) Solve $q = z^2p(1 - p^2)$

e) Obtain half range cosine series for $f(x) = x^2$ in $0 < x < 2$.

Q.3 Solve any THREE of the following. **09**

a) Solve $(2x + 5)^2 \frac{d^2y}{dx^2} + (2x + 5)\frac{dy}{dx} = x^3 + x$

b) Obtain the Fourier expansion of $f(x) = 9 - x^2$ in the interval $(-3,3)$

c) Solve $px^2 + qy^2 = z^2$

d) Solve $(D^2 - 4D + 4)y = x^3 + 6x$

e) Obtain the Fourier series of $f(x) = \sin x$ in $(-\pi, \pi)$

Q.4 Solve any TWO of the following. **10**

a) The deflection of a strut with one end built-in and other supported and subjected to end-thrust P satisfies the equation $EI\frac{d^2y}{dx^2} = Py - \frac{1}{2}Wx^2$.
Given that $\frac{dy}{dx} = 0, y = 0$ when $x = 0$.
Prove that $y = \frac{w}{Pn^2}(1 - \cosh nx) + \frac{Wx^2}{2P}$; where $n^2 = \frac{P}{EI}$

b) Obtain the Fourier expansion of $f(x) = \left(\frac{\pi - x}{2}\right)^2$ in the interval $(0,2\pi)$ and $f(x + 2\pi) = f(x)$. Also deduce that

$$\frac{\pi^2}{8} = \frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \frac{1}{7^2} + \cdots$$

c) Use variable separable method to solve $\frac{\partial z}{\partial x} + 4\frac{\partial z}{\partial y} = 0$, given $z(0, y) = 8e^{-3y}$

Section – II

Q.5 Solve any THREE of the following. **09**

a) Find $L\left[\int_0^t te^{-4t}\cos 2t\, dt\right]$

b) Find the inverse Laplace transform of $\frac{1}{2}\log\left(\frac{s^2+2^2}{s^2+3^2}\right)$

c) Fit a first degree curve to the following data

x	1	2	3	4	5
y	14	27	40	55	68

d) Fit a second degree parabola to following data :

x	1	2	3	4	5
y	1250	1400	1650	1950	2300

e) Find the value of k, if $f(x)$ is a probability density function

$$f(x) = \begin{cases} kx^2(1-x^3) & 0 \le x \le 1 \\ 0 & \text{otherwise} \end{cases}$$

Q.6 Solve any THREE of the following. **09**

a) Evaluate $\int_0^\infty \frac{e^{-t}-e^{-3t}}{t}$ by using Laplace transform.

b) Find the inverse using Laplace transform of $\left[\frac{s+29}{(s+4)(s^2+9)}\right]$

c) In a large assignment of electric bulbs, 10% are defective. A random sample of 20 is taken for inspection. Using Binomial distribution, find the probability that:

1) All are good bulbs
2) Exactly three are defective bulbs

d) Fit a poison distribution for following data :

x	0	1	2	3	4
f	123	59	14	3	1

e) For the following data fit a curve of the form $y = ax^b$

x	1	2	3	4	5	6
y	12	9	6	2	11	5

Q.7 Solve any TWO of the following. **10**

a) Use Laplace Transform to solve $\frac{d^2y}{dt^2} - \frac{dy}{dt} - 2y = 20\sin 2t$, where $(0) = 1; y'(0) = 2$

b) The marks of 1000 students in a university are found to be normally distributed with mean 70 and standard deviation 5. Estimate the number of students whose marks will be:

1) Between 60 & 75
2) More than 75

(For SNV, z area under the curve between z = 0 and z = 1 is 0.3413 and between z = 0 and z = 2 is 0.4772)

c) Find the equation of lines of regression and also coefficient of correlation from the following:

x:	57	42	38	42	45	44	40	46	44	43	40
y:	10	26	41	29	27	19	18	19	31	29	33

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Engineering Mathematics - III (BTN01404)

Day & Date: Thursday 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Fourier series of $f(x) = x\ in\ (-\pi, \pi)$ will contain _____.
a) No sine term b) No cosine term
c) Both cosine and sine term d) None of these

2) The solution of a partial differential equation $p + q = z$ is _____.
a) $f(xy, y\log z) = 0$ b) $f(x + y, y + \log z) = 0$
c) $f(x - y, y - \log z) = 0$ d) $f(x + y, y - \log z) = 0$

3) The solution of $(D^2 - 4)y = 0$ is _____.
a) $C_1e^{2x} + C_2e^{-2x}$
b) 0
c) $(C_1x + C_2)e^{-2x}$
d) $C_1e^{2x} + C_2e^{-2x} + (C_3\cos 2x + C_4\sin 2x)$

4) The solution of a partial differential equation $q = e^{-p}$ is _____.
a) $z = ax + by + c$ b) $z = ax + e^{-a}y + c$
c) $z = ax + e^{a}y + c$ d) $z = ax + y^{-b} + c$

5) The solution of a partial differential equation $p + q = z$ is _____.
a) $f(xy, y\log z) = 0$ b) $f(x + y, y + \log z) = 0$
c) $f(x - y, y - \log z) = 0$ d) $f(x + y, y - \log z) = 0$

6) The solution of a partial differential equation $xp + yq = z$ is _____.
a) $f(x^2, y^2) = 0$ b) $f(x, y) = 0$
c) $f(xz, yz) = 0$ d) $f\left(\frac{x}{y}, \frac{y}{z}\right) = 0$

7) The condition for expansion of function in Fourier series are known as _____.
a) Harmonic b) Riemann
c) Periodic d) Dirichlet

8) The Particular integral of $(D^3 - D^2)y = x$ is _____.

a) $\frac{x^3}{6} + \frac{x^2}{2}$ b) $\frac{-x^3}{6} + \frac{x^2}{2}$

c) $\frac{-x^3}{6} - \frac{x^2}{2}$ d) $\frac{x^3}{6} - \frac{x^2}{2}$

9) In the interval (0,2) the constant term in the Fourier series of $f(x) = x$ is _____.

a) 0 b) π

c) 1 d) 2

10) $L[e^t t^3]$ is _____.

a) $\frac{6}{(s-1)^4}$ b) $\frac{6}{s(s-1)^4}$

c) $\frac{1}{(s-1)^4}$ d) $\frac{1}{s(s-1)^4}$

11) In a Poisson's distribution such that $P(x = 2) = P(x = 3)$ then the mean of distribution is _____.

a) 2 b) 3

c) 2/3 d) 3/2

12) $L^{-1}\left[\frac{(s^2-1)^2}{s^5}\right]$ is _____.

a) $1 - t^2 + \frac{t^4}{24}$ b) $1 - t^2 + \frac{t^3}{24}$

c) $-1 - t^2 + \frac{t^4}{24}$ d) $-1 + t^2 + \frac{t^4}{24}$

13) The value of correlation coefficient r lies between _____.

a) -1 and 1 b) $-\infty$ and ∞

c) 0 and ∞ d) none of these

14) For binomial distribution the mean is 2 and standard deviation is 1. Hence the value of n is equal to _____.

a) 2 b) 4

c) 3 d) 1

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Engineering Mathematics - III (BTN01404)

Day & Date: Thursday 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any THREE of the following. **09**

a) Solve $(D^4 - 16)y = \sin 2x$

b) Solve $x^2 \frac{d^2y}{dx^2} + x\frac{dy}{dx} + y = x^2$

c) Solve $p^2 - q^2 = x - y$

d) Solve $q = z^2p(1 - p^2)$

e) Obtain half range cosine series for $f(x) = x^2$ in $0 < x < 2$.

Q.3 Solve any THREE of the following. **09**

a) Solve $(2x + 5)^2 \frac{d^2y}{dx^2} + (2x + 5)\frac{dy}{dx} = x^3 + x$

b) Obtain the Fourier expansion of $f(x) = 9 - x^2$ in the interval $(-3,3)$

c) Solve $px^2 + qy^2 = z^2$

d) Solve $(D^2 - 4D + 4)y = x^3 + 6x$

e) Obtain the Fourier series of $f(x) = \sin x$ in $(-\pi, \pi)$

Q.4 Solve any TWO of the following. **10**

a) The deflection of a strut with one end built-in and other supported and subjected to end-thrust P satisfies the equation $EI\frac{d^2y}{dx^2} = Py - \frac{1}{2}Wx^2$.
Given that $\frac{dy}{dx} = 0, y = 0$ when $x = 0$.
Prove that $y = \frac{w}{Pn^2}(1 - \cosh nx) + \frac{Wx^2}{2P}$; where $n^2 = \frac{P}{EI}$

b) Obtain the Fourier expansion of $f(x) = \left(\frac{\pi - x}{2}\right)^2$ in the interval $(0,2\pi)$ and $f(x + 2\pi) = f(x)$. Also deduce that

$$\frac{\pi^2}{8} = \frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \frac{1}{7^2} + \cdots$$

c) Use variable separable method to solve $\frac{\partial z}{\partial x} + 4\frac{\partial z}{\partial y} = 0$, given $z(0, y) = 8e^{-3y}$

Section – II

Q.5 Solve any THREE of the following. **09**

a) Find $L\left[\int_0^t te^{-4t}\cos 2t\,dt\right]$

b) Find the inverse Laplace transform of $\frac{1}{2}\log\left(\frac{s^2+2^2}{s^2+3^2}\right)$

c) Fit a first degree curve to the following data

x	1	2	3	4	5
y	14	27	40	55	68

d) Fit a second degree parabola to following data :

x	1	2	3	4	5
y	1250	1400	1650	1950	2300

e) Find the value of k, if $f(x)$ is a probability density function

$$f(x)=\begin{cases} kx^2(1-x^3) & 0\le x\le 1 \\ 0 & \text{otherwise}\end{cases}$$

Q.6 Solve any THREE of the following. **09**

a) Evaluate $\int_0^\infty \frac{e^{-t}-e^{-3t}}{t}$ by using Laplace transform.

b) Find the inverse using Laplace transform of $\left[\frac{s+29}{(s+4)(s^2+9)}\right]$

c) In a large assignment of electric bulbs, 10% are defective. A random sample of 20 is taken for inspection. Using Binomial distribution, find the probability that:

1) All are good bulbs
2) Exactly three are defective bulbs

d) Fit a poison distribution for following data :

x	0	1	2	3	4
f	123	59	14	3	1

e) For the following data fit a curve of the form $y=ax^b$

x	1	2	3	4	5	6
y	12	9	6	2	11	5

Q.7 Solve any TWO of the following. **10**

a) Use Laplace Transform to solve $\frac{d^2y}{dt^2} - \frac{dy}{dt} - 2y = 20\sin 2t$, where $(0) = 1; y'(0) = 2$

b) The marks of 1000 students in a university are found to be normally distributed with mean 70 and standard deviation 5. Estimate the number of students whose marks will be:

1) Between 60 & 75
2) More than 75

(For SNV, z area under the curve between z = 0 and z = 1 is 0.3413 and between z = 0 and z = 2 is 0.4772)

c) Find the equation of lines of regression and also coefficient of correlation from the following:

x:	57	42	38	42	45	44	40	46	44	43	40
y:	10	26	41	29	27	19	18	19	31	29	33

Seat No.		Set	R

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Engineering Mathematics - III (BTN01404)

Day & Date: Thursday 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The solution of a partial differential equation $q = e^{-p}$ is _____.
a) $z = ax + by + c$ b) $z = ax + e^{-a}y + c$
c) $z = ax + e^{a}y + c$ d) $z = ax + y^{-b} + c$

2) The solution of a partial differential equation $p + q = z$ is _____.
a) $f(xy, y\log z) = 0$ b) $f(x + y, y + \log z) = 0$
c) $f(x - y, y - \log z) = 0$ d) $f(x + y, y - \log z) = 0$

3) The solution of a partial differential equation $xp + yq = z$ is _____.
a) $f(x^2, y^2) = 0$ b) $f(x, y) = 0$
c) $f(xz, yz) = 0$ d) $f\left(\frac{x}{y}, \frac{y}{z}\right) = 0$

4) The condition for expansion of function in Fourier series are known as _____.
a) Harmonic b) Riemann
c) Periodic d) Dirichlet

5) The Particular integral of $(D^3 - D^2)y = x$ is _____.
a) $\frac{x^3}{6} + \frac{x^2}{2}$ b) $\frac{-x^3}{6} + \frac{x^2}{2}$
c) $\frac{-x^3}{6} - \frac{x^2}{2}$ d) $\frac{x^3}{6} - \frac{x^2}{2}$

6) In the interval (0,2) the constant term in the Fourier series of $f(x) = x$ is _____.
a) 0 b) π
c) 1 d) 2

7) $L[e^t t^3]$ is _____.

a) $\frac{6}{(s-1)^4}$ b) $\frac{6}{s(s-1)^4}$

c) $\frac{1}{(s-1)^4}$ d) $\frac{1}{s(s-1)^4}$

8) In a Poisson's distribution such that $P(x=2) = P(x=3)$ then the mean of distribution is _____.

a) 2 b) 3

c) 2/3 d) 3/2

9) $L^{-1}\left[\frac{(s^2-1)^2}{s^5}\right]$ is _____.

a) $1 - t^2 + \frac{t^4}{24}$ b) $1 - t^2 + \frac{t^3}{24}$

c) $-1 - t^2 + \frac{t^4}{24}$ d) $-1 + t^2 + \frac{t^4}{24}$

10) The value of correlation coefficient r lies between _____.

a) -1 and 1 b) $-\infty$ and ∞

c) 0 and ∞ d) none of these

11) For binomial distribution the mean is 2 and standard deviation is 1. Hence the value of n is equal to _____.

a) 2 b) 4

c) 3 d) 1

12) Fourier series of $f(x) = x\ in\ (-\pi, \pi)$ will contain _____.

a) No sine term b) No cosine term

c) Both cosine and sine term d) None of these

13) The solution of a partial differential equation $p + q = z$ is _____.

a) $f(xy, y\log z) = 0$ b) $f(x+y, y+\log z) = 0$

c) $f(x-y, y-\log z) = 0$ d) $f(x+y, y-\log z) = 0$

14) The solution of $(D^2 - 4)y = 0$ is _____.

a) $C_1 e^{2x} + C_2 e^{-2x}$

b) 0

c) $(C_1 x + C_2)e^{-2x}$

d) $C_1 e^{2x} + C_2 e^{-2x} + (C_3 \cos 2x + C_4 \sin 2x)$

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Engineering Mathematics - III (BTN01404)

Day & Date: Thursday 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any THREE of the following. **09**

a) Solve $(D^4 - 16)y = \sin 2x$

b) Solve $x^2 \frac{d^2y}{dx^2} + x\frac{dy}{dx} + y = x^2$

c) Solve $p^2 - q^2 = x - y$

d) Solve $q = z^2p(1 - p^2)$

e) Obtain half range cosine series for $f(x) = x^2$ in $0 < x < 2$.

Q.3 Solve any THREE of the following. **09**

a) Solve $(2x + 5)^2 \frac{d^2y}{dx^2} + (2x + 5)\frac{dy}{dx} = x^3 + x$

b) Obtain the Fourier expansion of $f(x) = 9 - x^2$ in the interval $(-3,3)$

c) Solve $px^2 + qy^2 = z^2$

d) Solve $(D^2 - 4D + 4)y = x^3 + 6x$

e) Obtain the Fourier series of $f(x) = \sin x$ in $(-\pi, \pi)$

Q.4 Solve any TWO of the following. **10**

a) The deflection of a strut with one end built-in and other supported and subjected to end-thrust P satisfies the equation $EI\frac{d^2y}{dx^2} = Py - \frac{1}{2}Wx^2$.
Given that $\frac{dy}{dx} = 0, y = 0$ when $x = 0$.
Prove that $y = \frac{w}{Pn^2}(1 - \cosh nx) + \frac{Wx^2}{2P}$; where $n^2 = \frac{P}{EI}$

b) Obtain the Fourier expansion of $f(x) = \left(\frac{\pi - x}{2}\right)^2$ in the interval $(0,2\pi)$ and $f(x + 2\pi) = f(x)$. Also deduce that

$$\frac{\pi^2}{8} = \frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \frac{1}{7^2} + \cdots$$

c) Use variable separable method to solve $\frac{\partial z}{\partial x} + 4\frac{\partial z}{\partial y} = 0$, given $z(0, y) = 8e^{-3y}$

Section – II

Q.5 Solve any THREE of the following. **09**

a) Find $L\left[\int_0^t te^{-4t}\cos 2t\,dt\right]$

b) Find the inverse Laplace transform of $\frac{1}{2}\log\left(\frac{s^2+2^2}{s^2+3^2}\right)$

c) Fit a first degree curve to the following data

x	1	2	3	4	5
y	14	27	40	55	68

d) Fit a second degree parabola to following data :

x	1	2	3	4	5
y	1250	1400	1650	1950	2300

e) Find the value of k, if $f(x)$ is a probability density function

$$f(x) = \begin{cases} kx^2(1-x^3) & 0 \le x \le 1 \\ 0 & \text{otherwise} \end{cases}$$

Q.6 Solve any THREE of the following. **09**

a) Evaluate $\int_0^\infty \frac{e^{-t}-e^{-3t}}{t}$ by using Laplace transform.

b) Find the inverse using Laplace transform of $\left[\frac{s+29}{(s+4)(s^2+9)}\right]$

c) In a large assignment of electric bulbs, 10% are defective. A random sample of 20 is taken for inspection. Using Binomial distribution, find the probability that:

1) All are good bulbs
2) Exactly three are defective bulbs

d) Fit a poison distribution for following data :

x	0	1	2	3	4
f	123	59	14	3	1

e) For the following data fit a curve of the form $y = ax^b$

x	1	2	3	4	5	6
y	12	9	6	2	11	5

Q.7 Solve any TWO of the following. **10**

a) Use Laplace Transform to solve $\frac{d^2y}{dt^2} - \frac{dy}{dt} - 2y = 20\sin 2t$, where $(0) = 1; y'(0) = 2$

b) The marks of 1000 students in a university are found to be normally distributed with mean 70 and standard deviation 5. Estimate the number of students whose marks will be:

1) Between 60 & 75
2) More than 75

(For SNV, z area under the curve between z = 0 and z = 1 is 0.3413 and between z = 0 and z = 2 is 0.4772)

c) Find the equation of lines of regression and also coefficient of correlation from the following:

x:	57	42	38	42	45	44	40	46	44	43	40
y:	10	26	41	29	27	19	18	19	31	29	33

Seat No.		Set	S

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Engineering Mathematics - III (BTN01404)

Day & Date: Thursday 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) The value of correlation coefficient r lies between _____.
a) -1 and 1 b) $-\infty$ and ∞
c) 0 and ∞ d) none of these

2) For binomial distribution the mean is 2 and standard deviation is 1. Hence the value of n is equal to _____.
a) 2 b) 4
c) 3 d) 1

3) Fourier series of $f(x) = x\ in\ (-\pi, \pi)$ will contain _____.
a) No sine term b) No cosine term
c) Both cosine and sine term d) None of these

4) The solution of a partial differential equation $p + q = z$ is _____.
a) $f(xy, y \log z) = 0$ b) $f(x + y, y + \log z) = 0$
c) $f(x - y, y - \log z) = 0$ d) $f(x + y, y - \log z) = 0$

5) The solution of $(D^2 - 4)y = 0$ is _____.
a) $C_1 e^{2x} + C_2 e^{-2x}$
b) 0
c) $(C_1 x + C_2)e^{-2x}$
d) $C_1 e^{2x} + C_2 e^{-2x} + (C_3 \cos 2x + C_4 \sin 2x)$

6) The solution of a partial differential equation $q = e^{-p}$ is _____.
a) $z = ax + by + c$ b) $z = ax + e^{-a}y + c$
c) $z = ax + e^{a}y + c$ d) $z = ax + y^{-b} + c$

7) The solution of a partial differential equation $p + q = z$ is _____.
a) $f(xy, y \log z) = 0$ b) $f(x + y, y + \log z) = 0$
c) $f(x - y, y - \log z) = 0$ d) $f(x + y, y - \log z) = 0$

8) The solution of a partial differential equation $xp + yq = z$ is _____.

a) $f(x^2, y^2) = 0$ b) $f(x, y) = 0$

c) $f(xz, yz) = 0$ d) $f\left(\frac{x}{y}, \frac{y}{z}\right) = 0$

9) The condition for expansion of function in Fourier series are known as _____.

a) Harmonic b) Riemann

c) Periodic d) Dirichlet

10) The Particular integral of $(D^3 - D^2)y = x$ is _____.

a) $\frac{x^3}{6} + \frac{x^2}{2}$ b) $\frac{-x^3}{6} + \frac{x^2}{2}$

c) $\frac{-x^3}{6} - \frac{x^2}{2}$ d) $\frac{x^3}{6} - \frac{x^2}{2}$

11) In the interval (0,2) the constant term in the Fourier series of $f(x) = x$ is _____.

a) 0 b) π

c) 1 d) 2

12) $L[e^t t^3]$ is _____.

a) $\frac{6}{(s-1)^4}$ b) $\frac{6}{s(s-1)^4}$

c) $\frac{1}{(s-1)^4}$ d) $\frac{1}{s(s-1)^4}$

13) In a Poisson's distribution such that $P(x = 2) = P(x = 3)$ then the mean of distribution is _____.

a) 2 b) 3

c) 2/3 d) 3/2

14) $L^{-1}\left[\frac{(s^2-1)^2}{s^5}\right]$ is _____.

a) $1 - t^2 + \frac{t^4}{24}$ b) $1 - t^2 + \frac{t^3}{24}$

c) $-1 - t^2 + \frac{t^4}{24}$ d) $-1 + t^2 + \frac{t^4}{24}$

Seat No.	

Set **S**

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Engineering Mathematics - III (BTN01404)

Day & Date: Thursday 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any THREE of the following. **09**

a) Solve $(D^4 - 16)y = \sin 2x$

b) Solve $x^2 \frac{d^2y}{dx^2} + x\frac{dy}{dx} + y = x^2$

c) Solve $p^2 - q^2 = x - y$

d) Solve $q = z^2p(1 - p^2)$

e) Obtain half range cosine series for $f(x) = x^2$ in $0 < x < 2$.

Q.3 Solve any THREE of the following. **09**

a) Solve $(2x + 5)^2 \frac{d^2y}{dx^2} + (2x + 5)\frac{dy}{dx} = x^3 + x$

b) Obtain the Fourier expansion of $f(x) = 9 - x^2$ in the interval $(-3,3)$

c) Solve $px^2 + qy^2 = z^2$

d) Solve $(D^2 - 4D + 4)y = x^3 + 6x$

e) Obtain the Fourier series of $f(x) = \sin x$ in $(-\pi, \pi)$

Q.4 Solve any TWO of the following. **10**

a) The deflection of a strut with one end built-in and other supported and subjected to end-thrust P satisfies the equation $EI\frac{d^2y}{dx^2} = Py - \frac{1}{2}Wx^2$.
Given that $\frac{dy}{dx} = 0, y = 0$ when $x = 0$.
Prove that $y = \frac{w}{Pn^2}(1 - \cosh nx) + \frac{Wx^2}{2P}$; where $n^2 = \frac{P}{EI}$

b) Obtain the Fourier expansion of $f(x) = \left(\frac{\pi - x}{2}\right)^2$ in the interval $(0,2\pi)$ and $f(x + 2\pi) = f(x)$. Also deduce that

$$\frac{\pi^2}{8} = \frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \frac{1}{7^2} + \cdots$$

c) Use variable separable method to solve $\frac{\partial z}{\partial x} + 4\frac{\partial z}{\partial y} = 0$, given $z(0, y) = 8e^{-3y}$

Section – II

Q.5 Solve any THREE of the following. **09**

a) Find $L\left[\int_0^t te^{-4t}\cos 2t\,dt\right]$

b) Find the inverse Laplace transform of $\frac{1}{2}\log\left(\frac{s^2+2^2}{s^2+3^2}\right)$

c) Fit a first degree curve to the following data

x	1	2	3	4	5
y	14	27	40	55	68

d) Fit a second degree parabola to following data :

x	1	2	3	4	5
y	1250	1400	1650	1950	2300

e) Find the value of k, if $f(x)$ is a probability density function

$$f(x)=\begin{cases} kx^2(1-x^3) & 0\le x\le 1 \\ 0 & \text{otherwise}\end{cases}$$

Q.6 Solve any THREE of the following. **09**

a) Evaluate $\int_0^\infty \frac{e^{-t}-e^{-3t}}{t}$ by using Laplace transform.

b) Find the inverse using Laplace transform of $\left[\frac{s+29}{(s+4)(s^2+9)}\right]$

c) In a large assignment of electric bulbs, 10% are defective. A random sample of 20 is taken for inspection. Using Binomial distribution, find the probability that:

1) All are good bulbs
2) Exactly three are defective bulbs

d) Fit a poison distribution for following data :

x	0	1	2	3	4
f	123	59	14	3	1

e) For the following data fit a curve of the form $y=ax^b$

x	1	2	3	4	5	6
y	12	9	6	2	11	5

Q.7 Solve any TWO of the following. **10**

a) Use Laplace Transform to solve $\frac{d^2y}{dt^2} - \frac{dy}{dt} - 2y = 20\sin 2t$, where $(0) = 1; y'(0) = 2$

b) The marks of 1000 students in a university are found to be normally distributed with mean 70 and standard deviation 5. Estimate the number of students whose marks will be:

1) Between 60 & 75
2) More than 75

(For SNV, z area under the curve between z = 0 and z = 1 is 0.3413 and between z = 0 and z = 2 is 0.4772)

c) Find the equation of lines of regression and also coefficient of correlation from the following:

x:	57	42	38	42	45	44	40	46	44	43	40
y:	10	26	41	29	27	19	18	19	31	29	33

SLR-BD-60

Seat No.	

Set P

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Laws and Impact Assessment (BTN01407)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) According to FCA 1980," To monitor the effective implementation of act ____ Committee/authority was constituted at the national level.
a) Compensatory Afforestation
b) Forest Control Committee Management & Planning Authority
c) Wildlife Conversation Authority
d) None of these

2) According to FCA 1980 "The law allows diversion of forest land only for ____ purpose.
i) Drinking Water Projects
ii) Irrigation Project
iii) Railway Line
iv) Mining
a) i and ii b) only i
c) i, ii & iii d) i, ii, iii & iv

3) According to which article it is the duty of the State government to protect and improve the natural environment including forests, lakes, rivers, and wildlife.
a) Article 48A b) Article 51A (clause g)
c) Article 19 (1) g d) Article 21

4) Which article provides the right to any person for their life and personal liberty?
a) Article 48A b) Article 21
c) Article 14 d) Article 51

5) Any person or Organization (either based in India or not) obtains any biological resources occurring in India for its research or commercial Utilization is prohibited in which Act.

a) Wildlife Protection Act
b) Biological Diversity Act
c) Forest Conservation Act
d) Water Act

6) ____ states that "parliament has power to make any law for the whole or any part of the country for implementing any treaty, agreement, or convention with any other country.

a) Article 253
b) Article 51
c) Article 21
d) Article 14

7) When the stock Holm conference was conducted.

a) 5-16 JUNE, 1972
b) 5-16 JULY, 1972
c) 17-30 JUNE, 1972
d) 17-30 JULY, 1972

8) Which of the following article promotes international peace and security.

a) Article 51
b) Article 21
c) Article 253
d) Article 14

9) Central government of India under Article 48A enacted a new legislation called ____.

a) forest conservation Act
b) wildlife protection act
c) Indian forest Act
d) Reserve forest act

10) The argument that the "polluters pay" principal is ineffective in terms of reducing pollution is because is to argued that: ____.

a) Richer consumers can easily afford to pay and so essential pollution will still continue to rise
b) It is unfair to penalize richer consumers who will pay more of the taxes
c) The polluters pay principal cannot solve environmental problems on its own population in hundreds
d) It is impossible to work out the size of the necessary act

11) One person to be nominated by each of participating ____ from amongst the members the members of the local authority functioning within the state concerned.

a) Central Government
b) State Government
c) Local Authorities
d) None of these

12) Environment act ____ gives power to this act by which the country shall endeavor to protect and improve the environment and to safeguard the forests and wildlife.

a) Article 48 A
b) Article 51 A
c) Article 41 A
d) Article 58 A

13) The water act comprises of _____ section which are divided into chapter.

a) 96 section 7 b) 68, 6
c) 64,8 d) 67,7

14) To provide for the prevention control and abatement of the air pollution is known as ____.

a) Air act b) Water act
c) Environment act d) None of these

Seat No.	

Set | P

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Laws and Impact Assessment (BTN01407)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Question no. 8 is compulsory in section II, and solve any two questions from the remaining.
3) Figures to the right indicate full marks.
4) Assume suitable data wherever necessary and mention it clearly.
5) Use of non-programmable calculator is allowed.

Section – I

Q.2	**a)**	Differentiate between Water Act 1974 and Water Cess act 1977.	**06**
	b)	Enlist various core values and principles of EIA.	**04**
Q.3	**a)**	Discuss importance of WLPA 1972 for protection of wildlife in forest.	**05**
	b)	Explain salient feature of IFA 1972. Analyze functional changes as per changing years in the law.	**04**
Q.4	**a)**	Discuss importance of Biological diversity act 2002 for protection of natural Environment.	**05**
	b)	Explain salient feature of Water Act 1974. Differentiate functions of CPCB & SPCB described in Water Act 1974.	**04**
Q.5	**a)**	Enlist advantages and disadvantages of LCA.	**05**
	b)	Explain PLI Act 1991 in detail.	**04**

Section – II

Q.6	**a)**	Explain procedure of EIA with the help of flow sheet.	**05**
	b)	Discuss role of various authorities in Water Cess act 1977.	**04**
Q.7	**a)**	Enlist advantages and disadvantages of Indian Forest Act 1927.	**05**
	b)	Discuss role of CPCB and SPCB in Air act 1974.	**04**
Q.8	**a)**	Examine salient feature of EIA methodologies.	**06**
	b)	Analysis numerous Laws introduced to minimize limitations of IFA 1927.	**04**
Q.9	**a)**	Explain Components of EIA Report in detail.	**05**
	b)	Enlist advantages and disadvantages of Adhoc method.	**04**

SLR-BD-60

Seat No.	

Set Q

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Laws and Impact Assessment (BTN01407)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Which of the following article promotes international peace and security.
a) Article 51 b) Article 21
c) Article 253 d) Article 14

2) Central government of India under Article 48A enacted a new legislation called ____.
a) forest conservation Act b) wildlife protection act
c) Indian forest Act d) Reserve forest act

3) The argument that the "polluters pay" principal is ineffective in terms of reducing pollution is because is to argued that: ____.
a) Richer consumers can easily afford to pay and so essential pollution will still continue to rise
b) It is unfair to penalize richer consumers who will pay more of the taxes
c) The polluters pay principal cannot solve environmental problems on its own population in hundreds
d) It is impossible to work out the size of the necessary act

4) One person to be nominated by each of participating ____ from amongst the members the members of the local authority functioning within the state concerned.
a) Central Government b) State Government
c) Local Authorities d) None of these

5) Environment act ____ gives power to this act by which the country shall endeavor to protect and improve the environment and to safeguard the forests and wildlife.
a) Article 48 A b) Article 51 A
c) Article 41 A d) Article 58 A

6) The water act comprises of _____ section which are divided into chapter.

a) 96 section 7 b) 68, 6
c) 64,8 d) 67,7

7) To provide for the prevention control and abatement of the air pollution is known as ____.

a) Air act b) Water act
c) Environment act d) None of these

8) According to FCA 1980," To monitor the effective implementation of act ____ Committee/authority was constituted at the national level.

a) Compensatory Afforestation
b) Forest Control Committee Management & Planning Authority
c) Wildlife Conversation Authority
d) None of these

9) According to FCA 1980 "The law allows diversion of forest land only for ____ purpose.

i) Drinking Water Projects
ii) Irrigation Project
iii) Railway Line
iv) Mining

a) i and ii b) only i
c) i, ii & iii d) i, ii, iii & iv

10) According to which article it is the duty of the State government to protect and improve the natural environment including forests, lakes, rivers, and wildlife.

a) Article 48A b) Article 51A (clause g)
c) Article 19 (1) g d) Article 21

11) Which article provides the right to any person for their life and personal liberty?

a) Article 48A b) Article 21
c) Article 14 d) Article 51

12) Any person or Organization (either based in India or not) obtains any biological resources occurring in India for its research or commercial Utilization is prohibited in which Act.

a) Wildlife Protection Act b) Biological Diversity Act
c) Forest Conservation Act d) Water Act

13) ____ states that "parliament has power to make any law for the whole or any part of the country for implementing any treaty, agreement, or convention with any other country.

a) Article 253 b) Article 51
c) Article 21 d) Article 14

14) When the stock Holm conference was conducted.

a) 5-16 JUNE, 1972
b) 5-16 JULY, 1972
c) 17-30 JUNE, 1972
d) 17-30 JULY, 1972

Seat No.	

Set | Q

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Laws and Impact Assessment (BTN01407)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Question no. 8 is compulsory in section II, and solve any two questions from the remaining.
3) Figures to the right indicate full marks.
4) Assume suitable data wherever necessary and mention it clearly.
5) Use of non-programmable calculator is allowed.

Section – I

Q.2	**a)**	Differentiate between Water Act 1974 and Water Cess act 1977.	**06**
	b)	Enlist various core values and principles of EIA.	**04**
Q.3	**a)**	Discuss importance of WLPA 1972 for protection of wildlife in forest.	**05**
	b)	Explain salient feature of IFA 1972. Analyze functional changes as per changing years in the law.	**04**
Q.4	**a)**	Discuss importance of Biological diversity act 2002 for protection of natural Environment.	**05**
	b)	Explain salient feature of Water Act 1974. Differentiate functions of CPCB & SPCB described in Water Act 1974.	**04**
Q.5	**a)**	Enlist advantages and disadvantages of LCA.	**05**
	b)	Explain PLI Act 1991 in detail.	**04**

Section – II

Q.6	**a)**	Explain procedure of EIA with the help of flow sheet.	**05**
	b)	Discuss role of various authorities in Water Cess act 1977.	**04**
Q.7	**a)**	Enlist advantages and disadvantages of Indian Forest Act 1927.	**05**
	b)	Discuss role of CPCB and SPCB in Air act 1974.	**04**
Q.8	**a)**	Examine salient feature of EIA methodologies.	**06**
	b)	Analysis numerous Laws introduced to minimize limitations of IFA 1927.	**04**
Q.9	**a)**	Explain Components of EIA Report in detail.	**05**
	b)	Enlist advantages and disadvantages of Adhoc method.	**04**

SLR-BD-60

Seat No.	

Set R

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Laws and Impact Assessment (BTN01407)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) One person to be nominated by each of participating ____ from amongst the members the members of the local authority functioning within the state concerned.
a) Central Government b) State Government
c) Local Authorities d) None of these

2) Environment act ____ gives power to this act by which the country shall endeavor to protect and improve the environment and to safeguard the forests and wildlife.
a) Article 48 A b) Article 51 A
c) Article 41 A d) Article 58 A

3) The water act comprises of _____ section which are divided into chapter.
a) 96 section 7 b) 68, 6
c) 64,8 d) 67,7

4) To provide for the prevention control and abatement of the air pollution is known as ____.
a) Air act b) Water act
c) Environment act d) None of these

5) According to FCA 1980," To monitor the effective implementation of act ____ Committee/authority was constituted at the national level.
a) Compensatory Afforestation
b) Forest Control Committee Management & Planning Authority
c) Wildlife Conversation Authority
d) None of these

6) According to FCA 1980 “The law allows diversion of forest land only for ____ purpose.

i) Drinking Water Projects
ii) Irrigation Project
iii) Railway Line
iv) Mining

a) i and ii
b) only i
c) i, ii & iii
d) i, ii, iii & iv

7) According to which article it is the duty of the State government to protect and improve the natural environment including forests, lakes, rivers, and wildlife.

a) Article 48A
b) Article 51A (clause g)
c) Article 19 (1) g
d) Article 21

8) Which article provides the right to any person for their life and personal liberty?

a) Article 48A
b) Article 21
c) Article 14
d) Article 51

9) Any person or Organization (either based in India or not) obtains any biological resources occurring in India for its research or commercial Utilization is prohibited in which Act.

a) Wildlife Protection Act
b) Biological Diversity Act
c) Forest Conservation Act
d) Water Act

10) ____ states that “parliament has power to make any law for the whole or any part of the country for implementing any treaty, agreement, or convention with any other country.

a) Article 253
b) Article 51
c) Article 21
d) Article 14

11) When the stock Holm conference was conducted.

a) 5-16 JUNE, 1972
b) 5-16 JULY, 1972
c) 17-30 JUNE, 1972
d) 17-30 JULY, 1972

12) Which of the following article promotes international peace and security.

a) Article 51
b) Article 21
c) Article 253
d) Article 14

13) Central government of India under Article 48A enacted a new legislation called ____.

a) forest conservation Act
b) wildlife protection act
c) Indian forest Act
d) Reserve forest act

14) The argument that the “polluters pay” principal is ineffective in terms of reducing pollution is because is to argued that: ____.

a) Richer consumers can easily afford to pay and so essential pollution will still continue to rise
b) It is unfair to penalize richer consumers who will pay more of the taxes
c) The polluters pay principal cannot solve environmental problems on its own population in hundreds
d) It is impossible to work out the size of the necessary act

Seat No.	

Set | R

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Laws and Impact Assessment (BTN01407)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Question no. 8 is compulsory in section II, and solve any two questions from the remaining.
3) Figures to the right indicate full marks.
4) Assume suitable data wherever necessary and mention it clearly.
5) Use of non-programmable calculator is allowed.

Section – I

Q.2	**a)**	Differentiate between Water Act 1974 and Water Cess act 1977.	**06**
	b)	Enlist various core values and principles of EIA.	**04**
Q.3	**a)**	Discuss importance of WLPA 1972 for protection of wildlife in forest.	**05**
	b)	Explain salient feature of IFA 1972. Analyze functional changes as per changing years in the law.	**04**
Q.4	**a)**	Discuss importance of Biological diversity act 2002 for protection of natural Environment.	**05**
	b)	Explain salient feature of Water Act 1974. Differentiate functions of CPCB & SPCB described in Water Act 1974.	**04**
Q.5	**a)**	Enlist advantages and disadvantages of LCA.	**05**
	b)	Explain PLI Act 1991 in detail.	**04**

Section – II

Q.6	**a)**	Explain procedure of EIA with the help of flow sheet.	**05**
	b)	Discuss role of various authorities in Water Cess act 1977.	**04**
Q.7	**a)**	Enlist advantages and disadvantages of Indian Forest Act 1927.	**05**
	b)	Discuss role of CPCB and SPCB in Air act 1974.	**04**
Q.8	**a)**	Examine salient feature of EIA methodologies.	**06**
	b)	Analysis numerous Laws introduced to minimize limitations of IFA 1927.	**04**
Q.9	**a)**	Explain Components of EIA Report in detail.	**05**
	b)	Enlist advantages and disadvantages of Adhoc method.	**04**

SLR-BD-60

Seat No.		Set	S

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Laws and Impact Assessment (BTN01407)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) ____ states that "parliament has power to make any law for the whole or any part of the country for implementing any treaty, agreement, or convention with any other country.
a) Article 253 b) Article 51
c) Article 21 d) Article 14

2) When the stock Holm conference was conducted.
a) 5-16 JUNE, 1972 b) 5-16 JULY, 1972
c) 17-30 JUNE, 1972 d) 17-30 JULY, 1972

3) Which of the following article promotes international peace and security.
a) Article 51 b) Article 21
c) Article 253 d) Article 14

4) Central government of India under Article 48A enacted a new legislation called ____.
a) forest conservation Act b) wildlife protection act
c) Indian forest Act d) Reserve forest act

5) The argument that the "polluters pay" principal is ineffective in terms of reducing pollution is because is to argued that: ____.
a) Richer consumers can easily afford to pay and so essential pollution will still continue to rise
b) It is unfair to penalize richer consumers who will pay more of the taxes
c) The polluters pay principal cannot solve environmental problems on its own population in hundreds
d) It is impossible to work out the size of the necessary act

6) One person to be nominated by each of participating ____ from amongst the members the members of the local authority functioning within the state concerned.

a) Central Government b) State Government
c) Local Authorities d) None of these

7) Environment act ____ gives power to this act by which the country shall endeavor to protect and improve the environment and to safeguard the forests and wildlife.

a) Article 48 A b) Article 51 A
c) Article 41 A d) Article 58 A

8) The water act comprises of _____ section which are divided into chapter.

a) 96 section 7 b) 68, 6
c) 64,8 d) 67,7

9) To provide for the prevention control and abatement of the air pollution is known as ____.

a) Air act b) Water act
c) Environment act d) None of these

10) According to FCA 1980," To monitor the effective implementation of act ____ Committee/authority was constituted at the national level.

a) Compensatory Afforestation
b) Forest Control Committee Management & Planning Authority
c) Wildlife Conversation Authority
d) None of these

11) According to FCA 1980 "The law allows diversion of forest land only for ____ purpose.

i) Drinking Water Projects
ii) Irrigation Project
iii) Railway Line
iv) Mining

a) i and ii b) only i
c) i, ii & iii d) i, ii, iii & iv

12) According to which article it is the duty of the State government to protect and improve the natural environment including forests, lakes, rivers, and wildlife.

a) Article 48A b) Article 51A (clause g)
c) Article 19 (1) g d) Article 21

13) Which article provides the right to any person for their life and personal liberty?

a) Article 48A b) Article 21
c) Article 14 d) Article 51

14) Any person or Organization (either based in India or not) obtains any biological resources occurring in India for its research or commercial Utilization is prohibited in which Act.

a) Wildlife Protection Act
b) Biological Diversity Act
c) Forest Conservation Act
d) Water Act

Seat No.		Set	S

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Environmental Laws and Impact Assessment (BTN01407)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining.
2) Question no. 8 is compulsory in section II, and solve any two questions from the remaining.
3) Figures to the right indicate full marks.
4) Assume suitable data wherever necessary and mention it clearly.
5) Use of non-programmable calculator is allowed.

Section – I

Q.2	**a)**	Differentiate between Water Act 1974 and Water Cess act 1977.	**06**
	b)	Enlist various core values and principles of EIA.	**04**
Q.3	**a)**	Discuss importance of WLPA 1972 for protection of wildlife in forest.	**05**
	b)	Explain salient feature of IFA 1972. Analyze functional changes as per changing years in the law.	**04**
Q.4	**a)**	Discuss importance of Biological diversity act 2002 for protection of natural Environment.	**05**
	b)	Explain salient feature of Water Act 1974. Differentiate functions of CPCB & SPCB described in Water Act 1974.	**04**
Q.5	**a)**	Enlist advantages and disadvantages of LCA.	**05**
	b)	Explain PLI Act 1991 in detail.	**04**

Section – II

Q.6	**a)**	Explain procedure of EIA with the help of flow sheet.	**05**
	b)	Discuss role of various authorities in Water Cess act 1977.	**04**
Q.7	**a)**	Enlist advantages and disadvantages of Indian Forest Act 1927.	**05**
	b)	Discuss role of CPCB and SPCB in Air act 1974.	**04**
Q.8	**a)**	Examine salient feature of EIA methodologies.	**06**
	b)	Analysis numerous Laws introduced to minimize limitations of IFA 1927.	**04**
Q.9	**a)**	Explain Components of EIA Report in detail.	**05**
	b)	Enlist advantages and disadvantages of Adhoc method.	**04**

SLR-BD-62

Seat No.		Set	P

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Design Thinking (BTN01409)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary and mention it clearly.
5) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The term "Service design" was coined by ____.
a) Lynn Shostack b) Lynn Mayer
c) Lynn Collins d) None of Above

2) Design service Process variation should be kept to a ____.
a) Maximum b) Minimum
c) Equal d) None of above

3) The Control and inspection of process in service design must be kept to a ____.
a) Minimum b) Maximum
c) Equal d) None of above

4) An integral architecture exhibits certain properties, such as ____.
a) Functional elements of the product are implemented using more than one chunk
b) The interactions between chunks are well defined and are generally fundamental to the primary functions of the product
c) Chunks implement one or a few functional elements in their entirety.
d) None of the above

5) Product architecture is the assignment of the ____ elements of a product to ____ building blocks of the product.
a) Functional; conceptual b) Functional; physical
c) Non-functional; conceptual d) Non-functional; physical

6) The Design for environment is done for ____.
a) Part of product b) Entire product
c) Entire life cycle of product d) Any of the above

7) One of the two categories of interactions between chunks is: _____.
a) Modular b) Designing
c) Geometric d) Incidental

8) Design thinking starts with ____.
a) Empathize b) Prototype
c) Test d) Ideate

9) Design thinking Mindsets: ____.
a) Show, don't tell b) Focus on human values
c) Be mindful of process d) All of above

10) An Interview with a customer to gather data usually takes: ____.
a) One to two hours b) Four to five hours
c) Whole day d) Many days

11) Interactions with customers during the data collection process are commonly documented by: ____.
a) Audio and/or video recording b) Taking notes
c) Taking photography d) All of the above

12) Focus groups are one of the methods for: ____.
a) Interpreting raw data collected from customers
b) Organizing data into a hierarchy of customer needs
c) Gathering raw data from customers
d) Reflecting on the result and the process of identifying customer need.

13) Types of Prototypes: ____.
a) Low Fi Prototype b) Medium Fi Prototype
c) High Fi Prototype d) All of Above

14) In Concept Generation Process, dividing a problem into simpler sub problems is called as ____.
a) Problem Decomposition b) Sub Problem
c) Clarify the Problem d) None of Above

Seat No.		Set	P

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Design Thinking (BTN01409)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining questions.
2) Section II is compulsory.
3) Figures to the right indicate full marks.
4) Assume suitable data wherever necessary and mention it clearly.
5) Use of non-programmable calculator is allowed.

Section – I

Q.2 **a)** Enlist the various different mindsets of design thinking. Explain in details. **05**
b) What is meant by the Design Thinking? Difference between the design thinking and traditional approaches. **05**

Q.3 **a)** Enlist various methods of the customer need identification and explain in short. **04**
b) What do you meant by the customer need identification? What are the goals of the customer need? **05**

Q.4 **a)** What do you mean by the Creativity? How to apply the creativity. **04**
b) Explain the term of Low- Fi Prototype. Medium Fi- Prototype, and High Fi-Prototype. **05**

Q.5 **a)** Explain the term of brainstorming with various types of brainstorming. **04**
b) Explain the Concept generation process in the brief with diagram. **05**

Section – II

Q.6 Attempt the following: (Any Two)
a) Explain the term of service design with the principles of service design. **05**
b) How the product development process useful for the service design. **05**
c) Explain the Various tools used in the service Design. **05**

Q.7 Attempt the following: (Any Three) **09**
a) Write a note on: Product Architecture.
b) Financial Analysis and Needs of Financial Analysis
c) Difference between modular product architecture and integral product architecture.
d) Modular product architecture and its types

Q.8 Attempt the following: (Any Three) **09**

a) Explain in short, the 7 Steps involved in design for environment process.

b) Draw & explain in short, the DFE to product life cycle. Also mention the three challenges of product design which are represented in life cycle.

c) Agile Product Development Process.

d) Staged Product Development Process.

SLR-BD-62

Seat No.	

Set Q

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Design Thinking (BTN01409)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary and mention it clearly.
5) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Design thinking starts with ____.
a) Empathize b) Prototype
c) Test d) Ideate

2) Design thinking Mindsets: ____.
a) Show, don't tell b) Focus on human values
c) Be mindful of process d) All of above

3) An Interview with a customer to gather data usually takes: ____.
a) One to two hours b) Four to five hours
c) Whole day d) Many days

4) Interactions with customers during the data collection process are commonly documented by: ____.
a) Audio and/or video recording b) Taking notes
c) Taking photography d) All of the above

5) Focus groups are one of the methods for: ____.
a) Interpreting raw data collected from customers
b) Organizing data into a hierarchy of customer needs
c) Gathering raw data from customers
d) Reflecting on the result and the process of identifying customer need.

6) Types of Prototypes: ____.
a) Low Fi Prototype b) Medium Fi Prototype
c) High Fi Prototype d) All of Above

7) In Concept Generation Process, dividing a problem into simpler sub problems is called as ____.
   a) Problem Decomposition b) Sub Problem
   c) Clarify the Problem d) None of Above

8) The term “Service design” was coined by ____.
   a) Lynn Shostack b) Lynn Mayer
   c) Lynn Collins d) None of Above

9) Design service Process variation should be kept to a ____.
   a) Maximum b) Minimum
   c) Equal d) None of above

10) The Control and inspection of process in service design must be kept to a ____.
   a) Minimum b) Maximum
   c) Equal d) None of above

11) An integral architecture exhibits certain properties, such as ____.
   a) Functional elements of the product are implemented using more than one chunk
   b) The interactions between chunks are well defined and are generally fundamental to the primary functions of the product
   c) Chunks implement one or a few functional elements in their entirety.
   d) None of the above

12) Product architecture is the assignment of the ____ elements of a product to ____ building blocks of the product.
   a) Functional; conceptual b) Functional; physical
   c) Non-functional; conceptual d) Non-functional; physical

13) The Design for environment is done for ____.
   a) Part of product b) Entire product
   c) Entire life cycle of product d) Any of the above

14) One of the two categories of interactions between chunks is: _____.
   a) Modular b) Designing
   c) Geometric d) Incidental

Seat No.		Set	Q

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Design Thinking (BTN01409)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining questions.
2) Section II is compulsory.
3) Figures to the right indicate full marks.
4) Assume suitable data wherever necessary and mention it clearly.
5) Use of non-programmable calculator is allowed.

Section – I

Q.2 **a)** Enlist the various different mindsets of design thinking. Explain in details. **05**
b) What is meant by the Design Thinking? Difference between the design thinking and traditional approaches. **05**

Q.3 **a)** Enlist various methods of the customer need identification and explain in short. **04**
b) What do you meant by the customer need identification? What are the goals of the customer need? **05**

Q.4 **a)** What do you mean by the Creativity? How to apply the creativity. **04**
b) Explain the term of Low- Fi Prototype. Medium Fi- Prototype, and High Fi-Prototype. **05**

Q.5 **a)** Explain the term of brainstorming with various types of brainstorming. **04**
b) Explain the Concept generation process in the brief with diagram. **05**

Section – II

Q.6 Attempt the following: (Any Two)
a) Explain the term of service design with the principles of service design. **05**
b) How the product development process useful for the service design. **05**
c) Explain the Various tools used in the service Design. **05**

Q.7 Attempt the following: (Any Three) **09**
a) Write a note on: Product Architecture.
b) Financial Analysis and Needs of Financial Analysis
c) Difference between modular product architecture and integral product architecture.
d) Modular product architecture and its types

Q.8 Attempt the following: (Any Three) **09**

a) Explain in short, the 7 Steps involved in design for environment process.

b) Draw & explain in short, the DFE to product life cycle. Also mention the three challenges of product design which are represented in life cycle.

c) Agile Product Development Process.

d) Staged Product Development Process.

Seat No.	

Set **R**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Design Thinking (BTN01409)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary and mention it clearly.
5) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Interactions with customers during the data collection process are commonly documented by: ____.
a) Audio and/or video recording b) Taking notes
c) Taking photography d) All of the above

2) Focus groups are one of the methods for: ____.
a) Interpreting raw data collected from customers
b) Organizing data into a hierarchy of customer needs
c) Gathering raw data from customers
d) Reflecting on the result and the process of identifying customer need.

3) Types of Prototypes: ____.
a) Low Fi Prototype b) Medium Fi Prototype
c) High Fi Prototype d) All of Above

4) In Concept Generation Process, dividing a problem into simpler sub problems is called as ____.
a) Problem Decomposition b) Sub Problem
c) Clarify the Problem d) None of Above

5) The term "Service design" was coined by ____.
a) Lynn Shostack b) Lynn Mayer
c) Lynn Collins d) None of Above

6) Design service Process variation should be kept to a ____.
a) Maximum b) Minimum
c) Equal d) None of above

7) The Control and inspection of process in service design must be kept to a ____.
   a) Minimum
   b) Maximum
   c) Equal
   d) None of above

8) An integral architecture exhibits certain properties, such as ____.
   a) Functional elements of the product are implemented using more than one chunk
   b) The interactions between chunks are well defined and are generally fundamental to the primary functions of the product
   c) Chunks implement one or a few functional elements in their entirety.
   d) None of the above

9) Product architecture is the assignment of the ____ elements of a product to ____ building blocks of the product.
   a) Functional; conceptual
   b) Functional; physical
   c) Non-functional; conceptual
   d) Non-functional; physical

10) The Design for environment is done for ____.
   a) Part of product
   b) Entire product
   c) Entire life cycle of product
   d) Any of the above

11) One of the two categories of interactions between chunks is: _____.
   a) Modular
   b) Designing
   c) Geometric
   d) Incidental

12) Design thinking starts with ____.
   a) Empathize
   b) Prototype
   c) Test
   d) Ideate

13) Design thinking Mindsets: ____.
   a) Show, don't tell
   b) Focus on human values
   c) Be mindful of process
   d) All of above

14) An Interview with a customer to gather data usually takes: ____.
   a) One to two hours
   b) Four to five hours
   c) Whole day
   d) Many days

Seat No.		Set	R

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Design Thinking (BTN01409)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining questions.
2) Section II is compulsory.
3) Figures to the right indicate full marks.
4) Assume suitable data wherever necessary and mention it clearly.
5) Use of non-programmable calculator is allowed.

Section – I

Q.2 **a)** Enlist the various different mindsets of design thinking. Explain in details. **05**
b) What is meant by the Design Thinking? Difference between the design thinking and traditional approaches. **05**

Q.3 **a)** Enlist various methods of the customer need identification and explain in short. **04**
b) What do you meant by the customer need identification? What are the goals of the customer need? **05**

Q.4 **a)** What do you mean by the Creativity? How to apply the creativity. **04**
b) Explain the term of Low- Fi Prototype. Medium Fi- Prototype, and High Fi-Prototype. **05**

Q.5 **a)** Explain the term of brainstorming with various types of brainstorming. **04**
b) Explain the Concept generation process in the brief with diagram. **05**

Section – II

Q.6 Attempt the following: (Any Two)
a) Explain the term of service design with the principles of service design. **05**
b) How the product development process useful for the service design. **05**
c) Explain the Various tools used in the service Design. **05**

Q.7 Attempt the following: (Any Three) **09**
a) Write a note on: Product Architecture.
b) Financial Analysis and Needs of Financial Analysis
c) Difference between modular product architecture and integral product architecture.
d) Modular product architecture and its types

Q.8 Attempt the following: (Any Three) **09**

a) Explain in short, the 7 Steps involved in design for environment process.

b) Draw & explain in short, the DFE to product life cycle. Also mention the three challenges of product design which are represented in life cycle.

c) Agile Product Development Process.

d) Staged Product Development Process.

SLR-BD-62

Seat No.		Set	S

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Design Thinking (BTN01409)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary and mention it clearly.
5) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) The Design for environment is done for ____.
a) Part of product b) Entire product
c) Entire life cycle of product d) Any of the above

2) One of the two categories of interactions between chunks is: _____.
a) Modular b) Designing
c) Geometric d) Incidental

3) Design thinking starts with ____.
a) Empathize b) Prototype
c) Test d) Ideate

4) Design thinking Mindsets: ____.
a) Show, don't tell b) Focus on human values
c) Be mindful of process d) All of above

5) An Interview with a customer to gather data usually takes: ____.
a) One to two hours b) Four to five hours
c) Whole day d) Many days

6) Interactions with customers during the data collection process are commonly documented by: ____.
a) Audio and/or video recording b) Taking notes
c) Taking photography d) All of the above

7) Focus groups are one of the methods for: ____.
   a) Interpreting raw data collected from customers
   b) Organizing data into a hierarchy of customer needs
   c) Gathering raw data from customers
   d) Reflecting on the result and the process of identifying customer need.

8) Types of Prototypes: ____.
   a) Low Fi Prototype
   b) Medium Fi Prototype
   c) High Fi Prototype
   d) All of Above

9) In Concept Generation Process, dividing a problem into simpler sub problems is called as ____.
   a) Problem Decomposition
   b) Sub Problem
   c) Clarify the Problem
   d) None of Above

10) The term “Service design” was coined by ____.
   a) Lynn Shostack
   b) Lynn Mayer
   c) Lynn Collins
   d) None of Above

11) Design service Process variation should be kept to a ____.
   a) Maximum
   b) Minimum
   c) Equal
   d) None of above

12) The Control and inspection of process in service design must be kept to a ____.
   a) Minimum
   b) Maximum
   c) Equal
   d) None of above

13) An integral architecture exhibits certain properties, such as ____.
   a) Functional elements of the product are implemented using more than one chunk
   b) The interactions between chunks are well defined and are generally fundamental to the primary functions of the product
   c) Chunks implement one or a few functional elements in their entirety.
   d) None of the above

14) Product architecture is the assignment of the ____ elements of a product to ____ building blocks of the product.
   a) Functional; conceptual
   b) Functional; physical
   c) Non-functional; conceptual
   d) Non-functional; physical

Seat No.		Set	S

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Design Thinking (BTN01409)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining questions.
2) Section II is compulsory.
3) Figures to the right indicate full marks.
4) Assume suitable data wherever necessary and mention it clearly.
5) Use of non-programmable calculator is allowed.

Section – I

Q.2 **a)** Enlist the various different mindsets of design thinking. Explain in details. **05**
b) What is meant by the Design Thinking? Difference between the design thinking and traditional approaches. **05**

Q.3 **a)** Enlist various methods of the customer need identification and explain in short. **04**
b) What do you meant by the customer need identification? What are the goals of the customer need? **05**

Q.4 **a)** What do you mean by the Creativity? How to apply the creativity. **04**
b) Explain the term of Low- Fi Prototype. Medium Fi- Prototype, and High Fi-Prototype. **05**

Q.5 **a)** Explain the term of brainstorming with various types of brainstorming. **04**
b) Explain the Concept generation process in the brief with diagram. **05**

Section – II

Q.6 Attempt the following: (Any Two)
a) Explain the term of service design with the principles of service design. **05**
b) How the product development process useful for the service design. **05**
c) Explain the Various tools used in the service Design. **05**

Q.7 Attempt the following: (Any Three) **09**
a) Write a note on: Product Architecture.
b) Financial Analysis and Needs of Financial Analysis
c) Difference between modular product architecture and integral product architecture.
d) Modular product architecture and its types

Q.8 Attempt the following: (Any Three) **09**

a) Explain in short, the 7 Steps involved in design for environment process.

b) Draw & explain in short, the DFE to product life cycle. Also mention the three challenges of product design which are represented in life cycle.

c) Agile Product Development Process.

d) Staged Product Development Process.

SLR-BD-63

Seat No.		Set	P

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Disaster Management (BTN01410)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Hazards and Disasters are mainly classified as ____.
a) Physical and chemical b) Natural and human-induced
c) Physical and Human d) Social and cultural

2) A hazard is a situation where there is ____.
a) Threat of natural calamity
b) Threat to property and lives from calamities
c) Threat for consequences of disaster
d) All of the above

3) A Disaster is an event arising out of ____.
a) Result of hazard event b) Causes of hazard event
c) Causes of disaster events d) All of the above

4) The typical examples of man-made disasters are____.
a) Chemical explosion b) Leakage of toxic waste
c) War and civil strife d) All of the above

5) What are the consequences of the disaster on a society?
a) Loss of life b) Damage to property
c) Environmental Damages d) All of the above

6) The scientific study of earthquakes is called ____.
a) Seismograph b) Seismology
c) Both a and b d) None of the above

7) What is the name of the instrument used for measuring earthquake intensity?
a) Modified Mercalli Scale b) Metrological scale
c) Vernier scale d) Barometer

8) The primary result of earthquakes is ____.
   a) Building and bridge collapsed
   b) Rapture of water and gas pipelines
   c) Change in course of river and creation of new islands
   d) All of the above

9) What are the major consequences of Tropical cyclones?
   a) Fierce wind
   b) Heavy rain
   c) Storm surge
   d) All of the above

10) The major man-made causes of floods are ____.
   a) Deforestation
   b) Siltation
   c) Bursting of dam
   d) All of the above

11) Mass killing diseases can be referred to as ____.
   a) Biological disaster
   b) Industrial disaster
   c) War disaster
   d) Flood disaster

12) What is the primary purpose of conducting a hazard vulnerability analysis?
   a) To determine the economic losses from potential disasters
   b) To identify areas and populations at greatest risk from hazards
   c) To predict the exact time and location of future hazard events
   d) To assess the effectiveness of post-disaster recovery efforts

13) Which of the following is a secondary effect of earthquakes?
   a) Ground shaking and surface rupture
   b) Tsunamis and landslides
   c) Building collapse and infrastructure damage
   d) All of the above

14) Early warning systems are crucial for disaster management because they: ___.
   a) Prevent the occurrence of natural hazards
   b) Reduce the impact of disasters by providing advance notice
   c) Help in post-disaster reconstruction and rehabilitation
   d) Eliminate the need for evacuation and preparedness measures

Seat No.	

Set | P

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Disaster Management (BTN01410)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two between Q.2, Q.3, Q.4 in Section – I.
2) Solve any Two between Q.5, Q.6, Q.7 in Section – II.
3) Figures to the right indicates full marks.

Section – I

Q.2	**a)**	What is the scope of disaster management in a developing country like India?	**07**
	b)	Explain the concept of risk assessment in disaster management.	**07**
Q.3	**a)**	Discuss the impact of climate change on the frequency and intensity of natural disasters.	**07**
	b)	Explain the causes and effects of landslides.	**07**
Q.4	**a)**	Discuss the challenges faced in managing a disaster like the Indian Ocean Tsunami (2004).	**07**
	b)	Explain the importance of disaster preparedness in urban areas.	**07**

Section – II

Q.5	**a)**	How can effective communication help in reducing the impact of a disaster?	**07**
	b)	Explain the role of NGOs in disaster relief and rehabilitation.	**07**
Q.6	**a)**	Discuss the ethical considerations in disaster response.	**07**
	b)	Explain the use of satellite technology in disaster warning systems.	**07**
Q.7	**a)**	What are the benefits of a community-based early warning system?	**07**
	b)	Explain the role of technology in improving disaster resilience.	**07**

SLR-BD-63

Seat No.	

Set Q

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Disaster Management (BTN01410)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The primary result of earthquakes is ____.
a) Building and bridge collapsed
b) Rapture of water and gas pipelines
c) Change in course of river and creation of new islands
d) All of the above

2) What are the major consequences of Tropical cyclones?
a) Fierce wind b) Heavy rain
c) Storm surge d) All of the above

3) The major man-made causes of floods are ____.
a) Deforestation b) Siltation
c) Bursting of dam d) All of the above

4) Mass killing diseases can be referred to as ____.
a) Biological disaster b) Industrial disaster
c) War disaster d) Flood disaster

5) What is the primary purpose of conducting a hazard vulnerability analysis?
a) To determine the economic losses from potential disasters
b) To identify areas and populations at greatest risk from hazards
c) To predict the exact time and location of future hazard events
d) To assess the effectiveness of post-disaster recovery efforts

6) Which of the following is a secondary effect of earthquakes?
a) Ground shaking and surface rupture
b) Tsunamis and landslides
c) Building collapse and infrastructure damage
d) All of the above

7) Early warning systems are crucial for disaster management because they: ___.
   a) Prevent the occurrence of natural hazards
   b) Reduce the impact of disasters by providing advance notice
   c) Help in post-disaster reconstruction and rehabilitation
   d) Eliminate the need for evacuation and preparedness measures

8) Hazards and Disasters are mainly classified as ____.
   a) Physical and chemical
   b) Natural and human-induced
   c) Physical and Human
   d) Social and cultural

9) A hazard is a situation where there is ____.
   a) Threat of natural calamity
   b) Threat to property and lives from calamities
   c) Threat for consequences of disaster
   d) All of the above

10) A Disaster is an event arising out of ____.
   a) Result of hazard event
   b) Causes of hazard event
   c) Causes of disaster events
   d) All of the above

11) The typical examples of man-made disasters are____.
   a) Chemical explosion
   b) Leakage of toxic waste
   c) War and civil strife
   d) All of the above

12) What are the consequences of the disaster on a society?
   a) Loss of life
   b) Damage to property
   c) Environmental Damages
   d) All of the above

13) The scientific study of earthquakes is called ____.
   a) Seismograph
   b) Seismology
   c) Both a and b
   d) None of the above

14) What is the name of the instrument used for measuring earthquake intensity?
   a) Modified Mercalli Scale
   b) Metrological scale
   c) Vernier scale
   d) Barometer

Seat No.	

Set | Q

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Disaster Management (BTN01410)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two between Q.2, Q.3, Q.4 in Section – I.
2) Solve any Two between Q.5, Q.6, Q.7 in Section – II.
3) Figures to the right indicates full marks.

Section – I

Q.2	**a)**	What is the scope of disaster management in a developing country like India?	**07**
	b)	Explain the concept of risk assessment in disaster management.	**07**
Q.3	**a)**	Discuss the impact of climate change on the frequency and intensity of natural disasters.	**07**
	b)	Explain the causes and effects of landslides.	**07**
Q.4	**a)**	Discuss the challenges faced in managing a disaster like the Indian Ocean Tsunami (2004).	**07**
	b)	Explain the importance of disaster preparedness in urban areas.	**07**

Section – II

Q.5	**a)**	How can effective communication help in reducing the impact of a disaster?	**07**
	b)	Explain the role of NGOs in disaster relief and rehabilitation.	**07**
Q.6	**a)**	Discuss the ethical considerations in disaster response.	**07**
	b)	Explain the use of satellite technology in disaster warning systems.	**07**
Q.7	**a)**	What are the benefits of a community-based early warning system?	**07**
	b)	Explain the role of technology in improving disaster resilience.	**07**

SLR-BD-63

Seat No.		Set	R

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Disaster Management (BTN01410)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Mass killing diseases can be referred to as ____.
a) Biological disaster b) Industrial disaster
c) War disaster d) Flood disaster

2) What is the primary purpose of conducting a hazard vulnerability analysis?
a) To determine the economic losses from potential disasters
b) To identify areas and populations at greatest risk from hazards
c) To predict the exact time and location of future hazard events
d) To assess the effectiveness of post-disaster recovery efforts

3) Which of the following is a secondary effect of earthquakes?
a) Ground shaking and surface rupture
b) Tsunamis and landslides
c) Building collapse and infrastructure damage
d) All of the above

4) Early warning systems are crucial for disaster management because they: ___.
a) Prevent the occurrence of natural hazards
b) Reduce the impact of disasters by providing advance notice
c) Help in post-disaster reconstruction and rehabilitation
d) Eliminate the need for evacuation and preparedness measures

5) Hazards and Disasters are mainly classified as ____.
a) Physical and chemical b) Natural and human-induced
c) Physical and Human d) Social and cultural

6) A hazard is a situation where there is ____.
   a) Threat of natural calamity
   b) Threat to property and lives from calamities
   c) Threat for consequences of disaster
   d) All of the above

7) A Disaster is an event arising out of ____.
   a) Result of hazard event b) Causes of hazard event
   c) Causes of disaster events d) All of the above

8) The typical examples of man-made disasters are____.
   a) Chemical explosion b) Leakage of toxic waste
   c) War and civil strife d) All of the above

9) What are the consequences of the disaster on a society?
   a) Loss of life b) Damage to property
   c) Environmental Damages d) All of the above

10) The scientific study of earthquakes is called ____.
   a) Seismograph b) Seismology
   c) Both a and b d) None of the above

11) What is the name of the instrument used for measuring earthquake intensity?
   a) Modified Mercalli Scale b) Metrological scale
   c) Vernier scale d) Barometer

12) The primary result of earthquakes is ____.
   a) Building and bridge collapsed
   b) Rapture of water and gas pipelines
   c) Change in course of river and creation of new islands
   d) All of the above

13) What are the major consequences of Tropical cyclones?
   a) Fierce wind b) Heavy rain
   c) Storm surge d) All of the above

14) The major man-made causes of floods are ____.
   a) Deforestation b) Siltation
   c) Bursting of dam d) All of the above

Seat No.	

Set **R**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Disaster Management (BTN01410)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two between Q.2, Q.3, Q.4 in Section – I.
2) Solve any Two between Q.5, Q.6, Q.7 in Section – II.
3) Figures to the right indicates full marks.

Section – I

Q.2	**a)**	What is the scope of disaster management in a developing country like India?	**07**
	b)	Explain the concept of risk assessment in disaster management.	**07**
Q.3	**a)**	Discuss the impact of climate change on the frequency and intensity of natural disasters.	**07**
	b)	Explain the causes and effects of landslides.	**07**
Q.4	**a)**	Discuss the challenges faced in managing a disaster like the Indian Ocean Tsunami (2004).	**07**
	b)	Explain the importance of disaster preparedness in urban areas.	**07**

Section – II

Q.5	**a)**	How can effective communication help in reducing the impact of a disaster?	**07**
	b)	Explain the role of NGOs in disaster relief and rehabilitation.	**07**
Q.6	**a)**	Discuss the ethical considerations in disaster response.	**07**
	b)	Explain the use of satellite technology in disaster warning systems.	**07**
Q.7	**a)**	What are the benefits of a community-based early warning system?	**07**
	b)	Explain the role of technology in improving disaster resilience.	**07**

Seat No.		Set	S

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Disaster Management (BTN01410)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The scientific study of earthquakes is called ____.
a) Seismograph b) Seismology
c) Both a and b d) None of the above

2) What is the name of the instrument used for measuring earthquake intensity?
a) Modified Mercalli Scale b) Metrological scale
c) Vernier scale d) Barometer

3) The primary result of earthquakes is ____.
a) Building and bridge collapsed
b) Rapture of water and gas pipelines
c) Change in course of river and creation of new islands
d) All of the above

4) What are the major consequences of Tropical cyclones?
a) Fierce wind b) Heavy rain
c) Storm surge d) All of the above

5) The major man-made causes of floods are ____.
a) Deforestation b) Siltation
c) Bursting of dam d) All of the above

6) Mass killing diseases can be referred to as ____.
a) Biological disaster b) Industrial disaster
c) War disaster d) Flood disaster

7) What is the primary purpose of conducting a hazard vulnerability analysis?
   a) To determine the economic losses from potential disasters
   b) To identify areas and populations at greatest risk from hazards
   c) To predict the exact time and location of future hazard events
   d) To assess the effectiveness of post-disaster recovery efforts

8) Which of the following is a secondary effect of earthquakes?
   a) Ground shaking and surface rupture
   b) Tsunamis and landslides
   c) Building collapse and infrastructure damage
   d) All of the above

9) Early warning systems are crucial for disaster management because they: ___.
   a) Prevent the occurrence of natural hazards
   b) Reduce the impact of disasters by providing advance notice
   c) Help in post-disaster reconstruction and rehabilitation
   d) Eliminate the need for evacuation and preparedness measures

10) Hazards and Disasters are mainly classified as ____.
   a) Physical and chemical
   b) Natural and human-induced
   c) Physical and Human
   d) Social and cultural

11) A hazard is a situation where there is ____.
   a) Threat of natural calamity
   b) Threat to property and lives from calamities
   c) Threat for consequences of disaster
   d) All of the above

12) A Disaster is an event arising out of ____.
   a) Result of hazard event
   b) Causes of hazard event
   c) Causes of disaster events
   d) All of the above

13) The typical examples of man-made disasters are____.
   a) Chemical explosion
   b) Leakage of toxic waste
   c) War and civil strife
   d) All of the above

14) What are the consequences of the disaster on a society?
   a) Loss of life
   b) Damage to property
   c) Environmental Damages
   d) All of the above

SLR-BD-63

Seat No.		Set	S

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Disaster Management (BTN01410)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any Two between Q.2, Q.3, Q.4 in Section – I.
2) Solve any Two between Q.5, Q.6, Q.7 in Section – II.
3) Figures to the right indicates full marks.

Section – I

Q.2	**a)**	What is the scope of disaster management in a developing country like India?	**07**
	b)	Explain the concept of risk assessment in disaster management.	**07**
Q.3	**a)**	Discuss the impact of climate change on the frequency and intensity of natural disasters.	**07**
	b)	Explain the causes and effects of landslides.	**07**
Q.4	**a)**	Discuss the challenges faced in managing a disaster like the Indian Ocean Tsunami (2004).	**07**
	b)	Explain the importance of disaster preparedness in urban areas.	**07**

Section – II

Q.5	**a)**	How can effective communication help in reducing the impact of a disaster?	**07**
	b)	Explain the role of NGOs in disaster relief and rehabilitation.	**07**
Q.6	**a)**	Discuss the ethical considerations in disaster response.	**07**
	b)	Explain the use of satellite technology in disaster warning systems.	**07**
Q.7	**a)**	What are the benefits of a community-based early warning system?	**07**
	b)	Explain the role of technology in improving disaster resilience.	**07**

Seat No.	

Set | P

S.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (NEP CBCS) Examination: March/April - 2025
Applied Thermodynamics (MECHPCC-01)

Day & Date: Saturday, 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Use of Scientific calculator is allowed.
4) Assume suitable data if required and state it clearly.
5) Neat diagrams must be drawn wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Dryness Fraction indicates ____.
a) Quality of steam b) Enthalpy of steam
c) Entropy of steam d) Degree of superheat

2) The term coefficient of performance is related to ____.
a) Heat Pump b) Heat Engine
c) Steam Engine d) Gas Turbine

3) Area under the curve on T-S chart indicates ____.
a) Net heat transfer b) Network transfer
c) Cycle efficiency d) None of the above

4) Kelvin-Planks Law deals with ____.
a) conversion of work b) conversion of heat
c) conversion of mass d) conversion of heat into work

5) The major heat loss in boiler is due to ____.
a) Moisture in fuel b) Dry flue gases
c) steam formation d) Unburnt fuel

6) The ratio of heat actually used in producing the steam to the heat liberated in the furnace is called _____.
a) Equivalent evaporation b) Evaporative capacity
c) Boiler efficiency d) Factor of evaporation

7) The Rankine cycle as compared to Carnot cycle has ____ work ratio.
a) high b) low
c) equal d) half

8) The flow of steam is supersonic ____.
a) at entrance of nozzle
b) at throat of the nozzle
c) in convergent part of the nozzle
d) in divergent part of nozzle

9) In jet type condenser ____.
a) Cooling water passes through tubes and steam surrounds them
b) steam passes through tubes and cooling water surrounds them
c) steam and cooling water mix
d) steam and cooling water do not mix

10) A condenser in steam power plant ____.
a) increases expansion ratio of steam
b) reduces back pressure of steam
c) reduces the temperature of steam
d) all of the above

11) Thermal efficiency of engine with condenser as compared to without condenser, for a given pressure and temperature of steam is ____.
a) higher
b) lower
c) same as long as initial pressure and temperature are unchanged
d) None of the above

12) The compounding of steam turbine is done in order to ____.
a) reduce the speed of rotor b) improve efficiency
c) reduce exit losses d) all of the above

13) With increase in clearance volume, the ideal work of compressing 1 kg of air _____.
a) increases
b) decreases
c) remains same
d) first increases and then decreases

14) In single stage single acting reciprocating compressor without clearance volume, the work done is minimum during ____.
a) isothermal compression b) isentropic compression
c) polytropic compression d) None of the above

Seat No.	

Set **P**

S.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (NEP CBCS) Examination: March/April - 2025
Applied Thermodynamics (MECHPCC-01)

Day & Date: Saturday, 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state it clearly.
4) Neat diagrams must be drawn wherever necessary.

Section – I

Q.2 Attempt the following questions:

a) State and explain first law of thermodynamics. What are its limitations? **04**

b) Calculate the standard enthalpy at 298.15 K for the reaction **05**
$4NH_3(g)+50_2(g)\rightarrow 4NO(g)+6H_2O(g)$
Given that standard enthalpy of formation for as
$NH_3(g)$=-46.055 KJ/Kmol
$NO(g)^{=}$ 90.435 KJ/Kmol
H_2O (g)=-24.997 KJ/Kmol
O_2 (g)= O

c) A reversible heat engine operates between three constant temperatures reservoirs at 600 K, 400 K, and 300 K. It receives 2500 KJ of heat from the reservoirs at 600 K and does 1000 KJ of work. Determine the magnitude and direction of the heat interaction with the other two reservoirs. **05**

Q.3 Attempt the following:

a) Explain the classification of boilers in brief. **04**

b) The heat engine receives reversibly 1130 KJ/cycle of heat from a source at 292 °C and rejected heat reversibly to a sink at 12 °C. There is no other heat transfer. Show which of following cases the cycle is irreversible, reversible and impossible **05**
i) 282 KJ cycle is rejected
ii) 855 KJ cycle is rejected
iii) 570 KJ cycle is rejected

c) A boiler produces wet steam having a dryness fraction of 0.98. The working pressure of the boiler is 7.5 bar absolute. It generates steam at the rate of 5400 kg/hr. and consumes coal at the rate of 670 kg/hr. If the calorific value of coal is 31,000 kJ/kg and water is fed at a temperature of 41.5 °C, calculate **05**

i) equivalent evaporation/kg of coal
ii) factor of evaporation
iii) boiler efficiency

Q.4 Attempt the following:

a) Derive an expression for efficiency of Carnot vapour Power Cycle **04**

b) Explain the effect of various operating conditions on the efficiency of the Rankine vapour cycle with the help of T-S diagram. **05**

c) In the Rankine cycle, steam enters the turbine at 140 bar pressure and 550 °C. The exhaust pressure of the turbine is 0.65 bar, and all processes are reversible, find: **05**

i) Rankine cycle efficiency
ii) Work Ratio
iii) Specific Steam Consumption

Section – II

Q.5 Attempt the following:

a) Define steam nozzle? Explain its different types? **04**

b) Differentiate between impulse turbine and reaction turbine **05**

c) Explain the meaning of compounding of steam turbines? Discuss pressure velocity compounding of steam turbine with neat sketch. **05**

Q.6 Attempt the following:

a) Explain the following terms in connection with stem condensers **04**
i) Condenser efficiency
ii) Vacuum efficiency

b) Differentiate between surface condenser and jet condenser **05**

c) Derive an expression for the volumetric efficiency of a reciprocating compressor with usual notations. **05**

Q.7 Attempt the following:

a) Derive an expression for work done per kg for the polytropic compression process without considering the clearance volume. **04**

b) Explain the need of multi-stage in a reciprocating compressor with a suitable PV diagram **05**

c) Atmospheric air is to be compressed ’in a single-state reciprocating compressor from 1.013 bar and 15 °C to 7 bar. Calculate the indicated power required for free air delivery of 0.3 m^3 /min, when the compression process is **05**

i) Isentropic
ii) Polytropic if n = 1.25
iii) Isothermal

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (NEP CBCS) Examination: March/April - 2025
Applied Thermodynamics (MECHPCC-01)

Day & Date: Saturday, 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Use of Scientific calculator is allowed.
4) Assume suitable data if required and state it clearly.
5) Neat diagrams must be drawn wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. **14**

1) The flow of steam is supersonic ____.
a) at entrance of nozzle
b) at throat of the nozzle
c) in convergent part of the nozzle
d) in divergent part of nozzle

2) In jet type condenser ____.
a) Cooling water passes through tubes and steam surrounds them
b) steam passes through tubes and cooling water surrounds them
c) steam and cooling water mix
d) steam and cooling water do not mix

3) A condenser in steam power plant ____.
a) increases expansion ratio of steam
b) reduces back pressure of steam
c) reduces the temperature of steam
d) all of the above

4) Thermal efficiency of engine with condenser as compared to without condenser, for a given pressure and temperature of steam is ____.
a) higher
b) lower
c) same as long as initial pressure and temperature are unchanged
d) None of the above

5) The compounding of steam turbine is done in order to ____.
a) reduce the speed of rotor b) improve efficiency
c) reduce exit losses d) all of the above

6) With increase in clearance volume, the ideal work of compressing 1 kg of air _____.
a) increases
b) decreases
c) remains same
d) first increases and then decreases

7) In single stage single acting reciprocating compressor without clearance volume, the work done is minimum during ____.
a) isothermal compression b) isentropic compression
c) polytropic compression d) None of the above

8) Dryness Fraction indicates ____.
a) Quality of steam b) Enthalpy of steam
c) Entropy of steam d) Degree of superheat

9) The term coefficient of performance is related to ____.
a) Heat Pump b) Heat Engine
c) Steam Engine d) Gas Turbine

10) Area under the curve on T-S chart indicates ____.
a) Net heat transfer b) Network transfer
c) Cycle efficiency d) None of the above

11) Kelvin-Planks Law deals with ____.
a) conversion of work b) conversion of heat
c) conversion of mass d) conversion of heat into work

12) The major heat loss in boiler is due to ____.
a) Moisture in fuel b) Dry flue gases
c) steam formation d) Unburnt fuel

13) The ratio of heat actually used in producing the steam to the heat liberated in the furnace is called _____.
a) Equivalent evaporation b) Evaporative capacity
c) Boiler efficiency d) Factor of evaporation

14) The Rankine cycle as compared to Carnot cycle has ____ work ratio.
a) high b) low
c) equal d) half

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (NEP CBCS) Examination: March/April - 2025
Applied Thermodynamics (MECHPCC-01)

Day & Date: Saturday, 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state it clearly.
4) Neat diagrams must be drawn wherever necessary.

Section – I

Q.2 Attempt the following questions:

a) State and explain first law of thermodynamics. What are its limitations? **04**

b) Calculate the standard enthalpy at 298.15 K for the reaction **05**
$4NH_3(g)+50_2(g)\rightarrow 4NO(g)+6H_2O(g)$
Given that standard enthalpy of formation for as
$NH_3(g)$=-46.055 KJ/Kmol
$NO(g)^{=}$ 90.435 KJ/Kmol
H_2O (g)=-24.997 KJ/Kmol
O_2 (g)= O

c) A reversible heat engine operates between three constant temperatures reservoirs at 600 K, 400 K, and 300 K. It receives 2500 KJ of heat from the reservoirs at 600 K and does 1000 KJ of work. Determine the magnitude and direction of the heat interaction with the other two reservoirs. **05**

Q.3 Attempt the following:

a) Explain the classification of boilers in brief. **04**

b) The heat engine receives reversibly 1130 KJ/cycle of heat from a source at 292 °C and rejected heat reversibly to a sink at 12 °C. There is no other heat transfer. Show which of following cases the cycle is irreversible, reversible and impossible **05**
i) 282 KJ cycle is rejected
ii) 855 KJ cycle is rejected
iii) 570 KJ cycle is rejected

c) A boiler produces wet steam having a dryness fraction of 0.98. The working pressure of the boiler is 7.5 bar absolute. It generates steam at the rate of 5400 kg/hr. and consumes coal at the rate of 670 kg/hr. If the calorific value of coal is 31,000 kJ/kg and water is fed at a temperature of 41.5 °C, calculate **05**

i) equivalent evaporation/kg of coal
ii) factor of evaporation
iii) boiler efficiency

Q.4 Attempt the following:

a) Derive an expression for efficiency of Carnot vapour Power Cycle **04**

b) Explain the effect of various operating conditions on the efficiency of the Rankine vapour cycle with the help of T-S diagram. **05**

c) In the Rankine cycle, steam enters the turbine at 140 bar pressure and 550 °C. The exhaust pressure of the turbine is 0.65 bar, and all processes are reversible, find: **05**

i) Rankine cycle efficiency
ii) Work Ratio
iii) Specific Steam Consumption

Section – II

Q.5 Attempt the following:

a) Define steam nozzle? Explain its different types? **04**

b) Differentiate between impulse turbine and reaction turbine **05**

c) Explain the meaning of compounding of steam turbines? Discuss pressure velocity compounding of steam turbine with neat sketch. **05**

Q.6 Attempt the following:

a) Explain the following terms in connection with stem condensers **04**

i) Condenser efficiency
ii) Vacuum efficiency

b) Differentiate between surface condenser and jet condenser **05**

c) Derive an expression for the volumetric efficiency of a reciprocating compressor with usual notations. **05**

Q.7 Attempt the following:

a) Derive an expression for work done per kg for the polytropic compression process without considering the clearance volume. **04**

b) Explain the need of multi-stage in a reciprocating compressor with a suitable PV diagram **05**

c) Atmospheric air is to be compressed ’in a single-state reciprocating compressor from 1.013 bar and 15 °C to 7 bar. Calculate the indicated power required for free air delivery of 0.3 m^3 /min, when the compression process is **05**

i) Isentropic
ii) Polytropic if n = 1.25
iii) Isothermal

Seat No.	

Set **R**

S.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New)
(NEP CBCS) Examination: March/April - 2025
Applied Thermodynamics (MECHPCC-01)

Day & Date: Saturday, 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Use of Scientific calculator is allowed.
4) Assume suitable data if required and state it clearly.
5) Neat diagrams must be drawn wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Thermal efficiency of engine with condenser as compared to without condenser, for a given pressure and temperature of steam is ____.
a) higher
b) lower
c) same as long as initial pressure and temperature are unchanged
d) None of the above

2) The compounding of steam turbine is done in order to ____.
a) reduce the speed of rotor b) improve efficiency
c) reduce exit losses d) all of the above

3) With increase in clearance volume, the ideal work of compressing 1 kg of air _____.
a) increases
b) decreases
c) remains same
d) first increases and then decreases

4) In single stage single acting reciprocating compressor without clearance volume, the work done is minimum during ____.
a) isothermal compression b) isentropic compression
c) polytropic compression d) None of the above

5) Dryness Fraction indicates ____.
a) Quality of steam b) Enthalpy of steam
c) Entropy of steam d) Degree of superheat

6) The term coefficient of performance is related to ____.
a) Heat Pump b) Heat Engine
c) Steam Engine d) Gas Turbine

7) Area under the curve on T-S chart indicates ____.
a) Net heat transfer b) Network transfer
c) Cycle efficiency d) None of the above

8) Kelvin-Planks Law deals with ____.
a) conversion of work b) conversion of heat
c) conversion of mass d) conversion of heat into work

9) The major heat loss in boiler is due to ____.
a) Moisture in fuel b) Dry flue gases
c) steam formation d) Unburnt fuel

10) The ratio of heat actually used in producing the steam to the heat liberated in the furnace is called _____.
a) Equivalent evaporation b) Evaporative capacity
c) Boiler efficiency d) Factor of evaporation

11) The Rankine cycle as compared to Carnot cycle has ____ work ratio.
a) high b) low
c) equal d) half

12) The flow of steam is supersonic ____.
a) at entrance of nozzle
b) at throat of the nozzle
c) in convergent part of the nozzle
d) in divergent part of nozzle

13) In jet type condenser ____.
a) Cooling water passes through tubes and steam surrounds them
b) steam passes through tubes and cooling water surrounds them
c) steam and cooling water mix
d) steam and cooling water do not mix

14) A condenser in steam power plant ____.
a) increases expansion ratio of steam
b) reduces back pressure of steam
c) reduces the temperature of steam
d) all of the above

Seat No.	

Set **R**

S.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (NEP CBCS) Examination: March/April - 2025
Applied Thermodynamics (MECHPCC-01)

Day & Date: Saturday, 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state it clearly.
4) Neat diagrams must be drawn wherever necessary.

Section – I

Q.2 Attempt the following questions:

a) State and explain first law of thermodynamics. What are its limitations? **04**

b) Calculate the standard enthalpy at 298.15 K for the reaction **05**
$4NH_3(g)+50_2(g)\rightarrow 4NO(g)+6H_2O(g)$
Given that standard enthalpy of formation for as
$NH_3(g)$=-46.055 KJ/Kmol
$NO(g)^{=}$ 90.435 KJ/Kmol
H_2O (g)=-24.997 KJ/Kmol
O_2 (g)= O

c) A reversible heat engine operates between three constant temperatures reservoirs at 600 K, 400 K, and 300 K. It receives 2500 KJ of heat from the reservoirs at 600 K and does 1000 KJ of work. Determine the magnitude and direction of the heat interaction with the other two reservoirs. **05**

Q.3 Attempt the following:

a) Explain the classification of boilers in brief. **04**

b) The heat engine receives reversibly 1130 KJ/cycle of heat from a source at 292 °C and rejected heat reversibly to a sink at 12 °C. There is no other heat transfer. Show which of following cases the cycle is irreversible, reversible and impossible **05**
i) 282 KJ cycle is rejected
ii) 855 KJ cycle is rejected
iii) 570 KJ cycle is rejected

c) A boiler produces wet steam having a dryness fraction of 0.98. The working pressure of the boiler is 7.5 bar absolute. It generates steam at the rate of 5400 kg/hr. and consumes coal at the rate of 670 kg/hr. If the calorific value of coal is 31,000 kJ/kg and water is fed at a temperature of 41.5 °C, calculate **05**

i) equivalent evaporation/kg of coal
ii) factor of evaporation
iii) boiler efficiency

Q.4 Attempt the following:

a) Derive an expression for efficiency of Carnot vapour Power Cycle **04**

b) Explain the effect of various operating conditions on the efficiency of the Rankine vapour cycle with the help of T-S diagram. **05**

c) In the Rankine cycle, steam enters the turbine at 140 bar pressure and 550 °C. The exhaust pressure of the turbine is 0.65 bar, and all processes are reversible, find: **05**

i) Rankine cycle efficiency
ii) Work Ratio
iii) Specific Steam Consumption

Section – II

Q.5 Attempt the following:

a) Define steam nozzle? Explain its different types? **04**

b) Differentiate between impulse turbine and reaction turbine **05**

c) Explain the meaning of compounding of steam turbines? Discuss pressure velocity compounding of steam turbine with neat sketch. **05**

Q.6 Attempt the following:

a) Explain the following terms in connection with stem condensers **04**

i) Condenser efficiency
ii) Vacuum efficiency

b) Differentiate between surface condenser and jet condenser **05**

c) Derive an expression for the volumetric efficiency of a reciprocating compressor with usual notations. **05**

Q.7 Attempt the following:

a) Derive an expression for work done per kg for the polytropic compression process without considering the clearance volume. **04**

b) Explain the need of multi-stage in a reciprocating compressor with a suitable PV diagram **05**

c) Atmospheric air is to be compressed ’in a single-state reciprocating compressor from 1.013 bar and 15 °C to 7 bar. Calculate the indicated power required for free air delivery of 0.3 m^3 /min, when the compression process is **05**

i) Isentropic
ii) Polytropic if n = 1.25
iii) Isothermal

Seat No.	

Set | **S**

S.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (NEP CBCS) Examination: March/April - 2025
Applied Thermodynamics (MECHPCC-01)

Day & Date: Saturday, 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Use of Scientific calculator is allowed.
4) Assume suitable data if required and state it clearly.
5) Neat diagrams must be drawn wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) The ratio of heat actually used in producing the steam to the heat liberated in the furnace is called _____.
a) Equivalent evaporation b) Evaporative capacity
c) Boiler efficiency d) Factor of evaporation

2) The Rankine cycle as compared to Carnot cycle has ____ work ratio.
a) high b) low
c) equal d) half

3) The flow of steam is supersonic ____.
a) at entrance of nozzle
b) at throat of the nozzle
c) in convergent part of the nozzle
d) in divergent part of nozzle

4) In jet type condenser ____.
a) Cooling water passes through tubes and steam surrounds them
b) steam passes through tubes and cooling water surrounds them
c) steam and cooling water mix
d) steam and cooling water do not mix

5) A condenser in steam power plant ____.
a) increases expansion ratio of steam
b) reduces back pressure of steam
c) reduces the temperature of steam
d) all of the above

6) Thermal efficiency of engine with condenser as compared to without condenser, for a given pressure and temperature of steam is ____.
a) higher
b) lower
c) same as long as initial pressure and temperature are unchanged
d) None of the above

7) The compounding of steam turbine is done in order to ____.
a) reduce the speed of rotor b) improve efficiency
c) reduce exit losses d) all of the above

8) With increase in clearance volume, the ideal work of compressing 1 kg of air _____.
a) increases
b) decreases
c) remains same
d) first increases and then decreases

9) In single stage single acting reciprocating compressor without clearance volume, the work done is minimum during ____.
a) isothermal compression b) isentropic compression
c) polytropic compression d) None of the above

10) Dryness Fraction indicates ____.
a) Quality of steam b) Enthalpy of steam
c) Entropy of steam d) Degree of superheat

11) The term coefficient of performance is related to ____.
a) Heat Pump b) Heat Engine
c) Steam Engine d) Gas Turbine

12) Area under the curve on T-S chart indicates ____.
a) Net heat transfer b) Network transfer
c) Cycle efficiency d) None of the above

13) Kelvin-Planks Law deals with ____.
a) conversion of work b) conversion of heat
c) conversion of mass d) conversion of heat into work

14) The major heat loss in boiler is due to ____.
a) Moisture in fuel b) Dry flue gases
c) steam formation d) Unburnt fuel

Seat No.	

Set **S**

S.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (New) (NEP CBCS) Examination: March/April - 2025
Applied Thermodynamics (MECHPCC-01)

Day & Date: Saturday, 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state it clearly.
4) Neat diagrams must be drawn wherever necessary.

Section – I

Q.2 Attempt the following questions:

a) State and explain first law of thermodynamics. What are its limitations? **04**

b) Calculate the standard enthalpy at 298.15 K for the reaction **05**
$4NH_3(g)+50_2(g)\rightarrow 4NO(g)+6H_2O(g)$
Given that standard enthalpy of formation for as
$NH_3(g)$=-46.055 KJ/Kmol
$NO(g)^{=}$ 90.435 KJ/Kmol
H_2O (g)=-24.997 KJ/Kmol
O_2 (g)= O

c) A reversible heat engine operates between three constant temperatures reservoirs at 600 K, 400 K, and 300 K. It receives 2500 KJ of heat from the reservoirs at 600 K and does 1000 KJ of work. Determine the magnitude and direction of the heat interaction with the other two reservoirs. **05**

Q.3 Attempt the following:

a) Explain the classification of boilers in brief. **04**

b) The heat engine receives reversibly 1130 KJ/cycle of heat from a source at 292 °C and rejected heat reversibly to a sink at 12 °C. There is no other heat transfer. Show which of following cases the cycle is irreversible, reversible and impossible **05**
i) 282 KJ cycle is rejected
ii) 855 KJ cycle is rejected
iii) 570 KJ cycle is rejected

c) A boiler produces wet steam having a dryness fraction of 0.98. The working pressure of the boiler is 7.5 bar absolute. It generates steam at the rate of 5400 kg/hr. and consumes coal at the rate of 670 kg/hr. If the calorific value of coal is 31,000 kJ/kg and water is fed at a temperature of 41.5 °C, calculate **05**

i) equivalent evaporation/kg of coal
ii) factor of evaporation
iii) boiler efficiency

Q.4 Attempt the following:

a) Derive an expression for efficiency of Carnot vapour Power Cycle **04**

b) Explain the effect of various operating conditions on the efficiency of the Rankine vapour cycle with the help of T-S diagram. **05**

c) In the Rankine cycle, steam enters the turbine at 140 bar pressure and 550 °C. The exhaust pressure of the turbine is 0.65 bar, and all processes are reversible, find: **05**

i) Rankine cycle efficiency
ii) Work Ratio
iii) Specific Steam Consumption

Section – II

Q.5 Attempt the following:

a) Define steam nozzle? Explain its different types? **04**

b) Differentiate between impulse turbine and reaction turbine **05**

c) Explain the meaning of compounding of steam turbines? Discuss pressure velocity compounding of steam turbine with neat sketch. **05**

Q.6 Attempt the following:

a) Explain the following terms in connection with stem condensers **04**
i) Condenser efficiency
ii) Vacuum efficiency

b) Differentiate between surface condenser and jet condenser **05**

c) Derive an expression for the volumetric efficiency of a reciprocating compressor with usual notations. **05**

Q.7 Attempt the following:

a) Derive an expression for work done per kg for the polytropic compression process without considering the clearance volume. **04**

b) Explain the need of multi-stage in a reciprocating compressor with a suitable PV diagram **05**

c) Atmospheric air is to be compressed ’in a single-state reciprocating compressor from 1.013 bar and 15 °C to 7 bar. Calculate the indicated power required for free air delivery of 0.3 m^3 /min, when the compression process is **05**

i) Isentropic
ii) Polytropic if n = 1.25
iii) Isothermal

SLR-BD-65

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Manufacturing Processes (MECHPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Assume suitable data if necessary and state it clearly.
4) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The furnace commonly used in brass foundries is _____.
a) Direct arc furnaces b) Cupola
c) Induction Furnace d) None of these

2) Which of the following rolling mill gives maximum reduction?
a) Two High b) Four High
c) Cluster d) Five High

3) For joining two parts without melting any base metal, following processes are used _____.
a) Brazing and welding b) Welding and soldering
c) Soldering and brazing d) Any of above

4) Which of the following welding process are is not visible to operator's eye?
a) TIG welding b) MIG welding
c) Submerged arc welding d) MMAW

5) Feeder head (riser) should solidify _____.
a) After solidification of casting
b) Along with casting
c) Before casting
d) any time during solidification of casting

6) Spring back effect in HERF is _____.
a) Large b) Small
c) Negligible d) None of above

7) Which statement is correct for HERF _____.
a) Die costs are relatively lower
b) No or minimum spring back effect on the material after the process
c) Complex shapes / profiles can be made much easily, as compared to conventional forming
d) All of above

8) In explosive forming _____.
a) Preheating of workpiece is required
b) Preheating of workpiece is not required
c) May be or may not be Preheating of workpiece is required
d) None of the above

9) Investment Casting _____.
a) Uses metal pattern
b) Suitable for mass production
c) Does not uses core
d) Used for manufacturing lathe bed

10) Projection welding is _____.
a) Continuous spot welding process
b) Multi spot welding process
c) Used to form rectangle
d) something else

11) Manufacturing of I-beams of mild steels _____.
a) Hot rolling is used
b) Cold rolling is used
c) Hot extrusion is used
d) Drawing is used

12) Carburetor body for a two wheeler is manufactured _____.
a) By die casting
b) Green sand moulding
c) Centrifugal casting
d) Continuous casting

13) Preheating before welding is done to _____.
a) Make the steel softer
b) burn away oil, grease, etc. from the plate surface
c) prevent plate distortion
d) prevent cold crack

14) Chills are used in moulds to _____.
a) Achieve Directional solidification
b) Reduce possibility of blow holes
c) Increase the freezing time
d) Smoothen the metal for reducing spatter

SLR-BD-65

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Manufacturing Processes (MECHPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from both sections.
2) Figures to the right indicate full marks.
3) Make suitable assumption, if required and state them clearly.

Section – I

Q.2	**a)**	Explain with flow chart, the basic steps in casting 'process. What are the advantages and limitations of sand casting?	**05**
	b)	What do you understand by the term gating system and Risers? Explain in brief the use of Chills.	**05**
	c)	What are the requirements of an effective Riser? Differentiate clearly between open riser and blind riser.	**04**
Q.3	**a)**	What is investment casting? Explain the process in detail with advantages and limitations.	**05**
	b)	Explain the stages of shell molding process in brief.	**05**
	c)	Give any two applications of following casting techniques: i) Investment casting ii) Sand casting iii) Die casting iv) Centrifugal casting	**04**
Q.4	**a)**	What is 'MMAW' process of welding? Explain its working with applications.	**05**
	b)	Explain with neat sketch Resistance welding. Welding process with advantages, disadvantages and applications.	**05**
	c)	Differentiate clearly between TIG & MIG.	**04**

Section – II

Q.5	**a)**	Explain process of open die working and give names of two components produced by this process.	**05**
	b)	Differentiate between hot working and cold working operations.	**05**
	c)	Discuss the setup for direct extrusion with neat sketch.	**04**
Q.6	**a)**	Discuss the process of multipass wire drawing set up with neat sketch.	**05**
	b)	Explain with neat sketches hydro forming process.	**05**
	c)	Explain with neat sketch electrohydraulic forming with advantages, disadvantages, applications.	**04**

Q.7	**a)**	Explain Selective Laser Sintering (SLS) with advantages, disadvantages and applications.	**05**
	b)	Explain Fused Deposition Modeling (FDM) with advantages, disadvantages and applications.	**05**
	c)	Explain advantages, disadvantages and applications of Rapid Prototyping.	**04**

SLR-BD-65

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Manufacturing Processes (MECHPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Assume suitable data if necessary and state it clearly.
4) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) In explosive forming _____.
a) Preheating of workpiece is required
b) Preheating of workpiece is not required
c) May be or may not be Preheating of workpiece is required
d) None of the above

2) Investment Casting _____.
a) Uses metal pattern
b) Suitable for mass production
c) Does not uses core
d) Used for manufacturing lathe bed

3) Projection welding is _____.
a) Continuous spot welding process
b) Multi spot welding process
c) Used to form rectangle
d) something else

4) Manufacturing of I-beams of mild steels _____.
a) Hot rolling is used b) Cold rolling is used
c) Hot extrusion is used d) Drawing is used

5) Carburetor body for a two wheeler is manufactured _____.
a) By die casting b) Green sand moulding
c) Centrifugal casting d) Continuous casting

6) Preheating before welding is done to _____.
a) Make the steel softer
b) burn away oil, grease, etc. from the plate surface
c) prevent plate distortion
d) prevent cold crack

7) Chills are used in moulds to _____.
a) Achieve Directional solidification
b) Reduce possibility of blow holes
c) Increase the freezing time
d) Smoothen the metal for reducing spatter

8) The furnace commonly used in brass foundries is _____.
a) Direct arc furnaces b) Cupola
c) Induction Furnace d) None of these

9) Which of the following rolling mill gives maximum reduction?
a) Two High b) Four High
c) Cluster d) Five High

10) For joining two parts without melting any base metal, following processes are used _____.
a) Brazing and welding b) Welding and soldering
c) Soldering and brazing d) Any of above

11) Which of the following welding process are is not visible to operator's eye?
a) TIG welding b) MIG welding
c) Submerged arc welding d) MMAW

12) Feeder head (riser) should solidify _____.
a) After solidification of casting
b) Along with casting
c) Before casting
d) any time during solidification of casting

13) Spring back effect in HERF is _____.
a) Large b) Small
c) Negligible d) None of above

14) Which statement is correct for HERF _____.
a) Die costs are relatively lower
b) No or minimum spring back effect on the material after the process
c) Complex shapes / profiles can be made much easily, as compared to conventional forming
d) All of above

SLR-BD-65

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Manufacturing Processes (MECHPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from both sections.
2) Figures to the right indicate full marks.
3) Make suitable assumption, if required and state them clearly.

Section – I

Q.2	**a)**	Explain with flow chart, the basic steps in casting 'process. What are the advantages and limitations of sand casting?	**05**
	b)	What do you understand by the term gating system and Risers? Explain in brief the use of Chills.	**05**
	c)	What are the requirements of an effective Riser? Differentiate clearly between open riser and blind riser.	**04**
Q.3	**a)**	What is investment casting? Explain the process in detail with advantages and limitations.	**05**
	b)	Explain the stages of shell molding process in brief.	**05**
	c)	Give any two applications of following casting techniques: i) Investment casting ii) Sand casting iii) Die casting iv) Centrifugal casting	**04**
Q.4	**a)**	What is 'MMAW' process of welding? Explain its working with applications.	**05**
	b)	Explain with neat sketch Resistance welding. Welding process with advantages, disadvantages and applications.	**05**
	c)	Differentiate clearly between TIG & MIG.	**04**

Section – II

Q.5	**a)**	Explain process of open die working and give names of two components produced by this process.	**05**
	b)	Differentiate between hot working and cold working operations.	**05**
	c)	Discuss the setup for direct extrusion with neat sketch.	**04**
Q.6	**a)**	Discuss the process of multipass wire drawing set up with neat sketch.	**05**
	b)	Explain with neat sketches hydro forming process.	**05**
	c)	Explain with neat sketch electrohydraulic forming with advantages, disadvantages, applications.	**04**

Q.7	**a)**	Explain Selective Laser Sintering (SLS) with advantages, disadvantages and applications.	**05**
	b)	Explain Fused Deposition Modeling (FDM) with advantages, disadvantages and applications.	**05**
	c)	Explain advantages, disadvantages and applications of Rapid Prototyping.	**04**

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Manufacturing Processes (MECHPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Assume suitable data if necessary and state it clearly.
4) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Manufacturing of I-beams of mild steels _____.
a) Hot rolling is used b) Cold rolling is used
c) Hot extrusion is used d) Drawing is used

2) Carburetor body for a two wheeler is manufactured _____.
a) By die casting b) Green sand moulding
c) Centrifugal casting d) Continuous casting

3) Preheating before welding is done to _____.
a) Make the steel softer
b) burn away oil, grease, etc. from the plate surface
c) prevent plate distortion
d) prevent cold crack

4) Chills are used in moulds to _____.
a) Achieve Directional solidification
b) Reduce possibility of blow holes
c) Increase the freezing time
d) Smoothen the metal for reducing spatter

5) The furnace commonly used in brass foundries is _____.
a) Direct arc furnaces b) Cupola
c) Induction Furnace d) None of these

6) Which of the following rolling mill gives maximum reduction?
a) Two High b) Four High
c) Cluster d) Five High

7) For joining two parts without melting any base metal, following processes are used _____.

a) Brazing and welding
b) Welding and soldering
c) Soldering and brazing
d) Any of above

8) Which of the following welding process are is not visible to operator's eye?

a) TIG welding
b) MIG welding
c) Submerged arc welding
d) MMAW

9) Feeder head (riser) should solidify _____.

a) After solidification of casting
b) Along with casting
c) Before casting
d) any time during solidification of casting

10) Spring back effect in HERF is _____.

a) Large
b) Small
c) Negligible
d) None of above

11) Which statement is correct for HERF _____.

a) Die costs are relatively lower
b) No or minimum spring back effect on the material after the process
c) Complex shapes / profiles can be made much easily, as compared to conventional forming
d) All of above

12) In explosive forming _____.

a) Preheating of workpiece is required
b) Preheating of workpiece is not required
c) May be or may not be Preheating of workpiece is required
d) None of the above

13) Investment Casting _____.

a) Uses metal pattern
b) Suitable for mass production
c) Does not uses core
d) Used for manufacturing lathe bed

14) Projection welding is _____.

a) Continuous spot welding process
b) Multi spot welding process
c) Used to form rectangle
d) something else

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Manufacturing Processes (MECHPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from both sections.
2) Figures to the right indicate full marks.
3) Make suitable assumption, if required and state them clearly.

Section – I

Q.2 **a)** Explain with flow chart, the basic steps in casting 'process. What are the advantages and limitations of sand casting? **05**

b) What do you understand by the term gating system and Risers? Explain in brief the use of Chills. **05**

c) What are the requirements of an effective Riser? Differentiate clearly between open riser and blind riser. **04**

Q.3 **a)** What is investment casting? Explain the process in detail with advantages and limitations. **05**

b) Explain the stages of shell molding process in brief. **05**

c) Give any two applications of following casting techniques: **04**
i) Investment casting
ii) Sand casting
iii) Die casting
iv) Centrifugal casting

Q.4 **a)** What is 'MMAW' process of welding? Explain its working with applications. **05**

b) Explain with neat sketch Resistance welding. Welding process with advantages, disadvantages and applications. **05**

c) Differentiate clearly between TIG & MIG. **04**

Section – II

Q.5 **a)** Explain process of open die working and give names of two components produced by this process. **05**

b) Differentiate between hot working and cold working operations. **05**

c) Discuss the setup for direct extrusion with neat sketch. **04**

Q.6 **a)** Discuss the process of multipass wire drawing set up with neat sketch. **05**

b) Explain with neat sketches hydro forming process. **05**

c) Explain with neat sketch electrohydraulic forming with advantages, disadvantages, applications. **04**

Q.7	**a)**	Explain Selective Laser Sintering (SLS) with advantages, disadvantages and applications.	**05**
	b)	Explain Fused Deposition Modeling (FDM) with advantages, disadvantages and applications.	**05**
	c)	Explain advantages, disadvantages and applications of Rapid Prototyping.	**04**

SLR-BD-65

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Manufacturing Processes (MECHPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Assume suitable data if necessary and state it clearly.
4) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Spring back effect in HERF is _____.
a) Large b) Small
c) Negligible d) None of above

2) Which statement is correct for HERF _____.
a) Die costs are relatively lower
b) No or minimum spring back effect on the material after the process
c) Complex shapes / profiles can be made much easily, as compared to conventional forming
d) All of above

3) In explosive forming _____.
a) Preheating of workpiece is required
b) Preheating of workpiece is not required
c) May be or may not be Preheating of workpiece is required
d) None of the above

4) Investment Casting _____.
a) Uses metal pattern
b) Suitable for mass production
c) Does not uses core
d) Used for manufacturing lathe bed

5) Projection welding is _____.
a) Continuous spot welding process
b) Multi spot welding process
c) Used to form rectangle
d) something else

6) Manufacturing of I-beams of mild steels _____.
a) Hot rolling is used b) Cold rolling is used
c) Hot extrusion is used d) Drawing is used

7) Carburetor body for a two wheeler is manufactured _____.
a) By die casting b) Green sand moulding
c) Centrifugal casting d) Continuous casting

8) Preheating before welding is done to _____.
a) Make the steel softer
b) burn away oil, grease, etc. from the plate surface
c) prevent plate distortion
d) prevent cold crack

9) Chills are used in moulds to _____.
a) Achieve Directional solidification
b) Reduce possibility of blow holes
c) Increase the freezing time
d) Smoothen the metal for reducing spatter

10) The furnace commonly used in brass foundries is _____.
a) Direct arc furnaces b) Cupola
c) Induction Furnace d) None of these

11) Which of the following rolling mill gives maximum reduction?
a) Two High b) Four High
c) Cluster d) Five High

12) For joining two parts without melting any base metal, following processes are used _____.
a) Brazing and welding b) Welding and soldering
c) Soldering and brazing d) Any of above

13) Which of the following welding process are is not visible to operator's eye?
a) TIG welding b) MIG welding
c) Submerged arc welding d) MMAW

14) Feeder head (riser) should solidify _____.
a) After solidification of casting
b) Along with casting
c) Before casting
d) any time during solidification of casting

SLR-BD-65

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Manufacturing Processes (MECHPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from both sections.
2) Figures to the right indicate full marks.
3) Make suitable assumption, if required and state them clearly.

Section – I

Q.2	**a)**	Explain with flow chart, the basic steps in casting 'process. What are the advantages and limitations of sand casting?	**05**
	b)	What do you understand by the term gating system and Risers? Explain in brief the use of Chills.	**05**
	c)	What are the requirements of an effective Riser? Differentiate clearly between open riser and blind riser.	**04**
Q.3	**a)**	What is investment casting? Explain the process in detail with advantages and limitations.	**05**
	b)	Explain the stages of shell molding process in brief.	**05**
	c)	Give any two applications of following casting techniques: i) Investment casting ii) Sand casting iii) Die casting iv) Centrifugal casting	**04**
Q.4	**a)**	What is 'MMAW' process of welding? Explain its working with applications.	**05**
	b)	Explain with neat sketch Resistance welding. Welding process with advantages, disadvantages and applications.	**05**
	c)	Differentiate clearly between TIG & MIG.	**04**

Section – II

Q.5	**a)**	Explain process of open die working and give names of two components produced by this process.	**05**
	b)	Differentiate between hot working and cold working operations.	**05**
	c)	Discuss the setup for direct extrusion with neat sketch.	**04**
Q.6	**a)**	Discuss the process of multipass wire drawing set up with neat sketch.	**05**
	b)	Explain with neat sketches hydro forming process.	**05**
	c)	Explain with neat sketch electrohydraulic forming with advantages, disadvantages, applications.	**04**

Q.7	**a)**	Explain Selective Laser Sintering (SLS) with advantages, disadvantages and applications.	**05**
	b)	Explain Fused Deposition Modeling (FDM) with advantages, disadvantages and applications.	**05**
	c)	Explain advantages, disadvantages and applications of Rapid Prototyping.	**04**

SLR-BD-66

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mechanics of Materials (MECHPCC-03)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) For a material with Poisson's ratio 0.2, the ratio of Elastic modulus to shear modulus is ____.
a) 2.45 b) 2.4
c) 3.0 d) 1.5

2) The Poisson's ratio is ratio of lateral strain to ____.
a) Shear strain b) Linear strain
c) elastic strain d) None of these

3) For a shaft subjected to torsion, the shear stress developed is ____
a) maximum at axis b) uniform over section
c) maximum at outer surface d) maximum at inner surface

4) In case of a cantilever beam, maximum B.M. and maximum S.F. always occur at ____
a) Couple end b) Fixed end
c) Free end d) Mid span

5) For transmitting same power, all properties remaining same, between a solid and hollow shaft ____
a) hollow shaft is economical b) solid shaft is economical
c) Both are costly d) None of the above

6) In case of Lift application due to sudden stoppage of lift kinetic energy is transformed to ____
a) potential energy b) strain energy
c) shear energy d) mechanical energy

7) For a simply supported beam carrying a couple, its B.M.D. shows ____
a) bending moment changes sign
b) Rise or fall in bending moment
c) Maximum bending moment
d) Maximum shear force

8) For a cantilever beam carrying U.D.L. over entire span, shape of SFD is ____
a) Parabolic
b) Right angle triangle
c) Two equal and opposite rectangles
d) Two equal and opposite triangles

9) When simply supported beam is loaded, maximum tensile stress shall develop at ____
a) at the neutral layer
b) top layer
c) Bottom layer
d) None of above

10) When a circular section of a beam, is subjected to a shearing force the ratio of maximum shear stress to the average shear stress is ____
a) 2
b) 1.5
c) 1.33
d) 1.2

11) The radius of Mohr's stress circle indicates ____
a) Maximum normal stress
b) Minimum normal stress
c) Minimum shear stress
d) Maximum shear stress

12) On a principal plane, the shear stress is ____
a) Maximum
b) Minimum
c) Average
d) Zero

13) For a simply supported beam carrying a U.D.L. on its entire span, the deflection is ____
a) same as slope
b) maximum at center
c) zero at center
d) Zero at support

14) Neutral axis of the beam is the axis at which ____
a) Shear force is zero
b) Moment of inertia is zero
c) Bending stress is zero
d) Bending stress is maximum

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mechanics of Materials (MECHPCC-03)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state it clearly.
4) Use of scientific calculator is allowed.

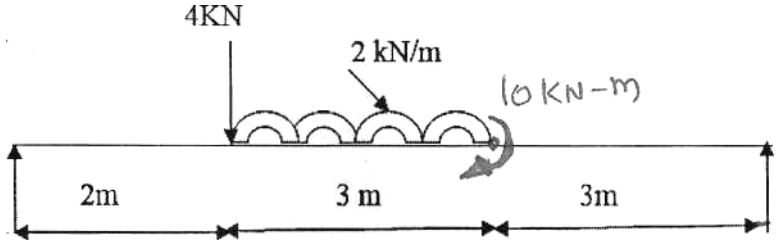
Section – I

Q.2 **a)** A steel bar is centrally enclosed in aluminum tube and is compressed between two rigid parallel palates at the ends by a force of 400 KN. The diameter of steel bar is 30 mm and the inner and outer diameter of the aluminum tubes are 40 mm and 60 mm respectively. The length of bar and the tube is 1200 mm. Determine the change in length of assembly and stresses induced in the steel bar and aluminum tube. Take, E for steel = 2.1 $X10^5$ N/mm^2: E for Aluminum = $70X10^3$ N/mm^2. **08**

b) A trolley of weight 80kN descending a slope at uniform velocity of 2.5m/sec and the end of which a steel cable is wound around the drum. When length of cable laid out is 600 meter, emergency brakes are suddenly applied and trolley brought to rest. If cross sectional area of cable is 600 mm^2, find stress induced in steel cable. Take E=200Gpa, g=9.81m/sec^2 **06**

Q.3 **a)** A steel solid circular shaft is being designed to transmit 150kW at 180 rpm. Maximum shear stress in the shaft must not exceed 80 MPa and the angle of twist is not to exceed 6° in a 4-m length. Determine the permissible diameter of shaft if Modulus of rigidity of shaft is 80Gpa. **06**

b) A simply supported beam as shown in figure carries. Draw SFD, BMD and determine location of bending moment and mark it clearly on BMD. **08**



Q.4 **a)** A steel bar 40 mm in diameter 5 m long is at a temperature of 15°C. Find the free expansion of the bar when it is heated to 70°C with its end clamped before heating. Calculate temperature stress exerted by bar on clamps if **06**

i) expansion of bar is fully prevented
ii) bar is permitted to expand by 0.5 mm
Take: α = 12 X 10^{-6} per °C and E == 200 GN/m^2

b) A tensile load of 30 KN is gradually applied to a circular bar of 25 mm diameter and 6 m long, if E = 200 GPa, Determine. **04**

i) Stress in the bar
ii) Elongation
iii) Strain energy stored in the rod

c) Define following leans: **04**

i) Point of Contra flexure
ii) Thermal stress
iii) Modulus of Resilience
iv) Torsional Stiffness

Section – II

Q.5 **a)** The stresses at a point in a strained material are 110 mpa (tensile) and 45mpa (compressive). Determine magnitude of normal and shear stresses on a plane inclined at an angle of 35° with axis of tensile stress. Also determine the magnitude of resultant stress, angle of obliquity and maximum intensity of shear stress. **06**

b) A beam of T-section of flange 200 x 40 mm and web size 260 x 40 mm is simply supported beam of span 8m and carries UDL of 5kN/m over its entire span. Determine maximum bending stress induced in the beam. **08**

Q.6 **a)** A steel simply supported beam having an I-section with top and bottom flange size 150 x 20 mm, web is 10 x 260 mm. If maximum shear force acting on the beam is 80kN. Determine shear stress across depth of cross section and draw shear stress distribution diagram **08**

b) A simply supported beam of 8-meter span carries point load of 40kN at its midspan. The cross section of beam is rectangle of 120 x 180 mm in size. Calculate the maximum slope at support and maximum deflection at center. **06**
Take E=110Gpa.

Q.7 **a)** Define Slope and Deflection of beam. Describe it in brief for simply supported and cantilever beam. **05**

b) A cantilever beam of uniform rectangular section 150 x 260mm carries UDL of 25 kN/m over its span 4 m. Determine maximum bending stress in the beam. **05**

c) Define the following terms: **04**

i) Theory of pure bending of beam
ii) Major principal stress
iii) Minor principal plane
iv) Angle of Obliquity

SLR-BD-66

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mechanics of Materials (MECHPCC-03)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) For a cantilever beam carrying U.D.L. over entire span, shape of SFD is ____
a) Parabolic
b) Right angle triangle
c) Two equal and opposite rectangles
d) Two equal and opposite triangles

2) When simply supported beam is loaded, maximum tensile stress shall develop at ____
a) at the neutral layer b) top layer
c) Bottom layer d) None of above

3) When a circular section of a beam, is subjected to a shearing force the ratio of maximum shear stress to the average shear stress is ____
a) 2 b) 1.5
c) 1.33 d) 1.2

4) The radius of Mohr's stress circle indicates ____
a) Maximum normal stress b) Minimum normal stress
c) Minimum shear stress d) Maximum shear stress

5) On a principal plane, the shear stress is ____
a) Maximum b) Minimum
c) Average d) Zero

6) For a simply supported beam carrying a U.D.L. on its entire span, the deflection is ____

a) same as slope b) maximum at center
c) zero at center d) Zero at support

7) Neutral axis of the beam is the axis at which ____

a) Shear force is zero b) Moment of inertia is zero
c) Bending stress is zero d) Bending stress is maximum

8) For a material with Poisson's ratio 0.2, the ratio of Elastic modulus to shear modulus is ____.

a) 2.45 b) 2.4
c) 3.0 d) 1.5

9) The Poisson's ratio is ratio of lateral strain to ____.

a) Shear strain b) Linear strain
c) elastic strain d) None of these

10) For a shaft subjected to torsion, the shear stress developed is ____

a) maximum at axis b) uniform over section
c) maximum at outer surface d) maximum at inner surface

11) In case of a cantilever beam, maximum B.M. and maximum S.F. always occur at ____

a) Couple end b) Fixed end
c) Free end d) Mid span

12) For transmitting same power, all properties remaining same, between a solid and hollow shaft ____

a) hollow shaft is economical b) solid shaft is economical
c) Both are costly d) None of the above

13) In case of Lift application due to sudden stoppage of lift kinetic energy is transformed to ____

a) potential energy b) strain energy
c) shear energy d) mechanical energy

14) For a simply supported beam carrying a couple, its B.M.D. shows ____

a) bending moment changes sign
b) Rise or fall in bending moment
c) Maximum bending moment
d) Maximum shear force

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mechanics of Materials (MECHPCC-03)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state it clearly.
4) Use of scientific calculator is allowed.

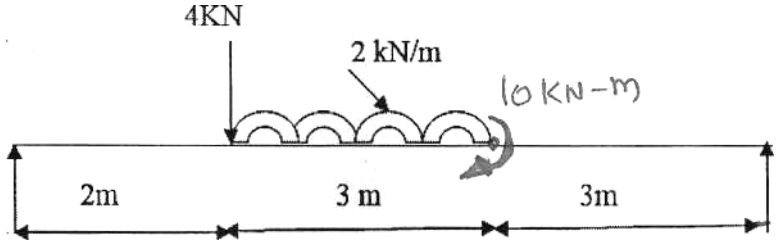
Section – I

Q.2 **a)** A steel bar is centrally enclosed in aluminum tube and is compressed between two rigid parallel palates at the ends by a force of 400 KN. The diameter of steel bar is 30 mm and the inner and outer diameter of the aluminum tubes are 40 mm and 60 mm respectively. The length of bar and the tube is 1200 mm. Determine the change in length of assembly and stresses induced in the steel bar and aluminum tube. Take, E for steel = 2.1 $X10^5$ N/mm^2: E for Aluminum = $70X10^3$ N/mm^2. **08**

b) A trolley of weight 80kN descending a slope at uniform velocity of 2.5m/sec and the end of which a steel cable is wound around the drum. When length of cable laid out is 600 meter, emergency brakes are suddenly applied and trolley brought to rest. If cross sectional area of cable is 600 mm^2, find stress induced in steel cable. Take E=200Gpa, g=9.81m/sec^2 **06**

Q.3 **a)** A steel solid circular shaft is being designed to transmit 150kW at 180 rpm. Maximum shear stress in the shaft must not exceed 80 MPa and the angle of twist is not to exceed 6° in a 4-m length. Determine the permissible diameter of shaft if Modulus of rigidity of shaft is 80Gpa. **06**

b) A simply supported beam as shown in figure carries. Draw SFD, BMD and determine location of bending moment and mark it clearly on BMD. **08**



Q.4 **a)** A steel bar 40 mm in diameter 5 m long is at a temperature of 15°C. Find the free expansion of the bar when it is heated to 70°C with its end clamped before heating. Calculate temperature stress exerted by bar on clamps if **06**

i) expansion of bar is fully prevented
ii) bar is permitted to expand by 0.5 mm
Take: α = 12 X 10^{-6} per °C and E == 200 GN/m^2

b) A tensile load of 30 KN is gradually applied to a circular bar of 25 mm diameter and 6 m long, if E = 200 GPa, Determine. **04**

i) Stress in the bar
ii) Elongation
iii) Strain energy stored in the rod

c) Define following leans: **04**

i) Point of Contra flexure
ii) Thermal stress
iii) Modulus of Resilience
iv) Torsional Stiffness

Section – II

Q.5 **a)** The stresses at a point in a strained material are 110 mpa (tensile) and 45mpa (compressive). Determine magnitude of normal and shear stresses on a plane inclined at an angle of 35° with axis of tensile stress. Also determine the magnitude of resultant stress, angle of obliquity and maximum intensity of shear stress. **06**

b) A beam of T-section of flange 200 x 40 mm and web size 260 x 40 mm is simply supported beam of span 8m and carries UDL of 5kN/m over its entire span. Determine maximum bending stress induced in the beam. **08**

Q.6 **a)** A steel simply supported beam having an I-section with top and bottom flange size 150 x 20 mm, web is 10 x 260 mm. If maximum shear force acting on the beam is 80kN. Determine shear stress across depth of cross section and draw shear stress distribution diagram **08**

b) A simply supported beam of 8-meter span carries point load of 40kN at its midspan. The cross section of beam is rectangle of 120 x 180 mm in size. Calculate the maximum slope at support and maximum deflection at center. **06**
Take E=110Gpa.

Q.7 **a)** Define Slope and Deflection of beam. Describe it in brief for simply supported and cantilever beam. **05**

b) A cantilever beam of uniform rectangular section 150 x 260mm carries UDL of 25 kN/m over its span 4 m. Determine maximum bending stress in the beam. **05**

c) Define the following terms: **04**

i) Theory of pure bending of beam
ii) Major principal stress
iii) Minor principal plane
iv) Angle of Obliquity

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mechanics of Materials (MECHPCC-03)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) The radius of Mohr's stress circle indicates ____
a) Maximum normal stress b) Minimum normal stress
c) Minimum shear stress d) Maximum shear stress

2) On a principal plane, the shear stress is ____
a) Maximum b) Minimum
c) Average d) Zero

3) For a simply supported beam carrying a U.D.L. on its entire span, the deflection is ____
a) same as slope b) maximum at center
c) zero at center d) Zero at support

4) Neutral axis of the beam is the axis at which ____
a) Shear force is zero b) Moment of inertia is zero
c) Bending stress is zero d) Bending stress is maximum

5) For a material with Poisson's ratio 0.2, the ratio of Elastic modulus to shear modulus is ____.
a) 2.45 b) 2.4
c) 3.0 d) 1.5

6) The Poisson's ratio is ratio of lateral strain to ____.
a) Shear strain b) Linear strain
c) elastic strain d) None of these

7) For a shaft subjected to torsion, the shear stress developed is ____
a) maximum at axis b) uniform over section
c) maximum at outer surface d) maximum at inner surface

8) In case of a cantilever beam, maximum B.M. and maximum S.F. always occur at ____

a) Couple end b) Fixed end
c) Free end d) Mid span

9) For transmitting same power, all properties remaining same, between a solid and hollow shaft ____

a) hollow shaft is economical b) solid shaft is economical
c) Both are costly d) None of the above

10) In case of Lift application due to sudden stoppage of lift kinetic energy is transformed to ____

a) potential energy b) strain energy
c) shear energy d) mechanical energy

11) For a simply supported beam carrying a couple, its B.M.D. shows ____

a) bending moment changes sign
b) Rise or fall in bending moment
c) Maximum bending moment
d) Maximum shear force

12) For a cantilever beam carrying U.D.L. over entire span, shape of SFD is ____

a) Parabolic
b) Right angle triangle
c) Two equal and opposite rectangles
d) Two equal and opposite triangles

13) When simply supported beam is loaded, maximum tensile stress shall develop at ____

a) at the neutral layer b) top layer
c) Bottom layer d) None of above

14) When a circular section of a beam, is subjected to a shearing force the ratio of maximum shear stress to the average shear stress is ____

a) 2 b) 1.5
c) 1.33 d) 1.2

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mechanics of Materials (MECHPCC-03)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state it clearly.
4) Use of scientific calculator is allowed.

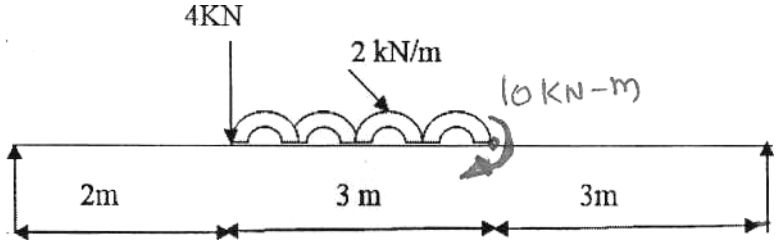
Section – I

Q.2 **a)** A steel bar is centrally enclosed in aluminum tube and is compressed between two rigid parallel palates at the ends by a force of 400 KN. The diameter of steel bar is 30 mm and the inner and outer diameter of the aluminum tubes are 40 mm and 60 mm respectively. The length of bar and the tube is 1200 mm. Determine the change in length of assembly and stresses induced in the steel bar and aluminum tube. Take, E for steel = 2.1 $X10^5$ N/mm^2: E for Aluminum = $70X10^3$ N/mm^2. **08**

b) A trolley of weight 80kN descending a slope at uniform velocity of 2.5m/sec and the end of which a steel cable is wound around the drum. When length of cable laid out is 600 meter, emergency brakes are suddenly applied and trolley brought to rest. If cross sectional area of cable is 600 mm^2, find stress induced in steel cable. Take E=200Gpa, g=9.81m/sec^2 **06**

Q.3 **a)** A steel solid circular shaft is being designed to transmit 150kW at 180 rpm. Maximum shear stress in the shaft must not exceed 80 MPa and the angle of twist is not to exceed 6° in a 4-m length. Determine the permissible diameter of shaft if Modulus of rigidity of shaft is 80Gpa. **06**

b) A simply supported beam as shown in figure carries. Draw SFD, BMD and determine location of bending moment and mark it clearly on BMD. **08**



Q.4 **a)** A steel bar 40 mm in diameter 5 m long is at a temperature of 15°C. Find the free expansion of the bar when it is heated to 70°C with its end clamped before heating. Calculate temperature stress exerted by bar on clamps if **06**

i) expansion of bar is fully prevented
ii) bar is permitted to expand by 0.5 mm
Take: α = 12 X 10^{-6} per °C and E == 200 GN/m^2

b) A tensile load of 30 KN is gradually applied to a circular bar of 25 mm diameter and 6 m long, if E = 200 GPa, Determine. **04**

i) Stress in the bar
ii) Elongation
iii) Strain energy stored in the rod

c) Define following leans: **04**

i) Point of Contra flexure
ii) Thermal stress
iii) Modulus of Resilience
iv) Torsional Stiffness

Section – II

Q.5 **a)** The stresses at a point in a strained material are 110 mpa (tensile) and 45mpa (compressive). Determine magnitude of normal and shear stresses on a plane inclined at an angle of 35° with axis of tensile stress. Also determine the magnitude of resultant stress, angle of obliquity and maximum intensity of shear stress. **06**

b) A beam of T-section of flange 200 x 40 mm and web size 260 x 40 mm is simply supported beam of span 8m and carries UDL of 5kN/m over its entire span. Determine maximum bending stress induced in the beam. **08**

Q.6 **a)** A steel simply supported beam having an I-section with top and bottom flange size 150 x 20 mm, web is 10 x 260 mm. If maximum shear force acting on the beam is 80kN. Determine shear stress across depth of cross section and draw shear stress distribution diagram **08**

b) A simply supported beam of 8-meter span carries point load of 40kN at its midspan. The cross section of beam is rectangle of 120 x 180 mm in size. Calculate the maximum slope at support and maximum deflection at center. **06**
Take E=110Gpa.

Q.7 **a)** Define Slope and Deflection of beam. Describe it in brief for simply supported and cantilever beam. **05**

b) A cantilever beam of uniform rectangular section 150 x 260mm carries UDL of 25 kN/m over its span 4 m. Determine maximum bending stress in the beam. **05**

c) Define the following terms: **04**

i) Theory of pure bending of beam
ii) Major principal stress
iii) Minor principal plane
iv) Angle of Obliquity

SLR-BD-66

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mechanics of Materials (MECHPCC-03)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) In case of Lift application due to sudden stoppage of lift kinetic energy is transformed to ____
a) potential energy b) strain energy
c) shear energy d) mechanical energy

2) For a simply supported beam carrying a couple, its B.M.D. shows ____
a) bending moment changes sign
b) Rise or fall in bending moment
c) Maximum bending moment
d) Maximum shear force

3) For a cantilever beam carrying U.D.L. over entire span, shape of SFD is ____
a) Parabolic
b) Right angle triangle
c) Two equal and opposite rectangles
d) Two equal and opposite triangles

4) When simply supported beam is loaded, maximum tensile stress shall develop at ____
a) at the neutral layer b) top layer
c) Bottom layer d) None of above

5) When a circular section of a beam, is subjected to a shearing force the ratio of maximum shear stress to the average shear stress is ____
a) 2 b) 1.5
c) 1.33 d) 1.2

6) The radius of Mohr's stress circle indicates ____
a) Maximum normal stress b) Minimum normal stress
c) Minimum shear stress d) Maximum shear stress

7) On a principal plane, the shear stress is ____
a) Maximum b) Minimum
c) Average d) Zero

8) For a simply supported beam carrying a U.D.L. on its entire span, the deflection is ____
a) same as slope b) maximum at center
c) zero at center d) Zero at support

9) Neutral axis of the beam is the axis at which ____
a) Shear force is zero b) Moment of inertia is zero
c) Bending stress is zero d) Bending stress is maximum

10) For a material with Poisson's ratio 0.2, the ratio of Elastic modulus to shear modulus is ____.
a) 2.45 b) 2.4
c) 3.0 d) 1.5

11) The Poisson's ratio is ratio of lateral strain to ____.
a) Shear strain b) Linear strain
c) elastic strain d) None of these

12) For a shaft subjected to torsion, the shear stress developed is ____
a) maximum at axis b) uniform over section
c) maximum at outer surface d) maximum at inner surface

13) In case of a cantilever beam, maximum B.M. and maximum S.F. always occur at ____
a) Couple end b) Fixed end
c) Free end d) Mid span

14) For transmitting same power, all properties remaining same, between a solid and hollow shaft ____
a) hollow shaft is economical b) solid shaft is economical
c) Both are costly d) None of the above

SLR-BD-66

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mechanics of Materials (MECHPCC-03)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state it clearly.
4) Use of scientific calculator is allowed.

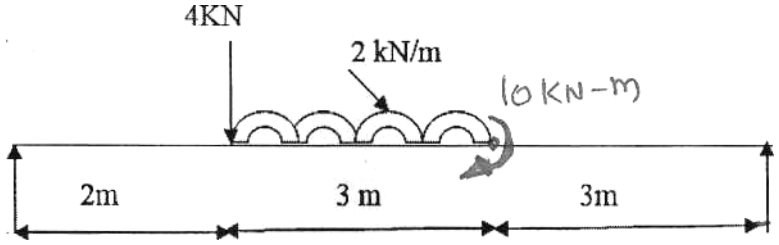
Section – I

Q.2 **a)** A steel bar is centrally enclosed in aluminum tube and is compressed between two rigid parallel palates at the ends by a force of 400 KN. The diameter of steel bar is 30 mm and the inner and outer diameter of the aluminum tubes are 40 mm and 60 mm respectively. The length of bar and the tube is 1200 mm. Determine the change in length of assembly and stresses induced in the steel bar and aluminum tube. Take, E for steel = 2.1 $X10^5$ N/mm^2: E for Aluminum = $70X10^3$ N/mm^2. **08**

b) A trolley of weight 80kN descending a slope at uniform velocity of 2.5m/sec and the end of which a steel cable is wound around the drum. When length of cable laid out is 600 meter, emergency brakes are suddenly applied and trolley brought to rest. If cross sectional area of cable is 600 mm^2, find stress induced in steel cable. Take E=200Gpa, g=9.81m/sec^2 **06**

Q.3 **a)** A steel solid circular shaft is being designed to transmit 150kW at 180 rpm. Maximum shear stress in the shaft must not exceed 80 MPa and the angle of twist is not to exceed 6° in a 4-m length. Determine the permissible diameter of shaft if Modulus of rigidity of shaft is 80Gpa. **06**

b) A simply supported beam as shown in figure carries. Draw SFD, BMD and determine location of bending moment and mark it clearly on BMD. **08**



Q.4 **a)** A steel bar 40 mm in diameter 5 m long is at a temperature of 15°C. Find the free expansion of the bar when it is heated to 70°C with its end clamped before heating. Calculate temperature stress exerted by bar on clamps if **06**

i) expansion of bar is fully prevented
ii) bar is permitted to expand by 0.5 mm
Take: α = 12 X 10^{-6} per °C and E == 200 GN/m^2

b) A tensile load of 30 KN is gradually applied to a circular bar of 25 mm diameter and 6 m long, if E = 200 GPa, Determine. **04**

i) Stress in the bar
ii) Elongation
iii) Strain energy stored in the rod

c) Define following leans: **04**

i) Point of Contra flexure
ii) Thermal stress
iii) Modulus of Resilience
iv) Torsional Stiffness

Section – II

Q.5 **a)** The stresses at a point in a strained material are 110 mpa (tensile) and 45mpa (compressive). Determine magnitude of normal and shear stresses on a plane inclined at an angle of 35° with axis of tensile stress. Also determine the magnitude of resultant stress, angle of obliquity and maximum intensity of shear stress. **06**

b) A beam of T-section of flange 200 x 40 mm and web size 260 x 40 mm is simply supported beam of span 8m and carries UDL of 5kN/m over its entire span. Determine maximum bending stress induced in the beam. **08**

Q.6 **a)** A steel simply supported beam having an I-section with top and bottom flange size 150 x 20 mm, web is 10 x 260 mm. If maximum shear force acting on the beam is 80kN. Determine shear stress across depth of cross section and draw shear stress distribution diagram **08**

b) A simply supported beam of 8-meter span carries point load of 40kN at its midspan. The cross section of beam is rectangle of 120 x 180 mm in size. Calculate the maximum slope at support and maximum deflection at center. **06**
Take E=110Gpa.

Q.7 **a)** Define Slope and Deflection of beam. Describe it in brief for simply supported and cantilever beam. **05**

b) A cantilever beam of uniform rectangular section 150 x 260mm carries UDL of 25 kN/m over its span 4 m. Determine maximum bending stress in the beam. **05**

c) Define the following terms: **04**

i) Theory of pure bending of beam
ii) Major principal stress
iii) Minor principal plane
iv) Angle of Obliquity

SLR-BD-67

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) If a linear differential equation with constant coefficients and r.h.s. equal to zero has a real root m_1 repeated Two times, then the corresponding part of the integral is _____.

a) $(c_1 + c_2)e^{m_1 X}$ b) $(c_1 + c_2 x)e^{m_1 X}$

c) $(c_1 x + c_2 x^2)e^{m_1 X}$ d) $(c_1 + c_2 x^3)e^{m_1 X}$

2) $\frac{1}{D-a}X$ is equal to _____.

a) $\int Xe^{ax}dx$ b) $e^{ax}\int X.e^{-ax}dx$

c) $\int Xe^{-ax}dx$ d) $e^{-ax}\int Xe^{-ax}dx$

3) $\frac{1}{D+1}(\log x + \frac{1}{x})$ is equal to _____.

a) e^x b) 1

c) x d) $\log x$

4) The solution of $q = e^{-p}$ is _____.

a) $z = ax + by + c$ b) $z = a^x + b^y + c$

c) $z = ax + y^{-b} + c$ d) $z = ax + e^{-a}y + c$

5) The solution of the equation $pq = p + q$ is _____.

a) $z = ax + (a+1)y + c$

b) $z = (a+1)x + a(a-1)y + c$

c) $z = (a-1)x + a(a+1)y + c$

d) $z(a-1) = a(a-1)x + ay + c$

6) If μ_1', μ_2', μ_3', μ_4' are the first four moments of the distribution about certain number then fourth moment μ_4 of the distribution about the arithmetic mean is given by _____.

a) $\mu_4' + 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^4 + 3(\mu_1')^4$

b) $\mu_4' - 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^2 - 3(\mu_1')^4$

c) $\mu_4' + 4\mu_3'\mu_1' - 6\mu_2'(\mu_1')^4 - 3(\mu_1')^4$

d) $\mu_4' + 2\mu_3'\mu_1' + 6\mu_2'(\mu_1')^4 - 3(\mu_1')^4$

7) Coefficient of kurtosis β_2 is given by _____.

a) $\frac{\mu_4}{\mu_3}$ b) $\frac{\mu_4}{\mu_2^2}$

c) $\frac{\mu_3}{\mu_2^2}$ d) $\frac{\mu_4}{\mu_2^3}$

8) If value of x for normal distribution is 35, mean of normal distribution is 65 and standard deviation is 25 then standardized random variable is ___.

a) -1.5 b) -1.7

c) -1.2 d) -4

9) A continuous random variable has the following probability density function $f(x) = kx(1-x), 0 \le x \le 1$ then $k =$ _____.

a) 6 b) 2

c) 3 d) 5

10) The area under the standard normal curve from $z = -\infty$ to $z = 0$ is ___.

a) 1 b) ½

c) 3/2 d) 0

11) If X, Y denotes the deviations from their means and if $\sum X^2 = 40, \sum Y^2 = 100, \sum XY = 50,$ then $r =$ _____.

a) 0.63 b) 0.82

c) 0.91 d) 0.79

12) The line of regression of x and y is given by _____.

a) $x - \bar{x} = b_{xy}(y - \bar{y})$ b) $x - \bar{y} = b_{xy}(x - \bar{x})$

c) $x - \bar{x} = b_{xx}(y - \bar{y})$ d) $x - \bar{x} = b_{yx}(y - \bar{y})$

13) The following mistakes per page were found in a book.

No. of mistakes:	0	1	2	3	4
Pages:	211	90	19	5	0

Then χ^2 is _____.

a) 0.59 b) 0.069

c) 0.81 d) 0.79

14) The 't-statistic' is defined as _____.

a) $\frac{\bar{x}-\mu}{\sigma/\sqrt{n}}$ b) $\frac{\bar{x}-\mu}{s/\sqrt{n}}$

c) $\frac{\bar{x}-\mu}{\sigma/n}$ d) $\frac{\bar{x}-\mu}{s/n}$

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **09**

a) Find the Arithmetic mean, Median and standard deviation for the following frequency distribution.

x	5	9	12	15	20	24	30	35	42	49
f	3	6	8	8	9	10	8	7	6	2

b) Solve $(D^2 - 4D + 4)y = 8.x^2e^{2x}\sin 2x$

c) Solve $(D^2 + D + 1)y = \sin 2x$

d) Calculate Mode for the following frequency distribution.

C.I.	00-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency (f)	4	7	8	12	25	18	10

e) Solve $p^2q^3 = x^2y^3$

Q.3 Attempt any Three. **09**

a) Solve: $(2D + 1)^2y = 4e^{-x/2}$

b) Solve: $p + q = pqz$

c) Find Q_1, Q_2, Q_3 from the following data.
5,7,12,14,15,22,25,30,36,42,53

d) Solve $x(y - z)p + y(z - x)q = z(x - y)$

e) Solve $(D^3 - 3D + 2)y = x$

Q.4 Attempt any Two **10**

a) The first four moments of a distribution about the value 5 are 2,20,40 and 50. from the given information obtain the first four central moments, coefficient of skewness and kurtosis.

b) Solve the following differential equation by the method of separation of variables.
$\frac{\partial z}{\partial x} - 2\frac{\partial z}{\partial y} = z$ given that $z(x, 0) = 3e^{-5x}$

c) Solve: $(D^2 - D - 2)y = 2\log x + \frac{1}{x} + \frac{1}{x^2}$

Section – II

Q.5 Attempt any three of the following. **09**

a) Find the value of k if each of the following functions is a probability density function.

$$f(x) = \begin{cases} kx^2(1-x^3), & 0 \le x \le 1 \\ 0, & \text{otherwise} \end{cases}$$

b) The mean life time of 100 fluorescent light bulbs produced by a Company is computed to be 1570 Hrs. with S.D. of 120 Hrs. If μ is the mean lifetime of all the bulbs produced by the Company, Test the Hypothesis $\mu = 1600$ Hrs. Against the alternative Hypothesis $\mu \neq 1600$ Hrs. using 5% level of Significance.
(Given Expected value at 5% LOS is 1.96)

c) Calculate the coefficient of correlation between height of father and height of son from the following data.

Height of father	64	65	66	67	68	69	70
Height of son	66	67	65	68	70	68	71

d) Two independent random sample have the following data,
$\overline{x_1} = 110, \sigma_1 = 25, n_1 = 16$
$\overline{x_2} = 120, \sigma_2 = 30, n_2 = 9$
If σ_1 and σ_2 are the S. D. of the populations. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance. (The table value of t at $\alpha = 0.05$ for $v = 23$ degrees of freedom is 2.069)

e) If in a lot of 500 solenoids 25 are defective, find the probability that there will be 0, 1, 2 defective solenoids in a random sample of 20 solenoids.

Q.6 Attempt any three of the following. **09**

a) If two independent random samples of sizes 15 and 8 have respectively the following mean and population standard deviations, $\overline{x_1} = 980, \overline{x_2} = 1012; \sigma_1 = 75, \sigma_2 = 80$. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance.
(Given Expected value at 5% LOS with 21 DF is 2.080)

b) The number of telephone calls received by an operator in a ten-minute interval follows a Poisson distribution with mean 1. What is the probability of receiving (i) no call, (ii) less than four calls, in the interval? What is the most likely number of calls?

c) Calculate the equations of the lines of regression. Given
Mean of $x = 50.07$, S.D. of $x = 5.26$
Mean of $y = 9.98$, S.D. of $y = 2.59$
$r = 0.898$

d) In an intelligence test administered to 1000 children the mean score was, 42 with s.d. 24. Find the number of children (i) scoring more than 60 and (ii) between 20 and 40 assuming the distribution to be normal.
(Given: For S.N.V. z area from z = 0 to z = 0.75 is 0.2734, that between z = 0 and z = 0.9167 is 0.3202 and that between z = 0 to z = 0.08333 is 0.0332.)

e) Fit a Straight line $y = a + bx$ to the following data.

x	0	1	2	3	4	5
y	1	2	3	4.5	6	7.5

Q.7 Attempt any Two. **10**

a) Fit a Poisson's distribution to the following data :

X	0	1	2	3	4	Total
f	112	63	20	4	1	200

b) Obtain a second-degree curve to the following data.

Year	1965	1966	1967	1968	1969	1970	1971	1972
Profit (in Corers Rs.)	125	140	165	195	200	215	220	230

Also estimate the profit in 1973.

c) Ten school boys were given a test in Statistics and their scores were recorded. They were given a month's special coaching and a second test was given to them in the same subject at the end of the coaching period. Test if the marks given below give evidence to the fact that the students are benefitted by coaching.
Marks in test I: 70, 68, 56, 75, 80, 90, 68, 75, 56, 58
Marks in Test II: 68, 70, 52, 73, 75, 78, 80, 92, 54, 55
(Given that value of t_α at 5 % LOS for v = 9 degrees of freedom is 1.86 for one tailed test)

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) If value of x for normal distribution is 35, mean of normal distribution is 65 and standard deviation is 25 then standardized random variable is ___.
a) -1.5 b) -1.7
c) -1.2 d) -4

2) A continuous random variable has the following probability density function $f(x) = kx(1-x), 0 \le x \le 1$ then $k =$ _____.
a) 6 b) 2
c) 3 d) 5

3) The area under the standard normal curve from $z = -\infty$ to $z = 0$ is ___.
a) 1 b) ½
c) 3/2 d) 0

4) If X, Y denotes the deviations from their means and if $\sum X^2 = 40, \sum Y^2 = 100, \sum XY = 50,$ then $r =$ _____.
a) 0.63 b) 0.82
c) 0.91 d) 0.79

5) The line of regression of x and y is given by _____.
a) $x - \bar{x} = b_{xy}(y - \bar{y})$ b) $x - \bar{y} = b_{xy}(x - \bar{x})$
c) $x - \bar{x} = b_{xx}(y - \bar{y})$ d) $x - \bar{x} = b_{yx}(y - \bar{y})$

6) The following mistakes per page were found in a book.

No. of mistakes:	0	1	2	3	4
Pages:	211	90	19	5	0

Then χ^2 is _____.
a) 0.59 b) 0.069
c) 0.81 d) 0.79

7) The 't-statistic' is defined as _____.

a) $\frac{\bar{x}-\mu}{\sigma/\sqrt{n}}$ b) $\frac{\bar{x}-\mu}{s/\sqrt{n}}$

c) $\frac{\bar{x}-\mu}{\sigma/n}$ d) $\frac{\bar{x}-\mu}{s/n}$

8) If a linear differential equation with constant coefficients and r.h.s. equal to zero has a real root m_1 repeated Two times, then the corresponding part of the integral is _____.

a) $(c_1 + c_2)e^{m_1 X}$ b) $(c_1 + c_2 x)e^{m_1 X}$

c) $(c_1 x + c_2 x^2)e^{m_1 X}$ d) $(c_1 + c_2 x^3)e^{m_1 X}$

9) $\frac{1}{D-a}X$ is equal to _____.

a) $\int Xe^{ax}dx$ b) $e^{ax}\int X.e^{-ax}dx$

c) $\int Xe^{-ax}dx$ d) $e^{-ax}\int Xe^{-ax}dx$

10) $\frac{1}{D+1}(\log x + \frac{1}{x})$ is equal to _____.

a) e^x b) 1

c) x d) $\log x$

11) The solution of $q = e^{-p}$ is _____.

a) $z = ax + by + c$ b) $z = a^x + b^y + c$

c) $z = ax + y^{-b} + c$ d) $z = ax + e^{-a}y + c$

12) The solution of the equation $pq = p + q$ is _____.

a) $z = ax + (a+1)y + c$

b) $z = (a+1)x + a(a-1)y + c$

c) $z = (a-1)x + a(a+1)y + c$

d) $z(a-1) = a(a-1)x + ay + c$

13) If μ_1', μ_2', μ_3', μ_4' are the first four moments of the distribution about certain number then fourth moment μ_4 of the distribution about the arithmetic mean is given by _____.

a) $\mu_4' + 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^4 + 3(\mu_1')^4$

b) $\mu_4' - 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^2 - 3(\mu_1')^4$

c) $\mu_4' + 4\mu_3'\mu_1' - 6\mu_2'(\mu_1')^4 - 3(\mu_1')^4$

d) $\mu_4' + 2\mu_3'\mu_1' + 6\mu_2'(\mu_1')^4 - 3(\mu_1')^4$

14) Coefficient of kurtosis β_2 is given by _____.

a) $\frac{\mu_4}{\mu_3}$ b) $\frac{\mu_4}{\mu_2^2}$

c) $\frac{\mu_3}{\mu_2^2}$ d) $\frac{\mu_4}{\mu_2^3}$

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **09**

a) Find the Arithmetic mean, Median and standard deviation for the following frequency distribution.

x	5	9	12	15	20	24	30	35	42	49
f	3	6	8	8	9	10	8	7	6	2

b) Solve $(D^2 - 4D + 4)y = 8.x^2e^{2x}\sin 2x$

c) Solve $(D^2 + D + 1)y = \sin 2x$

d) Calculate Mode for the following frequency distribution.

C.I.	00-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency (f)	4	7	8	12	25	18	10

e) Solve $p^2q^3 = x^2y^3$

Q.3 Attempt any Three. **09**

a) Solve: $(2D + 1)^2y = 4e^{-x/2}$

b) Solve: $p + q = pqz$

c) Find Q_1, Q_2, Q_3 from the following data.
5,7,12,14,15,22,25,30,36,42,53

d) Solve $x(y - z)p + y(z - x)q = z(x - y)$

e) Solve $(D^3 - 3D + 2)y = x$

Q.4 Attempt any Two **10**

a) The first four moments of a distribution about the value 5 are 2,20,40 and 50. from the given information obtain the first four central moments, coefficient of skewness and kurtosis.

b) Solve the following differential equation by the method of separation of variables.
$\frac{\partial z}{\partial x} - 2\frac{\partial z}{\partial y} = z$ given that $z(x, 0) = 3e^{-5x}$

c) Solve: $(D^2 - D - 2)y = 2\log x + \frac{1}{x} + \frac{1}{x^2}$

Section – II

Q.5 Attempt any three of the following. **09**

a) Find the value of k if each of the following functions is a probability density function.

$$f(x) = \begin{cases} kx^2(1-x^3), & 0 \le x \le 1 \\ 0, & \text{otherwise} \end{cases}$$

b) The mean life time of 100 fluorescent light bulbs produced by a Company is computed to be 1570 Hrs. with S.D. of 120 Hrs. If μ is the mean lifetime of all the bulbs produced by the Company, Test the Hypothesis $\mu = 1600$ Hrs. Against the alternative Hypothesis $\mu \neq 1600$ Hrs. using 5% level of Significance.
(Given Expected value at 5% LOS is 1.96)

c) Calculate the coefficient of correlation between height of father and height of son from the following data.

Height of father	64	65	66	67	68	69	70
Height of son	66	67	65	68	70	68	71

d) Two independent random sample have the following data,
$\overline{x_1} = 110, \sigma_1 = 25, n_1 = 16$
$\overline{x_2} = 120, \sigma_2 = 30, n_2 = 9$
If σ_1 and σ_2 are the S. D. of the populations. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance. (The table value of t at $\alpha = 0.05$ for $v = 23$ degrees of freedom is 2.069)

e) If in a lot of 500 solenoids 25 are defective, find the probability that there will be 0, 1, 2 defective solenoids in a random sample of 20 solenoids.

Q.6 Attempt any three of the following. **09**

a) If two independent random samples of sizes 15 and 8 have respectively the following mean and population standard deviations, $\overline{x_1} = 980, \overline{x_2} = 1012; \sigma_1 = 75, \sigma_2 = 80$. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance.
(Given Expected value at 5% LOS with 21 DF is 2.080)

b) The number of telephone calls received by an operator in a ten-minute interval follows a Poisson distribution with mean 1. What is the probability of receiving (i) no call, (ii) less than four calls, in the interval? What is the most likely number of calls?

c) Calculate the equations of the lines of regression. Given
Mean of $x = 50.07$, S.D. of $x = 5.26$
Mean of $y = 9.98$, S.D. of $y = 2.59$
$r = 0.898$

d) In an intelligence test administered to 1000 children the mean score was, 42 with s.d. 24. Find the number of children (i) scoring more than 60 and (ii) between 20 and 40 assuming the distribution to be normal.
(Given: For S.N.V. z area from z = 0 to z = 0.75 is 0.2734, that between z = 0 and z = 0.9167 is 0.3202 and that between z = 0 to z = 0.08333 is 0.0332.)

e) Fit a Straight line $y = a + bx$ to the following data.

x	0	1	2	3	4	5
y	1	2	3	4.5	6	7.5

Q.7 Attempt any Two. **10**

a) Fit a Poisson's distribution to the following data :

X	0	1	2	3	4	Total
f	112	63	20	4	1	200

b) Obtain a second-degree curve to the following data.

Year	1965	1966	1967	1968	1969	1970	1971	1972
Profit (in Corers Rs.)	125	140	165	195	200	215	220	230

Also estimate the profit in 1973.

c) Ten school boys were given a test in Statistics and their scores were recorded. They were given a month's special coaching and a second test was given to them in the same subject at the end of the coaching period. Test if the marks given below give evidence to the fact that the students are benefitted by coaching.
Marks in test I: 70, 68, 56, 75, 80, 90, 68, 75, 56, 58
Marks in Test II: 68, 70, 52, 73, 75, 78, 80, 92, 54, 55
(Given that value of t_α at 5 % LOS for v = 9 degrees of freedom is 1.86 for one tailed test)

Seat No.		Set	R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) If X, Y denotes the deviations from their means and if $\sum X^2 = 40, \sum Y^2 = 100, \sum XY = 50,$ then $r =$ _____.
a) 0.63 b) 0.82
c) 0.91 d) 0.79

2) The line of regression of x and y is given by _____.
a) $x - \bar{x} = b_{xy}(y - \bar{y})$ b) $x - \bar{y} = b_{xy}(x - \bar{x})$
c) $x - \bar{x} = b_{xx}(y - \bar{y})$ d) $x - \bar{x} = b_{yx}(y - \bar{y})$

3) The following mistakes per page were found in a book.

No. of mistakes:	0	1	2	3	4
Pages:	211	90	19	5	0

Then χ^2 is _____.
a) 0.59 b) 0.069
c) 0.81 d) 0.79

4) The 't-statistic' is defined as _____.
a) $\frac{\bar{x}-\mu}{\sigma/\sqrt{n}}$ b) $\frac{\bar{x}-\mu}{s/\sqrt{n}}$
c) $\frac{\bar{x}-\mu}{\sigma/n}$ d) $\frac{\bar{x}-\mu}{s/n}$

5) If a linear differential equation with constant coefficients and r.h.s. equal to zero has a real root m_1 repeated Two times, then the corresponding part of the integral is _____.
a) $(c_1 + c_2)e^{m_1 X}$ b) $(c_1 + c_2 x)e^{m_1 X}$
c) $(c_1 x + c_2 x^2)e^{m_1 X}$ d) $(c_1 + c_2 x^3)e^{m_1 X}$

6) $\frac{1}{D-a}X$ is equal to _____.

a) $\int Xe^{ax}dx$ b) $e^{ax}\int X.e^{-ax}dx$

c) $\int Xe^{-ax}dx$ d) $e^{-ax}\int Xe^{-ax}dx$

7) $\frac{1}{D+1}(\log x+\frac{1}{x})$ is equal to _____.

a) e^x b) 1

c) x d) $\log x$

8) The solution of $q=e^{-p}$ is _____.

a) $z=ax+by+c$ b) $z=a^x+b^y+c$

c) $z=ax+y^{-b}+c$ d) $z=ax+e^{-a}y+c$

9) The solution of the equation $pq=p+q$ is _____.

a) $z=ax+(a+1)y+c$

b) $z=(a+1)x+a(a-1)y+c$

c) $z=(a-1)x+a(a+1)y+c$

d) $z(a-1)=a(a-1)x+ay+c$

10) If μ_1', μ_2', μ_3', μ_4' are the first four moments of the distribution about certain number then fourth moment μ_4 of the distribution about the arithmetic mean is given by _____.

a) $\mu_4'+4\mu_3'\mu_1'+6\mu_2'(\mu_1')^4+3(\mu_1')^4$

b) $\mu_4'-4\mu_3'\mu_1'+6\mu_2'(\mu_1')^2-3(\mu_1')^4$

c) $\mu_4'+4\mu_3'\mu_1'-6\mu_2'(\mu_1')^4-3(\mu_1')^4$

d) $\mu_4'+2\mu_3'\mu_1'+6\mu_2'(\mu_1')^4-3(\mu_1')^4$

11) Coefficient of kurtosis β_2 is given by _____.

a) $\frac{\mu_4}{\mu_3}$ b) $\frac{\mu_4}{\mu_2^2}$

c) $\frac{\mu_3}{\mu_2^2}$ d) $\frac{\mu_4}{\mu_2^3}$

12) If value of x for normal distribution is 35, mean of normal distribution is 65 and standard deviation is 25 then standardized random variable is ___.

a) -1.5 b) -1.7

c) -1.2 d) -4

13) A continuous random variable has the following probability density function $f(x)=kx(1-x),0\le x\le 1$ then $k=$ _____.

a) 6 b) 2

c) 3 d) 5

14) The area under the standard normal curve from $z = -\infty$ to $z = 0$ is ___.

a) 1 b) ½

c) 3/2 d) 0

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **09**

a) Find the Arithmetic mean, Median and standard deviation for the following frequency distribution.

x	5	9	12	15	20	24	30	35	42	49
f	3	6	8	8	9	10	8	7	6	2

b) Solve $(D^2 - 4D + 4)y = 8.x^2e^{2x}\sin 2x$

c) Solve $(D^2 + D + 1)y = \sin 2x$

d) Calculate Mode for the following frequency distribution.

C.I.	00-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency (f)	4	7	8	12	25	18	10

e) Solve $p^2q^3 = x^2y^3$

Q.3 Attempt any Three. **09**

a) Solve: $(2D + 1)^2y = 4e^{-x/2}$

b) Solve: $p + q = pqz$

c) Find Q_1, Q_2, Q_3 from the following data.
5,7,12,14,15,22,25,30,36,42,53

d) Solve $x(y - z)p + y(z - x)q = z(x - y)$

e) Solve $(D^3 - 3D + 2)y = x$

Q.4 Attempt any Two **10**

a) The first four moments of a distribution about the value 5 are 2,20,40 and 50. from the given information obtain the first four central moments, coefficient of skewness and kurtosis.

b) Solve the following differential equation by the method of separation of variables.
$\frac{\partial z}{\partial x} - 2\frac{\partial z}{\partial y} = z$ given that $z(x, 0) = 3e^{-5x}$

c) Solve: $(D^2 - D - 2)y = 2\log x + \frac{1}{x} + \frac{1}{x^2}$

Section – II

Q.5 Attempt any three of the following. **09**

a) Find the value of k if each of the following functions is a probability density function.

$$f(x) = \begin{cases} kx^2(1-x^3), & 0 \le x \le 1 \\ 0, & \text{otherwise} \end{cases}$$

b) The mean life time of 100 fluorescent light bulbs produced by a Company is computed to be 1570 Hrs. with S.D. of 120 Hrs. If μ is the mean lifetime of all the bulbs produced by the Company, Test the Hypothesis $\mu = 1600$ Hrs. Against the alternative Hypothesis $\mu \neq 1600$ Hrs. using 5% level of Significance.
(Given Expected value at 5% LOS is 1.96)

c) Calculate the coefficient of correlation between height of father and height of son from the following data.

Height of father	64	65	66	67	68	69	70
Height of son	66	67	65	68	70	68	71

d) Two independent random sample have the following data,
$\overline{x_1} = 110, \sigma_1 = 25, n_1 = 16$
$\overline{x_2} = 120, \sigma_2 = 30, n_2 = 9$
If σ_1 and σ_2 are the S. D. of the populations. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance. (The table value of t at $\alpha = 0.05$ for $v = 23$ degrees of freedom is 2.069)

e) If in a lot of 500 solenoids 25 are defective, find the probability that there will be 0, 1, 2 defective solenoids in a random sample of 20 solenoids.

Q.6 Attempt any three of the following. **09**

a) If two independent random samples of sizes 15 and 8 have respectively the following mean and population standard deviations, $\overline{x_1} = 980, \overline{x_2} = 1012; \sigma_1 = 75, \sigma_2 = 80$. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance.
(Given Expected value at 5% LOS with 21 DF is 2.080)

b) The number of telephone calls received by an operator in a ten-minute interval follows a Poisson distribution with mean 1. What is the probability of receiving (i) no call, (ii) less than four calls, in the interval? What is the most likely number of calls?

c) Calculate the equations of the lines of regression. Given
Mean of $x = 50.07$, S.D. of $x = 5.26$
Mean of $y = 9.98$, S.D. of $y = 2.59$
$r = 0.898$

d) In an intelligence test administered to 1000 children the mean score was, 42 with s.d. 24. Find the number of children (i) scoring more than 60 and (ii) between 20 and 40 assuming the distribution to be normal.
(Given: For S.N.V. z area from z = 0 to z = 0.75 is 0.2734, that between z = 0 and z = 0.9167 is 0.3202 and that between z = 0 to z = 0.08333 is 0.0332.)

e) Fit a Straight line $y = a + bx$ to the following data.

x	0	1	2	3	4	5
y	1	2	3	4.5	6	7.5

Q.7 Attempt any Two. **10**

a) Fit a Poisson's distribution to the following data :

X	0	1	2	3	4	Total
f	112	63	20	4	1	200

b) Obtain a second-degree curve to the following data.

Year	1965	1966	1967	1968	1969	1970	1971	1972
Profit (in Corers Rs.)	125	140	165	195	200	215	220	230

Also estimate the profit in 1973.

c) Ten school boys were given a test in Statistics and their scores were recorded. They were given a month's special coaching and a second test was given to them in the same subject at the end of the coaching period. Test if the marks given below give evidence to the fact that the students are benefitted by coaching.
Marks in test I: 70, 68, 56, 75, 80, 90, 68, 75, 56, 58
Marks in Test II: 68, 70, 52, 73, 75, 78, 80, 92, 54, 55
(Given that value of t_α at 5 % LOS for v = 9 degrees of freedom is 1.86 for one tailed test)

SLR-BD-67

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) If μ_1', μ_2', μ_3', μ_4' are the first four moments of the distribution about certain number then fourth moment μ_4 of the distribution about the arithmetic mean is given by _____.

a) $\mu_4' + 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^4 + 3(\mu_1')^4$

b) $\mu_4' - 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^2 - 3(\mu_1')^4$

c) $\mu_4' + 4\mu_3'\mu_1' - 6\mu_2'(\mu_1')^4 - 3(\mu_1')^4$

d) $\mu_4' + 2\mu_3'\mu_1' + 6\mu_2'(\mu_1')^4 - 3(\mu_1')^4$

2) Coefficient of kurtosis β_2 is given by _____.

a) $\frac{\mu_4}{\mu_3}$ b) $\frac{\mu_4}{\mu_2^2}$

c) $\frac{\mu_3}{\mu_2^2}$ d) $\frac{\mu_4}{\mu_2^3}$

3) If value of x for normal distribution is 35, mean of normal distribution is 65 and standard deviation is 25 then standardized random variable is ___.

a) -1.5 b) -1.7
c) -1.2 d) -4

4) A continuous random variable has the following probability density function $f(x) = kx(1-x), 0 \le x \le 1$ then $k =$ _____.

a) 6 b) 2
c) 3 d) 5

5) The area under the standard normal curve from $z = -\infty$ to $z = 0$ is ___.

a) 1 b) ½
c) 3/2 d) 0

6) If X, Y denotes the deviations from their means and if $\sum X^2 = 40, \sum Y^2 = 100, \sum XY = 50,$ then $r =$ _____.

a) 0.63 b) 0.82

c) 0.91 d) 0.79

7) The line of regression of x and y is given by _____.

a) $x - \bar{x} = b_{xy}(y - \bar{y})$ b) $x - \bar{y} = b_{xy}(x - \bar{x})$

c) $x - \bar{x} = b_{xx}(y - \bar{y})$ d) $x - \bar{x} = b_{yx}(y - \bar{y})$

8) The following mistakes per page were found in a book.

No. of mistakes:	0	1	2	3	4
Pages:	211	90	19	5	0

Then χ^2 is _____.

a) 0.59 b) 0.069

c) 0.81 d) 0.79

9) The 't-statistic' is defined as _____.

a) $\frac{\bar{x}-\mu}{\sigma/\sqrt{n}}$ b) $\frac{\bar{x}-\mu}{s/\sqrt{n}}$

c) $\frac{\bar{x}-\mu}{\sigma/n}$ d) $\frac{\bar{x}-\mu}{s/n}$

10) If a linear differential equation with constant coefficients and r.h.s. equal to zero has a real root m_1 repeated Two times, then the corresponding part of the integral is _____.

a) $(c_1 + c_2)e^{m_1 X}$ b) $(c_1 + c_2 x)e^{m_1 X}$

c) $(c_1 x + c_2 x^2)e^{m_1 X}$ d) $(c_1 + c_2 x^3)e^{m_1 X}$

11) $\frac{1}{D-a}X$ is equal to _____.

a) $\int Xe^{ax}dx$ b) $e^{ax}\int X.e^{-ax}dx$

c) $\int Xe^{-ax}dx$ d) $e^{-ax}\int Xe^{-ax}dx$

12) $\frac{1}{D+1}(\log x + \frac{1}{x})$ is equal to _____.

a) e^x b) 1

c) x d) $\log x$

13) The solution of $q = e^{-p}$ is _____.

a) $z = ax + by + c$ b) $z = a^x + b^y + c$

c) $z = ax + y^{-b} + c$ d) $z = ax + e^{-a}y + c$

14) The solution of the equation $pq = p + q$ is _____.

a) $z = ax + (a+1)y + c$

b) $z = (a+1)x + a(a-1)y + c$

c) $z = (a-1)x + a(a+1)y + c$

d) $z(a-1) = a(a-1)x + ay + c$

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **09**

a) Find the Arithmetic mean, Median and standard deviation for the following frequency distribution.

x	5	9	12	15	20	24	30	35	42	49
f	3	6	8	8	9	10	8	7	6	2

b) Solve $(D^2 - 4D + 4)y = 8.x^2e^{2x}\sin 2x$

c) Solve $(D^2 + D + 1)y = \sin 2x$

d) Calculate Mode for the following frequency distribution.

C.I.	00-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency (f)	4	7	8	12	25	18	10

e) Solve $p^2q^3 = x^2y^3$

Q.3 Attempt any Three. **09**

a) Solve: $(2D + 1)^2y = 4e^{-x/2}$

b) Solve: $p + q = pqz$

c) Find Q_1, Q_2, Q_3 from the following data.
5,7,12,14,15,22,25,30,36,42,53

d) Solve $x(y - z)p + y(z - x)q = z(x - y)$

e) Solve $(D^3 - 3D + 2)y = x$

Q.4 Attempt any Two **10**

a) The first four moments of a distribution about the value 5 are 2,20,40 and 50. from the given information obtain the first four central moments, coefficient of skewness and kurtosis.

b) Solve the following differential equation by the method of separation of variables.
$\frac{\partial z}{\partial x} - 2\frac{\partial z}{\partial y} = z$ given that $z(x, 0) = 3e^{-5x}$

c) Solve: $(D^2 - D - 2)y = 2\log x + \frac{1}{x} + \frac{1}{x^2}$

Section – II

Q.5 Attempt any three of the following. **09**

a) Find the value of k if each of the following functions is a probability density function.

$$f(x) = \begin{cases} kx^2(1-x^3), & 0 \le x \le 1 \\ 0, & \text{otherwise} \end{cases}$$

b) The mean life time of 100 fluorescent light bulbs produced by a Company is computed to be 1570 Hrs. with S.D. of 120 Hrs. If μ is the mean lifetime of all the bulbs produced by the Company, Test the Hypothesis $\mu = 1600$ Hrs. Against the alternative Hypothesis $\mu \neq 1600$ Hrs. using 5% level of Significance.
(Given Expected value at 5% LOS is 1.96)

c) Calculate the coefficient of correlation between height of father and height of son from the following data.

Height of father	64	65	66	67	68	69	70
Height of son	66	67	65	68	70	68	71

d) Two independent random sample have the following data,
$\overline{x_1} = 110, \sigma_1 = 25, n_1 = 16$
$\overline{x_2} = 120, \sigma_2 = 30, n_2 = 9$
If σ_1 and σ_2 are the S. D. of the populations. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance. (The table value of t at $\alpha = 0.05$ for $v = 23$ degrees of freedom is 2.069)

e) If in a lot of 500 solenoids 25 are defective, find the probability that there will be 0, 1, 2 defective solenoids in a random sample of 20 solenoids.

Q.6 Attempt any three of the following. **09**

a) If two independent random samples of sizes 15 and 8 have respectively the following mean and population standard deviations, $\overline{x_1} = 980, \overline{x_2} = 1012; \sigma_1 = 75, \sigma_2 = 80$. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance.
(Given Expected value at 5% LOS with 21 DF is 2.080)

b) The number of telephone calls received by an operator in a ten-minute interval follows a Poisson distribution with mean 1. What is the probability of receiving (i) no call, (ii) less than four calls, in the interval? What is the most likely number of calls?

c) Calculate the equations of the lines of regression. Given
Mean of $x = 50.07$, S.D. of $x = 5.26$
Mean of $y = 9.98$, S.D. of $y = 2.59$
$r = 0.898$

d) In an intelligence test administered to 1000 children the mean score was, 42 with s.d. 24. Find the number of children (i) scoring more than 60 and (ii) between 20 and 40 assuming the distribution to be normal.
(Given: For S.N.V. z area from z = 0 to z = 0.75 is 0.2734, that between z = 0 and z = 0.9167 is 0.3202 and that between z = 0 to z = 0.08333 is 0.0332.)

e) Fit a Straight line $y = a + bx$ to the following data.

x	0	1	2	3	4	5
y	1	2	3	4.5	6	7.5

Q.7 Attempt any Two. **10**

a) Fit a Poisson's distribution to the following data :

X	0	1	2	3	4	Total
f	112	63	20	4	1	200

b) Obtain a second-degree curve to the following data.

Year	1965	1966	1967	1968	1969	1970	1971	1972
Profit (in Corers Rs.)	125	140	165	195	200	215	220	230

Also estimate the profit in 1973.

c) Ten school boys were given a test in Statistics and their scores were recorded. They were given a month's special coaching and a second test was given to them in the same subject at the end of the coaching period. Test if the marks given below give evidence to the fact that the students are benefitted by coaching.
Marks in test I: 70, 68, 56, 75, 80, 90, 68, 75, 56, 58
Marks in Test II: 68, 70, 52, 73, 75, 78, 80, 92, 54, 55
(Given that value of t_α at 5 % LOS for v = 9 degrees of freedom is 1.86 for one tailed test)

SLR-BD-68

Seat No.		Set	P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which dimension of e-commerce enables commerce beyond the boundaries of the country?
a) Richness b) Interactivity
c) Global Reach d) Ubiquity

2) Which of the following describes the definition of electronic commerce?
a) Doing business
b) Sale and purchase of goods
c) Doing business electronically
d) All of the above mentioned

3) Which e-commerce model involves the sale of goods or services from businesses to the general public?
a) Business to Government b) Business to Consumer
c) Business to Business d) Consumer to Business

4) All of the following are major B2C business models except _____.
a) content provider b) industry consortium
c) transaction broker d) service provider

5) Which of the following advantage of E-commerce?
a) Ability to operate 24/7
b) Inability to personalize the shopping
c) Higher operational cost
d) Limited reach CO1 I

6) Which e-commerce transaction provides the benefits of eliminating the requirement of a middleman?

a) Business to Business
b) Business to Government
c) Consumer to Business
d) Business to Consumer

7) After completing an E-Commerce transaction, the seller and buyer should be provided an opportunity to _____ their transaction experience.

a) undo
b) regret
c) provide rating for
d) forget

8) Which of the following is a common digital marketing strategy used in E-commerce?

a) Search Engine Optimization (SEO)
b) Traditional print advertising
c) Cold-calling potential customers
d) Distributing flyers in local neighborhoods

9) Digital Cash has following characteristic _____.

a) Anonymity
b) Security
c) Confidentiality
d) All above

10) Which component of E-commerce ensures secure online transactions and customer data protection?

a) Payment gateways
b) Shopping carts
c) Product catalogs
d) Data warehouses

11) Which type of attack is a method of defeating a cryptographic scheme of trying a large number of possibilities?

a) Teardrop attack
b) Brute force attack
c) Phlashing
d) Smurf attack

12) What is the another name called PDoS?

a) Brute force attack
b) Non technical attack
c) Phlashing
d) Smurf attack

13) What does the term “data security” refer to in E-commerce?

a) The use of cookies to track customer behavior
b) The protection of customer data from unauthorized access and breaches
c) The analysis of customer browsing history for personalized recommendations
d) The process of categorizing customer data for marketing purposes

14) Which of the following is a characteristic of E-commerce marketplaces?

a) They only allow B2C transactions
b) They sell physical products exclusively
c) They are limited to a specific geographical area
d) Multiple sellers can list their products to reach a broader audience

SLR-BD-68

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve any four of the following. **16**

a) What is electronic commerce? Explain its applications?
b) Describe the web 2.0 in detail.
c) What do you mean by Supply Chain Execution Framework?
d) Discuss in brief virtual auction. Explain the differences between virtual auction and reverse auction.
e) Give the types of E payment methods. Explain in detail the EPS?

Q.3 Solve any two of the following. **12**

a) Define Electronic Data Interchange. What are the components of Electronic Data Interchange?
b) Explain in detail Business to consumer e-Commerce model.
c) What are the key technologies for B2B E-commerce? Explain architectural models of B2B E-commerce.

Section – II

Q.4 Solve any four of the following. **16**

a) What is the purpose of using social media in E-commerce marketing?
b) Explain technical malware attack method related to different services.
c) Explain E-Commerce micro payments in detail.
d) Explain SEO in detail.
e) Explain web advertising types in detail.

Q.5 Solve any two of the following. **12**

a) Define digital cash or e-cash. Explain with example how an online banking system works.
b) What are the different strategies to increase the sale?
c) What are the security challenges and protection measure available to any e business?

SLR-BD-68

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is a common digital marketing strategy used in E-commerce?
a) Search Engine Optimization (SEO)
b) Traditional print advertising
c) Cold-calling potential customers
d) Distributing flyers in local neighborhoods

2) Digital Cash has following characteristic _____.
a) Anonymity b) Security
c) Confidentiality d) All above

3) Which component of E-commerce ensures secure online transactions and customer data protection?
a) Payment gateways b) Shopping carts
c) Product catalogs d) Data warehouses

4) Which type of attack is a method of defeating a cryptographic scheme of trying a large number of possibilities?
a) Teardrop attack b) Brute force attack
c) Phlashing d) Smurf attack

5) What is the another name called PDoS?
a) Brute force attack b) Non technical attack
c) Phlashing d) Smurf attack

6) What does the term “data security” refer to in E-commerce?
a) The use of cookies to track customer behavior
b) The protection of customer data from unauthorized access and breaches
c) The analysis of customer browsing history for personalized recommendations
d) The process of categorizing customer data for marketing purposes

7) Which of the following is a characteristic of E-commerce marketplaces?
a) They only allow B2C transactions
b) They sell physical products exclusively
c) They are limited to a specific geographical area
d) Multiple sellers can list their products to reach a broader audience

8) Which dimension of e-commerce enables commerce beyond the boundaries of the country?
a) Richness b) Interactivity
c) Global Reach d) Ubiquity

9) Which of the following describes the definition of electronic commerce?
a) Doing business
b) Sale and purchase of goods
c) Doing business electronically
d) All of the above mentioned

10) Which e-commerce model involves the sale of goods or services from businesses to the general public?
a) Business to Government b) Business to Consumer
c) Business to Business d) Consumer to Business

11) All of the following are major B2C business models except _____.
a) content provider b) industry consortium
c) transaction broker d) service provider

12) Which of the following advantage of E-commerce?
a) Ability to operate 24/7
b) Inability to personalize the shopping
c) Higher operational cost
d) Limited reach CO1 I

13) Which e-commerce transaction provides the benefits of eliminating the requirement of a middleman?
a) Business to Business b) Business to Government
c) Consumer to Business d) Business to Consumer

14) After completing an E-Commerce transaction, the seller and buyer should be provided an opportunity to _____ their transaction experience.
a) undo b) regret
c) provide rating for d) forget

SLR-BD-68

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve any four of the following. **16**

a) What is electronic commerce? Explain its applications?
b) Describe the web 2.0 in detail.
c) What do you mean by Supply Chain Execution Framework?
d) Discuss in brief virtual auction. Explain the differences between virtual auction and reverse auction.
e) Give the types of E payment methods. Explain in detail the EPS?

Q.3 Solve any two of the following. **12**

a) Define Electronic Data Interchange. What are the components of Electronic Data Interchange?
b) Explain in detail Business to consumer e-Commerce model.
c) What are the key technologies for B2B E-commerce? Explain architectural models of B2B E-commerce.

Section – II

Q.4 Solve any four of the following. **16**

a) What is the purpose of using social media in E-commerce marketing?
b) Explain technical malware attack method related to different services.
c) Explain E-Commerce micro payments in detail.
d) Explain SEO in detail.
e) Explain web advertising types in detail.

Q.5 Solve any two of the following. **12**

a) Define digital cash or e-cash. Explain with example how an online banking system works.
b) What are the different strategies to increase the sale?
c) What are the security challenges and protection measure available to any e business?

SLR-BD-68

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Which type of attack is a method of defeating a cryptographic scheme of trying a large number of possibilities?
a) Teardrop attack b) Brute force attack
c) Phlashing d) Smurf attack

2) What is the another name called PDoS?
a) Brute force attack b) Non technical attack
c) Phlashing d) Smurf attack

3) What does the term "data security" refer to in E-commerce?
a) The use of cookies to track customer behavior
b) The protection of customer data from unauthorized access and breaches
c) The analysis of customer browsing history for personalized recommendations
d) The process of categorizing customer data for marketing purposes

4) Which of the following is a characteristic of E-commerce marketplaces?
a) They only allow B2C transactions
b) They sell physical products exclusively
c) They are limited to a specific geographical area
d) Multiple sellers can list their products to reach a broader audience

5) Which dimension of e-commerce enables commerce beyond the boundaries of the country?
a) Richness b) Interactivity
c) Global Reach d) Ubiquity

6) Which of the following describes the definition of electronic commerce?
a) Doing business
b) Sale and purchase of goods
c) Doing business electronically
d) All of the above mentioned

7) Which e-commerce model involves the sale of goods or services from businesses to the general public?
a) Business to Government b) Business to Consumer
c) Business to Business d) Consumer to Business

8) All of the following are major B2C business models except _____.
a) content provider b) industry consortium
c) transaction broker d) service provider

9) Which of the following advantage of E-commerce?
a) Ability to operate 24/7
b) Inability to personalize the shopping
c) Higher operational cost
d) Limited reach CO1 I

10) Which e-commerce transaction provides the benefits of eliminating the requirement of a middleman?
a) Business to Business b) Business to Government
c) Consumer to Business d) Business to Consumer

11) After completing an E-Commerce transaction, the seller and buyer should be provided an opportunity to _____ their transaction experience.
a) undo b) regret
c) provide rating for d) forget

12) Which of the following is a common digital marketing strategy used in E-commerce?
a) Search Engine Optimization (SEO)
b) Traditional print advertising
c) Cold-calling potential customers
d) Distributing flyers in local neighborhoods

13) Digital Cash has following characteristic _____.
a) Anonymity b) Security
c) Confidentiality d) All above

14) Which component of E-commerce ensures secure online transactions and customer data protection?
a) Payment gateways b) Shopping carts
c) Product catalogs d) Data warehouses

SLR-BD-68

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve any four of the following. **16**

a) What is electronic commerce? Explain its applications?
b) Describe the web 2.0 in detail.
c) What do you mean by Supply Chain Execution Framework?
d) Discuss in brief virtual auction. Explain the differences between virtual auction and reverse auction.
e) Give the types of E payment methods. Explain in detail the EPS?

Q.3 Solve any two of the following. **12**

a) Define Electronic Data Interchange. What are the components of Electronic Data Interchange?
b) Explain in detail Business to consumer e-Commerce model.
c) What are the key technologies for B2B E-commerce? Explain architectural models of B2B E-commerce.

Section – II

Q.4 Solve any four of the following. **16**

a) What is the purpose of using social media in E-commerce marketing?
b) Explain technical malware attack method related to different services.
c) Explain E-Commerce micro payments in detail.
d) Explain SEO in detail.
e) Explain web advertising types in detail.

Q.5 Solve any two of the following. **12**

a) Define digital cash or e-cash. Explain with example how an online banking system works.
b) What are the different strategies to increase the sale?
c) What are the security challenges and protection measure available to any e business?

SLR-BD-68

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which e-commerce transaction provides the benefits of eliminating the requirement of a middleman?
a) Business to Business b) Business to Government
c) Consumer to Business d) Business to Consumer

2) After completing an E-Commerce transaction, the seller and buyer should be provided an opportunity to _____ their transaction experience.
a) undo b) regret
c) provide rating for d) forget

3) Which of the following is a common digital marketing strategy used in E-commerce?
a) Search Engine Optimization (SEO)
b) Traditional print advertising
c) Cold-calling potential customers
d) Distributing flyers in local neighborhoods

4) Digital Cash has following characteristic _____.
a) Anonymity b) Security
c) Confidentiality d) All above

5) Which component of E-commerce ensures secure online transactions and customer data protection?
a) Payment gateways b) Shopping carts
c) Product catalogs d) Data warehouses

6) Which type of attack is a method of defeating a cryptographic scheme of trying a large number of possibilities?
a) Teardrop attack b) Brute force attack
c) Phlashing d) Smurf attack

7) What is the another name called PDoS?
a) Brute force attack b) Non technical attack
c) Phlashing d) Smurf attack

8) What does the term “data security” refer to in E-commerce?
a) The use of cookies to track customer behavior
b) The protection of customer data from unauthorized access and breaches
c) The analysis of customer browsing history for personalized recommendations
d) The process of categorizing customer data for marketing purposes

9) Which of the following is a characteristic of E-commerce marketplaces?
a) They only allow B2C transactions
b) They sell physical products exclusively
c) They are limited to a specific geographical area
d) Multiple sellers can list their products to reach a broader audience

10) Which dimension of e-commerce enables commerce beyond the boundaries of the country?
a) Richness b) Interactivity
c) Global Reach d) Ubiquity

11) Which of the following describes the definition of electronic commerce?
a) Doing business
b) Sale and purchase of goods
c) Doing business electronically
d) All of the above mentioned

12) Which e-commerce model involves the sale of goods or services from businesses to the general public?
a) Business to Government b) Business to Consumer
c) Business to Business d) Consumer to Business

13) All of the following are major B2C business models except _____.
a) content provider b) industry consortium
c) transaction broker d) service provider

14) Which of the following advantage of E-commerce?
a) Ability to operate 24/7
b) Inability to personalize the shopping
c) Higher operational cost
d) Limited reach CO1 I

SLR-BD-68

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve any four of the following. **16**

a) What is electronic commerce? Explain its applications?
b) Describe the web 2.0 in detail.
c) What do you mean by Supply Chain Execution Framework?
d) Discuss in brief virtual auction. Explain the differences between virtual auction and reverse auction.
e) Give the types of E payment methods. Explain in detail the EPS?

Q.3 Solve any two of the following. **12**

a) Define Electronic Data Interchange. What are the components of Electronic Data Interchange?
b) Explain in detail Business to consumer e-Commerce model.
c) What are the key technologies for B2B E-commerce? Explain architectural models of B2B E-commerce.

Section – II

Q.4 Solve any four of the following. **16**

a) What is the purpose of using social media in E-commerce marketing?
b) Explain technical malware attack method related to different services.
c) Explain E-Commerce micro payments in detail.
d) Explain SEO in detail.
e) Explain web advertising types in detail.

Q.5 Solve any two of the following. **12**

a) Define digital cash or e-cash. Explain with example how an online banking system works.
b) What are the different strategies to increase the sale?
c) What are the security challenges and protection measure available to any e business?

SLR-BD-69

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The main focus of the humanities is: _____.
a) Scientific experiments
b) Human culture and expression
c) Market trends and economies
d) Medical advancements

2) Which of the following does not come under the humanities?
a) Philosophy b) Literature
c) Physics d) Art History

3) The main focus of social sciences is on:
a) The physical and natural world
b) Human society and social relationships
c) Ancient artifacts
d) Chemical compositions

4) The study of language structure and its evolution is called: _____.
a) Sociology b) Linguistics
c) Psychology d) Anthropology

5) Identify the key person in philosophy _____.
a) Isaac Newton b) Leonardo da Vinci
c) Aristotle d) Charles Darwin

6) The archaeology focuses on: _____.
a) Economic theories
b) The study of celestial bodies
c) Material remains of past societies
d) Genetic research

7) Which of the following disciplines deals with political systems and governance?

a) Economics b) Political Science
c) Sociology d) Cultural Studies

8) Sociology mainly focuses on: _____.

a) Artistic techniques
b) Social behaviour and societal structures
c) Social economics
d) Historical events

9) Which discipline studies the production, distribution, and consumption of goods and services?

a) Sociology b) Political Science
c) Economics d) History

10) In which ancient civilization did the term "democracy" originate?

a) Ancient Egypt b) Ancient Greece
c) Ancient Rome d) Mesopotamia

11) Identify the primary focus of ethics in philosophy _____.

a) Logic and reasoning b) Moral principles and conduct
c) Aesthetics and beauty d) Scientific discovery

12) Feminism primarily addresses issues related to: _____.

a) Economic inequality
b) Gender equality and women's rights
c) Political ideologies
d) Technological advancements

13) What is the fundamental problem of economics?

a) Production of goods b) Scarcity of resources
c) Inflation d) Trade barriers

14) Dr. Sigmund Freud is best known for his contributions to: _____.

a) Political science b) Psychoanalysis
c) Economic theory d) Structural linguistics

SLR-BD-69

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **12**

a) Explain the interdisciplinary nature of disciplines under humanities and social sciences.
b) Write a short note on: Scope of humanities.
c) Explain how perceptual processes shape human behaviour.
d) Write a short note on: Different aspects of perception.
e) Write a short note on: Major philosophical movements and their impact.

Q.3 Attempt any Two. **16**

a) Explain the advantages and disadvantages of democracy.
b) Explain major theories of psychology.
c) Explain how different psychological aspects affect social communication.

Section – II

Q.4 Attempt any Three. **12**

a) Write a short note on: Social Institutions.
b) Explain different elements of culture and society.
c) Write a short note on: Contributions of ancient civilizations to modern society.
d) How did industrial revolution contribute to technical advancements?
e) Write a short note on: Ethics in Engineering.

Q.5 Attempt any Two. **16**

a) What is industrialization? Explain the social and economic consequences of industrialization.
b) Describe different economic theories and thinkers.
c) Explain the technological innovations in 18^{th} & 19^{th} century.

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Sociology mainly focuses on: _____.
a) Artistic techniques
b) Social behaviour and societal structures
c) Social economics
d) Historical events

2) Which discipline studies the production, distribution, and consumption of goods and services?
a) Sociology b) Political Science
c) Economics d) History

3) In which ancient civilization did the term "democracy" originate?
a) Ancient Egypt b) Ancient Greece
c) Ancient Rome d) Mesopotamia

4) Identify the primary focus of ethics in philosophy _____.
a) Logic and reasoning b) Moral principles and conduct
c) Aesthetics and beauty d) Scientific discovery

5) Feminism primarily addresses issues related to: _____.
a) Economic inequality
b) Gender equality and women's rights
c) Political ideologies
d) Technological advancements

6) What is the fundamental problem of economics?
a) Production of goods b) Scarcity of resources
c) Inflation d) Trade barriers

7) Dr. Sigmund Freud is best known for his contributions to: _____.
a) Political science b) Psychoanalysis
c) Economic theory d) Structural linguistics

8) The main focus of the humanities is: _____.
a) Scientific experiments
b) Human culture and expression
c) Market trends and economies
d) Medical advancements

9) Which of the following does not come under the humanities?
a) Philosophy b) Literature
c) Physics d) Art History

10) The main focus of social sciences is on:
a) The physical and natural world
b) Human society and social relationships
c) Ancient artifacts
d) Chemical compositions

11) The study of language structure and its evolution is called: _____.
a) Sociology b) Linguistics
c) Psychology d) Anthropology

12) Identify the key person in philosophy _____.
a) Isaac Newton b) Leonardo da Vinci
c) Aristotle d) Charles Darwin

13) The archaeology focuses on: _____.
a) Economic theories
b) The study of celestial bodies
c) Material remains of past societies
d) Genetic research

14) Which of the following disciplines deals with political systems and governance?
a) Economics b) Political Science
c) Sociology d) Cultural Studies

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **12**

a) Explain the interdisciplinary nature of disciplines under humanities and social sciences.
b) Write a short note on: Scope of humanities.
c) Explain how perceptual processes shape human behaviour.
d) Write a short note on: Different aspects of perception.
e) Write a short note on: Major philosophical movements and their impact.

Q.3 Attempt any Two. **16**

a) Explain the advantages and disadvantages of democracy.
b) Explain major theories of psychology.
c) Explain how different psychological aspects affect social communication.

Section – II

Q.4 Attempt any Three. **12**

a) Write a short note on: Social Institutions.
b) Explain different elements of culture and society.
c) Write a short note on: Contributions of ancient civilizations to modern society.
d) How did industrial revolution contribute to technical advancements?
e) Write a short note on: Ethics in Engineering.

Q.5 Attempt any Two. **16**

a) What is industrialization? Explain the social and economic consequences of industrialization.
b) Describe different economic theories and thinkers.
c) Explain the technological innovations in 18^{th} & 19^{th} century.

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Identify the primary focus of ethics in philosophy _____.
a) Logic and reasoning b) Moral principles and conduct
c) Aesthetics and beauty d) Scientific discovery

2) Feminism primarily addresses issues related to: _____.
a) Economic inequality
b) Gender equality and women's rights
c) Political ideologies
d) Technological advancements

3) What is the fundamental problem of economics?
a) Production of goods b) Scarcity of resources
c) Inflation d) Trade barriers

4) Dr. Sigmund Freud is best known for his contributions to: _____.
a) Political science b) Psychoanalysis
c) Economic theory d) Structural linguistics

5) The main focus of the humanities is: _____.
a) Scientific experiments
b) Human culture and expression
c) Market trends and economies
d) Medical advancements

6) Which of the following does not come under the humanities?
a) Philosophy b) Literature
c) Physics d) Art History

7) The main focus of social sciences is on:
a) The physical and natural world
b) Human society and social relationships
c) Ancient artifacts
d) Chemical compositions

8) The study of language structure and its evolution is called: _____.
a) Sociology b) Linguistics
c) Psychology d) Anthropology

9) Identify the key person in philosophy _____.
a) Isaac Newton b) Leonardo da Vinci
c) Aristotle d) Charles Darwin

10) The archaeology focuses on: _____.
a) Economic theories
b) The study of celestial bodies
c) Material remains of past societies
d) Genetic research

11) Which of the following disciplines deals with political systems and governance?
a) Economics b) Political Science
c) Sociology d) Cultural Studies

12) Sociology mainly focuses on: _____.
a) Artistic techniques
b) Social behaviour and societal structures
c) Social economics
d) Historical events

13) Which discipline studies the production, distribution, and consumption of goods and services?
a) Sociology b) Political Science
c) Economics d) History

14) In which ancient civilization did the term "democracy" originate?
a) Ancient Egypt b) Ancient Greece
c) Ancient Rome d) Mesopotamia

SLR-BD-69

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **12**

a) Explain the interdisciplinary nature of disciplines under humanities and social sciences.
b) Write a short note on: Scope of humanities.
c) Explain how perceptual processes shape human behaviour.
d) Write a short note on: Different aspects of perception.
e) Write a short note on: Major philosophical movements and their impact.

Q.3 Attempt any Two. **16**

a) Explain the advantages and disadvantages of democracy.
b) Explain major theories of psychology.
c) Explain how different psychological aspects affect social communication.

Section – II

Q.4 Attempt any Three. **12**

a) Write a short note on: Social Institutions.
b) Explain different elements of culture and society.
c) Write a short note on: Contributions of ancient civilizations to modern society.
d) How did industrial revolution contribute to technical advancements?
e) Write a short note on: Ethics in Engineering.

Q.5 Attempt any Two. **16**

a) What is industrialization? Explain the social and economic consequences of industrialization.
b) Describe different economic theories and thinkers.
c) Explain the technological innovations in 18^{th} & 19^{th} century.

SLR-BD-69

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The archaeology focuses on: _____.

a) Economic theories
b) The study of celestial bodies
c) Material remains of past societies
d) Genetic research

2) Which of the following disciplines deals with political systems and governance?

a) Economics b) Political Science
c) Sociology d) Cultural Studies

3) Sociology mainly focuses on: _____.

a) Artistic techniques
b) Social behaviour and societal structures
c) Social economics
d) Historical events

4) Which discipline studies the production, distribution, and consumption of goods and services?

a) Sociology b) Political Science
c) Economics d) History

5) In which ancient civilization did the term "democracy" originate?

a) Ancient Egypt b) Ancient Greece
c) Ancient Rome d) Mesopotamia

6) Identify the primary focus of ethics in philosophy _____.

a) Logic and reasoning b) Moral principles and conduct
c) Aesthetics and beauty d) Scientific discovery

7) Feminism primarily addresses issues related to: _____.
a) Economic inequality
b) Gender equality and women's rights
c) Political ideologies
d) Technological advancements

8) What is the fundamental problem of economics?
a) Production of goods
b) Scarcity of resources
c) Inflation
d) Trade barriers

9) Dr. Sigmund Freud is best known for his contributions to: _____.
a) Political science
b) Psychoanalysis
c) Economic theory
d) Structural linguistics

10) The main focus of the humanities is: _____.
a) Scientific experiments
b) Human culture and expression
c) Market trends and economies
d) Medical advancements

11) Which of the following does not come under the humanities?
a) Philosophy
b) Literature
c) Physics
d) Art History

12) The main focus of social sciences is on:
a) The physical and natural world
b) Human society and social relationships
c) Ancient artifacts
d) Chemical compositions

13) The study of language structure and its evolution is called: _____.
a) Sociology
b) Linguistics
c) Psychology
d) Anthropology

14) Identify the key person in philosophy _____.
a) Isaac Newton
b) Leonardo da Vinci
c) Aristotle
d) Charles Darwin

SLR-BD-69

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **12**

a) Explain the interdisciplinary nature of disciplines under humanities and social sciences.
b) Write a short note on: Scope of humanities.
c) Explain how perceptual processes shape human behaviour.
d) Write a short note on: Different aspects of perception.
e) Write a short note on: Major philosophical movements and their impact.

Q.3 Attempt any Two. **16**

a) Explain the advantages and disadvantages of democracy.
b) Explain major theories of psychology.
c) Explain how different psychological aspects affect social communication.

Section – II

Q.4 Attempt any Three. **12**

a) Write a short note on: Social Institutions.
b) Explain different elements of culture and society.
c) Write a short note on: Contributions of ancient civilizations to modern society.
d) How did industrial revolution contribute to technical advancements?
e) Write a short note on: Ethics in Engineering.

Q.5 Attempt any Two. **16**

a) What is industrialization? Explain the social and economic consequences of industrialization.
b) Describe different economic theories and thinkers.
c) Explain the technological innovations in 18^{th} & 19^{th} century.

SLR-BD-70

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ is defined as "the discipline dealing with what is good & bad & with moral duty & obligation".
a) Rule b) Organisation culture
c) Protocol d) Ethics

2) _____ involves establishing the amount of work to be done & the time when each element of the work will start.
a) Planning b) Routing
c) Scheduling d) Organizing

3) In _____ concept product enjoys the supreme importance.
a) Selling b) Marketing
c) Manufacturing d) Business

4) _____ are the greatest importance at the supervisory level.
a) Supervisory skills b) Human relation skills
c) Technical skills d) Planning skills

5) The responsibilities of the operations manager include _____.
a) Planning , organizing , staffing , procuring , and reviewing
b) Forecasting , designing , planning , organizing , and controlling
c) Forecasting , designing , operating , procuring , and reviewing
d) Planning , organizing , staffing , leading , and controlling
e) Designing & operating

6) Self-esteem, status affiliation with others, affection those come under _____ needs.
a) Basic b) Primary
c) Third level of d) Secondary

7) _____ is ability of individual or group to induce or influence the beliefs or action of other person or group.

a) Power b) Authority
c) Post d) Leadership

8) The basic objective of quality control in any organization is to _____.

a) Quality development, quality maintenance and quality improvement activities in organization
b) Achieve optimum cost
c) Achieve customer's satisfaction
d) Achieve all the above

9) Cost associated with defective products being shipped to the customers are called as _____.

a) Cost of internal failure b) Total cost of failure
c) Rejection cost d) Cost of external failure

10) For identification of vital few for the given data, the tool used is _____.

a) Cause-Effect diagram b) Scatter diagram
c) Pareto Analysis d) Check Sheet

11) Total quality management (TQM) mainly aims for _____.

a) Control for quality b) Usefulness of product
c) Customer satisfaction d) Cost control

12) The statistician who invented the control chart for use in industrial quality control was: _____.

a) Deming b) Taguchi
c) Pareto d) Shewhart
e) None of the above

13) The method of accepting or rejecting the lot is known as _____.

a) Lot sampling b) Acceptance sampling
c) Batch sampling d) Quality control

14) In double sampling plan, second sample is taken when the number of defectives _____.

a) > C1 but < C2 b) > C1
c) > C1 and C2 d) < C2

SLR-BD-70

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2	**a)**	Explain the Social responsibilities and ethics in management.	**07**
	b)	Explain decision making process with types of decision.	**07**
Q.3	**a)**	What is planning process? Explain steps in planning.	**07**
	b)	What is leadership? Explain any four styles.	**07**
Q.4	**a)**	Explain communication and Various types of communications.	**07**
	b)	What is motivation? Explain Maslow's theory of motivation.	**07**

Section – II

Q.5	**a)**	Define quality and state the Steps in quality control.	**07**
	b)	Explain Benchmarking with advantages and disadvantages.	**07**
Q.6	**a)**	Explain Deming Wheel with suitable example.	**07**
	b)	Explain the following as applied to quality control: 1) Appraisal costs 2) Prevention costs 3) Failure costs 4) Optimum costs	**07**

Q.7 **a)** In a manufacturing process the number of defectives found in the inspection of 20 lots of 100 samples is given below. **07**

1) Determine the control limit of P chart and state whether the process is in control or not.
2) Determine the new value of mean fraction defective if some points are out of control. Compute the corresponding control limits and state whether the process is still in control or not.

Lot No.	No. of defectives	Lot No.	No. of Defectives
1	5	11	7
2	4	12	6
3	3	13	3
4	5	14	5
5	4	15	4
6	6	16	2
7	9	17	8
8	15	18	7
9	11	19	6
10	6	20	4

b) Differentiate between single sampling plan & double sampling plan. **07**

SLR-BD-70

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) The basic objective of quality control in any organization is to _____.
a) Quality development, quality maintenance and quality improvement activities in organization
b) Achieve optimum cost
c) Achieve customer's satisfaction
d) Achieve all the above

2) Cost associated with defective products being shipped to the customers are called as _____.
a) Cost of internal failure b) Total cost of failure
c) Rejection cost d) Cost of external failure

3) For identification of vital few for the given data, the tool used is _____.
a) Cause-Effect diagram b) Scatter diagram
c) Pareto Analysis d) Check Sheet

4) Total quality management (TQM) mainly aims for _____.
a) Control for quality b) Usefulness of product
c) Customer satisfaction d) Cost control

5) The statistician who invented the control chart for use in industrial quality control was: _____.
a) Deming b) Taguchi
c) Pareto d) Shewhart
e) None of the above

6) The method of accepting or rejecting the lot is known as _____.
a) Lot sampling b) Acceptance sampling
c) Batch sampling d) Quality control

7) In double sampling plan, second sample is taken when the number of defectives _____.

a) > C1 but < C2 b) > C1
c) > C1 and C2 d) < C2

8) _____ is defined as “the discipline dealing with what is good & bad & with moral duty & obligation”.

a) Rule b) Organisation culture
c) Protocol d) Ethics

9) _____ involves establishing the amount of work to be done & the time when each element of the work will start.

a) Planning b) Routing
c) Scheduling d) Organizing

10) In _____ concept product enjoys the supreme importance.

a) Selling b) Marketing
c) Manufacturing d) Business

11) _____ are the greatest importance at the supervisory level.

a) Supervisory skills b) Human relation skills
c) Technical skills d) Planning skills

12) The responsibilities of the operations manager include _____.

a) Planning , organizing , staffing , procuring , and reviewing
b) Forecasting , designing , planning , organizing , and controlling
c) Forecasting , designing , operating , procuring , and reviewing
d) Planning , organizing , staffing , leading , and controlling
e) Designing & operating

13) Self-esteem, status affiliation with others, affection those come under _____ needs.

a) Basic b) Primary
c) Third level of d) Secondary

14) _____ is ability of individual or group to induce or influence the beliefs or action of other person or group.

a) Power b) Authority
c) Post d) Leadership

SLR-BD-70

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2	**a)**	Explain the Social responsibilities and ethics in management.	**07**
	b)	Explain decision making process with types of decision.	**07**
Q.3	**a)**	What is planning process? Explain steps in planning.	**07**
	b)	What is leadership? Explain any four styles.	**07**
Q.4	**a)**	Explain communication and Various types of communications.	**07**
	b)	What is motivation? Explain Maslow's theory of motivation.	**07**

Section – II

Q.5	**a)**	Define quality and state the Steps in quality control.	**07**
	b)	Explain Benchmarking with advantages and disadvantages.	**07**
Q.6	**a)**	Explain Deming Wheel with suitable example.	**07**
	b)	Explain the following as applied to quality control: 1) Appraisal costs 2) Prevention costs 3) Failure costs 4) Optimum costs	**07**

Q.7 **a)** In a manufacturing process the number of defectives found in the inspection of 20 lots of 100 samples is given below. **07**

1) Determine the control limit of P chart and state whether the process is in control or not.
2) Determine the new value of mean fraction defective if some points are out of control. Compute the corresponding control limits and state whether the process is still in control or not.

Lot No.	No. of defectives	Lot No.	No. of Defectives
1	5	11	7
2	4	12	6
3	3	13	3
4	5	14	5
5	4	15	4
6	6	16	2
7	9	17	8
8	15	18	7
9	11	19	6
10	6	20	4

b) Differentiate between single sampling plan & double sampling plan. **07**

SLR-BD-70

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Total quality management (TQM) mainly aims for _____.
a) Control for quality b) Usefulness of product
c) Customer satisfaction d) Cost control

2) The statistician who invented the control chart for use in industrial quality control was: _____.
a) Deming b) Taguchi
c) Pareto d) Shewhart
e) None of the above

3) The method of accepting or rejecting the lot is known as _____.
a) Lot sampling b) Acceptance sampling
c) Batch sampling d) Quality control

4) In double sampling plan, second sample is taken when the number of defectives _____.
a) > C1 but < C2 b) > C1
c) > C1 and C2 d) < C2

5) _____ is defined as "the discipline dealing with what is good & bad & with moral duty & obligation".
a) Rule b) Organisation culture
c) Protocol d) Ethics

6) _____ involves establishing the amount of work to be done & the time when each element of the work will start.
a) Planning b) Routing
c) Scheduling d) Organizing

7) In _____ concept product enjoys the supreme importance.
a) Selling b) Marketing
c) Manufacturing d) Business

8) _____ are the greatest importance at the supervisory level.
a) Supervisory skills b) Human relation skills
c) Technical skills d) Planning skills

9) The responsibilities of the operations manager include _____.
a) Planning , organizing , staffing , procuring , and reviewing
b) Forecasting , designing , planning , organizing , and controlling
c) Forecasting , designing , operating , procuring , and reviewing
d) Planning , organizing , staffing , leading , and controlling
e) Designing & operating

10) Self-esteem, status affiliation with others, affection those come under _____ needs.
a) Basic b) Primary
c) Third level of d) Secondary

11) _____ is ability of individual or group to induce or influence the beliefs or action of other person or group.
a) Power b) Authority
c) Post d) Leadership

12) The basic objective of quality control in any organization is to _____.
a) Quality development, quality maintenance and quality improvement activities in organization
b) Achieve optimum cost
c) Achieve customer's satisfaction
d) Achieve all the above

13) Cost associated with defective products being shipped to the customers are called as _____.
a) Cost of internal failure b) Total cost of failure
c) Rejection cost d) Cost of external failure

14) For identification of vital few for the given data, the tool used is _____.
a) Cause-Effect diagram b) Scatter diagram
c) Pareto Analysis d) Check Sheet

SLR-BD-70

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2	**a)**	Explain the Social responsibilities and ethics in management.	**07**
	b)	Explain decision making process with types of decision.	**07**
Q.3	**a)**	What is planning process? Explain steps in planning.	**07**
	b)	What is leadership? Explain any four styles.	**07**
Q.4	**a)**	Explain communication and Various types of communications.	**07**
	b)	What is motivation? Explain Maslow's theory of motivation.	**07**

Section – II

Q.5	**a)**	Define quality and state the Steps in quality control.	**07**
	b)	Explain Benchmarking with advantages and disadvantages.	**07**
Q.6	**a)**	Explain Deming Wheel with suitable example.	**07**
	b)	Explain the following as applied to quality control: 1) Appraisal costs 2) Prevention costs 3) Failure costs 4) Optimum costs	**07**

Q.7 **a)** In a manufacturing process the number of defectives found in the inspection of 20 lots of 100 samples is given below. **07**

1) Determine the control limit of P chart and state whether the process is in control or not.
2) Determine the new value of mean fraction defective if some points are out of control. Compute the corresponding control limits and state whether the process is still in control or not.

Lot No.	No. of defectives	Lot No.	No. of Defectives
1	5	11	7
2	4	12	6
3	3	13	3
4	5	14	5
5	4	15	4
6	6	16	2
7	9	17	8
8	15	18	7
9	11	19	6
10	6	20	4

b) Differentiate between single sampling plan & double sampling plan. **07**

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Self-esteem, status affiliation with others, affection those come under _____ needs.
a) Basic b) Primary
c) Third level of d) Secondary

2) _____ is ability of individual or group to induce or influence the beliefs or action of other person or group.
a) Power b) Authority
c) Post d) Leadership

3) The basic objective of quality control in any organization is to _____.
a) Quality development, quality maintenance and quality improvement activities in organization
b) Achieve optimum cost
c) Achieve customer's satisfaction
d) Achieve all the above

4) Cost associated with defective products being shipped to the customers are called as _____.
a) Cost of internal failure b) Total cost of failure
c) Rejection cost d) Cost of external failure

5) For identification of vital few for the given data, the tool used is _____.
a) Cause-Effect diagram b) Scatter diagram
c) Pareto Analysis d) Check Sheet

6) Total quality management (TQM) mainly aims for _____.
a) Control for quality b) Usefulness of product
c) Customer satisfaction d) Cost control

7) The statistician who invented the control chart for use in industrial quality control was: _____.

a) Deming b) Taguchi
c) Pareto d) Shewhart
e) None of the above

8) The method of accepting or rejecting the lot is known as _____.

a) Lot sampling b) Acceptance sampling
c) Batch sampling d) Quality control

9) In double sampling plan, second sample is taken when the number of defectives _____.

a) > C1 but < C2 b) > C1
c) > C1 and C2 d) < C2

10) _____ is defined as “the discipline dealing with what is good & bad & with moral duty & obligation”.

a) Rule b) Organisation culture
c) Protocol d) Ethics

11) _____ involves establishing the amount of work to be done & the time when each element of the work will start.

a) Planning b) Routing
c) Scheduling d) Organizing

12) In _____ concept product enjoys the supreme importance.

a) Selling b) Marketing
c) Manufacturing d) Business

13) _____ are the greatest importance at the supervisory level.

a) Supervisory skills b) Human relation skills
c) Technical skills d) Planning skills

14) The responsibilities of the operations manager include _____.

a) Planning , organizing , staffing , procuring , and reviewing
b) Forecasting , designing , planning , organizing , and controlling
c) Forecasting , designing , operating , procuring , and reviewing
d) Planning , organizing , staffing , leading , and controlling
e) Designing & operating

SLR-BD-70

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2	**a)**	Explain the Social responsibilities and ethics in management.	**07**
	b)	Explain decision making process with types of decision.	**07**
Q.3	**a)**	What is planning process? Explain steps in planning.	**07**
	b)	What is leadership? Explain any four styles.	**07**
Q.4	**a)**	Explain communication and Various types of communications.	**07**
	b)	What is motivation? Explain Maslow's theory of motivation.	**07**

Section – II

Q.5	**a)**	Define quality and state the Steps in quality control.	**07**
	b)	Explain Benchmarking with advantages and disadvantages.	**07**
Q.6	**a)**	Explain Deming Wheel with suitable example.	**07**
	b)	Explain the following as applied to quality control: 1) Appraisal costs 2) Prevention costs 3) Failure costs 4) Optimum costs	**07**

Q.7 **a)** In a manufacturing process the number of defectives found in the inspection of 20 lots of 100 samples is given below. **07**

1) Determine the control limit of P chart and state whether the process is in control or not.
2) Determine the new value of mean fraction defective if some points are out of control. Compute the corresponding control limits and state whether the process is still in control or not.

Lot No.	No. of defectives	Lot No.	No. of Defectives
1	5	11	7
2	4	12	6
3	3	13	3
4	5	14	5
5	4	15	4
6	6	16	2
7	9	17	8
8	15	18	7
9	11	19	6
10	6	20	4

b) Differentiate between single sampling plan & double sampling plan. **07**

SLR-BD-71

Seat No.	

Set P

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Laplace transform of $\int_0^t u^3 du =$_____.

a) $\frac{3}{s^5}$ b) $\frac{6}{s^5}$

c) $\frac{1}{s^5}$ d) $\frac{6}{s^4}$

2) If $L\{f(t)\} = \emptyset(s)$, then $L\{f(at)\} =$ _____.

a) $\emptyset\left(\frac{s}{a}\right)$ b) $\frac{1}{s}\emptyset\left(\frac{s}{a}\right)$

c) $\emptyset'\left(\frac{s}{a}\right)$ d) $\frac{1}{a}\emptyset\left(\frac{s}{a}\right)$

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

a) $\frac{1}{3}\sin 3t$ b) $\frac{1}{3}\cos 3t$

c) $\frac{1}{3}\cosh 3t$ d) $\frac{1}{3}\sinh 3t$

4) For $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 3y = 3e^{2x}$, the particular integral is _____.

a) $\frac{1}{15}e^{2x}$ b) $3e^{2x}$

c) $\frac{1}{5}e^{2x}$ d) $C_1e^{-x} + C_2e^{-2x}$

5) The general solution of the equation $(D^3 - 7D - 6)y = 0$ is _____.

a) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{-3x}$

b) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{3x}$

c) $y = c_1e^{-x} + c_2e^{-2x} + c_3e^{-3x}$

d) None of these

6) $z\{k\} =$_____ for $|z| > 1$

a) $\frac{z}{z-1}$ b) $\frac{1}{(z-1)^2}$

c) $\frac{z}{(z-1)^2}$ d) $\frac{z}{(z+1)^2}$

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

a) $f\left(\frac{a}{z}\right)$ b) $f\left(\frac{z}{a}\right)$

c) $\frac{1}{a}f\left(\frac{z}{a}\right)$ d) None

8) $Z\left\{\frac{1}{k!}\right\} =?$ for $k \geq 0$

a) e^z b) $e^{\frac{1}{z}}$

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

9) The Fourier sine transform of $f(x)$ is given by _____.

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

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

10) From the result $\int_{-\infty}^{\infty} \frac{\cos sx.\sin sk}{s} ds = \begin{cases} \pi & , \ |x| < k \\ 0 & , \ |x| > k \end{cases}$ we can deduce that $\int_0^{\infty} \frac{\sin sk}{s}\, ds =$ _____.

a) 0 b) 1

c) π d) $\frac{\pi}{2}$

11) The first real positive root of $x^3 = 6x - 4$ by Newton Raphson method near $x_0 = 1$ is _____.

a) 0.6667 b) 0.6

c) 0.4 d) 0.3

12) How many steps does the fourth-order Runge-Kutta method use?

a) Two steps b) Five steps

c) Four steps d) Three steps

13) In the interval $(0, a)$ the constant term in the Fourier series of $f(x) = \frac{a}{2} - x$ is _____.

a) 0 b) 1

c) $\frac{a^2}{2\pi}$ d) $\frac{a^2}{4\pi}$

14) Fourier series of $f(x) = x\ in(-\pi, \pi)$ will contain ____

a) No sine term b) No cosine term

c) Both cosine and sine term d) None of these

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any three **09**

a) Solve : $(D^2 + 4D + 5)y = -2\cos hx + 2^x$

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

c) Find Z-transform of $x_k = 2^k \cos(3k + 2)\,, k \geq 0$

d) Find Z-transform of $x_k = k^2 e^{-ak}, k \geq 0$

e) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{1}{s(s^2+4)}\right]$

Q.3 Attempt any three of the following. **09**

a) Evaluate by using Laplace transform $\int_0^\infty \left(\frac{e^{-t}-e^{-3t}}{t}\right) dt$

b) Find the inverse Z-transform of $f(k) = \begin{cases} 4^k, & k < 0 \\ 3^k, & k \geq 0 \end{cases}$

c) Find $Z\{e^{-3k}\sin 2k\}, k \geq 0$

d) Solve $(D^2 - 1)y = (1 + e^{-x})^2$

e) Find Laplace Transform of $\{t\cos 2t\}$

Q.4 Attempt any two **10**

a) Find the inverse Z-transform of $\frac{1}{(z-a)^2}$ if

1) $|z| < a$,
2) $|z| > a$,

b) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$

c) Solve $(D^2 - 6D + 13)y = e^{x\log 2} + 8e^{3x}\sin 4x$

Section – II

Q.5 Attempt any three **09**

a) Evaluate $\int_0^5 \frac{1}{4x+5} dx$ using $n = 5$ by Trapezoidal rule.

b) Evaluate $I = \int_0^2 e^{-x} dx$ by using the Simpson's 1/3rd rule given h= 0.5

c) Obtain half range cosine series $f(x) = x$ in $0 < x < 1$

d) Find the Fourier series expansion of $f(x) = x^2$ in $(-\pi, \pi)$

e) Find the Fourier transform of $f(x) = \begin{cases} \frac{1}{2\epsilon}, & |x| \leq \epsilon \\ 0, & |x| > \epsilon \end{cases}$

Q.6 Attempt any three **09**

a) Find f(x) if its Fourier sine transform e^{-as}

b) Find the Fourier cosine transform of

$f(x)$, if $f(x) = \begin{cases} 1, & 0 \leq x < 1 \\ 0, & x \geq 1 \end{cases}$

c) Find the Fourier series expansion of $f(x) = x$ in $(-\pi, \pi)$

d) Solve by Newton Raphson method $x^4 - x = 10$ correct to four decimal places. (perform two iterations only)

e) Find $\int_0^6 \frac{1}{1+x^2} dx \; n = 6$ using Simpson's 3/8th rule.

Q.7 Attempt any two. **10**

a) Find $\int_1^8 \frac{1}{1+x} dx \; h = 1$ by using Trapezoidal rule and Simpson's 1/3rd rule.

b) Find Fourier transform of

$f(x) = 1 \; |x| < k$

$= 0 \; |x| > k$ and

Hence evaluate i) $\int_{-\infty}^{\infty} \frac{\sin sk . \cos sk}{s} ds$ ii) $\int_{-\infty}^{\infty} \frac{\sin ks}{s} ds$

c) Find the Fourier series expansion of the function $f(x) = e^{-\alpha x}$ in $(0, 2\pi)$

SLR-BD-71

Seat No.	

Set Q

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) $Z\left\{\frac{1}{k!}\right\} = ?$ for $k \geq 0$

a) e^z b) $e^{\frac{1}{z}}$

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

2) The Fourier sine transform of $f(x)$ is given by _____.

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

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

3) From the result $\int_{-\infty}^{\infty}\frac{\cos sx.\sin sk}{s}ds = \begin{cases}\pi & , \ |x| < k \\ 0 & , \ |x| > k\end{cases}$ we can deduce that $\int_0^{\infty}\frac{\sin sk}{s}\, ds =$ _____.

a) 0 b) 1

c) π d) $\frac{\pi}{2}$

4) The first real positive root of $x^3 = 6x - 4$ by Newton Raphson method near $x_0 = 1$ is _____.

a) 0.6667 b) 0.6

c) 0.4 d) 0.3

5) How many steps does the fourth-order Runge-Kutta method use?

a) Two steps b) Five steps

c) Four steps d) Three steps

6) In the interval $(0, a)$ the constant term in the Fourier series of $f(x) = \frac{a}{2} - x$ is _____.

a) 0 b) 1

c) $\frac{a^2}{2\pi}$ d) $\frac{a^2}{4\pi}$

7) Fourier series of $f(x) = x\ in(-\pi, \pi)$ will contain _____

a) No sine term b) No cosine term

c) Both cosine and sine term d) None of these

8) Laplace transform of $\int_0^t u^3 du =$_____.

a) $\frac{3}{s^5}$ b) $\frac{6}{s^5}$

c) $\frac{1}{s^5}$ d) $\frac{6}{s^4}$

9) If $L\{f(t)\} = \emptyset(s)$, then $L\{f(at)\} =$ _____.

a) $\emptyset\left(\frac{s}{a}\right)$ b) $\frac{1}{s}\emptyset\left(\frac{s}{a}\right)$

c) $\emptyset'\left(\frac{s}{a}\right)$ d) $\frac{1}{a}\emptyset\left(\frac{s}{a}\right)$

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

a) $\frac{1}{3}\sin 3t$ b) $\frac{1}{3}\cos 3t$

c) $\frac{1}{3}\cosh 3t$ d) $\frac{1}{3}\sinh 3t$

11) For $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 3y = 3e^{2x}$, the particular integral is _____.

a) $\frac{1}{15}e^{2x}$ b) $3e^{2x}$

c) $\frac{1}{5}e^{2x}$ d) $C_1e^{-x} + C_2e^{-2x}$

12) The general solution of the equation $(D^3 - 7D - 6)y = 0$ is _____.

a) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{-3x}$

b) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{3x}$

c) $y = c_1e^{-x} + c_2e^{-2x} + c_3e^{-3x}$

d) None of these

13) $z\{k\} =$_____ for $|z| > 1$

a) $\frac{z}{z-1}$ b) $\frac{1}{(z-1)^2}$

c) $\frac{z}{(z-1)^2}$ d) $\frac{z}{(z+1)^2}$

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

a) $f\left(\frac{a}{z}\right)$ b) $f\left(\frac{z}{a}\right)$

c) $\frac{1}{a} f\left(\frac{z}{a}\right)$ d) None

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any three **09**

a) Solve : $(D^2 + 4D + 5)y = -2\cos hx + 2^x$

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

c) Find Z-transform of $x_k = 2^k \cos(3k + 2)\,, k \geq 0$

d) Find Z-transform of $x_k = k^2 e^{-ak}, k \geq 0$

e) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{1}{s(s^2+4)}\right]$

Q.3 Attempt any three of the following. **09**

a) Evaluate by using Laplace transform $\int_0^\infty \left(\frac{e^{-t}-e^{-3t}}{t}\right) dt$

b) Find the inverse Z-transform of $f(k) = \begin{cases} 4^k, & k < 0 \\ 3^k, & k \geq 0 \end{cases}$

c) Find $Z\{e^{-3k}\sin 2k\}, k \geq 0$

d) Solve $(D^2 - 1)y = (1 + e^{-x})^2$

e) Find Laplace Transform of $\{t\cos 2t\}$

Q.4 Attempt any two **10**

a) Find the inverse Z-transform of $\frac{1}{(z-a)^2}$ if

1) $|z| < a$,
2) $|z| > a$,

b) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$

c) Solve $(D^2 - 6D + 13)y = e^{x\log 2} + 8e^{3x}\sin 4x$

Section – II

Q.5 Attempt any three **09**

a) Evaluate $\int_0^5 \frac{1}{4x+5} dx$ using $n = 5$ by Trapezoidal rule.

b) Evaluate $I = \int_0^2 e^{-x} dx$ by using the Simpson's 1/3rd rule given h= 0.5

c) Obtain half range cosine series $f(x) = x$ in $0 < x < 1$

d) Find the Fourier series expansion of $f(x) = x^2$ in $(-\pi, \pi)$

e) Find the Fourier transform of $f(x) = \begin{cases} \frac{1}{2\epsilon}, & |x| \leq \epsilon \\ 0, & |x| > \epsilon \end{cases}$

Q.6 Attempt any three **09**

a) Find f(x) if its Fourier sine transform e^{-as}

b) Find the Fourier cosine transform of

$f(x)$, if $f(x) = \begin{cases} 1, & 0 \leq x < 1 \\ 0, & x \geq 1 \end{cases}$

c) Find the Fourier series expansion of $f(x) = x$ in $(-\pi, \pi)$

d) Solve by Newton Raphson method $x^4 - x = 10$ correct to four decimal places. (perform two iterations only)

e) Find $\int_0^6 \frac{1}{1+x^2} dx \; n = 6$ using Simpson's 3/8th rule.

Q.7 Attempt any two. **10**

a) Find $\int_1^8 \frac{1}{1+x} dx \; h = 1$ by using Trapezoidal rule and Simpson's 1/3rd rule.

b) Find Fourier transform of

$f(x) = 1 \; |x| < k$

$= 0 \; |x| > k$ and

Hence evaluate i) $\int_{-\infty}^{\infty} \frac{\sin sk . \cos sk}{s} ds$ ii) $\int_{-\infty}^{\infty} \frac{\sin ks}{s} ds$

c) Find the Fourier series expansion of the function $f(x) = e^{-\alpha x}$ in $(0, 2\pi)$

Seat No.	

Set R

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) The first real positive root of $x^3 = 6x - 4$ by Newton Raphson method near $x_0 = 1$ is _____.

a) 0.6667 b) 0.6
c) 0.4 d) 0.3

2) How many steps does the fourth-order Runge-Kutta method use?

a) Two steps b) Five steps
c) Four steps d) Three steps

3) In the interval $(0, a)$ the constant term in the Fourier series of $f(x) = \frac{a}{2} - x$ is _____.

a) 0 b) 1
c) $\frac{a^2}{2\pi}$ d) $\frac{a^2}{4\pi}$

4) Fourier series of $f(x) = x\ in(-\pi, \pi)$ will contain ____

a) No sine term b) No cosine term
c) Both cosine and sine term d) None of these

5) Laplace transform of $\int_0^t u^3 du$ =_____.

a) $\frac{3}{s^5}$ b) $\frac{6}{s^5}$
c) $\frac{1}{s^5}$ d) $\frac{6}{s^4}$

6) If $L\{f(t)\} = \emptyset(s)$, then $L\{f(at)\} =$ _____.

a) $\emptyset\left(\frac{s}{a}\right)$ b) $\frac{1}{s}\emptyset\left(\frac{s}{a}\right)$

c) $\emptyset'\left(\frac{s}{a}\right)$ d) $\frac{1}{a}\emptyset\left(\frac{s}{a}\right)$

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

a) $\frac{1}{3}\sin 3t$ b) $\frac{1}{3}\cos 3t$

c) $\frac{1}{3}\cosh 3t$ d) $\frac{1}{3}\sinh 3t$

8) For $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 3y = 3e^{2x}$, the particular integral is _____.

a) $\frac{1}{15}e^{2x}$ b) $3e^{2x}$

c) $\frac{1}{5}e^{2x}$ d) $C_1e^{-x} + C_2e^{-2x}$

9) The general solution of the equation $(D^3 - 7D - 6)y = 0$ is _____.

a) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{-3x}$

b) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{3x}$

c) $y = c_1e^{-x} + c_2e^{-2x} + c_3e^{-3x}$

d) None of these

10) $z\{k\} =$_____ for $|z| > 1$

a) $\frac{z}{z-1}$ b) $\frac{1}{(z-1)^2}$

c) $\frac{z}{(z-1)^2}$ d) $\frac{z}{(z+1)^2}$

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

a) $f\left(\frac{a}{z}\right)$ b) $f\left(\frac{z}{a}\right)$

c) $\frac{1}{a}f\left(\frac{z}{a}\right)$ d) None

12) $Z\left\{\frac{1}{k!}\right\} =$? for $k \geq 0$

a) e^z b) $e^{\frac{1}{z}}$

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

13) The Fourier sine transform of $f(x)$ is given by _____.

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

b) $\int_{-\infty}^{\infty} f(x)\cos sx\ dx$

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

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

14) From the result $\int_{-\infty}^{\infty}\frac{\cos sx.\sin sk}{s}ds = \begin{cases}\pi & , \ |x| < k \\ 0 & , \ |x| > k\end{cases}$ we can deduce that $\int_{0}^{\infty}\frac{\sin sk}{s}\ ds =$ _____.

a) 0

b) 1

c) π

d) $\frac{\pi}{2}$

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any three **09**

a) Solve : $(D^2+4D+5)y=-2\cos hx+2^x$

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

c) Find Z-transform of $x_k=2^k\cos(3k+2)\,,k\geq 0$

d) Find Z-transform of $x_k=k^2e^{-ak},k\geq 0$

e) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{1}{s(s^2+4)}\right]$

Q.3 Attempt any three of the following. **09**

a) Evaluate by using Laplace transform $\int_0^\infty\left(\frac{e^{-t}-e^{-3t}}{t}\right)dt$

b) Find the inverse Z-transform of $f(k)=\begin{cases}4^k, & k<0\\3^k, & k\geq 0\end{cases}$

c) Find $Z\{e^{-3k}\sin 2k\},k\geq 0$

d) Solve $(D^2-1)y=(1+e^{-x})^2$

e) Find Laplace Transform of $\{t\cos 2t\}$

Q.4 Attempt any two **10**

a) Find the inverse Z-transform of $\frac{1}{(z-a)^2}$ if

1) $|z|<a$,
2) $|z|>a$,

b) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$

c) Solve $(D^2-6D+13)y=e^{x\log 2}+8e^{3x}\sin 4x$

Section – II

Q.5 Attempt any three **09**

a) Evaluate $\int_0^5 \frac{1}{4x+5} dx$ using $n = 5$ by Trapezoidal rule.

b) Evaluate $I = \int_0^2 e^{-x} dx$ by using the Simpson's 1/3rd rule given h= 0.5

c) Obtain half range cosine series $f(x) = x$ in $0 < x < 1$

d) Find the Fourier series expansion of $f(x) = x^2$ in $(-\pi, \pi)$

e) Find the Fourier transform of $f(x) = \begin{cases} \frac{1}{2\epsilon}, & |x| \leq \epsilon \\ 0, & |x| > \epsilon \end{cases}$

Q.6 Attempt any three **09**

a) Find f(x) if its Fourier sine transform e^{-as}

b) Find the Fourier cosine transform of

$f(x)$, if $f(x) = \begin{cases} 1, & 0 \leq x < 1 \\ 0, & x \geq 1 \end{cases}$

c) Find the Fourier series expansion of $f(x) = x$ in $(-\pi, \pi)$

d) Solve by Newton Raphson method $x^4 - x = 10$ correct to four decimal places. (perform two iterations only)

e) Find $\int_0^6 \frac{1}{1+x^2} dx \; n = 6$ using Simpson's 3/8th rule.

Q.7 Attempt any two. **10**

a) Find $\int_1^8 \frac{1}{1+x} dx \; h = 1$ by using Trapezoidal rule and Simpson's 1/3rd rule.

b) Find Fourier transform of

$f(x) = 1 \; |x| < k$

$= 0 \; |x| > k$ and

Hence evaluate i) $\int_{-\infty}^{\infty} \frac{\sin sk . \cos sk}{s} ds$ ii) $\int_{-\infty}^{\infty} \frac{\sin ks}{s} ds$

c) Find the Fourier series expansion of the function $f(x) = e^{-\alpha x}$ in $(0, 2\pi)$

Seat No.		Set	S

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) $z\{k\} =$_____ for $|z| > 1$

a) $\frac{z}{z-1}$ b) $\frac{1}{(z-1)^2}$

c) $\frac{z}{(z-1)^2}$ d) $\frac{z}{(z+1)^2}$

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

a) $f\left(\frac{a}{z}\right)$ b) $f\left(\frac{z}{a}\right)$

c) $\frac{1}{a} f\left(\frac{z}{a}\right)$ d) None

3) $Z\left\{\frac{1}{k!}\right\} =?$ for $k \geq 0$

a) e^z b) $e^{\frac{1}{z}}$

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

4) The Fourier sine transform of $f(x)$ is given by _____.

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

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

5) From the result $\int_{-\infty}^{\infty} \frac{\cos sx.\sin sk}{s} ds = \begin{cases} \pi & , \ |x| < k \\ 0 & , \ |x| > k \end{cases}$ we can deduce that $\int_0^{\infty} \frac{\sin sk}{s} \, ds =$ _____.

a) 0 b) 1

c) π d) $\frac{\pi}{2}$

6) The first real positive root of $x^3 = 6x - 4$ by Newton Raphson method near $x_0 = 1$ is _____.

a) 0.6667 b) 0.6

c) 0.4 d) 0.3

7) How many steps does the fourth-order Runge-Kutta method use?

a) Two steps b) Five steps

c) Four steps d) Three steps

8) In the interval $(0, a)$ the constant term in the Fourier series of $f(x) = \frac{a}{2} - x$ is _____.

a) 0 b) 1

c) $\frac{a^2}{2\pi}$ d) $\frac{a^2}{4\pi}$

9) Fourier series of $f(x) = x \ in(-\pi, \pi)$ will contain ____

a) No sine term b) No cosine term

c) Both cosine and sine term d) None of these

10) Laplace transform of $\int_0^t u^3 du =$_____.

a) $\frac{3}{s^5}$ b) $\frac{6}{s^5}$

c) $\frac{1}{s^5}$ d) $\frac{6}{s^4}$

11) If $L\{f(t)\} = \emptyset(s)$, then $L\{f(at)\} =$ _____.

a) $\emptyset\left(\frac{s}{a}\right)$ b) $\frac{1}{s}\emptyset\left(\frac{s}{a}\right)$

c) $\emptyset'\left(\frac{s}{a}\right)$ d) $\frac{1}{a}\emptyset\left(\frac{s}{a}\right)$

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

a) $\frac{1}{3}\sin 3t$ b) $\frac{1}{3}\cos 3t$

c) $\frac{1}{3}\cosh 3t$ d) $\frac{1}{3}\sinh 3t$

13) For $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 3y = 3e^{2x}$, the particular integral is _____.

a) $\frac{1}{15}e^{2x}$ b) $3e^{2x}$

c) $\frac{1}{5}e^{2x}$ d) $C_1e^{-x} + C_2e^{-2x}$

14) The general solution of the equation $(D^3 - 7D - 6)y = 0$ is _____.

a) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{-3x}$

b) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{3x}$

c) $y = c_1e^{-x} + c_2e^{-2x} + c_3e^{-3x}$

d) None of these

SLR-BD-71

Seat No.		Set	S

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any three **09**

a) Solve : $(D^2 + 4D + 5)y = -2\cos hx + 2^x$

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

c) Find Z-transform of $x_k = 2^k \cos(3k + 2)\,, k \geq 0$

d) Find Z-transform of $x_k = k^2 e^{-ak}, k \geq 0$

e) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{1}{s(s^2+4)}\right]$

Q.3 Attempt any three of the following. **09**

a) Evaluate by using Laplace transform $\int_0^\infty \left(\frac{e^{-t}-e^{-3t}}{t}\right) dt$

b) Find the inverse Z-transform of $f(k) = \begin{cases} 4^k, & k < 0 \\ 3^k, & k \geq 0 \end{cases}$

c) Find $Z\{e^{-3k}\sin 2k\}, k \geq 0$

d) Solve $(D^2 - 1)y = (1 + e^{-x})^2$

e) Find Laplace Transform of $\{t\cos 2t\}$

Q.4 Attempt any two **10**

a) Find the inverse Z-transform of $\frac{1}{(z-a)^2}$ if

1) $|z| < a$,
2) $|z| > a$,

b) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$

c) Solve $(D^2 - 6D + 13)y = e^{x\log 2} + 8e^{3x}\sin 4x$

Section – II

Q.5 Attempt any three **09**

a) Evaluate $\int_0^5 \frac{1}{4x+5} dx$ using $n = 5$ by Trapezoidal rule.

b) Evaluate $I = \int_0^2 e^{-x} dx$ by using the Simpson's 1/3rd rule given h= 0.5

c) Obtain half range cosine series $f(x) = x$ in $0 < x < 1$

d) Find the Fourier series expansion of $f(x) = x^2$ in $(-\pi, \pi)$

e) Find the Fourier transform of $f(x) = \begin{cases} \frac{1}{2\epsilon}, & |x| \leq \epsilon \\ 0, & |x| > \epsilon \end{cases}$

Q.6 Attempt any three **09**

a) Find f(x) if its Fourier sine transform e^{-as}

b) Find the Fourier cosine transform of

$f(x)$, if $f(x) = \begin{cases} 1, & 0 \leq x < 1 \\ 0, & x \geq 1 \end{cases}$

c) Find the Fourier series expansion of $f(x) = x$ in $(-\pi, \pi)$

d) Solve by Newton Raphson method $x^4 - x = 10$ correct to four decimal places. (perform two iterations only)

e) Find $\int_0^6 \frac{1}{1+x^2} dx \; n = 6$ using Simpson's 3/8th rule.

Q.7 Attempt any two. **10**

a) Find $\int_1^8 \frac{1}{1+x} dx \; h = 1$ by using Trapezoidal rule and Simpson's 1/3rd rule.

b) Find Fourier transform of

$f(x) = 1 \; |x| < k$

$= 0 \; |x| > k$ and

Hence evaluate i) $\int_{-\infty}^{\infty} \frac{\sin sk . \cos sk}{s} ds$ ii) $\int_{-\infty}^{\infty} \frac{sin\, ks}{s} ds$

c) Find the Fourier series expansion of the function $f(x) = e^{-\alpha x}$ in $(0, 2\pi)$

SLR-BD-72

Seat No.		Set	P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is feedback in communication?
a) The process of encoding a message.
b) The process of transmitting the message.
c) The response or reaction to a message.
d) The process of decoding a message.

2) In the process of communication 'Encoding' means _____.
a) Using symbol to express an idea
b) Deciphering the message
c) Creating noise in the communication
d) Interpreting the meaning of message

3) Empathy refers to: _____.
a) Capacity to understand or feel what another person feels
b) Having better understanding of partner's emotions
c) The higher the likelihood of self harm
d) Getting what one wants out of the relationship

4) Repots, suggestions, appeals grievances etc. are examples of: _____.
a) Down ward communication
b) Upward communication
c) Horizontal communication
d) Informal communication

5) Informal communication is commonly known as: _____.
a) Down ward communication b) Upward communication
c) Horizontal communication d) Grapevine

6) _____ is not a communication barrier?
a) Language b) Culture
c) Habits d) Physical

7) Which of the following is NOT a component of communication?
a) Sender b) Message
c) Receiver d) Translator

8) Emotional Intelligence primarily refers to the ability to: _____.
a) Understand and manage one's own emotions and the emotions of others
b) Solve mathematical problems
c) Memorize large amounts of information
d) Make logical decisions without emotions

9) Time management can help reduce stress by: _____
a) Creating unnecessary pressure
b) Organizing tasks and prioritizing effectively
c) Avoiding responsibilities altogether
d) Increasing the workload

10) The term “self-regulation” in Emotional Intelligence means: _____.
a) Hiding your emotions from others
b) Controlling impulsive behaviours and adapting to changing circumstances
c) Ignoring your emotional responses
d) Following strict rules without considering emotions

11) What is the primary purpose of a job interview?
a) To test the candidate's academic knowledge
b) To compare the candidate's qualifications with others
c) To discuss salary expectations only
d) To assess the candidate’s suitability for the job role

12) What kind of information will you collect before going to an interview?
a) About the job you are applying for
b) About the company
c) About the work culture
d) All of the above

13) Which of the following is an effective stress management technique?
a) Procrastination
b) Deep breathing and relaxation exercises
c) Avoiding physical activity
d) Excessive multitasking

14) Which of the following is an important step to prepare for an interview?
a) Memorizing answers word for word
b) Arriving late to showcase confidence
c) Avoiding practice to appear natural
d) Researching the company and role

SLR-BD-72

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Two. **12**

a) Define human communication and explain importance of communication.
b) Explain in brief:
1) Personal Barrier
2) Social Barrier
c) Enlighten in a brief strategy to improve emotional intelligence.

Q.3 Attempt any Four. **16**

a) Explain importance of emotional intelligence.
b) State advantages and disadvantages of informal communication.
c) Describe different modes of communication.
d) Highlight role of social awareness as key factor of emotional intelligence.
e) Explain relationship management as key factor of emotional intelligence.

Section – II

Q.4 Attempt any Two. **12**

a) What is interview? Explain various steps in the process of interview.
b) Explain importance of time management.
c) Explain the four P's of effective presentation.

Q.5 Attempt any Four. **16**

a) Explain importance of stress management.
b) Explain various types of interviews.
c) Describe various strategies for effective time management.
d) Explain various strategies of stress management.
e) Write short note on: Non- verbal aspects of presentation.

SLR-BD-72

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Emotional Intelligence primarily refers to the ability to: _____.
a) Understand and manage one's own emotions and the emotions of others
b) Solve mathematical problems
c) Memorize large amounts of information
d) Make logical decisions without emotions

2) Time management can help reduce stress by: _____
a) Creating unnecessary pressure
b) Organizing tasks and prioritizing effectively
c) Avoiding responsibilities altogether
d) Increasing the workload

3) The term "self-regulation" in Emotional Intelligence means: _____.
a) Hiding your emotions from others
b) Controlling impulsive behaviours and adapting to changing circumstances
c) Ignoring your emotional responses
d) Following strict rules without considering emotions

4) What is the primary purpose of a job interview?
a) To test the candidate's academic knowledge
b) To compare the candidate's qualifications with others
c) To discuss salary expectations only
d) To assess the candidate's suitability for the job role

5) What kind of information will you collect before going to an interview?
a) About the job you are applying for
b) About the company
c) About the work culture
d) All of the above

6) Which of the following is an effective stress management technique?
a) Procrastination
b) Deep breathing and relaxation exercises
c) Avoiding physical activity
d) Excessive multitasking

7) Which of the following is an important step to prepare for an interview?
a) Memorizing answers word for word
b) Arriving late to showcase confidence
c) Avoiding practice to appear natural
d) Researching the company and role

8) What is feedback in communication?
a) The process of encoding a message.
b) The process of transmitting the message.
c) The response or reaction to a message.
d) The process of decoding a message.

9) In the process of communication 'Encoding' means _____.
a) Using symbol to express an idea
b) Deciphering the message
c) Creating noise in the communication
d) Interpreting the meaning of message

10) Empathy refers to: _____.
a) Capacity to understand or feel what another person feels
b) Having better understanding of partner's emotions
c) The higher the likelihood of self harm
d) Getting what one wants out of the relationship

11) Repots, suggestions, appeals grievances etc. are examples of: _____.
a) Down ward communication
b) Upward communication
c) Horizontal communication
d) Informal communication

12) Informal communication is commonly known as: _____.
a) Down ward communication b) Upward communication
c) Horizontal communication d) Grapevine

13) _____ is not a communication barrier?
a) Language b) Culture
c) Habits d) Physical

14) Which of the following is NOT a component of communication?
a) Sender b) Message
c) Receiver d) Translator

SLR-BD-72

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Two. **12**

a) Define human communication and explain importance of communication.
b) Explain in brief:
1) Personal Barrier
2) Social Barrier
c) Enlighten in a brief strategy to improve emotional intelligence.

Q.3 Attempt any Four. **16**

a) Explain importance of emotional intelligence.
b) State advantages and disadvantages of informal communication.
c) Describe different modes of communication.
d) Highlight role of social awareness as key factor of emotional intelligence.
e) Explain relationship management as key factor of emotional intelligence.

Section – II

Q.4 Attempt any Two. **12**

a) What is interview? Explain various steps in the process of interview.
b) Explain importance of time management.
c) Explain the four P's of effective presentation.

Q.5 Attempt any Four. **16**

a) Explain importance of stress management.
b) Explain various types of interviews.
c) Describe various strategies for effective time management.
d) Explain various strategies of stress management.
e) Write short note on: Non- verbal aspects of presentation.

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the primary purpose of a job interview?
a) To test the candidate's academic knowledge
b) To compare the candidate's qualifications with others
c) To discuss salary expectations only
d) To assess the candidate's suitability for the job role

2) What kind of information will you collect before going to an interview?
a) About the job you are applying for
b) About the company
c) About the work culture
d) All of the above

3) Which of the following is an effective stress management technique?
a) Procrastination
b) Deep breathing and relaxation exercises
c) Avoiding physical activity
d) Excessive multitasking

4) Which of the following is an important step to prepare for an interview?
a) Memorizing answers word for word
b) Arriving late to showcase confidence
c) Avoiding practice to appear natural
d) Researching the company and role

5) What is feedback in communication?
a) The process of encoding a message.
b) The process of transmitting the message.
c) The response or reaction to a message.
d) The process of decoding a message.

6) In the process of communication 'Encoding' means _____.
a) Using symbol to express an idea
b) Deciphering the message
c) Creating noise in the communication
d) Interpreting the meaning of message

7) Empathy refers to: _____.
a) Capacity to understand or feel what another person feels
b) Having better understanding of partner's emotions
c) The higher the likelihood of self harm
d) Getting what one wants out of the relationship

8) Repots, suggestions, appeals grievances etc. are examples of: _____.
a) Down ward communication
b) Upward communication
c) Horizontal communication
d) Informal communication

9) Informal communication is commonly known as: _____.
a) Down ward communication b) Upward communication
c) Horizontal communication d) Grapevine

10) _____ is not a communication barrier?
a) Language b) Culture
c) Habits d) Physical

11) Which of the following is NOT a component of communication?
a) Sender b) Message
c) Receiver d) Translator

12) Emotional Intelligence primarily refers to the ability to: _____.
a) Understand and manage one's own emotions and the emotions of others
b) Solve mathematical problems
c) Memorize large amounts of information
d) Make logical decisions without emotions

13) Time management can help reduce stress by: _____
a) Creating unnecessary pressure
b) Organizing tasks and prioritizing effectively
c) Avoiding responsibilities altogether
d) Increasing the workload

14) The term "self-regulation" in Emotional Intelligence means: _____.
a) Hiding your emotions from others
b) Controlling impulsive behaviours and adapting to changing circumstances
c) Ignoring your emotional responses
d) Following strict rules without considering emotions

SLR-BD-72

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Two. **12**

a) Define human communication and explain importance of communication.
b) Explain in brief:
1) Personal Barrier
2) Social Barrier
c) Enlighten in a brief strategy to improve emotional intelligence.

Q.3 Attempt any Four. **16**

a) Explain importance of emotional intelligence.
b) State advantages and disadvantages of informal communication.
c) Describe different modes of communication.
d) Highlight role of social awareness as key factor of emotional intelligence.
e) Explain relationship management as key factor of emotional intelligence.

Section – II

Q.4 Attempt any Two. **12**

a) What is interview? Explain various steps in the process of interview.
b) Explain importance of time management.
c) Explain the four P's of effective presentation.

Q.5 Attempt any Four. **16**

a) Explain importance of stress management.
b) Explain various types of interviews.
c) Describe various strategies for effective time management.
d) Explain various strategies of stress management.
e) Write short note on: Non- verbal aspects of presentation.

SLR-BD-72

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ is not a communication barrier?
a) Language b) Culture
c) Habits d) Physical

2) Which of the following is NOT a component of communication?
a) Sender b) Message
c) Receiver d) Translator

3) Emotional Intelligence primarily refers to the ability to: _____.
a) Understand and manage one's own emotions and the emotions of others
b) Solve mathematical problems
c) Memorize large amounts of information
d) Make logical decisions without emotions

4) Time management can help reduce stress by: _____
a) Creating unnecessary pressure
b) Organizing tasks and prioritizing effectively
c) Avoiding responsibilities altogether
d) Increasing the workload

5) The term "self-regulation" in Emotional Intelligence means: _____.
a) Hiding your emotions from others
b) Controlling impulsive behaviours and adapting to changing circumstances
c) Ignoring your emotional responses
d) Following strict rules without considering emotions

6) What is the primary purpose of a job interview?
a) To test the candidate's academic knowledge
b) To compare the candidate's qualifications with others
c) To discuss salary expectations only
d) To assess the candidate's suitability for the job role

7) What kind of information will you collect before going to an interview?
a) About the job you are applying for
b) About the company
c) About the work culture
d) All of the above

8) Which of the following is an effective stress management technique?
a) Procrastination
b) Deep breathing and relaxation exercises
c) Avoiding physical activity
d) Excessive multitasking

9) Which of the following is an important step to prepare for an interview?
a) Memorizing answers word for word
b) Arriving late to showcase confidence
c) Avoiding practice to appear natural
d) Researching the company and role

10) What is feedback in communication?
a) The process of encoding a message.
b) The process of transmitting the message.
c) The response or reaction to a message.
d) The process of decoding a message.

11) In the process of communication 'Encoding' means _____.
a) Using symbol to express an idea
b) Deciphering the message
c) Creating noise in the communication
d) Interpreting the meaning of message

12) Empathy refers to: _____.
a) Capacity to understand or feel what another person feels
b) Having better understanding of partner's emotions
c) The higher the likelihood of self harm
d) Getting what one wants out of the relationship

13) Repots, suggestions, appeals grievances etc. are examples of: _____.
a) Down ward communication
b) Upward communication
c) Horizontal communication
d) Informal communication

14) Informal communication is commonly known as: _____.
a) Down ward communication b) Upward communication
c) Horizontal communication d) Grapevine

SLR-BD-72

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Two. **12**

a) Define human communication and explain importance of communication.
b) Explain in brief:
1) Personal Barrier
2) Social Barrier
c) Enlighten in a brief strategy to improve emotional intelligence.

Q.3 Attempt any Four. **16**

a) Explain importance of emotional intelligence.
b) State advantages and disadvantages of informal communication.
c) Describe different modes of communication.
d) Highlight role of social awareness as key factor of emotional intelligence.
e) Explain relationship management as key factor of emotional intelligence.

Section – II

Q.4 Attempt any Two. **12**

a) What is interview? Explain various steps in the process of interview.
b) Explain importance of time management.
c) Explain the four P's of effective presentation.

Q.5 Attempt any Four. **16**

a) Explain importance of stress management.
b) Explain various types of interviews.
c) Describe various strategies for effective time management.
d) Explain various strategies of stress management.
e) Write short note on: Non- verbal aspects of presentation.

Seat No.	

Set **P**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the primary focus of Design Thinking?
a) Maximizing shareholder
b) Developing innovative and user-centered solutions
c) Streamlining manufacturing processes
d) Enhancing employee productivity

2) Which of the following correctly lists the first three phases of the Design Thinking process?
a) Empathize, Ideate, Prototype
b) Define, Ideate, Test
c) Empathize, Define, Ideate
d) Prototype, Test, Implement

3) In the context of Design Thinking, what is "brainstorming" used for?
a) Generating a wide range of ideas
b) Testing final products
c) Developing financial models
d) Identifying user pain points

4) What does a "customer journey map" help to visualize?
a) The financial cost of product development
b) The steps a customer goes through while interacting with a product or service
c) The design specifications of a product
d) The competitive landscape of a market

5) Which tool in Design Thinking helps in understanding the target user's needs and behaviors?
a) Prototype b) Persona
c) SWOT analysis d) Business model canvas

6) What is the final phase in the Design Thinking process?
a) Test b) Implement
c) Prototype d) Ideate

7) Which of the following is NOT an objective of design thinking?
a) To create user-friendly products
b) To streamline manufacturing processes
c) To encourage iterative prototyping
d) To enhance collaboration among teams

8) Which of the following is a benefit of using design thinking?
a) Reduces product variety b) Increases customer satisfaction
c) Limits team collaboration d) Eliminates risk in decision-making

9) What role does technology play in innovation management?
a) It complicates processes
b) It is irrelevant to innovation
c) It serves as a tool for enhancing efficiency and creativity
d) It replaces human input

10) Which leadership style involves making decisions based on input from team members?
a) Autocratic b) Laissez-faire
c) Democratic d) Transactional

11) What does "Product Solution Fit" refer to?
a) The alignment of the product with customer needs and problems
b) The product's price in relation to competitors
c) The marketing strategy for the product
d) The technical specifications of the product

12) Which of the following best defines "Product Market Fit"?
a) The degree to which a product meets the demands of a specific market
b) The number of products available in the market
c) The financial performance of a product
d) The product's popularity on social media

13) What is the primary goal of service design?
a) To reduce costs
b) To enhance customer experience
c) To standardize services
d) To simplify service offerings

14) Which of the following is a key principle of service design?
a) Focus on profitability over customer satisfaction
b) User-centered design
c) Minimal feedback from users
d) Rigid service processes

SLR-BD-73

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Describe each phase of the Design Thinking process in detail, explaining how they contribute to the overall methodology. **06**

b) Provide a comprehensive definition of Design Thinking, including its essential characteristics and principles. **04**

Q.3 **Attempt any three.** **18**

a) Discuss the role of creativity and innovation in organizations and their impact on business performance.

b) What is the importance of empathy in Design Thinking?

c) Define leadership and explain its different types. How can effective leadership influence the success of an organization? Provide examples.

d) Explain the utilization of cognitive technology in decision-making processes.

e) Explain exemplary practices of effective leadership with relevant case studies.

Section – II

Q.4 **a)** Explain exemplary practices of effective leadership with relevant case studies. **06**

b) What is product solution fit, and how does it differ from product market fit? **04**

Q.5 **Attempt any three.** **18**

a) Define the development lifecycle and explain its significance in product development.

b) What are the benefits of implementing service design in organizations?

c) How can organizations effectively design a service to meet customer needs?

d) How does Intellectual Property (IP) play a role in product development and design thinking?

e) Explain any two successful case studies demonstrating design thinking in various engineering sectors.

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is a benefit of using design thinking?
a) Reduces product variety b) Increases customer satisfaction
c) Limits team collaboration d) Eliminates risk in decision-making

2) What role does technology play in innovation management?
a) It complicates processes
b) It is irrelevant to innovation
c) It serves as a tool for enhancing efficiency and creativity
d) It replaces human input

3) Which leadership style involves making decisions based on input from team members?
a) Autocratic b) Laissez-faire
c) Democratic d) Transactional

4) What does "Product Solution Fit" refer to?
a) The alignment of the product with customer needs and problems
b) The product's price in relation to competitors
c) The marketing strategy for the product
d) The technical specifications of the product

5) Which of the following best defines "Product Market Fit"?
a) The degree to which a product meets the demands of a specific market
b) The number of products available in the market
c) The financial performance of a product
d) The product's popularity on social media

6) What is the primary goal of service design?
a) To reduce costs
b) To enhance customer experience
c) To standardize services
d) To simplify service offerings

7) Which of the following is a key principle of service design?
a) Focus on profitability over customer satisfaction
b) User-centered design
c) Minimal feedback from users
d) Rigid service processes

8) What is the primary focus of Design Thinking?
a) Maximizing shareholder
b) Developing innovative and user-centered solutions
c) Streamlining manufacturing processes
d) Enhancing employee productivity

9) Which of the following correctly lists the first three phases of the Design Thinking process?
a) Empathize, Ideate, Prototype
b) Define, Ideate, Test
c) Empathize, Define, Ideate
d) Prototype, Test, Implement

10) In the context of Design Thinking, what is "brainstorming" used for?
a) Generating a wide range of ideas
b) Testing final products
c) Developing financial models
d) Identifying user pain points

11) What does a "customer journey map" help to visualize?
a) The financial cost of product development
b) The steps a customer goes through while interacting with a product or service
c) The design specifications of a product
d) The competitive landscape of a market

12) Which tool in Design Thinking helps in understanding the target user's needs and behaviors?
a) Prototype
b) Persona
c) SWOT analysis
d) Business model canvas

13) What is the final phase in the Design Thinking process?
a) Test
b) Implement
c) Prototype
d) Ideate

14) Which of the following is NOT an objective of design thinking?

a) To create user-friendly products
b) To streamline manufacturing processes
c) To encourage iterative prototyping
d) To enhance collaboration among teams

SLR-BD-73

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Describe each phase of the Design Thinking process in detail, explaining how they contribute to the overall methodology. **06**

b) Provide a comprehensive definition of Design Thinking, including its essential characteristics and principles. **04**

Q.3 **Attempt any three.** **18**

a) Discuss the role of creativity and innovation in organizations and their impact on business performance.

b) What is the importance of empathy in Design Thinking?

c) Define leadership and explain its different types. How can effective leadership influence the success of an organization? Provide examples.

d) Explain the utilization of cognitive technology in decision-making processes.

e) Explain exemplary practices of effective leadership with relevant case studies.

Section – II

Q.4 **a)** Explain exemplary practices of effective leadership with relevant case studies. **06**

b) What is product solution fit, and how does it differ from product market fit? **04**

Q.5 **Attempt any three.** **18**

a) Define the development lifecycle and explain its significance in product development.

b) What are the benefits of implementing service design in organizations?

c) How can organizations effectively design a service to meet customer needs?

d) How does Intellectual Property (IP) play a role in product development and design thinking?

e) Explain any two successful case studies demonstrating design thinking in various engineering sectors.

SLR-BD-73

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What does "Product Solution Fit" refer to?
a) The alignment of the product with customer needs and problems
b) The product's price in relation to competitors
c) The marketing strategy for the product
d) The technical specifications of the product

2) Which of the following best defines "Product Market Fit"?
a) The degree to which a product meets the demands of a specific market
b) The number of products available in the market
c) The financial performance of a product
d) The product's popularity on social media

3) What is the primary goal of service design?
a) To reduce costs
b) To enhance customer experience
c) To standardize services
d) To simplify service offerings

4) Which of the following is a key principle of service design?
a) Focus on profitability over customer satisfaction
b) User-centered design
c) Minimal feedback from users
d) Rigid service processes

5) What is the primary focus of Design Thinking?
a) Maximizing shareholder
b) Developing innovative and user-centered solutions
c) Streamlining manufacturing processes
d) Enhancing employee productivity

6) Which of the following correctly lists the first three phases of the Design Thinking process?
a) Empathize, Ideate, Prototype
b) Define, Ideate, Test
c) Empathize, Define, Ideate
d) Prototype, Test, Implement

7) In the context of Design Thinking, what is "brainstorming" used for?
a) Generating a wide range of ideas
b) Testing final products
c) Developing financial models
d) Identifying user pain points

8) What does a "customer journey map" help to visualize?
a) The financial cost of product development
b) The steps a customer goes through while interacting with a product or service
c) The design specifications of a product
d) The competitive landscape of a market

9) Which tool in Design Thinking helps in understanding the target user's needs and behaviors?
a) Prototype b) Persona
c) SWOT analysis d) Business model canvas

10) What is the final phase in the Design Thinking process?
a) Test b) Implement
c) Prototype d) Ideate

11) Which of the following is NOT an objective of design thinking?
a) To create user-friendly products
b) To streamline manufacturing processes
c) To encourage iterative prototyping
d) To enhance collaboration among teams

12) Which of the following is a benefit of using design thinking?
a) Reduces product variety b) Increases customer satisfaction
c) Limits team collaboration d) Eliminates risk in decision-making

13) What role does technology play in innovation management?
a) It complicates processes
b) It is irrelevant to innovation
c) It serves as a tool for enhancing efficiency and creativity
d) It replaces human input

14) Which leadership style involves making decisions based on input from team members?
a) Autocratic b) Laissez-faire
c) Democratic d) Transactional

SLR-BD-73

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Describe each phase of the Design Thinking process in detail, explaining how they contribute to the overall methodology. **06**

b) Provide a comprehensive definition of Design Thinking, including its essential characteristics and principles. **04**

Q.3 **Attempt any three.** **18**

a) Discuss the role of creativity and innovation in organizations and their impact on business performance.

b) What is the importance of empathy in Design Thinking?

c) Define leadership and explain its different types. How can effective leadership influence the success of an organization? Provide examples.

d) Explain the utilization of cognitive technology in decision-making processes.

e) Explain exemplary practices of effective leadership with relevant case studies.

Section – II

Q.4 **a)** Explain exemplary practices of effective leadership with relevant case studies. **06**

b) What is product solution fit, and how does it differ from product market fit? **04**

Q.5 **Attempt any three.** **18**

a) Define the development lifecycle and explain its significance in product development.

b) What are the benefits of implementing service design in organizations?

c) How can organizations effectively design a service to meet customer needs?

d) How does Intellectual Property (IP) play a role in product development and design thinking?

e) Explain any two successful case studies demonstrating design thinking in various engineering sectors.

Seat No.	

Set **S**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the final phase in the Design Thinking process?
a) Test b) Implement
c) Prototype d) Ideate

2) Which of the following is NOT an objective of design thinking?
a) To create user-friendly products
b) To streamline manufacturing processes
c) To encourage iterative prototyping
d) To enhance collaboration among teams

3) Which of the following is a benefit of using design thinking?
a) Reduces product variety b) Increases customer satisfaction
c) Limits team collaboration d) Eliminates risk in decision-making

4) What role does technology play in innovation management?
a) It complicates processes
b) It is irrelevant to innovation
c) It serves as a tool for enhancing efficiency and creativity
d) It replaces human input

5) Which leadership style involves making decisions based on input from team members?
a) Autocratic b) Laissez-faire
c) Democratic d) Transactional

6) What does "Product Solution Fit" refer to?
a) The alignment of the product with customer needs and problems
b) The product's price in relation to competitors
c) The marketing strategy for the product
d) The technical specifications of the product

7) Which of the following best defines "Product Market Fit"?
a) The degree to which a product meets the demands of a specific market
b) The number of products available in the market
c) The financial performance of a product
d) The product's popularity on social media

8) What is the primary goal of service design?
a) To reduce costs
b) To enhance customer experience
c) To standardize services
d) To simplify service offerings

9) Which of the following is a key principle of service design?
a) Focus on profitability over customer satisfaction
b) User-centered design
c) Minimal feedback from users
d) Rigid service processes

10) What is the primary focus of Design Thinking?
a) Maximizing shareholder
b) Developing innovative and user-centered solutions
c) Streamlining manufacturing processes
d) Enhancing employee productivity

11) Which of the following correctly lists the first three phases of the Design Thinking process?
a) Empathize, Ideate, Prototype
b) Define, Ideate, Test
c) Empathize, Define, Ideate
d) Prototype, Test, Implement

12) In the context of Design Thinking, what is "brainstorming" used for?
a) Generating a wide range of ideas
b) Testing final products
c) Developing financial models
d) Identifying user pain points

13) What does a "customer journey map" help to visualize?
a) The financial cost of product development
b) The steps a customer goes through while interacting with a product or service
c) The design specifications of a product
d) The competitive landscape of a market

14) Which tool in Design Thinking helps in understanding the target user's needs and behaviors?
a) Prototype
b) Persona
c) SWOT analysis
d) Business model canvas

SLR-BD-73

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Describe each phase of the Design Thinking process in detail, explaining how they contribute to the overall methodology. **06**

b) Provide a comprehensive definition of Design Thinking, including its essential characteristics and principles. **04**

Q.3 **Attempt any three.** **18**

a) Discuss the role of creativity and innovation in organizations and their impact on business performance.

b) What is the importance of empathy in Design Thinking?

c) Define leadership and explain its different types. How can effective leadership influence the success of an organization? Provide examples.

d) Explain the utilization of cognitive technology in decision-making processes.

e) Explain exemplary practices of effective leadership with relevant case studies.

Section – II

Q.4 **a)** Explain exemplary practices of effective leadership with relevant case studies. **06**

b) What is product solution fit, and how does it differ from product market fit? **04**

Q.5 **Attempt any three.** **18**

a) Define the development lifecycle and explain its significance in product development.

b) What are the benefits of implementing service design in organizations?

c) How can organizations effectively design a service to meet customer needs?

d) How does Intellectual Property (IP) play a role in product development and design thinking?

e) Explain any two successful case studies demonstrating design thinking in various engineering sectors.

SLR-BD-74

Seat No.	

Set P

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options. 14

1) What does GIS integrate spatial data with?
a) Other data resources b) Only tabular data
c) Only hard copy maps d) Only digital maps

2) What is the purpose of GIS software?
a) Data management and analysis
b) Creating physical maps
c) Collecting data only
d) Storing non-spatial data

3) Which of the following is a key function of an information system?
a) Data storage only
b) Data collection and processing
c) Document shredding
d) Manual calculations

4) Statistical data in GIS is primarily used for _____.
a) Data visualization b) Data analysis and interpretation
c) Data storage d) Data collection

5) Satellite data is most commonly used in GIS for _____.
a) Remote sensing b) Data entry
c) Statistical analysis d) Map digitization

6) A zone with a width created around a spatial feature is called as ____.
a) dissolve b) buffer
c) relation d) overlay

7) Network databases is to support relationships of _____.
a) many to many b) one to many
c) none of above d) all of above

8) The sensitivity of a sensor to detect slight differences in energy (brightness) is _____.
a) Spectral resolution b) Spatial resolution
c) Temporal resolution d) Radiometric resolution

9) Descriptive information provides qualitative data about the characteristics and conditions of Earth's surface features _____.
a) qualitative b) quantitative
c) both d) none

10) The instruments which provide electromagnetic radiation of specified wave length or a band of wave lengths to illuminate the earth surface, are called _____.
a) scanner b) passive sensors
c) active sensors d) none of these

11) Canal site selection using GIS is primarily concerned with _____.
a) Mapping the soil composition along the canal route
b) Studying land use in the surrounding areas
c) Identifying areas with the most water flow potential
d) Both a and c

12) What is the primary application of GIS in map revision?
a) To create new maps from scratch
b) To update and modify existing maps with current data
c) To design and print physical maps
d) To analyze spatial data for new projects

13) Which phase of GIS project planning involves the most detailed work on defining technical requirements and hardware/software needs?
a) feasibility study
b) planning and requirements analysis
c) design phase
d) testing phase

14) Which of the following is an example of a GIS design project task?
a) data model development
b) stakeholder consultation
c) site analysis and requirement definition
d) all of these

SLR-BD-74

Seat No.	

Set P

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch whenever necessary.

Section - I

Q.2 Attempt any four from the following. **16**
a) Describe commercial & open source GIS softwares.
b) Describe in detail data organisation method-layered based approach.
c) Describe field data & its collection methods.
d) Discuss advantages & disadvantages of aerial photographs.
e) Describe in detail run-length encoding.
f) Describe in detail about data analysis.

Q.3 Attempt any two from the following. **12**
a) Describe in detail digitizers, its process, advantages & disadvantages.
b) Describe the organisation of data in GIS.
c) Explain various data models used in DBMS in detail.

Section - II

Q.4 Attempt any four from the following. **16**
a) Explain in detail passive & active remote sensing with sketch.
b) Describe in detail metric information.
c) Describe application of GIS in dam site selection.
d) Describe application of GIS in soil erosion.
e) Explain in detail phases of planning & implementation.
f) Describe characteristics of advanced GIS projects.

Q.5 Attempt any two from the following. **12**
a) Describe need of integration of remote sensing & GIS in detail.
b) Describe key application of GIS in map revision.
c) Describe benefits of GIS implementation plan.

SLR-BD-74

Seat No.	

Set Q

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options. 14

1) The sensitivity of a sensor to detect slight differences in energy (brightness) is _____.
a) Spectral resolution b) Spatial resolution
c) Temporal resolution d) Radiometric resolution

2) Descriptive information provides qualitative data about the characteristics and conditions of Earth's surface features _____.
a) qualitative b) quantitative
c) both d) none

3) The instruments which provide electromagnetic radiation of specified wave length or a band of wave lengths to illuminate the earth surface, are called _____.
a) scanner b) passive sensors
c) active sensors d) none of these

4) Canal site selection using GIS is primarily concerned with _____.
a) Mapping the soil composition along the canal route
b) Studying land use in the surrounding areas
c) Identifying areas with the most water flow potential
d) Both a and c

5) What is the primary application of GIS in map revision?
a) To create new maps from scratch
b) To update and modify existing maps with current data
c) To design and print physical maps
d) To analyze spatial data for new projects

6) Which phase of GIS project planning involves the most detailed work on defining technical requirements and hardware/software needs?
a) feasibility study
b) planning and requirements analysis
c) design phase
d) testing phase

7) Which of the following is an example of a GIS design project task?
a) data model development
b) stakeholder consultation
c) site analysis and requirement definition
d) all of these

8) What does GIS integrate spatial data with?
a) Other data resources
b) Only tabular data
c) Only hard copy maps
d) Only digital maps

9) What is the purpose of GIS software?
a) Data management and analysis
b) Creating physical maps
c) Collecting data only
d) Storing non-spatial data

10) Which of the following is a key function of an information system?
a) Data storage only
b) Data collection and processing
c) Document shredding
d) Manual calculations

11) Statistical data in GIS is primarily used for _____.
a) Data visualization
b) Data analysis and interpretation
c) Data storage
d) Data collection

12) Satellite data is most commonly used in GIS for _____.
a) Remote sensing
b) Data entry
c) Statistical analysis
d) Map digitization

13) A zone with a width created around a spatial feature is called as ____.
a) dissolve
b) buffer
c) relation
d) overlay

14) Network databases is to support relationships of _____.
a) many to many
b) one to many
c) none of above
d) all of above

SLR-BD-74

Seat No.	

Set Q

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch whenever necessary.

Section - I

Q.2 Attempt any four from the following. **16**
a) Describe commercial & open source GIS softwares.
b) Describe in detail data organisation method-layered based approach.
c) Describe field data & its collection methods.
d) Discuss advantages & disadvantages of aerial photographs.
e) Describe in detail run-length encoding.
f) Describe in detail about data analysis.

Q.3 Attempt any two from the following. **12**
a) Describe in detail digitizers, its process, advantages & disadvantages.
b) Describe the organisation of data in GIS.
c) Explain various data models used in DBMS in detail.

Section - II

Q.4 Attempt any four from the following. **16**
a) Explain in detail passive & active remote sensing with sketch.
b) Describe in detail metric information.
c) Describe application of GIS in dam site selection.
d) Describe application of GIS in soil erosion.
e) Explain in detail phases of planning & implementation.
f) Describe characteristics of advanced GIS projects.

Q.5 Attempt any two from the following. **12**
a) Describe need of integration of remote sensing & GIS in detail.
b) Describe key application of GIS in map revision.
c) Describe benefits of GIS implementation plan.

SLR-BD-74

Seat No.	

Set R

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options. 14

1) Canal site selection using GIS is primarily concerned with _____.
a) Mapping the soil composition along the canal route
b) Studying land use in the surrounding areas
c) Identifying areas with the most water flow potential
d) Both a and c

2) What is the primary application of GIS in map revision?
a) To create new maps from scratch
b) To update and modify existing maps with current data
c) To design and print physical maps
d) To analyze spatial data for new projects

3) Which phase of GIS project planning involves the most detailed work on defining technical requirements and hardware/software needs?
a) feasibility study
b) planning and requirements analysis
c) design phase
d) testing phase

4) Which of the following is an example of a GIS design project task?
a) data model development
b) stakeholder consultation
c) site analysis and requirement definition
d) all of these

5) What does GIS integrate spatial data with?
a) Other data resources b) Only tabular data
c) Only hard copy maps d) Only digital maps

6) What is the purpose of GIS software?
a) Data management and analysis
b) Creating physical maps
c) Collecting data only
d) Storing non-spatial data

7) Which of the following is a key function of an information system?
a) Data storage only
b) Data collection and processing
c) Document shredding
d) Manual calculations

8) Statistical data in GIS is primarily used for _____.
a) Data visualization b) Data analysis and interpretation
c) Data storage d) Data collection

9) Satellite data is most commonly used in GIS for _____.
a) Remote sensing b) Data entry
c) Statistical analysis d) Map digitization

10) A zone with a width created around a spatial feature is called as ____.
a) dissolve b) buffer
c) relation d) overlay ___

11) Network databases is to support relationships of _____.
a) many to many b) one to many
c) none of above d) all of above

12) The sensitivity of a sensor to detect slight differences in energy (brightness) is _____.
a) Spectral resolution b) Spatial resolution
c) Temporal resolution d) Radiometric resolution

13) Descriptive information provides qualitative data about the characteristics and conditions of Earth's surface features _____.
a) qualitative b) quantitative
c) both d) none

14) The instruments which provide electromagnetic radiation of specified wave length or a band of wave lengths to illuminate the earth surface, are called _____.
a) scanner b) passive sensors
c) active sensors d) none of these

Seat No.	

Set **R**

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch whenever necessary.

Section - I

Q.2 Attempt any four from the following. **16**
a) Describe commercial & open source GIS softwares.
b) Describe in detail data organisation method-layered based approach.
c) Describe field data & its collection methods.
d) Discuss advantages & disadvantages of aerial photographs.
e) Describe in detail run-length encoding.
f) Describe in detail about data analysis.

Q.3 Attempt any two from the following. **12**
a) Describe in detail digitizers, its process, advantages & disadvantages.
b) Describe the organisation of data in GIS.
c) Explain various data models used in DBMS in detail.

Section - II

Q.4 Attempt any four from the following. **16**
a) Explain in detail passive & active remote sensing with sketch.
b) Describe in detail metric information.
c) Describe application of GIS in dam site selection.
d) Describe application of GIS in soil erosion.
e) Explain in detail phases of planning & implementation.
f) Describe characteristics of advanced GIS projects.

Q.5 Attempt any two from the following. **12**
a) Describe need of integration of remote sensing & GIS in detail.
b) Describe key application of GIS in map revision.
c) Describe benefits of GIS implementation plan.

Seat No.		Set	S

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options. 14

1) A zone with a width created around a spatial feature is called as ____.
a) dissolve b) buffer
c) relation d) overlay

2) Network databases is to support relationships of _____.
a) many to many b) one to many
c) none of above d) all of above

3) The sensitivity of a sensor to detect slight differences in energy (brightness) is _____.
a) Spectral resolution b) Spatial resolution
c) Temporal resolution d) Radiometric resolution

4) Descriptive information provides qualitative data about the characteristics and conditions of Earth's surface features _____.
a) qualitative b) quantitative
c) both d) none

5) The instruments which provide electromagnetic radiation of specified wave length or a band of wave lengths to illuminate the earth surface, are called _____.
a) scanner b) passive sensors
c) active sensors d) none of these

6) Canal site selection using GIS is primarily concerned with _____.
a) Mapping the soil composition along the canal route
b) Studying land use in the surrounding areas
c) Identifying areas with the most water flow potential
d) Both a and c

7) What is the primary application of GIS in map revision?
a) To create new maps from scratch
b) To update and modify existing maps with current data
c) To design and print physical maps
d) To analyze spatial data for new projects

8) Which phase of GIS project planning involves the most detailed work on defining technical requirements and hardware/software needs?
a) feasibility study
b) planning and requirements analysis
c) design phase
d) testing phase

9) Which of the following is an example of a GIS design project task?
a) data model development
b) stakeholder consultation
c) site analysis and requirement definition
d) all of these

10) What does GIS integrate spatial data with?
a) Other data resources
b) Only tabular data
c) Only hard copy maps
d) Only digital maps

11) What is the purpose of GIS software?
a) Data management and analysis
b) Creating physical maps
c) Collecting data only
d) Storing non-spatial data

12) Which of the following is a key function of an information system?
a) Data storage only
b) Data collection and processing
c) Document shredding
d) Manual calculations

13) Statistical data in GIS is primarily used for _____.
a) Data visualization
b) Data analysis and interpretation
c) Data storage
d) Data collection

14) Satellite data is most commonly used in GIS for _____.
a) Remote sensing
b) Data entry
c) Statistical analysis
d) Map digitization

SLR-BD-74

Seat No.		Set	S

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch whenever necessary.

Section - I

Q.2 Attempt any four from the following. **16**
a) Describe commercial & open source GIS softwares.
b) Describe in detail data organisation method-layered based approach.
c) Describe field data & its collection methods.
d) Discuss advantages & disadvantages of aerial photographs.
e) Describe in detail run-length encoding.
f) Describe in detail about data analysis.

Q.3 Attempt any two from the following. **12**
a) Describe in detail digitizers, its process, advantages & disadvantages.
b) Describe the organisation of data in GIS.
c) Explain various data models used in DBMS in detail.

Section - II

Q.4 Attempt any four from the following. **16**
a) Explain in detail passive & active remote sensing with sketch.
b) Describe in detail metric information.
c) Describe application of GIS in dam site selection.
d) Describe application of GIS in soil erosion.
e) Explain in detail phases of planning & implementation.
f) Describe characteristics of advanced GIS projects.

Q.5 Attempt any two from the following. **12**
a) Describe need of integration of remote sensing & GIS in detail.
b) Describe key application of GIS in map revision.
c) Describe benefits of GIS implementation plan.

SLR-BD-75

Seat No.	

Set P

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The terms in SOP are called _____.
a) max terms b) min terms
c) mid terms d) sum terms

2) The number of cells in a K-map with n- variables.
a) 2n b) n^2
c) 2^n d) n

3) The logical sum of two or more logical product terms is called _____.
a) SOP b) POS
c) OR operation d) NAND operation

4) A Karnaugh map (K-map) is an abstract form of _____ diagram organized as a matrix of squares.
a) Venn Diagram b) Cycle Diagram
c) Block diagram d) Triangular Diagram

5) If A and B are the inputs of a half adder, the sum is given by _____.
a) A AND B b) A OR B
c) A XOR B d) A EX-NOR B

6) Let A and B is the input of a Subtractor, then the output will be _____.
a) A XOR B b) A AND B
c) A OR B d) A EX-NOR B

7) What is a multiplexer?

a) It is a type of decoder which decodes several inputs and gives one output
b) A multiplexer is a device which converts many signals into one
c) It takes one input and results into many output
d) It is a type of encoder which decodes several inputs and gives one output

8) A basic S-R flip-flop can be constructed by cross-coupling of which basic logic gates?

a) AND or OR gates
b) XOR or XNOR gates
c) NOR or NAND gates
d) AND or NOR gates

9) In S-R flip-flop, if Q = 0 the output is said to be _____.

a) Set
b) Reset
c) Previous state
d) Current state

10) A D-Flip flop is said to be transparent, when _____.

a) the output is Low
b) the output is High
c) the output follows clock
d) the output follows input

11) How many stable state/states present in flip-flop?

a) 1
b) 0
c) 2
d) 4

12) How many natural states will there be in a 4-bit ripple counter?

a) 4
b) 8
c) 16
d) 32

13) How many flip-flops are required to construct a decade counter?

a) 4
b) 8
c) 5
d) 10

14) A 4-bit counter has a maximum modulus of _____.

a) 3
b) 6
c) 8
d) 16

SLR-BD-75

Seat No.	

Set P

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) Explain Standard representation of logic function.
b) Express Boolean function $F = xy + x'z$ as a product of Max-terms.
c) Explain Half Adder with logic diagram.
d) Explain 1:4 De-Multiplexer with truth Table and logic diagram.
e) Explain stepwise procedure for K-map solution.

Q.3 Attempt any two. **12**

a) Explain Binary to Gray conversion in details.
b) Explain Full Adder with suitable diagram
c) Solve using K Map -

$$F\ (A, B, C, D)\ = \sum (0, 2, 5, 7, 8, 10, 13, 15)$$

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic SR Flip-flop using logic gates.
b) Explain D-Flip-Flop with suitable diagram.
c) Differentiate between Synchronous and Asynchronous sequential circuit.
d) Explain PISO shift register.
e) Explain Race-Round condition. How this condition will overcome?

Q.5 Attempt any two. **12**

a) Design MOD-10 Counter.
b) Explain JK Flip flop with suitable diagram, and truth table.
c) Explain 4-bit UP/DOWN counter with suitable diagram.

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) A basic S-R flip-flop can be constructed by cross-coupling of which basic logic gates?
a) AND or OR gates b) XOR or XNOR gates
c) NOR or NAND gates d) AND or NOR gates

2) In S-R flip-flop, if Q = 0 the output is said to be _____.
a) Set b) Reset
c) Previous state d) Current state

3) A D-Flip flop is said to be transparent, when _____.
a) the output is Low b) the output is High
c) the output follows clock d) the output follows input

4) How many stable state/states present in flip-flop?
a) 1 b) 0
c) 2 d) 4

5) How many natural states will there be in a 4-bit ripple counter?
a) 4 b) 8
c) 16 d) 32

6) How many flip-flops are required to construct a decade counter?
a) 4 b) 8
c) 5 d) 10

7) A 4-bit counter has a maximum modulus of _____.
a) 3 b) 6
c) 8 d) 16

8) The terms in SOP are called _____.
a) max terms b) min terms
c) mid terms d) sum terms

9) The number of cells in a K-map with n- variables.
a) 2n b) n^2
c) 2^n d) n

10) The logical sum of two or more logical product terms is called _____.
a) SOP b) POS
c) OR operation d) NAND operation

11) A Karnaugh map (K-map) is an abstract form of _____ diagram organized as a matrix of squares.
a) Venn Diagram b) Cycle Diagram
c) Block diagram d) Triangular Diagram

12) If A and B are the inputs of a half adder, the sum is given by _____.
a) A AND B b) A OR B
c) A XOR B d) A EX-NOR B

13) Let A and B is the input of a Subtractor, then the output will be _____.
a) A XOR B b) A AND B
c) A OR B d) A EX-NOR B

14) What is a multiplexer?
a) It is a type of decoder which decodes several inputs and gives one output
b) A multiplexer is a device which converts many signals into one
c) It takes one input and results into many output
d) It is a type of encoder which decodes several inputs and gives one output

SLR-BD-75

Seat No.	

Set Q

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) Explain Standard representation of logic function.
b) Express Boolean function $F = xy + x'z$ as a product of Max-terms.
c) Explain Half Adder with logic diagram.
d) Explain 1:4 De-Multiplexer with truth Table and logic diagram.
e) Explain stepwise procedure for K-map solution.

Q.3 Attempt any two. **12**

a) Explain Binary to Gray conversion in details.
b) Explain Full Adder with suitable diagram
c) Solve using K Map -

$$F\ (A, B, C, D)\ = \sum (0, 2, 5, 7, 8, 10, 13, 15)$$

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic SR Flip-flop using logic gates.
b) Explain D-Flip-Flop with suitable diagram.
c) Differentiate between Synchronous and Asynchronous sequential circuit.
d) Explain PISO shift register.
e) Explain Race-Round condition. How this condition will overcome?

Q.5 Attempt any two. **12**

a) Design MOD-10 Counter.
b) Explain JK Flip flop with suitable diagram, and truth table.
c) Explain 4-bit UP/DOWN counter with suitable diagram.

Seat No.	

Set R

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) How many stable state/states present in flip-flop?
a) 1 b) 0
c) 2 d) 4

2) How many natural states will there be in a 4-bit ripple counter?
a) 4 b) 8
c) 16 d) 32

3) How many flip-flops are required to construct a decade counter?
a) 4 b) 8
c) 5 d) 10

4) A 4-bit counter has a maximum modulus of _____.
a) 3 b) 6
c) 8 d) 16

5) The terms in SOP are called _____.
a) max terms b) min terms
c) mid terms d) sum terms

6) The number of cells in a K-map with n- variables.
a) 2n b) n^2
c) 2^n d) n

7) The logical sum of two or more logical product terms is called _____.
a) SOP b) POS
c) OR operation d) NAND operation

8) A Karnaugh map (K-map) is an abstract form of _____ diagram organized as a matrix of squares.

a) Venn Diagram b) Cycle Diagram
c) Block diagram d) Triangular Diagram

9) If A and B are the inputs of a half adder, the sum is given by _____.

a) A AND B b) A OR B
c) A XOR B d) A EX-NOR B

10) Let A and B is the input of a Subtractor, then the output will be _____.

a) A XOR B b) A AND B
c) A OR B d) A EX-NOR B

11) What is a multiplexer?

a) It is a type of decoder which decodes several inputs and gives one output
b) A multiplexer is a device which converts many signals into one
c) It takes one input and results into many output
d) It is a type of encoder which decodes several inputs and gives one output

12) A basic S-R flip-flop can be constructed by cross-coupling of which basic logic gates?

a) AND or OR gates b) XOR or XNOR gates
c) NOR or NAND gates d) AND or NOR gates

13) In S-R flip-flop, if Q = 0 the output is said to be _____.

a) Set b) Reset
c) Previous state d) Current state

14) A D-Flip flop is said to be transparent, when _____.

a) the output is Low b) the output is High
c) the output follows clock d) the output follows input

SLR-BD-75

Seat No.	

Set R

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) Explain Standard representation of logic function.
b) Express Boolean function $F = xy + x'z$ as a product of Max-terms.
c) Explain Half Adder with logic diagram.
d) Explain 1:4 De-Multiplexer with truth Table and logic diagram.
e) Explain stepwise procedure for K-map solution.

Q.3 Attempt any two. **12**

a) Explain Binary to Gray conversion in details.
b) Explain Full Adder with suitable diagram
c) Solve using K Map -

$$F\ (A, B, C, D)\ = \sum (0, 2, 5, 7, 8, 10, 13, 15)$$

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic SR Flip-flop using logic gates.
b) Explain D-Flip-Flop with suitable diagram.
c) Differentiate between Synchronous and Asynchronous sequential circuit.
d) Explain PISO shift register.
e) Explain Race-Round condition. How this condition will overcome?

Q.5 Attempt any two. **12**

a) Design MOD-10 Counter.
b) Explain JK Flip flop with suitable diagram, and truth table.
c) Explain 4-bit UP/DOWN counter with suitable diagram.

Seat No.		Set	S

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Let A and B is the input of a Subtractor, then the output will be _____.
a) A XOR B b) A AND B
c) A OR B d) A EX-NOR B

2) What is a multiplexer?
a) It is a type of decoder which decodes several inputs and gives one output
b) A multiplexer is a device which converts many signals into one
c) It takes one input and results into many output
d) It is a type of encoder which decodes several inputs and gives one output

3) A basic S-R flip-flop can be constructed by cross-coupling of which basic logic gates?
a) AND or OR gates b) XOR or XNOR gates
c) NOR or NAND gates d) AND or NOR gates

4) In S-R flip-flop, if Q = 0 the output is said to be _____.
a) Set b) Reset
c) Previous state d) Current state

5) A D-Flip flop is said to be transparent, when _____.
a) the output is Low b) the output is High
c) the output follows clock d) the output follows input

6) How many stable state/states present in flip-flop?
a) 1 b) 0
c) 2 d) 4

7) How many natural states will there be in a 4-bit ripple counter?
a) 4 b) 8
c) 16 d) 32

8) How many flip-flops are required to construct a decade counter?
a) 4 b) 8
c) 5 d) 10

9) A 4-bit counter has a maximum modulus of _____.
a) 3 b) 6
c) 8 d) 16

10) The terms in SOP are called _____.
a) max terms b) min terms
c) mid terms d) sum terms

11) The number of cells in a K-map with n- variables.
a) 2n b) n^2
c) 2^n d) n

12) The logical sum of two or more logical product terms is called _____.
a) SOP b) POS
c) OR operation d) NAND operation

13) A Karnaugh map (K-map) is an abstract form of _____ diagram organized as a matrix of squares.
a) Venn Diagram b) Cycle Diagram
c) Block diagram d) Triangular Diagram

14) If A and B are the inputs of a half adder, the sum is given by _____.
a) A AND B b) A OR B
c) A XOR B d) A EX-NOR B

SLR-BD-75

Seat No.	

Set S

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) Explain Standard representation of logic function.
b) Express Boolean function $F = xy + x'z$ as a product of Max-terms.
c) Explain Half Adder with logic diagram.
d) Explain 1:4 De-Multiplexer with truth Table and logic diagram.
e) Explain stepwise procedure for K-map solution.

Q.3 Attempt any two. **12**

a) Explain Binary to Gray conversion in details.
b) Explain Full Adder with suitable diagram
c) Solve using K Map -

$$F\ (A, B, C, D)\ = \sum (0, 2, 5, 7, 8, 10, 13, 15)$$

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic SR Flip-flop using logic gates.
b) Explain D-Flip-Flop with suitable diagram.
c) Differentiate between Synchronous and Asynchronous sequential circuit.
d) Explain PISO shift register.
e) Explain Race-Round condition. How this condition will overcome?

Q.5 Attempt any two. **12**

a) Design MOD-10 Counter.
b) Explain JK Flip flop with suitable diagram, and truth table.
c) Explain 4-bit UP/DOWN counter with suitable diagram.

SLR-BD-76

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Thermocouple generate output voltage according to _____.
a) Circuit parameters b) Humidity
c) Temperature d) Voltage

2) Sensor is a type of transducer.
a) True b) False

3) Which factor affects the least while selection of sensor?
a) Size b) Accuracy
c) Colour d) Durability

4) Which sensor should one prefer for accurate measurement of distance upto 1 meter?
a) Ultrasonic sensor b) Infrared sensor
c) PIR sensor d) Photoresistor sensor

5) IR sensors can't work in dark environment.
a) True b) False

6) Which sensor should be used for calculating humidity?
a) DHT11 b) LM335Z/NOPB
c) HC-SR04 d) MPX10DP

7) What is the primary purpose of a strain gauge?
a) Measure temperature
b) Measure pressure
c) Measure deformation or strain
d) Measure voltage

8) What is a Wheatstone bridge used for in the context of strain gauges?
a) To amplify the signal
b) To convert mechanical strain to a voltage output
c) To filter noise from the signal
d) To measure temperature

9) Signal conditioning is carried out in _____.
a) Transducer housing b) Processor
c) Network interface d) None of the mentioned

10) What principle does a thermocouple operate on?
a) Seebeck effect b) Peltier effect
c) Joule heating d) Hall effect

11) Which material is most commonly used in RTDs for temperature sensing?
a) Copper b) Aluminum
c) Platinum d) Nickel

12) What is the typical temperature range for standard RTDs?
a) -200 to 500 °C b) -50 to 200 °C
c) 0 to 100 °C d) -100 to 1000 °C

13) What type of electrode is commonly used in a pHsensor?
a) Reference electrode b) Glass electrode
c) Metal electrode d) Carbon electrode

14) What is the output of atypical pHsensor?
a) Voltage b) Resistance
c) Current d) Frequency

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any Four. **16**

a) Define Motion Transducer. Explain different types of motion sensor with example.
b) Write a short note on sensor selection.
c) Define Sensor & Transducer. How do they differ from each other?
d) What is Calibration? With the help of block diagram explain procedure of calibration.
e) Explain concept of strain gauge & light intensity.
f) Describe concept of motion transducer in detail.

Q.3 Attempt any two. **12**

a) Discuss the classification of sensor based on Measurand. Provide the example of each type and their application.
b) State the working principle of LDR. Explain the construction & working of it. Also state advantages, disadvantages & application of it.
c) Write a note on:-
1) Temperature sensing
2) Light Intensity
3) Strain gauge
4) Magnetic field Sensor

Section – II

Q.4 Attempt any Four. **16**

a) With the help of neat sketch explain concept of LVDT.
b) Illustrate concept of ultrasonic sensor & Chemical sensor in detail
c) With the help of explain RTD.
d) With the help of neat sketch explain concept of RVDT.
e) Describe the concept of motion transducer.

Q.5 Attempt any two. **12**

a) With the help of neat sketch explain concept of AC Tachometer & DC Tachometer.

b) Define following concepts:

1) Humidity Sensor
2) Vibration Sensor
3) Gas Sensor

c) With the help of neat sketch explain Thermocouple & Thermistor.

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) What is a Wheatstone bridge used for in the context of strain gauges?
a) To amplify the signal
b) To convert mechanical strain to a voltage output
c) To filter noise from the signal
d) To measure temperature

2) Signal conditioning is carried out in _____.
a) Transducer housing b) Processor
c) Network interface d) None of the mentioned

3) What principle does a thermocouple operate on?
a) Seebeck effect b) Peltier effect
c) Joule heating d) Hall effect

4) Which material is most commonly used in RTDs for temperature sensing?
a) Copper b) Aluminum
c) Platinum d) Nickel

5) What is the typical temperature range for standard RTDs?
a) -200 to 500 °C b) -50 to 200 °C
c) 0 to 100 °C d) -100 to 1000 °C

6) What type of electrode is commonly used in a pHsensor?
a) Reference electrode b) Glass electrode
c) Metal electrode d) Carbon electrode

7) What is the output of atypical pHsensor?
a) Voltage b) Resistance
c) Current d) Frequency

8) Thermocouple generate output voltage according to _____.
a) Circuit parameters b) Humidity
c) Temperature d) Voltage

9) Sensor is a type of transducer.
a) True b) False

10) Which factor affects the least while selection of sensor?
a) Size b) Accuracy
c) Colour d) Durability

11) Which sensor should one prefer for accurate measurement of distance upto 1 meter?
a) Ultrasonic sensor b) Infrared sensor
c) PIR sensor d) Photoresistor sensor

12) IR sensors can't work in dark environment.
a) True b) False

13) Which sensor should be used for calculating humidity?
a) DHT11 b) LM335Z/NOPB
c) HC-SR04 d) MPX10DP

14) What is the primary purpose of a strain gauge?
a) Measure temperature
b) Measure pressure
c) Measure deformation or strain
d) Measure voltage

SLR-BD-76

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any Four. **16**

a) Define Motion Transducer. Explain different types of motion sensor with example.
b) Write a short note on sensor selection.
c) Define Sensor & Transducer. How do they differ from each other?
d) What is Calibration? With the help of block diagram explain procedure of calibration.
e) Explain concept of strain gauge & light intensity.
f) Describe concept of motion transducer in detail.

Q.3 Attempt any two. **12**

a) Discuss the classification of sensor based on Measurand. Provide the example of each type and their application.
b) State the working principle of LDR. Explain the construction & working of it. Also state advantages, disadvantages & application of it.
c) Write a note on:-
1) Temperature sensing
2) Light Intensity
3) Strain gauge
4) Magnetic field Sensor

Section – II

Q.4 Attempt any Four. **16**

a) With the help of neat sketch explain concept of LVDT.
b) Illustrate concept of ultrasonic sensor & Chemical sensor in detail
c) With the help of explain RTD.
d) With the help of neat sketch explain concept of RVDT.
e) Describe the concept of motion transducer.

Q.5 Attempt any two. **12**

a) With the help of neat sketch explain concept of AC Tachometer & DC Tachometer.

b) Define following concepts:

1) Humidity Sensor
2) Vibration Sensor
3) Gas Sensor

c) With the help of neat sketch explain Thermocouple & Thermistor.

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which material is most commonly used in RTDs for temperature sensing?
a) Copper b) Aluminum
c) Platinum d) Nickel

2) What is the typical temperature range for standard RTDs?
a) -200 to 500 °C b) -50 to 200 °C
c) 0 to 100 °C d) -100 to 1000 °C

3) What type of electrode is commonly used in a pHsensor?
a) Reference electrode b) Glass electrode
c) Metal electrode d) Carbon electrode

4) What is the output of atypical pHsensor?
a) Voltage b) Resistance
c) Current d) Frequency

5) Thermocouple generate output voltage according to _____.
a) Circuit parameters b) Humidity
c) Temperature d) Voltage

6) Sensor is a type of transducer.
a) True b) False

7) Which factor affects the least while selection of sensor?
a) Size b) Accuracy
c) Colour d) Durability

8) Which sensor should one prefer for accurate measurement of distance upto 1 meter?

a) Ultrasonic sensor
b) Infrared sensor
c) PIR sensor
d) Photoresistor sensor

9) IR sensors can't work in dark environment.

a) True
b) False

10) Which sensor should be used for calculating humidity?

a) DHT11
b) LM335Z/NOPB
c) HC-SR04
d) MPX10DP

11) What is the primary purpose of a strain gauge?

a) Measure temperature
b) Measure pressure
c) Measure deformation or strain
d) Measure voltage

12) What is a Wheatstone bridge used for in the context of strain gauges?

a) To amplify the signal
b) To convert mechanical strain to a voltage output
c) To filter noise from the signal
d) To measure temperature

13) Signal conditioning is carried out in _____.

a) Transducer housing
b) Processor
c) Network interface
d) None of the mentioned

14) What principle does a thermocouple operate on?

a) Seebeck effect
b) Peltier effect
c) Joule heating
d) Hall effect

SLR-BD-76

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any Four. **16**

a) Define Motion Transducer. Explain different types of motion sensor with example.
b) Write a short note on sensor selection.
c) Define Sensor & Transducer. How do they differ from each other?
d) What is Calibration? With the help of block diagram explain procedure of calibration.
e) Explain concept of strain gauge & light intensity.
f) Describe concept of motion transducer in detail.

Q.3 Attempt any two. **12**

a) Discuss the classification of sensor based on Measurand. Provide the example of each type and their application.
b) State the working principle of LDR. Explain the construction & working of it. Also state advantages, disadvantages & application of it.
c) Write a note on:-
1) Temperature sensing
2) Light Intensity
3) Strain gauge
4) Magnetic field Sensor

Section – II

Q.4 Attempt any Four. **16**

a) With the help of neat sketch explain concept of LVDT.
b) Illustrate concept of ultrasonic sensor & Chemical sensor in detail
c) With the help of explain RTD.
d) With the help of neat sketch explain concept of RVDT.
e) Describe the concept of motion transducer.

Q.5 Attempt any two. **12**

a) With the help of neat sketch explain concept of AC Tachometer & DC Tachometer.

b) Define following concepts:

1) Humidity Sensor
2) Vibration Sensor
3) Gas Sensor

c) With the help of neat sketch explain Thermocouple & Thermistor.

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Which sensor should be used for calculating humidity?
a) DHT11 b) LM335Z/NOPB
c) HC-SR04 d) MPX10DP

2) What is the primary purpose of a strain gauge?
a) Measure temperature
b) Measure pressure
c) Measure deformation or strain
d) Measure voltage

3) What is a Wheatstone bridge used for in the context of strain gauges?
a) To amplify the signal
b) To convert mechanical strain to a voltage output
c) To filter noise from the signal
d) To measure temperature

4) Signal conditioning is carried out in _____.
a) Transducer housing b) Processor
c) Network interface d) None of the mentioned

5) What principle does a thermocouple operate on?
a) Seebeck effect b) Peltier effect
c) Joule heating d) Hall effect

6) Which material is most commonly used in RTDs for temperature sensing?
a) Copper b) Aluminum
c) Platinum d) Nickel

7) What is the typical temperature range for standard RTDs?
a) -200 to 500 °C b) -50 to 200 °C
c) 0 to 100 °C d) -100 to 1000 °C

8) What type of electrode is commonly used in a pHsensor?
a) Reference electrode b) Glass electrode
c) Metal electrode d) Carbon electrode

9) What is the output of atypical pHsensor?
a) Voltage b) Resistance
c) Current d) Frequency

10) Thermocouple generate output voltage according to _____.
a) Circuit parameters b) Humidity
c) Temperature d) Voltage

11) Sensor is a type of transducer.
a) True b) False

12) Which factor affects the least while selection of sensor?
a) Size b) Accuracy
c) Colour d) Durability

13) Which sensor should one prefer for accurate measurement of distance upto 1 meter?
a) Ultrasonic sensor b) Infrared sensor
c) PIR sensor d) Photoresistor sensor

14) IR sensors can't work in dark environment.
a) True b) False

SLR-BD-76

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any Four. **16**

a) Define Motion Transducer. Explain different types of motion sensor with example.
b) Write a short note on sensor selection.
c) Define Sensor & Transducer. How do they differ from each other?
d) What is Calibration? With the help of block diagram explain procedure of calibration.
e) Explain concept of strain gauge & light intensity.
f) Describe concept of motion transducer in detail.

Q.3 Attempt any two. **12**

a) Discuss the classification of sensor based on Measurand. Provide the example of each type and their application.
b) State the working principle of LDR. Explain the construction & working of it. Also state advantages, disadvantages & application of it.
c) Write a note on:-
1) Temperature sensing
2) Light Intensity
3) Strain gauge
4) Magnetic field Sensor

Section – II

Q.4 Attempt any Four. **16**

a) With the help of neat sketch explain concept of LVDT.
b) Illustrate concept of ultrasonic sensor & Chemical sensor in detail
c) With the help of explain RTD.
d) With the help of neat sketch explain concept of RVDT.
e) Describe the concept of motion transducer.

Q.5 Attempt any two. **12**

a) With the help of neat sketch explain concept of AC Tachometer & DC Tachometer.

b) Define following concepts:

1) Humidity Sensor
2) Vibration Sensor
3) Gas Sensor

c) With the help of neat sketch explain Thermocouple & Thermistor.

SLR-BD-77

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the output of print(3 * 4.5 // 2)?
a) 5 b) 6
c) 7 d) 8

2) Which data type is mutable in Python?
a) int b) float
c) tuple d) list

3) What is the primary purpose of the Python interpreter?
a) To convert Python code into machine code directly.
b) To compile Python code into a .exe file.
c) To interpret and execute Python code line by line.
d) To optimize Python code for faster execution.

4) How do you import a function myfunc from a module mymodule?
a) import mymodule .myfunc
b) from mymodule import myfunc
c) import myfunc from mymodule
d) from myfunc import mymodule

5) Which statement about tuples in Python is true?
a) Tuples can be modified after creation.
b) Tuples are indexed starting from 1.
c) Tuples use square brackets for element access.
d) Tuples are immutable.

6) Given s = 'Hello World!', what does s[1:5] evaluate to?
a) 'Hell' b) 'ello'
c) 'ello ' d) None of the above

7) Which keyword is used to handle exceptions in Python?

a) catch b) except
c) handle d) recover

8) What does the self parameter represent in Python class methods?

a) It refers to the current instance of the class.
b) It is used to denote private attributes.
c) It is used for method overloading.
d) It refers to the superclass.

9) What does the following code output?

```
class MyClass:
    def greet(self):
    return "Hello!"
obj = MyClass()
print(obj.greet())
```

a) Hello! b) greet
c) Error d) None

10) How do you open a file myfile.txt in read mode in Python?

a) file = open('myfile.txt', 'r')
b) file = open('myfile.txf)
c) file = open('myfile.txt', mode='read')
d) file = open('myfile.txt', mode='w')

11) Which Python library is used for numerical operations and array manipulations?

a) numpy b) math
c) scipy d) statistics

12) Which Python module is commonly used for writing unit tests?

a) unittest b) pytest
c) testing d) check

13) Which module is used to generate pseudo-random numbers in Python?

a) random b) numpy
c) math d) os

14) What is the default logging level in Python?

a) DEBUG b) INFO
c) WARNING d) ERROR

SLR-BD-77

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) What is python interpreter? Explain with neat diagram.
b) Differentiate between list and tuples in python.
c) Write a python program to check whether a given string is palindrome.
d) What are the class and objects in python? Explain with syntax and example.
e) What is exceptional handling in python? How it is implemented using try, except and finally block?

Q.3 Attempt any two. **12**

a) Illustrate following control structures and write syntax for each type of control structure.
1) Decision making statements
2) Iterative statements (Loop control statements)
3) Transfer statements
b) Explain string handling functions with syntax and example.
c) Explain inheritance in python with their types.

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic date and time types with syntax and example.
b) Differentiate between shallow copy and deep copy operations.
c) Write a python program to create a 2D Numpy array and perform basic operations like addition, subtraction, division and multiplication.
d) Implement a program to measure execution time of small code snippets.
e) Explain Logging facility in python with all levels of logging.

Q.5 Attempt any two. **12**

a) Explain mathematical functions and pseudo random functions with syntax and example.
b) Define data persistence and implement program for read & write operations on .csv file.
c) Explain the methods of testing and debugging in python. Explain unit test in python.

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What does the self parameter represent in Python class methods?
a) It refers to the current instance of the class.
b) It is used to denote private attributes.
c) It is used for method overloading.
d) It refers to the superclass.

2) What does the following code output?

```
class MyClass:
    def greet(self):
    return "Hello!"
obj = MyClass()
print(obj.greet())
```

a) Hello! b) greet
c) Error d) None

3) How do you open a file myfile.txt in read mode in Python?
a) file = open('myfile.txt', 'r')
b) file = open('myfile.txf)
c) file = open('myfile.txt', mode='read')
d) file = open('myfile.txt', mode='w')

4) Which Python library is used for numerical operations and array manipulations?
a) numpy b) math
c) scipy d) statistics

5) Which Python module is commonly used for writing unit tests?
a) unittest b) pytest
c) testing d) check

6) Which module is used to generate pseudo-random numbers in Python?

a) random b) numpy
c) math d) os

7) What is the default logging level in Python?

a) DEBUG b) INFO
c) WARNING d) ERROR

8) What is the output of print(3 * 4.5 // 2)?

a) 5 b) 6
c) 7 d) 8

9) Which data type is mutable in Python?

a) int b) float
c) tuple d) list

10) What is the primary purpose of the Python interpreter?

a) To convert Python code into machine code directly.
b) To compile Python code into a .exe file.
c) To interpret and execute Python code line by line.
d) To optimize Python code for faster execution.

11) How do you import a function myfunc from a module mymodule?

a) import mymodule .myfunc
b) from mymodule import myfunc
c) import myfunc from mymodule
d) from myfunc import mymodule

12) Which statement about tuples in Python is true?

a) Tuples can be modified after creation.
b) Tuples are indexed starting from 1.
c) Tuples use square brackets for element access.
d) Tuples are immutable.

13) Given s = 'Hello World!', what does s[1:5] evaluate to?

a) 'Hell' b) 'ello'
c) 'ello ' d) None of the above

14) Which keyword is used to handle exceptions in Python?

a) catch b) except
c) handle d) recover

SLR-BD-77

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) What is python interpreter? Explain with neat diagram.
b) Differentiate between list and tuples in python.
c) Write a python program to check whether a given string is palindrome.
d) What are the class and objects in python? Explain with syntax and example.
e) What is exceptional handling in python? How it is implemented using try, except and finally block?

Q.3 Attempt any two. **12**

a) Illustrate following control structures and write syntax for each type of control structure.
1) Decision making statements
2) Iterative statements (Loop control statements)
3) Transfer statements
b) Explain string handling functions with syntax and example.
c) Explain inheritance in python with their types.

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic date and time types with syntax and example.
b) Differentiate between shallow copy and deep copy operations.
c) Write a python program to create a 2D Numpy array and perform basic operations like addition, subtraction, division and multiplication.
d) Implement a program to measure execution time of small code snippets.
e) Explain Logging facility in python with all levels of logging.

Q.5 Attempt any two. **12**

a) Explain mathematical functions and pseudo random functions with syntax and example.
b) Define data persistence and implement program for read & write operations on .csv file.
c) Explain the methods of testing and debugging in python. Explain unit test in python.

SLR-BD-77

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which Python library is used for numerical operations and array manipulations?
a) numpy b) math
c) scipy d) statistics

2) Which Python module is commonly used for writing unit tests?
a) unittest b) pytest
c) testing d) check

3) Which module is used to generate pseudo-random numbers in Python?
a) random b) numpy
c) math d) os

4) What is the default logging level in Python?
a) DEBUG b) INFO
c) WARNING d) ERROR

5) What is the output of print(3 * 4.5 // 2)?
a) 5 b) 6
c) 7 d) 8

6) Which data type is mutable in Python?
a) int b) float
c) tuple d) list

7) What is the primary purpose of the Python interpreter?
a) To convert Python code into machine code directly.
b) To compile Python code into a .exe file.
c) To interpret and execute Python code line by line.
d) To optimize Python code for faster execution.

8) How do you import a function myfunc from a module mymodule?
a) import mymodule .myfunc
b) from mymodule import myfunc
c) import myfunc from mymodule
d) from myfunc import mymodule

9) Which statement about tuples in Python is true?
a) Tuples can be modified after creation.
b) Tuples are indexed starting from 1.
c) Tuples use square brackets for element access.
d) Tuples are immutable.

10) Given s = 'Hello World!', what does s[1:5] evaluate to?
a) 'Hell' b) 'ello'
c) 'ello ' d) None of the above

11) Which keyword is used to handle exceptions in Python?
a) catch b) except
c) handle d) recover

12) What does the self parameter represent in Python class methods?
a) It refers to the current instance of the class.
b) It is used to denote private attributes.
c) It is used for method overloading.
d) It refers to the superclass.

13) What does the following code output?

```
class MyClass:
    def greet(self):
    return "Hello!"
obj = MyClass()
print(obj.greet())
```

a) Hello! b) greet
c) Error d) None

14) How do you open a file myfile.txt in read mode in Python?
a) file = open('myfile.txt', 'r')
b) file = open('myfile.txf)
c) file = open('myfile.txt', mode='read')
d) file = open('myfile.txt', mode='w')

SLR-BD-77

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) What is python interpreter? Explain with neat diagram.
b) Differentiate between list and tuples in python.
c) Write a python program to check whether a given string is palindrome.
d) What are the class and objects in python? Explain with syntax and example.
e) What is exceptional handling in python? How it is implemented using try, except and finally block?

Q.3 Attempt any two. **12**

a) Illustrate following control structures and write syntax for each type of control structure.
1) Decision making statements
2) Iterative statements (Loop control statements)
3) Transfer statements
b) Explain string handling functions with syntax and example.
c) Explain inheritance in python with their types.

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic date and time types with syntax and example.
b) Differentiate between shallow copy and deep copy operations.
c) Write a python program to create a 2D Numpy array and perform basic operations like addition, subtraction, division and multiplication.
d) Implement a program to measure execution time of small code snippets.
e) Explain Logging facility in python with all levels of logging.

Q.5 Attempt any two. **12**

a) Explain mathematical functions and pseudo random functions with syntax and example.
b) Define data persistence and implement program for read & write operations on .csv file.
c) Explain the methods of testing and debugging in python. Explain unit test in python.

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Given s = 'Hello World!', what does s[1:5] evaluate to?
a) 'Hell' b) 'ello'
c) 'ello ' d) None of the above

2) Which keyword is used to handle exceptions in Python?
a) catch b) except
c) handle d) recover

3) What does the self parameter represent in Python class methods?
a) It refers to the current instance of the class.
b) It is used to denote private attributes.
c) It is used for method overloading.
d) It refers to the superclass.

4) What does the following code output?

```
class MyClass:
    def greet(self):
    return "Hello!"
obj = MyClass()
print(obj.greet())
```

a) Hello! b) greet
c) Error d) None

5) How do you open a file myfile.txt in read mode in Python?
a) file = open('myfile.txt', 'r')
b) file = open('myfile.txf)
c) file = open('myfile.txt', mode='read')
d) file = open('myfile.txt', mode='w')

6) Which Python library is used for numerical operations and array manipulations?

a) numpy b) math
c) scipy d) statistics

7) Which Python module is commonly used for writing unit tests?

a) unittest b) pytest
c) testing d) check

8) Which module is used to generate pseudo-random numbers in Python?

a) random b) numpy
c) math d) os

9) What is the default logging level in Python?

a) DEBUG b) INFO
c) WARNING d) ERROR

10) What is the output of print(3 * 4.5 // 2)?

a) 5 b) 6
c) 7 d) 8

11) Which data type is mutable in Python?

a) int b) float
c) tuple d) list

12) What is the primary purpose of the Python interpreter?

a) To convert Python code into machine code directly.
b) To compile Python code into a .exe file.
c) To interpret and execute Python code line by line.
d) To optimize Python code for faster execution.

13) How do you import a function myfunc from a module mymodule?

a) import mymodule .myfunc
b) from mymodule import myfunc
c) import myfunc from mymodule
d) from myfunc import mymodule

14) Which statement about tuples in Python is true?

a) Tuples can be modified after creation.
b) Tuples are indexed starting from 1.
c) Tuples use square brackets for element access.
d) Tuples are immutable.

SLR-BD-77

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) What is python interpreter? Explain with neat diagram.
b) Differentiate between list and tuples in python.
c) Write a python program to check whether a given string is palindrome.
d) What are the class and objects in python? Explain with syntax and example.
e) What is exceptional handling in python? How it is implemented using try, except and finally block?

Q.3 Attempt any two. **12**

a) Illustrate following control structures and write syntax for each type of control structure.
1) Decision making statements
2) Iterative statements (Loop control statements)
3) Transfer statements
b) Explain string handling functions with syntax and example.
c) Explain inheritance in python with their types.

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic date and time types with syntax and example.
b) Differentiate between shallow copy and deep copy operations.
c) Write a python program to create a 2D Numpy array and perform basic operations like addition, subtraction, division and multiplication.
d) Implement a program to measure execution time of small code snippets.
e) Explain Logging facility in python with all levels of logging.

Q.5 Attempt any two. **12**

a) Explain mathematical functions and pseudo random functions with syntax and example.
b) Define data persistence and implement program for read & write operations on .csv file.
c) Explain the methods of testing and debugging in python. Explain unit test in python.

SLR-BD-78

Seat No.		Set	P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ model is good for well understood problems, short duration project, and automation of existing manual systems.
a) Waterfall b) Iterative enhancement
c) Prototyping d) Spiral

2) Software consists of ____.
a) Set of instructions + operating procedures
b) Set of programs
c) Programs + documentation + operating procedures
d) Programs + hardware manuals

3) SDLC is framework for ____
a) Requirement b) Design
c) Code & Test d) All of above

4) Black box testing is also called as ____.
a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

5) A detailed project schedule is never ____.
a) fixed b) variable
c) dynamic d) static

6) What is the sequence of maturity levels in CMM framework?
a) Initial, defined, repeatable, managed, and optimizing
b) Initial, defined, repeatable, optimizing, and managed
c) Initial, repeatable, defined, managed, and optimizing
d) Initial, repeatable, defined, optimizing, and managed

7) A ____ is logically separable part of program. It is a program unit that is discrete and identifiable with respect to compiling and loading.

a) Component b) Connector
c) Module d) None of above

8) Risk Management aims to ____ and then take action to minimize their effect on project.

a) Identify cost and estimation
b) Identify risks
c) Identify plan
d) All of above

9) The output of requirement process is ____

a) Validated SRS b) Validation
c) Problem analysis d) Verification

10) White Box Testing is also called as ____.

a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

11) Agile Software Development is depends on ____.

a) Incremental Development
b) Iterative Development
c) Linear Development
d) Both Incremental and Iterative Development

12) ____ is a first level of testing.

a) Unit testing b) Integration Testing
c) System Testing d) None of above

13) CMM means ____.

a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

14) Which of the following is/are characteristics of SRS?

a) Unambiguous b) Verifiable
c) Consistent d) All of above

SLR-BD-78

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Solve: (Any Four) **16**

a) Explain Prototype model.
b) What is SRS? Explain characteristics of SRS.
c) Explain Entity Relationship diagram in detail.
d) Write a short note on Function Oriented Design.
e) Explain characteristics of software process.

Q.3 Solve: (Any Two) **12**

a) Define DFD with all notations and levels. Draw Zero level DFD for Hotel Management System.
b) Draw and Explain waterfall model with its strength and weaknesses.
c) Write a short note on high level design & detailed design.

SECTION – II

Q.4 Solve: (Any Two) **16**

a) Compare White and Black box testing.
b) Explain equivalence partitioning technique of black box testing.
c) Explain CMM with diagram.
d) What are levels of testing? Explain Unit Testing in detail.
e) Write a short note on Agile Project Management.

Q.5 Solve: (Any Two) **12**

a) Explain top down & bottom-up effort estimation technique.
b) Explain Software Configuration Management Process.
c) What is Scrum? Explain in detail Scrum methodology.

SLR-BD-78

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Risk Management aims to ____ and then take action to minimize their effect on project.
a) Identify cost and estimation
b) Identify risks
c) Identify plan
d) All of above

2) The output of requirement process is ____
a) Validated SRS b) Validation
c) Problem analysis d) Verification

3) White Box Testing is also called as ____.
a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

4) Agile Software Development is depends on ____.
a) Incremental Development
b) Iterative Development
c) Linear Development
d) Both Incremental and Iterative Development

5) ____ is a first level of testing.
a) Unit testing b) Integration Testing
c) System Testing d) None of above

6) CMM means ____.
a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

7) Which of the following is/are characteristics of SRS?
a) Unambiguous b) Verifiable
c) Consistent d) All of above

8) ____ model is good for well understood problems, short duration project, and automation of existing manual systems.
a) Waterfall b) Iterative enhancement
c) Prototyping d) Spiral

9) Software consists of ____.
a) Set of instructions + operating procedures
b) Set of programs
c) Programs + documentation + operating procedures
d) Programs + hardware manuals

10) SDLC is framework for ____
a) Requirement b) Design
c) Code & Test d) All of above

11) Black box testing is also called as ____.
a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

12) A detailed project schedule is never ____.
a) fixed b) variable
c) dynamic d) static

13) What is the sequence of maturity levels in CMM framework?
a) Initial, defined, repeatable, managed, and optimizing
b) Initial, defined, repeatable, optimizing, and managed
c) Initial, repeatable, defined, managed, and optimizing
d) Initial, repeatable, defined, optimizing, and managed

14) A ____ is logically separable part of program. It is a program unit that is discrete and identifiable with respect to compiling and loading.
a) Component b) Connector
c) Module d) None of above

SLR-BD-78

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Solve: (Any Four) **16**

a) Explain Prototype model.
b) What is SRS? Explain characteristics of SRS.
c) Explain Entity Relationship diagram in detail.
d) Write a short note on Function Oriented Design.
e) Explain characteristics of software process.

Q.3 Solve: (Any Two) **12**

a) Define DFD with all notations and levels. Draw Zero level DFD for Hotel Management System.
b) Draw and Explain waterfall model with its strength and weaknesses.
c) Write a short note on high level design & detailed design.

SECTION – II

Q.4 Solve: (Any Two) **16**

a) Compare White and Black box testing.
b) Explain equivalence partitioning technique of black box testing.
c) Explain CMM with diagram.
d) What are levels of testing? Explain Unit Testing in detail.
e) Write a short note on Agile Project Management.

Q.5 Solve: (Any Two) **12**

a) Explain top down & bottom-up effort estimation technique.
b) Explain Software Configuration Management Process.
c) What is Scrum? Explain in detail Scrum methodology.

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Agile Software Development is depends on ____.
a) Incremental Development
b) Iterative Development
c) Linear Development
d) Both Incremental and Iterative Development

2) ____ is a first level of testing.
a) Unit testing b) Integration Testing
c) System Testing d) None of above

3) CMM means ____.
a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

4) Which of the following is/are characteristics of SRS?
a) Unambiguous b) Verifiable
c) Consistent d) All of above

5) ____ model is good for well understood problems, short duration project, and automation of existing manual systems.
a) Waterfall b) Iterative enhancement
c) Prototyping d) Spiral

6) Software consists of ____.
a) Set of instructions + operating procedures
b) Set of programs
c) Programs + documentation + operating procedures
d) Programs + hardware manuals

7) SDLC is framework for ____
a) Requirement b) Design
c) Code & Test d) All of above

8) Black box testing is also called as ____.
a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

9) A detailed project schedule is never ____.
a) fixed b) variable
c) dynamic d) static

10) What is the sequence of maturity levels in CMM framework?
a) Initial, defined, repeatable, managed, and optimizing
b) Initial, defined, repeatable, optimizing, and managed
c) Initial, repeatable, defined, managed, and optimizing
d) Initial, repeatable, defined, optimizing, and managed

11) A ____ is logically separable part of program. It is a program unit that is discrete and identifiable with respect to compiling and loading.
a) Component b) Connector
c) Module d) None of above

12) Risk Management aims to ____ and then take action to minimize their effect on project.
a) Identify cost and estimation
b) Identify risks
c) Identify plan
d) All of above

13) The output of requirement process is ____
a) Validated SRS b) Validation
c) Problem analysis d) Verification

14) White Box Testing is also called as ____.
a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

SLR-BD-78

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Solve: (Any Four) **16**

a) Explain Prototype model.
b) What is SRS? Explain characteristics of SRS.
c) Explain Entity Relationship diagram in detail.
d) Write a short note on Function Oriented Design.
e) Explain characteristics of software process.

Q.3 Solve: (Any Two) **12**

a) Define DFD with all notations and levels. Draw Zero level DFD for Hotel Management System.
b) Draw and Explain waterfall model with its strength and weaknesses.
c) Write a short note on high level design & detailed design.

SECTION – II

Q.4 Solve: (Any Two) **16**

a) Compare White and Black box testing.
b) Explain equivalence partitioning technique of black box testing.
c) Explain CMM with diagram.
d) What are levels of testing? Explain Unit Testing in detail.
e) Write a short note on Agile Project Management.

Q.5 Solve: (Any Two) **12**

a) Explain top down & bottom-up effort estimation technique.
b) Explain Software Configuration Management Process.
c) What is Scrum? Explain in detail Scrum methodology.

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the sequence of maturity levels in CMM framework?
a) Initial, defined, repeatable, managed, and optimizing
b) Initial, defined, repeatable, optimizing, and managed
c) Initial, repeatable, defined, managed, and optimizing
d) Initial, repeatable, defined, optimizing, and managed

2) A ____ is logically separable part of program. It is a program unit that is discrete and identifiable with respect to compiling and loading.
a) Component b) Connector
c) Module d) None of above

3) Risk Management aims to ____ and then take action to minimize their effect on project.
a) Identify cost and estimation
b) Identify risks
c) Identify plan
d) All of above

4) The output of requirement process is ____
a) Validated SRS b) Validation
c) Problem analysis d) Verification

5) White Box Testing is also called as ____.
a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

6) Agile Software Development is depends on ____.
a) Incremental Development
b) Iterative Development
c) Linear Development
d) Both Incremental and Iterative Development

7) ____ is a first level of testing.
a) Unit testing b) Integration Testing
c) System Testing d) None of above

8) CMM means ____.
a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

9) Which of the following is/are characteristics of SRS?
a) Unambiguous b) Verifiable
c) Consistent d) All of above

10) ____ model is good for well understood problems, short duration project, and automation of existing manual systems.
a) Waterfall b) Iterative enhancement
c) Prototyping d) Spiral

11) Software consists of ____.
a) Set of instructions + operating procedures
b) Set of programs
c) Programs + documentation + operating procedures
d) Programs + hardware manuals

12) SDLC is framework for ____
a) Requirement b) Design
c) Code & Test d) All of above

13) Black box testing is also called as ____.
a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

14) A detailed project schedule is never ____.
a) fixed b) variable
c) dynamic d) static

SLR-BD-78

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Solve: (Any Four) **16**

a) Explain Prototype model.
b) What is SRS? Explain characteristics of SRS.
c) Explain Entity Relationship diagram in detail.
d) Write a short note on Function Oriented Design.
e) Explain characteristics of software process.

Q.3 Solve: (Any Two) **12**

a) Define DFD with all notations and levels. Draw Zero level DFD for Hotel Management System.
b) Draw and Explain waterfall model with its strength and weaknesses.
c) Write a short note on high level design & detailed design.

SECTION – II

Q.4 Solve: (Any Two) **16**

a) Compare White and Black box testing.
b) Explain equivalence partitioning technique of black box testing.
c) Explain CMM with diagram.
d) What are levels of testing? Explain Unit Testing in detail.
e) Write a short note on Agile Project Management.

Q.5 Solve: (Any Two) **12**

a) Explain top down & bottom-up effort estimation technique.
b) Explain Software Configuration Management Process.
c) What is Scrum? Explain in detail Scrum methodology.

SLR-BD-79

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is an advantage of electronic energy meters over induction-type meters?
a) Higher accuracy b) More moving parts
c) More expensive d) Require more maintenance

2) Moving iron instruments have _____.
a) Uniform scale b) Squared scale
c) Log scale d) Linear scale

3) Digital voltmeters convert _____.
a) Analog to digital signal b) Digital to analog signal
c) Current to voltage d) Resistance to voltage

4) In a separately excited DC motor, the field windings are _____.
a) Connected in series with the armature
b) Supplied from an independent source
c) Connected to the same supply as the armature
d) None of above

5) A single-phase induction motor is inherently _____.
a) Self-starting
b) Not self-starting
c) More efficient than a three-phase motor
d) Can operate on both AC and DC supplies

6) The synchronous speed of a synchronous generator is dependent on __.
a) Rotor size
b) Number of poles and frequency
c) Magnetic field strength
d) Load current

7) The synchronous generator operates at _____.
a) A variable speed
b) A constant speed
c) A speed proportional to the load
d) A speed inversely proportional to the load

8) What is the main advantage of a permanent magnet DC motor over a conventional DC motor?
a) No need for a field winding b) Higher efficiency at low speeds
c) Reduced cost of construction d) All of the above

9) Which of the following is an application of PMSMs?
a) Fans b) Electric vehicles
c) HVAC systems d) All of the above

10) What is the purpose of laminated cores in AC machines?
a) Reduce mechanical stress
b) Minimize eddy current losses
c) Increase the resistance of the windings
d) Improve heat dissipation

11) In energy-efficient AC motors, the stator windings are often made of _____.
a) Aluminum b) Copper
c) Steel d) Brass

12) Which of the following does not change in a transformer?
a) Current b) Voltage
c) Frequency d) All of the above

13) When a transformer is loaded, the primary current?
a) Increases b) Decreases
c) Remains constant d) Becomes zero

14) Open circuit test on transformers is conducted to determine _____.
a) hysteresis losses b) copper losses
c) core losses d) eddy current losses

SLR-BD-79

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) With neat sketch explain PMMC type instrument.
b) A 3-phase 500V motor load has a power factor of 0.4 two wattmeter connected to measure input. They show input to be 30 KW. Find the reading of each instrument.
c) With neat sketch explain the construction of DC machine.
d) What is the purpose of the auxiliary winding in a single-phase induction motor?
e) Explain the working principle of a synchronous generator.

Q.3 Attempt any two. **12**

a) Explain 1 - ø induction energy meter with neat diagram.
b) Explain the speed control techniques of separately excited dc motor.
c) Explain the principle of operation of 3ø induction motor. With the help of phasor diagram explain how rotating magnetic field is produced?

Section – II

Q.4 Attempt any Four. **16**

a) Explain with neat sketch construction of permanent magnet brushless DC motor.
b) Explain the principle of operation of a linear induction motor.
c) Discuss the techniques used to reduce iron losses in energy-efficient AC machines.
d) A 230/2300V transformer takes a no-load current of 6.5 A and absorbs 187W if the resistance of the primary is 0.6 Ω. Find.
1) the core loss
2) no load power factor
3) active component of current
4) magnetizing current
e) Derive the expression for saving of copper in autotransformer.

Q.5 Attempt any two. **12**

a) What are the applications of Synchronous Reluctance Motor? Explain with phasor diagram torque speed characteristics of Synchronous Reluctance Motor.

b) An energy-efficient AC motor has the following loss components:
Copper losses: 2 kW
Iron losses: 1.5 kW
Friction and windage losses: 0.5 kW
The input power is 25 kW. Calculate the efficiency of the motor.

c) With neat sketch explain open circuit and short circuit test of transformer. How equivalent circuit parameters and efficiency of a transformer are computed?

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the main advantage of a permanent magnet DC motor over a conventional DC motor?
a) No need for a field winding b) Higher efficiency at low speeds
c) Reduced cost of construction d) All of the above

2) Which of the following is an application of PMSMs?
a) Fans b) Electric vehicles
c) HVAC systems d) All of the above

3) What is the purpose of laminated cores in AC machines?
a) Reduce mechanical stress
b) Minimize eddy current losses
c) Increase the resistance of the windings
d) Improve heat dissipation

4) In energy-efficient AC motors, the stator windings are often made of _____.
a) Aluminum b) Copper
c) Steel d) Brass

5) Which of the following does not change in a transformer?
a) Current b) Voltage
c) Frequency d) All of the above

6) When a transformer is loaded, the primary current?
a) Increases b) Decreases
c) Remains constant d) Becomes zero

7) Open circuit test on transformers is conducted to determine _____.
a) hysteresis losses b) copper losses
c) core losses d) eddy current losses

8) Which of the following is an advantage of electronic energy meters over induction-type meters?
a) Higher accuracy b) More moving parts
c) More expensive d) Require more maintenance

9) Moving iron instruments have _____.
a) Uniform scale b) Squared scale
c) Log scale d) Linear scale

10) Digital voltmeters convert _____.
a) Analog to digital signal b) Digital to analog signal
c) Current to voltage d) Resistance to voltage

11) In a separately excited DC motor, the field windings are _____.
a) Connected in series with the armature
b) Supplied from an independent source
c) Connected to the same supply as the armature
d) None of above

12) A single-phase induction motor is inherently _____.
a) Self-starting
b) Not self-starting
c) More efficient than a three-phase motor
d) Can operate on both AC and DC supplies

13) The synchronous speed of a synchronous generator is dependent on __.
a) Rotor size
b) Number of poles and frequency
c) Magnetic field strength
d) Load current

14) The synchronous generator operates at _____.
a) A variable speed
b) A constant speed
c) A speed proportional to the load
d) A speed inversely proportional to the load

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) With neat sketch explain PMMC type instrument.
b) A 3-phase 500V motor load has a power factor of 0.4 two wattmeter connected to measure input. They show input to be 30 KW. Find the reading of each instrument.
c) With neat sketch explain the construction of DC machine.
d) What is the purpose of the auxiliary winding in a single-phase induction motor?
e) Explain the working principle of a synchronous generator.

Q.3 Attempt any two. **12**

a) Explain 1 - ø induction energy meter with neat diagram.
b) Explain the speed control techniques of separately excited dc motor.
c) Explain the principle of operation of 3ø induction motor. With the help of phasor diagram explain how rotating magnetic field is produced?

Section – II

Q.4 Attempt any Four. **16**

a) Explain with neat sketch construction of permanent magnet brushless DC motor.
b) Explain the principle of operation of a linear induction motor.
c) Discuss the techniques used to reduce iron losses in energy-efficient AC machines.
d) A 230/2300V transformer takes a no-load current of 6.5 A and absorbs 187W if the resistance of the primary is 0.6 Ω. Find.
1) the core loss
2) no load power factor
3) active component of current
4) magnetizing current
e) Derive the expression for saving of copper in autotransformer.

Q.5 Attempt any two. **12**

a) What are the applications of Synchronous Reluctance Motor? Explain with phasor diagram torque speed characteristics of Synchronous Reluctance Motor.

b) An energy-efficient AC motor has the following loss components:
Copper losses: 2 kW
Iron losses: 1.5 kW
Friction and windage losses: 0.5 kW
The input power is 25 kW. Calculate the efficiency of the motor.

c) With neat sketch explain open circuit and short circuit test of transformer. How equivalent circuit parameters and efficiency of a transformer are computed?

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) In energy-efficient AC motors, the stator windings are often made of _____.
a) Aluminum b) Copper
c) Steel d) Brass

2) Which of the following does not change in a transformer?
a) Current b) Voltage
c) Frequency d) All of the above

3) When a transformer is loaded, the primary current?
a) Increases b) Decreases
c) Remains constant d) Becomes zero

4) Open circuit test on transformers is conducted to determine _____.
a) hysteresis losses b) copper losses
c) core losses d) eddy current losses

5) Which of the following is an advantage of electronic energy meters over induction-type meters?
a) Higher accuracy b) More moving parts
c) More expensive d) Require more maintenance

6) Moving iron instruments have _____.
a) Uniform scale b) Squared scale
c) Log scale d) Linear scale

7) Digital voltmeters convert _____.
a) Analog to digital signal b) Digital to analog signal
c) Current to voltage d) Resistance to voltage

8) In a separately excited DC motor, the field windings are _____.
a) Connected in series with the armature
b) Supplied from an independent source
c) Connected to the same supply as the armature
d) None of above

9) A single-phase induction motor is inherently _____.
a) Self-starting
b) Not self-starting
c) More efficient than a three-phase motor
d) Can operate on both AC and DC supplies

10) The synchronous speed of a synchronous generator is dependent on __.
a) Rotor size
b) Number of poles and frequency
c) Magnetic field strength
d) Load current

11) The synchronous generator operates at _____.
a) A variable speed
b) A constant speed
c) A speed proportional to the load
d) A speed inversely proportional to the load

12) What is the main advantage of a permanent magnet DC motor over a conventional DC motor?
a) No need for a field winding b) Higher efficiency at low speeds
c) Reduced cost of construction d) All of the above

13) Which of the following is an application of PMSMs?
a) Fans b) Electric vehicles
c) HVAC systems d) All of the above

14) What is the purpose of laminated cores in AC machines?
a) Reduce mechanical stress
b) Minimize eddy current losses
c) Increase the resistance of the windings
d) Improve heat dissipation

SLR-BD-79

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) With neat sketch explain PMMC type instrument.
b) A 3-phase 500V motor load has a power factor of 0.4 two wattmeter connected to measure input. They show input to be 30 KW. Find the reading of each instrument.
c) With neat sketch explain the construction of DC machine.
d) What is the purpose of the auxiliary winding in a single-phase induction motor?
e) Explain the working principle of a synchronous generator.

Q.3 Attempt any two. **12**

a) Explain 1 - ø induction energy meter with neat diagram.
b) Explain the speed control techniques of separately excited dc motor.
c) Explain the principle of operation of 3ø induction motor. With the help of phasor diagram explain how rotating magnetic field is produced?

Section – II

Q.4 Attempt any Four. **16**

a) Explain with neat sketch construction of permanent magnet brushless DC motor.
b) Explain the principle of operation of a linear induction motor.
c) Discuss the techniques used to reduce iron losses in energy-efficient AC machines.
d) A 230/2300V transformer takes a no-load current of 6.5 A and absorbs 187W if the resistance of the primary is 0.6 Ω. Find.
1) the core loss
2) no load power factor
3) active component of current
4) magnetizing current
e) Derive the expression for saving of copper in autotransformer.

Q.5 Attempt any two. **12**

a) What are the applications of Synchronous Reluctance Motor? Explain with phasor diagram torque speed characteristics of Synchronous Reluctance Motor.

b) An energy-efficient AC motor has the following loss components:
Copper losses: 2 kW
Iron losses: 1.5 kW
Friction and windage losses: 0.5 kW
The input power is 25 kW. Calculate the efficiency of the motor.

c) With neat sketch explain open circuit and short circuit test of transformer. How equivalent circuit parameters and efficiency of a transformer are computed?

SLR-BD-79

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) The synchronous speed of a synchronous generator is dependent on __.
a) Rotor size
b) Number of poles and frequency
c) Magnetic field strength
d) Load current

2) The synchronous generator operates at _____.
a) A variable speed
b) A constant speed
c) A speed proportional to the load
d) A speed inversely proportional to the load

3) What is the main advantage of a permanent magnet DC motor over a conventional DC motor?
a) No need for a field winding b) Higher efficiency at low speeds
c) Reduced cost of construction d) All of the above

4) Which of the following is an application of PMSMs?
a) Fans b) Electric vehicles
c) HVAC systems d) All of the above

5) What is the purpose of laminated cores in AC machines?
a) Reduce mechanical stress
b) Minimize eddy current losses
c) Increase the resistance of the windings
d) Improve heat dissipation

6) In energy-efficient AC motors, the stator windings are often made of _____.
a) Aluminum b) Copper
c) Steel d) Brass

7) Which of the following does not change in a transformer?
a) Current b) Voltage
c) Frequency d) All of the above

8) When a transformer is loaded, the primary current?
a) Increases b) Decreases
c) Remains constant d) Becomes zero

9) Open circuit test on transformers is conducted to determine _____.
a) hysteresis losses b) copper losses
c) core losses d) eddy current losses

10) Which of the following is an advantage of electronic energy meters over induction-type meters?
a) Higher accuracy b) More moving parts
c) More expensive d) Require more maintenance

11) Moving iron instruments have _____.
a) Uniform scale b) Squared scale
c) Log scale d) Linear scale

12) Digital voltmeters convert _____.
a) Analog to digital signal b) Digital to analog signal
c) Current to voltage d) Resistance to voltage

13) In a separately excited DC motor, the field windings are _____.
a) Connected in series with the armature
b) Supplied from an independent source
c) Connected to the same supply as the armature
d) None of above

14) A single-phase induction motor is inherently _____.
a) Self-starting
b) Not self-starting
c) More efficient than a three-phase motor
d) Can operate on both AC and DC supplies

SLR-BD-79

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) With neat sketch explain PMMC type instrument.
b) A 3-phase 500V motor load has a power factor of 0.4 two wattmeter connected to measure input. They show input to be 30 KW. Find the reading of each instrument.
c) With neat sketch explain the construction of DC machine.
d) What is the purpose of the auxiliary winding in a single-phase induction motor?
e) Explain the working principle of a synchronous generator.

Q.3 Attempt any two. **12**

a) Explain 1 - ø induction energy meter with neat diagram.
b) Explain the speed control techniques of separately excited dc motor.
c) Explain the principle of operation of 3ø induction motor. With the help of phasor diagram explain how rotating magnetic field is produced?

Section – II

Q.4 Attempt any Four. **16**

a) Explain with neat sketch construction of permanent magnet brushless DC motor.
b) Explain the principle of operation of a linear induction motor.
c) Discuss the techniques used to reduce iron losses in energy-efficient AC machines.
d) A 230/2300V transformer takes a no-load current of 6.5 A and absorbs 187W if the resistance of the primary is 0.6 Ω. Find.
1) the core loss
2) no load power factor
3) active component of current
4) magnetizing current
e) Derive the expression for saving of copper in autotransformer.

Q.5 Attempt any two. **12**

a) What are the applications of Synchronous Reluctance Motor? Explain with phasor diagram torque speed characteristics of Synchronous Reluctance Motor.

b) An energy-efficient AC motor has the following loss components:
Copper losses: 2 kW
Iron losses: 1.5 kW
Friction and windage losses: 0.5 kW
The input power is 25 kW. Calculate the efficiency of the motor.

c) With neat sketch explain open circuit and short circuit test of transformer. How equivalent circuit parameters and efficiency of a transformer are computed?

SLR-BD-80

Seat No.		Set	P

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is an electric vehicle?
a) Vehicle powered by gasoline
b) Vehicle powered by Electricity
c) Vehicle powered by Diesel
d) Vehicle powered by solar energy

2) What is the function of electric motor in an EV?
a) To charge the battery b) To power the wheels
c) To generate electricity d) To cool the vehicle

3) What is the purpose of battery management system (BMS) in an EV?
a) To monitor and control the battery's state of charge
b) To power the electric motor
c) To generate electricity
d) To cool the vehicle

4) What is the primary advantage of hybrid electric vehicle?
a) Increase driving range
b) Decreased operating cost
c) Reduced Greenhouse gas emissions
d) All of above

5) What type of battery is commonly used in Battery Electric Vehicles?
a) Lead -acid battery b) Nickel- metal hybrid battery
c) Lithium- ion battery d) All of above

6) Which is the types of electric vehicle charging?
a) Level one charging b) Level two charging
c) DC fast charging d) All of the above

7) Which of the following affects battery lifespan?
a) Depth of discharge (DOD) b) Temperature
c) Charging Frequency d) All of above

8) What type of fuel do Fuel Cell Electric Vehicles use?
a) Gasoline b) Diesel
c) Hydrogen d) Natural gas

9) What is the primary cause of battery degradation?
a) Overcharge b) Undercharge
c) Depth of discharge d) High temperature

10) How does battery storage system help in grid stability?
a) By supplying reactive power
b) By absorbing excess energy
c) By providing frequency regulation
d) All of above

11) Which of the following is the benefit of Electric Vehicles?
a) Zero emission b) Lower operating cost
c) Improved performance d) All of above

12) What is the purpose of power electronic controller in electric vehicle?
a) To regulate the flow of electrical energy
b) To monitor the vehicles speed
c) To control the onboard charger
d) To regulate the battery's state of charge

13) What is the purpose of equalization in battery Storage?
a) To balance cell voltage b) To increase battery capacity
c) To reduce charging time d) To improve discharge rate

14) What is the primary function of the on board charger in electric vehicle?
a) To charge the battery from an external power source
b) To convert AC power to DC power
c) To regulate battery's state of charge
d) To monitor the vehicles speed

SLR-BD-80

Seat No.	

Set P

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four **16**

a) State and explain challenges faced by Hybrid electric vehicle.
b) State and explain Economics and Environmental impacts of using electrical vehicles.
c) State and explain need of Electrical Vehicle.
d) State and Explain common part between ICE and EV drivetrain.
e) State and explain battery pack and battery management system.

Q.3 Attempt any two. **12**

a) State and explain major requirements of electrical vehicles.
b) State and explain types of electric vehicles in brief.
c) State and explain electric vehicle configuration in brief.

Section – II

Q.4 Attempt any Four. **16**

a) State and explain battery based energy storage system.
b) State and Explain components of HEVs drive train system.
c) State and explain alternative novel energy source solar photovoltaic cells, fuel cells, super capacitors and flywheels.
d) State and explain HEVs basic architecture.
e) Compare between Hybrid electric vehicle and Fuel cell electric vehicle.

Q.5 Attempt any two. **12**

a) State and explain overview of batteries and battery parameters, battery charging, regenerative braking.
b) State and Explain classification of HEVs: Conventional HEVs, Grid able HEVs.
c) State and explain fuel efficiency in HEV.

SLR-BD-80

Seat No.	

Set Q

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What type of fuel do Fuel Cell Electric Vehicles use?
a) Gasoline b) Diesel
c) Hydrogen d) Natural gas

2) What is the primary cause of battery degradation?
a) Overcharge b) Undercharge
c) Depth of discharge d) High temperature

3) How does battery storage system help in grid stability?
a) By supplying reactive power
b) By absorbing excess energy
c) By providing frequency regulation
d) All of above

4) Which of the following is the benefit of Electric Vehicles?
a) Zero emission b) Lower operating cost
c) Improved performance d) All of above

5) What is the purpose of power electronic controller in electric vehicle?
a) To regulate the flow of electrical energy
b) To monitor the vehicles speed
c) To control the onboard charger
d) To regulate the battery's state of charge

6) What is the purpose of equalization in battery Storage?
a) To balance cell voltage b) To increase battery capacity
c) To reduce charging time d) To improve discharge rate

7) What is the primary function of the on board charger in electric vehicle?
a) To charge the battery from an external power source
b) To convert AC power to DC power
c) To regulate battery's state of charge
d) To monitor the vehicles speed

8) What is an electric vehicle?
a) Vehicle powered by gasoline
b) Vehicle powered by Electricity
c) Vehicle powered by Diesel
d) Vehicle powered by solar energy

9) What is the function of electric motor in an EV?
a) To charge the battery b) To power the wheels
c) To generate electricity d) To cool the vehicle

10) What is the purpose of battery management system (BMS) in an EV?
a) To monitor and control the battery's state of charge
b) To power the electric motor
c) To generate electricity
d) To cool the vehicle

11) What is the primary advantage of hybrid electric vehicle?
a) Increase driving range
b) Decreased operating cost
c) Reduced Greenhouse gas emissions
d) All of above

12) What type of battery is commonly used in Battery Electric Vehicles?
a) Lead -acid battery b) Nickel- metal hybrid battery
c) Lithium- ion battery d) All of above

13) Which is the types of electric vehicle charging?
a) Level one charging b) Level two charging
c) DC fast charging d) All of the above

14) Which of the following affects battery lifespan?
a) Depth of discharge (DOD) b) Temperature
c) Charging Frequency d) All of above

SLR-BD-80

Seat No.	

Set Q

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four **16**

a) State and explain challenges faced by Hybrid electric vehicle.
b) State and explain Economics and Environmental impacts of using electrical vehicles.
c) State and explain need of Electrical Vehicle.
d) State and Explain common part between ICE and EV drivetrain.
e) State and explain battery pack and battery management system.

Q.3 Attempt any two. **12**

a) State and explain major requirements of electrical vehicles.
b) State and explain types of electric vehicles in brief.
c) State and explain electric vehicle configuration in brief.

Section – II

Q.4 Attempt any Four. **16**

a) State and explain battery based energy storage system.
b) State and Explain components of HEVs drive train system.
c) State and explain alternative novel energy source solar photovoltaic cells, fuel cells, super capacitors and flywheels.
d) State and explain HEVs basic architecture.
e) Compare between Hybrid electric vehicle and Fuel cell electric vehicle.

Q.5 Attempt any two. **12**

a) State and explain overview of batteries and battery parameters, battery charging, regenerative braking.
b) State and Explain classification of HEVs: Conventional HEVs, Grid able HEVs.
c) State and explain fuel efficiency in HEV.

SLR-BD-80

Seat No.	

Set R

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is the benefit of Electric Vehicles?
a) Zero emission b) Lower operating cost
c) Improved performance d) All of above

2) What is the purpose of power electronic controller in electric vehicle?
a) To regulate the flow of electrical energy
b) To monitor the vehicles speed
c) To control the onboard charger
d) To regulate the battery's state of charge

3) What is the purpose of equalization in battery Storage?
a) To balance cell voltage b) To increase battery capacity
c) To reduce charging time d) To improve discharge rate

4) What is the primary function of the on board charger in electric vehicle?
a) To charge the battery from an external power source
b) To convert AC power to DC power
c) To regulate battery's state of charge
d) To monitor the vehicles speed

5) What is an electric vehicle?
a) Vehicle powered by gasoline
b) Vehicle powered by Electricity
c) Vehicle powered by Diesel
d) Vehicle powered by solar energy

6) What is the function of electric motor in an EV?
a) To charge the battery b) To power the wheels
c) To generate electricity d) To cool the vehicle

7) What is the purpose of battery management system (BMS) in an EV?
a) To monitor and control the battery's state of charge
b) To power the electric motor
c) To generate electricity
d) To cool the vehicle

8) What is the primary advantage of hybrid electric vehicle?
a) Increase driving range
b) Decreased operating cost
c) Reduced Greenhouse gas emissions
d) All of above

9) What type of battery is commonly used in Battery Electric Vehicles?
a) Lead -acid battery b) Nickel- metal hybrid battery
c) Lithium- ion battery d) All of above

10) Which is the types of electric vehicle charging?
a) Level one charging b) Level two charging
c) DC fast charging d) All of the above

11) Which of the following affects battery lifespan?
a) Depth of discharge (DOD) b) Temperature
c) Charging Frequency d) All of above

12) What type of fuel do Fuel Cell Electric Vehicles use?
a) Gasoline b) Diesel
c) Hydrogen d) Natural gas

13) What is the primary cause of battery degradation?
a) Overcharge b) Undercharge
c) Depth of discharge d) High temperature

14) How does battery storage system help in grid stability?
a) By supplying reactive power
b) By absorbing excess energy
c) By providing frequency regulation
d) All of above

SLR-BD-80

Seat No.	

Set R

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four **16**

a) State and explain challenges faced by Hybrid electric vehicle.
b) State and explain Economics and Environmental impacts of using electrical vehicles.
c) State and explain need of Electrical Vehicle.
d) State and Explain common part between ICE and EV drivetrain.
e) State and explain battery pack and battery management system.

Q.3 Attempt any two. **12**

a) State and explain major requirements of electrical vehicles.
b) State and explain types of electric vehicles in brief.
c) State and explain electric vehicle configuration in brief.

Section – II

Q.4 Attempt any Four. **16**

a) State and explain battery based energy storage system.
b) State and Explain components of HEVs drive train system.
c) State and explain alternative novel energy source solar photovoltaic cells, fuel cells, super capacitors and flywheels.
d) State and explain HEVs basic architecture.
e) Compare between Hybrid electric vehicle and Fuel cell electric vehicle.

Q.5 Attempt any two. **12**

a) State and explain overview of batteries and battery parameters, battery charging, regenerative braking.
b) State and Explain classification of HEVs: Conventional HEVs, Grid able HEVs.
c) State and explain fuel efficiency in HEV.

SLR-BD-80

Seat No.		Set	S

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which is the types of electric vehicle charging?
a) Level one charging b) Level two charging
c) DC fast charging d) All of the above

2) Which of the following affects battery lifespan?
a) Depth of discharge (DOD) b) Temperature
c) Charging Frequency d) All of above

3) What type of fuel do Fuel Cell Electric Vehicles use?
a) Gasoline b) Diesel
c) Hydrogen d) Natural gas

4) What is the primary cause of battery degradation?
a) Overcharge b) Undercharge
c) Depth of discharge d) High temperature

5) How does battery storage system help in grid stability?
a) By supplying reactive power
b) By absorbing excess energy
c) By providing frequency regulation
d) All of above

6) Which of the following is the benefit of Electric Vehicles?
a) Zero emission b) Lower operating cost
c) Improved performance d) All of above

7) What is the purpose of power electronic controller in electric vehicle?
a) To regulate the flow of electrical energy
b) To monitor the vehicles speed
c) To control the onboard charger
d) To regulate the battery's state of charge

8) What is the purpose of equalization in battery Storage?
a) To balance cell voltage
b) To increase battery capacity
c) To reduce charging time
d) To improve discharge rate

9) What is the primary function of the on board charger in electric vehicle?
a) To charge the battery from an external power source
b) To convert AC power to DC power
c) To regulate battery's state of charge
d) To monitor the vehicles speed

10) What is an electric vehicle?
a) Vehicle powered by gasoline
b) Vehicle powered by Electricity
c) Vehicle powered by Diesel
d) Vehicle powered by solar energy

11) What is the function of electric motor in an EV?
a) To charge the battery
b) To power the wheels
c) To generate electricity
d) To cool the vehicle

12) What is the purpose of battery management system (BMS) in an EV?
a) To monitor and control the battery's state of charge
b) To power the electric motor
c) To generate electricity
d) To cool the vehicle

13) What is the primary advantage of hybrid electric vehicle?
a) Increase driving range
b) Decreased operating cost
c) Reduced Greenhouse gas emissions
d) All of above

14) What type of battery is commonly used in Battery Electric Vehicles?
a) Lead -acid battery
b) Nickel- metal hybrid battery
c) Lithium- ion battery
d) All of above

SLR-BD-80

Seat No.	

Set S

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four **16**

a) State and explain challenges faced by Hybrid electric vehicle.
b) State and explain Economics and Environmental impacts of using electrical vehicles.
c) State and explain need of Electrical Vehicle.
d) State and Explain common part between ICE and EV drivetrain.
e) State and explain battery pack and battery management system.

Q.3 Attempt any two. **12**

a) State and explain major requirements of electrical vehicles.
b) State and explain types of electric vehicles in brief.
c) State and explain electric vehicle configuration in brief.

Section – II

Q.4 Attempt any Four. **16**

a) State and explain battery based energy storage system.
b) State and Explain components of HEVs drive train system.
c) State and explain alternative novel energy source solar photovoltaic cells, fuel cells, super capacitors and flywheels.
d) State and explain HEVs basic architecture.
e) Compare between Hybrid electric vehicle and Fuel cell electric vehicle.

Q.5 Attempt any two. **12**

a) State and explain overview of batteries and battery parameters, battery charging, regenerative braking.
b) State and Explain classification of HEVs: Conventional HEVs, Grid able HEVs.
c) State and explain fuel efficiency in HEV.

SLR-BD-81

Seat No.		Set	P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Industrial Robotics (MechHon-01A)

Day & Date: Friday 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Work envelope generated by Cartesian coordinate robot is _____.
a) sphere b) cylinder
c) rectangular box d) triangle

2) In which scenario would a legged robot be more suitable than a wheeled robot?
a) Racing on a paved track
b) Navigating uneven terrain with obstacles
c) Transporting heavy payloads over long distances
d) Delivering packages in a warehouse with smooth floors

3) The four basic configurations that can be combined to produce a variety of robotic combinations are Cartesian, articulated, cylindrical and _____.
a) octagonal b) cobot
c) spherical d) square

4) The main objective(s)of Industrial robot is to _____.
a) To minimize the labour requirement
b) To increase productivity
c) To enhance the life of production machines
d) All of the above

5) Precision, speed control and dexterity in robots warrants the use of actuators _____.
a) pneumatic b) hydraulic
c) hybrid d) electric

6) Which type of position can be determined by a position sensor?
a) Mechanical position b) Lateral position
c) Prone position d) Lithotomy position

7) The process of finding the position of the end effectors when the joint variables are known is called _____.

a) Forward Kinematics b) Inverse Kinematics
c) Forward Dynamics d) Inverse Dynamics

8) Pick the configuration which is specifically designed for high-speed Assembly operations _____.

a) SCARA b) Cartesian
c) Cylindrical d) Spherical

9) What is the function of a sensor?

a) To convert physical quantities into electrical signals
b) To convert electrical signals into physical quantities
c) To measure the speed of a moving objects
d) To control the temperature of a system

10) What is the primary function of a LiDAR sensor in robotics?

a) Object manipulation b) Navigation and mapping
c) Tactile feedback d) Speech recognition

11) What is the standard form of PTP?

a) Point to path b) Point to point
c) Path to point d) Path to Path

12) Which programming language is commonly used in robotics?

a) Java b) Python
c) C++ d) All of the above

13) The _____ of a manipulator is a measure of how close the manipulator can come to a given point within its workspace.

a) accuracy b) repeatability
c) efficiency d) resolution

14) Which type of robot is commonly used for tasks in hazardous environments?

a) Industrial Robot b) Aerial Robot
c) Search and Rescue Robot d) Humanoid Robot

SLR-BD-81

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Industrial Robotics (MechHon-01A)

Day & Date: Friday 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each Section I & Section II.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Attempt the following. **14**
a) Define robot and explain basic components of robots with functions?
b) What is an AGV? Discuss are the different navigation techniques used for industrial AGVs.

Q.3 Attempt the following. **14**
a) Explain linear and absolute rotary encoders used in robots.
b) Compare hydraulic, pneumatic and electric actuators used in robotics in detail?

Q.4 Attempt the following. **14**
a) Write a note on End Effectors design and Selection criteria.
b) Explain in detail classification of end effectors.

Section – II

Q.5 Attempt the following. **14**
a) Explain Dynamic models of two-axis planar robots.
b) Derive forward kinematics equation for 2 DOF planar system.

Q.6 Attempt the following. **14**
a) Explain with neat block diagram force control and PID control adaptive control.
b) Explain Trajectory planning and enlist issue with Trajectory Planning.

Q.7 Attempt the following. **14**
a) What are the general considerations for selecting robots for electronic assembly application?
b) What are the general considerations for selecting robots for spot welding application?

SLR-BD-81

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Industrial Robotics (MechHon-01A)

Day & Date: Friday 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Pick the configuration which is specifically designed for high-speed Assembly operations _____.
a) SCARA b) Cartesian
c) Cylindrical d) Spherical

2) What is the function of a sensor?
a) To convert physical quantities into electrical signals
b) To convert electrical signals into physical quantities
c) To measure the speed of a moving objects
d) To control the temperature of a system

3) What is the primary function of a LiDAR sensor in robotics?
a) Object manipulation b) Navigation and mapping
c) Tactile feedback d) Speech recognition

4) What is the standard form of PTP?
a) Point to path b) Point to point
c) Path to point d) Path to Path

5) Which programming language is commonly used in robotics?
a) Java b) Python
c) C++ d) All of the above

6) The _____ of a manipulator is a measure of how close the manipulator can come to a given point within its workspace.
a) accuracy b) repeatability
c) efficiency d) resolution

7) Which type of robot is commonly used for tasks in hazardous environments?

a) Industrial Robot b) Aerial Robot
c) Search and Rescue Robot d) Humanoid Robot

8) Work envelope generated by Cartesian coordinate robot is _____.

a) sphere b) cylinder
c) rectangular box d) triangle

9) In which scenario would a legged robot be more suitable than a wheeled robot?

a) Racing on a paved track
b) Navigating uneven terrain with obstacles
c) Transporting heavy payloads over long distances
d) Delivering packages in a warehouse with smooth floors

10) The four basic configurations that can be combined to produce a variety of robotic combinations are Cartesian, articulated, cylindrical and _____.

a) octagonal b) cobot
c) spherical d) square

11) The main objective(s)of Industrial robot is to _____.

a) To minimize the labour requirement
b) To increase productivity
c) To enhance the life of production machines
d) All of the above

12) Precision, speed control and dexterity in robots warrants the use of actuators _____.

a) pneumatic b) hydraulic
c) hybrid d) electric

13) Which type of position can be determined by a position sensor?

a) Mechanical position b) Lateral position
c) Prone position d) Lithotomy position

14) The process of finding the position of the end effectors when the joint variables are known is called _____.

a) Forward Kinematics b) Inverse Kinematics
c) Forward Dynamics d) Inverse Dynamics

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Industrial Robotics (MechHon-01A)

Day & Date: Friday 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each Section I & Section II.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Attempt the following. **14**
a) Define robot and explain basic components of robots with functions?
b) What is an AGV? Discuss are the different navigation techniques used for industrial AGVs.

Q.3 Attempt the following. **14**
a) Explain linear and absolute rotary encoders used in robots.
b) Compare hydraulic, pneumatic and electric actuators used in robotics in detail?

Q.4 Attempt the following. **14**
a) Write a note on End Effectors design and Selection criteria.
b) Explain in detail classification of end effectors.

Section – II

Q.5 Attempt the following. **14**
a) Explain Dynamic models of two-axis planar robots.
b) Derive forward kinematics equation for 2 DOF planar system.

Q.6 Attempt the following. **14**
a) Explain with neat block diagram force control and PID control adaptive control.
b) Explain Trajectory planning and enlist issue with Trajectory Planning.

Q.7 Attempt the following. **14**
a) What are the general considerations for selecting robots for electronic assembly application?
b) What are the general considerations for selecting robots for spot welding application?

SLR-BD-81

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Industrial Robotics (MechHon-01A)

Day & Date: Friday 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the standard form of PTP?
a) Point to path b) Point to point
c) Path to point d) Path to Path

2) Which programming language is commonly used in robotics?
a) Java b) Python
c) C++ d) All of the above

3) The _____ of a manipulator is a measure of how close the manipulator can come to a given point within its workspace.
a) accuracy b) repeatability
c) efficiency d) resolution

4) Which type of robot is commonly used for tasks in hazardous environments?
a) Industrial Robot b) Aerial Robot
c) Search and Rescue Robot d) Humanoid Robot

5) Work envelope generated by Cartesian coordinate robot is _____.
a) sphere b) cylinder
c) rectangular box d) triangle

6) In which scenario would a legged robot be more suitable than a wheeled robot?
a) Racing on a paved track
b) Navigating uneven terrain with obstacles
c) Transporting heavy payloads over long distances
d) Delivering packages in a warehouse with smooth floors

7) The four basic configurations that can be combined to produce a variety of robotic combinations are Cartesian, articulated, cylindrical and _____.

a) octagonal b) cobot
c) spherical d) square

8) The main objective(s)of Industrial robot is to _____.

a) To minimize the labour requirement
b) To increase productivity
c) To enhance the life of production machines
d) All of the above

9) Precision, speed control and dexterity in robots warrants the use of actuators _____.

a) pneumatic b) hydraulic
c) hybrid d) electric

10) Which type of position can be determined by a position sensor?

a) Mechanical position b) Lateral position
c) Prone position d) Lithotomy position

11) The process of finding the position of the end effectors when the joint variables are known is called _____.

a) Forward Kinematics b) Inverse Kinematics
c) Forward Dynamics d) Inverse Dynamics

12) Pick the configuration which is specifically designed for high-speed Assembly operations _____.

a) SCARA b) Cartesian
c) Cylindrical d) Spherical

13) What is the function of a sensor?

a) To convert physical quantities into electrical signals
b) To convert electrical signals into physical quantities
c) To measure the speed of a moving objects
d) To control the temperature of a system

14) What is the primary function of a LiDAR sensor in robotics?

a) Object manipulation b) Navigation and mapping
c) Tactile feedback d) Speech recognition

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Industrial Robotics (MechHon-01A)

Day & Date: Friday 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each Section I & Section II.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Attempt the following. **14**
a) Define robot and explain basic components of robots with functions?
b) What is an AGV? Discuss are the different navigation techniques used for industrial AGVs.

Q.3 Attempt the following. **14**
a) Explain linear and absolute rotary encoders used in robots.
b) Compare hydraulic, pneumatic and electric actuators used in robotics in detail?

Q.4 Attempt the following. **14**
a) Write a note on End Effectors design and Selection criteria.
b) Explain in detail classification of end effectors.

Section – II

Q.5 Attempt the following. **14**
a) Explain Dynamic models of two-axis planar robots.
b) Derive forward kinematics equation for 2 DOF planar system.

Q.6 Attempt the following. **14**
a) Explain with neat block diagram force control and PID control adaptive control.
b) Explain Trajectory planning and enlist issue with Trajectory Planning.

Q.7 Attempt the following. **14**
a) What are the general considerations for selecting robots for electronic assembly application?
b) What are the general considerations for selecting robots for spot welding application?

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Industrial Robotics (MechHon-01A)

Day & Date: Friday 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which type of position can be determined by a position sensor?
a) Mechanical position b) Lateral position
c) Prone position d) Lithotomy position

2) The process of finding the position of the end effectors when the joint variables are known is called _____.
a) Forward Kinematics b) Inverse Kinematics
c) Forward Dynamics d) Inverse Dynamics

3) Pick the configuration which is specifically designed for high-speed Assembly operations _____.
a) SCARA b) Cartesian
c) Cylindrical d) Spherical

4) What is the function of a sensor?
a) To convert physical quantities into electrical signals
b) To convert electrical signals into physical quantities
c) To measure the speed of a moving objects
d) To control the temperature of a system

5) What is the primary function of a LiDAR sensor in robotics?
a) Object manipulation b) Navigation and mapping
c) Tactile feedback d) Speech recognition

6) What is the standard form of PTP?
a) Point to path b) Point to point
c) Path to point d) Path to Path

7) Which programming language is commonly used in robotics?
a) Java b) Python
c) C++ d) All of the above

8) The _____ of a manipulator is a measure of how close the manipulator can come to a given point within its workspace.

a) accuracy b) repeatability
c) efficiency d) resolution

9) Which type of robot is commonly used for tasks in hazardous environments?

a) Industrial Robot b) Aerial Robot
c) Search and Rescue Robot d) Humanoid Robot

10) Work envelope generated by Cartesian coordinate robot is _____.

a) sphere b) cylinder
c) rectangular box d) triangle

11) In which scenario would a legged robot be more suitable than a wheeled robot?

a) Racing on a paved track
b) Navigating uneven terrain with obstacles
c) Transporting heavy payloads over long distances
d) Delivering packages in a warehouse with smooth floors

12) The four basic configurations that can be combined to produce a variety of robotic combinations are Cartesian, articulated, cylindrical and _____.

a) octagonal b) cobot
c) spherical d) square

13) The main objective(s)of Industrial robot is to _____.

a) To minimize the labour requirement
b) To increase productivity
c) To enhance the life of production machines
d) All of the above

14) Precision, speed control and dexterity in robots warrants the use of actuators _____.

a) pneumatic b) hydraulic
c) hybrid d) electric

SLR-BD-81

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Industrial Robotics (MechHon-01A)

Day & Date: Friday 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each Section I & Section II.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Attempt the following. **14**
a) Define robot and explain basic components of robots with functions?
b) What is an AGV? Discuss are the different navigation techniques used for industrial AGVs.

Q.3 Attempt the following. **14**
a) Explain linear and absolute rotary encoders used in robots.
b) Compare hydraulic, pneumatic and electric actuators used in robotics in detail?

Q.4 Attempt the following. **14**
a) Write a note on End Effectors design and Selection criteria.
b) Explain in detail classification of end effectors.

Section – II

Q.5 Attempt the following. **14**
a) Explain Dynamic models of two-axis planar robots.
b) Derive forward kinematics equation for 2 DOF planar system.

Q.6 Attempt the following. **14**
a) Explain with neat block diagram force control and PID control adaptive control.
b) Explain Trajectory planning and enlist issue with Trajectory Planning.

Q.7 Attempt the following. **14**
a) What are the general considerations for selecting robots for electronic assembly application?
b) What are the general considerations for selecting robots for spot welding application?

SLR-BD-82

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to Automobile Engineering (MechHon-01B)

Day & Date: Friday 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of these falls under LMV (Light Motor Vehicle) category based on capacity?
a) Motorbikes b) Cars
c) Buses d) Trains

2) The transmission system transmits _____ from engine to wheels.
a) Speed b) Power
c) Current d) Pressure

3) Which of these were or are used in automobiles to provide suspension?
a) Leaf springs b) Coil springs
c) Torsion bars d) All of the mentioned

4) What is the angle between the steering axis and the vertical in the plane of the wheel?
a) Castor b) Camber
c) Steering axis inclination d) Kingpin inclination

5) Which of the following is not a part of the transmission system?
a) Clutch b) Axles
c) Wheels d) Gear box

6) Trucks and Buses use which type of fuel?
a) Petrol b) LPG
c) CNG d) Diesel

7) Where is the clutch located?
a) Between transmission and engine
b) Between transmission and rear axle
c) Between transmission and propeller shaft
d) Between transmission and differential

8) Which types of gears are used in constant mesh gearbox?
a) Spur gear b) Helical gear
c) Bevel gear d) Worm gear

9) What is the angle between the vertical when the top of the wheel slants outward?
a) Negative camber b) Negative castor
c) Positive camber d) Positive castor

10) Generally which brakes are on the front wheels?
a) Drum brake b) Disc brake
c) Shoe brake d) Double shoe brake

11) The function of antilock brake system (ABS) is that is _____.
a) Reduces the stopping distance
b) Minimises the brake fade
c) Maintains directional control during braking by preventing the wheels from locking
d) Prevents nose dives during braking and thereby postpones locking of the wheels

12) The starting system includes _____.
a) A battery, a starter, and an ignition switch
b) A battery, a distributor, and an ignition switch
c) A battery, a starter, and a distributor
d) A distributor, a starter, and an ignition switch

13) Caster is a _____.
a) Forward tilt of the kingpin b) Backward tilt of the kingpin
c) Either 'a' or 'b' d) None of these

14) What is the need of the universal joint?
a) To change inclination
b) To bend sideways
c) To transfer torque at an angle
d) To change length

SLR-BD-82

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to Automobile Engineering (MechHon-01B)

Day & Date: Friday 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each equation.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Descriptive Question.

a)	Write short note on front Engine Rear Wheel drive Layout and their Applications.	**05**
b)	Discuss HEV with block diagram.	**04**
c)	Explain Construction and working of 4 stoke Diesel Engine.	**05**

Q.3 Descriptive Question.

a)	Explain Centrifugal Clutch with neat sketch.	**05**
b)	Draw neat sketch of constant mesh Gear Box and also write constructions and working.	**05**
c)	Explain how differential works with neat sketch.	**04**

Q.4 Descriptive Question.

a)	Explain Pneumatic Braking System.	**05**
b)	Explain Antilock Braking system (ABS) with neat sketch.	**04**
c)	Draw a neat sketch of Master Cylinder and explain in brief.	**05**

Section – II

Q.5 Descriptive Question.

a)	Explain Rack and pinion steering Gear box with neat sketch.	**05**
b)	Explain Steering Geometry with sketch. 1) Toe-in & Toe-out 2) Caster angle	**04**
c)	Write short note on Hydraulic Power steering system.	**05**

Q.6 Descriptive Question.

a)	Write a note on Leaf springs used in suspension systems.	**05**
b)	Explain MacPherson strut type suspension system.	**05**
c)	Write down difference between Tubed and Tubeless tyre.	**04**

Q.7 Descriptive Question.

a)	Write a note on Spark Plug in automobile with neat sketch.	**05**
b)	Why is CNG replacing petroleum fuels in automobiles? Justify answer.	**04**
c)	Write a note on Bendix Drive system.	**05**

SLR-BD-82

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to Automobile Engineering (MechHon-01B)

Day & Date: Friday 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which types of gears are used in constant mesh gearbox?
a) Spur gear b) Helical gear
c) Bevel gear d) Worm gear

2) What is the angle between the vertical when the top of the wheel slants outward?
a) Negative camber b) Negative castor
c) Positive camber d) Positive castor

3) Generally which brakes are on the front wheels?
a) Drum brake b) Disc brake
c) Shoe brake d) Double shoe brake

4) The function of antilock brake system (ABS) is that is _____.
a) Reduces the stopping distance
b) Minimises the brake fade
c) Maintains directional control during braking by preventing the wheels from locking
d) Prevents nose dives during braking and thereby postpones locking of the wheels

5) The starting system includes _____.
a) A battery, a starter, and an ignition switch
b) A battery, a distributor, and an ignition switch
c) A battery, a starter, and a distributor
d) A distributor, a starter, and an ignition switch

6) Caster is a _____.
a) Forward tilt of the kingpin b) Backward tilt of the kingpin
c) Either 'a' or 'b' d) None of these

7) What is the need of the universal joint?
a) To change inclination
b) To bend sideways
c) To transfer torque at an angle
d) To change length

8) Which of these falls under LMV (Light Motor Vehicle) category based on capacity?
a) Motorbikes b) Cars
c) Buses d) Trains

9) The transmission system transmits _____ from engine to wheels.
a) Speed b) Power
c) Current d) Pressure

10) Which of these were or are used in automobiles to provide suspension?
a) Leaf springs b) Coil springs
c) Torsion bars d) All of the mentioned

11) What is the angle between the steering axis and the vertical in the plane of the wheel?
a) Castor b) Camber
c) Steering axis inclination d) Kingpin inclination

12) Which of the following is not a part of the transmission system?
a) Clutch b) Axles
c) Wheels d) Gear box

13) Trucks and Buses use which type of fuel?
a) Petrol b) LPG
c) CNG d) Diesel

14) Where is the clutch located?
a) Between transmission and engine
b) Between transmission and rear axle
c) Between transmission and propeller shaft
d) Between transmission and differential

SLR-BD-82

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to Automobile Engineering (MechHon-01B)

Day & Date: Friday 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each equation.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Descriptive Question.

a) Write short note on front Engine Rear Wheel drive Layout and their Applications. **05**

b) Discuss HEV with block diagram. **04**

c) Explain Construction and working of 4 stoke Diesel Engine. **05**

Q.3 Descriptive Question.

a) Explain Centrifugal Clutch with neat sketch. **05**

b) Draw neat sketch of constant mesh Gear Box and also write constructions and working. **05**

c) Explain how differential works with neat sketch. **04**

Q.4 Descriptive Question.

a) Explain Pneumatic Braking System. **05**

b) Explain Antilock Braking system (ABS) with neat sketch. **04**

c) Draw a neat sketch of Master Cylinder and explain in brief. **05**

Section – II

Q.5 Descriptive Question.

a) Explain Rack and pinion steering Gear box with neat sketch. **05**

b) Explain Steering Geometry with sketch. **04**
1) Toe-in & Toe-out
2) Caster angle

c) Write short note on Hydraulic Power steering system. **05**

Q.6 Descriptive Question.

a) Write a note on Leaf springs used in suspension systems. **05**

b) Explain MacPherson strut type suspension system. **05**

c) Write down difference between Tubed and Tubeless tyre. **04**

Q.7 Descriptive Question.

a)	Write a note on Spark Plug in automobile with neat sketch.	**05**
b)	Why is CNG replacing petroleum fuels in automobiles? Justify answer.	**04**
c)	Write a note on Bendix Drive system.	**05**

SLR-BD-82

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to Automobile Engineering (MechHon-01B)

Day & Date: Friday 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) The function of antilock brake system (ABS) is that is _____.
a) Reduces the stopping distance
b) Minimises the brake fade
c) Maintains directional control during braking by preventing the wheels from locking
d) Prevents nose dives during braking and thereby postpones locking of the wheels

2) The starting system includes _____.
a) A battery, a starter, and an ignition switch
b) A battery, a distributor, and an ignition switch
c) A battery, a starter, and a distributor
d) A distributor, a starter, and an ignition switch

3) Caster is a _____.
a) Forward tilt of the kingpin b) Backward tilt of the kingpin
c) Either 'a' or 'b' d) None of these

4) What is the need of the universal joint?
a) To change inclination
b) To bend sideways
c) To transfer torque at an angle
d) To change length

5) Which of these falls under LMV (Light Motor Vehicle) category based on capacity?
a) Motorbikes b) Cars
c) Buses d) Trains

6) The transmission system transmits _____ from engine to wheels.
a) Speed b) Power
c) Current d) Pressure

7) Which of these were or are used in automobiles to provide suspension?
a) Leaf springs b) Coil springs
c) Torsion bars d) All of the mentioned

8) What is the angle between the steering axis and the vertical in the plane of the wheel?
a) Castor b) Camber
c) Steering axis inclination d) Kingpin inclination

9) Which of the following is not a part of the transmission system?
a) Clutch b) Axles
c) Wheels d) Gear box

10) Trucks and Buses use which type of fuel?
a) Petrol b) LPG
c) CNG d) Diesel

11) Where is the clutch located?
a) Between transmission and engine
b) Between transmission and rear axle
c) Between transmission and propeller shaft
d) Between transmission and differential

12) Which types of gears are used in constant mesh gearbox?
a) Spur gear b) Helical gear
c) Bevel gear d) Worm gear

13) What is the angle between the vertical when the top of the wheel slants outward?
a) Negative camber b) Negative castor
c) Positive camber d) Positive castor

14) Generally which brakes are on the front wheels?
a) Drum brake b) Disc brake
c) Shoe brake d) Double shoe brake

SLR-BD-82

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to Automobile Engineering (MechHon-01B)

Day & Date: Friday 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each equation.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Descriptive Question.

a) Write short note on front Engine Rear Wheel drive Layout and their Applications. **05**

b) Discuss HEV with block diagram. **04**

c) Explain Construction and working of 4 stoke Diesel Engine. **05**

Q.3 Descriptive Question.

a) Explain Centrifugal Clutch with neat sketch. **05**

b) Draw neat sketch of constant mesh Gear Box and also write constructions and working. **05**

c) Explain how differential works with neat sketch. **04**

Q.4 Descriptive Question.

a) Explain Pneumatic Braking System. **05**

b) Explain Antilock Braking system (ABS) with neat sketch. **04**

c) Draw a neat sketch of Master Cylinder and explain in brief. **05**

Section – II

Q.5 Descriptive Question.

a) Explain Rack and pinion steering Gear box with neat sketch. **05**

b) Explain Steering Geometry with sketch. **04**
1) Toe-in & Toe-out
2) Caster angle

c) Write short note on Hydraulic Power steering system. **05**

Q.6 Descriptive Question.

a) Write a note on Leaf springs used in suspension systems. **05**

b) Explain MacPherson strut type suspension system. **05**

c) Write down difference between Tubed and Tubeless tyre. **04**

Q.7 Descriptive Question.

a)	Write a note on Spark Plug in automobile with neat sketch.	**05**
b)	Why is CNG replacing petroleum fuels in automobiles? Justify answer.	**04**
c)	Write a note on Bendix Drive system.	**05**

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to Automobile Engineering (MechHon-01B)

Day & Date: Friday 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Trucks and Buses use which type of fuel?
a) Petrol b) LPG
c) CNG d) Diesel

2) Where is the clutch located?
a) Between transmission and engine
b) Between transmission and rear axle
c) Between transmission and propeller shaft
d) Between transmission and differential

3) Which types of gears are used in constant mesh gearbox?
a) Spur gear b) Helical gear
c) Bevel gear d) Worm gear

4) What is the angle between the vertical when the top of the wheel slants outward?
a) Negative camber b) Negative castor
c) Positive camber d) Positive castor

5) Generally which brakes are on the front wheels?
a) Drum brake b) Disc brake
c) Shoe brake d) Double shoe brake

6) The function of antilock brake system (ABS) is that is _____.
a) Reduces the stopping distance
b) Minimises the brake fade
c) Maintains directional control during braking by preventing the wheels from locking
d) Prevents nose dives during braking and thereby postpones locking of the wheels

7) The starting system includes _____.
a) A battery, a starter, and an ignition switch
b) A battery, a distributor, and an ignition switch
c) A battery, a starter, and a distributor
d) A distributor, a starter, and an ignition switch

8) Caster is a _____.
a) Forward tilt of the kingpin
b) Backward tilt of the kingpin
c) Either 'a' or 'b'
d) None of these

9) What is the need of the universal joint?
a) To change inclination
b) To bend sideways
c) To transfer torque at an angle
d) To change length

10) Which of these falls under LMV (Light Motor Vehicle) category based on capacity?
a) Motorbikes
b) Cars
c) Buses
d) Trains

11) The transmission system transmits _____ from engine to wheels.
a) Speed
b) Power
c) Current
d) Pressure

12) Which of these were or are used in automobiles to provide suspension?
a) Leaf springs
b) Coil springs
c) Torsion bars
d) All of the mentioned

13) What is the angle between the steering axis and the vertical in the plane of the wheel?
a) Castor
b) Camber
c) Steering axis inclination
d) Kingpin inclination

14) Which of the following is not a part of the transmission system?
a) Clutch
b) Axles
c) Wheels
d) Gear box

SLR-BD-82

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to Automobile Engineering (MechHon-01B)

Day & Date: Friday 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each equation.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Descriptive Question.

a) Write short note on front Engine Rear Wheel drive Layout and their Applications. **05**

b) Discuss HEV with block diagram. **04**

c) Explain Construction and working of 4 stoke Diesel Engine. **05**

Q.3 Descriptive Question.

a) Explain Centrifugal Clutch with neat sketch. **05**

b) Draw neat sketch of constant mesh Gear Box and also write constructions and working. **05**

c) Explain how differential works with neat sketch. **04**

Q.4 Descriptive Question.

a) Explain Pneumatic Braking System. **05**

b) Explain Antilock Braking system (ABS) with neat sketch. **04**

c) Draw a neat sketch of Master Cylinder and explain in brief. **05**

Section – II

Q.5 Descriptive Question.

a) Explain Rack and pinion steering Gear box with neat sketch. **05**

b) Explain Steering Geometry with sketch. **04**
1) Toe-in & Toe-out
2) Caster angle

c) Write short note on Hydraulic Power steering system. **05**

Q.6 Descriptive Question.

a) Write a note on Leaf springs used in suspension systems. **05**

b) Explain MacPherson strut type suspension system. **05**

c) Write down difference between Tubed and Tubeless tyre. **04**

Q.7 Descriptive Question.

a)	Write a note on Spark Plug in automobile with neat sketch.	**05**
b)	Why is CNG replacing petroleum fuels in automobiles? Justify answer.	**04**
c)	Write a note on Bendix Drive system.	**05**

SLR-BD-83

Seat No.		Set	P

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Universal Human Values (VEC-01)

Day & Date: Saturday, 24-05-2025 Max. Marks: 50
Time: 03:00 PM To 4:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) Basic unit of human interaction is _____.
a) Family b) Society
c) Group d) None of the above

2) The Self(I) is the seer, _____.
a) Doer b) Enjoyer
c) Doer & Enjoyer d) None

3) PROSPERITY deals with _____.
a) Right understanding in the self
b) Fulfilment in relationship
c) Ensuring more than required physical facility
d) None

4) When we expect feelings from others for our happiness, it is a state of _____.
a) Swatantrata b) Partantrata
c) Prosperity d) None

5) For continuity of happiness, what is essential?
a) Right understanding in the Self
b) Right feeling and right thought in the Self
c) Recognition of needs, ensure more than required, make right utilisation of it
d) All the above

6) Right Understanding and Right Feeling is matter of _____.
a) Self b) Body
c) Both d) None

7) Acceptance of excellence in others is called _____.

a) Gratitude b) Reverence
c) Glory d) None of above

8) Self and _____ are different in nature, materiality, needs and activities.

a) Prosperity b) Right Understanding
c) Body d) None of above

9) _____ is assuming without knowing.

a) Knowing b) Assuming
c) Preconditioning d) Relationship

10) Imagination is combination of _____.

a) Desire & thought
b) Desire, thought & expectation
c) Expectation & thought
d) None of above

11) Following are the basic guidelines for value education except _____.

a) Universal b) Personal
c) Rational d) Natural

12) Natural acceptance and _____ are the two processes of knowing.

a) Self-Actualization b) Self-exploration
c) Self Evaluation d) Self control

13) Human Life is lived at four levels: Individual, Family, and Society and _____.

a) Nature b) Nurture
c) World d) Universe

14) Value education should not be based on dogmas or blind beliefs _____.

a) True b) False

15) Value of an entity is _____.

a) Physical Facility
b) Prosperity
c) Its participation in the larger order of which it is part
d) both a and b

16) _____ are as Basic Human Aspirations.

a) Money
b) Relationship without money
c) Physical Facility
d) Continuous Happiness and Prosperity

17) Please give the correct priority for Physical Facilities, Right Understanding and Relationship _____.

a) Physical Facilities, Right Understanding and Relationship
b) Relationship, Right Understanding and Physical Facilities
c) Right Understanding, Relationship and Physical Facilities
d) None of the above

18) Right Understanding in relationship lead to _____.

a) Mutual Happiness b) Mutual Prosperity
c) Both a and b d) All are wrong

19) SSDD stands for _____.

a) Sadhan Viheen Dukhi Daridra
b) Sadhan Sampan Dukhi Daridra
c) Sadhan Sampan Sukhi Samridha
d) None of the above

20) Natural acceptance does not change with _____.

a) Time b) Place
c) Beliefs d) All of above

21) Human being is co-existence of the _____ and the _____.

a) self, self b) body, body
c) self, body d) None

22) _____ is the feeling of responsibility for nurturing, protecting and right utilizing the body.

a) Swasthya b) Sanyam
c) Prosperity d) None

23) The _____ is an instrument of _____.

a) I, Body b) Body, I
c) Both a and b d) None

24) _____ is the information we get from the Body through the five sense organs.

a) Precondition b) Sensation
c) Natural acceptance d) None

25) Which of the following is NOT a response of the Self?

a) Knowing b) Assuming
c) Recognising d) Preconditioning

26) Needs of Body are quantitative whereas needs of Self are qualitative _____.

a) True b) False

27) Sah-astitva means _____.

a) Co-existence b) Co-operation
c) Cooption d) Corporate identity

28) Ensuring justice in the relationship, on the basis of values leads to _____ in society.

a) Fearlessness b) Confusion
c) Confidence d) Fear

29) _____ is the complete value in relationship.

a) Respect b) Love
c) Trust d) Glory

30) The feeling to nurture and protect the body of our relative is called _____.

a) Care b) Affection
c) Gratitude d) Respect

31) _____ is the feeling of acceptance for those who have made efforts for my excellence.

a) Reverence b) Glory
c) Gratitude d) Guidance

32) We all are similar at the level of our _____ but differ in our _____.

a) Competence, Intension b) Intension, Competence
c) Competence, Competence d) None

33) Abhay means _____.

a) Right understanding b) Trust and fearlessness
c) Prosperity d) Co-existance

34) All the units of nature can be classified into _____ orders.

a) Two b) Three
c) Four d) Six

35) Which of the following does not form an order in nature?

a) Bio b) Animal
c) Consciousness d) Human

36) According to quantity, which of the following is true for the orders in nature?

a) Bio order >> Physical order >> Animal order >> Human order
b) Animal order >> Bio order >> Physical order >> Human order
c) Physical order >> Bio order >> Animal order >> Human order
d) Physical order >> Animal order >> Bio order >> Human order

37) What is NOT acceptable naturally in the nature?

a) Enrichment of nature b) Pollution in nature
c) Protection of nature d) Right Utilization of nature

38) Which of the following is NOT a unit of physical order?

a) Soil b) Air
c) Tree d) Water

39) There is justice in relationship when there is _____.
a) Self-regulation b) Freedom
c) Mutual fulfillment d) None

40) Justice from family to world family leads to _____.
a) Powerful nation
b) Strong political ties between nations
c) Undivided society
d) Disruption of the family structure

41) _____ is and it exists between one self (I1) and other self (I2).
a) Body b) Relationship
c) Health d) All

42) Which of the following results from over-evaluation _____.
a) Ego b) Depression
c) Self-confidence d) Trust

43) Which of the following statement is true?
a) Intention of a human being is always doubtful
b) One's intension is always to make the other happy
c) Intension of a human keeps varying from time to time
d) Intension of a human being can never be understood

44) Feeling of relationship exist between _____.
a) Self and self b) Body and Body
c) Self and body d) None of the above

45) Which of the following is NOT one of the goals at the level of society?
a) Right Understanding b) Fearlessness
c) Madness for profit d) Prosperity

46) Intension of a human being is the same as _____.
a) Natural acceptance b) Competence
c) Thought d) Pre-conditioning

47) Harmony should be maintained in _____.
a) Between body and life b) Between self and body
c) Between self and society d) All of the above

48) If something is _____ to us without any force or compulsion, then it is often correct and does not change with time and people.
a) Not acceptable b) Completely acceptable
c) Naturally acceptable d) Less acceptable

49) Nurturing on the Body depends upon _____.
a) Ingestion b) Digestion
c) Excretion d) All of the above

50) Sensation is related to _____.

a) Body
b) Self 'I'
c) Both a and b
d) None of the above

SLR-BD-83

Seat No.		Set	Q

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Universal Human Values (VEC-01)

Day & Date: Saturday, 24-05-2025 Max. Marks: 50
Time: 03:00 PM To 4:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) _____ is the feeling of acceptance for those who have made efforts for my excellence.
a) Reverence b) Glory
c) Gratitude d) Guidance

2) We all are similar at the level of our _____ but differ in our _____.
a) Competence, Intension b) Intension, Competence
c) Competence, Competence d) None

3) Abhay means _____.
a) Right understanding b) Trust and fearlessness
c) Prosperity d) Co-existance

4) All the units of nature can be classified into _____ orders.
a) Two b) Three
c) Four d) Six

5) Which of the following does not form an order in nature?
a) Bio b) Animal
c) Consciousness d) Human

6) According to quantity, which of the following is true for the orders in nature?
a) Bio order >> Physical order >> Animal order >> Human order
b) Animal order >> Bio order >> Physical order >> Human order
c) Physical order >> Bio order >> Animal order >> Human order
d) Physical order >> Animal order >> Bio order >> Human order

7) What is NOT acceptable naturally in the nature?
a) Enrichment of nature b) Pollution in nature
c) Protection of nature d) Right Utilization of nature

8) Which of the following is NOT a unit of physical order?
a) Soil b) Air
c) Tree d) Water

9) There is justice in relationship when there is _____.
a) Self-regulation b) Freedom
c) Mutual fulfillment d) None

10) Justice from family to world family leads to _____.
a) Powerful nation
b) Strong political ties between nations
c) Undivided society
d) Disruption of the family structure

11) _____ is and it exists between one self (I1) and other self (I2).
a) Body b) Relationship
c) Health d) All

12) Which of the following results from over-evaluation _____.
a) Ego b) Depression
c) Self-confidence d) Trust

13) Which of the following statement is true?
a) Intention of a human being is always doubtful
b) One's intension is always to make the other happy
c) Intension of a human keeps varying from time to time
d) Intension of a human being can never be understood

14) Feeling of relationship exist between _____.
a) Self and self b) Body and Body
c) Self and body d) None of the above

15) Which of the following is NOT one of the goals at the level of society?
a) Right Understanding b) Fearlessness
c) Madness for profit d) Prosperity

16) Intension of a human being is the same as _____.
a) Natural acceptance b) Competence
c) Thought d) Pre-conditioning

17) Harmony should be maintained in _____.
a) Between body and life b) Between self and body
c) Between self and society d) All of the above

18) If something is _____ to us without any force or compulsion, then it is often correct and does not change with time and people.
a) Not acceptable b) Completely acceptable
c) Naturally acceptable d) Less acceptable

19) Nurturing on the Body depends upon _____.

a) Ingestion b) Digestion
c) Excretion d) All of the above

20) Sensation is related to _____.

a) Body b) Self 'I'
c) Both a and b d) None of the above

21) Basic unit of human interaction is _____.

a) Family b) Society
c) Group d) None of the above

22) The Self(I) is the seer, _____.

a) Doer b) Enjoyer
c) Doer & Enjoyer d) None

23) PROSPERITY deals with _____.

a) Right understanding in the self
b) Fulfilment in relationship
c) Ensuring more than required physical facility
d) None

24) When we expect feelings from others for our happiness, it is a state of _____.

a) Swatantrata b) Partantrata
c) Prosperity d) None

25) For continuity of happiness, what is essential?

a) Right understanding in the Self
b) Right feeling and right thought in the Self
c) Recognition of needs, ensure more than required, make right utilisation of it
d) All the above

26) Right Understanding and Right Feeling is matter of _____.

a) Self b) Body
c) Both d) None

27) Acceptance of excellence in others is called _____.

a) Gratitude b) Reverence
c) Glory d) None of above

28) Self and _____ are different in nature, materiality, needs and activities.

a) Prosperity b) Right Understanding
c) Body d) None of above

29) _____ is assuming without knowing.

a) Knowing b) Assuming
c) Preconditioning d) Relationship

30) Imagination is combination of _____.

a) Desire & thought
b) Desire, thought & expectation
c) Expectation & thought
d) None of above

31) Following are the basic guidelines for value education except _____.

a) Universal b) Personal
c) Rational d) Natural

32) Natural acceptance and _____ are the two processes of knowing.

a) Self-Actualization b) Self-exploration
c) Self Evaluation d) Self control

33) Human Life is lived at four levels: Individual, Family, and Society and _____.

a) Nature b) Nurture
c) World d) Universe

34) Value education should not be based on dogmas or blind beliefs _____.

a) True b) False

35) Value of an entity is _____.

a) Physical Facility
b) Prosperity
c) Its participation in the larger order of which it is part
d) both a and b

36) _____ are as Basic Human Aspirations.

a) Money
b) Relationship without money
c) Physical Facility
d) Continuous Happiness and Prosperity

37) Please give the correct priority for Physical Facilities, Right Understanding and Relationship _____.

a) Physical Facilities, Right Understanding and Relationship
b) Relationship, Right Understanding and Physical Facilities
c) Right Understanding, Relationship and Physical Facilities
d) None of the above

38) Right Understanding in relationship lead to _____.
a) Mutual Happiness b) Mutual Prosperity
c) Both a and b d) All are wrong

39) SSDD stands for _____.
a) Sadhan Viheen Dukhi Daridra
b) Sadhan Sampan Dukhi Daridra
c) Sadhan Sampan Sukhi Samridha
d) None of the above

40) Natural acceptance does not change with _____.
a) Time b) Place
c) Beliefs d) All of above

41) Human being is co-existence of the _____ and the _____.
a) self, self b) body, body
c) self, body d) None

42) _____ is the feeling of responsibility for nurturing, protecting and right utilizing the body.
a) Swasthya b) Sanyam
c) Prosperity d) None

43) The _____ is an instrument of _____.
a) I, Body b) Body, I
c) Both a and b d) None

44) _____ is the information we get from the Body through the five sense organs.
a) Precondition b) Sensation
c) Natural acceptance d) None

45) Which of the following is NOT a response of the Self?
a) Knowing b) Assuming
c) Recognising d) Preconditioning

46) Needs of Body are quantitative whereas needs of Self are qualitative _____.
a) True b) False

47) Sah-astitva means _____.
a) Co-existence b) Co-operation
c) Cooption d) Corporate identity

48) Ensuring justice in the relationship, on the basis of values leads to _____ in society.
a) Fearlessness b) Confusion
c) Confidence d) Fear

49) _____ is the complete value in relationship.

a) Respect b) Love

c) Trust d) Glory

50) The feeling to nurture and protect the body of our relative is called _____.

a) Care b) Affection

c) Gratitude d) Respect

SLR-BD-83

Seat No.		Set	R

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Universal Human Values (VEC-01)

Day & Date: Saturday, 24-05-2025 Max. Marks: 50
Time: 03:00 PM To 4:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) Following are the basic guidelines for value education except _____.
a) Universal b) Personal
c) Rational d) Natural

2) Natural acceptance and _____ are the two processes of knowing.
a) Self-Actualization b) Self-exploration
c) Self Evaluation d) Self control

3) Human Life is lived at four levels: Individual, Family, and Society and _____.
a) Nature b) Nurture
c) World d) Universe

4) Value education should not be based on dogmas or blind beliefs _____.
a) True b) False

5) Value of an entity is _____.
a) Physical Facility
b) Prosperity
c) Its participation in the larger order of which it is part
d) both a and b

6) _____ are as Basic Human Aspirations.
a) Money
b) Relationship without money
c) Physical Facility
d) Continuous Happiness and Prosperity

7) Please give the correct priority for Physical Facilities, Right Understanding and Relationship _____.

a) Physical Facilities, Right Understanding and Relationship
b) Relationship, Right Understanding and Physical Facilities
c) Right Understanding, Relationship and Physical Facilities
d) None of the above

8) Right Understanding in relationship lead to _____.

a) Mutual Happiness b) Mutual Prosperity
c) Both a and b d) All are wrong

9) SSDD stands for _____.

a) Sadhan Viheen Dukhi Daridra
b) Sadhan Sampan Dukhi Daridra
c) Sadhan Sampan Sukhi Samridha
d) None of the above

10) Natural acceptance does not change with _____.

a) Time b) Place
c) Beliefs d) All of above

11) Human being is co-existence of the _____ and the _____.

a) self, self b) body, body
c) self, body d) None

12) _____ is the feeling of responsibility for nurturing, protecting and right utilizing the body.

a) Swasthya b) Sanyam
c) Prosperity d) None

13) The _____ is an instrument of _____.

a) I, Body b) Body, I
c) Both a and b d) None

14) _____ is the information we get from the Body through the five sense organs.

a) Precondition b) Sensation
c) Natural acceptance d) None

15) Which of the following is NOT a response of the Self?

a) Knowing b) Assuming
c) Recognising d) Preconditioning

16) Needs of Body are quantitative whereas needs of Self are qualitative _____.

a) True b) False

17) Sah-astitva means _____.

a) Co-existence b) Co-operation
c) Cooption d) Corporate identity

18) Ensuring justice in the relationship, on the basis of values leads to _____ in society.

a) Fearlessness b) Confusion
c) Confidence d) Fear

19) _____ is the complete value in relationship.

a) Respect b) Love
c) Trust d) Glory

20) The feeling to nurture and protect the body of our relative is called _____.

a) Care b) Affection
c) Gratitude d) Respect

21) _____ is the feeling of acceptance for those who have made efforts for my excellence.

a) Reverence b) Glory
c) Gratitude d) Guidance

22) We all are similar at the level of our _____ but differ in our _____.

a) Competence, Intension b) Intension, Competence
c) Competence, Competence d) None

23) Abhay means _____.

a) Right understanding b) Trust and fearlessness
c) Prosperity d) Co-existance

24) All the units of nature can be classified into _____ orders.

a) Two b) Three
c) Four d) Six

25) Which of the following does not form an order in nature?

a) Bio b) Animal
c) Consciousness d) Human

26) According to quantity, which of the following is true for the orders in nature?

a) Bio order >> Physical order >> Animal order >> Human order
b) Animal order >> Bio order >> Physical order >> Human order
c) Physical order >> Bio order >> Animal order >> Human order
d) Physical order >> Animal order >> Bio order >> Human order

27) What is NOT acceptable naturally in the nature?

a) Enrichment of nature b) Pollution in nature
c) Protection of nature d) Right Utilization of nature

28) Which of the following is NOT a unit of physical order?

a) Soil b) Air
c) Tree d) Water

29) There is justice in relationship when there is _____.
a) Self-regulation b) Freedom
c) Mutual fulfillment d) None

30) Justice from family to world family leads to _____.
a) Powerful nation
b) Strong political ties between nations
c) Undivided society
d) Disruption of the family structure

31) _____ is and it exists between one self (I1) and other self (I2).
a) Body b) Relationship
c) Health d) All

32) Which of the following results from over-evaluation _____.
a) Ego b) Depression
c) Self-confidence d) Trust

33) Which of the following statement is true?
a) Intention of a human being is always doubtful
b) One's intension is always to make the other happy
c) Intension of a human keeps varying from time to time
d) Intension of a human being can never be understood

34) Feeling of relationship exist between _____.
a) Self and self b) Body and Body
c) Self and body d) None of the above

35) Which of the following is NOT one of the goals at the level of society?
a) Right Understanding b) Fearlessness
c) Madness for profit d) Prosperity

36) Intension of a human being is the same as _____.
a) Natural acceptance b) Competence
c) Thought d) Pre-conditioning

37) Harmony should be maintained in _____.
a) Between body and life b) Between self and body
c) Between self and society d) All of the above

38) If something is _____ to us without any force or compulsion, then it is often correct and does not change with time and people.
a) Not acceptable b) Completely acceptable
c) Naturally acceptable d) Less acceptable

39) Nurturing on the Body depends upon _____.
a) Ingestion b) Digestion
c) Excretion d) All of the above

40) Sensation is related to _____.

a) Body b) Self 'I'

c) Both a and b d) None of the above

41) Basic unit of human interaction is _____.

a) Family b) Society

c) Group d) None of the above

42) The Self(I) is the seer, _____.

a) Doer b) Enjoyer

c) Doer & Enjoyer d) None

43) PROSPERITY deals with _____.

a) Right understanding in the self

b) Fulfilment in relationship

c) Ensuring more than required physical facility

d) None

44) When we expect feelings from others for our happiness, it is a state of _____.

a) Swatantrata b) Partantrata

c) Prosperity d) None

45) For continuity of happiness, what is essential?

a) Right understanding in the Self

b) Right feeling and right thought in the Self

c) Recognition of needs, ensure more than required, make right utilisation of it

d) All the above

46) Right Understanding and Right Feeling is matter of _____.

a) Self b) Body

c) Both d) None

47) Acceptance of excellence in others is called _____.

a) Gratitude b) Reverence

c) Glory d) None of above

48) Self and _____ are different in nature, materiality, needs and activities.

a) Prosperity b) Right Understanding

c) Body d) None of above

49) _____ is assuming without knowing.

a) Knowing b) Assuming

c) Preconditioning d) Relationship

50) Imagination is combination of _____.

a) Desire & thought
b) Desire, thought & expectation
c) Expectation & thought
d) None of above

SLR-BD-83

Seat No.		Set	S

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - I) (New) (NEP CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Universal Human Values (VEC-01)

Day & Date: Saturday, 24-05-2025 Max. Marks: 50
Time: 03:00 PM To 4:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) _____ is and it exists between one self (I1) and other self (I2).
a) Body b) Relationship
c) Health d) All

2) Which of the following results from over-evaluation _____.
a) Ego b) Depression
c) Self-confidence d) Trust

3) Which of the following statement is true?
a) Intention of a human being is always doubtful
b) One's intension is always to make the other happy
c) Intension of a human keeps varying from time to time
d) Intension of a human being can never be understood

4) Feeling of relationship exist between _____.
a) Self and self b) Body and Body
c) Self and body d) None of the above

5) Which of the following is NOT one of the goals at the level of society?
a) Right Understanding b) Fearlessness
c) Madness for profit d) Prosperity

6) Intension of a human being is the same as _____.
a) Natural acceptance b) Competence
c) Thought d) Pre-conditioning

7) Harmony should be maintained in _____.
a) Between body and life b) Between self and body
c) Between self and society d) All of the above

8) If something is _____ to us without any force or compulsion, then it is often correct and does not change with time and people.

a) Not acceptable
b) Completely acceptable
c) Naturally acceptable
d) Less acceptable

9) Nurturing on the Body depends upon _____.

a) Ingestion
b) Digestion
c) Excretion
d) All of the above

10) Sensation is related to _____.

a) Body
b) Self 'I'
c) Both a and b
d) None of the above

11) Basic unit of human interaction is _____.

a) Family
b) Society
c) Group
d) None of the above

12) The Self(I) is the seer, _____.

a) Doer
b) Enjoyer
c) Doer & Enjoyer
d) None

13) PROSPERITY deals with _____.

a) Right understanding in the self
b) Fulfilment in relationship
c) Ensuring more than required physical facility
d) None

14) When we expect feelings from others for our happiness, it is a state of _____.

a) Swatantrata
b) Partantrata
c) Prosperity
d) None

15) For continuity of happiness, what is essential?

a) Right understanding in the Self
b) Right feeling and right thought in the Self
c) Recognition of needs, ensure more than required, make right utilisation of it
d) All the above

16) Right Understanding and Right Feeling is matter of _____.

a) Self
b) Body
c) Both
d) None

17) Acceptance of excellence in others is called _____.

a) Gratitude
b) Reverence
c) Glory
d) None of above

18) Self and _____ are different in nature, materiality, needs and activities.

a) Prosperity b) Right Understanding
c) Body d) None of above

19) _____ is assuming without knowing.

a) Knowing b) Assuming
c) Preconditioning d) Relationship

20) Imagination is combination of _____.

a) Desire & thought
b) Desire, thought & expectation
c) Expectation & thought
d) None of above

21) Following are the basic guidelines for value education except _____.

a) Universal b) Personal
c) Rational d) Natural

22) Natural acceptance and _____ are the two processes of knowing.

a) Self-Actualization b) Self-exploration
c) Self Evaluation d) Self control

23) Human Life is lived at four levels: Individual, Family, and Society and _____.

a) Nature b) Nurture
c) World d) Universe

24) Value education should not be based on dogmas or blind beliefs _____.

a) True b) False

25) Value of an entity is _____.

a) Physical Facility
b) Prosperity
c) Its participation in the larger order of which it is part
d) both a and b

26) _____ are as Basic Human Aspirations.

a) Money
b) Relationship without money
c) Physical Facility
d) Continuous Happiness and Prosperity

27) Please give the correct priority for Physical Facilities, Right Understanding and Relationship _____.

a) Physical Facilities, Right Understanding and Relationship
b) Relationship, Right Understanding and Physical Facilities
c) Right Understanding, Relationship and Physical Facilities
d) None of the above

28) Right Understanding in relationship lead to _____.

a) Mutual Happiness b) Mutual Prosperity
c) Both a and b d) All are wrong

29) SSDD stands for _____.

a) Sadhan Viheen Dukhi Daridra
b) Sadhan Sampan Dukhi Daridra
c) Sadhan Sampan Sukhi Samridha
d) None of the above

30) Natural acceptance does not change with _____.

a) Time b) Place
c) Beliefs d) All of above

31) Human being is co-existence of the _____ and the _____.

a) self, self b) body, body
c) self, body d) None

32) _____ is the feeling of responsibility for nurturing, protecting and right utilizing the body.

a) Swasthya b) Sanyam
c) Prosperity d) None

33) The _____ is an instrument of _____.

a) I, Body b) Body, I
c) Both a and b d) None

34) _____ is the information we get from the Body through the five sense organs.

a) Precondition b) Sensation
c) Natural acceptance d) None

35) Which of the following is NOT a response of the Self?

a) Knowing b) Assuming
c) Recognising d) Preconditioning

36) Needs of Body are quantitative whereas needs of Self are qualitative _____.

a) True b) False

37) Sah-astitva means _____.

a) Co-existence b) Co-operation
c) Cooption d) Corporate identity

38) Ensuring justice in the relationship, on the basis of values leads to _____ in society.

a) Fearlessness b) Confusion
c) Confidence d) Fear

39) _____ is the complete value in relationship.

a) Respect b) Love
c) Trust d) Glory

40) The feeling to nurture and protect the body of our relative is called _____.

a) Care b) Affection
c) Gratitude d) Respect

41) _____ is the feeling of acceptance for those who have made efforts for my excellence.

a) Reverence b) Glory
c) Gratitude d) Guidance

42) We all are similar at the level of our _____ but differ in our _____.

a) Competence, Intension b) Intension, Competence
c) Competence, Competence d) None

43) Abhay means _____.

a) Right understanding b) Trust and fearlessness
c) Prosperity d) Co-existance

44) All the units of nature can be classified into _____ orders.

a) Two b) Three
c) Four d) Six

45) Which of the following does not form an order in nature?

a) Bio b) Animal
c) Consciousness d) Human

46) According to quantity, which of the following is true for the orders in nature?

a) Bio order >> Physical order >> Animal order >> Human order
b) Animal order >> Bio order >> Physical order >> Human order
c) Physical order >> Bio order >> Animal order >> Human order
d) Physical order >> Animal order >> Bio order >> Human order

47) What is NOT acceptable naturally in the nature?

a) Enrichment of nature b) Pollution in nature
c) Protection of nature d) Right Utilization of nature

48) Which of the following is NOT a unit of physical order?

a) Soil b) Air
c) Tree d) Water

49) There is justice in relationship when there is _____.

a) Self-regulation b) Freedom

c) Mutual fulfillment d) None

50) Justice from family to world family leads to _____.

a) Powerful nation

b) Strong political ties between nations

c) Undivided society

d) Disruption of the family structure

Seat No.	

Set P

S.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2025
Applied Thermodynamics (BTN02301)

Day & Date: Saturday, 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Attempt the following MCQ: 14

1) Critical point of water is at ____.
a) 221 bar and 374°C b) 100 bar and 273 °C
c) 200 bar and 100°C d) 374 bar and 221 °C

2) The term coefficient of performance is related to _____.
a) Refrigerator b) Heat Engine
c) Steam Engine d) Gas Turbine

3) Area under the curve on P-V chart indicates _____.
a) Net heat transfer b) Network transfer
c) Cycle efficiency d) None of the above

4) Kelvin-Planks Law deals with _____.
a) conversion of work b) conversion of heat
c) conversion of mass d) conversion of heat into work

5) The major heat loss in boiler is due to ____.
a) Moisture in fuel b) Dry flue gases
c) steam formation d) Unburnt fuel

6) The ratio of heat actually used in producing the steam to the heat liberated in the furnace is called _____.
a) Equivalent evaporation b) Evaporative capacity
c) Boiler efficiency d) Factor of evaporation

7) The Rankine cycle as compared to Carnot cycle has ____ work ratio.
a) high b) low
c) equal d) half

8) The flow of steam is subsonic _____.
a) at entrance of nozzle
b) at throat of the nozzle
c) in convergent part of the nozzle
d) in divergent part of nozzle

9) In a shell and tube surface condenser ____.
a) steam and cooling water mix to give the condensate
b) cooling water passes through the tubes and steam surrounds them
c) steam passes the cooling tubes and cooling water surrounds them
d) all of the above varying with situation

10) A condenser in steam power plant ____.
a) increases expansion ratio of steam
b) reduces back pressure of steam
c) reduces the temperature of steam
d) all of the above

11) The cooing section in the surface condenser _____.
a) increases the quantity of vapor extracted along with air
b) reduces the quantity of vapor extracted along with air
c) does not affect vapor quantity extracted but reduces pump capacity of air extraction pump
d) None of these

12) The compounding of steam turbine is done in order to _____.
a) reduce the speed of rotor b) improve efficiency
c) reduce exit losses d) all of the above

13) With increase in clearance volume, the ideal work of compressing 1 kg of air _____.
a) increases
b) decreases
c) remains same
d) first increases and then decreases

14) In single stage single acting reciprocating compressor without clearance volume, the work done is minimum during ____.
a) isothermal compression b) isentropic compression
c) polytropic compression d) None of the above

Seat No.	

Set **P**

S.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2025
Applied Thermodynamics (BTN02301)

Day & Date: Saturday, 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Use of Scientific calculator is allowed.
4) Use of steam tables is allowed.
5) Assume suitable data if required and state it clearly.
6) Neat diagrams must be drawn wherever necessary.

Section – I

Q.2 Attempt the following questions:

a) State and explain first law of thermodynamics. What are its limitations? **04**

b) Explain the following terms: **05**
1) Standard Enthalpy of Reaction.
2) Standard enthalpy of Formation

c) A reversible heat engine operates between three constant temperatures reservoirs at 600 K, 400 K and 300 K. It receives 2500 KJ of heat from the reservoir at 600 K and does 1000 KJ of work. determine the magnitude and direction of the heat interaction with the other two reservoirs **05**

Q.3 Attempt the following:

a) Explain the classification of steam Boilers in detail. **04**

b) A hot copper block of mass 30 kg having a temperature of 500 °C is dropped in 200 kg of oil at 20 °C. If Cp oil =2.5 kJ/kg.K and Cp_{copper} =0.5 kJ/kgK, find the change in entropy of the universe. Assume adiabatic mixing. **05**

c) A boiler produces wet steam having a dryness fraction of 0.98. The working pressure of the boiler is 7.5 bar absolute. It generates steam at the rate of 5400 kg/hr and consumes coal at the rate of 670 kg/hr. If the calorific value of coal is 31,000 kJ/kg and water is fed at a temperature of 41.5 °C, calculate **05**
1) equivalent evaporation/kg of coal
2) factor of evaporation
3) boiler efficiency

Q.4 Attempt the following:

a) Explain the effect of various operating conditions on the efficiency of the Rankine vapour cycle. **04**

b) Differentiate between Carnot cycle and Rankine cycle. **05**

c) In the Rankine cycle, dry and saturated steam enters the turbine at 20 bar pressure. The exhaust pressure of the turbine is 0.1 bar, and all processes are reversible, find: **05**

1) Cycle thermal efficiency
2) Work ratio
3) Specific steam Consumption

Section – II

Q.5 Attempt the following:

a) Define steam nozzle? Explain its different types? **04**

b) Explain the meaning of compounding of steam turbines? Discuss pressure compounding of steam turbine with neat sketch. **05**

c) Derive an expression for maximum blade efficiency of a single-stage impulse turbine. **05**

Q.6 Attempt the following:

a) Explain the following terms in connection with steam condensers **04**

1) condenser efficiency
2) vacuum efficiency

b) Differentiate between surface condenser and jet condenser **05**

c) Derive an expression for the volumetric efficiency of a reciprocating compressor with usual notations. **05**

Q.7 Attempt the following:

a) Derive an expression for work done per kg for the polytropic compression process without considering the clearance volume. **04**

b) Atmospheric air is to be compressed in a single-state reciprocating compressor from 1.013 bar and 15 °C to 7 bar. Calculate the indicated power required for free air delivery of 0.3 m^3/min, when the compression process is **05**

1) Isentropic
2) Polytropic if n = 1.25.
3) Isothermal

c) A single-stage, single-acting compressor delivers 150 m^3 of free air per minute from 1 bar to 8 bar. The speed of the compressor is 300 rpm. Assuming that compression and expansion follow the law $PV^{13}=C$, and clearance volume is $[1/16t]^{th}$ of swept volume, find the diameter(D) and stroke Length(L) of the compressor. Take L/D=1.5. Assume the temperature and pressure of air at the suction are as atmospheric air. **05**

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2025
Applied Thermodynamics (BTN02301)

Day & Date: Saturday, 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Attempt the following MCQ: **14**

1) The flow of steam is subsonic _____.
a) at entrance of nozzle
b) at throat of the nozzle
c) in convergent part of the nozzle
d) in divergent part of nozzle

2) In a shell and tube surface condenser ____.
a) steam and cooling water mix to give the condensate
b) cooling water passes through the tubes and steam surrounds them
c) steam passes the cooling tubes and cooling water surrounds them
d) all of the above varying with situation

3) A condenser in steam power plant ____.
a) increases expansion ratio of steam
b) reduces back pressure of steam
c) reduces the temperature of steam
d) all of the above

4) The cooing section in the surface condenser _____.
a) increases the quantity of vapor extracted along with air
b) reduces the quantity of vapor extracted along with air
c) does not affect vapor quantity extracted but reduces pump capacity of air extraction pump
d) None of these

5) The compounding of steam turbine is done in order to _____.
a) reduce the speed of rotor b) improve efficiency
c) reduce exit losses d) all of the above

6) With increase in clearance volume, the ideal work of compressing 1 kg of air _____.
a) increases
b) decreases
c) remains same
d) first increases and then decreases

7) In single stage single acting reciprocating compressor without clearance volume, the work done is minimum during ____.
a) isothermal compression b) isentropic compression
c) polytropic compression d) None of the above

8) Critical point of water is at ____.
a) 221 bar and 374°C b) 100 bar and 273 °C
c) 200 bar and 100°C d) 374 bar and 221 °C

9) The term coefficient of performance is related to _____.
a) Refrigerator b) Heat Engine
c) Steam Engine d) Gas Turbine

10) Area under the curve on P-V chart indicates _____.
a) Net heat transfer b) Network transfer
c) Cycle efficiency d) None of the above

11) Kelvin-Planks Law deals with _____.
a) conversion of work b) conversion of heat
c) conversion of mass d) conversion of heat into work

12) The major heat loss in boiler is due to ____.
a) Moisture in fuel b) Dry flue gases
c) steam formation d) Unburnt fuel

13) The ratio of heat actually used in producing the steam to the heat liberated in the furnace is called _____.
a) Equivalent evaporation b) Evaporative capacity
c) Boiler efficiency d) Factor of evaporation

14) The Rankine cycle as compared to Carnot cycle has ____ work ratio.
a) high b) low
c) equal d) half

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2025
Applied Thermodynamics (BTN02301)

Day & Date: Saturday, 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Use of Scientific calculator is allowed.
4) Use of steam tables is allowed.
5) Assume suitable data if required and state it clearly.
6) Neat diagrams must be drawn wherever necessary.

Section – I

Q.2 Attempt the following questions:

a) State and explain first law of thermodynamics. What are its limitations? **04**

b) Explain the following terms: **05**
1) Standard Enthalpy of Reaction.
2) Standard enthalpy of Formation

c) A reversible heat engine operates between three constant temperatures reservoirs at 600 K, 400 K and 300 K. It receives 2500 KJ of heat from the reservoir at 600 K and does 1000 KJ of work. determine the magnitude and direction of the heat interaction with the other two reservoirs **05**

Q.3 Attempt the following:

a) Explain the classification of steam Boilers in detail. **04**

b) A hot copper block of mass 30 kg having a temperature of 500 °C is dropped in 200 kg of oil at 20 °C. If Cp oil =2.5 kJ/kg.K and Cp_{copper} =0.5 kJ/kgK, find the change in entropy of the universe. Assume adiabatic mixing. **05**

c) A boiler produces wet steam having a dryness fraction of 0.98. The working pressure of the boiler is 7.5 bar absolute. It generates steam at the rate of 5400 kg/hr and consumes coal at the rate of 670 kg/hr. If the calorific value of coal is 31,000 kJ/kg and water is fed at a temperature of 41.5 °C, calculate **05**
1) equivalent evaporation/kg of coal
2) factor of evaporation
3) boiler efficiency

Q.4 Attempt the following:

a) Explain the effect of various operating conditions on the efficiency of the Rankine vapour cycle. **04**

b) Differentiate between Carnot cycle and Rankine cycle. **05**

c) In the Rankine cycle, dry and saturated steam enters the turbine at 20 bar pressure. The exhaust pressure of the turbine is 0.1 bar, and all processes are reversible, find: **05**

1) Cycle thermal efficiency
2) Work ratio
3) Specific steam Consumption

Section – II

Q.5 Attempt the following:

a) Define steam nozzle? Explain its different types? **04**

b) Explain the meaning of compounding of steam turbines? Discuss pressure compounding of steam turbine with neat sketch. **05**

c) Derive an expression for maximum blade efficiency of a single-stage impulse turbine. **05**

Q.6 Attempt the following:

a) Explain the following terms in connection with steam condensers **04**

1) condenser efficiency
2) vacuum efficiency

b) Differentiate between surface condenser and jet condenser **05**

c) Derive an expression for the volumetric efficiency of a reciprocating compressor with usual notations. **05**

Q.7 Attempt the following:

a) Derive an expression for work done per kg for the polytropic compression process without considering the clearance volume. **04**

b) Atmospheric air is to be compressed in a single-state reciprocating compressor from 1.013 bar and 15 °C to 7 bar. Calculate the indicated power required for free air delivery of 0.3 m^3/min, when the compression process is **05**

1) Isentropic
2) Polytropic if n = 1.25.
3) Isothermal

c) A single-stage, single-acting compressor delivers 150 m^3 of free air per minute from 1 bar to 8 bar. The speed of the compressor is 300 rpm. Assuming that compression and expansion follow the law $PV^{13}=C$, and clearance volume is $[1/16t]^{th}$ of swept volume, find the diameter(D) and stroke Length(L) of the compressor. Take L/D=1.5. Assume the temperature and pressure of air at the suction are as atmospheric air. **05**

Seat No.	

Set R

S.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2025
Applied Thermodynamics (BTN02301)

Day & Date: Saturday, 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Attempt the following MCQ: 14

1) The cooing section in the surface condenser _____.
a) increases the quantity of vapor extracted along with air
b) reduces the quantity of vapor extracted along with air
c) does not affect vapor quantity extracted but reduces pump capacity of air extraction pump
d) None of these

2) The compounding of steam turbine is done in order to _____.
a) reduce the speed of rotor b) improve efficiency
c) reduce exit losses d) all of the above

3) With increase in clearance volume, the ideal work of compressing 1 kg of air _____.
a) increases
b) decreases
c) remains same
d) first increases and then decreases

4) In single stage single acting reciprocating compressor without clearance volume, the work done is minimum during ____.
a) isothermal compression b) isentropic compression
c) polytropic compression d) None of the above

5) Critical point of water is at ____.
a) 221 bar and 374°C b) 100 bar and 273 °C
c) 200 bar and 100°C d) 374 bar and 221 °C

6) The term coefficient of performance is related to _____.
a) Refrigerator b) Heat Engine
c) Steam Engine d) Gas Turbine

7) Area under the curve on P-V chart indicates _____.
a) Net heat transfer b) Network transfer
c) Cycle efficiency d) None of the above

8) Kelvin-Planks Law deals with _____.
a) conversion of work b) conversion of heat
c) conversion of mass d) conversion of heat into work

9) The major heat loss in boiler is due to ____.
a) Moisture in fuel b) Dry flue gases
c) steam formation d) Unburnt fuel

10) The ratio of heat actually used in producing the steam to the heat liberated in the furnace is called _____.
a) Equivalent evaporation b) Evaporative capacity
c) Boiler efficiency d) Factor of evaporation

11) The Rankine cycle as compared to Carnot cycle has ____ work ratio.
a) high b) low
c) equal d) half

12) The flow of steam is subsonic _____.
a) at entrance of nozzle
b) at throat of the nozzle
c) in convergent part of the nozzle
d) in divergent part of nozzle

13) In a shell and tube surface condenser ____.
a) steam and cooling water mix to give the condensate
b) cooling water passes through the tubes and steam surrounds them
c) steam passes the cooling tubes and cooling water surrounds them
d) all of the above varying with situation

14) A condenser in steam power plant ____.
a) increases expansion ratio of steam
b) reduces back pressure of steam
c) reduces the temperature of steam
d) all of the above

Seat No.	

Set **R**

S.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2025
Applied Thermodynamics (BTN02301)

Day & Date: Saturday, 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Use of Scientific calculator is allowed.
4) Use of steam tables is allowed.
5) Assume suitable data if required and state it clearly.
6) Neat diagrams must be drawn wherever necessary.

Section – I

Q.2 Attempt the following questions:

a) State and explain first law of thermodynamics. What are its limitations? **04**

b) Explain the following terms: **05**
1) Standard Enthalpy of Reaction.
2) Standard enthalpy of Formation

c) A reversible heat engine operates between three constant temperatures reservoirs at 600 K, 400 K and 300 K. It receives 2500 KJ of heat from the reservoir at 600 K and does 1000 KJ of work. determine the magnitude and direction of the heat interaction with the other two reservoirs **05**

Q.3 Attempt the following:

a) Explain the classification of steam Boilers in detail. **04**

b) A hot copper block of mass 30 kg having a temperature of 500 °C is dropped in 200 kg of oil at 20 °C. If Cp oil =2.5 kJ/kg.K and Cp_{copper} =0.5 kJ/kgK, find the change in entropy of the universe. Assume adiabatic mixing. **05**

c) A boiler produces wet steam having a dryness fraction of 0.98. The working pressure of the boiler is 7.5 bar absolute. It generates steam at the rate of 5400 kg/hr and consumes coal at the rate of 670 kg/hr. If the calorific value of coal is 31,000 kJ/kg and water is fed at a temperature of 41.5 °C, calculate **05**
1) equivalent evaporation/kg of coal
2) factor of evaporation
3) boiler efficiency

Q.4 Attempt the following:

a) Explain the effect of various operating conditions on the efficiency of the Rankine vapour cycle. **04**

b) Differentiate between Carnot cycle and Rankine cycle. **05**

c) In the Rankine cycle, dry and saturated steam enters the turbine at 20 bar pressure. The exhaust pressure of the turbine is 0.1 bar, and all processes are reversible, find: **05**

1) Cycle thermal efficiency
2) Work ratio
3) Specific steam Consumption

Section – II

Q.5 Attempt the following:

a) Define steam nozzle? Explain its different types? **04**

b) Explain the meaning of compounding of steam turbines? Discuss pressure compounding of steam turbine with neat sketch. **05**

c) Derive an expression for maximum blade efficiency of a single-stage impulse turbine. **05**

Q.6 Attempt the following:

a) Explain the following terms in connection with steam condensers **04**

1) condenser efficiency
2) vacuum efficiency

b) Differentiate between surface condenser and jet condenser **05**

c) Derive an expression for the volumetric efficiency of a reciprocating compressor with usual notations. **05**

Q.7 Attempt the following:

a) Derive an expression for work done per kg for the polytropic compression process without considering the clearance volume. **04**

b) Atmospheric air is to be compressed in a single-state reciprocating compressor from 1.013 bar and 15 °C to 7 bar. Calculate the indicated power required for free air delivery of 0.3 m^3/min, when the compression process is **05**

1) Isentropic
2) Polytropic if n = 1.25.
3) Isothermal

c) A single-stage, single-acting compressor delivers 150 m^3 of free air per minute from 1 bar to 8 bar. The speed of the compressor is 300 rpm. Assuming that compression and expansion follow the law $PV^{13}=C$, and clearance volume is $[1/16t]^{th}$ of swept volume, find the diameter(D) and stroke Length(L) of the compressor. Take L/D=1.5. Assume the temperature and pressure of air at the suction are as atmospheric air. **05**

Seat No.	

Set **S**

S.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2025
Applied Thermodynamics (BTN02301)

Day & Date: Saturday, 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Attempt the following MCQ: 14

1) The ratio of heat actually used in producing the steam to the heat liberated in the furnace is called _____.
a) Equivalent evaporation b) Evaporative capacity
c) Boiler efficiency d) Factor of evaporation

2) The Rankine cycle as compared to Carnot cycle has ____ work ratio.
a) high b) low
c) equal d) half

3) The flow of steam is subsonic _____.
a) at entrance of nozzle
b) at throat of the nozzle
c) in convergent part of the nozzle
d) in divergent part of nozzle

4) In a shell and tube surface condenser ____.
a) steam and cooling water mix to give the condensate
b) cooling water passes through the tubes and steam surrounds them
c) steam passes the cooling tubes and cooling water surrounds them
d) all of the above varying with situation

5) A condenser in steam power plant ____.
a) increases expansion ratio of steam
b) reduces back pressure of steam
c) reduces the temperature of steam
d) all of the above

6) The cooing section in the surface condenser _____.
a) increases the quantity of vapor extracted along with air
b) reduces the quantity of vapor extracted along with air
c) does not affect vapor quantity extracted but reduces pump capacity of air extraction pump
d) None of these

7) The compounding of steam turbine is done in order to _____.
a) reduce the speed of rotor b) improve efficiency
c) reduce exit losses d) all of the above

8) With increase in clearance volume, the ideal work of compressing 1 kg of air _____.
a) increases
b) decreases
c) remains same
d) first increases and then decreases

9) In single stage single acting reciprocating compressor without clearance volume, the work done is minimum during ____.
a) isothermal compression b) isentropic compression
c) polytropic compression d) None of the above

10) Critical point of water is at ____.
a) 221 bar and 374°C b) 100 bar and 273 °C
c) 200 bar and 100°C d) 374 bar and 221 °C

11) The term coefficient of performance is related to _____.
a) Refrigerator b) Heat Engine
c) Steam Engine d) Gas Turbine

12) Area under the curve on P-V chart indicates _____.
a) Net heat transfer b) Network transfer
c) Cycle efficiency d) None of the above

13) Kelvin-Planks Law deals with _____.
a) conversion of work b) conversion of heat
c) conversion of mass d) conversion of heat into work

14) The major heat loss in boiler is due to ____.
a) Moisture in fuel b) Dry flue gases
c) steam formation d) Unburnt fuel

Seat No.	

Set **S**

S.Y. (B.Tech.) (Mechanical Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2025
Applied Thermodynamics (BTN02301)

Day & Date: Saturday, 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Use of Scientific calculator is allowed.
4) Use of steam tables is allowed.
5) Assume suitable data if required and state it clearly.
6) Neat diagrams must be drawn wherever necessary.

Section – I

Q.2 Attempt the following questions:

a) State and explain first law of thermodynamics. What are its limitations? **04**

b) Explain the following terms: **05**
1) Standard Enthalpy of Reaction.
2) Standard enthalpy of Formation

c) A reversible heat engine operates between three constant temperatures reservoirs at 600 K, 400 K and 300 K. It receives 2500 KJ of heat from the reservoir at 600 K and does 1000 KJ of work. determine the magnitude and direction of the heat interaction with the other two reservoirs **05**

Q.3 Attempt the following:

a) Explain the classification of steam Boilers in detail. **04**

b) A hot copper block of mass 30 kg having a temperature of 500 °C is dropped in 200 kg of oil at 20 °C. If Cp oil =2.5 kJ/kg.K and Cp_{copper} =0.5 kJ/kgK, find the change in entropy of the universe. Assume adiabatic mixing. **05**

c) A boiler produces wet steam having a dryness fraction of 0.98. The working pressure of the boiler is 7.5 bar absolute. It generates steam at the rate of 5400 kg/hr and consumes coal at the rate of 670 kg/hr. If the calorific value of coal is 31,000 kJ/kg and water is fed at a temperature of 41.5 °C, calculate **05**
1) equivalent evaporation/kg of coal
2) factor of evaporation
3) boiler efficiency

Q.4 Attempt the following:

a) Explain the effect of various operating conditions on the efficiency of the Rankine vapour cycle. **04**

b) Differentiate between Carnot cycle and Rankine cycle. **05**

c) In the Rankine cycle, dry and saturated steam enters the turbine at 20 bar pressure. The exhaust pressure of the turbine is 0.1 bar, and all processes are reversible, find: **05**

1) Cycle thermal efficiency
2) Work ratio
3) Specific steam Consumption

Section – II

Q.5 Attempt the following:

a) Define steam nozzle? Explain its different types? **04**

b) Explain the meaning of compounding of steam turbines? Discuss pressure compounding of steam turbine with neat sketch. **05**

c) Derive an expression for maximum blade efficiency of a single-stage impulse turbine. **05**

Q.6 Attempt the following:

a) Explain the following terms in connection with steam condensers **04**

1) condenser efficiency
2) vacuum efficiency

b) Differentiate between surface condenser and jet condenser **05**

c) Derive an expression for the volumetric efficiency of a reciprocating compressor with usual notations. **05**

Q.7 Attempt the following:

a) Derive an expression for work done per kg for the polytropic compression process without considering the clearance volume. **04**

b) Atmospheric air is to be compressed in a single-state reciprocating compressor from 1.013 bar and 15 °C to 7 bar. Calculate the indicated power required for free air delivery of 0.3 m^3/min, when the compression process is **05**

1) Isentropic
2) Polytropic if n = 1.25.
3) Isothermal

c) A single-stage, single-acting compressor delivers 150 m^3 of free air per minute from 1 bar to 8 bar. The speed of the compressor is 300 rpm. Assuming that compression and expansion follow the law $PV^{13}=C$, and clearance volume is $[1/16t]^{th}$ of swept volume, find the diameter(D) and stroke Length(L) of the compressor. Take L/D=1.5. Assume the temperature and pressure of air at the suction are as atmospheric air. **05**

SLR-BD-85

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mechanics of Materials (BTN02302)

Day & Date: Monday, 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) The modulus of elasticity for a material is 200 GN/m^2 and Poisson's ratio is 0.25. What is the modulus of rigidity?
a) 80 GN/m^2 b) 125 GN/m^2
c) 250 GN/m^2 d) 320 GN/m^2

2) What is the shear stress acting on the outer surface of a hollow shaft subjected to a torque of 100 Nm (The inner and outer diameter of the shaft is 15 mm and 30 mm respectively)?
a) 50.26Mpa b) 40.24Mpa
c) 20.12Mpa d) 8.74Mpa

3) The relationship between Young's modulus (E) shear modulus (G) and Poisson's ratio (μ) is given by ____
a) $E = 3G (1+2\mu)$ b) $E = 2G (1+ \mu)$
c) $E = 2G (1-3\mu)$ d) $E = 3G (1+ \mu)$

4) The principal stress calculations are carried on ____.
a) normal plane b) vertical plane
c) oblique plane d) Normal point

5) The stress due to suddenly applied load is ____ times the gradually applied load.
a) Three b) Two
c) Four d) Five

6) Modulus of resilience is the ratio of ____.
a) minimum strain energy and unit volume
b) strain and unit volume
c) proof resilience and unit volume
d) resilience and unit area

7) Angle between the principal planes and plane of maximum shear stress is ____.

a) 90° b) 120°
c) 45° d) 30°

8) For a simply supported beam carrying a U.D.L. on its entire span, the slope is ____

a) zero at support b) maximum at center
c) same as deflection d) zero at center

9) In the theory of simple bending, the bending stress in the beam section varies ____.

a) Linearly b) Parabolically
c) Elliptically d) None of these

10) A simply supported beam of span (L) carries point load (W) at the center of the beam. The shear force diagram will be _____.

a) A triangle
b) Two equal and opposite rectangles
c) Two equal and opposite triangles
d) A rectangle

11) The property of material same in all direction is known as ____.

a) Homogeneous b) Elastic
c) Isotropic d) Orthotropic

12) For a cantilever beam loaded with point load at free end, the maximum slope occurs at the ____.

a) Fixed end b) Free end
c) Load point d) Both a and b

13) For an I section ____.

a) Bending stress is maximum at neutral axis
b) Shear stress is zero at neutral axis
c) Bending stress is zero at edges
d) Shear stress is maximum at the neutral axis

14) When a rectangular section of a beam is subjected to a shearing force the ratio of maximum shear stress to the average shear stress is ____.

a) 2 b) 1.75
c) 1.5 d) 1.25

SLR-BD-85

Seat No.		Set	P

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mechanics of Materials (BTN02302)

Day & Date: Monday, 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Use of Scientific calculator is allowed.
3) Figure to right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 Attempt the following questions:

a) A bar of length 500mm and square in cross section 15 x 15mm is subjected to a pull of 20kN in the direction of bar length. Extension along length of bar is found to be 0.2mm while decrease in each lateral direction is 0.0024mm. Determine E, G, K and Poisson's ratio. **08**

b) A weight of 1500N is dropped on the collar attached at the lower end of vertical bar 4meter long and 30mm diameter. Calculate height of drop if maximum instantaneous stress is not to exceed 120Mpa. Also calculate elongation produced Take E=200Gpa. **06**

Q.3 Attempt the following:

a) A plane element in a boiler is subjected to tensile stress of 400Mpa on one plane along X-axis and 150Mpa on the other at right angle to former (Y-axis). Each of above stresses is accompanied by a shear stress of 100 Mpa such that when associated with Major tensile stress tends to rotate the element. Find a) Principal stresses and their directions b) Maximum shearing stress **06**

b) A hollow shaft is to transmit 300 kW at 80 rpm. If the shear stress is not to exceed 60 Mpa and internal diameter is 0.6 of the external diameters, find the external and internal diameters assuming that the maximum torque is 1.4 times the mean. **08**

Q.4 Attempt the following:

a) Prove that E=3K(1-2 μ), where E is modulus of elasticity, K is Bulk modulus and μ is Poisson's ratio. **05**

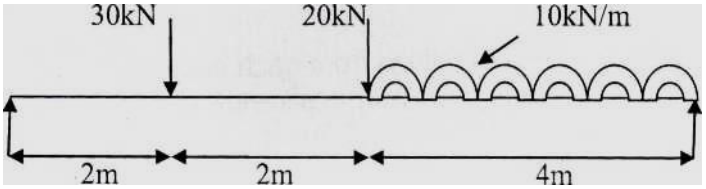
b) At a point in elastic material under strain, there are normal tensile stresses of 50 Mpa and 30 Mpa respectively at the right angles to each other along with a shear stress of 25Mpa. Find graphically principal stresses, position of principal plane and maximum shear stress. **04**

c) A bar of 50mm diameter 2meter long is fixed at upper end and provided with collar at lower end. A weight of 450N is dropped on the collar from height of 250mm. Find a) instantaneous stress b) instantaneous elongation. Take E=200Gpa. **05**

Section – II

Q.5 Attempt the following:

a) A simply supported beam as shown in figure carries two concentrated loads and UDL. Draw SFD and BMD **08**



b) An I section of equal flange 110 x 10 mm and web of 120mm x 10 mm is used over a span of 4meter. Find the intensity of UDL which simply supported beam can carry safely if allowable bending stress is 100 Mpa. **06**

Q.6 Attempt the following:

a) An I Girder is 400 mm deep with 150mm long and 20 mm thick flange and 15mm thick web. Calculate maximum intensity of shear stress if shear force acting at the section is 145kN. **06**

b) A beam of T section having top flange 120mm x 20mm and web 20mm x 100mm simply supported over span of 5m and carries UDL of 3kN/m over entire span. Determine maximum tensile and compressive stresses developed. Also Draw bending stress distribution diagram. **08**

Q.7 Attempt the following:

a) A beam of uniform rectangular section 150 x 200 mm is simply supported at ends. It carries uniformly distributed load of 10 kN/m over entire span of 6 meter. **08**
Find a) slope of support b) Maximum deflection E=11 Gpa

b) Explain the terms Slope and Deflection. **02**

c) Draw SFD and BMD for simply supported beam having length(L) and subjected to point load ‘W’ at center. **04**

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mechanics of Materials (BTN02302)

Day & Date: Monday, 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) For a simply supported beam carrying a U.D.L. on its entire span, the slope is ____
a) zero at support b) maximum at center
c) same as deflection d) zero at center

2) In the theory of simple bending, the bending stress in the beam section varies ____.
a) Linearly b) Parabolically
c) Elliptically d) None of these

3) A simply supported beam of span (L) carries point load (W) at the center of the beam. The shear force diagram will be _____.
a) A triangle
b) Two equal and opposite rectangles
c) Two equal and opposite triangles
d) A rectangle

4) The property of material same in all direction is known as ____.
a) Homogeneous b) Elastic
c) Isotropic d) Orthotropic

5) For a cantilever beam loaded with point load at free end, the maximum slope occurs at the ____.
a) Fixed end b) Free end
c) Load point d) Both a and b

6) For an I section ____.
a) Bending stress is maximum at neutral axis
b) Shear stress is zero at neutral axis
c) Bending stress is zero at edges
d) Shear stress is maximum at the neutral axis

7) When a rectangular section of a beam is subjected to a shearing force the ratio of maximum shear stress to the average shear stress is ____.

a) 2 b) 1.75
c) 1.5 d) 1.25

8) The modulus of elasticity for a material is 200 GN/m^2 and Poisson's ratio is 0.25. What is the modulus of rigidity?

a) 80 GN/m^2 b) 125 GN/m^2
c) 250 GN/m^2 d) 320 GN/m^2

9) What is the shear stress acting on the outer surface of a hollow shaft subjected to a torque of 100 Nm (The inner and outer diameter of the shaft is 15 mm and 30 mm respectively)?

a) 50.26Mpa b) 40.24Mpa
c) 20.12Mpa d) 8.74Mpa

10) The relationship between Young's modulus (E) shear modulus (G) and Poisson's ratio (μ) is given by ____

a) E = 3G (1+2μ) b) E = 2G (1+ μ)
c) E = 2G (1-3μ) d) E = 3G (1+ μ)

11) The principal stress calculations are carried on ____.

a) normal plane b) vertical plane
c) oblique plane d) Normal point

12) The stress due to suddenly applied load is ____ times the gradually applied load.

a) Three b) Two
c) Four d) Five

13) Modulus of resilience is the ratio of ____.

a) minimum strain energy and unit volume
b) strain and unit volume
c) proof resilience and unit volume
d) resilience and unit area

14) Angle between the principal planes and plane of maximum shear stress is ____.

a) 90° b) 120°
c) 45° d) 30°

SLR-BD-85

Seat No.		Set	Q

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mechanics of Materials (BTN02302)

Day & Date: Monday, 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Use of Scientific calculator is allowed.
3) Figure to right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 Attempt the following questions:

a) A bar of length 500mm and square in cross section 15 x 15mm is subjected to a pull of 20kN in the direction of bar length. Extension along length of bar is found to be 0.2mm while decrease in each lateral direction is 0.0024mm. Determine E, G, K and Poisson's ratio. **08**

b) A weight of 1500N is dropped on the collar attached at the lower end of vertical bar 4meter long and 30mm diameter. Calculate height of drop if maximum instantaneous stress is not to exceed 120Mpa. Also calculate elongation produced Take E=200Gpa. **06**

Q.3 Attempt the following:

a) A plane element in a boiler is subjected to tensile stress of 400Mpa on one plane along X-axis and 150Mpa on the other at right angle to former (Y-axis). Each of above stresses is accompanied by a shear stress of 100 Mpa such that when associated with Major tensile stress tends to rotate the element. Find a) Principal stresses and their directions b) Maximum shearing stress **06**

b) A hollow shaft is to transmit 300 kW at 80 rpm. If the shear stress is not to exceed 60 Mpa and internal diameter is 0.6 of the external diameters, find the external and internal diameters assuming that the maximum torque is 1.4 times the mean. **08**

Q.4 Attempt the following:

a) Prove that E=3K(1-2 μ), where E is modulus of elasticity, K is Bulk modulus and μ is Poisson's ratio. **05**

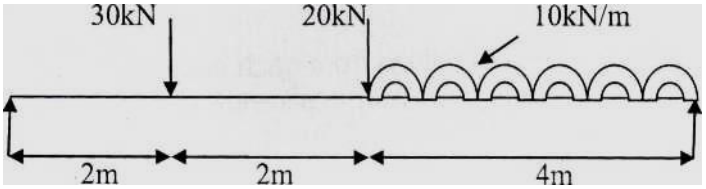
b) At a point in elastic material under strain, there are normal tensile stresses of 50 Mpa and 30 Mpa respectively at the right angles to each other along with a shear stress of 25Mpa. Find graphically principal stresses, position of principal plane and maximum shear stress. **04**

c) A bar of 50mm diameter 2meter long is fixed at upper end and provided with collar at lower end. A weight of 450N is dropped on the collar from height of 250mm. Find a) instantaneous stress b) instantaneous elongation. Take E=200Gpa. **05**

Section – II

Q.5 Attempt the following:

a) A simply supported beam as shown in figure carries two concentrated loads and UDL. Draw SFD and BMD **08**



b) An I section of equal flange 110 x 10 mm and web of 120mm x 10 mm is used over a span of 4meter. Find the intensity of UDL which simply supported beam can carry safely if allowable bending stress is 100 Mpa. **06**

Q.6 Attempt the following:

a) An I Girder is 400 mm deep with 150mm long and 20 mm thick flange and 15mm thick web. Calculate maximum intensity of shear stress if shear force acting at the section is 145kN. **06**

b) A beam of T section having top flange 120mm x 20mm and web 20mm x 100mm simply supported over span of 5m and carries UDL of 3kN/m over entire span. Determine maximum tensile and compressive stresses developed. Also Draw bending stress distribution diagram. **08**

Q.7 Attempt the following:

a) A beam of uniform rectangular section 150 x 200 mm is simply supported at ends. It carries uniformly distributed load of 10 kN/m over entire span of 6 meter. **08**
Find a) slope of support b) Maximum deflection E=11 Gpa

b) Explain the terms Slope and Deflection. **02**

c) Draw SFD and BMD for simply supported beam having length(L) and subjected to point load ‘W’ at center. **04**

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mechanics of Materials (BTN02302)

Day & Date: Monday, 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) The property of material same in all direction is known as ____.
a) Homogeneous b) Elastic
c) Isotropic d) Orthotropic

2) For a cantilever beam loaded with point load at free end, the maximum slope occurs at the ____.
a) Fixed end b) Free end
c) Load point d) Both a and b

3) For an I section ____.
a) Bending stress is maximum at neutral axis
b) Shear stress is zero at neutral axis
c) Bending stress is zero at edges
d) Shear stress is maximum at the neutral axis

4) When a rectangular section of a beam is subjected to a shearing force the ratio of maximum shear stress to the average shear stress is ____.
a) 2 b) 1.75
c) 1.5 d) 1.25

5) The modulus of elasticity for a material is 200 GN/m^2 and Poisson's ratio is 0.25. What is the modulus of rigidity?
a) 80 GN/m^2 b) 125 GN/m^2
c) 250 GN/m^2 d) 320 GN/m^2

6) What is the shear stress acting on the outer surface of a hollow shaft subjected to a torque of 100 Nm (The inner and outer diameter of the shaft is 15 mm and 30 mm respectively)?

a) 50.26Mpa b) 40.24Mpa
c) 20.12Mpa d) 8.74Mpa

7) The relationship between Young's modulus (E) shear modulus (G) and Poisson's ratio (μ) is given by ____

a) $E = 3G (1+2\mu)$ b) $E = 2G (1+ \mu)$
c) $E = 2G (1-3\mu)$ d) $E = 3G (1+ \mu)$

8) The principal stress calculations are carried on ____.

a) normal plane b) vertical plane
c) oblique plane d) Normal point

9) The stress due to suddenly applied load is ____ times the gradually applied load.

a) Three b) Two
c) Four d) Five

10) Modulus of resilience is the ratio of ____.

a) minimum strain energy and unit volume
b) strain and unit volume
c) proof resilience and unit volume
d) resilience and unit area

11) Angle between the principal planes and plane of maximum shear stress is ____.

a) 90° b) 120°
c) 45° d) 30°

12) For a simply supported beam carrying a U.D.L. on its entire span, the slope is ____

a) zero at support b) maximum at center
c) same as deflection d) zero at center

13) In the theory of simple bending, the bending stress in the beam section varies ____.

a) Linearly b) Parabolically
c) Elliptically d) None of these

14) A simply supported beam of span (L) carries point load (W) at the center of the beam. The shear force diagram will be _____.

a) A triangle
b) Two equal and opposite rectangles
c) Two equal and opposite triangles
d) A rectangle

Seat No.		Set	R

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mechanics of Materials (BTN02302)

Day & Date: Monday, 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Use of Scientific calculator is allowed.
3) Figure to right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 Attempt the following questions:

a) A bar of length 500mm and square in cross section 15 x 15mm is subjected to a pull of 20kN in the direction of bar length. Extension along length of bar is found to be 0.2mm while decrease in each lateral direction is 0.0024mm. Determine E, G, K and Poisson's ratio. **08**

b) A weight of 1500N is dropped on the collar attached at the lower end of vertical bar 4meter long and 30mm diameter. Calculate height of drop if maximum instantaneous stress is not to exceed 120Mpa. Also calculate elongation produced Take E=200Gpa. **06**

Q.3 Attempt the following:

a) A plane element in a boiler is subjected to tensile stress of 400Mpa on one plane along X-axis and 150Mpa on the other at right angle to former (Y-axis). Each of above stresses is accompanied by a shear stress of 100 Mpa such that when associated with Major tensile stress tends to rotate the element. Find a) Principal stresses and their directions b) Maximum shearing stress **06**

b) A hollow shaft is to transmit 300 kW at 80 rpm. If the shear stress is not to exceed 60 Mpa and internal diameter is 0.6 of the external diameters, find the external and internal diameters assuming that the maximum torque is 1.4 times the mean. **08**

Q.4 Attempt the following:

a) Prove that E=3K(1-2 μ), where E is modulus of elasticity, K is Bulk modulus and μ is Poisson's ratio. **05**

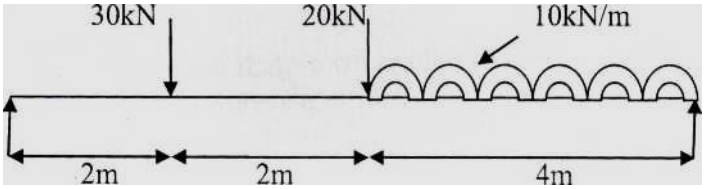
b) At a point in elastic material under strain, there are normal tensile stresses of 50 Mpa and 30 Mpa respectively at the right angles to each other along with a shear stress of 25Mpa. Find graphically principal stresses, position of principal plane and maximum shear stress. **04**

c) A bar of 50mm diameter 2meter long is fixed at upper end and provided with collar at lower end. A weight of 450N is dropped on the collar from height of 250mm. Find a) instantaneous stress b) instantaneous elongation. Take E=200Gpa. **05**

Section – II

Q.5 Attempt the following:

a) A simply supported beam as shown in figure carries two concentrated loads and UDL. Draw SFD and BMD **08**



b) An I section of equal flange 110 x 10 mm and web of 120mm x 10 mm is used over a span of 4meter. Find the intensity of UDL which simply supported beam can carry safely if allowable bending stress is 100 Mpa. **06**

Q.6 Attempt the following:

a) An I Girder is 400 mm deep with 150mm long and 20 mm thick flange and 15mm thick web. Calculate maximum intensity of shear stress if shear force acting at the section is 145kN. **06**

b) A beam of T section having top flange 120mm x 20mm and web 20mm x 100mm simply supported over span of 5m and carries UDL of 3kN/m over entire span. Determine maximum tensile and compressive stresses developed. Also Draw bending stress distribution diagram. **08**

Q.7 Attempt the following:

a) A beam of uniform rectangular section 150 x 200 mm is simply supported at ends. It carries uniformly distributed load of 10 kN/m over entire span of 6 meter. **08**
Find a) slope of support b) Maximum deflection E=11 Gpa

b) Explain the terms Slope and Deflection. **02**

c) Draw SFD and BMD for simply supported beam having length(L) and subjected to point load ‘W’ at center. **04**

Seat No.	

Set **S**

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mechanics of Materials (BTN02302)

Day & Date: Monday, 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) Modulus of resilience is the ratio of ____.
a) minimum strain energy and unit volume
b) strain and unit volume
c) proof resilience and unit volume
d) resilience and unit area

2) Angle between the principal planes and plane of maximum shear stress is ____.
a) 90° b) 120°
c) 45° d) 30°

3) For a simply supported beam carrying a U.D.L. on its entire span, the slope is ____
a) zero at support b) maximum at center
c) same as deflection d) zero at center

4) In the theory of simple bending, the bending stress in the beam section varies ____.
a) Linearly b) Parabolically
c) Elliptically d) None of these

5) A simply supported beam of span (L) carries point load (W) at the center of the beam. The shear force diagram will be _____.
a) A triangle
b) Two equal and opposite rectangles
c) Two equal and opposite triangles
d) A rectangle

6) The property of material same in all direction is known as ____.
a) Homogeneous b) Elastic
c) Isotropic d) Orthotropic

7) For a cantilever beam loaded with point load at free end, the maximum slope occurs at the ____.
a) Fixed end b) Free end
c) Load point d) Both a and b

8) For an I section ____.
a) Bending stress is maximum at neutral axis
b) Shear stress is zero at neutral axis
c) Bending stress is zero at edges
d) Shear stress is maximum at the neutral axis

9) When a rectangular section of a beam is subjected to a shearing force the ratio of maximum shear stress to the average shear stress is ____.
a) 2 b) 1.75
c) 1.5 d) 1.25

10) The modulus of elasticity for a material is 200 GN/m^2 and Poisson's ratio is 0.25. What is the modulus of rigidity?
a) 80 GN/m^2 b) 125 GN/m^2
c) 250 GN/m^2 d) 320 GN/m^2

11) What is the shear stress acting on the outer surface of a hollow shaft subjected to a torque of 100 Nm (The inner and outer diameter of the shaft is 15 mm and 30 mm respectively)?
a) 50.26Mpa b) 40.24Mpa
c) 20.12Mpa d) 8.74Mpa

12) The relationship between Young's modulus (E) shear modulus (G) and Poisson's ratio (μ) is given by ____
a) $E = 3G (1+2\mu)$ b) $E = 2G (1+ \mu)$
c) $E = 2G (1-3\mu)$ d) $E = 3G (1+ \mu)$

13) The principal stress calculations are carried on ____.
a) normal plane b) vertical plane
c) oblique plane d) Normal point

14) The stress due to suddenly applied load is ____ times the gradually applied load.
a) Three b) Two
c) Four d) Five

SLR-BD-85

Seat No.		Set	S

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mechanics of Materials (BTN02302)

Day & Date: Monday, 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Use of Scientific calculator is allowed.
3) Figure to right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 Attempt the following questions:

a) A bar of length 500mm and square in cross section 15 x 15mm is subjected to a pull of 20kN in the direction of bar length. Extension along length of bar is found to be 0.2mm while decrease in each lateral direction is 0.0024mm. Determine E, G, K and Poisson's ratio. **08**

b) A weight of 1500N is dropped on the collar attached at the lower end of vertical bar 4meter long and 30mm diameter. Calculate height of drop if maximum instantaneous stress is not to exceed 120Mpa. Also calculate elongation produced Take E=200Gpa. **06**

Q.3 Attempt the following:

a) A plane element in a boiler is subjected to tensile stress of 400Mpa on one plane along X-axis and 150Mpa on the other at right angle to former (Y-axis). Each of above stresses is accompanied by a shear stress of 100 Mpa such that when associated with Major tensile stress tends to rotate the element. Find a) Principal stresses and their directions b) Maximum shearing stress **06**

b) A hollow shaft is to transmit 300 kW at 80 rpm. If the shear stress is not to exceed 60 Mpa and internal diameter is 0.6 of the external diameters, find the external and internal diameters assuming that the maximum torque is 1.4 times the mean. **08**

Q.4 Attempt the following:

a) Prove that E=3K(1-2 μ), where E is modulus of elasticity, K is Bulk modulus and μ is Poisson's ratio. **05**

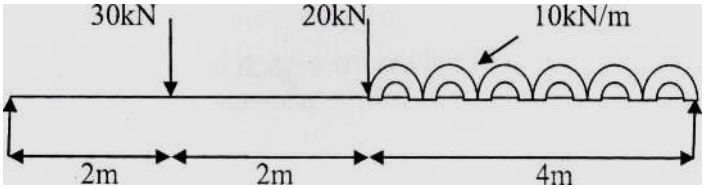
b) At a point in elastic material under strain, there are normal tensile stresses of 50 Mpa and 30 Mpa respectively at the right angles to each other along with a shear stress of 25Mpa. Find graphically principal stresses, position of principal plane and maximum shear stress. **04**

c) A bar of 50mm diameter 2meter long is fixed at upper end and provided with collar at lower end. A weight of 450N is dropped on the collar from height of 250mm. Find a) instantaneous stress b) instantaneous elongation. Take E=200Gpa. **05**

Section – II

Q.5 Attempt the following:

a) A simply supported beam as shown in figure carries two concentrated loads and UDL. Draw SFD and BMD **08**



b) An I section of equal flange 110 x 10 mm and web of 120mm x 10 mm is used over a span of 4meter. Find the intensity of UDL which simply supported beam can carry safely if allowable bending stress is 100 Mpa. **06**

Q.6 Attempt the following:

a) An I Girder is 400 mm deep with 150mm long and 20 mm thick flange and 15mm thick web. Calculate maximum intensity of shear stress if shear force acting at the section is 145kN. **06**

b) A beam of T section having top flange 120mm x 20mm and web 20mm x 100mm simply supported over span of 5m and carries UDL of 3kN/m over entire span. Determine maximum tensile and compressive stresses developed. Also Draw bending stress distribution diagram. **08**

Q.7 Attempt the following:

a) A beam of uniform rectangular section 150 x 200 mm is simply supported at ends. It carries uniformly distributed load of 10 kN/m over entire span of 6 meter. **08**
Find a) slope of support b) Maximum deflection E=11 Gpa

b) Explain the terms Slope and Deflection. **02**

c) Draw SFD and BMD for simply supported beam having length(L) and subjected to point load ‘W’ at center. **04**

SLR-BD-86

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Manufacturing Process (BTN02303)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Choke is generally provided at ____
a) Gate b) Pouring cup
c) Feeder d) Mould Cavity

2) Sand which is used for core making is ____.
a) Shell sand b) Facing sand
c) Green sand d) Dry Sand

3) In sand molding, the middle part of joining two flask is called ____.
a) Coupe b) Parting line
c) Drag d) Flask-middle

4) Carburetor of two-wheeler is manufactured by ____
a) Sand Casting b) Shell Moulding
c) Permanent Mold casting d) Centrifugal casting

5) The patterns used for the lost wax type investment casting are made of: ____
a) wood b) gypsum
c) frozen mercury d) wax

6) The process of removing unwanted material from casting is called: ___
a) Fettling b) Cleaning
c) Finishing d) Blowing

7) Which one of the following welding processes uses non consumable electrode?
a) Gas metal arc welding b) Submerged arc welding
c) Gas tungsten arc welding d) Flux coated arc welding

8) In ____ process, the molten metal is poured and allowed to solidify, while mold is rotating.

a) Die casting b) Sand molding
c) Permanent mold casting d) Centrifugal casting

9) Tooth paste is manufactured by ____.

a) Direct extrusion b) Indirect Extrusion
c) Impact extrusion d) Hydrostatic Extrusion

10) Which of the following manufacturing processes is mainly considered for producing the components of very high strength?

a) Casting b) Forging
c) Extrusion d) Rolling

11) Which is incorrect statement about results of hot working ____.

a) Annealing operation is not necessary
b) Power requirements are low
c) Surface finish is good
d) Grain refinement is possible

12) In cold working process ____.

a) Good surface finish is obtained
b) Scaling occurs
c) Close tolerance is difficult to achieve
d) All the above

13) From following, the alternative name for RP is ____.

a) Additive Manufacturing b) Layer Manufacturing
c) Direct CAD Manufacturing d) All of the above

14) Gravity dies casting process is used for manufactured of ____

a) Lathe bed b) Drainage pipes
c) Spanner d) Carburetor body

SLR-BD-86

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Manufacturing Process (BTN02303)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figure to right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2	**a)**	Explain with neat sketch Gas tungsten arc welding.	**05**
	b)	Compare between welding and brazing.	**05**
	c)	Explain the basic steps in casting process with flow chart.	**04**
Q.3	**a)**	Explain in brief any three types of molding sand and their properties.	**05**
	b)	Difference between soldering and brazing.	**05**
	c)	Write short note Fettling and cleaning of casting.	**04**
Q.4	**a)**	What is significance of Allowances used in Pattern? Explain any two allowances.	**05**
	b)	Explain soldering process and its applications.	**05**
	c)	Explain centrifugal casting process.	**04**

Section – II

Q.5	**a)**	Explain with neat sketch classification of rolling mill on the basis of no. of rolls.	**05**
	b)	Differentiate between hot rolling and cold rolling operations.	**05**
	c)	State advantages, disadvantages, and applications of RP.	**04**
Q.6	**a)**	Explain with neat sketch open die forging process.	**05**
	b)	Explain with neat sketch hydro mechanical forming process.	**05**
	c)	Explain with neat sketch Fused Deposition modeling.	**04**
Q.7	**Write short note on:**		
	a)	Electro hydraulic forming	**05**
	b)	Bulk forming processes	**05**
	c)	Selective Laser Sintering (SLS)	**04**

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Manufacturing Process (BTN02303)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) In ____ process, the molten metal is poured and allowed to solidify, while mold is rotating.
a) Die casting b) Sand molding
c) Permanent mold casting d) Centrifugal casting

2) Tooth paste is manufactured by ____.
a) Direct extrusion b) Indirect Extrusion
c) Impact extrusion d) Hydrostatic Extrusion

3) Which of the following manufacturing processes is mainly considered for producing the components of very high strength?
a) Casting b) Forging
c) Extrusion d) Rolling

4) Which is incorrect statement about results of hot working ____.
a) Annealing operation is not necessary
b) Power requirements are low
c) Surface finish is good
d) Grain refinement is possible

5) In cold working process ____.
a) Good surface finish is obtained
b) Scaling occurs
c) Close tolerance is difficult to achieve
d) All the above

6) From following, the alternative name for RP is ____.
a) Additive Manufacturing b) Layer Manufacturing
c) Direct CAD Manufacturing d) All of the above

7) Gravity dies casting process is used for manufactured of ____
a) Lathe bed b) Drainage pipes
c) Spanner d) Carburetor body

8) Choke is generally provided at ____
a) Gate b) Pouring cup
c) Feeder d) Mould Cavity

9) Sand which is used for core making is ____.
a) Shell sand b) Facing sand
c) Green sand d) Dry Sand

10) In sand molding, the middle part of joining two flask is called ____.
a) Coupe b) Parting line
c) Drag d) Flask-middle

11) Carburetor of two-wheeler is manufactured by ____
a) Sand Casting b) Shell Moulding
c) Permanent Mold casting d) Centrifugal casting

12) The patterns used for the lost wax type investment casting are made of: ____
a) wood b) gypsum
c) frozen mercury d) wax

13) The process of removing unwanted material from casting is called: ___
a) Fettling b) Cleaning
c) Finishing d) Blowing

14) Which one of the following welding processes uses non consumable electrode?
a) Gas metal arc welding b) Submerged arc welding
c) Gas tungsten arc welding d) Flux coated arc welding

SLR-BD-86

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Manufacturing Process (BTN02303)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figure to right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2	**a)**	Explain with neat sketch Gas tungsten arc welding.	**05**
	b)	Compare between welding and brazing.	**05**
	c)	Explain the basic steps in casting process with flow chart.	**04**
Q.3	**a)**	Explain in brief any three types of molding sand and their properties.	**05**
	b)	Difference between soldering and brazing.	**05**
	c)	Write short note Fettling and cleaning of casting.	**04**
Q.4	**a)**	What is significance of Allowances used in Pattern? Explain any two allowances.	**05**
	b)	Explain soldering process and its applications.	**05**
	c)	Explain centrifugal casting process.	**04**

Section – II

Q.5	**a)**	Explain with neat sketch classification of rolling mill on the basis of no. of rolls.	**05**
	b)	Differentiate between hot rolling and cold rolling operations.	**05**
	c)	State advantages, disadvantages, and applications of RP.	**04**
Q.6	**a)**	Explain with neat sketch open die forging process.	**05**
	b)	Explain with neat sketch hydro mechanical forming process.	**05**
	c)	Explain with neat sketch Fused Deposition modeling.	**04**
Q.7	**Write short note on:**		
	a)	Electro hydraulic forming	**05**
	b)	Bulk forming processes	**05**
	c)	Selective Laser Sintering (SLS)	**04**

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Manufacturing Process (BTN02303)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which is incorrect statement about results of hot working ____.
a) Annealing operation is not necessary
b) Power requirements are low
c) Surface finish is good
d) Grain refinement is possible

2) In cold working process ____.
a) Good surface finish is obtained
b) Scaling occurs
c) Close tolerance is difficult to achieve
d) All the above

3) From following, the alternative name for RP is ____.
a) Additive Manufacturing b) Layer Manufacturing
c) Direct CAD Manufacturing d) All of the above

4) Gravity dies casting process is used for manufactured of ____
a) Lathe bed b) Drainage pipes
c) Spanner d) Carburetor body

5) Choke is generally provided at ____
a) Gate b) Pouring cup
c) Feeder d) Mould Cavity

6) Sand which is used for core making is ____.
a) Shell sand b) Facing sand
c) Green sand d) Dry Sand

7) In sand molding, the middle part of joining two flask is called ____.
a) Coupe b) Parting line
c) Drag d) Flask-middle

8) Carburetor of two-wheeler is manufactured by ____
a) Sand Casting b) Shell Moulding
c) Permanent Mold casting d) Centrifugal casting

9) The patterns used for the lost wax type investment casting are made of: ____
a) wood b) gypsum
c) frozen mercury d) wax

10) The process of removing unwanted material from casting is called: ___
a) Fettling b) Cleaning
c) Finishing d) Blowing

11) Which one of the following welding processes uses non consumable electrode?
a) Gas metal arc welding b) Submerged arc welding
c) Gas tungsten arc welding d) Flux coated arc welding

12) In ____ process, the molten metal is poured and allowed to solidify, while mold is rotating.
a) Die casting b) Sand molding
c) Permanent mold casting d) Centrifugal casting

13) Tooth paste is manufactured by ____.
a) Direct extrusion b) Indirect Extrusion
c) Impact extrusion d) Hydrostatic Extrusion

14) Which of the following manufacturing processes is mainly considered for producing the components of very high strength?
a) Casting b) Forging
c) Extrusion d) Rolling

SLR-BD-86

Seat No.	

Set R

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Manufacturing Process (BTN02303)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figure to right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2	**a)**	Explain with neat sketch Gas tungsten arc welding.	**05**
	b)	Compare between welding and brazing.	**05**
	c)	Explain the basic steps in casting process with flow chart.	**04**
Q.3	**a)**	Explain in brief any three types of molding sand and their properties.	**05**
	b)	Difference between soldering and brazing.	**05**
	c)	Write short note Fettling and cleaning of casting.	**04**
Q.4	**a)**	What is significance of Allowances used in Pattern? Explain any two allowances.	**05**
	b)	Explain soldering process and its applications.	**05**
	c)	Explain centrifugal casting process.	**04**

Section – II

Q.5	**a)**	Explain with neat sketch classification of rolling mill on the basis of no. of rolls.	**05**
	b)	Differentiate between hot rolling and cold rolling operations.	**05**
	c)	State advantages, disadvantages, and applications of RP.	**04**
Q.6	**a)**	Explain with neat sketch open die forging process.	**05**
	b)	Explain with neat sketch hydro mechanical forming process.	**05**
	c)	Explain with neat sketch Fused Deposition modeling.	**04**
Q.7	**Write short note on:**		
	a)	Electro hydraulic forming	**05**
	b)	Bulk forming processes	**05**
	c)	Selective Laser Sintering (SLS)	**04**

Seat No.	

Set **S**

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Manufacturing Process (BTN02303)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The process of removing unwanted material from casting is called: ___
a) Fettling b) Cleaning
c) Finishing d) Blowing

2) Which one of the following welding processes uses non consumable electrode?
a) Gas metal arc welding b) Submerged arc welding
c) Gas tungsten arc welding d) Flux coated arc welding

3) In ____ process, the molten metal is poured and allowed to solidify, while mold is rotating.
a) Die casting b) Sand molding
c) Permanent mold casting d) Centrifugal casting

4) Tooth paste is manufactured by ____.
a) Direct extrusion b) Indirect Extrusion
c) Impact extrusion d) Hydrostatic Extrusion

5) Which of the following manufacturing processes is mainly considered for producing the components of very high strength?
a) Casting b) Forging
c) Extrusion d) Rolling

6) Which is incorrect statement about results of hot working ____.
a) Annealing operation is not necessary
b) Power requirements are low
c) Surface finish is good
d) Grain refinement is possible

7) In cold working process ____.
a) Good surface finish is obtained
b) Scaling occurs
c) Close tolerance is difficult to achieve
d) All the above

8) From following, the alternative name for RP is ____.
a) Additive Manufacturing b) Layer Manufacturing
c) Direct CAD Manufacturing d) All of the above

9) Gravity dies casting process is used for manufactured of ____
a) Lathe bed b) Drainage pipes
c) Spanner d) Carburetor body

10) Choke is generally provided at ____
a) Gate b) Pouring cup
c) Feeder d) Mould Cavity

11) Sand which is used for core making is ____.
a) Shell sand b) Facing sand
c) Green sand d) Dry Sand

12) In sand molding, the middle part of joining two flask is called ____.
a) Coupe b) Parting line
c) Drag d) Flask-middle

13) Carburetor of two-wheeler is manufactured by ____
a) Sand Casting b) Shell Moulding
c) Permanent Mold casting d) Centrifugal casting

14) The patterns used for the lost wax type investment casting are made of: ____
a) wood b) gypsum
c) frozen mercury d) wax

SLR-BD-86

Seat No.		Set	S

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Manufacturing Process (BTN02303)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figure to right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2	**a)**	Explain with neat sketch Gas tungsten arc welding.	**05**
	b)	Compare between welding and brazing.	**05**
	c)	Explain the basic steps in casting process with flow chart.	**04**
Q.3	**a)**	Explain in brief any three types of molding sand and their properties.	**05**
	b)	Difference between soldering and brazing.	**05**
	c)	Write short note Fettling and cleaning of casting.	**04**
Q.4	**a)**	What is significance of Allowances used in Pattern? Explain any two allowances.	**05**
	b)	Explain soldering process and its applications.	**05**
	c)	Explain centrifugal casting process.	**04**

Section – II

Q.5	**a)**	Explain with neat sketch classification of rolling mill on the basis of no. of rolls.	**05**
	b)	Differentiate between hot rolling and cold rolling operations.	**05**
	c)	State advantages, disadvantages, and applications of RP.	**04**
Q.6	**a)**	Explain with neat sketch open die forging process.	**05**
	b)	Explain with neat sketch hydro mechanical forming process.	**05**
	c)	Explain with neat sketch Fused Deposition modeling.	**04**
Q.7	**Write short note on:**		
	a)	Electro hydraulic forming	**05**
	b)	Bulk forming processes	**05**
	c)	Selective Laser Sintering (SLS)	**04**

SLR-BD-87

Seat No.	

Set P

S. Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Machine Drawing & CAD (BTN02304)

Day & Date: Wednesday, 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer.
Type -1: Straight Objective Type / classical MCQ (Each bit one Mark each). 05

1) Hatching lines are drawn at an angle of ____ to the axis or to the main outline of the sections.
a) 60° b) 45°
c) 30° d) 54°

2) The length to width ratio of an arrowhead should be limited to ___
a) 1: 2 b) 1: 3
c) 3: 1 d) 2: 1

3) Standard size for A2 drawing sheet is as per BIS in mm is ____.
a) 594x841 b) 297x420
c) 210x297 d) 420x594

4) The size across Hats in a hexagonal nut is ____.
a) 1.5D b) 0.9D
c) 1.5D + 3 d) 1.2D

5) In the solid flanged couplings, the flange is ____.
a) Separate, mounted using a sunk key
b) Integral with the shaft
c) Fitted with interference fit
d) Fitted with clearance fit

Type-2 Correct or Incorrect (Attempt any two) (Each bit One Mark each) **02**

1) Zero line-It is the line of zero deviation and represents the basic size.

2) The relationships between the mating parts are called limit

3) The Size of A2 sheet is 420×594.

Type -3 multiple correct answer type. (Solve any two) (Each correct bit 2 mark) **04**

1) In split muff coupling the numbers of bolts will always be ____

a) Odd b) Even

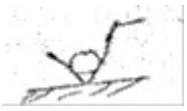
c) Four d) Three

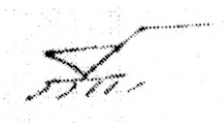
2) In Full section how much part of object is imagined to be removed?

a) Half b) Full

c) Quarter d) Can't predict

3) Which of the following symbols used for showing that "machining is prohibited"?

a)  b)

c) d) 

Type -4 Match the pairs (One marks for each correct answer) **03**

Column I	**Column II**
1)	a) N11
2)	b) N8
3)	c) N5
	d) N3

SLR-BD-87

Seat No.		Set	P

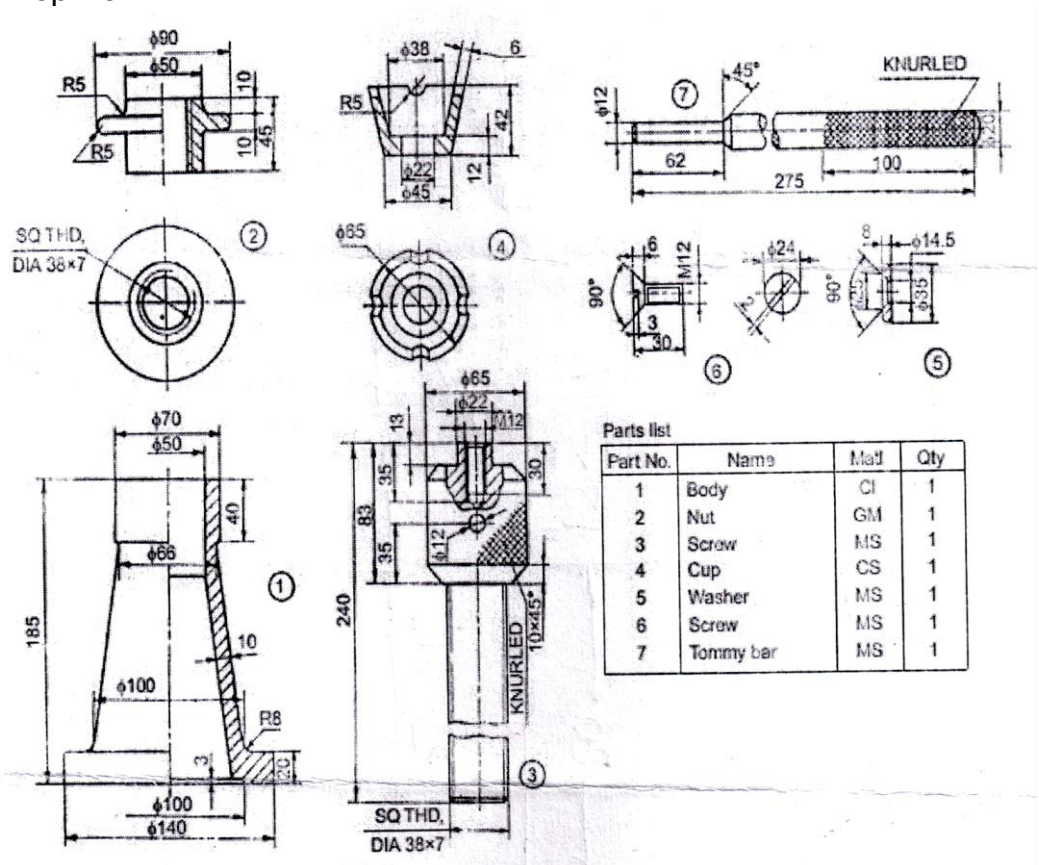
S. Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Machine Drawing & CAD (BTN02304)

Day & Date: Wednesday, 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All question are compulsory.
2) Assume suitable dimensions if not given.
3) Figure to right indicate full marks.
4) Use first angle Method of projections.

Q.2 Figure No.1 The detail parts of Screw Jack is given, Assemble the parts and show the following views. **22**

1) Front view
2) Top view



Parts list

Part No.	Name	Matl	Qty
1	Body	CI	1
2	Nut	GM	1
3	Screw	MS	1
4	Cup	CS	1
5	Washer	MS	1
6	Screw	MS	1
7	Tommy bar	MS	1

Fig. No. 1

Q.3 **a)** **Solve the following:** **08**

Draw the BIS Convention of

1) Slotted Head
2) Bearing
3) Tension Spring
4) Diamond Knurling

b) **Freehand sketching for the Following (Any One)** **05**

1) Eye Foundation Bolt
2) Double Riveted Lap Joint

Q.4 **a)** **Draw the BIS Convention for Following (Any Two)** **04**

1) Removed Section
2) Bevel Gear
3) Serrated Shalt

b) **Draw the Freehand Sketching for the Following (Any One)** **06**

1) Oldham's coupling
2) Foot Step bearing

Q.5 **Solve the Following:**

a) Draw the Representation of Hole and Shaft Basis System. **04**

b) Redraw the following Figure No. 2 with given dimensions and show following geometrical tolerances on it. **07**

1) Surface C and D Parallel to each other within 0.2 mm
2) Axis of holes ø15 Perpendicular to the axis of ø 24 hole within 0.2 mm
3) Surface E is to be milled with two triangle finish

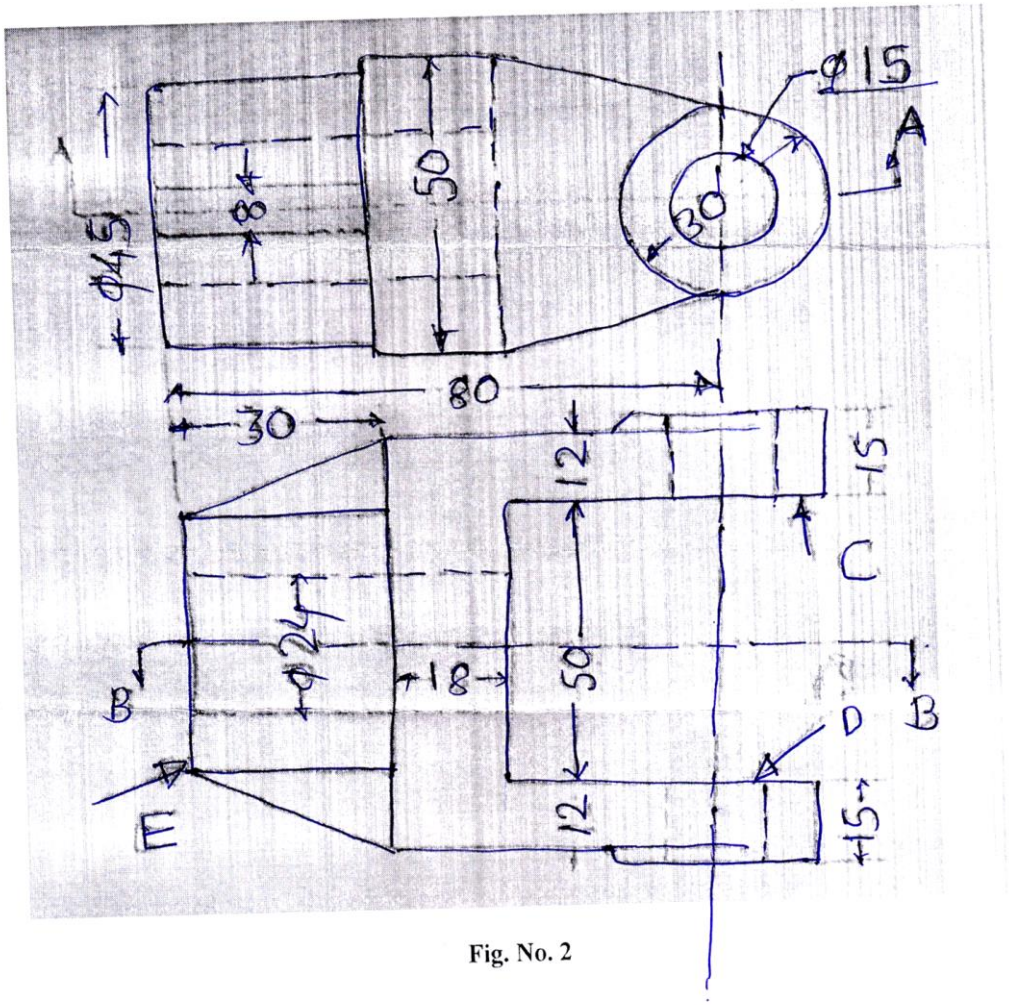


Fig. No. 2

SLR-BD-87

Seat No.	

Set Q

S. Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Machine Drawing & CAD (BTN02304)

Day & Date: Wednesday, 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer.
Type -1: Straight Objective Type / classical MCQ (Each bit one Mark each). 05

1) Standard size for A2 drawing sheet is as per BIS in mm is ____.
a) 594x841 b) 297x420
c) 210x297 d) 420x594

2) The size across Hats in a hexagonal nut is ____.
a) 1.5D b) 0.9D
c) 1.5D + 3 d) 1.2D

3) In the solid flanged couplings, the flange is ____.
a) Separate, mounted using a sunk key
b) Integral with the shaft
c) Fitted with interference fit
d) Fitted with clearance fit

4) Hatching lines are drawn at an angle of ____ to the axis or to the main outline of the sections.
a) 60° b) 45°
c) 30° d) 54°

5) The length to width ratio of an arrowhead should be limited to ___
a) 1: 2 b) 1: 3
c) 3: 1 d) 2: 1

Type-2 Correct or Incorrect (Attempt any two) (Each bit One Mark each) **02**

1) Zero line-It is the line of zero deviation and represents the basic size.

2) The relationships between the mating parts are called limit

3) The Size of A2 sheet is 420×594.

Type -3 multiple correct answer type. (Solve any two) (Each correct bit 2 mark) **04**

1) In split muff coupling the numbers of bolts will always be ____

a) Odd b) Even

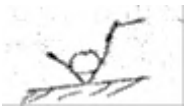
c) Four d) Three

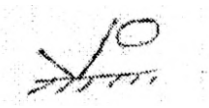
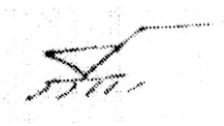
2) In Full section how much part of object is imagined to be removed?

a) Half b) Full

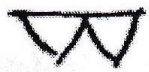
c) Quarter d) Can't predict

3) Which of the following symbols used for showing that "machining is prohibited"?

a)  b)

c)  d) 

Type -4 Match the pairs (One marks for each correct answer) **03**

Column I	**Column II**
1)	a) N11
2) 	b) N8
3)	c) N5
	d) N3

SLR-BD-87

Seat No.	

Set Q

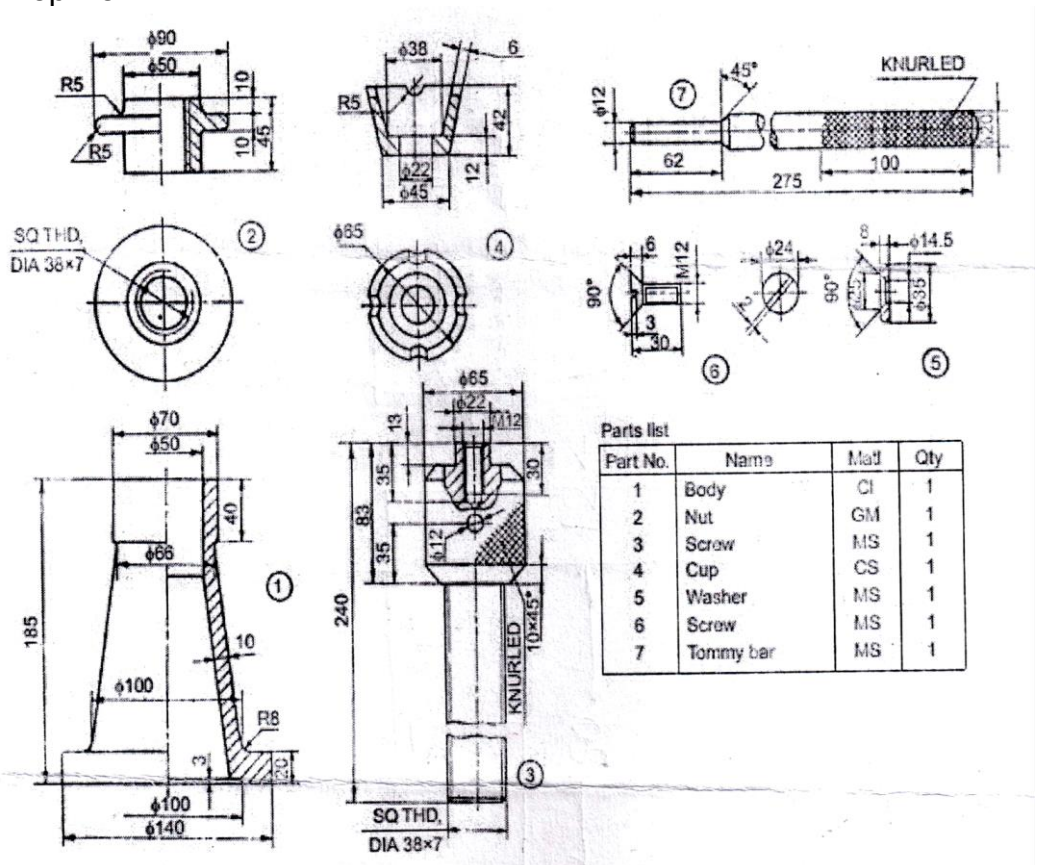
S. Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Machine Drawing & CAD (BTN02304)

Day & Date: Wednesday, 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All question are compulsory.
2) Assume suitable dimensions if not given.
3) Figure to right indicate full marks.
4) Use first angle Method of projections.

Q.2 Figure No.1 The detail parts of Screw Jack is given, Assemble the parts and show the following views. **22**

1) Front view
2) Top view



Parts list

Part No.	Name	Matl	Qty
1	Body	CI	1
2	Nut	GM	1
3	Screw	MS	1
4	Cup	CS	1
5	Washer	MS	1
6	Screw	MS	1
7	Tommy bar	MS	1

Fig. No. 1

Q.3 **a)** **Solve the following:** **08**

Draw the BIS Convention of

1) Slotted Head
2) Bearing
3) Tension Spring
4) Diamond Knurling

b) **Freehand sketching for the Following (Any One)** **05**

1) Eye Foundation Bolt
2) Double Riveted Lap Joint

Q.4 **a)** **Draw the BIS Convention for Following (Any Two)** **04**

1) Removed Section
2) Bevel Gear
3) Serrated Shalt

b) **Draw the Freehand Sketching for the Following (Any One)** **06**

1) Oldham's coupling
2) Foot Step bearing

Q.5 **Solve the Following:**

a) Draw the Representation of Hole and Shaft Basis System. **04**

b) Redraw the following Figure No. 2 with given dimensions and show following geometrical tolerances on it. **07**

1) Surface C and D Parallel to each other within 0.2 mm
2) Axis of holes ø15 Perpendicular to the axis of ø 24 hole within 0.2 mm
3) Surface E is to be milled with two triangle finish

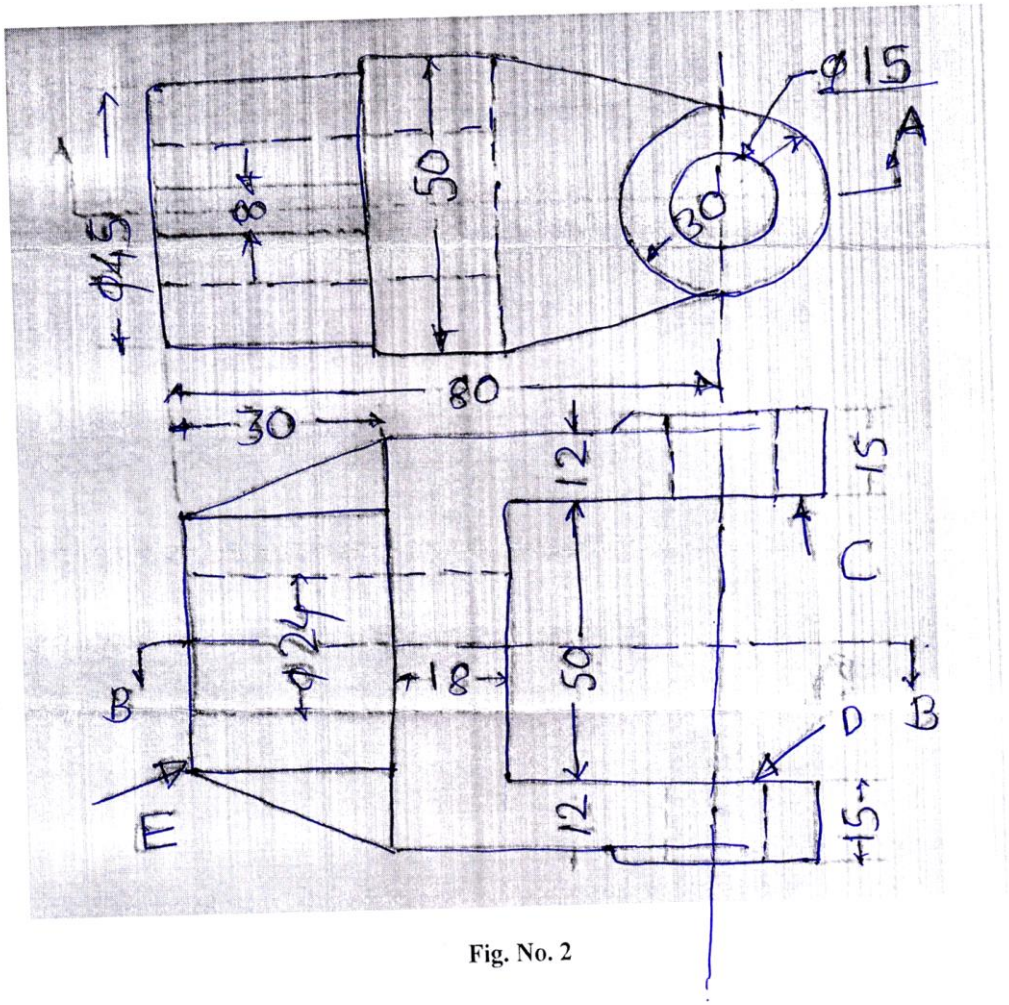


Fig. No. 2

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Machine Drawing & CAD (BTN02304)

Day & Date: Wednesday, 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer.
Type -1: Straight Objective Type / classical MCQ (Each bit one Mark each). 05

1) In the solid flanged couplings, the flange is ____.
a) Separate, mounted using a sunk key
b) Integral with the shaft
c) Fitted with interference fit
d) Fitted with clearance fit

2) Hatching lines are drawn at an angle of ____ to the axis or to the main outline of the sections.
a) 60° b) 45°
c) 30° d) 54°

3) The length to width ratio of an arrowhead should be limited to ___
a) 1: 2 b) 1: 3
c) 3: 1 d) 2: 1

4) Standard size for A2 drawing sheet is as per BIS in mm is ____.
a) 594x841 b) 297x420
c) 210x297 d) 420x594

5) The size across Hats in a hexagonal nut is ____.
a) 1.5D b) 0.9D
c) 1.5D + 3 d) 1.2D

Type-2 Correct or Incorrect (Attempt any two) (Each bit One Mark each) **02**

1) Zero line-It is the line of zero deviation and represents the basic size.

2) The relationships between the mating parts are called limit

3) The Size of A2 sheet is 420×594.

Type -3 multiple correct answer type. (Solve any two) (Each correct bit 2 mark) **04**

1) In split muff coupling the numbers of bolts will always be ____

a) Odd b) Even

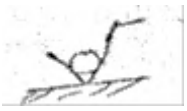
c) Four d) Three

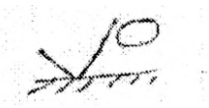
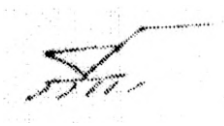
2) In Full section how much part of object is imagined to be removed?

a) Half b) Full

c) Quarter d) Can't predict

3) Which of the following symbols used for showing that "machining is prohibited"?

a)  b)

c)  d) 

Type -4 Match the pairs (One marks for each correct answer) **03**

Column I	**Column II**
1)	a) N11
2)	b) N8
3)	c) N5
	d) N3

SLR-BD-87

Seat No.	

Set | **R**

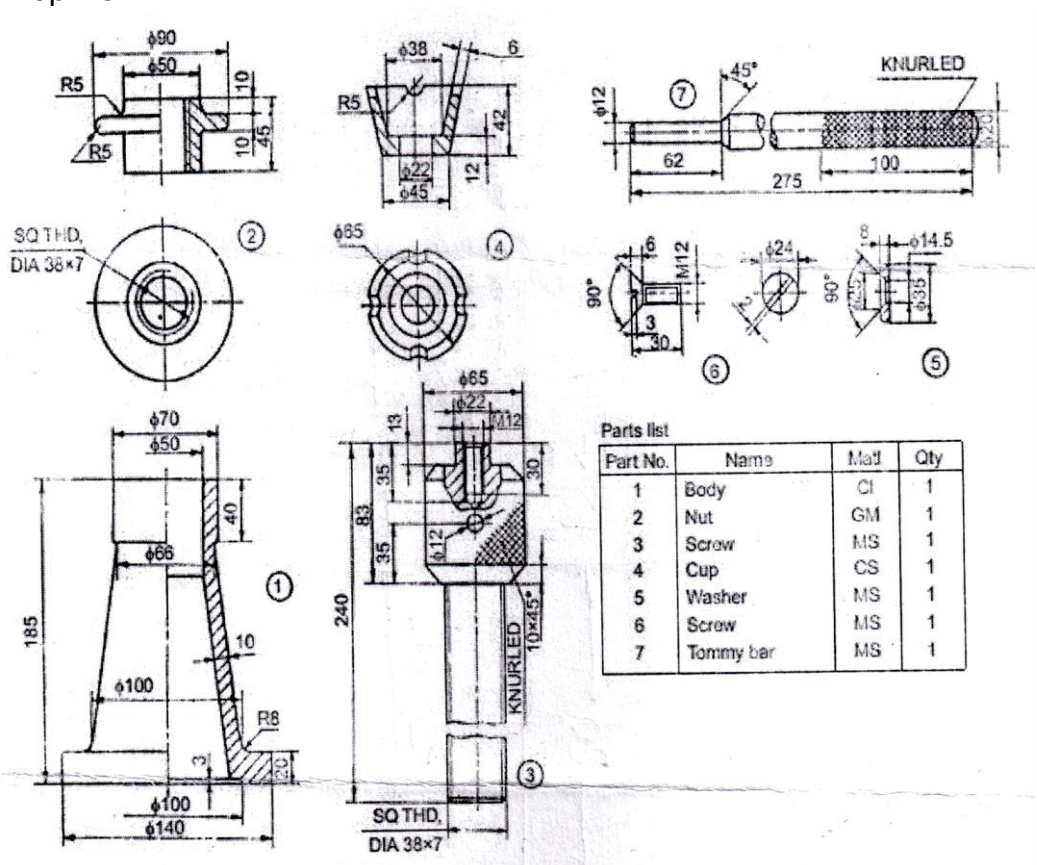
S. Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Machine Drawing & CAD (BTN02304)

Day & Date: Wednesday, 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All question are compulsory.
2) Assume suitable dimensions if not given.
3) Figure to right indicate full marks.
4) Use first angle Method of projections.

Q.2 Figure No.1 The detail parts of Screw Jack is given, Assemble the parts and show the following views. **22**

1) Front view
2) Top view



Parts list

Part No.	Name	Matl	Qty
1	Body	CI	1
2	Nut	GM	1
3	Screw	MS	1
4	Cup	CS	1
5	Washer	MS	1
6	Screw	MS	1
7	Tommy bar	MS	1

Fig. No. 1

Q.3 **a)** **Solve the following:** **08**

Draw the BIS Convention of

1) Slotted Head
2) Bearing
3) Tension Spring
4) Diamond Knurling

b) **Freehand sketching for the Following (Any One)** **05**

1) Eye Foundation Bolt
2) Double Riveted Lap Joint

Q.4 **a)** **Draw the BIS Convention for Following (Any Two)** **04**

1) Removed Section
2) Bevel Gear
3) Serrated Shalt

b) **Draw the Freehand Sketching for the Following (Any One)** **06**

1) Oldham's coupling
2) Foot Step bearing

Q.5 **Solve the Following:**

a) Draw the Representation of Hole and Shaft Basis System. **04**

b) Redraw the following Figure No. 2 with given dimensions and show following geometrical tolerances on it. **07**

1) Surface C and D Parallel to each other within 0.2 mm
2) Axis of holes ø15 Perpendicular to the axis of ø 24 hole within 0.2 mm
3) Surface E is to be milled with two triangle finish

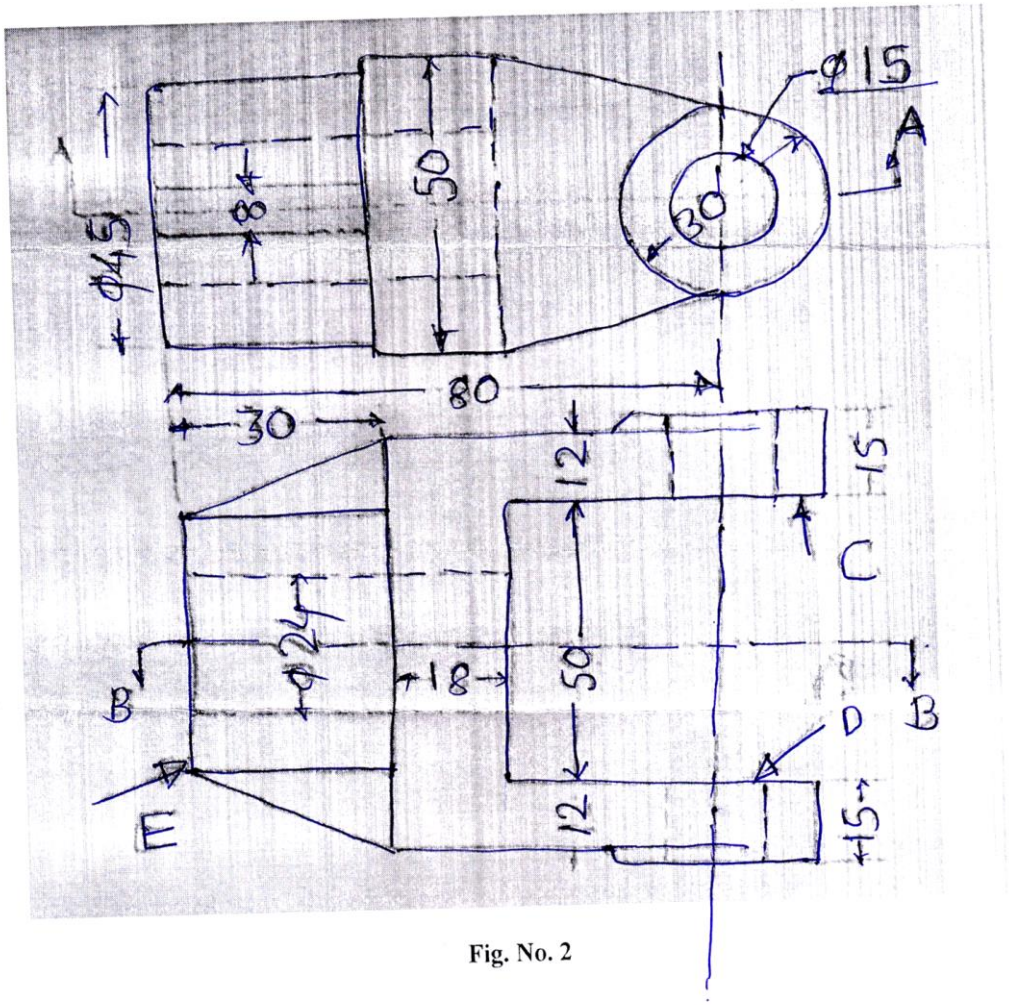


Fig. No. 2

Seat No.	

Set **S**

S. Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Machine Drawing & CAD (BTN02304)

Day & Date: Wednesday, 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer.
Type -1: Straight Objective Type / classical MCQ (Each bit one Mark each). 05

1) The length to width ratio of an arrowhead should be limited to ___
a) 1: 2 b) 1: 3
c) 3: 1 d) 2: 1

2) Standard size for A2 drawing sheet is as per BIS in mm is ____.
a) 594x841 b) 297x420
c) 210x297 d) 420x594

3) The size across Hats in a hexagonal nut is ____.
a) 1.5D b) 0.9D
c) 1.5D + 3 d) 1.2D

4) In the solid flanged couplings, the flange is ____.
a) Separate, mounted using a sunk key
b) Integral with the shaft
c) Fitted with interference fit
d) Fitted with clearance fit

5) Hatching lines are drawn at an angle of ____ to the axis or to the main outline of the sections.
a) 60° b) 45°
c) 30° d) 54°

Type-2 Correct or Incorrect (Attempt any two) (Each bit One Mark each) **02**

1) Zero line-It is the line of zero deviation and represents the basic size.

2) The relationships between the mating parts are called limit

3) The Size of A2 sheet is 420×594.

Type -3 multiple correct answer type. (Solve any two) (Each correct bit 2 mark) **04**

1) In split muff coupling the numbers of bolts will always be ____

a) Odd b) Even

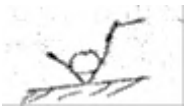
c) Four d) Three

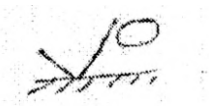
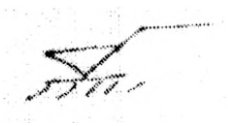
2) In Full section how much part of object is imagined to be removed?

a) Half b) Full

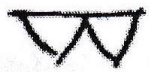
c) Quarter d) Can't predict

3) Which of the following symbols used for showing that "machining is prohibited"?

a)  b)

c)  d) 

Type -4 Match the pairs (One marks for each correct answer) **03**

Column I	**Column II**
1)	a) N11
2) 	b) N8
3)	c) N5
	d) N3

SLR-BD-87

Seat No.		Set	S

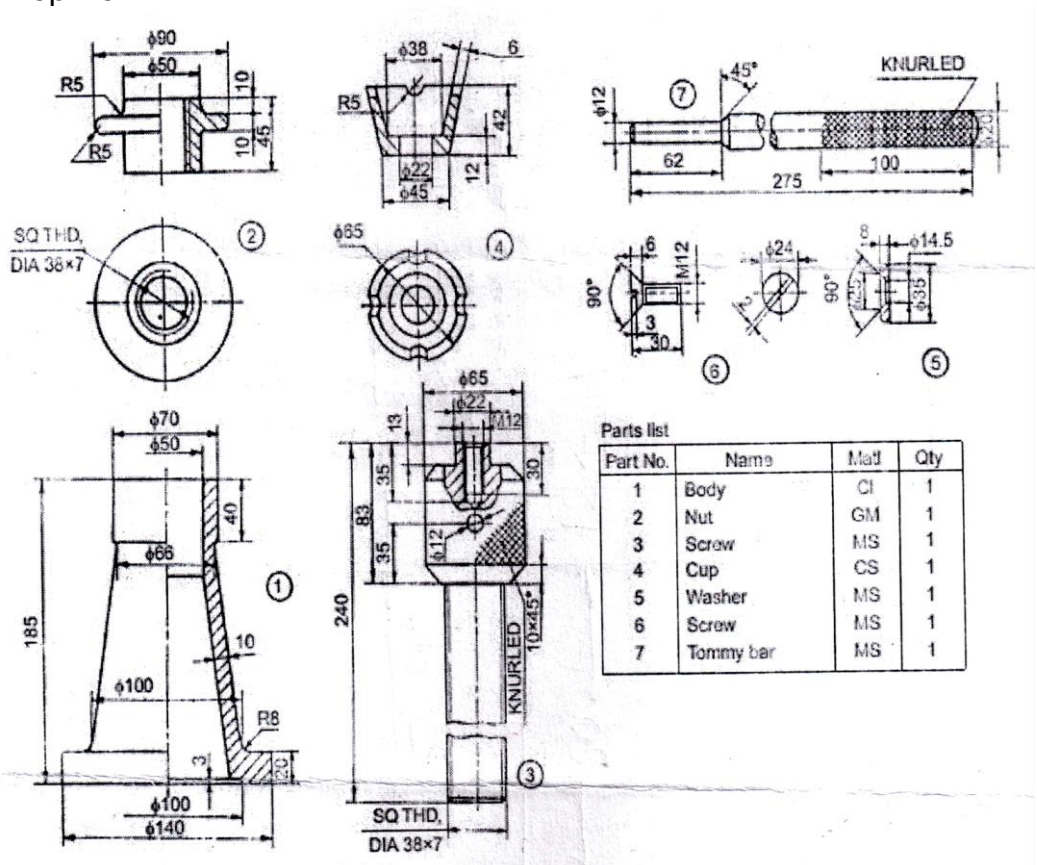
S. Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Machine Drawing & CAD (BTN02304)

Day & Date: Wednesday, 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All question are compulsory.
2) Assume suitable dimensions if not given.
3) Figure to right indicate full marks.
4) Use first angle Method of projections.

Q.2 Figure No.1 The detail parts of Screw Jack is given, Assemble the parts and show the following views. **22**

1) Front view
2) Top view



Parts list

Part No.	Name	Matl	Qty
1	Body	CI	1
2	Nut	GM	1
3	Screw	MS	1
4	Cup	CS	1
5	Washer	MS	1
6	Screw	MS	1
7	Tommy bar	MS	1

Fig. No. 1

Q.3 **a)** **Solve the following:** **08**

Draw the BIS Convention of

1) Slotted Head
2) Bearing
3) Tension Spring
4) Diamond Knurling

b) **Freehand sketching for the Following (Any One)** **05**

1) Eye Foundation Bolt
2) Double Riveted Lap Joint

Q.4 **a)** **Draw the BIS Convention for Following (Any Two)** **04**

1) Removed Section
2) Bevel Gear
3) Serrated Shalt

b) **Draw the Freehand Sketching for the Following (Any One)** **06**

1) Oldham's coupling
2) Foot Step bearing

Q.5 **Solve the Following:**

a) Draw the Representation of Hole and Shaft Basis System. **04**

b) Redraw the following Figure No. 2 with given dimensions and show following geometrical tolerances on it. **07**

1) Surface C and D Parallel to each other within 0.2 mm
2) Axis of holes ø15 Perpendicular to the axis of ø 24 hole within 0.2 mm
3) Surface E is to be milled with two triangle finish

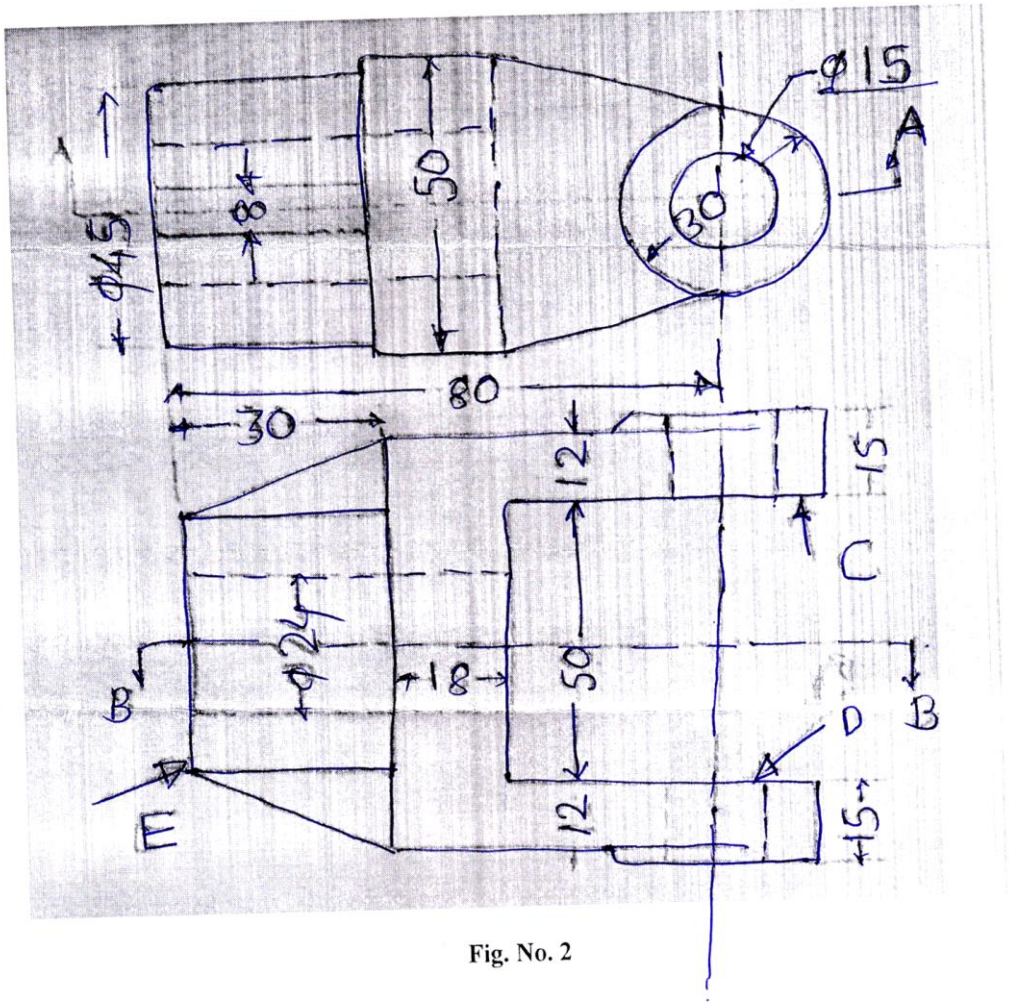


Fig. No. 2

SLR-BD-89

Seat No.	

Set P

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Internal Combustion Engines (BTN02306)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Increasing the compression ratio in SI engines the knocking tendency _____.
a) Increases b) Not affected
c) Decreases d) None of the above

2) If the N is the rpm, number of power strokes/min in a two-stroke engine is _____.
a) 2N b) N
c) 4N d) N/2

3) Volumetric efficiency is a measure of _____.
a) speed of the engine
b) power of the engine
c) breathing capacity of the engine
d) pressure rise in the cylinder

4) Octane number of n-heptane is _____.
a) 30 b) 60
c) 100 d) 0

5) Supercharging increases the power output of the engine by _____.
a) Increasing the charge temperature
b) Increasing the speed of engine
c) Increasing the charge pressure
d) None of these

6) Brake power is measured by _____.
a) Morse test b) Burette test
c) Dynamometers d) Motoring test

7) NOx emission is maximum in SI engine when _____.
a) Temperature is more b) Residence time is more
c) Oxygen is more d) All of the above

8) An indication of ignition quality of a diesel fuel is given by _____.
a) Preignition b) Cetane number
c) Detonation d) Octane number

9) Spark advance is usually specified in terms of _____.
a) engine speed in rev/min b) degrees of crank rotation
c) time in seconds d) none of the above

10) Brake specific fuel consumption is defined as _____.
a) fuel consumption per hour
b) fuel consumption per km
c) fuel consumption per brake power
d) fuel consumption per brake power hour

11) D-MPFI System is _____.
a) port fuel injection system b) manifold fuel injection system
c) venture fuel injection system d) none of the above

12) In Air-fuel mixture, the mixture contains more air is called _____.
a) Rich mixture b) Chemically correct mixture
c) Lean mixture d) None of above

13) One of the major exhaust emissions from CI Engine compared to SI Engine _____.
a) Oxides of nitrogen b) Particulates
c) Unburnt hydrocarbons d) CO and CO2

14) The period between start of injection and start of ignition is called _____.
a) Ignition period b) Mixing period
c) Injection delay d) Ignition delay

SLR-BD-89

Seat No.		Set	P

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Internal Combustion Engines (BTN02306)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Make suitable data if required.
4) Use of scientific calculator is allowed.

Section – I

Q.2 Answer the following questions.
a) Explain selection of I C Engine for power generation and automobile Application. **07**
b) Draw and explain Valve Timing diagrams for 2S SI engine and 4S CI Engine both operated on high speed. **07**

Q.3 Answer the following questions.
a) Drive the expression of air fuel ratio of carburetor by exact analysis method. **07**
b) Explain In details common rail fuel injection system. **07**

Q.4 Answer the following questions.
a) Enlist the types of injector nozzles used in engines and explain any one with neat sketch. **07**
b) Compare 2S & 4S internal combustion engines. **07**

Section – II

Q.5 Answer the following questions.
a) Discuss the Phenomenon of knocking or detonation in SI engines **07**
b) Explain with neat sketch the combustion process in a CI engines. **07**

Q.6 Answer the following questions.
a) Explain Heat balance sheet in detail. **07**
b) Explain stages of combustion in CI Engine. **07**

Q.7 Answer the following questions.
a) Discuss the suitability of bio gas as an alternative fuel. **07**
b) Explain any three factors affecting knock in CI engines. **07**

SLR-BD-89

Seat No.	

Set Q

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Internal Combustion Engines (BTN02306)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) An indication of ignition quality of a diesel fuel is given by _____.
a) Preignition b) Cetane number
c) Detonation d) Octane number

2) Spark advance is usually specified in terms of _____.
a) engine speed in rev/min b) degrees of crank rotation
c) time in seconds d) none of the above

3) Brake specific fuel consumption is defined as _____.
a) fuel consumption per hour
b) fuel consumption per km
c) fuel consumption per brake power
d) fuel consumption per brake power hour

4) D-MPFI System is _____.
a) port fuel injection system b) manifold fuel injection system
c) venture fuel injection system d) none of the above

5) In Air-fuel mixture, the mixture contains more air is called _____.
a) Rich mixture b) Chemically correct mixture
c) Lean mixture d) None of above

6) One of the major exhaust emissions from CI Engine compared to SI Engine _____.
a) Oxides of nitrogen b) Particulates
c) Unburnt hydrocarbons d) CO and CO2

7) The period between start of injection and start of ignition is called _____.
a) Ignition period b) Mixing period
c) Injection delay d) Ignition delay

8) Increasing the compression ratio in SI engines the knocking tendency _____.

a) Increases
b) Not affected
c) Decreases
d) None of the above

9) If the N is the rpm, number of power strokes/min in a two-stroke engine is _____.

a) 2N
b) N
c) 4N
d) N/2

10) Volumetric efficiency is a measure of _____.

a) speed of the engine
b) power of the engine
c) breathing capacity of the engine
d) pressure rise in the cylinder

11) Octane number of n-heptane is _____.

a) 30
b) 60
c) 100
d) 0

12) Supercharging increases the power output of the engine by _____.

a) Increasing the charge temperature
b) Increasing the speed of engine
c) Increasing the charge pressure
d) None of these

13) Brake power is measured by _____.

a) Morse test
b) Burette test
c) Dynamometers
d) Motoring test

14) NOx emission is maximum in SI engine when _____.

a) Temperature is more
b) Residence time is more
c) Oxygen is more
d) All of the above

SLR-BD-89

Seat No.	

Set Q

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Internal Combustion Engines (BTN02306)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Make suitable data if required.
4) Use of scientific calculator is allowed.

Section – I

Q.2 Answer the following questions.

a) Explain selection of I C Engine for power generation and automobile Application. **07**

b) Draw and explain Valve Timing diagrams for 2S SI engine and 4S CI Engine both operated on high speed. **07**

Q.3 Answer the following questions.

a) Drive the expression of air fuel ratio of carburetor by exact analysis method. **07**

b) Explain In details common rail fuel injection system. **07**

Q.4 Answer the following questions.

a) Enlist the types of injector nozzles used in engines and explain any one with neat sketch. **07**

b) Compare 2S & 4S internal combustion engines. **07**

Section – II

Q.5 Answer the following questions.

a) Discuss the Phenomenon of knocking or detonation in SI engines **07**

b) Explain with neat sketch the combustion process in a CI engines. **07**

Q.6 Answer the following questions.

a) Explain Heat balance sheet in detail. **07**

b) Explain stages of combustion in CI Engine. **07**

Q.7 Answer the following questions.

a) Discuss the suitability of bio gas as an alternative fuel. **07**

b) Explain any three factors affecting knock in CI engines. **07**

SLR-BD-89

Seat No.		Set	R

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Internal Combustion Engines (BTN02306)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) D-MPFI System is _____.
a) port fuel injection system b) manifold fuel injection system
c) venture fuel injection system d) none of the above

2) In Air-fuel mixture, the mixture contains more air is called _____.
a) Rich mixture b) Chemically correct mixture
c) Lean mixture d) None of above

3) One of the major exhaust emissions from CI Engine compared to SI Engine _____.
a) Oxides of nitrogen b) Particulates
c) Unburnt hydrocarbons d) CO and CO2

4) The period between start of injection and start of ignition is called _____.
a) Ignition period b) Mixing period
c) Injection delay d) Ignition delay

5) Increasing the compression ratio in SI engines the knocking tendency _____.
a) Increases b) Not affected
c) Decreases d) None of the above

6) If the N is the rpm, number of power strokes/min in a two-stroke engine is _____.
a) 2N b) N
c) 4N d) N/2

7) Volumetric efficiency is a measure of _____.
a) speed of the engine
b) power of the engine
c) breathing capacity of the engine
d) pressure rise in the cylinder

8) Octane number of n-heptane is _____.
a) 30 b) 60
c) 100 d) 0

9) Supercharging increases the power output of the engine by _____.
a) Increasing the charge temperature
b) Increasing the speed of engine
c) Increasing the charge pressure
d) None of these

10) Brake power is measured by _____.
a) Morse test b) Burette test
c) Dynamometers d) Motoring test

11) NOx emission is maximum in SI engine when _____.
a) Temperature is more b) Residence time is more
c) Oxygen is more d) All of the above

12) An indication of ignition quality of a diesel fuel is given by _____.
a) Preignition b) Cetane number
c) Detonation d) Octane number

13) Spark advance is usually specified in terms of _____.
a) engine speed in rev/min b) degrees of crank rotation
c) time in seconds d) none of the above

14) Brake specific fuel consumption is defined as _____.
a) fuel consumption per hour
b) fuel consumption per km
c) fuel consumption per brake power
d) fuel consumption per brake power hour

SLR-BD-89

Seat No.	

Set R

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Internal Combustion Engines (BTN02306)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Make suitable data if required.
4) Use of scientific calculator is allowed.

Section – I

Q.2 Answer the following questions.
a) Explain selection of I C Engine for power generation and automobile Application. **07**
b) Draw and explain Valve Timing diagrams for 2S SI engine and 4S CI Engine both operated on high speed. **07**

Q.3 Answer the following questions.
a) Drive the expression of air fuel ratio of carburetor by exact analysis method. **07**
b) Explain In details common rail fuel injection system. **07**

Q.4 Answer the following questions.
a) Enlist the types of injector nozzles used in engines and explain any one with neat sketch. **07**
b) Compare 2S & 4S internal combustion engines. **07**

Section – II

Q.5 Answer the following questions.
a) Discuss the Phenomenon of knocking or detonation in SI engines **07**
b) Explain with neat sketch the combustion process in a CI engines. **07**

Q.6 Answer the following questions.
a) Explain Heat balance sheet in detail. **07**
b) Explain stages of combustion in CI Engine. **07**

Q.7 Answer the following questions.
a) Discuss the suitability of bio gas as an alternative fuel. **07**
b) Explain any three factors affecting knock in CI engines. **07**

Seat No.		Set	S

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Internal Combustion Engines (BTN02306)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Brake power is measured by _____.
a) Morse test b) Burette test
c) Dynamometers d) Motoring test

2) NOx emission is maximum in SI engine when _____.
a) Temperature is more b) Residence time is more
c) Oxygen is more d) All of the above

3) An indication of ignition quality of a diesel fuel is given by _____.
a) Preignition b) Cetane number
c) Detonation d) Octane number

4) Spark advance is usually specified in terms of _____.
a) engine speed in rev/min b) degrees of crank rotation
c) time in seconds d) none of the above

5) Brake specific fuel consumption is defined as _____.
a) fuel consumption per hour
b) fuel consumption per km
c) fuel consumption per brake power
d) fuel consumption per brake power hour

6) D-MPFI System is _____.
a) port fuel injection system b) manifold fuel injection system
c) venture fuel injection system d) none of the above

7) In Air-fuel mixture, the mixture contains more air is called _____.
a) Rich mixture b) Chemically correct mixture
c) Lean mixture d) None of above

8) One of the major exhaust emissions from CI Engine compared to SI Engine _____.

a) Oxides of nitrogen
b) Particulates
c) Unburnt hydrocarbons
d) CO and CO2

9) The period between start of injection and start of ignition is called _____.

a) Ignition period
b) Mixing period
c) Injection delay
d) Ignition delay

10) Increasing the compression ratio in SI engines the knocking tendency _____.

a) Increases
b) Not affected
c) Decreases
d) None of the above

11) If the N is the rpm, number of power strokes/min in a two-stroke engine is _____.

a) 2N
b) N
c) 4N
d) N/2

12) Volumetric efficiency is a measure of _____.

a) speed of the engine
b) power of the engine
c) breathing capacity of the engine
d) pressure rise in the cylinder

13) Octane number of n-heptane is _____.

a) 30
b) 60
c) 100
d) 0

14) Supercharging increases the power output of the engine by _____.

a) Increasing the charge temperature
b) Increasing the speed of engine
c) Increasing the charge pressure
d) None of these

SLR-BD-89

Seat No.		Set	S

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Internal Combustion Engines (BTN02306)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Make suitable data if required.
4) Use of scientific calculator is allowed.

Section – I

Q.2 Answer the following questions.
a) Explain selection of I C Engine for power generation and automobile Application. **07**
b) Draw and explain Valve Timing diagrams for 2S SI engine and 4S CI Engine both operated on high speed. **07**

Q.3 Answer the following questions.
a) Drive the expression of air fuel ratio of carburetor by exact analysis method. **07**
b) Explain In details common rail fuel injection system. **07**

Q.4 Answer the following questions.
a) Enlist the types of injector nozzles used in engines and explain any one with neat sketch. **07**
b) Compare 2S & 4S internal combustion engines. **07**

Section – II

Q.5 Answer the following questions.
a) Discuss the Phenomenon of knocking or detonation in SI engines **07**
b) Explain with neat sketch the combustion process in a CI engines. **07**

Q.6 Answer the following questions.
a) Explain Heat balance sheet in detail. **07**
b) Explain stages of combustion in CI Engine. **07**

Q.7 Answer the following questions.
a) Discuss the suitability of bio gas as an alternative fuel. **07**
b) Explain any three factors affecting knock in CI engines. **07**

SLR-BD-90

Seat No.	

Set P

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Composite Material (BTN02307)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) In sandwich composites, which of the following material can be used for filling purposes?
a) Wood b) Cement
c) Polymer d) All of the mentioned

2) Composites can be classified based on _____.
a) Matrix type
b) Reinforcement constituent
c) Matrix type & reinforcement constituent
d) Neither on matrix type nor on reinforcement constituent type

3) The composite constituents of both matrix and reinforcements are softer.
a) True b) False

4) Which of the following has a greater impact on the longitudinal strength of reinforced composites?
a) Fiber orientation b) Fiber strength
c) Fiber length d) Fiber diameter

5) Which of the following does not combine with fiber to give composites?
a) Metals b) Ceramics
c) Non-metals d) Polymers

6) Which of the following may alter the mechanical properties of reinforced composites?
a) Constituent properties b) Fiber length
c) Fiber orientation d) All of the mentioned

7) Hand lay-up process predominantly uses _____ fibers.
a) unidirectional b) bidirectional
c) multidirectional d) none of the above

8) The fire point of composite is high.
a) True b) False

9) Which of the following does not combine with fiber to give composites?
a) Metals b) Ceramics
c) Non-metals d) Polymers

10) Which of the following type of composite is not classified under the category of a number of layers?
a) Unidirectional fiber reinforced b) Laminar
c) Sandwich panels d) Glass-fibre reinforced

11) The matrix phase controls the environmental resistance of the composites.
a) True b) False

12) In _____ it's a challenge to control the fiber volume fraction.
a) Hand lay-up b) Injection molding
c) Pultrusion d) Spray lay-up

13) Hand lay-up method can be easily used for manufacturing _____.
a) automotive parts b) dashboard
c) boat hulls d) all of the mentioned

14) Higher the length to diameter (L/D) ratio, greater opportunity for mixing of polymer and fiber.
a) True b) False

SLR-BD-90

Seat No.	

Set P

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Composite Material (BTN02307)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section I, Q. No. 2 is compulsory and attempt any two questions remaining of the questions.
2) In Section II, Q. No. 7 is compulsory and attempt any two questions remaining of the questions.
3) Figures to the right indicate full marks.

Section – I

Q.2	**a)**	Classify composite materials and explain any one with neat sketch.	**05**
	b)	Differentiate between Carbon-Carbon Composites, Metal Matrix Composites.	**05**
Q.3	**a)**	Define Stress, Strain, Elastic Moduli, Strain Energy.	**05**
	b)	Differentiate between Anisotropic Materials and Orthotropic Material.	**04**
Q.4	**a)**	Explain Hooke's Law for a Two-Dimensional Unidirectional Lamina.	**04**
	b)	Explain Engineering Constants of an Angle Lamina.	**05**

Q.5 Write short note on any three. **09**
a) Recycling Fiber-Reinforced Composites
b) Polymer Matrix Composites
c) Transversely Isotropic Material
d) Hooke's Law for a Two-Dimensional Angle Lamina

Section – II

Q.6	**a)**	Explain Density, Void Content.	**04**
	b)	Explain Evaluation of the Four Elastic Moduli.	**05**
Q.7	**a)**	Explain Transverse Young's Modulus.	**05**
	b)	Explain In-Plane Shear Modulus.	**05**
Q.8	**a)**	Explain Injection molding with neat sketch.	**05**
	b)	Differentiate Open and closed mold-processing.	**04**

Q.9 Write short note on any three. **09**
a) Hand lay-up techniques
b) Volume Fractions, Mass Fractions.
c) Bag molding and filament winding
d) Major Poisson's Ratio

SLR-BD-90

Seat No.	

Set Q

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Composite Material (BTN02307)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The fire point of composite is high.
a) True b) False

2) Which of the following does not combine with fiber to give composites?
a) Metals b) Ceramics
c) Non-metals d) Polymers

3) Which of the following type of composite is not classified under the category of a number of layers?
a) Unidirectional fiber reinforced b) Laminar
c) Sandwich panels d) Glass-fibre reinforced

4) The matrix phase controls the environmental resistance of the composites.
a) True b) False

5) In _____ it's a challenge to control the fiber volume fraction.
a) Hand lay-up b) Injection molding
c) Pultrusion d) Spray lay-up

6) Hand lay-up method can be easily used for manufacturing _____.
a) automotive parts b) dashboard
c) boat hulls d) all of the mentioned

7) Higher the length to diameter (L/D) ratio, greater opportunity for mixing of polymer and fiber.
a) True b) False

8) In sandwich composites, which of the following material can be used for filling purposes?

a) Wood
b) Cement
c) Polymer
d) All of the mentioned

9) Composites can be classified based on _____.

a) Matrix type
b) Reinforcement constituent
c) Matrix type & reinforcement constituent
d) Neither on matrix type nor on reinforcement constituent type

10) The composite constituents of both matrix and reinforcements are softer.

a) True
b) False

11) Which of the following has a greater impact on the longitudinal strength of reinforced composites?

a) Fiber orientation
b) Fiber strength
c) Fiber length
d) Fiber diameter

12) Which of the following does not combine with fiber to give composites?

a) Metals
b) Ceramics
c) Non-metals
d) Polymers

13) Which of the following may alter the mechanical properties of reinforced composites?

a) Constituent properties
b) Fiber length
c) Fiber orientation
d) All of the mentioned

14) Hand lay-up process predominantly uses _____ fibers.

a) unidirectional
b) bidirectional
c) multidirectional
d) none of the above

SLR-BD-90

Seat No.	

Set Q

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Composite Material (BTN02307)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section I, Q. No. 2 is compulsory and attempt any two questions remaining of the questions.
2) In Section II, Q. No. 7 is compulsory and attempt any two questions remaining of the questions.
3) Figures to the right indicate full marks.

Section – I

Q.2	**a)**	Classify composite materials and explain any one with neat sketch.	**05**
	b)	Differentiate between Carbon-Carbon Composites, Metal Matrix Composites.	**05**
Q.3	**a)**	Define Stress, Strain, Elastic Moduli, Strain Energy.	**05**
	b)	Differentiate between Anisotropic Materials and Orthotropic Material.	**04**
Q.4	**a)**	Explain Hooke's Law for a Two-Dimensional Unidirectional Lamina.	**04**
	b)	Explain Engineering Constants of an Angle Lamina.	**05**

Q.5 Write short note on any three. **09**
- **a)** Recycling Fiber-Reinforced Composites
- **b)** Polymer Matrix Composites
- **c)** Transversely Isotropic Material
- **d)** Hooke's Law for a Two-Dimensional Angle Lamina

Section – II

Q.6	**a)**	Explain Density, Void Content.	**04**
	b)	Explain Evaluation of the Four Elastic Moduli.	**05**
Q.7	**a)**	Explain Transverse Young's Modulus.	**05**
	b)	Explain In-Plane Shear Modulus.	**05**
Q.8	**a)**	Explain Injection molding with neat sketch.	**05**
	b)	Differentiate Open and closed mold-processing.	**04**

Q.9 Write short note on any three. **09**
- **a)** Hand lay-up techniques
- **b)** Volume Fractions, Mass Fractions.
- **c)** Bag molding and filament winding
- **d)** Major Poisson's Ratio

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Composite Material (BTN02307)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The matrix phase controls the environmental resistance of the composites.
a) True b) False

2) In _____ it's a challenge to control the fiber volume fraction.
a) Hand lay-up b) Injection molding
c) Pultrusion d) Spray lay-up

3) Hand lay-up method can be easily used for manufacturing _____.
a) automotive parts b) dashboard
c) boat hulls d) all of the mentioned

4) Higher the length to diameter (L/D) ratio, greater opportunity for mixing of polymer and fiber.
a) True b) False

5) In sandwich composites, which of the following material can be used for filling purposes?
a) Wood b) Cement
c) Polymer d) All of the mentioned

6) Composites can be classified based on _____.
a) Matrix type
b) Reinforcement constituent
c) Matrix type & reinforcement constituent
d) Neither on matrix type nor on reinforcement constituent type

7) The composite constituents of both matrix and reinforcements are softer.
a) True b) False

8) Which of the following has a greater impact on the longitudinal strength of reinforced composites?

a) Fiber orientation b) Fiber strength
c) Fiber length d) Fiber diameter

9) Which of the following does not combine with fiber to give composites?

a) Metals b) Ceramics
c) Non-metals d) Polymers

10) Which of the following may alter the mechanical properties of reinforced composites?

a) Constituent properties b) Fiber length
c) Fiber orientation d) All of the mentioned

11) Hand lay-up process predominantly uses _____ fibers.

a) unidirectional b) bidirectional
c) multidirectional d) none of the above

12) The fire point of composite is high.

a) True b) False

13) Which of the following does not combine with fiber to give composites?

a) Metals b) Ceramics
c) Non-metals d) Polymers

14) Which of the following type of composite is not classified under the category of a number of layers?

a) Unidirectional fiber reinforced b) Laminar
c) Sandwich panels d) Glass-fibre reinforced

SLR-BD-90

Seat No.	

Set R

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Composite Material (BTN02307)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section I, Q. No. 2 is compulsory and attempt any two questions remaining of the questions.
2) In Section II, Q. No. 7 is compulsory and attempt any two questions remaining of the questions.
3) Figures to the right indicate full marks.

Section – I

Q.2	**a)**	Classify composite materials and explain any one with neat sketch.	**05**
	b)	Differentiate between Carbon-Carbon Composites, Metal Matrix Composites.	**05**
Q.3	**a)**	Define Stress, Strain, Elastic Moduli, Strain Energy.	**05**
	b)	Differentiate between Anisotropic Materials and Orthotropic Material.	**04**
Q.4	**a)**	Explain Hooke's Law for a Two-Dimensional Unidirectional Lamina.	**04**
	b)	Explain Engineering Constants of an Angle Lamina.	**05**

Q.5 Write short note on any three. **09**
a) Recycling Fiber-Reinforced Composites
b) Polymer Matrix Composites
c) Transversely Isotropic Material
d) Hooke's Law for a Two-Dimensional Angle Lamina

Section – II

Q.6	**a)**	Explain Density, Void Content.	**04**
	b)	Explain Evaluation of the Four Elastic Moduli.	**05**
Q.7	**a)**	Explain Transverse Young's Modulus.	**05**
	b)	Explain In-Plane Shear Modulus.	**05**
Q.8	**a)**	Explain Injection molding with neat sketch.	**05**
	b)	Differentiate Open and closed mold-processing.	**04**

Q.9 Write short note on any three. **09**
a) Hand lay-up techniques
b) Volume Fractions, Mass Fractions.
c) Bag molding and filament winding
d) Major Poisson's Ratio

SLR-BD-90

Seat No.	

Set S

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Composite Material (BTN02307)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following may alter the mechanical properties of reinforced composites?
a) Constituent properties b) Fiber length
c) Fiber orientation d) All of the mentioned

2) Hand lay-up process predominantly uses _____ fibers.
a) unidirectional b) bidirectional
c) multidirectional d) none of the above

3) The fire point of composite is high.
a) True b) False

4) Which of the following does not combine with fiber to give composites?
a) Metals b) Ceramics
c) Non-metals d) Polymers

5) Which of the following type of composite is not classified under the category of a number of layers?
a) Unidirectional fiber reinforced b) Laminar
c) Sandwich panels d) Glass-fibre reinforced

6) The matrix phase controls the environmental resistance of the composites.
a) True b) False

7) In _____ it's a challenge to control the fiber volume fraction.
a) Hand lay-up b) Injection molding
c) Pultrusion d) Spray lay-up

8) Hand lay-up method can be easily used for manufacturing _____.
a) automotive parts b) dashboard
c) boat hulls d) all of the mentioned

9) Higher the length to diameter (L/D) ratio, greater opportunity for mixing of polymer and fiber.
a) True b) False

10) In sandwich composites, which of the following material can be used for filling purposes?
a) Wood b) Cement
c) Polymer d) All of the mentioned

11) Composites can be classified based on _____.
a) Matrix type
b) Reinforcement constituent
c) Matrix type & reinforcement constituent
d) Neither on matrix type nor on reinforcement constituent type

12) The composite constituents of both matrix and reinforcements are softer.
a) True b) False

13) Which of the following has a greater impact on the longitudinal strength of reinforced composites?
a) Fiber orientation b) Fiber strength
c) Fiber length d) Fiber diameter

14) Which of the following does not combine with fiber to give composites?
a) Metals b) Ceramics
c) Non-metals d) Polymers

SLR-BD-90

Seat No.		Set	S

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Composite Material (BTN02307)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section I, Q. No. 2 is compulsory and attempt any two questions remaining of the questions.
2) In Section II, Q. No. 7 is compulsory and attempt any two questions remaining of the questions.
3) Figures to the right indicate full marks.

Section – I

Q.2	**a)**	Classify composite materials and explain any one with neat sketch.	**05**
	b)	Differentiate between Carbon-Carbon Composites, Metal Matrix Composites.	**05**
Q.3	**a)**	Define Stress, Strain, Elastic Moduli, Strain Energy.	**05**
	b)	Differentiate between Anisotropic Materials and Orthotropic Material.	**04**
Q.4	**a)**	Explain Hooke's Law for a Two-Dimensional Unidirectional Lamina.	**04**
	b)	Explain Engineering Constants of an Angle Lamina.	**05**
Q.5	**Write short note on any three.**		**09**
	a)	Recycling Fiber-Reinforced Composites	
	b)	Polymer Matrix Composites	
	c)	Transversely Isotropic Material	
	d)	Hooke's Law for a Two-Dimensional Angle Lamina	

Section – II

Q.6	**a)**	Explain Density, Void Content.	**04**
	b)	Explain Evaluation of the Four Elastic Moduli.	**05**
Q.7	**a)**	Explain Transverse Young's Modulus.	**05**
	b)	Explain In-Plane Shear Modulus.	**05**
Q.8	**a)**	Explain Injection molding with neat sketch.	**05**
	b)	Differentiate Open and closed mold-processing.	**04**
Q.9	**Write short note on any three.**		**09**
	a)	Hand lay-up techniques	
	b)	Volume Fractions, Mass Fractions.	
	c)	Bag molding and filament winding	
	d)	Major Poisson's Ratio	

SLR-BD-91

Seat No.	

Set P

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Kinematics and Theory of Machine (MECHPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct answer: 14

1) In a mechanism which one is true _____
a) All links fixed b) One link is fixed
c) All links free d) None of the above

2) The lead screw of a lathe with nut forms a _____
a) sliding pair b) rolling pair
c) screw pair d) turning pair

3) The mechanism forms a structure, when the number of degrees of freedom (n) is equal to _____
a) 0 b) 1
c) 2 d) -1

4) The component of acceleration along the link is called as _____
a) Radial component b) Tangential component
c) Coriolis component d) None

5) The direction of linear velocity of any point on a link with respect to another point on the same link is _____
a) parallel to the link joining the points
b) perpendicular to the link joining the points
c) at 45° to the link joining the points
d) none of these

6) The size of cam depends upon _____
a) base circle b) pitch circle
c) Prime circle d) Pitch curve

7) Offset is provided to a cam follower mechanism to _____
a) minimize the side thrust b) accelerate
c) avoid jerk d) none of these

8) The type of gears used to connect two non-parallel non-intersecting shafts are _____
a) spur gears b) helical gears
c) spiral gears d) none of these

9) When the axes of first and last gear are co-axial, then gear train is known as _____
a) simple gear train b) compound gear train
c) reverted gear train d) epicyclic gear train

10) A differential gear in an automobile is a _____
a) simple gear train b) epicyclic gear train
c) compound gear train d) none of these

11) When the sleeve of a Porter governor moves upwards, the governor speed _____.
a) increase b) decreases
c) remains unaffected d) may increase or decrease

12) A Hartnell governor is a _____
a) pendulum type governor b) spring loaded governor
c) dead weight governor d) inertia governor

13) For static balancing of a shaft, _____
a) the net dynamic force acting on the shaft is equal to zero
b) the net couple due to the dynamic forces acting on the shaft is equal to zero
c) both (a) and (b)
d) none of the above

14) In order to have a complete balance of the several revolving masses in different planes _____
a) the resultant force must be zero
b) the resultant couple must be zero
c) both the resultant force and couple must be zero
d) none of the above

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Kinematics and Theory of Machine (MECHPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Use of scientific calculator is allowed.
3) Figures to right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.
5) Use university graph paper & semi-log paper if required.

SECTION – I

Q.2 Attempt the following.

a) Explain different kinds of kinematic pairs giving example for each of them. **04**

b) Explain Kutzbach's criterion for planar mechanisms with suitable examples. **04**

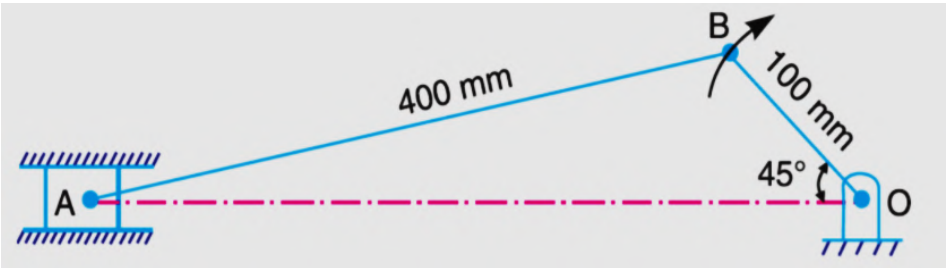
c) In a four-bar chain ABCD, AD is fixed and is 150 mm long. The crank AB is 40 mm long and rotates at 120 r.p.m. clockwise, while the link CD = 80 mm oscillates about D. BC and AD are of equal length. Find the angular velocity of link CD when angle BAD = 60°. **06**

Q.3 Attempt the following.

a) What is inversion of mechanism? Explain any two inversions of slider crank mechanism. **06**

b) Locate all the instantaneous centres of the slider crank mechanism as shown in below figure. The lengths of crank OB and connecting rod AB are 100 mm and 400 mm respectively. If the crank rotates clockwise with an angular velocity of 10 rad/s, find: **08**

i) Velocity of the slider A, and
ii) Angular velocity of the connecting rod AB.



Q.4 Attempt the following.

a) Explain with neat sketch different types of cams and followers. **06**

b) A cam is to be designed for a knife edge follower with the following data: **08**

i) Cam lift = 40 mm during 90° of cam rotation with simple harmonic motion.

ii) Dwell for the next 30°.

iii) During the next 60° of cam rotation, the follower returns to its original position with simple harmonic motion.

iv) Dwell during the remaining 180°.

Draw the profile of the cam when the line of stroke of the follower passes through the axis of the cam shaft. The radius of the base circle of the cam is 40 mm. Determine the maximum velocity and acceleration of the follower during its ascent and descent, if the cam rotates at 240 r.p.m.

SECTION – II

Q.5 Attempt the following.

a) Define the following terms. **04**

i) Addendum

ii) Dedendum

iii) Module

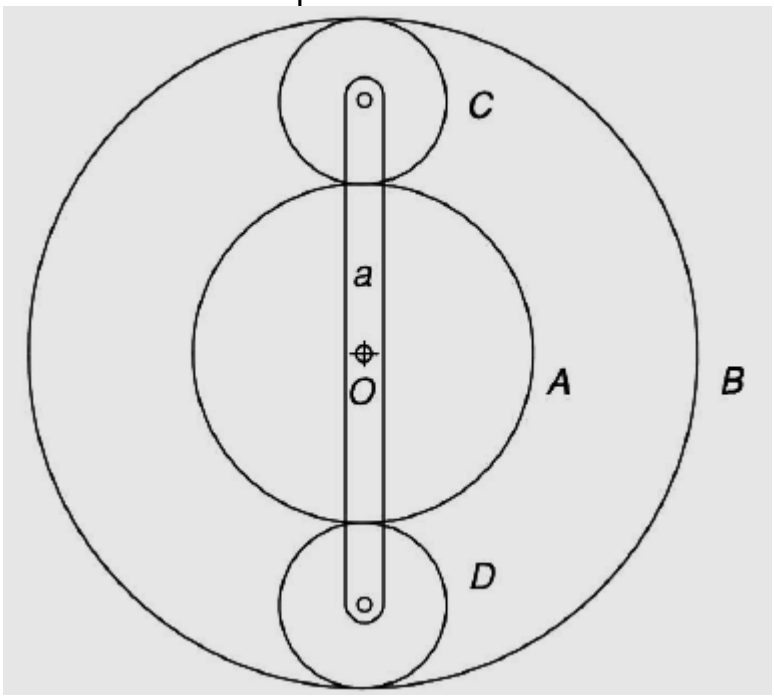
iv) Circular Pitch

b) Differentiate between Involute & Cycloidal Gear Teeth Profile. **04**

c) An Epicyclic gear train is as shown in figure below. The number of teeth on A and B are 80 and 200. Determine the speed of the arm a **06**

i) if A rotates at 100 rpm clockwise and B at 50 rpm counterclockwise.

ii) if A rotates at 100 rpm clockwise and B is stationary.



Q.6 Attempt the following.

a) Define and explain the following terms relating to governors: **06**
- i) Stability
- ii) Sensitiveness
- iii) Isochronous governor
- iv) Hunting
- v) Effort of a governor
- vi) Power of a governor

b) The arms of a Porter governor are each 250 mm long and pivoted on the governor axis. The mass of each ball is 5 kg and the mass of the central sleeve is 30 kg. The radius of rotation of the balls is 150 mm when the sleeve begins to rise and reaches a value of 200 mm for maximum speed. Determine the speed range of the governor. If the friction at the sleeve is equivalent of 20 N of load at the sleeve, determine how the speed range is modified. **08**

Q.7 Attempt the following.

a) Write a short note on static balancing and dynamic balancing. **04**

b) A, B, C and D are four masses carried by a rotating shaft at radii 100, 125, 200 and 150 mm respectively. The planes in which the masses revolve are spaced 600 mm apart and the mass of B, C and D are 10 kg, 5 kg, and 4 kg respectively. **10**

Find the required mass A and the relative angular settings of the four masses so that the shaft shall be in complete balance.

SLR-BD-91

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Kinematics and Theory of Machine (MECHPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct answer: 14

1) The type of gears used to connect two non-parallel non-intersecting shafts are _____

a) spur gears b) helical gears
c) spiral gears d) none of these

2) When the axes of first and last gear are co-axial, then gear train is known as _____

a) simple gear train b) compound gear train
c) reverted gear train d) epicyclic gear train

3) A differential gear in an automobile is a _____

a) simple gear train b) epicyclic gear train
c) compound gear train d) none of these

4) When the sleeve of a Porter governor moves upwards, the governor speed _____.

a) increase b) decreases
c) remains unaffected d) may increase or decrease

5) A Hartnell governor is a _____

a) pendulum type governor b) spring loaded governor
c) dead weight governor d) inertia governor

6) For static balancing of a shaft, _____

a) the net dynamic force acting on the shaft is equal to zero
b) the net couple due to the dynamic forces acting on the shaft is equal to zero
c) both (a) and (b)
d) none of the above

7) In order to have a complete balance of the several revolving masses in different planes _____
a) the resultant force must be zero
b) the resultant couple must be zero
c) both the resultant force and couple must be zero
d) none of the above

8) In a mechanism which one is true _____
a) All links fixed b) One link is fixed
c) All links free d) None of the above

9) The lead screw of a lathe with nut forms a _____
a) sliding pair b) rolling pair
c) screw pair d) turning pair

10) The mechanism forms a structure, when the number of degrees of freedom (n) is equal to _____
a) 0 b) 1
c) 2 d) -1

11) The component of acceleration along the link is called as _____
a) Radial component b) Tangential component
c) Coriolis component d) None

12) The direction of linear velocity of any point on a link with respect to another point on the same link is _____
a) parallel to the link joining the points
b) perpendicular to the link joining the points
c) at 45° to the link joining the points
d) none of these

13) The size of cam depends upon _____
a) base circle b) pitch circle
c) Prime circle d) Pitch curve

14) Offset is provided to a cam follower mechanism to _____
a) minimize the side thrust b) accelerate
c) avoid jerk d) none of these

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Kinematics and Theory of Machine (MECHPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Use of scientific calculator is allowed.
3) Figures to right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.
5) Use university graph paper & semi-log paper if required.

SECTION – I

Q.2 Attempt the following.

a) Explain different kinds of kinematic pairs giving example for each of them. **04**

b) Explain Kutzbach's criterion for planar mechanisms with suitable examples. **04**

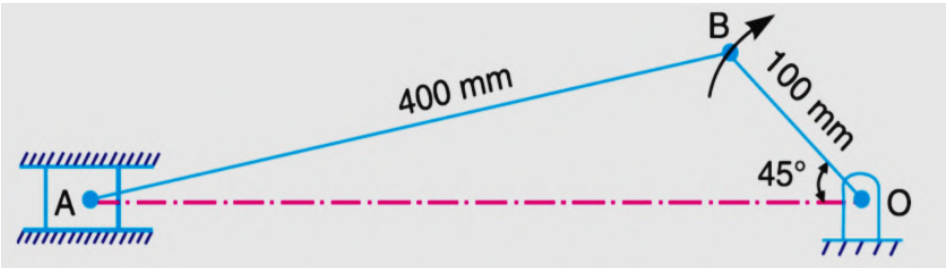
c) In a four-bar chain ABCD, AD is fixed and is 150 mm long. The crank AB is 40 mm long and rotates at 120 r.p.m. clockwise, while the link CD = 80 mm oscillates about D. BC and AD are of equal length. Find the angular velocity of link CD when angle BAD = 60°. **06**

Q.3 Attempt the following.

a) What is inversion of mechanism? Explain any two inversions of slider crank mechanism. **06**

b) Locate all the instantaneous centres of the slider crank mechanism as shown in below figure. The lengths of crank OB and connecting rod AB are 100 mm and 400 mm respectively. If the crank rotates clockwise with an angular velocity of 10 rad/s, find: **08**

i) Velocity of the slider A, and
ii) Angular velocity of the connecting rod AB.



Q.4 Attempt the following.

a) Explain with neat sketch different types of cams and followers. **06**

b) A cam is to be designed for a knife edge follower with the following data: **08**

i) Cam lift = 40 mm during 90° of cam rotation with simple harmonic motion.

ii) Dwell for the next 30°.

iii) During the next 60° of cam rotation, the follower returns to its original position with simple harmonic motion.

iv) Dwell during the remaining 180°.

Draw the profile of the cam when the line of stroke of the follower passes through the axis of the cam shaft. The radius of the base circle of the cam is 40 mm. Determine the maximum velocity and acceleration of the follower during its ascent and descent, if the cam rotates at 240 r.p.m.

SECTION – II

Q.5 Attempt the following.

a) Define the following terms. **04**

i) Addendum

ii) Dedendum

iii) Module

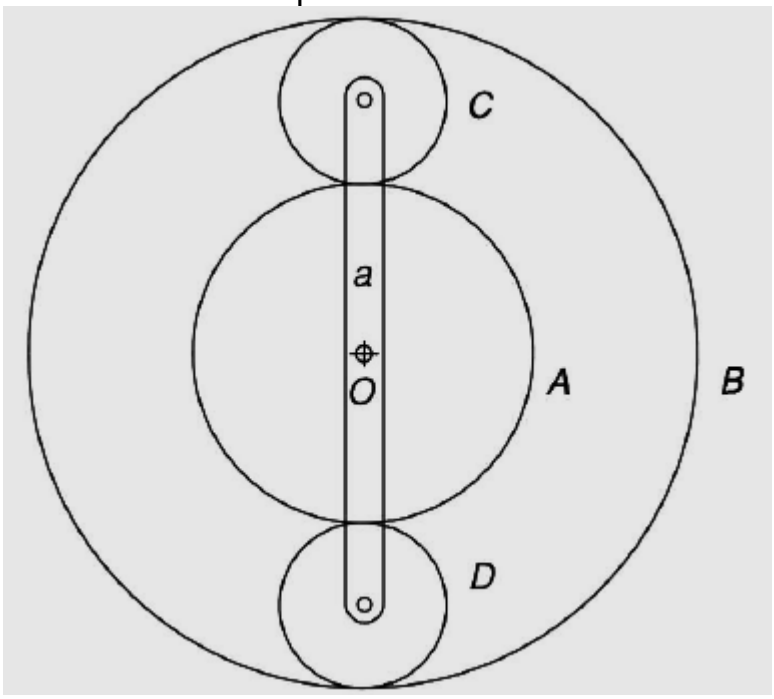
iv) Circular Pitch

b) Differentiate between Involute & Cycloidal Gear Teeth Profile. **04**

c) An Epicyclic gear train is as shown in figure below. The number of teeth on A and B are 80 and 200. Determine the speed of the arm a **06**

i) if A rotates at 100 rpm clockwise and B at 50 rpm counterclockwise.

ii) if A rotates at 100 rpm clockwise and B is stationary.



Q.6 Attempt the following.

a) Define and explain the following terms relating to governors: **06**
- i) Stability
- ii) Sensitiveness
- iii) Isochronous governor
- iv) Hunting
- v) Effort of a governor
- vi) Power of a governor

b) The arms of a Porter governor are each 250 mm long and pivoted on the governor axis. The mass of each ball is 5 kg and the mass of the central sleeve is 30 kg. The radius of rotation of the balls is 150 mm when the sleeve begins to rise and reaches a value of 200 mm for maximum speed. Determine the speed range of the governor. If the friction at the sleeve is equivalent of 20 N of load at the sleeve, determine how the speed range is modified. **08**

Q.7 Attempt the following.

a) Write a short note on static balancing and dynamic balancing. **04**

b) A, B, C and D are four masses carried by a rotating shaft at radii 100, 125, 200 and 150 mm respectively. The planes in which the masses revolve are spaced 600 mm apart and the mass of B, C and D are 10 kg, 5 kg, and 4 kg respectively. **10**
Find the required mass A and the relative angular settings of the four masses so that the shaft shall be in complete balance.

SLR-BD-91

Seat No.	

Set R

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Kinematics and Theory of Machine (MECHPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct answer: 14

1) When the sleeve of a Porter governor moves upwards, the governor speed _____.
a) increase b) decreases
c) remains unaffected d) may increase or decrease

2) A Hartnell governor is a _____
a) pendulum type governor b) spring loaded governor
c) dead weight governor d) inertia governor

3) For static balancing of a shaft, _____
a) the net dynamic force acting on the shaft is equal to zero
b) the net couple due to the dynamic forces acting on the shaft is equal to zero
c) both (a) and (b)
d) none of the above

4) In order to have a complete balance of the several revolving masses in different planes _____
a) the resultant force must be zero
b) the resultant couple must be zero
c) both the resultant force and couple must be zero
d) none of the above

5) In a mechanism which one is true _____
a) All links fixed b) One link is fixed
c) All links free d) None of the above

6) The lead screw of a lathe with nut forms a _____
a) sliding pair b) rolling pair
c) screw pair d) turning pair

7) The mechanism forms a structure, when the number of degrees of freedom (n) is equal to _____

a) 0 b) 1
c) 2 d) -1

8) The component of acceleration along the link is called as _____

a) Radial component b) Tangential component
c) Coriolis component d) None

9) The direction of linear velocity of any point on a link with respect to another point on the same link is _____

a) parallel to the link joining the points
b) perpendicular to the link joining the points
c) at 45° to the link joining the points
d) none of these

10) The size of cam depends upon _____

a) base circle b) pitch circle
c) Prime circle d) Pitch curve

11) Offset is provided to a cam follower mechanism to _____

a) minimize the side thrust b) accelerate
c) avoid jerk d) none of these

12) The type of gears used to connect two non-parallel non-intersecting shafts are _____

a) spur gears b) helical gears
c) spiral gears d) none of these

13) When the axes of first and last gear are co-axial, then gear train is known as _____

a) simple gear train b) compound gear train
c) reverted gear train d) epicyclic gear train

14) A differential gear in an automobile is a _____

a) simple gear train b) epicyclic gear train
c) compound gear train d) none of these

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Kinematics and Theory of Machine (MECHPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Use of scientific calculator is allowed.
3) Figures to right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.
5) Use university graph paper & semi-log paper if required.

SECTION – I

Q.2 Attempt the following.

a) Explain different kinds of kinematic pairs giving example for each of them. **04**

b) Explain Kutzbach's criterion for planar mechanisms with suitable examples. **04**

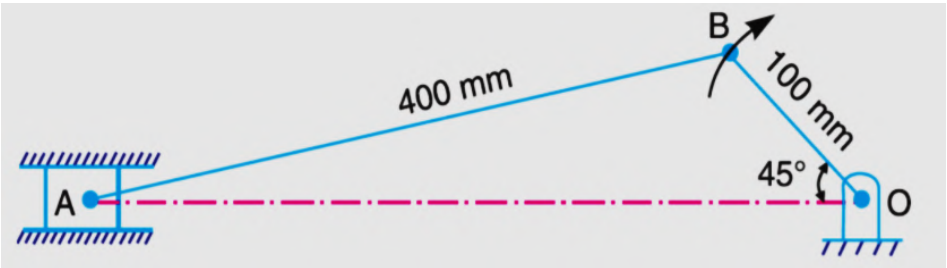
c) In a four-bar chain ABCD, AD is fixed and is 150 mm long. The crank AB is 40 mm long and rotates at 120 r.p.m. clockwise, while the link CD = 80 mm oscillates about D. BC and AD are of equal length. Find the angular velocity of link CD when angle BAD = 60°. **06**

Q.3 Attempt the following.

a) What is inversion of mechanism? Explain any two inversions of slider crank mechanism. **06**

b) Locate all the instantaneous centres of the slider crank mechanism as shown in below figure. The lengths of crank OB and connecting rod AB are 100 mm and 400 mm respectively. If the crank rotates clockwise with an angular velocity of 10 rad/s, find: **08**

i) Velocity of the slider A, and
ii) Angular velocity of the connecting rod AB.



Q.4 Attempt the following.

a) Explain with neat sketch different types of cams and followers. **06**

b) A cam is to be designed for a knife edge follower with the following data: **08**

i) Cam lift = 40 mm during 90° of cam rotation with simple harmonic motion.

ii) Dwell for the next 30°.

iii) During the next 60° of cam rotation, the follower returns to its original position with simple harmonic motion.

iv) Dwell during the remaining 180°.

Draw the profile of the cam when the line of stroke of the follower passes through the axis of the cam shaft. The radius of the base circle of the cam is 40 mm. Determine the maximum velocity and acceleration of the follower during its ascent and descent, if the cam rotates at 240 r.p.m.

SECTION – II

Q.5 Attempt the following.

a) Define the following terms. **04**

i) Addendum

ii) Dedendum

iii) Module

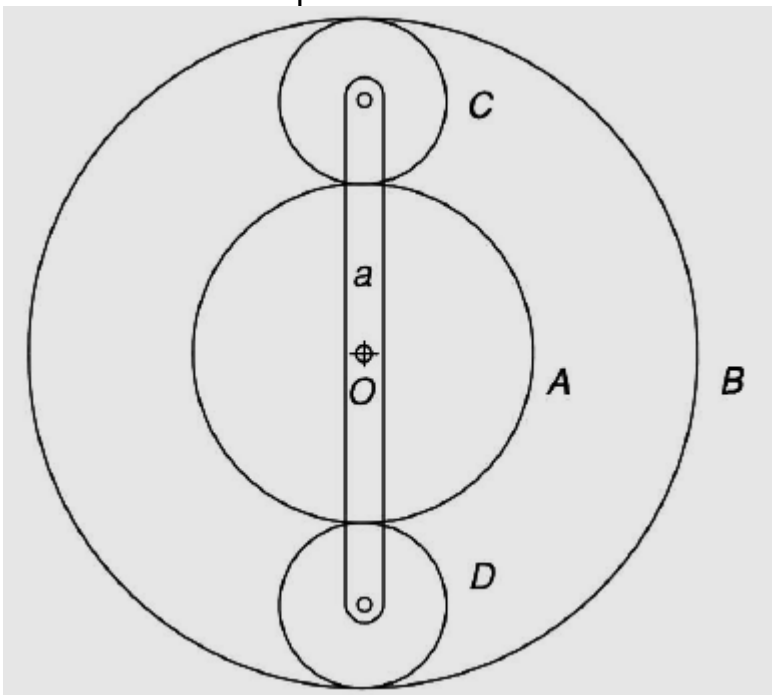
iv) Circular Pitch

b) Differentiate between Involute & Cycloidal Gear Teeth Profile. **04**

c) An Epicyclic gear train is as shown in figure below. The number of teeth on A and B are 80 and 200. Determine the speed of the arm a **06**

i) if A rotates at 100 rpm clockwise and B at 50 rpm counterclockwise.

ii) if A rotates at 100 rpm clockwise and B is stationary.



Q.6 Attempt the following.

a) Define and explain the following terms relating to governors: **06**
- i) Stability
- ii) Sensitiveness
- iii) Isochronous governor
- iv) Hunting
- v) Effort of a governor
- vi) Power of a governor

b) The arms of a Porter governor are each 250 mm long and pivoted on the governor axis. The mass of each ball is 5 kg and the mass of the central sleeve is 30 kg. The radius of rotation of the balls is 150 mm when the sleeve begins to rise and reaches a value of 200 mm for maximum speed. Determine the speed range of the governor. If the friction at the sleeve is equivalent of 20 N of load at the sleeve, determine how the speed range is modified. **08**

Q.7 Attempt the following.

a) Write a short note on static balancing and dynamic balancing. **04**

b) A, B, C and D are four masses carried by a rotating shaft at radii 100, 125, 200 and 150 mm respectively. The planes in which the masses revolve are spaced 600 mm apart and the mass of B, C and D are 10 kg, 5 kg, and 4 kg respectively. **10**
Find the required mass A and the relative angular settings of the four masses so that the shaft shall be in complete balance.

SLR-BD-91

Seat No.		Set	S

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Kinematics and Theory of Machine (MECHPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct answer: 14

1) The size of cam depends upon _____
a) base circle b) pitch circle
c) Prime circle d) Pitch curve

2) Offset is provided to a cam follower mechanism to _____
a) minimize the side thrust b) accelerate
c) avoid jerk d) none of these

3) The type of gears used to connect two non-parallel non-intersecting shafts are _____
a) spur gears b) helical gears
c) spiral gears d) none of these

4) When the axes of first and last gear are co-axial, then gear train is known as _____
a) simple gear train b) compound gear train
c) reverted gear train d) epicyclic gear train

5) A differential gear in an automobile is a _____
a) simple gear train b) epicyclic gear train
c) compound gear train d) none of these

6) When the sleeve of a Porter governor moves upwards, the governor speed _____.
a) increase b) decreases
c) remains unaffected d) may increase or decrease

7) A Hartnell governor is a _____
a) pendulum type governor b) spring loaded governor
c) dead weight governor d) inertia governor

8) For static balancing of a shaft, _____
a) the net dynamic force acting on the shaft is equal to zero
b) the net couple due to the dynamic forces acting on the shaft is equal to zero
c) both (a) and (b)
d) none of the above

9) In order to have a complete balance of the several revolving masses in different planes _____
a) the resultant force must be zero
b) the resultant couple must be zero
c) both the resultant force and couple must be zero
d) none of the above

10) In a mechanism which one is true _____
a) All links fixed
b) One link is fixed
c) All links free
d) None of the above

11) The lead screw of a lathe with nut forms a _____
a) sliding pair
b) rolling pair
c) screw pair
d) turning pair

12) The mechanism forms a structure, when the number of degrees of freedom (n) is equal to _____
a) 0
b) 1
c) 2
d) -1

13) The component of acceleration along the link is called as _____
a) Radial component
b) Tangential component
c) Coriolis component
d) None

14) The direction of linear velocity of any point on a link with respect to another point on the same link is _____
a) parallel to the link joining the points
b) perpendicular to the link joining the points
c) at 45° to the link joining the points
d) none of these

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Kinematics and Theory of Machine (MECHPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each Section.
2) Use of scientific calculator is allowed.
3) Figures to right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.
5) Use university graph paper & semi-log paper if required.

SECTION – I

Q.2 Attempt the following.

a) Explain different kinds of kinematic pairs giving example for each of them. **04**

b) Explain Kutzbach's criterion for planar mechanisms with suitable examples. **04**

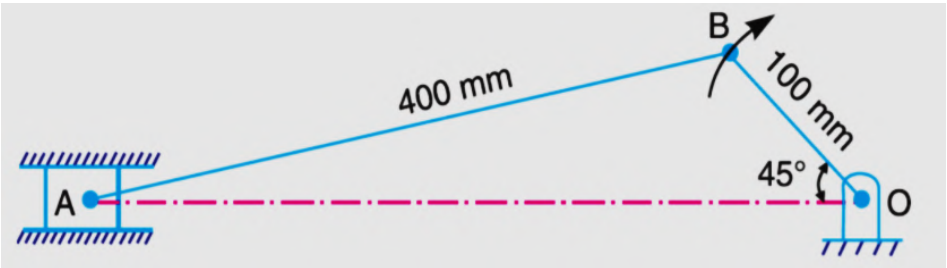
c) In a four-bar chain ABCD, AD is fixed and is 150 mm long. The crank AB is 40 mm long and rotates at 120 r.p.m. clockwise, while the link CD = 80 mm oscillates about D. BC and AD are of equal length. Find the angular velocity of link CD when angle BAD = 60°. **06**

Q.3 Attempt the following.

a) What is inversion of mechanism? Explain any two inversions of slider crank mechanism. **06**

b) Locate all the instantaneous centres of the slider crank mechanism as shown in below figure. The lengths of crank OB and connecting rod AB are 100 mm and 400 mm respectively. If the crank rotates clockwise with an angular velocity of 10 rad/s, find: **08**

i) Velocity of the slider A, and
ii) Angular velocity of the connecting rod AB.



Q.4 Attempt the following.

a) Explain with neat sketch different types of cams and followers. **06**

b) A cam is to be designed for a knife edge follower with the following data: **08**

i) Cam lift = 40 mm during 90° of cam rotation with simple harmonic motion.

ii) Dwell for the next 30°.

iii) During the next 60° of cam rotation, the follower returns to its original position with simple harmonic motion.

iv) Dwell during the remaining 180°.

Draw the profile of the cam when the line of stroke of the follower passes through the axis of the cam shaft. The radius of the base circle of the cam is 40 mm. Determine the maximum velocity and acceleration of the follower during its ascent and descent, if the cam rotates at 240 r.p.m.

SECTION – II

Q.5 Attempt the following.

a) Define the following terms. **04**

i) Addendum

ii) Dedendum

iii) Module

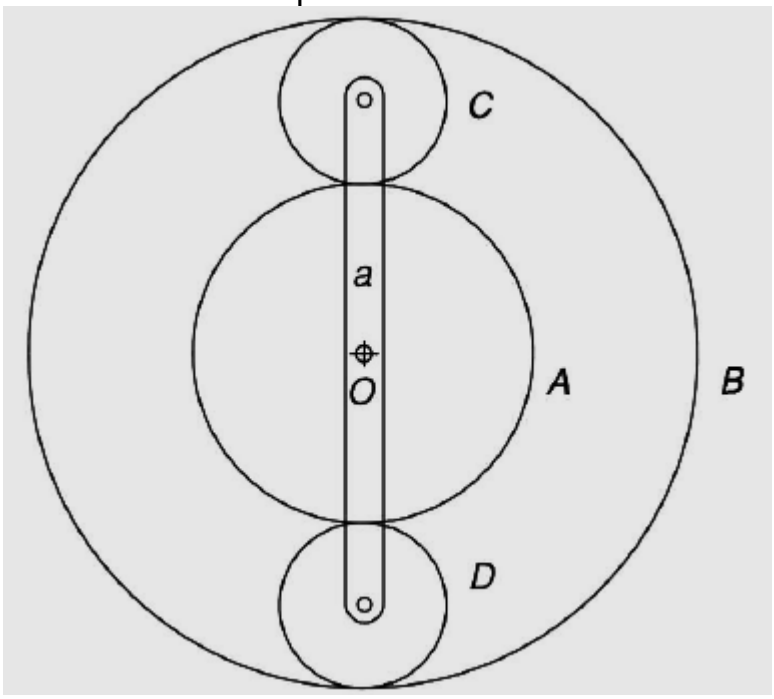
iv) Circular Pitch

b) Differentiate between Involute & Cycloidal Gear Teeth Profile. **04**

c) An Epicyclic gear train is as shown in figure below. The number of teeth on A and B are 80 and 200. Determine the speed of the arm a **06**

i) if A rotates at 100 rpm clockwise and B at 50 rpm counterclockwise.

ii) if A rotates at 100 rpm clockwise and B is stationary.



Q.6 Attempt the following.

a) Define and explain the following terms relating to governors: **06**
- i) Stability
- ii) Sensitiveness
- iii) Isochronous governor
- iv) Hunting
- v) Effort of a governor
- vi) Power of a governor

b) The arms of a Porter governor are each 250 mm long and pivoted on the governor axis. The mass of each ball is 5 kg and the mass of the central sleeve is 30 kg. The radius of rotation of the balls is 150 mm when the sleeve begins to rise and reaches a value of 200 mm for maximum speed. Determine the speed range of the governor. If the friction at the sleeve is equivalent of 20 N of load at the sleeve, determine how the speed range is modified. **08**

Q.7 Attempt the following.

a) Write a short note on static balancing and dynamic balancing. **04**

b) A, B, C and D are four masses carried by a rotating shaft at radii 100, 125, 200 and 150 mm respectively. The planes in which the masses revolve are spaced 600 mm apart and the mass of B, C and D are 10 kg, 5 kg, and 4 kg respectively. **10**
Find the required mass A and the relative angular settings of the four masses so that the shaft shall be in complete balance.

SLR-BD-92

Seat No.		Set	P

S. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Machine Drawing (MECHPCC-05)

Day & Date: Wednesday, 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

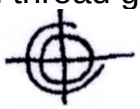
Q.1 Choose the correct answer.

Type - 1: Straight Objective Type / classical MCQ **05**
(Each bit one Mark each).

1) The length to width ratio of an arrowhead should be limited to
a) 1 : 2 b) 1 : 3
c) 3 : 1 d) 2 : 1

2) Standard size for A2 drawing sheet is as per BIS in mm is ____
a) 594×841 b) 297×420
c) 210×297 d) 420×594

3) This is the symbol for internal thread geometry.



a) True b) False

4) Angle of Knuckle thread is _____ degrees.
a) 90° b) 50°
c) 45° d) 30°

5) In the solid flanged couplings, the flange is ____.
a) Separate, mounted using a sunk key
b) Integral with the shaft
c) Fitted with interference fit
d) Fitted with clearance fit

Type - 2 Correct or Incorrect (Attempt any two) **02**
(Each bit One Mark each)

1) A hole whose lower deviation is zero is called as Hole basic hole.
2) Woodruff key is a type of sunk key.
3) The size across flats in hexagonal nut is 2D

Type - 3 multiple correct answer type. (Solve any two) **04**
(Each correct bit 2 mark)

1) In bushed journal bearing bush usually made of soft material such as _____.

a) Cast Iron b) Brass
c) Bronze d) Linoleum

2) $8.70^{\pm 0.10, 0.00}$ is example of _____ tolerance.

a) Unilateral b) Bilateral
c) Geometrical d) None of the above

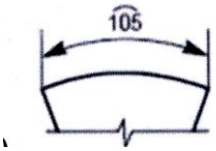
3) 

Fig represents dimensioning of _____

a) Arc b) Diameter
c) Radius d) Flat

Type - 4 Match the pairs (One marks for each correct answer) **03**

Roughness Grade No	**Roughness Grade symbol**
A) N11	P) 0.1
B) N6	Q) 0.8
C) N3	R) 25

SLR-BD-92

Seat No.		Set	P

S. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Machine Drawing (MECHPCC-05)

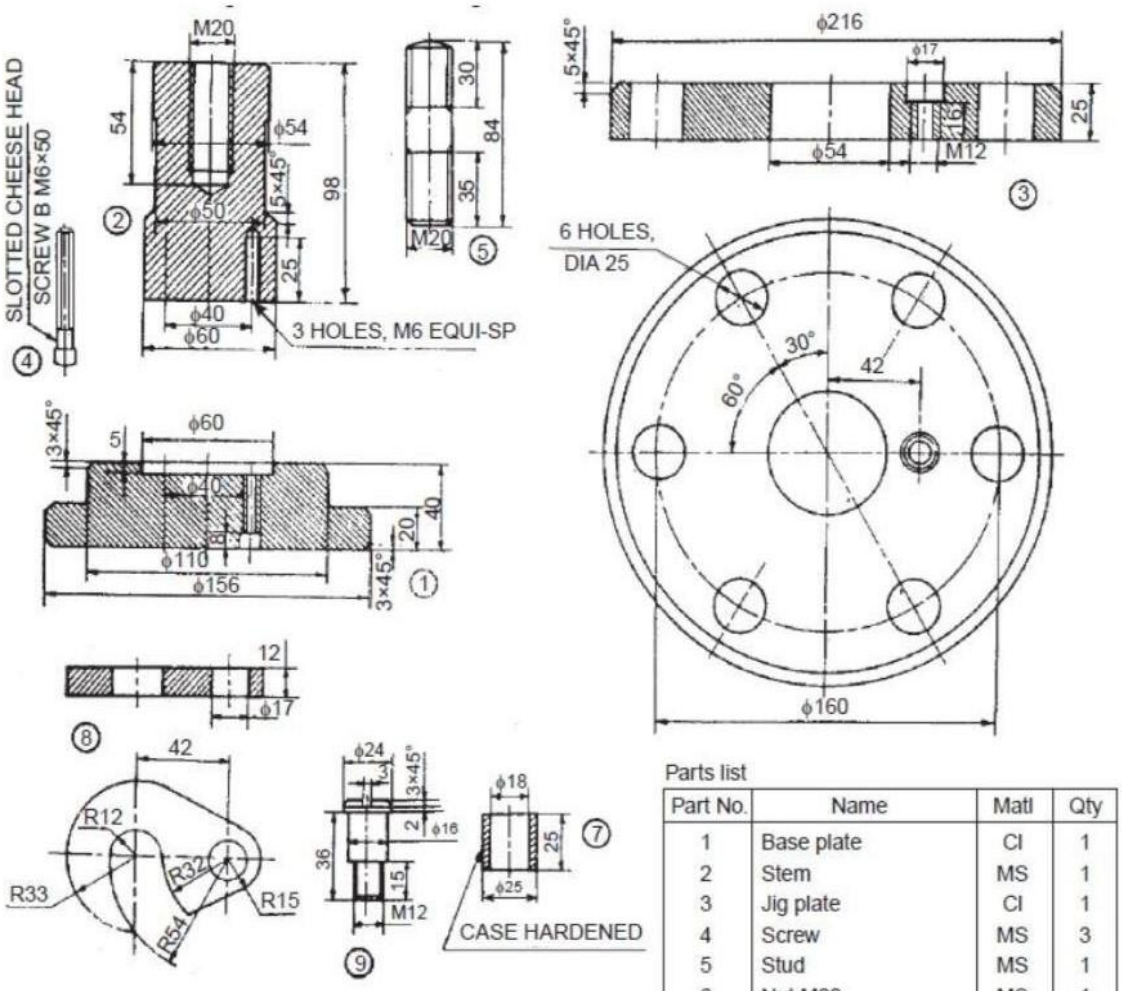
Day & Date: Wednesday, 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figure to right indicate full marks.

Q.2 Figure No. 1 shows the details of Drill jig. Assemble the given parts and draw: **22**

1) Front view
2) Top view

Prepare the List of Material and give the entire dimension.



Parts list

Part No.	Name	Matl	Qty
1	Base plate	CI	1
2	Stem	MS	1
3	Jig plate	CI	1
4	Screw	MS	3
5	Stud	MS	1
6	Nut M20	MS	1
7	Bush case hardened	Steel	6
8	Latch washer	MS	1
9	Screw	MS	1

Figure 1

Q.3 a) Solve any Four out of five. (Every bit has 2 marks) **08**

Draw the BIS Convention of

1) Splined Shaft
2) Bevel Gear
3) Single Bevel Butt Weld
4) Draw any four dimensioning Common Feature
5) Draw Chain and parallel placing of Dimensioning

b) Freehand sketching for the Following (Any One) **05**

1) Knuckle Joint
2) Eye Foundation Bolt

Q.4 a) Draw the BIS Convention for Following (Any Two) **04**

1) Solid Journal Bearing
2) Hexagonal headed Bolt
3) Flat belt pulley

b) Draw the Freehand Sketching for the Following (Any One) **06**

1) Protected Flange Coupling
2) Double Riveted Double Strap Butt Joint

Q.5 Solve the Following:

a) Define following Term and Show it by drawing hole and shaft figure **05**
i) Basic Size ii) Zero line iii) Deviation iv) Limits

b) Redraw the fig. with given dimension and show following geometrical symbol and tolerance **06**

1) Concentricity of 50mm has bilateral tolerance of 0.01 mm.
2) Surface A Straight with 0.01 mm.
3) Surface B grounded with Ra value 10 Micron.
4) Show Parallelism between C&D within 0.01mm

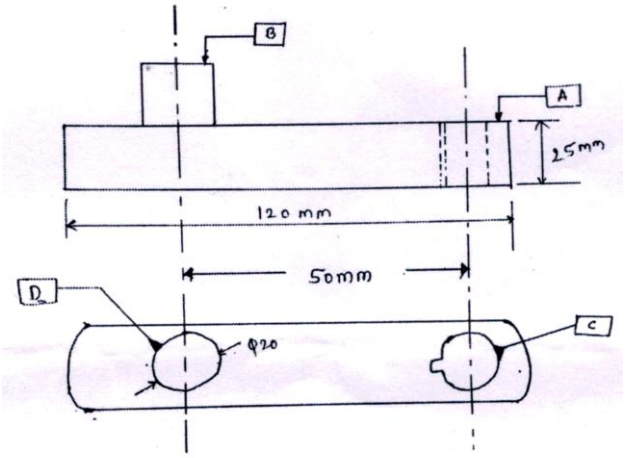


Figure No-2

SLR-BD-92

Seat No.		Set	Q

S. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Machine Drawing (MECHPCC-05)

Day & Date: Wednesday, 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

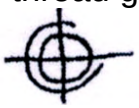
MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer.

Type - 1: Straight Objective Type / classical MCQ **05**
(Each bit one Mark each).

1) This is the symbol for internal thread geometry.



a) True b) False

2) Angle of Knuckle thread is _____ degrees.
a) 90° b) 50°
c) 45° d) 30°

3) In the solid flanged couplings, the flange is ____.
a) Separate, mounted using a sunk key
b) Integral with the shaft
c) Fitted with interference fit
d) Fitted with clearance fit

4) The length to width ratio of an arrowhead should be limited to
a) 1 : 2 b) 1 : 3
c) 3 : 1 d) 2 : 1

5) Standard size for A2 drawing sheet is as per BIS in mm is ____
a) 594×841 b) 297×420
c) 210×297 d) 420×594

Type - 2 Correct or Incorrect (Attempt any two) **02**
(Each bit One Mark each)

1) A hole whose lower deviation is zero is called as Hole basic hole.
2) Woodruff key is a type of sunk key.
3) The size across flats in hexagonal nut is 2D

Type - 3 multiple correct answer type. (Solve any two) **04**
(Each correct bit 2 mark)

1) In bushed journal bearing bush usually made of soft material such as _____.

a) Cast Iron b) Brass
c) Bronze d) Linoleum

2) $8.70^{\pm 0.10, 0.00}$ is example of _____ tolerance.

a) Unilateral b) Bilateral
c) Geometrical d) None of the above

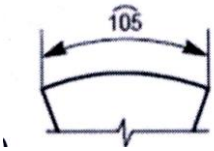
3) 

Fig represents dimensioning of _____

a) Arc b) Diameter
c) Radius d) Flat

Type - 4 Match the pairs (One marks for each correct answer) **03**

Roughness Grade No	**Roughness Grade symbol**
A) N11	P) 0.1
B) N6	Q) 0.8
C) N3	R) 25

SLR-BD-92

Seat No.	

Set Q

S. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Machine Drawing (MECHPCC-05)

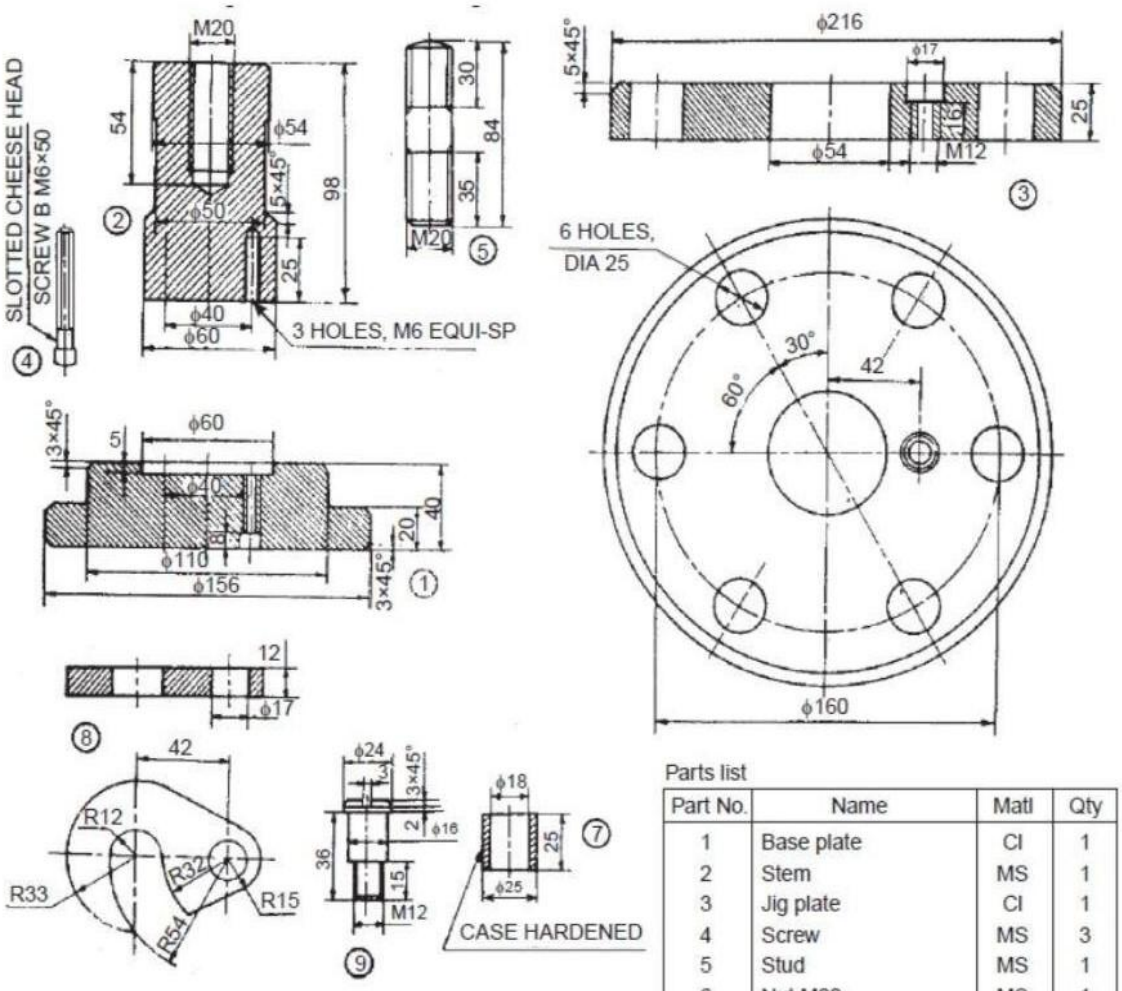
Day & Date: Wednesday, 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figure to right indicate full marks.

Q.2 Figure No. 1 shows the details of Drill jig. Assemble the given parts and draw: **22**

1) Front view
2) Top view

Prepare the List of Material and give the entire dimension.



Parts list

Part No.	Name	Matl	Qty
1	Base plate	CI	1
2	Stem	MS	1
3	Jig plate	CI	1
4	Screw	MS	3
5	Stud	MS	1
6	Nut M20	MS	1
7	Bush case hardened	Steel	6
8	Latch washer	MS	1
9	Screw	MS	1

Figure 1

Q.3 a) Solve any Four out of five. (Every bit has 2 marks) **08**

Draw the BIS Convention of

1) Splined Shaft
2) Bevel Gear
3) Single Bevel Butt Weld
4) Draw any four dimensioning Common Feature
5) Draw Chain and parallel placing of Dimensioning

b) Freehand sketching for the Following (Any One) **05**

1) Knuckle Joint
2) Eye Foundation Bolt

Q.4 a) Draw the BIS Convention for Following (Any Two) **04**

1) Solid Journal Bearing
2) Hexagonal headed Bolt
3) Flat belt pulley

b) Draw the Freehand Sketching for the Following (Any One) **06**

1) Protected Flange Coupling
2) Double Riveted Double Strap Butt Joint

Q.5 Solve the Following:

a) Define following Term and Show it by drawing hole and shaft figure **05**
i) Basic Size ii) Zero line iii) Deviation iv) Limits

b) Redraw the fig. with given dimension and show following geometrical symbol and tolerance **06**

1) Concentricity of 50mm has bilateral tolerance of 0.01 mm.
2) Surface A Straight with 0.01 mm.
3) Surface B grounded with Ra value 10 Micron.
4) Show Parallelism between C&D within 0.01mm

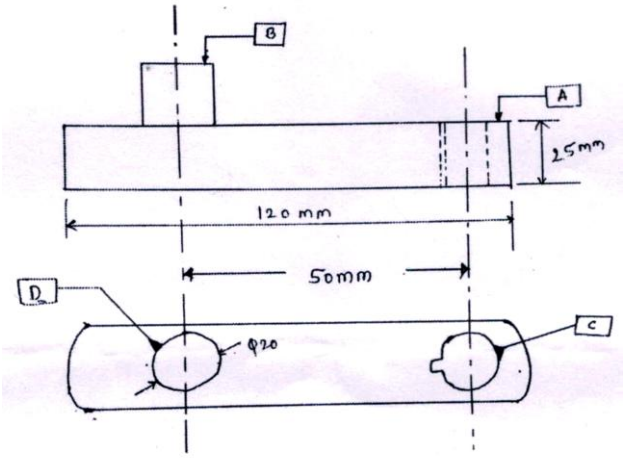


Figure No-2

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Machine Drawing (MECHPCC-05)

Day & Date: Wednesday, 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer.

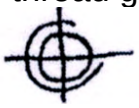
Type - 1: Straight Objective Type / classical MCQ **05**
(Each bit one Mark each).

1) In the solid flanged couplings, the flange is ____.
a) Separate, mounted using a sunk key
b) Integral with the shaft
c) Fitted with interference fit
d) Fitted with clearance fit

2) The length to width ratio of an arrowhead should be limited to
a) 1 : 2 b) 1 : 3
c) 3 : 1 d) 2 : 1

3) Standard size for A2 drawing sheet is as per BIS in mm is ____
a) 594×841 b) 297×420
c) 210×297 d) 420×594

4) This is the symbol for internal thread geometry.



a) True b) False

5) Angle of Knuckle thread is _____ degrees.
a) 90° b) 50°
c) 45° d) 30°

Type - 2 Correct or Incorrect (Attempt any two) **02**
(Each bit One Mark each)

1) A hole whose lower deviation is zero is called as Hole basic hole.
2) Woodruff key is a type of sunk key.
3) The size across flats in hexagonal nut is 2D

Type - 3 multiple correct answer type. (Solve any two) **04**
(Each correct bit 2 mark)

1) In bushed journal bearing bush usually made of soft material such as _____.

a) Cast Iron b) Brass
c) Bronze d) Linoleum

2) $8.70^{\pm 0.10, 0.00}$ is example of _____ tolerance.

a) Unilateral b) Bilateral
c) Geometrical d) None of the above

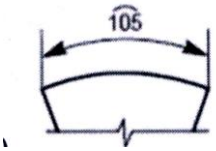
3) 

Fig represents dimensioning of _____

a) Arc b) Diameter
c) Radius d) Flat

Type - 4 Match the pairs (One marks for each correct answer) **03**

Roughness Grade No	**Roughness Grade symbol**
A) N11	P) 0.1
B) N6	Q) 0.8
C) N3	R) 25

SLR-BD-92

Seat No.		Set	R

S. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Machine Drawing (MECHPCC-05)

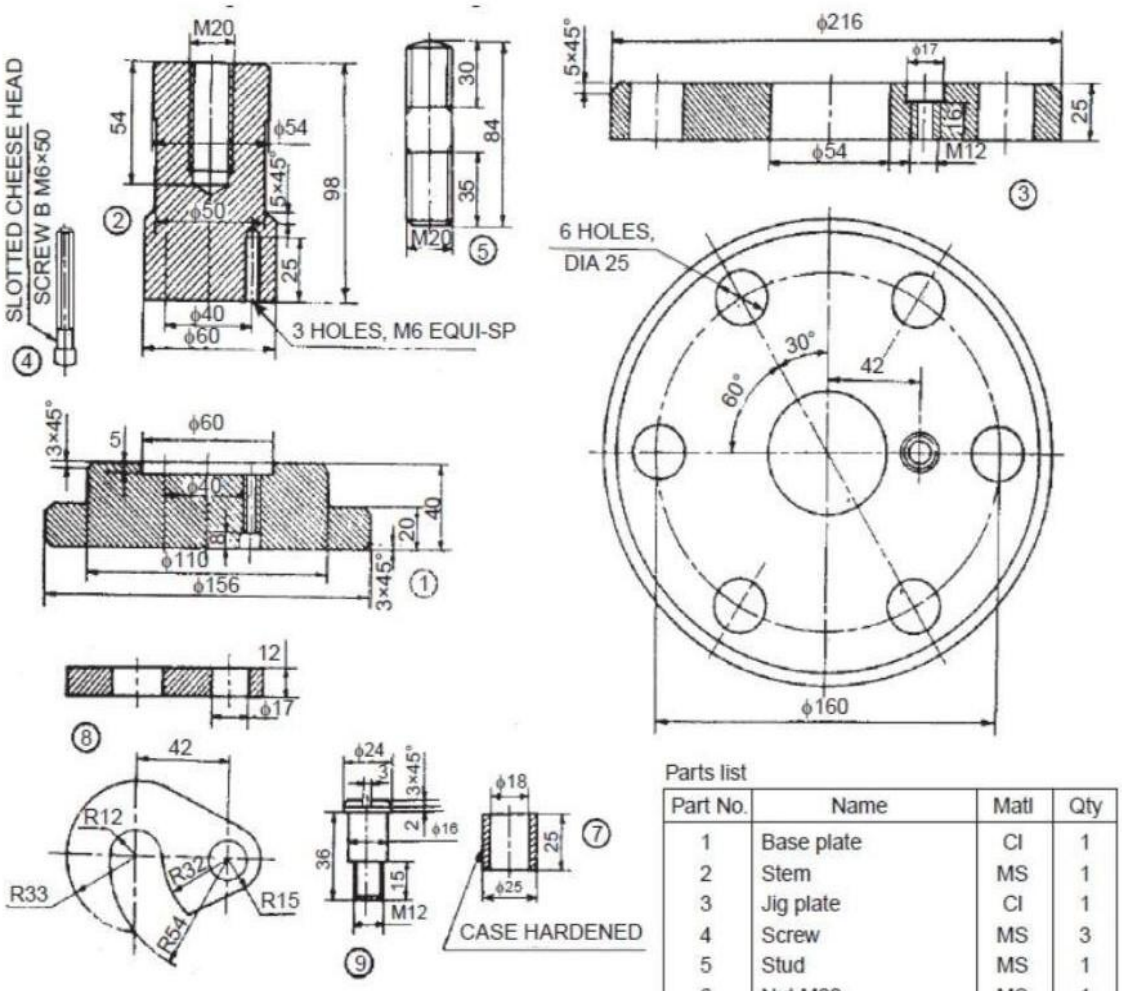
Day & Date: Wednesday, 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figure to right indicate full marks.

Q.2 Figure No. 1 shows the details of Drill jig. Assemble the given parts and draw: **22**

1) Front view
2) Top view

Prepare the List of Material and give the entire dimension.



Parts list

Part No.	Name	Matl	Qty
1	Base plate	CI	1
2	Stem	MS	1
3	Jig plate	CI	1
4	Screw	MS	3
5	Stud	MS	1
6	Nut M20	MS	1
7	Bush case hardened	Steel	6
8	Latch washer	MS	1
9	Screw	MS	1

Figure 1

Q.3 a) Solve any Four out of five. (Every bit has 2 marks) **08**

Draw the BIS Convention of

1) Splined Shaft
2) Bevel Gear
3) Single Bevel Butt Weld
4) Draw any four dimensioning Common Feature
5) Draw Chain and parallel placing of Dimensioning

b) Freehand sketching for the Following (Any One) **05**

1) Knuckle Joint
2) Eye Foundation Bolt

Q.4 a) Draw the BIS Convention for Following (Any Two) **04**

1) Solid Journal Bearing
2) Hexagonal headed Bolt
3) Flat belt pulley

b) Draw the Freehand Sketching for the Following (Any One) **06**

1) Protected Flange Coupling
2) Double Riveted Double Strap Butt Joint

Q.5 Solve the Following:

a) Define following Term and Show it by drawing hole and shaft figure **05**
i) Basic Size ii) Zero line iii) Deviation iv) Limits

b) Redraw the fig. with given dimension and show following geometrical symbol and tolerance **06**

1) Concentricity of 50mm has bilateral tolerance of 0.01 mm.
2) Surface A Straight with 0.01 mm.
3) Surface B grounded with Ra value 10 Micron.
4) Show Parallelism between C&D within 0.01mm

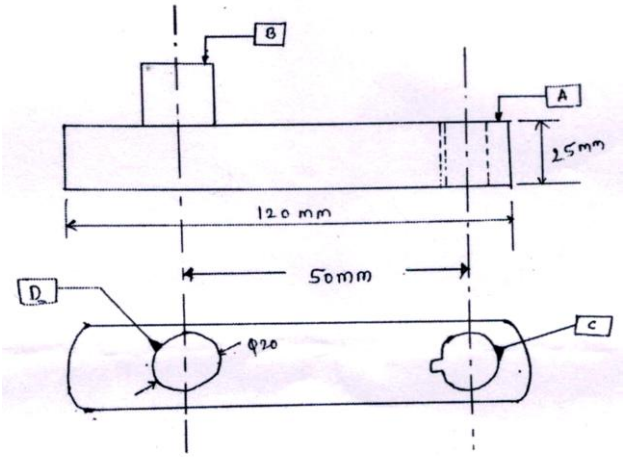


Figure No-2

SLR-BD-92

Seat No.		Set	S

S. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Machine Drawing (MECHPCC-05)

Day & Date: Wednesday, 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

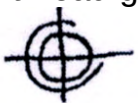
Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer.

Type - 1: Straight Objective Type / classical MCQ **05**
(Each bit one Mark each).

1) Standard size for A2 drawing sheet is as per BIS in mm is ____
a) 594×841 b) 297×420
c) 210×297 d) 420×594

2) This is the symbol for internal thread geometry.



a) True b) False

3) Angle of Knuckle thread is _____ degrees.
a) 90° b) 50°
c) 45° d) 30°

4) In the solid flanged couplings, the flange is ____.
a) Separate, mounted using a sunk key
b) Integral with the shaft
c) Fitted with interference fit
d) Fitted with clearance fit

5) The length to width ratio of an arrowhead should be limited to
a) 1 : 2 b) 1 : 3
c) 3 : 1 d) 2 : 1

Type - 2 Correct or Incorrect (Attempt any two) **02**
(Each bit One Mark each)

1) A hole whose lower deviation is zero is called as Hole basic hole.
2) Woodruff key is a type of sunk key.
3) The size across flats in hexagonal nut is 2D

Type - 3 multiple correct answer type. (Solve any two) **04**
(Each correct bit 2 mark)

1) In bushed journal bearing bush usually made of soft material such as _____.

a) Cast Iron b) Brass
c) Bronze d) Linoleum

2) $8.70^{\pm 0.10, 0.00}$ is example of _____ tolerance.

a) Unilateral b) Bilateral
c) Geometrical d) None of the above

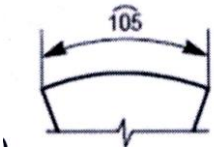
3) 

Fig represents dimensioning of _____

a) Arc b) Diameter
c) Radius d) Flat

Type - 4 Match the pairs (One marks for each correct answer) **03**

Roughness Grade No	**Roughness Grade symbol**
A) N11	P) 0.1
B) N6	Q) 0.8
C) N3	R) 25

SLR-BD-92

Seat No.		Set	S

S. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Machine Drawing (MECHPCC-05)

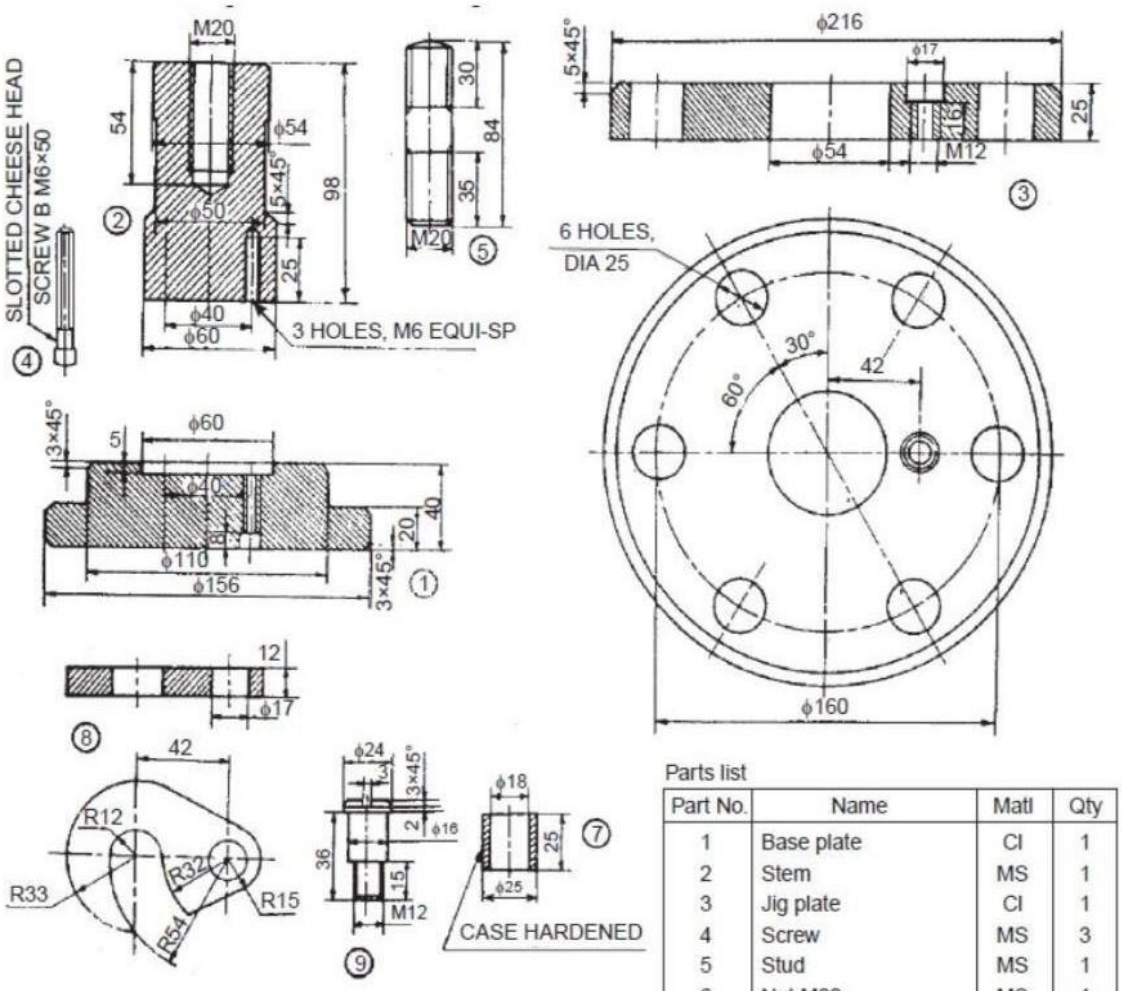
Day & Date: Wednesday, 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figure to right indicate full marks.

Q.2 Figure No. 1 shows the details of Drill jig. Assemble the given parts and draw: **22**

1) Front view
2) Top view

Prepare the List of Material and give the entire dimension.



Parts list

Part No.	Name	Matl	Qty
1	Base plate	CI	1
2	Stem	MS	1
3	Jig plate	CI	1
4	Screw	MS	3
5	Stud	MS	1
6	Nut M20	MS	1
7	Bush case hardened	Steel	6
8	Latch washer	MS	1
9	Screw	MS	1

Figure 1

Q.3 a) Solve any Four out of five. (Every bit has 2 marks) **08**

Draw the BIS Convention of

1) Splined Shaft
2) Bevel Gear
3) Single Bevel Butt Weld
4) Draw any four dimensioning Common Feature
5) Draw Chain and parallel placing of Dimensioning

b) Freehand sketching for the Following (Any One) **05**

1) Knuckle Joint
2) Eye Foundation Bolt

Q.4 a) Draw the BIS Convention for Following (Any Two) **04**

1) Solid Journal Bearing
2) Hexagonal headed Bolt
3) Flat belt pulley

b) Draw the Freehand Sketching for the Following (Any One) **06**

1) Protected Flange Coupling
2) Double Riveted Double Strap Butt Joint

Q.5 Solve the Following:

a) Define following Term and Show it by drawing hole and shaft figure **05**
i) Basic Size ii) Zero line iii) Deviation iv) Limits

b) Redraw the fig. with given dimension and show following geometrical symbol and tolerance **06**

1) Concentricity of 50mm has bilateral tolerance of 0.01 mm.
2) Surface A Straight with 0.01 mm.
3) Surface B grounded with Ra value 10 Micron.
4) Show Parallelism between C&D within 0.01mm

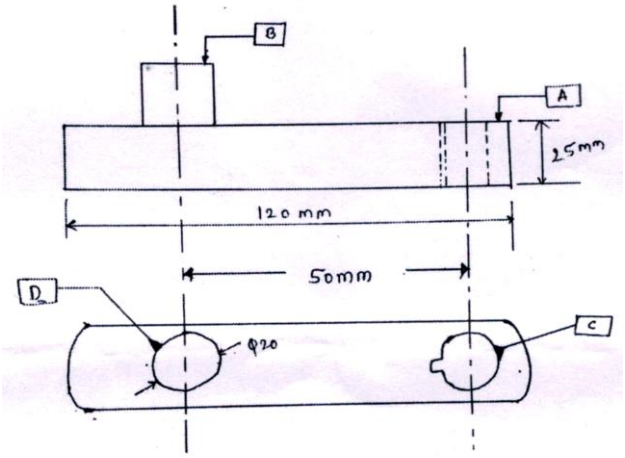


Figure No-2

SLR-BD-93

Seat No.	

Set P

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Fluid mechanics and Fluid Machines (MECHPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Pelton turbine is _____
a) Tangential flow b) Radial flow
c) Axial flow d) Mixed flow

2) The S.I. unit of total pressure on a plane immersed surface is _____
a) Newton per meter square
b) Newton
c) Newton square per meter
d) Newton per meter cube

3) Buoyancy acts on a floating body _____
a) vertically upward
b) horizontally
c) vertically downward
d) both vertically upward and horizontally

4) A large Reynolds number is indication of _____
a) Smooth and streamline flow b) Laminar flow
c) Steady flow d) Highly turbulent flow

5) The Bernoulli's equation refers to conservation of _____
a) mass b) linear momentum
c) angular momentum d) energy

6) Hydraulic Gradient Line is always ____ Total Energy Line.
a) Above b) Below
c) Parallel to d) None of the above

7) Minor losses occur due to _____
a) Sudden enlargement in pipe b) Bends in pipe
c) Sudden contraction in pipe d) All of these

8) The velocity of water in an open channel can be measured by _____
a) Venturimeter b) Rotameter
c) Pitot tube d) Orifice plate

9) The Buckingham-Pi theorem is widely used in the dimensional analysis and expresses the resulting equation in terms of _____
a) the dependent and independent variables
b) n dimensionless parameters
c) (n - m) dimensionless parameters
d) geometric, kinematic and dynamic variables

10) The process of filling the liquid into the suction pipe and the pump casing up to the level of the delivery valve is called _____
a) Filling b) Pumping
c) Priming d) Leveling

11) The turbine preferred for 0 to 25 m head of water is _____
a) Pelton wheel b) Kaplan turbine
c) Tube turbine d) Francis turbine

12) Design of Pelton wheel means the following data is to be determined.
a) Width of buckets b) Number of buckets
c) Depth of buckets d) All of the mentioned

13) In a centrifugal pump, the liquid enters the pump _____
a) at the top b) at the bottom
c) at the centre d) from sides

14) What is the unit of the drag coefficient?
a) N/sec b) m/sec
c) kg/N d) Dimensionless quantity

SLR-BD-93

Seat No.		Set	P

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Fluid mechanics and Fluid Machines (MECHPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section.
2) Use of scientific calculator is allowed.
3) Figures to the right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly.
4) Use university graph paper & semi-log paper if required.

Section – I

Q.2 Attempt of the following

a) With a neat sketch explain the conditions of the equilibrium for submerged body. **04**

b) Derive an expression for total pressure and center of pressure on a vertical plane surface immersed in a static liquid. **05**

c) An isosceles triangular plate of base 4m & altitude 4m is immersed vertically in an oil of specific gravity 0.9. The base of plate coincides with free surface of oil. Determine total pressure & centre of pressure. **05**

Q.3 Attempt the following

a) What are the different types of fluid flow? Explain with an example. **05**

b) Define : **04**
1) Stream line 2) Streak Line 3) Path line 4) Equipotential Line

c) An oil of specific gravity 0.8 is flowing through a venturimeter having diameter 20 cm and throat diameter 10 cm. The oil mercury differential manometer shows a reading of 25 cm. Calculate the discharge of the oil through the horizontal venturimeter. Take C_d = 0.98. **05**

Q.4 Attempt the following

a) Explain the different losses that occur in the pipeline connection, with the help of formulae. **05**

b) Derive Dupit's equation for equivalent pipes. **04**

c) The difference in water surface levels in two tanks, which are connected by three pipes in series of lengths 300 m, 170 m and 210 m and of diameters 300 mm, 200 mm and 400 mm respectively, is 12 m. Determine the rate of flow of water if the coefficient of friction are 0.005, 0.0052 and 0.0048 respectively, by neglecting minor losses. **05**

Section – II

Q.5 Attempt the following.

a) The frictional torque T of a disc of diameter D rotating at a speed N in a fluid of viscosity μ and density ρ in a turbulent flow is given by $T = D^5 N^2 \rho \, \phi \, [\mu / D^2 N \rho]$, Prove this by the method of dimensions. **05**

b) Explain the terms: **04**
i) Drag ii) Lift

c) How do you classify water turbines? **05**

Q.6 Attempt the following.

a) A Pelton wheel has a mean bucket speed of 10 m/sec with jet of water flowing at the rate of 700 lit /s under a head of 30 meters. The buckets deflect the jet through an angle of 160°. Calculate the power given by water to the runner and the hydraulic efficiency of the turbine. Assume coefficient of velocity as 0.98. **05**

b) State the difference between Impulse Turbine and Reaction Turbine. **05**

c) Explain types of draft tube. What are the functions of the draft tube? **04**

Q.7 Attempt the following

a) A Francis turbine works at 450 rpm under a head of 120 m. The diameter of runner at inlet is 1.2 m and flow area of 0.4 m^2. At the inlet the absolute and relative velocities makes an angle of 20° and 60° respectively with tangential velocity. Determine i) The volume flow rate ii) runner power and iii) hydraulic efficiency. Assume the velocity of whirl at the outlet to be zero. **05**

b) Define the terms **04**
i) Suction head ii) Delivery head iii) Static head iv) Manometric head

c) Explain multistage pumps. **05**

SLR-BD-93

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Fluid mechanics and Fluid Machines (MECHPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The velocity of water in an open channel can be measured by _____
a) Venturimeter b) Rotameter
c) Pitot tube d) Orifice plate

2) The Buckingham-Pi theorem is widely used in the dimensional analysis and expresses the resulting equation in terms of _____
a) the dependent and independent variables
b) n dimensionless parameters
c) (n - m) dimensionless parameters
d) geometric, kinematic and dynamic variables

3) The process of filling the liquid into the suction pipe and the pump casing up to the level of the delivery valve is called _____
a) Filling b) Pumping
c) Priming d) Leveling

4) The turbine preferred for 0 to 25 m head of water is _____
a) Pelton wheel b) Kaplan turbine
c) Tube turbine d) Francis turbine

5) Design of Pelton wheel means the following data is to be determined.
a) Width of buckets b) Number of buckets
c) Depth of buckets d) All of the mentioned

6) In a centrifugal pump, the liquid enters the pump _____
a) at the top b) at the bottom
c) at the centre d) from sides

7) What is the unit of the drag coefficient?
a) N/sec b) m/sec
c) kg/N d) Dimensionless quantity

8) Pelton turbine is _____
a) Tangential flow b) Radial flow
c) Axial flow d) Mixed flow

9) The S.I. unit of total pressure on a plane immersed surface is _____
a) Newton per meter square
b) Newton
c) Newton square per meter
d) Newton per meter cube

10) Buoyancy acts on a floating body _____
a) vertically upward
b) horizontally
c) vertically downward
d) both vertically upward and horizontally

11) A large Reynolds number is indication of _____
a) Smooth and streamline flow b) Laminar flow
c) Steady flow d) Highly turbulent flow

12) The Bernoulli's equation refers to conservation of _____
a) mass b) linear momentum
c) angular momentum d) energy

13) Hydraulic Gradient Line is always ____ Total Energy Line.
a) Above b) Below
c) Parallel to d) None of the above

14) Minor losses occur due to _____
a) Sudden enlargement in pipe b) Bends in pipe
c) Sudden contraction in pipe d) All of these

SLR-BD-93

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Fluid mechanics and Fluid Machines (MECHPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section.
2) Use of scientific calculator is allowed.
3) Figures to the right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly.
4) Use university graph paper & semi-log paper if required.

Section – I

Q.2 Attempt of the following

a) With a neat sketch explain the conditions of the equilibrium for submerged body. **04**

b) Derive an expression for total pressure and center of pressure on a vertical plane surface immersed in a static liquid. **05**

c) An isosceles triangular plate of base 4m & altitude 4m is immersed vertically in an oil of specific gravity 0.9. The base of plate coincides with free surface of oil. Determine total pressure & centre of pressure. **05**

Q.3 Attempt the following

a) What are the different types of fluid flow? Explain with an example. **05**

b) Define : **04**
1) Stream line 2) Streak Line 3) Path line 4) Equipotential Line

c) An oil of specific gravity 0.8 is flowing through a venturimeter having diameter 20 cm and throat diameter 10 cm. The oil mercury differential manometer shows a reading of 25 cm. Calculate the discharge of the oil through the horizontal venturimeter. Take C_d = 0.98. **05**

Q.4 Attempt the following

a) Explain the different losses that occur in the pipeline connection, with the help of formulae. **05**

b) Derive Dupit's equation for equivalent pipes. **04**

c) The difference in water surface levels in two tanks, which are connected by three pipes in series of lengths 300 m, 170 m and 210 m and of diameters 300 mm, 200 mm and 400 mm respectively, is 12 m. Determine the rate of flow of water if the coefficient of friction are 0.005, 0.0052 and 0.0048 respectively, by neglecting minor losses. **05**

Section – II

Q.5 Attempt the following.

a) The frictional torque T of a disc of diameter D rotating at a speed N in a fluid of viscosity μ and density ρ in a turbulent flow is given by $T = D^5 N^2 \rho \, \phi \, [\mu / D^2 N \rho]$, Prove this by the method of dimensions. **05**

b) Explain the terms: **04**
i) Drag ii) Lift

c) How do you classify water turbines? **05**

Q.6 Attempt the following.

a) A Pelton wheel has a mean bucket speed of 10 m/sec with jet of water flowing at the rate of 700 lit /s under a head of 30 meters. The buckets deflect the jet through an angle of 160°. Calculate the power given by water to the runner and the hydraulic efficiency of the turbine. Assume coefficient of velocity as 0.98. **05**

b) State the difference between Impulse Turbine and Reaction Turbine. **05**

c) Explain types of draft tube. What are the functions of the draft tube? **04**

Q.7 Attempt the following

a) A Francis turbine works at 450 rpm under a head of 120 m. The diameter of runner at inlet is 1.2 m and flow area of 0.4 m^2. At the inlet the absolute and relative velocities makes an angle of 20° and 60° respectively with tangential velocity. Determine i) The volume flow rate ii) runner power and iii) hydraulic efficiency. Assume the velocity of whirl at the outlet to be zero. **05**

b) Define the terms **04**
i) Suction head ii) Delivery head iii) Static head iv) Manometric head

c) Explain multistage pumps. **05**

SLR-BD-93

Seat No.	

Set R

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Fluid mechanics and Fluid Machines (MECHPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The turbine preferred for 0 to 25 m head of water is _____
a) Pelton wheel b) Kaplan turbine
c) Tube turbine d) Francis turbine

2) Design of Pelton wheel means the following data is to be determined.
a) Width of buckets b) Number of buckets
c) Depth of buckets d) All of the mentioned

3) In a centrifugal pump, the liquid enters the pump _____
a) at the top b) at the bottom
c) at the centre d) from sides

4) What is the unit of the drag coefficient?
a) N/sec b) m/sec
c) kg/N d) Dimensionless quantity

5) Pelton turbine is _____
a) Tangential flow b) Radial flow
c) Axial flow d) Mixed flow

6) The S.I. unit of total pressure on a plane immersed surface is _____
a) Newton per meter square
b) Newton
c) Newton square per meter
d) Newton per meter cube

7) Buoyancy acts on a floating body _____
a) vertically upward
b) horizontally
c) vertically downward
d) both vertically upward and horizontally

8) A large Reynolds number is indication of _____
a) Smooth and streamline flow b) Laminar flow
c) Steady flow d) Highly turbulent flow

9) The Bernoulli's equation refers to conservation of _____
a) mass b) linear momentum
c) angular momentum d) energy

10) Hydraulic Gradient Line is always ____ Total Energy Line.
a) Above b) Below
c) Parallel to d) None of the above

11) Minor losses occur due to _____
a) Sudden enlargement in pipe b) Bends in pipe
c) Sudden contraction in pipe d) All of these

12) The velocity of water in an open channel can be measured by _____
a) Venturimeter b) Rotameter
c) Pitot tube d) Orifice plate

13) The Buckingham-Pi theorem is widely used in the dimensional analysis and expresses the resulting equation in terms of _____
a) the dependent and independent variables
b) n dimensionless parameters
c) (n - m) dimensionless parameters
d) geometric, kinematic and dynamic variables

14) The process of filling the liquid into the suction pipe and the pump casing up to the level of the delivery valve is called _____
a) Filling b) Pumping
c) Priming d) Leveling

SLR-BD-93

Seat No.	

Set R

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Fluid mechanics and Fluid Machines (MECHPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section.
2) Use of scientific calculator is allowed.
3) Figures to the right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly.
4) Use university graph paper & semi-log paper if required.

Section – I

Q.2 Attempt of the following

a) With a neat sketch explain the conditions of the equilibrium for submerged body. **04**

b) Derive an expression for total pressure and center of pressure on a vertical plane surface immersed in a static liquid. **05**

c) An isosceles triangular plate of base 4m & altitude 4m is immersed vertically in an oil of specific gravity 0.9. The base of plate coincides with free surface of oil. Determine total pressure & centre of pressure. **05**

Q.3 Attempt the following

a) What are the different types of fluid flow? Explain with an example. **05**

b) Define : **04**
1) Stream line 2) Streak Line 3) Path line 4) Equipotential Line

c) An oil of specific gravity 0.8 is flowing through a venturimeter having diameter 20 cm and throat diameter 10 cm. The oil mercury differential manometer shows a reading of 25 cm. Calculate the discharge of the oil through the horizontal venturimeter. Take C_d = 0.98. **05**

Q.4 Attempt the following

a) Explain the different losses that occur in the pipeline connection, with the help of formulae. **05**

b) Derive Dupit's equation for equivalent pipes. **04**

c) The difference in water surface levels in two tanks, which are connected by three pipes in series of lengths 300 m, 170 m and 210 m and of diameters 300 mm, 200 mm and 400 mm respectively, is 12 m. Determine the rate of flow of water if the coefficient of friction are 0.005, 0.0052 and 0.0048 respectively, by neglecting minor losses. **05**

Section – II

Q.5 Attempt the following.

a) The frictional torque T of a disc of diameter D rotating at a speed N in a fluid of viscosity μ and density ρ in a turbulent flow is given by $T = D^5 N^2 \rho \, \phi \, [\mu / D^2 N \rho]$, Prove this by the method of dimensions. **05**

b) Explain the terms: **04**
i) Drag ii) Lift

c) How do you classify water turbines? **05**

Q.6 Attempt the following.

a) A Pelton wheel has a mean bucket speed of 10 m/sec with jet of water flowing at the rate of 700 lit /s under a head of 30 meters. The buckets deflect the jet through an angle of 160°. Calculate the power given by water to the runner and the hydraulic efficiency of the turbine. Assume coefficient of velocity as 0.98. **05**

b) State the difference between Impulse Turbine and Reaction Turbine. **05**

c) Explain types of draft tube. What are the functions of the draft tube? **04**

Q.7 Attempt the following

a) A Francis turbine works at 450 rpm under a head of 120 m. The diameter of runner at inlet is 1.2 m and flow area of 0.4 m^2. At the inlet the absolute and relative velocities makes an angle of 20° and 60° respectively with tangential velocity. Determine i) The volume flow rate ii) runner power and iii) hydraulic efficiency. Assume the velocity of whirl at the outlet to be zero. **05**

b) Define the terms **04**
i) Suction head ii) Delivery head iii) Static head iv) Manometric head

c) Explain multistage pumps. **05**

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Fluid mechanics and Fluid Machines (MECHPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Hydraulic Gradient Line is always ____ Total Energy Line.
a) Above b) Below
c) Parallel to d) None of the above

2) Minor losses occur due to _____
a) Sudden enlargement in pipe b) Bends in pipe
c) Sudden contraction in pipe d) All of these

3) The velocity of water in an open channel can be measured by _____
a) Venturimeter b) Rotameter
c) Pitot tube d) Orifice plate

4) The Buckingham-Pi theorem is widely used in the dimensional analysis and expresses the resulting equation in terms of _____
a) the dependent and independent variables
b) n dimensionless parameters
c) (n - m) dimensionless parameters
d) geometric, kinematic and dynamic variables

5) The process of filling the liquid into the suction pipe and the pump casing up to the level of the delivery valve is called _____
a) Filling b) Pumping
c) Priming d) Leveling

6) The turbine preferred for 0 to 25 m head of water is _____
a) Pelton wheel b) Kaplan turbine
c) Tube turbine d) Francis turbine

7) Design of Pelton wheel means the following data is to be determined.
a) Width of buckets b) Number of buckets
c) Depth of buckets d) All of the mentioned

8) In a centrifugal pump, the liquid enters the pump _____
a) at the top b) at the bottom
c) at the centre d) from sides

9) What is the unit of the drag coefficient?
a) N/sec b) m/sec
c) kg/N d) Dimensionless quantity

10) Pelton turbine is _____
a) Tangential flow b) Radial flow
c) Axial flow d) Mixed flow

11) The S.I. unit of total pressure on a plane immersed surface is _____
a) Newton per meter square
b) Newton
c) Newton square per meter
d) Newton per meter cube

12) Buoyancy acts on a floating body _____
a) vertically upward
b) horizontally
c) vertically downward
d) both vertically upward and horizontally

13) A large Reynolds number is indication of _____
a) Smooth and streamline flow b) Laminar flow
c) Steady flow d) Highly turbulent flow

14) The Bernoulli's equation refers to conservation of _____
a) mass b) linear momentum
c) angular momentum d) energy

SLR-BD-93

Seat No.		Set	S

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Fluid mechanics and Fluid Machines (MECHPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section.
2) Use of scientific calculator is allowed.
3) Figures to the right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly.
4) Use university graph paper & semi-log paper if required.

Section – I

Q.2 Attempt of the following

a) With a neat sketch explain the conditions of the equilibrium for submerged body. **04**

b) Derive an expression for total pressure and center of pressure on a vertical plane surface immersed in a static liquid. **05**

c) An isosceles triangular plate of base 4m & altitude 4m is immersed vertically in an oil of specific gravity 0.9. The base of plate coincides with free surface of oil. Determine total pressure & centre of pressure. **05**

Q.3 Attempt the following

a) What are the different types of fluid flow? Explain with an example. **05**

b) Define : **04**
1) Stream line 2) Streak Line 3) Path line 4) Equipotential Line

c) An oil of specific gravity 0.8 is flowing through a venturimeter having diameter 20 cm and throat diameter 10 cm. The oil mercury differential manometer shows a reading of 25 cm. Calculate the discharge of the oil through the horizontal venturimeter. Take C_d = 0.98. **05**

Q.4 Attempt the following

a) Explain the different losses that occur in the pipeline connection, with the help of formulae. **05**

b) Derive Dupit's equation for equivalent pipes. **04**

c) The difference in water surface levels in two tanks, which are connected by three pipes in series of lengths 300 m, 170 m and 210 m and of diameters 300 mm, 200 mm and 400 mm respectively, is 12 m. Determine the rate of flow of water if the coefficient of friction are 0.005, 0.0052 and 0.0048 respectively, by neglecting minor losses. **05**

Section – II

Q.5 Attempt the following.

a) The frictional torque T of a disc of diameter D rotating at a speed N in a fluid of viscosity μ and density ρ in a turbulent flow is given by $T = D^5 N^2 \rho \, \phi \, [\mu / D^2 N \rho]$, Prove this by the method of dimensions. **05**

b) Explain the terms: **04**
i) Drag ii) Lift

c) How do you classify water turbines? **05**

Q.6 Attempt the following.

a) A Pelton wheel has a mean bucket speed of 10 m/sec with jet of water flowing at the rate of 700 lit /s under a head of 30 meters. The buckets deflect the jet through an angle of 160°. Calculate the power given by water to the runner and the hydraulic efficiency of the turbine. Assume coefficient of velocity as 0.98. **05**

b) State the difference between Impulse Turbine and Reaction Turbine. **05**

c) Explain types of draft tube. What are the functions of the draft tube? **04**

Q.7 Attempt the following

a) A Francis turbine works at 450 rpm under a head of 120 m. The diameter of runner at inlet is 1.2 m and flow area of 0.4 m^2. At the inlet the absolute and relative velocities makes an angle of 20° and 60° respectively with tangential velocity. Determine i) The volume flow rate ii) runner power and iii) hydraulic efficiency. Assume the velocity of whirl at the outlet to be zero. **05**

b) Define the terms **04**
i) Suction head ii) Delivery head iii) Static head iv) Manometric head

c) Explain multistage pumps. **05**

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Innovation can be best described as: _____
a) A new idea only
b) The process of creating value through ideas
c) Invention
d) None of the above

2) Entrepreneurship is primarily related to: _____
a) Administration b) Risk-taking
c) Planning d) None of these

3) Which of the following is not an entrepreneurial competency?
a) Innovation b) Leadership
c) Laziness d) Decision making

4) An entrepreneur operates: _____
a) Outside the organization b) Within an existing company
c) As a freelancer d) None

5) "Push" type innovation comes from: _____
a) Market needs b) Customer demands
c) Internal ideas d) Suppliers

6) Agile management promotes: _____
a) Linear process b) Flexibility and iteration
c) Bureaucracy d) None

7) Blue Ocean strategy refers to: _____
a) Competing in existing markets
b) Creating new market space
c) Losing market share
d) None

8) Which of these is not a barrier to innovation?
a) Risk-taking culture b) Resistance to change
c) Lack of resources d) Poor leadership

9) The shifting composition of the economy refers to: _____
a) Stable industries b) Changing business models
c) Static job roles d) None

10) Lean start-up encourages: _____
a) High upfront investment b) Rapid prototyping
c) Formal structure d) None

11) Legal considerations for entrepreneurs include: _____
a) Taxation b) IP protection
c) Contracts d) All of these

12) One of the seven sources of innovation is: _____
a) Competitor's failure b) Demographics
c) Inflation d) GDP

13) Entrepreneurial opportunity recognition is: _____
a) Unimportant b) Intuition-based only
c) Structured process d) Not taught

14) Six Thinking Hats is a method for: _____
a) Innovation testing b) Decision-making
c) Funding d) Legal advice

SLR-BD-94

Seat No.	

Set P

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 All questions are compulsory.

a) Define innovation. Explain its relationship with entrepreneurship. **06**
b) Distinguish between Entrepreneur, Manager, and Intrapreneur. **04**

Q.3 Solve any three questions.

a) Explain classification of innovation. **06**
b) Describe the economic theories of entrepreneurship. **06**
c) Discuss need and importance of Entrepreneurship Development. **06**
d) Describe sources of innovation with examples. **06**
e) Explain Agile management and NUF test in innovation. **06**

Section – II

Q.4 All questions are compulsory.

a) Explain the purpose and process of innovation. **06**
b) What are the needs for continuous learning in innovation? **04**

Q.5 Solve any three questions.

a) Explain different types of innovative strategies. **06**
b) Describe Red Ocean vs Blue Ocean strategies. **06**
c) List barriers to innovation and explain with examples. **06**
d) Explain the entrepreneurial process and opportunity recognition. **06**
e) Write short note on Lean start-up methodology. **06**

SLR-BD-94

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of these is not a barrier to innovation?
a) Risk-taking culture b) Resistance to change
c) Lack of resources d) Poor leadership

2) The shifting composition of the economy refers to: _____
a) Stable industries b) Changing business models
c) Static job roles d) None

3) Lean start-up encourages: _____
a) High upfront investment b) Rapid prototyping
c) Formal structure d) None

4) Legal considerations for entrepreneurs include: _____
a) Taxation b) IP protection
c) Contracts d) All of these

5) One of the seven sources of innovation is: _____
a) Competitor's failure b) Demographics
c) Inflation d) GDP

6) Entrepreneurial opportunity recognition is: _____
a) Unimportant b) Intuition-based only
c) Structured process d) Not taught

7) Six Thinking Hats is a method for: _____
a) Innovation testing b) Decision-making
c) Funding d) Legal advice

8) Innovation can be best described as: _____
a) A new idea only
b) The process of creating value through ideas
c) Invention
d) None of the above

9) Entrepreneurship is primarily related to: _____
a) Administration
b) Risk-taking
c) Planning
d) None of these

10) Which of the following is not an entrepreneurial competency?
a) Innovation
b) Leadership
c) Laziness
d) Decision making

11) An entrepreneur operates: _____
a) Outside the organization
b) Within an existing company
c) As a freelancer
d) None

12) "Push" type innovation comes from: _____
a) Market needs
b) Customer demands
c) Internal ideas
d) Suppliers

13) Agile management promotes: _____
a) Linear process
b) Flexibility and iteration
c) Bureaucracy
d) None

14) Blue Ocean strategy refers to: _____
a) Competing in existing markets
b) Creating new market space
c) Losing market share
d) None

SLR-BD-94

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 All questions are compulsory.

a) Define innovation. Explain its relationship with entrepreneurship. **06**
b) Distinguish between Entrepreneur, Manager, and Intrapreneur. **04**

Q.3 Solve any three questions.

a) Explain classification of innovation. **06**
b) Describe the economic theories of entrepreneurship. **06**
c) Discuss need and importance of Entrepreneurship Development. **06**
d) Describe sources of innovation with examples. **06**
e) Explain Agile management and NUF test in innovation. **06**

Section – II

Q.4 All questions are compulsory.

a) Explain the purpose and process of innovation. **06**
b) What are the needs for continuous learning in innovation? **04**

Q.5 Solve any three questions.

a) Explain different types of innovative strategies. **06**
b) Describe Red Ocean vs Blue Ocean strategies. **06**
c) List barriers to innovation and explain with examples. **06**
d) Explain the entrepreneurial process and opportunity recognition. **06**
e) Write short note on Lean start-up methodology. **06**

SLR-BD-94

Seat No.	

Set R

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Legal considerations for entrepreneurs include: _____
a) Taxation b) IP protection
c) Contracts d) All of these

2) One of the seven sources of innovation is: _____
a) Competitor's failure b) Demographics
c) Inflation d) GDP

3) Entrepreneurial opportunity recognition is: _____
a) Unimportant b) Intuition-based only
c) Structured process d) Not taught

4) Six Thinking Hats is a method for: _____
a) Innovation testing b) Decision-making
c) Funding d) Legal advice

5) Innovation can be best described as: _____
a) A new idea only
b) The process of creating value through ideas
c) Invention
d) None of the above

6) Entrepreneurship is primarily related to: _____
a) Administration b) Risk-taking
c) Planning d) None of these

7) Which of the following is not an entrepreneurial competency?
a) Innovation b) Leadership
c) Laziness d) Decision making

8) An entrepreneur operates: _____
a) Outside the organization
b) Within an existing company
c) As a freelancer
d) None

9) "Push" type innovation comes from: _____
a) Market needs
b) Customer demands
c) Internal ideas
d) Suppliers

10) Agile management promotes: _____
a) Linear process
b) Flexibility and iteration
c) Bureaucracy
d) None

11) Blue Ocean strategy refers to: _____
a) Competing in existing markets
b) Creating new market space
c) Losing market share
d) None

12) Which of these is not a barrier to innovation?
a) Risk-taking culture
b) Resistance to change
c) Lack of resources
d) Poor leadership

13) The shifting composition of the economy refers to: _____
a) Stable industries
b) Changing business models
c) Static job roles
d) None

14) Lean start-up encourages: _____
a) High upfront investment
b) Rapid prototyping
c) Formal structure
d) None

SLR-BD-94

Seat No.	

Set R

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 All questions are compulsory.

a) Define innovation. Explain its relationship with entrepreneurship. **06**
b) Distinguish between Entrepreneur, Manager, and Intrapreneur. **04**

Q.3 Solve any three questions.

a) Explain classification of innovation. **06**
b) Describe the economic theories of entrepreneurship. **06**
c) Discuss need and importance of Entrepreneurship Development. **06**
d) Describe sources of innovation with examples. **06**
e) Explain Agile management and NUF test in innovation. **06**

Section – II

Q.4 All questions are compulsory.

a) Explain the purpose and process of innovation. **06**
b) What are the needs for continuous learning in innovation? **04**

Q.5 Solve any three questions.

a) Explain different types of innovative strategies. **06**
b) Describe Red Ocean vs Blue Ocean strategies. **06**
c) List barriers to innovation and explain with examples. **06**
d) Explain the entrepreneurial process and opportunity recognition. **06**
e) Write short note on Lean start-up methodology. **06**

SLR-BD-94

Seat No.		Set	S

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Agile management promotes: _____
a) Linear process b) Flexibility and iteration
c) Bureaucracy d) None

2) Blue Ocean strategy refers to: _____
a) Competing in existing markets
b) Creating new market space
c) Losing market share
d) None

3) Which of these is not a barrier to innovation?
a) Risk-taking culture b) Resistance to change
c) Lack of resources d) Poor leadership

4) The shifting composition of the economy refers to: _____
a) Stable industries b) Changing business models
c) Static job roles d) None

5) Lean start-up encourages: _____
a) High upfront investment b) Rapid prototyping
c) Formal structure d) None

6) Legal considerations for entrepreneurs include: _____
a) Taxation b) IP protection
c) Contracts d) All of these

7) One of the seven sources of innovation is: _____
a) Competitor's failure b) Demographics
c) Inflation d) GDP

8) Entrepreneurial opportunity recognition is: _____
a) Unimportant b) Intuition-based only
c) Structured process d) Not taught

9) Six Thinking Hats is a method for: _____
a) Innovation testing b) Decision-making
c) Funding d) Legal advice

10) Innovation can be best described as: _____
a) A new idea only
b) The process of creating value through ideas
c) Invention
d) None of the above

11) Entrepreneurship is primarily related to: _____
a) Administration b) Risk-taking
c) Planning d) None of these

12) Which of the following is not an entrepreneurial competency?
a) Innovation b) Leadership
c) Laziness d) Decision making

13) An entrepreneur operates: _____
a) Outside the organization b) Within an existing company
c) As a freelancer d) None

14) "Push" type innovation comes from: _____
a) Market needs b) Customer demands
c) Internal ideas d) Suppliers

SLR-BD-94

Seat No.	

Set S

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 All questions are compulsory.

a) Define innovation. Explain its relationship with entrepreneurship. **06**
b) Distinguish between Entrepreneur, Manager, and Intrapreneur. **04**

Q.3 Solve any three questions.

a) Explain classification of innovation. **06**
b) Describe the economic theories of entrepreneurship. **06**
c) Discuss need and importance of Entrepreneurship Development. **06**
d) Describe sources of innovation with examples. **06**
e) Explain Agile management and NUF test in innovation. **06**

Section – II

Q.4 All questions are compulsory.

a) Explain the purpose and process of innovation. **06**
b) What are the needs for continuous learning in innovation? **04**

Q.5 Solve any three questions.

a) Explain different types of innovative strategies. **06**
b) Describe Red Ocean vs Blue Ocean strategies. **06**
c) List barriers to innovation and explain with examples. **06**
d) Explain the entrepreneurial process and opportunity recognition. **06**
e) Write short note on Lean start-up methodology. **06**

SLR-BD-95

Seat No.		Set	P

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) The Occupational Health and Safety Management System (OHSMS) primarily aims to: _____
a) Increase industrial profits
b) Reduce energy consumption
c) Ensure worker safety and reduce health risks in workplaces
d) Promote environmental tourism

2) In-situ conservation refers to: _____
a) Conservation of species in zoos
b) Conservation using biotechnology
c) Conservation in gene banks
d) Conservation of species in their natural habitats

3) Carbon footprint is a measure of: _____
a) Land occupied by forests
b) Energy consumption in a home
c) Greenhouse gas emissions by an activity or person
d) Amount of carbon in plants

4) The main goal of sustainability is to: _____
a) Meet present needs without compromising future needs
b) Increase profit only
c) Eliminate economic development
d) Promote urbanization

5) Which of the following is an example of hazardous waste?
a) Expired medicines b) Plastic bottles
c) Food scraps d) Paper waste

6) Biodiversity hotspots in India include: _____
a) Eastern Ghats and Indo-Gangetic Plain
b) Western Ghats and the Himalayas
c) Thar Desert and Sundarbans only
d) Deccan Plateau and Indo-Gangetic Basin

7) The 3R concept stands for: _____
a) Reuse, Reduce, Rebuild
b) Reduce, Reuse, Recycle
c) Replace, Reuse, Restore
d) Recycle, Recover, Rebuild

8) The ISO 14000 Series deals with: _____
a) Energy-efficient building design
b) Environmental Management Systems
c) Industrial Safety Standards
d) Economic Performance Indicators

9) Which of the following is a non-conventional source of energy?
a) Coal
b) Natural Gas
c) Wind
d) Diesel

10) The main goal of a circular economy is to: _____
a) Increase fossil fuel usage
b) Promote single-use products
c) Minimize waste and resource use
d) Maximize profit only

11) The first step in preparing an Environmental Impact Assessment (EIA) report is: _____
a) Cost-benefit analysis
b) Monitoring
c) Screening
d) Public hearing

12) Which of the following is not a principle of Environmental Management?
a) Polluter pays
b) Sustainability
c) Preventive action
d) Maximum profit generation

13) Cost-Benefit Analysis (CBA) in environmental policies is used to: _____
a) Maximize pollution
b) Evaluate environmental legislation
c) Compare environmental costs with economic benefits
d) Promote industrialization

14) An ecosystem consists of: _____
a) Living organisms only
b) Non-living components only
c) Living organisms and their physical environment
d) Plants and animals only

SLR-BD-95

Seat No.		Set	P

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following **12**

a) Define the term "environment". Discuss the scope and importance of environmental studies. Why is there a need for public awareness?
b) Describe the causes and effects of air and water pollution. Suggest two preventive measures for each.
c) Define sustainability. Discuss any two major challenges in achieving sustainable development.

Q.3 Attempt Any Two **10**

a) What are hazardous wastes and e-wastes? How should they be managed?
b) What are carbon credits and carbon footprints? Explain with examples.
c) List any two Millennium Development Goals (MDGs). Mention one environmental protocol.

Q.4 Write short notes on any two of the following: **06**

a) Genetic diversity
b) India as a mega-diversity nation
c) In-situ and Ex-situ conservation

Section – II

Q.5 Write short notes on any two of the following: **10**

a) ISO 14000 Series
b) Sustainable Habitat - Green Buildings
c) Non-conventional energy sources

Q.6 Attempt the following **10**

a) Define Environmental Management. Discuss its nature, scope, and components.
b) Define the 3R concept and explain how it supports the zero waste approach.

Q.7 Attempt any two **08**

a) Define Environmental Management. Discuss its nature, scope, and components.

b) What is Environmental Policy Analysis? Distinguish between macro-level and micro-level analysis.

c) Outline the steps involved in the Environmental Impact Assessment (EIA) process.

SLR-BD-95

Seat No.		Set	Q

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) The ISO 14000 Series deals with: _____
a) Energy-efficient building design
b) Environmental Management Systems
c) Industrial Safety Standards
d) Economic Performance Indicators

2) Which of the following is a non-conventional source of energy?
a) Coal b) Natural Gas
c) Wind d) Diesel

3) The main goal of a circular economy is to: _____
a) Increase fossil fuel usage
b) Promote single-use products
c) Minimize waste and resource use
d) Maximize profit only

4) The first step in preparing an Environmental Impact Assessment (EIA) report is: _____
a) Cost-benefit analysis b) Monitoring
c) Screening d) Public hearing

5) Which of the following is not a principle of Environmental Management?
a) Polluter pays b) Sustainability
c) Preventive action d) Maximum profit generation

6) Cost-Benefit Analysis (CBA) in environmental policies is used to: _____
a) Maximize pollution
b) Evaluate environmental legislation
c) Compare environmental costs with economic benefits
d) Promote industrialization

7) An ecosystem consists of: _____
a) Living organisms only
b) Non-living components only
c) Living organisms and their physical environment
d) Plants and animals only

8) The Occupational Health and Safety Management System (OHSMS) primarily aims to: _____
a) Increase industrial profits
b) Reduce energy consumption
c) Ensure worker safety and reduce health risks in workplaces
d) Promote environmental tourism

9) In-situ conservation refers to: _____
a) Conservation of species in zoos
b) Conservation using biotechnology
c) Conservation in gene banks
d) Conservation of species in their natural habitats

10) Carbon footprint is a measure of: _____
a) Land occupied by forests
b) Energy consumption in a home
c) Greenhouse gas emissions by an activity or person
d) Amount of carbon in plants

11) The main goal of sustainability is to: _____
a) Meet present needs without compromising future needs
b) Increase profit only
c) Eliminate economic development
d) Promote urbanization

12) Which of the following is an example of hazardous waste?
a) Expired medicines b) Plastic bottles
c) Food scraps d) Paper waste

13) Biodiversity hotspots in India include: _____
a) Eastern Ghats and Indo-Gangetic Plain
b) Western Ghats and the Himalayas
c) Thar Desert and Sundarbans only
d) Deccan Plateau and Indo-Gangetic Basin

14) The 3R concept stands for: _____
a) Reuse, Reduce, Rebuild b) Reduce, Reuse, Recycle
c) Replace, Reuse, Restore d) Recycle, Recover, Rebuild

SLR-BD-95

Seat No.		Set	Q

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following **12**

a) Define the term "environment". Discuss the scope and importance of environmental studies. Why is there a need for public awareness?
b) Describe the causes and effects of air and water pollution. Suggest two preventive measures for each.
c) Define sustainability. Discuss any two major challenges in achieving sustainable development.

Q.3 Attempt Any Two **10**

a) What are hazardous wastes and e-wastes? How should they be managed?
b) What are carbon credits and carbon footprints? Explain with examples.
c) List any two Millennium Development Goals (MDGs). Mention one environmental protocol.

Q.4 Write short notes on any two of the following: **06**

a) Genetic diversity
b) India as a mega-diversity nation
c) In-situ and Ex-situ conservation

Section – II

Q.5 Write short notes on any two of the following: **10**

a) ISO 14000 Series
b) Sustainable Habitat - Green Buildings
c) Non-conventional energy sources

Q.6 Attempt the following **10**

a) Define Environmental Management. Discuss its nature, scope, and components.
b) Define the 3R concept and explain how it supports the zero waste approach.

Q.7 Attempt any two **08**

a) Define Environmental Management. Discuss its nature, scope, and components.

b) What is Environmental Policy Analysis? Distinguish between macro-level and micro-level analysis.

c) Outline the steps involved in the Environmental Impact Assessment (EIA) process.

SLR-BD-95

Seat No.		Set	R

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) The first step in preparing an Environmental Impact Assessment (EIA) report is: _____
a) Cost-benefit analysis b) Monitoring
c) Screening d) Public hearing

2) Which of the following is not a principle of Environmental Management?
a) Polluter pays b) Sustainability
c) Preventive action d) Maximum profit generation

3) Cost-Benefit Analysis (CBA) in environmental policies is used to: _____
a) Maximize pollution
b) Evaluate environmental legislation
c) Compare environmental costs with economic benefits
d) Promote industrialization

4) An ecosystem consists of: _____
a) Living organisms only
b) Non-living components only
c) Living organisms and their physical environment
d) Plants and animals only

5) The Occupational Health and Safety Management System (OHSMS) primarily aims to: _____
a) Increase industrial profits
b) Reduce energy consumption
c) Ensure worker safety and reduce health risks in workplaces
d) Promote environmental tourism

6) In-situ conservation refers to: _____
a) Conservation of species in zoos
b) Conservation using biotechnology
c) Conservation in gene banks
d) Conservation of species in their natural habitats

7) Carbon footprint is a measure of: _____
a) Land occupied by forests
b) Energy consumption in a home
c) Greenhouse gas emissions by an activity or person
d) Amount of carbon in plants

8) The main goal of sustainability is to: _____
a) Meet present needs without compromising future needs
b) Increase profit only
c) Eliminate economic development
d) Promote urbanization

9) Which of the following is an example of hazardous waste?
a) Expired medicines b) Plastic bottles
c) Food scraps d) Paper waste

10) Biodiversity hotspots in India include: _____
a) Eastern Ghats and Indo-Gangetic Plain
b) Western Ghats and the Himalayas
c) Thar Desert and Sundarbans only
d) Deccan Plateau and Indo-Gangetic Basin

11) The 3R concept stands for: _____
a) Reuse, Reduce, Rebuild b) Reduce, Reuse, Recycle
c) Replace, Reuse, Restore d) Recycle, Recover, Rebuild

12) The ISO 14000 Series deals with: _____
a) Energy-efficient building design
b) Environmental Management Systems
c) Industrial Safety Standards
d) Economic Performance Indicators

13) Which of the following is a non-conventional source of energy?
a) Coal b) Natural Gas
c) Wind d) Diesel

14) The main goal of a circular economy is to: _____
a) Increase fossil fuel usage
b) Promote single-use products
c) Minimize waste and resource use
d) Maximize profit only

SLR-BD-95

Seat No.		Set	R

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following **12**

a) Define the term "environment". Discuss the scope and importance of environmental studies. Why is there a need for public awareness?
b) Describe the causes and effects of air and water pollution. Suggest two preventive measures for each.
c) Define sustainability. Discuss any two major challenges in achieving sustainable development.

Q.3 Attempt Any Two **10**

a) What are hazardous wastes and e-wastes? How should they be managed?
b) What are carbon credits and carbon footprints? Explain with examples.
c) List any two Millennium Development Goals (MDGs). Mention one environmental protocol.

Q.4 Write short notes on any two of the following: **06**

a) Genetic diversity
b) India as a mega-diversity nation
c) In-situ and Ex-situ conservation

Section – II

Q.5 Write short notes on any two of the following: **10**

a) ISO 14000 Series
b) Sustainable Habitat - Green Buildings
c) Non-conventional energy sources

Q.6 Attempt the following **10**

a) Define Environmental Management. Discuss its nature, scope, and components.
b) Define the 3R concept and explain how it supports the zero waste approach.

Q.7 Attempt any two **08**

a) Define Environmental Management. Discuss its nature, scope, and components.

b) What is Environmental Policy Analysis? Distinguish between macro-level and micro-level analysis.

c) Outline the steps involved in the Environmental Impact Assessment (EIA) process.

SLR-BD-95

Seat No.		Set	S

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) Biodiversity hotspots in India include: _____
a) Eastern Ghats and Indo-Gangetic Plain
b) Western Ghats and the Himalayas
c) Thar Desert and Sundarbans only
d) Deccan Plateau and Indo-Gangetic Basin

2) The 3R concept stands for: _____
a) Reuse, Reduce, Rebuild b) Reduce, Reuse, Recycle
c) Replace, Reuse, Restore d) Recycle, Recover, Rebuild

3) The ISO 14000 Series deals with: _____
a) Energy-efficient building design
b) Environmental Management Systems
c) Industrial Safety Standards
d) Economic Performance Indicators

4) Which of the following is a non-conventional source of energy?
a) Coal b) Natural Gas
c) Wind d) Diesel

5) The main goal of a circular economy is to: _____
a) Increase fossil fuel usage
b) Promote single-use products
c) Minimize waste and resource use
d) Maximize profit only

6) The first step in preparing an Environmental Impact Assessment (EIA) report is: _____
a) Cost-benefit analysis b) Monitoring
c) Screening d) Public hearing

7) Which of the following is not a principle of Environmental Management?
a) Polluter pays
b) Sustainability
c) Preventive action
d) Maximum profit generation

8) Cost-Benefit Analysis (CBA) in environmental policies is used to: _____
a) Maximize pollution
b) Evaluate environmental legislation
c) Compare environmental costs with economic benefits
d) Promote industrialization

9) An ecosystem consists of: _____
a) Living organisms only
b) Non-living components only
c) Living organisms and their physical environment
d) Plants and animals only

10) The Occupational Health and Safety Management System (OHSMS) primarily aims to: _____
a) Increase industrial profits
b) Reduce energy consumption
c) Ensure worker safety and reduce health risks in workplaces
d) Promote environmental tourism

11) In-situ conservation refers to: _____
a) Conservation of species in zoos
b) Conservation using biotechnology
c) Conservation in gene banks
d) Conservation of species in their natural habitats

12) Carbon footprint is a measure of: _____
a) Land occupied by forests
b) Energy consumption in a home
c) Greenhouse gas emissions by an activity or person
d) Amount of carbon in plants

13) The main goal of sustainability is to: _____
a) Meet present needs without compromising future needs
b) Increase profit only
c) Eliminate economic development
d) Promote urbanization

14) Which of the following is an example of hazardous waste?
a) Expired medicines
b) Plastic bottles
c) Food scraps
d) Paper waste

SLR-BD-95

Seat No.		Set	S

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following **12**

a) Define the term "environment". Discuss the scope and importance of environmental studies. Why is there a need for public awareness?
b) Describe the causes and effects of air and water pollution. Suggest two preventive measures for each.
c) Define sustainability. Discuss any two major challenges in achieving sustainable development.

Q.3 Attempt Any Two **10**

a) What are hazardous wastes and e-wastes? How should they be managed?
b) What are carbon credits and carbon footprints? Explain with examples.
c) List any two Millennium Development Goals (MDGs). Mention one environmental protocol.

Q.4 Write short notes on any two of the following: **06**

a) Genetic diversity
b) India as a mega-diversity nation
c) In-situ and Ex-situ conservation

Section – II

Q.5 Write short notes on any two of the following: **10**

a) ISO 14000 Series
b) Sustainable Habitat - Green Buildings
c) Non-conventional energy sources

Q.6 Attempt the following **10**

a) Define Environmental Management. Discuss its nature, scope, and components.
b) Define the 3R concept and explain how it supports the zero waste approach.

Q.7 Attempt any two **08**

a) Define Environmental Management. Discuss its nature, scope, and components.

b) What is Environmental Policy Analysis? Distinguish between macro-level and micro-level analysis.

c) Outline the steps involved in the Environmental Impact Assessment (EIA) process.

SLR-BD-96

Seat No.		Set	P

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which is the primary advantage of using solar energy power generation?
a) Low initial coast
b) Reduce environmental impact
c) Do not require large area
d) Simple storage method

2) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

3) Which of the following common application of solar energy?
a) Generating electricity
b) Heating water
c) Providing power for electronic device
d) All of the above

4) Passive solar energy refers to trapping the Suns energy _____.
a) Using mechanical devices
b) without using mechanical devices
c) Using chemical
d) Incineration

5) The process or digestion taking place in the presence of air is called as _____.
a) Aerobic digestion
b) Anaerobic digestion
c) Hydrolysis
d) None of these

6) Which type of renewable energy resources generate low power energy?

a) Biomass b) Solar
c) Wind d) All of the above

7) In wind turbine gear box is used to _____.

a) Step up the speed b) Reduce the speed
c) shut down d) None of these

8) Geothermal energy present _____ of the earth.

a) Rotation b) Exterior
c) North side d) Interior

9) Biogas is the gaseous fuel which is obtained from biomass by means of _____ fermentation.

a) Aerobic b) Anaerobic
c) Constant d) None of the above

10) _____ is produced by blending of vegetable oil.

a) CNG b) Methane gas
c) Biofuel d) Biodisel

11) Availability of Solar energy on the earth surface is _____MW.

a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

12) Energy is _____ of substance or a body to do work.

a) Obesity b) Power
c) Capacity d) None of the above

13) Wind energy used from _____ years ago.

a) 3000 b) 2000
c) 6000 d) 5000

14) The major source of the Geothermal energy is _____.

a) Water b) Hot water reservoir
c) Oil d) Gas

SLR-BD-96

Seat No.	

Set P

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Attempt any Four **16**

a) Explain advantages of biomass energy.
b) Explain in detail scope of renewable energy.
c) What is biomass energy and explain resources of biomass energy.
d) Write a note on applications of solar energy.
e) Explain function of biogas digester.
f) Write a note on aerobic and anaerobic digestion.

Q.3 Attempt any two. **12**

a) Explain Solar photovoltaic technology.
b) Explain Basic components of wind energy conversion system.
c) Explain in detail advantages and disadvantages of renewable energy.
d) Explain in detail advantage and disadvantage of Solar energy.

Section – II

Q.4 Attempt any Four. **16**

a) Write a note on wave energy.
b) Merits and demerits of hydropower energy.
c) Explain specifications of energy storage devices.
d) Main parts of hydropower station.
e) Importance of tidal energy.
f) Importance of energy storage devices

Q.5 Attempt any two. **12**

a) Write a note on potential of wave energy in India.
b) Explain different methods of energy storage.
c) Explain with neat diagram hydropower plant.
d) Explain in detail ocean thermal energy conversion (OTEC) .

Seat No.	

Set **Q**

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Geothermal energy present _____ of the earth.
a) Rotation b) Exterior
c) North side d) Interior

2) Biogas is the gaseous fuel which is obtained from biomass by means of _____ fermentation.
a) Aerobic b) Anaerobic
c) Constant d) None of the above

3) _____ is produced by blending of vegetable oil.
a) CNG b) Methane gas
c) Biofuel d) Biodisel

4) Availability of Solar energy on the earth surface is _____MW.
a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

5) Energy is _____ of substance or a body to do work.
a) Obesity b) Power
c) Capacity d) None of the above

6) Wind energy used from _____ years ago.
a) 3000 b) 2000
c) 6000 d) 5000

7) The major source of the Geothermal energy is _____.
a) Water b) Hot water reservoir
c) Oil d) Gas

8) Which is the primary advantage of using solar energy power generation?
a) Low initial coast
b) Reduce environmental impact
c) Do not require large area
d) Simple storage method

9) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

10) Which of the following common application of solar energy?
a) Generating electricity
b) Heating water
c) Providing power for electronic device
d) All of the above

11) Passive solar energy refers to trapping the Suns energy _____.
a) Using mechanical devices
b) without using mechanical devices
c) Using chemical
d) Incineration

12) The process or digestion taking place in the presence of air is called as _____.
a) Aerobic digestion b) Anaerobic digestion
c) Hydrolysis d) None of these

13) Which type of renewable energy resources generate low power energy?
a) Biomass b) Solar
c) Wind d) All of the above

14) In wind turbine gear box is used to _____.
a) Step up the speed b) Reduce the speed
c) shut down d) None of these

SLR-BD-96

Seat No.	

Set Q

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Attempt any Four **16**

a) Explain advantages of biomass energy.
b) Explain in detail scope of renewable energy.
c) What is biomass energy and explain resources of biomass energy.
d) Write a note on applications of solar energy.
e) Explain function of biogas digester.
f) Write a note on aerobic and anaerobic digestion.

Q.3 Attempt any two. **12**

a) Explain Solar photovoltaic technology.
b) Explain Basic components of wind energy conversion system.
c) Explain in detail advantages and disadvantages of renewable energy.
d) Explain in detail advantage and disadvantage of Solar energy.

Section – II

Q.4 Attempt any Four. **16**

a) Write a note on wave energy.
b) Merits and demerits of hydropower energy.
c) Explain specifications of energy storage devices.
d) Main parts of hydropower station.
e) Importance of tidal energy.
f) Importance of energy storage devices

Q.5 Attempt any two. **12**

a) Write a note on potential of wave energy in India.
b) Explain different methods of energy storage.
c) Explain with neat diagram hydropower plant.
d) Explain in detail ocean thermal energy conversion (OTEC).

Seat No.	

Set **R**

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Availability of Solar energy on the earth surface is _____MW.
a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

2) Energy is _____ of substance or a body to do work.
a) Obesity b) Power
c) Capacity d) None of the above

3) Wind energy used from _____ years ago.
a) 3000 b) 2000
c) 6000 d) 5000

4) The major source of the Geothermal energy is _____.
a) Water b) Hot water reservoir
c) Oil d) Gas

5) Which is the primary advantage of using solar energy power generation?
a) Low initial coast
b) Reduce environmental impact
c) Do not require large area
d) Simple storage method

6) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

7) Which of the following common application of solar energy?
a) Generating electricity
b) Heating water
c) Providing power for electronic device
d) All of the above

8) Passive solar energy refers to trapping the Suns energy _____.
a) Using mechanical devices
b) without using mechanical devices
c) Using chemical
d) Incineration

9) The process or digestion taking place in the presence of air is called as _____.
a) Aerobic digestion
b) Anaerobic digestion
c) Hydrolysis
d) None of these

10) Which type of renewable energy resources generate low power energy?
a) Biomass
b) Solar
c) Wind
d) All of the above

11) In wind turbine gear box is used to _____.
a) Step up the speed
b) Reduce the speed
c) shut down
d) None of these

12) Geothermal energy present _____ of the earth.
a) Rotation
b) Exterior
c) North side
d) Interior

13) Biogas is the gaseous fuel which is obtained from biomass by means of _____ fermentation.
a) Aerobic
b) Anaerobic
c) Constant
d) None of the above

14) _____ is produced by blending of vegetable oil.
a) CNG
b) Methane gas
c) Biofuel
d) Biodisel

SLR-BD-96

Seat No.	

Set R

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Attempt any Four **16**

a) Explain advantages of biomass energy.
b) Explain in detail scope of renewable energy.
c) What is biomass energy and explain resources of biomass energy.
d) Write a note on applications of solar energy.
e) Explain function of biogas digester.
f) Write a note on aerobic and anaerobic digestion.

Q.3 Attempt any two. **12**

a) Explain Solar photovoltaic technology.
b) Explain Basic components of wind energy conversion system.
c) Explain in detail advantages and disadvantages of renewable energy.
d) Explain in detail advantage and disadvantage of Solar energy.

Section – II

Q.4 Attempt any Four. **16**

a) Write a note on wave energy.
b) Merits and demerits of hydropower energy.
c) Explain specifications of energy storage devices.
d) Main parts of hydropower station.
e) Importance of tidal energy.
f) Importance of energy storage devices

Q.5 Attempt any two. **12**

a) Write a note on potential of wave energy in India.
b) Explain different methods of energy storage.
c) Explain with neat diagram hydropower plant.
d) Explain in detail ocean thermal energy conversion (OTEC).

Seat No.	

Set **S**

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which type of renewable energy resources generate low power energy?
a) Biomass b) Solar
c) Wind d) All of the above

2) In wind turbine gear box is used to _____.
a) Step up the speed b) Reduce the speed
c) shut down d) None of these

3) Geothermal energy present _____ of the earth.
a) Rotation b) Exterior
c) North side d) Interior

4) Biogas is the gaseous fuel which is obtained from biomass by means of _____ fermentation.
a) Aerobic b) Anaerobic
c) Constant d) None of the above

5) _____ is produced by blending of vegetable oil.
a) CNG b) Methane gas
c) Biofuel d) Biodisel

6) Availability of Solar energy on the earth surface is _____MW.
a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

7) Energy is _____ of substance or a body to do work.
a) Obesity b) Power
c) Capacity d) None of the above

8) Wind energy used from _____ years ago.
a) 3000 b) 2000
c) 6000 d) 5000

9) The major source of the Geothermal energy is _____.
a) Water b) Hot water reservoir
c) Oil d) Gas

10) Which is the primary advantage of using solar energy power generation?
a) Low initial coast
b) Reduce environmental impact
c) Do not require large area
d) Simple storage method

11) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

12) Which of the following common application of solar energy?
a) Generating electricity
b) Heating water
c) Providing power for electronic device
d) All of the above

13) Passive solar energy refers to trapping the Suns energy _____.
a) Using mechanical devices
b) without using mechanical devices
c) Using chemical
d) Incineration

14) The process or digestion taking place in the presence of air is called as _____.
a) Aerobic digestion b) Anaerobic digestion
c) Hydrolysis d) None of these

SLR-BD-96

Seat No.	

Set S

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Attempt any Four **16**

a) Explain advantages of biomass energy.
b) Explain in detail scope of renewable energy.
c) What is biomass energy and explain resources of biomass energy.
d) Write a note on applications of solar energy.
e) Explain function of biogas digester.
f) Write a note on aerobic and anaerobic digestion.

Q.3 Attempt any two. **12**

a) Explain Solar photovoltaic technology.
b) Explain Basic components of wind energy conversion system.
c) Explain in detail advantages and disadvantages of renewable energy.
d) Explain in detail advantage and disadvantage of Solar energy.

Section – II

Q.4 Attempt any Four. **16**

a) Write a note on wave energy.
b) Merits and demerits of hydropower energy.
c) Explain specifications of energy storage devices.
d) Main parts of hydropower station.
e) Importance of tidal energy.
f) Importance of energy storage devices

Q.5 Attempt any two. **12**

a) Write a note on potential of wave energy in India.
b) Explain different methods of energy storage.
c) Explain with neat diagram hydropower plant.
d) Explain in detail ocean thermal energy conversion (OTEC).

SLR-BD-97

Seat No.	

Set P

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Draw neat diagrams whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) An instrument transformer is used to extend the range of _____.
a) induction instrument b) electrostatic instrument
c) moving coil instrument d) any of the above

2) The internal resistance of an ammeter should be _____.
a) Very small b) Medium
c) High d) Infinity

3) The smallest change which a sensor can detect is termed: _____
a) Accuracy b) Precision
c) Resolution d) Scale

4) Sensor effectiveness depends on _____ parameter.
a) Sensitivity b) Radiation
c) Restively d) All the above

5) The desirable static characteristics of a measuring system are _____
a) accuracy and drift
b) accuracy, sensitivity and reproducibility
c) drift and dead zone
d) static error

6) A _____ device prevents the oscillation of the moving system and enables the latter to reach its final position quickly.
a) Deflecting b) Controlling
c) Damping d) any of the above

7) _____ is an instrument which measures the insulation resistance of an electric circuit relative to earth and one another.
a) Tangent galvanometer
b) Megger
c) Current transformer
d) None of the above

8) Which of the following is a key characteristic of a sensor?
a) It can only measure temperature
b) It is an active component
c) It converts physical parameters into an electrical signal
d) Il requires no external power

9) Which of the following is a type of magnetic sensor?
a) Thermistor
b) Strain gauge
c) Hall effect sensor
d) LVDT

10) Typical conversion speed of ADC is _____
a) Less than 1 μs
b) Less than 100 μs
c) Less than 500 μs
d) Greater than 1000 μs

11) What is signal conditioning?
a) To analyze any signal
b) Conversion or modification is referred to as conditioning
c) Conversion from analog to digital is signal conditioning
d) Conversion from digital to analog is signal conditioning

12) Touch screen devices use which sensor?
a) Touch sensor
b) Temperature sensor
c) Humidity sensor
d) Pressure sensor

13) ENOB in ADC stand for _____
a) Effective number of bytes
b) Effective number of bits
c) Effective nibble baud
d) None of the mentioned

14) A simple bridge circuit consists of a network of _____
a) 3 resistance arms
b) 2 resistance arms
c) 4 resistance arms
d) 6 resistance arms

SLR-BD-97

Seat No.	

Set P

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt any four of the following: 16

a) Define standard & explain types of standards.
b) Define the following characteristics
1) Linearity 2) Accuracy 3) Repeatability 4) Sensitivity
c) Derive the expression for unknown capacitance with phasor diagram by using Schering Bridge.
d) Write difference between Current Transformer and Potential Transformer.
e) Explain working of digital storage oscilloscope with suitable block diagram.

Q.3 Attempt any two of the following: 12

a) Illustrate and derive the torque equation for a Moving iron instrument with neat diagram.
b) Draw the equivalent circuit and phasor diagram of a CT. Derive the expressions for ratio and phase angle errors.
c) Explain digital ramp type and dual slope integrating type digital voltmeter.

Section – II

Q.4 Attempt any four of the following: 16

a) Explain the principle of working of Hall effect sensor.
b) Explain different types of temperature sensor with details.
c) Discuss Classification of sensor and explain active and passive sensor.
d) State and explain the methods of data transmission.
e) State and Explain the Modes of Heat transfer.

Q.5 Attempt any two of the following: 12

a) Stale the sensors used for Velocity and Acceleration application and explain any one of them.
b) Slate and explain the sensors used for occupancy and motion detector application.
c) Define the temperature and explain the thermal properties of material.

SLR-BD-97

Seat No.	

Set Q

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Draw neat diagrams whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which of the following is a key characteristic of a sensor?
a) It can only measure temperature
b) It is an active component
c) It converts physical parameters into an electrical signal
d) Il requires no external power

2) Which of the following is a type of magnetic sensor?
a) Thermistor b) Strain gauge
c) Hall effect sensor d) LVDT

3) Typical conversion speed of ADC is _____
a) Less than 1 μs b) Less than 100 μs
c) Less than 500 μs d) Greater than 1000 μs

4) What is signal conditioning?
a) To analyze any signal
b) Conversion or modification is referred to as conditioning
c) Conversion from analog to digital is signal conditioning
d) Conversion from digital to analog is signal conditioning

5) Touch screen devices use which sensor?
a) Touch sensor b) Temperature sensor
c) Humidity sensor d) Pressure sensor

6) ENOB in ADC stand for _____
a) Effective number of bytes b) Effective number of bits
c) Effective nibble baud d) None of the mentioned

7) A simple bridge circuit consists of a network of _____
a) 3 resistance arms b) 2 resistance arms
c) 4 resistance arms d) 6 resistance arms

8) An instrument transformer is used to extend the range of _____.
a) induction instrument b) electrostatic instrument
c) moving coil instrument d) any of the above

9) The internal resistance of an ammeter should be _____.
a) Very small b) Medium
c) High d) Infinity

10) The smallest change which a sensor can detect is termed: _____
a) Accuracy b) Precision
c) Resolution d) Scale

11) Sensor effectiveness depends on _____ parameter.
a) Sensitivity b) Radiation
c) Restively d) All the above

12) The desirable static characteristics of a measuring system are _____
a) accuracy and drift
b) accuracy, sensitivity and reproducibility
c) drift and dead zone
d) static error

13) A _____ device prevents the oscillation of the moving system and enables the latter to reach its final position quickly.
a) Deflecting b) Controlling
c) Damping d) any of the above

14) _____ is an instrument which measures the insulation resistance of an electric circuit relative to earth and one another.
a) Tangent galvanometer
b) Megger
c) Current transformer
d) None of the above

SLR-BD-97

Seat No.	

Set Q

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt any four of the following: 16

a) Define standard & explain types of standards.
b) Define the following characteristics
1) Linearity 2) Accuracy 3) Repeatability 4) Sensitivity
c) Derive the expression for unknown capacitance with phasor diagram by using Schering Bridge.
d) Write difference between Current Transformer and Potential Transformer.
e) Explain working of digital storage oscilloscope with suitable block diagram.

Q.3 Attempt any two of the following: 12

a) Illustrate and derive the torque equation for a Moving iron instrument with neat diagram.
b) Draw the equivalent circuit and phasor diagram of a CT. Derive the expressions for ratio and phase angle errors.
c) Explain digital ramp type and dual slope integrating type digital voltmeter.

Section – II

Q.4 Attempt any four of the following: 16

a) Explain the principle of working of Hall effect sensor.
b) Explain different types of temperature sensor with details.
c) Discuss Classification of sensor and explain active and passive sensor.
d) State and explain the methods of data transmission.
e) State and Explain the Modes of Heat transfer.

Q.5 Attempt any two of the following: 12

a) Stale the sensors used for Velocity and Acceleration application and explain any one of them.
b) Slate and explain the sensors used for occupancy and motion detector application.
c) Define the temperature and explain the thermal properties of material.

SLR-BD-97

Seat No.	

Set R

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Draw neat diagrams whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) What is signal conditioning?
a) To analyze any signal
b) Conversion or modification is referred to as conditioning
c) Conversion from analog to digital is signal conditioning
d) Conversion from digital to analog is signal conditioning

2) Touch screen devices use which sensor?
a) Touch sensor b) Temperature sensor
c) Humidity sensor d) Pressure sensor

3) ENOB in ADC stand for _____
a) Effective number of bytes b) Effective number of bits
c) Effective nibble baud d) None of the mentioned

4) A simple bridge circuit consists of a network of _____
a) 3 resistance arms b) 2 resistance arms
c) 4 resistance arms d) 6 resistance arms

5) An instrument transformer is used to extend the range of _____.
a) induction instrument b) electrostatic instrument
c) moving coil instrument d) any of the above

6) The internal resistance of an ammeter should be _____.
a) Very small b) Medium
c) High d) Infinity

7) The smallest change which a sensor can detect is termed: _____
a) Accuracy b) Precision
c) Resolution d) Scale

8) Sensor effectiveness depends on _____ parameter.
a) Sensitivity b) Radiation
c) Restively d) All the above

9) The desirable static characteristics of a measuring system are _____
a) accuracy and drift
b) accuracy, sensitivity and reproducibility
c) drift and dead zone
d) static error

10) A _____ device prevents the oscillation of the moving system and enables the latter to reach its final position quickly.
a) Deflecting b) Controlling
c) Damping d) any of the above

11) _____ is an instrument which measures the insulation resistance of an electric circuit relative to earth and one another.
a) Tangent galvanometer
b) Megger
c) Current transformer
d) None of the above

12) Which of the following is a key characteristic of a sensor?
a) It can only measure temperature
b) It is an active component
c) It converts physical parameters into an electrical signal
d) Il requires no external power

13) Which of the following is a type of magnetic sensor?
a) Thermistor b) Strain gauge
c) Hall effect sensor d) LVDT

14) Typical conversion speed of ADC is _____
a) Less than 1 μs b) Less than 100 μs
c) Less than 500 μs d) Greater than 1000 μs

SLR-BD-97

Seat No.	

Set R

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt any four of the following: 16

a) Define standard & explain types of standards.
b) Define the following characteristics
1) Linearity 2) Accuracy 3) Repeatability 4) Sensitivity
c) Derive the expression for unknown capacitance with phasor diagram by using Schering Bridge.
d) Write difference between Current Transformer and Potential Transformer.
e) Explain working of digital storage oscilloscope with suitable block diagram.

Q.3 Attempt any two of the following: 12

a) Illustrate and derive the torque equation for a Moving iron instrument with neat diagram.
b) Draw the equivalent circuit and phasor diagram of a CT. Derive the expressions for ratio and phase angle errors.
c) Explain digital ramp type and dual slope integrating type digital voltmeter.

Section – II

Q.4 Attempt any four of the following: 16

a) Explain the principle of working of Hall effect sensor.
b) Explain different types of temperature sensor with details.
c) Discuss Classification of sensor and explain active and passive sensor.
d) State and explain the methods of data transmission.
e) State and Explain the Modes of Heat transfer.

Q.5 Attempt any two of the following: 12

a) Stale the sensors used for Velocity and Acceleration application and explain any one of them.
b) Slate and explain the sensors used for occupancy and motion detector application.
c) Define the temperature and explain the thermal properties of material.

SLR-BD-97

Seat No.	

Set S

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Draw neat diagrams whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) A _____ device prevents the oscillation of the moving system and enables the latter to reach its final position quickly.
a) Deflecting b) Controlling
c) Damping d) any of the above

2) _____ is an instrument which measures the insulation resistance of an electric circuit relative to earth and one another.
a) Tangent galvanometer
b) Megger
c) Current transformer
d) None of the above

3) Which of the following is a key characteristic of a sensor?
a) It can only measure temperature
b) It is an active component
c) It converts physical parameters into an electrical signal
d) Il requires no external power

4) Which of the following is a type of magnetic sensor?
a) Thermistor b) Strain gauge
c) Hall effect sensor d) LVDT

5) Typical conversion speed of ADC is _____
a) Less than 1 μs b) Less than 100 μs
c) Less than 500 μs d) Greater than 1000 μs

6) What is signal conditioning?
a) To analyze any signal
b) Conversion or modification is referred to as conditioning
c) Conversion from analog to digital is signal conditioning
d) Conversion from digital to analog is signal conditioning

7) Touch screen devices use which sensor?
a) Touch sensor b) Temperature sensor
c) Humidity sensor d) Pressure sensor

8) ENOB in ADC stand for _____
a) Effective number of bytes b) Effective number of bits
c) Effective nibble baud d) None of the mentioned

9) A simple bridge circuit consists of a network of _____
a) 3 resistance arms b) 2 resistance arms
c) 4 resistance arms d) 6 resistance arms

10) An instrument transformer is used to extend the range of _____.
a) induction instrument b) electrostatic instrument
c) moving coil instrument d) any of the above

11) The internal resistance of an ammeter should be _____.
a) Very small b) Medium
c) High d) Infinity

12) The smallest change which a sensor can detect is termed: _____
a) Accuracy b) Precision
c) Resolution d) Scale

13) Sensor effectiveness depends on _____ parameter.
a) Sensitivity b) Radiation
c) Restively d) All the above

14) The desirable static characteristics of a measuring system are _____
a) accuracy and drift
b) accuracy, sensitivity and reproducibility
c) drift and dead zone
d) static error

SLR-BD-97

Seat No.		Set	S

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt any four of the following: 16

a) Define standard & explain types of standards.
b) Define the following characteristics
1) Linearity 2) Accuracy 3) Repeatability 4) Sensitivity
c) Derive the expression for unknown capacitance with phasor diagram by using Schering Bridge.
d) Write difference between Current Transformer and Potential Transformer.
e) Explain working of digital storage oscilloscope with suitable block diagram.

Q.3 Attempt any two of the following: 12

a) Illustrate and derive the torque equation for a Moving iron instrument with neat diagram.
b) Draw the equivalent circuit and phasor diagram of a CT. Derive the expressions for ratio and phase angle errors.
c) Explain digital ramp type and dual slope integrating type digital voltmeter.

Section – II

Q.4 Attempt any four of the following: 16

a) Explain the principle of working of Hall effect sensor.
b) Explain different types of temperature sensor with details.
c) Discuss Classification of sensor and explain active and passive sensor.
d) State and explain the methods of data transmission.
e) State and Explain the Modes of Heat transfer.

Q.5 Attempt any two of the following: 12

a) Stale the sensors used for Velocity and Acceleration application and explain any one of them.
b) Slate and explain the sensors used for occupancy and motion detector application.
c) Define the temperature and explain the thermal properties of material.

SLR-BD-98

Seat No.		Set	P

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Linear programming deals with the optimization of a function of variables is, known as _____
a) Subjective function b) Objective function
c) Combined Equation d) None of these

2) What is the condition of Balance Assignment Problem?
a) Σ Demand$=\Sigma$ Supply
b) No. of rows $>$ No. of column
c) No. of rows $<$ No. of column
d) No. of rows $=$ No. of columns

3) EOQ means: _____
a) Economic Offering Quantity b) Empty Order Quantity
c) Economic Order Quantity d) Economic Order Quality

4) In ABC analysis, high monitoring and control are required for: _____
a) A class items b) B class items
c) C class items d) All of these

5) Graphical method, simplex method, and transportation method are concerned with _____.
a) Break-even analysis b) Value analysis
c) Linear programming d) Queueing theory

6) The cost of keeping items in inventory is called _____
a) Set up cost b) Holding cost
c) Shortage cost d) None of these

7) Dual of the Dual is _____
a) Dual b) Primal
c) Zero d) Infinity

8) At the Break-Even Point _____
a) Profit > Loss
b) Profit < Loss
c) Profit = Loss
d) None of these

9) The PERT in project management means Program Evaluation and _____ Technique.
a) Resource
b) Reconciliation
c) Reconsideration
d) Review

10) _____ Stock is the lower limit of stock below which the stock should not be allowed to fall.
a) Maximum
b) Average
c) Safety
d) Standard

11) Optimization Means _____.
a) Maximization
b) Minimization
c) Minimization or Maximization
d) Mean of Minimization & Maximization

12) A feasible solution to LPP _____.
a) Must satisfy all the constraints simultaneously
b) Need not satisfy all the constraints
c) Must be a corner point of feasible region
d) Must optimize the objective function

13) In a project network, the critical path _____.
a) May be the shortest path
b) Is the longest path
c) May be the longest path
d) Is the shortest path

14) The inventory carrying costs are also called as _____.
a) Procurement costs
b) Set-up costs
c) Storage costs
d) None of the above

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt Any Three. **24**

a) Using Graphical method, Solve

Maximize $Z = 10X_1 + 8X_2$
Subject to, $2X_1 + X_2 \leq 40;$
$2X_1 + 3X_2 \leq 80;$
$0 \leq X_1; 0 \leq X_2$

b) Solve the following assignment model for minimum processing time.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Find the initial basic feasible solution by Least Cost Method.

	W1	W2	W3	W4	Supply
F1	48	60	56	58	140
F2	45	55	53	60	260
F3	50	65	60	62	360
F4	52	64	55	61	220
Demand	200	320	250	210	

d) What are the different Limitations & Applications of 'Operation Research'?
e) How do you solve unbalanced transportation problem? What are different methods to solve Transportation Model? Explain in details.

Q.3 Answer any one. **04**

a) What is LPP? What are different components of LPP?
b) How assignment model is useful in practical life?

Section – II

Q.4 Attempt Any Three. **24**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/- Find economic order quantity and number of orders to be placed per month?

b) Write a note various types inventory cost.

c) Draw network, find out CP & PD. Calculate All floats of each non-critical Activity.

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Immediate Predecessor	-	-	-	B	A	A	B	C,D	C,D	E	F,G,H	F,G,H	I	J,K
Time in Months	2	6	4	3	6	8	3	7	2	5	4	3	13	7

d) A small project consists of seven activities. The time estimates in weeks of different activities are given below. Find out probability of completing the project in 18 weeks.

Activity	Estimated Time		
	to	tm	tp
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

Probability Factor	Probability
0	50%
1	84.13%
2	97.72%
3	99.87%

e) Explain Sequencing Problem Technique. What are its Different Elements, also elaborate its assumptions.

Q.3 Attempt Any One. **04**

a) What is EOQ? What is its important?

b) Distinguish between CPM & PERT (At least 4 points)

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) At the Break-Even Point _____
a) Profit > Loss b) Profit < Loss
c) Profit = Loss d) None of these

2) The PERT in project management means Program Evaluation and _____ Technique.
a) Resource b) Reconciliation
c) Reconsideration d) Review

3) _____ Stock is the lower limit of stock below which the stock should not be allowed to fall.
a) Maximum b) Average
c) Safety d) Standard

4) Optimization Means _____.
a) Maximization
b) Minimization
c) Minimization or Maximization
d) Mean of Minimization & Maximization

5) A feasible solution to LPP _____.
a) Must satisfy all the constraints simultaneously
b) Need not satisfy all the constraints
c) Must be a corner point of feasible region
d) Must optimize the objective function

6) In a project network, the critical path _____.
a) May be the shortest path b) Is the longest path
c) May be the longest path d) Is the shortest path

7) The inventory carrying costs are also called as _____.
a) Procurement costs b) Set-up costs
c) Storage costs d) None of the above

8) Linear programming deals with the optimization of a function of variables is, known as _____
a) Subjective function b) Objective function
c) Combined Equation d) None of these

9) What is the condition of Balance Assignment Problem?
a) Σ Demand= Σ Supply
b) No. of rows > No. of column
c) No. of rows < No. of column
d) No. of rows = No. of columns

10) EOQ means: _____
a) Economic Offering Quantity b) Empty Order Quantity
c) Economic Order Quantity d) Economic Order Quality

11) In ABC analysis, high monitoring and control are required for: _____
a) A class items b) B class items
c) C class items d) All of these

12) Graphical method, simplex method, and transportation method are concerned with _____.
a) Break-even analysis b) Value analysis
c) Linear programming d) Queueing theory

13) The cost of keeping items in inventory is called _____
a) Set up cost b) Holding cost
c) Shortage cost d) None of these

14) Dual of the Dual is _____
a) Dual b) Primal
c) Zero d) Infinity

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt Any Three. **24**

a) Using Graphical method, Solve

Maximize $Z = 10X_1 + 8X_2$
Subject to, $2X_1 + X_2 \leq 40;$
$2X_1 + 3X_2 \leq 80;$
$0 \leq X_1; 0 \leq X_2$

b) Solve the following assignment model for minimum processing time.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Find the initial basic feasible solution by Least Cost Method.

	W1	W2	W3	W4	Supply
F1	48	60	56	58	140
F2	45	55	53	60	260
F3	50	65	60	62	360
F4	52	64	55	61	220
Demand	200	320	250	210	

d) What are the different Limitations & Applications of 'Operation Research'?
e) How do you solve unbalanced transportation problem? What are different methods to solve Transportation Model? Explain in details.

Q.3 Answer any one. **04**

a) What is LPP? What are different components of LPP?
b) How assignment model is useful in practical life?

Section – II

Q.4 Attempt Any Three. **24**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/- Find economic order quantity and number of orders to be placed per month?

b) Write a note various types inventory cost.

c) Draw network, find out CP & PD. Calculate All floats of each non-critical Activity.

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Immediate Predecessor	-	-	-	B	A	A	B	C,D	C,D	E	F,G,H	F,G,H	I	J,K
Time in Months	2	6	4	3	6	8	3	7	2	5	4	3	13	7

d) A small project consists of seven activities. The time estimates in weeks of different activities are given below. Find out probability of completing the project in 18 weeks.

Activity	Estimated Time		
	to	tm	tp
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

Probability Factor	Probability
0	50%
1	84.13%
2	97.72%
3	99.87%

e) Explain Sequencing Problem Technique. What are its Different Elements, also elaborate its assumptions.

Q.3 Attempt Any One. **04**

a) What is EOQ? What is its important?

b) Distinguish between CPM & PERT (At least 4 points)

SLR-BD-98

Seat No.		Set	R

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) Optimization Means _____.
a) Maximization
b) Minimization
c) Minimization or Maximization
d) Mean of Minimization & Maximization

2) A feasible solution to LPP _____.
a) Must satisfy all the constraints simultaneously
b) Need not satisfy all the constraints
c) Must be a corner point of feasible region
d) Must optimize the objective function

3) In a project network, the critical path _____.
a) May be the shortest path b) Is the longest path
c) May be the longest path d) Is the shortest path

4) The inventory carrying costs are also called as _____.
a) Procurement costs b) Set-up costs
c) Storage costs d) None of the above

5) Linear programming deals with the optimization of a function of variables is, known as _____
a) Subjective function b) Objective function
c) Combined Equation d) None of these

6) What is the condition of Balance Assignment Problem?
a) Σ Demand$=\Sigma$ Supply
b) No. of rows $>$ No. of column
c) No. of rows $<$ No. of column
d) No. of rows $=$ No. of columns

7) EOQ means: _____

a) Economic Offering Quantity b) Empty Order Quantity
c) Economic Order Quantity d) Economic Order Quality

8) In ABC analysis, high monitoring and control are required for: _____

a) A class items b) B class items
c) C class items d) All of these

9) Graphical method, simplex method, and transportation method are concerned with _____.

a) Break-even analysis b) Value analysis
c) Linear programming d) Queueing theory

10) The cost of keeping items in inventory is called _____

a) Set up cost b) Holding cost
c) Shortage cost d) None of these

11) Dual of the Dual is _____

a) Dual b) Primal
c) Zero d) Infinity

12) At the Break-Even Point _____

a) Profit > Loss b) Profit < Loss
c) Profit = Loss d) None of these

13) The PERT in project management means Program Evaluation and _____ Technique.

a) Resource b) Reconciliation
c) Reconsideration d) Review

14) _____ Stock is the lower limit of stock below which the stock should not be allowed to fall.

a) Maximum b) Average
c) Safety d) Standard

Seat No.	

Set R

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt Any Three. **24**

a) Using Graphical method, Solve

Maximize $Z = 10X_1 + 8X_2$
Subject to, $2X_1 + X_2 \leq 40;$
$2X_1 + 3X_2 \leq 80;$
$0 \leq X_1; 0 \leq X_2$

b) Solve the following assignment model for minimum processing time.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Find the initial basic feasible solution by Least Cost Method.

	W1	W2	W3	W4	Supply
F1	48	60	56	58	140
F2	45	55	53	60	260
F3	50	65	60	62	360
F4	52	64	55	61	220
Demand	200	320	250	210	

d) What are the different Limitations & Applications of 'Operation Research'?
e) How do you solve unbalanced transportation problem? What are different methods to solve Transportation Model? Explain in details.

Q.3 Answer any one. **04**

a) What is LPP? What are different components of LPP?
b) How assignment model is useful in practical life?

Section – II

Q.4 Attempt Any Three. **24**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/- Find economic order quantity and number of orders to be placed per month?

b) Write a note various types inventory cost.

c) Draw network, find out CP & PD. Calculate All floats of each non-critical Activity.

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Immediate Predecessor	-	-	-	B	A	A	B	C,D	C,D	E	F,G,H	F,G,H	I	J,K
Time in Months	2	6	4	3	6	8	3	7	2	5	4	3	13	7

d) A small project consists of seven activities. The time estimates in weeks of different activities are given below. Find out probability of completing the project in 18 weeks.

Activity	Estimated Time		
	to	tm	tp
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

Probability Factor	Probability
0	50%
1	84.13%
2	97.72%
3	99.87%

e) Explain Sequencing Problem Technique. What are its Different Elements, also elaborate its assumptions.

Q.3 Attempt Any One. **04**

a) What is EOQ? What is its important?

b) Distinguish between CPM & PERT (At least 4 points)

SLR-BD-98

Seat No.		Set	S

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) The cost of keeping items in inventory is called _____
a) Set up cost b) Holding cost
c) Shortage cost d) None of these

2) Dual of the Dual is _____
a) Dual b) Primal
c) Zero d) Infinity

3) At the Break-Even Point _____
a) Profit > Loss b) Profit < Loss
c) Profit = Loss d) None of these

4) The PERT in project management means Program Evaluation and _____ Technique.
a) Resource b) Reconciliation
c) Reconsideration d) Review

5) _____ Stock is the lower limit of stock below which the stock should not be allowed to fall.
a) Maximum b) Average
c) Safety d) Standard

6) Optimization Means _____.
a) Maximization
b) Minimization
c) Minimization or Maximization
d) Mean of Minimization & Maximization

7) A feasible solution to LPP _____.
a) Must satisfy all the constraints simultaneously
b) Need not satisfy all the constraints
c) Must be a corner point of feasible region
d) Must optimize the objective function

8) In a project network, the critical path _____.
a) May be the shortest path b) Is the longest path
c) May be the longest path d) Is the shortest path

9) The inventory carrying costs are also called as _____.
a) Procurement costs b) Set-up costs
c) Storage costs d) None of the above

10) Linear programming deals with the optimization of a function of variables is, known as _____
a) Subjective function b) Objective function
c) Combined Equation d) None of these

11) What is the condition of Balance Assignment Problem?
a) Σ Demand= Σ Supply
b) No. of rows > No. of column
c) No. of rows < No. of column
d) No. of rows = No. of columns

12) EOQ means: _____
a) Economic Offering Quantity b) Empty Order Quantity
c) Economic Order Quantity d) Economic Order Quality

13) In ABC analysis, high monitoring and control are required for: _____
a) A class items b) B class items
c) C class items d) All of these

14) Graphical method, simplex method, and transportation method are concerned with _____.
a) Break-even analysis b) Value analysis
c) Linear programming d) Queueing theory

Seat No.	

Set **S**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt Any Three. **24**

a) Using Graphical method, Solve

Maximize $Z = 10X_1 + 8X_2$
Subject to, $2X_1 + X_2 \leq 40;$
$2X_1 + 3X_2 \leq 80;$
$0 \leq X_1; 0 \leq X_2$

b) Solve the following assignment model for minimum processing time.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Find the initial basic feasible solution by Least Cost Method.

	W1	W2	W3	W4	Supply
F1	48	60	56	58	140
F2	45	55	53	60	260
F3	50	65	60	62	360
F4	52	64	55	61	220
Demand	200	320	250	210	

d) What are the different Limitations & Applications of 'Operation Research'?
e) How do you solve unbalanced transportation problem? What are different methods to solve Transportation Model? Explain in details.

Q.3 Answer any one. **04**

a) What is LPP? What are different components of LPP?
b) How assignment model is useful in practical life?

Section – II

Q.4 Attempt Any Three. **24**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/- Find economic order quantity and number of orders to be placed per month?

b) Write a note various types inventory cost.

c) Draw network, find out CP & PD. Calculate All floats of each non-critical Activity.

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Immediate Predecessor	-	-	-	B	A	A	B	C,D	C,D	E	F,G,H	F,G,H	I	J,K
Time in Months	2	6	4	3	6	8	3	7	2	5	4	3	13	7

d) A small project consists of seven activities. The time estimates in weeks of different activities are given below. Find out probability of completing the project in 18 weeks.

Activity	Estimated Time		
	to	tm	tp
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

Probability Factor	Probability
0	50%
1	84.13%
2	97.72%
3	99.87%

e) Explain Sequencing Problem Technique. What are its Different Elements, also elaborate its assumptions.

Q.3 Attempt Any One. **04**

a) What is EOQ? What is its important?

b) Distinguish between CPM & PERT (At least 4 points)

SLR-BD-99

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) A transcendental equation is an equation that involves _____.
a) Only algebraic terms
b) Only transcendental functions
c) Both algebraic and transcendental functions
d) Linear terms only

2) The interval in which a real root of the equation $x^3 - 2x - 5 = 0$ lies is _____.
a) $(1,2)$ b) $(0,1)$
c) $(2,3)$ d) $(3,4)$

3) The Gauss-Seidel method is used for solving _____.
a) Nonlinear equations
b) Systems of linear equations
c) Ordinary differential equations
d) Partial differential equations

4) Which of the following is a disadvantage of the Gauss-Jacobi method?
a) It converges faster than most direct methods
b) It requires a large number of iterations for a good approximation
c) It cannot be used for systems with more than two equations
d) It works only for symmetric systems

5) The use of Romberg's method is _____.
a) To solve simultaneous linear equation
b) To find root of linear equation
c) To evaluate definite integration
d) To find the Eigen values

6) The order of convergence of Newton-Raphson method is _____.

a) 1 b) 2

c) $\sqrt{2}$ d) 1.6

7) Power Method is used to find _____.

a) Negative Eigen Value b) Largest Eigen value

c) Positive Eigen Value d) None of these

8) To find the Numerically largest Eigen value using iterative Method we use the equation _____.

a) $A = \lambda X$ b) $AX = X$

c) $X = \lambda X$ d) $AX = \lambda X$

9) If $\frac{dy}{dx} = x - y$ and $y(0) = 1$ then by Picard's method the value of $y_1(1)$ is _____.

a) 0.905 b) 1.905

c) 2.905 d) none

10) Runge-Kutta method is self-starting method _____.

a) true d) false

c) we can't say d) none

11) If the data is equally spaced and interpolation is near the beginning of the data then _____ Interpolation formula is used.

a) Newton's backward difference

b) Newton's divided difference

c) Newton's forward difference

d) Lagrange's

12) The process of finding the value inside the interval (x_0, x_n) is called ___.

a) Interpolation b) Extrapolation

c) Iterative d) polynomial equation

13) Using Newton-Raphson method the first approximation to the root of the equation $x^4 - x - 10 = 0$ near to $x_0 = 2$ is _____.

a) 1.671 b) 2.271

c) 2.071 d) 1.871

14) To apply Simpson's one-third rule the number of sub-intervals must be _____.

a) Even b) Odd

c) Multiple of 3 d) Multiple of 6

SLR-BD-99

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any three. **09**

a) Find the double root of the equation $x^3 - 5.4x^2 + 9.24x - 5.096 = 0$ given that it is nearer to 1.5.

b) Solve the system of equations by Jacobi's iterative method (perform 3 iterations) $27x + 6y - z = 85,\ 6x + 15y + 2z = 72,\ x + y + 54z = 110$

c) Find positive real root of the equation $x \sin x + \cos x = 0$ using Newton Raphson method correct to 3 decimal places.

d) Solve the system of equation by using Gauss-Elimination method. $x + 4y - z = -5, x + y - 6z = -12, -3x - y - z = 4$

e) Solve $\frac{dy}{dx} = -xy$ with $x_0 = 0\ ,\ y_0 = 1$ using Picard's method upto 3rd approximation.

Q.3 Answer any three. **09**

a) Solve $\frac{dy}{dx} = x + y$ with $x_0 = 0\ , y_0 = 1$ using Range kutta forth order method and find approximate value of y when $x = 0.2$

b) Solve $\frac{dy}{dx} = 1 + xy$ with $y(0) = 1$ using Picard's method take first approximation and find y for $x = 0.1$

c) Solve by Gauss Seidel Method, the equations $20x + y - 2z = 17, 3x + 20y - z = -18, 2x - 3y + 20z = 25$ Perform 3 iteration.

d) Find the value of $\sqrt{5}$ using newton's iterative formula. Perform 3 iteration.

e) Find the positive root of $f(x) = 2x^3 - 3x - 6$ by Newton's Raphson method perform 3 iteration.

Q.4 Answer any two. **10**

a) Perform 2-iteration by Newton's Raphson Method to Solve the non-linear equation $x = x^2 + y^2,\ y = x^2 - y^2$ Take initial approximation $x_0 = 0.8, y_0 = 0.4$

b) Solve the system of equation by LU decomposition Method $3x + 2y + 7z = 4,\quad 2x + 3y + z = 5,\quad 3x + 4y + z = 7$

c) Solve differential equation $\frac{dy}{dx} = 1 + xz,\ \frac{dz}{dx} = -xy$ for $x = 0.3$ using 4th order Runge-Kutta Method Initial Values are $x = 0,\ y = 0,\ z = 1$

Section – II

Q.5 Answer any Three. **09**

a) Evaluate the integral $\int_0^1 \frac{x^2}{1+x^3}\,dx$ using Simpson's $\frac{1}{3}$rd rule, Take $h = 0.25$

b) Determine the largest Eigen value and corresponding Eigen vector of the matrix $\begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$ by using power method perform three iteration.

c) Use Trapezoidal Rule to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as 0.5

d) Using Newton's divided difference formula, find the value of $f(2)$. Given the following table.

x	4	5	7	10	11	13
$f(x)$	48	100	294	900	1210	2028

e) Construct Newton's Forward interpolation polynomial for the following data:

x	4	6	8	10
y	1	3	8	16

Hence find the value of y for $x = 5$

Q.6 Answer any Three. **09**

a) Solve the integral $\int_0^{1/2} \frac{1}{\sqrt{1-x^2}}\,dx$ using Weddle's rule Taking $n = 6$

b) Solve $\int_3^5 \frac{4}{(2x^2)}\,dx$ Using Gauss Formula for $n = 2$ and $n = 3$.

c) Find all Eigen values and Eigen vectors of the following matrix by using Gauss Jacobi's Method. $\begin{bmatrix} 2 & 3 \\ 3 & 2 \end{bmatrix}$

d) Solve $\int_0^6 \frac{dx}{1+x^2}$ by using Simpsons 3/8th rule take $h = 1$

e) Using Newton's Backward formula, find the value of $f(2)$ if

x	1	1.4	1.8	2.2
$f(x)$	3.49	4.82	5.96	6.5

Q.7 Answer any two. **10**

a) Find the largest eigen value and the corresponding eigen vector of the matrix:

$\begin{bmatrix} 25 & 1 & 2 \\ 1 & 3 & 0 \\ 2 & 0 & -4 \end{bmatrix}$ by using power method

Take $[1 \quad 0 \quad 0]^r$ as initial eigen vector (perform 5 iterations)

b) Use Romberg's method to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as $0.5, 0.25, 0.125$

c) Given the Values

x	5	7	11	13	17
$f(x)$	150	392	1452	2366	5202

Evaluate $f(9)$,using Lagrange's Formula.

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) To find the Numerically largest Eigen value using iterative Method we use the equation _____.
a) $A = \lambda X$ b) $AX = X$
c) $X = \lambda X$ d) $AX = \lambda X$

2) If $\frac{dy}{dx} = x - y$ and $y(0) = 1$ then by Picard's method the value of $y_1(1)$ is _____.
a) 0.905 b) 1.905
c) 2.905 d) none

3) Runge-Kutta method is self-starting method _____.
a) true d) false
c) we can't say d) none

4) If the data is equally spaced and interpolation is near the beginning of the data then _____ Interpolation formula is used.
a) Newton's backward difference
b) Newton's divided difference
c) Newton's forward difference
d) Lagrange's

5) The process of finding the value inside the interval (x_0, x_n) is called ___.
a) Interpolation b) Extrapolation
c) Iterative d) polynomial equation

6) Using Newton-Raphson method the first approximation to the root of the equation $x^4 - x - 10 = 0$ near to $x_0 = 2$ is _____.
a) 1.671 b) 2.271
c) 2.071 d) 1.871

7) To apply Simpson's one-third rule the number of sub-intervals must be _____.
a) Even b) Odd
c) Multiple of 3 d) Multiple of 6

8) A transcendental equation is an equation that involves _____.
a) Only algebraic terms
b) Only transcendental functions
c) Both algebraic and transcendental functions
d) Linear terms only

9) The interval in which a real root of the equation $x^3 - 2x - 5 = 0$ lies is _____.
a) $(1,2)$ b) $(0,1)$
c) $(2,3)$ d) $(3,4)$

10) The Gauss-Seidel method is used for solving _____.
a) Nonlinear equations
b) Systems of linear equations
c) Ordinary differential equations
d) Partial differential equations

11) Which of the following is a disadvantage of the Gauss-Jacobi method?
a) It converges faster than most direct methods
b) It requires a large number of iterations for a good approximation
c) It cannot be used for systems with more than two equations
d) It works only for symmetric systems

12) The use of Romberg's method is _____.
a) To solve simultaneous linear equation
b) To find root of linear equation
c) To evaluate definite integration
d) To find the Eigen values

13) The order of convergence of Newton-Raphson method is _____.
a) 1 b) 2
c) $\sqrt{2}$ d) 1.6

14) Power Method is used to find _____.
a) Negative Eigen Value b) Largest Eigen value
c) Positive Eigen Value d) None of these

SLR-BD-99

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any three. **09**

a) Find the double root of the equation $x^3 - 5.4x^2 + 9.24x - 5.096 = 0$ given that it is nearer to 1.5.

b) Solve the system of equations by Jacobi's iterative method (perform 3 iterations) $27x + 6y - z = 85,\ 6x + 15y + 2z = 72,\ x + y + 54z = 110$

c) Find positive real root of the equation $x \sin x + \cos x = 0$ using Newton Raphson method correct to 3 decimal places.

d) Solve the system of equation by using Gauss-Elimination method. $x + 4y - z = -5, x + y - 6z = -12, -3x - y - z = 4$

e) Solve $\frac{dy}{dx} = -xy$ with $x_0 = 0\ ,\ y_0 = 1$ using Picard's method upto 3rd approximation.

Q.3 Answer any three. **09**

a) Solve $\frac{dy}{dx} = x + y$ with $x_0 = 0\ , y_0 = 1$ using Range kutta forth order method and find approximate value of y when $x = 0.2$

b) Solve $\frac{dy}{dx} = 1 + xy$ with $y(0) = 1$ using Picard's method take first approximation and find y for $x = 0.1$

c) Solve by Gauss Seidel Method, the equations $20x + y - 2z = 17, 3x + 20y - z = -18, 2x - 3y + 20z = 25$ Perform 3 iteration.

d) Find the value of $\sqrt{5}$ using newton's iterative formula. Perform 3 iteration.

e) Find the positive root of $f(x) = 2x^3 - 3x - 6$ by Newton's Raphson method perform 3 iteration.

Q.4 Answer any two. **10**

a) Perform 2-iteration by Newton's Raphson Method to Solve the non-linear equation $x = x^2 + y^2,\ y = x^2 - y^2$ Take initial approximation $x_0 = 0.8, y_0 = 0.4$

b) Solve the system of equation by LU decomposition Method $3x + 2y + 7z = 4,\quad 2x + 3y + z = 5,\quad 3x + 4y + z = 7$

c) Solve differential equation $\frac{dy}{dx} = 1 + xz,\ \frac{dz}{dx} = -xy$ for $x = 0.3$ using 4th order Runge-Kutta Method Initial Values are $x = 0,\ y = 0,\ z = 1$

Section – II

Q.5 Answer any Three. **09**

a) Evaluate the integral $\int_0^1 \frac{x^2}{1+x^3}\,dx$ using Simpson's $\frac{1}{3}$rd rule, Take $h = 0.25$

b) Determine the largest Eigen value and corresponding Eigen vector of the matrix $\begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$ by using power method perform three iteration.

c) Use Trapezoidal Rule to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as 0.5

d) Using Newton's divided difference formula, find the value of $f(2)$. Given the following table.

x	4	5	7	10	11	13
$f(x)$	48	100	294	900	1210	2028

e) Construct Newton's Forward interpolation polynomial for the following data:

x	4	6	8	10
y	1	3	8	16

Hence find the value of y for $x = 5$

Q.6 Answer any Three. **09**

a) Solve the integral $\int_0^{1/2} \frac{1}{\sqrt{1-x^2}}\,dx$ using Weddle's rule Taking $n = 6$

b) Solve $\int_3^5 \frac{4}{(2x^2)}\,dx$ Using Gauss Formula for $n = 2$ and $n = 3$.

c) Find all Eigen values and Eigen vectors of the following matrix by using Gauss Jacobi's Method. $\begin{bmatrix} 2 & 3 \\ 3 & 2 \end{bmatrix}$

d) Solve $\int_0^6 \frac{dx}{1+x^2}$ by using Simpsons 3/8th rule take $h = 1$

e) Using Newton's Backward formula, find the value of $f(2)$ if

x	1	1.4	1.8	2.2
$f(x)$	3.49	4.82	5.96	6.5

Q.7 Answer any two. **10**

a) Find the largest eigen value and the corresponding eigen vector of the matrix:

$\begin{bmatrix} 25 & 1 & 2 \\ 1 & 3 & 0 \\ 2 & 0 & -4 \end{bmatrix}$ by using power method

Take $[1 \quad 0 \quad 0]^r$ as initial eigen vector (perform 5 iterations)

b) Use Romberg's method to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as $0.5, 0.25, 0.125$

c) Given the Values

x	5	7	11	13	17
$f(x)$	150	392	1452	2366	5202

Evaluate $f(9)$,using Lagrange's Formula.

SLR-BD-99

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) If the data is equally spaced and interpolation is near the beginning of the data then _____ Interpolation formula is used.
a) Newton's backward difference
b) Newton's divided difference
c) Newton's forward difference
d) Lagrange's

2) The process of finding the value inside the interval (x_0, x_n) is called ___.
a) Interpolation b) Extrapolation
c) Iterative d) polynomial equation

3) Using Newton-Raphson method the first approximation to the root of the equation $x^4 - x - 10 = 0$ near to $x_0 = 2$ is _____.
a) 1.671 b) 2.271
c) 2.071 d) 1.871

4) To apply Simpson's one-third rule the number of sub-intervals must be _____.
a) Even b) Odd
c) Multiple of 3 d) Multiple of 6

5) A transcendental equation is an equation that involves _____.
a) Only algebraic terms
b) Only transcendental functions
c) Both algebraic and transcendental functions
d) Linear terms only

6) The interval in which a real root of the equation $x^3 - 2x - 5 = 0$ lies is _____.

a) $(1,2)$ b) $(0,1)$
c) $(2,3)$ d) $(3,4)$

7) The Gauss-Seidel method is used for solving _____.

a) Nonlinear equations
b) Systems of linear equations
c) Ordinary differential equations
d) Partial differential equations

8) Which of the following is a disadvantage of the Gauss-Jacobi method?

a) It converges faster than most direct methods
b) It requires a large number of iterations for a good approximation
c) It cannot be used for systems with more than two equations
d) It works only for symmetric systems

9) The use of Romberg's method is _____.

a) To solve simultaneous linear equation
b) To find root of linear equation
c) To evaluate definite integration
d) To find the Eigen values

10) The order of convergence of Newton-Raphson method is _____.

a) 1 b) 2
c) $\sqrt{2}$ d) 1.6

11) Power Method is used to find _____.

a) Negative Eigen Value b) Largest Eigen value
c) Positive Eigen Value d) None of these

12) To find the Numerically largest Eigen value using iterative Method we use the equation _____.

a) $A = \lambda X$ b) $AX = X$
c) $X = \lambda X$ d) $AX = \lambda X$

13) If $\frac{dy}{dx} = x - y$ and $y(0) = 1$ then by Picard's method the value of $y_1(1)$ is _____.

a) 0.905 b) 1.905
c) 2.905 d) none

14) Runge-Kutta method is self-starting method _____.

a) true d) false
c) we can't say d) none

SLR-BD-99

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any three. **09**

a) Find the double root of the equation $x^3 - 5.4x^2 + 9.24x - 5.096 = 0$ given that it is nearer to 1.5.

b) Solve the system of equations by Jacobi's iterative method (perform 3 iterations) $27x + 6y - z = 85,\ 6x + 15y + 2z = 72,\ x + y + 54z = 110$

c) Find positive real root of the equation $x \sin x + \cos x = 0$ using Newton Raphson method correct to 3 decimal places.

d) Solve the system of equation by using Gauss-Elimination method. $x + 4y - z = -5, x + y - 6z = -12, -3x - y - z = 4$

e) Solve $\frac{dy}{dx} = -xy$ with $x_0 = 0\ ,\ y_0 = 1$ using Picard's method upto 3rd approximation.

Q.3 Answer any three. **09**

a) Solve $\frac{dy}{dx} = x + y$ with $x_0 = 0\ , y_0 = 1$ using Range kutta forth order method and find approximate value of y when $x = 0.2$

b) Solve $\frac{dy}{dx} = 1 + xy$ with $y(0) = 1$ using Picard's method take first approximation and find y for $x = 0.1$

c) Solve by Gauss Seidel Method, the equations $20x + y - 2z = 17, 3x + 20y - z = -18, 2x - 3y + 20z = 25$ Perform 3 iteration.

d) Find the value of $\sqrt{5}$ using newton's iterative formula. Perform 3 iteration.

e) Find the positive root of $f(x) = 2x^3 - 3x - 6$ by Newton's Raphson method perform 3 iteration.

Q.4 Answer any two. **10**

a) Perform 2-iteration by Newton's Raphson Method to Solve the non-linear equation $x = x^2 + y^2,\ y = x^2 - y^2$ Take initial approximation $x_0 = 0.8, y_0 = 0.4$

b) Solve the system of equation by LU decomposition Method $3x + 2y + 7z = 4,\quad 2x + 3y + z = 5,\quad 3x + 4y + z = 7$

c) Solve differential equation $\frac{dy}{dx} = 1 + xz,\ \frac{dz}{dx} = -xy$ for $x = 0.3$ using 4th order Runge-Kutta Method Initial Values are $x = 0,\ y = 0,\ z = 1$

Section – II

Q.5 Answer any Three. **09**

a) Evaluate the integral $\int_0^1 \frac{x^2}{1+x^3}\,dx$ using Simpson's $\frac{1}{3}$rd rule, Take $h = 0.25$

b) Determine the largest Eigen value and corresponding Eigen vector of the matrix $\begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$ by using power method perform three iteration.

c) Use Trapezoidal Rule to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as 0.5

d) Using Newton's divided difference formula, find the value of $f(2)$. Given the following table.

x	4	5	7	10	11	13
$f(x)$	48	100	294	900	1210	2028

e) Construct Newton's Forward interpolation polynomial for the following data:

x	4	6	8	10
y	1	3	8	16

Hence find the value of y for $x = 5$

Q.6 Answer any Three. **09**

a) Solve the integral $\int_0^{1/2} \frac{1}{\sqrt{1-x^2}}\,dx$ using Weddle's rule Taking $n = 6$

b) Solve $\int_3^5 \frac{4}{(2x^2)}\,dx$ Using Gauss Formula for $n = 2$ and $n = 3$.

c) Find all Eigen values and Eigen vectors of the following matrix by using Gauss Jacobi's Method. $\begin{bmatrix} 2 & 3 \\ 3 & 2 \end{bmatrix}$

d) Solve $\int_0^6 \frac{dx}{1+x^2}$ by using Simpsons 3/8th rule take $h = 1$

e) Using Newton's Backward formula, find the value of $f(2)$ if

x	1	1.4	1.8	2.2
$f(x)$	3.49	4.82	5.96	6.5

Q.7 Answer any two. **10**

a) Find the largest eigen value and the corresponding eigen vector of the matrix:

$\begin{bmatrix} 25 & 1 & 2 \\ 1 & 3 & 0 \\ 2 & 0 & -4 \end{bmatrix}$ by using power method

Take $[1 \quad 0 \quad 0]^r$ as initial eigen vector (perform 5 iterations)

b) Use Romberg's method to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as $0.5, 0.25, 0.125$

c) Given the Values

x	5	7	11	13	17
$f(x)$	150	392	1452	2366	5202

Evaluate $f(9)$,using Lagrange's Formula.

SLR-BD-99

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The order of convergence of Newton-Raphson method is _____.
a) 1 b) 2
c) $\sqrt{2}$ d) 1.6

2) Power Method is used to find _____.
a) Negative Eigen Value b) Largest Eigen value
c) Positive Eigen Value d) None of these

3) To find the Numerically largest Eigen value using iterative Method we use the equation _____.
a) $A = \lambda X$ b) $AX = X$
c) $X = \lambda X$ d) $AX = \lambda X$

4) If $\frac{dy}{dx} = x - y$ and $y(0) = 1$ then by Picard's method the value of $y_1(1)$ is _____.
a) 0.905 b) 1.905
c) 2.905 d) none

5) Runge-Kutta method is self-starting method _____.
a) true d) false
c) we can't say d) none

6) If the data is equally spaced and interpolation is near the beginning of the data then _____ Interpolation formula is used.
a) Newton's backward difference
b) Newton's divided difference
c) Newton's forward difference
d) Lagrange's

7) The process of finding the value inside the interval (x_0, x_n) is called ___.
a) Interpolation b) Extrapolation
c) Iterative d) polynomial equation

8) Using Newton-Raphson method the first approximation to the root of the equation $x^4 - x - 10 = 0$ near to $x_0 = 2$ is _____.
a) 1.671 b) 2.271
c) 2.071 d) 1.871

9) To apply Simpson's one-third rule the number of sub-intervals must be _____.
a) Even b) Odd
c) Multiple of 3 d) Multiple of 6

10) A transcendental equation is an equation that involves _____.
a) Only algebraic terms
b) Only transcendental functions
c) Both algebraic and transcendental functions
d) Linear terms only

11) The interval in which a real root of the equation $x^3 - 2x - 5 = 0$ lies is _____.
a) $(1,2)$ b) $(0,1)$
c) $(2,3)$ d) $(3,4)$

12) The Gauss-Seidel method is used for solving _____.
a) Nonlinear equations
b) Systems of linear equations
c) Ordinary differential equations
d) Partial differential equations

13) Which of the following is a disadvantage of the Gauss-Jacobi method?
a) It converges faster than most direct methods
b) It requires a large number of iterations for a good approximation
c) It cannot be used for systems with more than two equations
d) It works only for symmetric systems

14) The use of Romberg's method is _____.
a) To solve simultaneous linear equation
b) To find root of linear equation
c) To evaluate definite integration
d) To find the Eigen values

SLR-BD-99

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any three. **09**

a) Find the double root of the equation $x^3 - 5.4x^2 + 9.24x - 5.096 = 0$ given that it is nearer to 1.5.

b) Solve the system of equations by Jacobi's iterative method (perform 3 iterations) $27x + 6y - z = 85,\ 6x + 15y + 2z = 72,\ x + y + 54z = 110$

c) Find positive real root of the equation $x \sin x + \cos x = 0$ using Newton Raphson method correct to 3 decimal places.

d) Solve the system of equation by using Gauss-Elimination method. $x + 4y - z = -5, x + y - 6z = -12, -3x - y - z = 4$

e) Solve $\frac{dy}{dx} = -xy$ with $x_0 = 0\ ,\ y_0 = 1$ using Picard's method upto 3rd approximation.

Q.3 Answer any three. **09**

a) Solve $\frac{dy}{dx} = x + y$ with $x_0 = 0\ , y_0 = 1$ using Range kutta forth order method and find approximate value of y when $x = 0.2$

b) Solve $\frac{dy}{dx} = 1 + xy$ with $y(0) = 1$ using Picard's method take first approximation and find y for $x = 0.1$

c) Solve by Gauss Seidel Method, the equations $20x + y - 2z = 17, 3x + 20y - z = -18, 2x - 3y + 20z = 25$ Perform 3 iteration.

d) Find the value of $\sqrt{5}$ using newton's iterative formula. Perform 3 iteration.

e) Find the positive root of $f(x) = 2x^3 - 3x - 6$ by Newton's Raphson method perform 3 iteration.

Q.4 Answer any two. **10**

a) Perform 2-iteration by Newton's Raphson Method to Solve the non-linear equation $x = x^2 + y^2,\ y = x^2 - y^2$ Take initial approximation $x_0 = 0.8, y_0 = 0.4$

b) Solve the system of equation by LU decomposition Method $3x + 2y + 7z = 4,\quad 2x + 3y + z = 5,\quad 3x + 4y + z = 7$

c) Solve differential equation $\frac{dy}{dx} = 1 + xz,\ \frac{dz}{dx} = -xy$ for $x = 0.3$ using 4th order Runge-Kutta Method Initial Values are $x = 0,\ y = 0,\ z = 1$

Section – II

Q.5 Answer any Three. **09**

a) Evaluate the integral $\int_0^1 \frac{x^2}{1+x^3}\,dx$ using Simpson's $\frac{1}{3}$rd rule, Take $h = 0.25$

b) Determine the largest Eigen value and corresponding Eigen vector of the matrix $\begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$ by using power method perform three iteration.

c) Use Trapezoidal Rule to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as 0.5

d) Using Newton's divided difference formula, find the value of $f(2)$. Given the following table.

x	4	5	7	10	11	13
$f(x)$	48	100	294	900	1210	2028

e) Construct Newton's Forward interpolation polynomial for the following data:

x	4	6	8	10
y	1	3	8	16

Hence find the value of y for $x = 5$

Q.6 Answer any Three. **09**

a) Solve the integral $\int_0^{1/2} \frac{1}{\sqrt{1-x^2}}\,dx$ using Weddle's rule Taking $n = 6$

b) Solve $\int_3^5 \frac{4}{(2x^2)}\,dx$ Using Gauss Formula for $n = 2$ and $n = 3$.

c) Find all Eigen values and Eigen vectors of the following matrix by using Gauss Jacobi's Method. $\begin{bmatrix} 2 & 3 \\ 3 & 2 \end{bmatrix}$

d) Solve $\int_0^6 \frac{dx}{1+x^2}$ by using Simpsons 3/8th rule take $h = 1$

e) Using Newton's Backward formula, find the value of $f(2)$ if

x	1	1.4	1.8	2.2
$f(x)$	3.49	4.82	5.96	6.5

Q.7 Answer any two. **10**

a) Find the largest eigen value and the corresponding eigen vector of the matrix:

$\begin{bmatrix} 25 & 1 & 2 \\ 1 & 3 & 0 \\ 2 & 0 & -4 \end{bmatrix}$ by using power method

Take $[1 \quad 0 \quad 0]^r$ as initial eigen vector (perform 5 iterations)

b) Use Romberg's method to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as $0.5, 0.25, 0.125$

c) Given the Values

x	5	7	11	13	17
$f(x)$	150	392	1452	2366	5202

Evaluate $f(9)$,using Lagrange's Formula.

SLR-BD-100

Seat No.	

Set P

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) In communication, _____ is the person who receives and decodes the message.
a) Sender b) Receiver
c) Driver d) Cleaner

2) Which among the following is not a manmade channel of communication?
a) Telephone b) Cell phone
c) Fax d) Air

3) Communication is the part of _____ skills.
a) Rough b) Soft
c) Hard d) Short

4) Which among the following are the barriers to communication?
a) Physical b) Mechanical
c) Psychological d) All of above

5) To overcome language barrier, which of the ways should not be followed?
a) Easy and understandable words should be used.
b) Jokes should be told to the audience.
c) The language of audience should be used.
d) Non-verbal ways should be used to the extent possible.

6) Which of the following is not among 7Cs?
a) Conciseness b) Completeness
c) Clarity d) Charity

7) Posters fall under _____ communication.
a) oral b) visual
c) written d) spoken

8) On the _____ it is possible to get immediate feedback.
a) letter b) e-mail
c) fax d) telephone

9) The response to a sender's message is called as _____.
a) Reply b) Feedback
c) Answer d) None of the above

10) _____ is the soul of communication.
a) Sender b) Receiver
c) Message d) Feedback

11) Which of these is not an element of non-verbal communication?
a) Personal appearance b) Posture
c) Eye contact d) Name of the speaker

12) Telephonic conversation is a form of: _____
a) verbal communication b) non-verbal communication
c) visual communication d) Written

13) To give a good presentation, full rehearsal is: _____
a) Optional b) Necessary
c) Useless d) Audience based

14) Which of the following is not an advantage of oral presentation?
a) Flexibility b) Scope for body language
c) Expensive d) Time-saving

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Three. **12**

a) Explain how communication is necessary for business.
b) What is feedback? Explain its necessity in communication.
c) Write short note on: Different channels of communication.
d) Explain language barriers to communication with the ways to overcome them.
e) Explain language as a tool of communication.

Q.3 Attempt Any Four. **16**

a) Explain seven C's of effective communication.
b) Explain various types of barriers to communication and the ways to overcome them.
c) What is oral communication? Explain its advantages.
d) Explain various steps in the process of communication.
e) What is written communication? Explain its benefits.

Section – II

Q.4 Attempt Any Three. **12**

a) Explain the difference between formal and informal communication.
b) Explain vertical communication with its types.
c) Explain farewell speech by the departing person, with an example
d) Explain the speech for vote of thanks, with an example.
e) Write short note on: Non- verbal aspects of presentation.

Q.5 Attempt Any Four. **16**

a) Explain the structure of a business letter with its various components.
b) Explain the steps in the process of presentation.
c) You had purchased some furniture items from a vendor. Afterwards you found that the furniture items are in a damaged condition. Write a letter of complaint and ask for replacement.
d) Explain four P's of effective presentations.
e) You are in need of some computer hardware parts. Prepare a letter placing order to the supplier. Specify the terms and conditions of purchase.

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) On the _____ it is possible to get immediate feedback.
a) letter b) e-mail
c) fax d) telephone

2) The response to a sender's message is called as _____.
a) Reply b) Feedback
c) Answer d) None of the above

3) _____ is the soul of communication.
a) Sender b) Receiver
c) Message d) Feedback

4) Which of these is not an element of non-verbal communication?
a) Personal appearance b) Posture
c) Eye contact d) Name of the speaker

5) Telephonic conversation is a form of: _____
a) verbal communication b) non-verbal communication
c) visual communication d) Written

6) To give a good presentation, full rehearsal is: _____
a) Optional b) Necessary
c) Useless d) Audience based

7) Which of the following is not an advantage of oral presentation?
a) Flexibility b) Scope for body language
c) Expensive d) Time-saving

8) In communication, _____ is the person who receives and decodes the message.
a) Sender b) Receiver
c) Driver d) Cleaner

9) Which among the following is not a manmade channel of communication?
a) Telephone b) Cell phone
c) Fax d) Air

10) Communication is the part of _____ skills.
a) Rough b) Soft
c) Hard d) Short

11) Which among the following are the barriers to communication?
a) Physical b) Mechanical
c) Psychological d) All of above

12) To overcome language barrier, which of the ways should not be followed?
a) Easy and understandable words should be used.
b) Jokes should be told to the audience.
c) The language of audience should be used.
d) Non-verbal ways should be used to the extent possible.

13) Which of the following is not among 7Cs?
a) Conciseness b) Completeness
c) Clarity d) Charity

14) Posters fall under _____ communication.
a) oral b) visual
c) written d) spoken

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Three. **12**

a) Explain how communication is necessary for business.
b) What is feedback? Explain its necessity in communication.
c) Write short note on: Different channels of communication.
d) Explain language barriers to communication with the ways to overcome them.
e) Explain language as a tool of communication.

Q.3 Attempt Any Four. **16**

a) Explain seven C's of effective communication.
b) Explain various types of barriers to communication and the ways to overcome them.
c) What is oral communication? Explain its advantages.
d) Explain various steps in the process of communication.
e) What is written communication? Explain its benefits.

Section – II

Q.4 Attempt Any Three. **12**

a) Explain the difference between formal and informal communication.
b) Explain vertical communication with its types.
c) Explain farewell speech by the departing person, with an example
d) Explain the speech for vote of thanks, with an example.
e) Write short note on: Non- verbal aspects of presentation.

Q.5 Attempt Any Four. **16**

a) Explain the structure of a business letter with its various components.
b) Explain the steps in the process of presentation.
c) You had purchased some furniture items from a vendor. Afterwards you found that the furniture items are in a damaged condition. Write a letter of complaint and ask for replacement.
d) Explain four P's of effective presentations.
e) You are in need of some computer hardware parts. Prepare a letter placing order to the supplier. Specify the terms and conditions of purchase.

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Which of these is not an element of non-verbal communication?
a) Personal appearance b) Posture
c) Eye contact d) Name of the speaker

2) Telephonic conversation is a form of: _____
a) verbal communication b) non-verbal communication
c) visual communication d) Written

3) To give a good presentation, full rehearsal is: _____
a) Optional b) Necessary
c) Useless d) Audience based

4) Which of the following is not an advantage of oral presentation?
a) Flexibility b) Scope for body language
c) Expensive d) Time-saving

5) In communication, _____ is the person who receives and decodes the message.
a) Sender b) Receiver
c) Driver d) Cleaner

6) Which among the following is not a manmade channel of communication?
a) Telephone b) Cell phone
c) Fax d) Air

7) Communication is the part of _____ skills.
a) Rough b) Soft
c) Hard d) Short

8) Which among the following are the barriers to communication?
a) Physical b) Mechanical
c) Psychological d) All of above

9) To overcome language barrier, which of the ways should not be followed?
a) Easy and understandable words should be used.
b) Jokes should be told to the audience.
c) The language of audience should be used.
d) Non-verbal ways should be used to the extent possible.

10) Which of the following is not among 7Cs?
a) Conciseness b) Completeness
c) Clarity d) Charity

11) Posters fall under _____ communication.
a) oral b) visual
c) written d) spoken

12) On the _____ it is possible to get immediate feedback.
a) letter b) e-mail
c) fax d) telephone

13) The response to a sender's message is called as _____.
a) Reply b) Feedback
c) Answer d) None of the above

14) _____ is the soul of communication.
a) Sender b) Receiver
c) Message d) Feedback

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Three. **12**

a) Explain how communication is necessary for business.
b) What is feedback? Explain its necessity in communication.
c) Write short note on: Different channels of communication.
d) Explain language barriers to communication with the ways to overcome them.
e) Explain language as a tool of communication.

Q.3 Attempt Any Four. **16**

a) Explain seven C's of effective communication.
b) Explain various types of barriers to communication and the ways to overcome them.
c) What is oral communication? Explain its advantages.
d) Explain various steps in the process of communication.
e) What is written communication? Explain its benefits.

Section – II

Q.4 Attempt Any Three. **12**

a) Explain the difference between formal and informal communication.
b) Explain vertical communication with its types.
c) Explain farewell speech by the departing person, with an example
d) Explain the speech for vote of thanks, with an example.
e) Write short note on: Non- verbal aspects of presentation.

Q.5 Attempt Any Four. **16**

a) Explain the structure of a business letter with its various components.
b) Explain the steps in the process of presentation.
c) You had purchased some furniture items from a vendor. Afterwards you found that the furniture items are in a damaged condition. Write a letter of complaint and ask for replacement.
d) Explain four P's of effective presentations.
e) You are in need of some computer hardware parts. Prepare a letter placing order to the supplier. Specify the terms and conditions of purchase.

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) Which of the following is not among 7Cs?
a) Conciseness b) Completeness
c) Clarity d) Charity

2) Posters fall under _____ communication.
a) oral b) visual
c) written d) spoken

3) On the _____ it is possible to get immediate feedback.
a) letter b) e-mail
c) fax d) telephone

4) The response to a sender's message is called as _____.
a) Reply b) Feedback
c) Answer d) None of the above

5) _____ is the soul of communication.
a) Sender b) Receiver
c) Message d) Feedback

6) Which of these is not an element of non-verbal communication?
a) Personal appearance b) Posture
c) Eye contact d) Name of the speaker

7) Telephonic conversation is a form of: _____
a) verbal communication b) non-verbal communication
c) visual communication d) Written

8) To give a good presentation, full rehearsal is: _____
a) Optional b) Necessary
c) Useless d) Audience based

9) Which of the following is not an advantage of oral presentation?
a) Flexibility b) Scope for body language
c) Expensive d) Time-saving

10) In communication, _____ is the person who receives and decodes the message.
a) Sender b) Receiver
c) Driver d) Cleaner

11) Which among the following is not a manmade channel of communication?
a) Telephone b) Cell phone
c) Fax d) Air

12) Communication is the part of _____ skills.
a) Rough b) Soft
c) Hard d) Short

13) Which among the following are the barriers to communication?
a) Physical b) Mechanical
c) Psychological d) All of above

14) To overcome language barrier, which of the ways should not be followed?
a) Easy and understandable words should be used.
b) Jokes should be told to the audience.
c) The language of audience should be used.
d) Non-verbal ways should be used to the extent possible.

SLR-BD-100

Seat No.	

Set S

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Three. **12**

a) Explain how communication is necessary for business.
b) What is feedback? Explain its necessity in communication.
c) Write short note on: Different channels of communication.
d) Explain language barriers to communication with the ways to overcome them.
e) Explain language as a tool of communication.

Q.3 Attempt Any Four. **16**

a) Explain seven C's of effective communication.
b) Explain various types of barriers to communication and the ways to overcome them.
c) What is oral communication? Explain its advantages.
d) Explain various steps in the process of communication.
e) What is written communication? Explain its benefits.

Section – II

Q.4 Attempt Any Three. **12**

a) Explain the difference between formal and informal communication.
b) Explain vertical communication with its types.
c) Explain farewell speech by the departing person, with an example
d) Explain the speech for vote of thanks, with an example.
e) Write short note on: Non- verbal aspects of presentation.

Q.5 Attempt Any Four. **16**

a) Explain the structure of a business letter with its various components.
b) Explain the steps in the process of presentation.
c) You had purchased some furniture items from a vendor. Afterwards you found that the furniture items are in a damaged condition. Write a letter of complaint and ask for replacement.
d) Explain four P's of effective presentations.
e) You are in need of some computer hardware parts. Prepare a letter placing order to the supplier. Specify the terms and conditions of purchase.

SLR-BD-101

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat and proper diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Which of the following is NOT a type of composite material?
a) Polymer matrix composites b) Carbon-carbon composites
c) Metal matrix composites d) Pure aluminum

2) The main role of the matrix in a composite material is to: _____.
a) Provide reinforcement
b) Transfer load and protect fibers
c) Reduce weight
d) Act as an insulator

3) What are organic matrix composites made of?
a) Metal alloys b) Ceramics
c) Polymers d) Natural fibers

4) What is a major advantage of nanoscale materials?
a) Lower durability b) High reactivity
c) Large weight d) Reduced surface energy

5) Why do nanoparticles exhibit different thermal properties compared to bulk materials?
a) They have high density b) Due to quantum size effects
c) They are less stable d) They are heavier

6) What property of nanomaterials makes them effective as antibacterial agents?
a) Electrical conductivity b) Large size
c) High surface energy d) Thermal conductivity

7) What is a nanofluid?
a) Solid fluid
b) Fluid with nanoparticles
c) Gas-like fluid
d) Pure liquid

8) How do nanopore filters benefit water treatment?
a) Increase hardness
b) Remove contaminants
c) Add minerals
d) Change color

9) Why are nanomaterials suitable for self-cleaning surfaces?
a) High friction
b) Hydrophobic properties
c) High absorption
d) High conductivity

10) What is the effect of impurities on the resistivity of metals?
a) Increase resistivity
b) Decrease resistivity
c) No effect
d) Increase conductivity

11) CMOS technology is widely used in: _____.
a) Power generation
b) Microelectronics
c) Chemical reactions
d) Thermal conduction

12) Which of the following materials is ferromagnetic?
a) Copper
b) Aluminum
c) Iron
d) Glass

13) Saturation magnetization refers to: _____.
a) Maximum magnetic field
b) Maximum magnetic moment per unit volume
c) Zero magnetization
d) High resistance

14) What is the role of a coolant in a nuclear reactor?
a) Absorb neutrons
b) Transfer heat
c) Generate electricity
d) Contain radioactive waste

Seat No.		Set	P

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat and proper diagram wherever necessary.

Section – I

Q.2 Attempt Any Two Questions

a) Explain the classification of composites based on matrix materials, including polymer matrix composites (PMC) and carbon-carbon composites. **05**

b) What is the role of reinforcement materials in composites? How are they selected for specific applications? **05**

c) Explain the sol-gel method for making nanomaterials. **05**

Q.3 Attempt Any Two Questions

a) Explain with neat sketch is lithography. How is it different from chemical vapor deposition? **05**

b) Explain with neat sketch how does physical vapor deposition work as a bottom-up technique? **05**

c) Compare with neat sketches atomic layer deposition and combustion methods as bottom-up approaches. **05**

Q.4 Write short notes on (Any Two)

a) Explain the role of green chemistry in nanomaterial synthesis. **04**

b) List and explain different types of nanomaterials and give one example of each type. **04**

c) What are the key mechanical tests performed on composite materials? Explain tensile and compressive testing procedures. **04**

Section – II

Q.5 Attempt Any Two Questions

a) Explain with neat sketch the skin effect and its significance in electrical conduction. **05**

b) Describe the manufacturing process of silicon wafers for microelectronics. **05**

c) Differentiate between soft and hard magnetic materials, providing their applications. **05**

Q.6 Attempt Any Two Questions

a)	Explain the properties and applications of ferrites in magnetic recording materials.	**05**
b)	What are moderators in nuclear reactors? Describe the materials used as moderators and their properties.	**05**
c)	What are the applications of zirconium in nuclear reactors? Highlight its key properties.	**05**

Q.7 Write short notes on (Any Two)

a)	Explain why a low capture cross-section for neutrons is critical in the selection of nuclear materials.	**04**
b)	Explain the properties and applications of ferrites in magnetic recording materials.	**04**
c)	Define quantum efficiency in solar cells and explain its importance in device performance.	**04**

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat and proper diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) How do nanopore filters benefit water treatment?
a) Increase hardness b) Remove contaminants
c) Add minerals d) Change color

2) Why are nanomaterials suitable for self-cleaning surfaces?
a) High friction b) Hydrophobic properties
c) High absorption d) High conductivity

3) What is the effect of impurities on the resistivity of metals?
a) Increase resistivity b) Decrease resistivity
c) No effect d) Increase conductivity

4) CMOS technology is widely used in: _____.
a) Power generation b) Microelectronics
c) Chemical reactions d) Thermal conduction

5) Which of the following materials is ferromagnetic?
a) Copper b) Aluminum
c) Iron d) Glass

6) Saturation magnetization refers to: _____.
a) Maximum magnetic field
b) Maximum magnetic moment per unit volume
c) Zero magnetization
d) High resistance

7) What is the role of a coolant in a nuclear reactor?
a) Absorb neutrons
b) Transfer heat
c) Generate electricity
d) Contain radioactive waste

8) Which of the following is NOT a type of composite material?
a) Polymer matrix composites b) Carbon-carbon composites
c) Metal matrix composites d) Pure aluminum

9) The main role of the matrix in a composite material is to: _____.
a) Provide reinforcement
b) Transfer load and protect fibers
c) Reduce weight
d) Act as an insulator

10) What are organic matrix composites made of?
a) Metal alloys b) Ceramics
c) Polymers d) Natural fibers

11) What is a major advantage of nanoscale materials?
a) Lower durability b) High reactivity
c) Large weight d) Reduced surface energy

12) Why do nanoparticles exhibit different thermal properties compared to bulk materials?
a) They have high density b) Due to quantum size effects
c) They are less stable d) They are heavier

13) What property of nanomaterials makes them effective as antibacterial agents?
a) Electrical conductivity b) Large size
c) High surface energy d) Thermal conductivity

14) What is a nanofluid?
a) Solid fluid b) Fluid with nanoparticles
c) Gas-like fluid d) Pure liquid

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat and proper diagram wherever necessary.

Section – I

Q.2 Attempt Any Two Questions

a) Explain the classification of composites based on matrix materials, including polymer matrix composites (PMC) and carbon-carbon composites. **05**

b) What is the role of reinforcement materials in composites? How are they selected for specific applications? **05**

c) Explain the sol-gel method for making nanomaterials. **05**

Q.3 Attempt Any Two Questions

a) Explain with neat sketch is lithography. How is it different from chemical vapor deposition? **05**

b) Explain with neat sketch how does physical vapor deposition work as a bottom-up technique? **05**

c) Compare with neat sketches atomic layer deposition and combustion methods as bottom-up approaches. **05**

Q.4 Write short notes on (Any Two)

a) Explain the role of green chemistry in nanomaterial synthesis. **04**

b) List and explain different types of nanomaterials and give one example of each type. **04**

c) What are the key mechanical tests performed on composite materials? Explain tensile and compressive testing procedures. **04**

Section – II

Q.5 Attempt Any Two Questions

a) Explain with neat sketch the skin effect and its significance in electrical conduction. **05**

b) Describe the manufacturing process of silicon wafers for microelectronics. **05**

c) Differentiate between soft and hard magnetic materials, providing their applications. **05**

Q.6 Attempt Any Two Questions

a)	Explain the properties and applications of ferrites in magnetic recording materials.	**05**
b)	What are moderators in nuclear reactors? Describe the materials used as moderators and their properties.	**05**
c)	What are the applications of zirconium in nuclear reactors? Highlight its key properties.	**05**

Q.7 Write short notes on (Any Two)

a)	Explain why a low capture cross-section for neutrons is critical in the selection of nuclear materials.	**04**
b)	Explain the properties and applications of ferrites in magnetic recording materials.	**04**
c)	Define quantum efficiency in solar cells and explain its importance in device performance.	**04**

Seat No.	

Set R

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat and proper diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) CMOS technology is widely used in: _____.
a) Power generation b) Microelectronics
c) Chemical reactions d) Thermal conduction

2) Which of the following materials is ferromagnetic?
a) Copper b) Aluminum
c) Iron d) Glass

3) Saturation magnetization refers to: _____.
a) Maximum magnetic field
b) Maximum magnetic moment per unit volume
c) Zero magnetization
d) High resistance

4) What is the role of a coolant in a nuclear reactor?
a) Absorb neutrons
b) Transfer heat
c) Generate electricity
d) Contain radioactive waste

5) Which of the following is NOT a type of composite material?
a) Polymer matrix composites b) Carbon-carbon composites
c) Metal matrix composites d) Pure aluminum

6) The main role of the matrix in a composite material is to: _____.
a) Provide reinforcement
b) Transfer load and protect fibers
c) Reduce weight
d) Act as an insulator

7) What are organic matrix composites made of?
a) Metal alloys b) Ceramics
c) Polymers d) Natural fibers

8) What is a major advantage of nanoscale materials?
a) Lower durability b) High reactivity
c) Large weight d) Reduced surface energy

9) Why do nanoparticles exhibit different thermal properties compared to bulk materials?
a) They have high density b) Due to quantum size effects
c) They are less stable d) They are heavier

10) What property of nanomaterials makes them effective as antibacterial agents?
a) Electrical conductivity b) Large size
c) High surface energy d) Thermal conductivity

11) What is a nanofluid?
a) Solid fluid b) Fluid with nanoparticles
c) Gas-like fluid d) Pure liquid

12) How do nanopore filters benefit water treatment?
a) Increase hardness b) Remove contaminants
c) Add minerals d) Change color

13) Why are nanomaterials suitable for self-cleaning surfaces?
a) High friction b) Hydrophobic properties
c) High absorption d) High conductivity

14) What is the effect of impurities on the resistivity of metals?
a) Increase resistivity b) Decrease resistivity
c) No effect d) Increase conductivity

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat and proper diagram wherever necessary.

Section – I

Q.2 Attempt Any Two Questions

a) Explain the classification of composites based on matrix materials, including polymer matrix composites (PMC) and carbon-carbon composites. **05**

b) What is the role of reinforcement materials in composites? How are they selected for specific applications? **05**

c) Explain the sol-gel method for making nanomaterials. **05**

Q.3 Attempt Any Two Questions

a) Explain with neat sketch is lithography. How is it different from chemical vapor deposition? **05**

b) Explain with neat sketch how does physical vapor deposition work as a bottom-up technique? **05**

c) Compare with neat sketches atomic layer deposition and combustion methods as bottom-up approaches. **05**

Q.4 Write short notes on (Any Two)

a) Explain the role of green chemistry in nanomaterial synthesis. **04**

b) List and explain different types of nanomaterials and give one example of each type. **04**

c) What are the key mechanical tests performed on composite materials? Explain tensile and compressive testing procedures. **04**

Section – II

Q.5 Attempt Any Two Questions

a) Explain with neat sketch the skin effect and its significance in electrical conduction. **05**

b) Describe the manufacturing process of silicon wafers for microelectronics. **05**

c) Differentiate between soft and hard magnetic materials, providing their applications. **05**

Q.6 Attempt Any Two Questions

a)	Explain the properties and applications of ferrites in magnetic recording materials.	**05**
b)	What are moderators in nuclear reactors? Describe the materials used as moderators and their properties.	**05**
c)	What are the applications of zirconium in nuclear reactors? Highlight its key properties.	**05**

Q.7 Write short notes on (Any Two)

a)	Explain why a low capture cross-section for neutrons is critical in the selection of nuclear materials.	**04**
b)	Explain the properties and applications of ferrites in magnetic recording materials.	**04**
c)	Define quantum efficiency in solar cells and explain its importance in device performance.	**04**

Seat No.	

Set **S**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat and proper diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) What property of nanomaterials makes them effective as antibacterial agents?
a) Electrical conductivity b) Large size
c) High surface energy d) Thermal conductivity

2) What is a nanofluid?
a) Solid fluid b) Fluid with nanoparticles
c) Gas-like fluid d) Pure liquid

3) How do nanopore filters benefit water treatment?
a) Increase hardness b) Remove contaminants
c) Add minerals d) Change color

4) Why are nanomaterials suitable for self-cleaning surfaces?
a) High friction b) Hydrophobic properties
c) High absorption d) High conductivity

5) What is the effect of impurities on the resistivity of metals?
a) Increase resistivity b) Decrease resistivity
c) No effect d) Increase conductivity

6) CMOS technology is widely used in: _____.
a) Power generation b) Microelectronics
c) Chemical reactions d) Thermal conduction

7) Which of the following materials is ferromagnetic?
a) Copper b) Aluminum
c) Iron d) Glass

8) Saturation magnetization refers to: _____.
a) Maximum magnetic field
b) Maximum magnetic moment per unit volume
c) Zero magnetization
d) High resistance

9) What is the role of a coolant in a nuclear reactor?
a) Absorb neutrons
b) Transfer heat
c) Generate electricity
d) Contain radioactive waste

10) Which of the following is NOT a type of composite material?
a) Polymer matrix composites b) Carbon-carbon composites
c) Metal matrix composites d) Pure aluminum

11) The main role of the matrix in a composite material is to: _____.
a) Provide reinforcement
b) Transfer load and protect fibers
c) Reduce weight
d) Act as an insulator

12) What are organic matrix composites made of?
a) Metal alloys b) Ceramics
c) Polymers d) Natural fibers

13) What is a major advantage of nanoscale materials?
a) Lower durability b) High reactivity
c) Large weight d) Reduced surface energy

14) Why do nanoparticles exhibit different thermal properties compared to bulk materials?
a) They have high density b) Due to quantum size effects
c) They are less stable d) They are heavier

Seat No.	

Set | S

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat and proper diagram wherever necessary.

Section – I

Q.2 Attempt Any Two Questions

a) Explain the classification of composites based on matrix materials, including polymer matrix composites (PMC) and carbon-carbon composites. **05**

b) What is the role of reinforcement materials in composites? How are they selected for specific applications? **05**

c) Explain the sol-gel method for making nanomaterials. **05**

Q.3 Attempt Any Two Questions

a) Explain with neat sketch is lithography. How is it different from chemical vapor deposition? **05**

b) Explain with neat sketch how does physical vapor deposition work as a bottom-up technique? **05**

c) Compare with neat sketches atomic layer deposition and combustion methods as bottom-up approaches. **05**

Q.4 Write short notes on (Any Two)

a) Explain the role of green chemistry in nanomaterial synthesis. **04**

b) List and explain different types of nanomaterials and give one example of each type. **04**

c) What are the key mechanical tests performed on composite materials? Explain tensile and compressive testing procedures. **04**

Section – II

Q.5 Attempt Any Two Questions

a) Explain with neat sketch the skin effect and its significance in electrical conduction. **05**

b) Describe the manufacturing process of silicon wafers for microelectronics. **05**

c) Differentiate between soft and hard magnetic materials, providing their applications. **05**

Q.6 Attempt Any Two Questions

a)	Explain the properties and applications of ferrites in magnetic recording materials.	**05**
b)	What are moderators in nuclear reactors? Describe the materials used as moderators and their properties.	**05**
c)	What are the applications of zirconium in nuclear reactors? Highlight its key properties.	**05**

Q.7 Write short notes on (Any Two)

a)	Explain why a low capture cross-section for neutrons is critical in the selection of nuclear materials.	**04**
b)	Explain the properties and applications of ferrites in magnetic recording materials.	**04**
c)	Define quantum efficiency in solar cells and explain its importance in device performance.	**04**

SLR-BD-101

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat and proper diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Which of the following is NOT a type of composite material?
a) Polymer matrix composites b) Carbon-carbon composites
c) Metal matrix composites d) Pure aluminum

2) The main role of the matrix in a composite material is to: _____.
a) Provide reinforcement
b) Transfer load and protect fibers
c) Reduce weight
d) Act as an insulator

3) What are organic matrix composites made of?
a) Metal alloys b) Ceramics
c) Polymers d) Natural fibers

4) What is a major advantage of nanoscale materials?
a) Lower durability b) High reactivity
c) Large weight d) Reduced surface energy

5) Why do nanoparticles exhibit different thermal properties compared to bulk materials?
a) They have high density b) Due to quantum size effects
c) They are less stable d) They are heavier

6) What property of nanomaterials makes them effective as antibacterial agents?
a) Electrical conductivity b) Large size
c) High surface energy d) Thermal conductivity

7) What is a nanofluid?
a) Solid fluid
b) Fluid with nanoparticles
c) Gas-like fluid
d) Pure liquid

8) How do nanopore filters benefit water treatment?
a) Increase hardness
b) Remove contaminants
c) Add minerals
d) Change color

9) Why are nanomaterials suitable for self-cleaning surfaces?
a) High friction
b) Hydrophobic properties
c) High absorption
d) High conductivity

10) What is the effect of impurities on the resistivity of metals?
a) Increase resistivity
b) Decrease resistivity
c) No effect
d) Increase conductivity

11) CMOS technology is widely used in: _____.
a) Power generation
b) Microelectronics
c) Chemical reactions
d) Thermal conduction

12) Which of the following materials is ferromagnetic?
a) Copper
b) Aluminum
c) Iron
d) Glass

13) Saturation magnetization refers to: _____.
a) Maximum magnetic field
b) Maximum magnetic moment per unit volume
c) Zero magnetization
d) High resistance

14) What is the role of a coolant in a nuclear reactor?
a) Absorb neutrons
b) Transfer heat
c) Generate electricity
d) Contain radioactive waste

Seat No.	

Set | P

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat and proper diagram wherever necessary.

Section – I

Q.2 Attempt Any Two Questions

a) Explain the classification of composites based on matrix materials, including polymer matrix composites (PMC) and carbon-carbon composites. **05**

b) What is the role of reinforcement materials in composites? How are they selected for specific applications? **05**

c) Explain the sol-gel method for making nanomaterials. **05**

Q.3 Attempt Any Two Questions

a) Explain with neat sketch is lithography. How is it different from chemical vapor deposition? **05**

b) Explain with neat sketch how does physical vapor deposition work as a bottom-up technique? **05**

c) Compare with neat sketches atomic layer deposition and combustion methods as bottom-up approaches. **05**

Q.4 Write short notes on (Any Two)

a) Explain the role of green chemistry in nanomaterial synthesis. **04**

b) List and explain different types of nanomaterials and give one example of each type. **04**

c) What are the key mechanical tests performed on composite materials? Explain tensile and compressive testing procedures. **04**

Section – II

Q.5 Attempt Any Two Questions

a) Explain with neat sketch the skin effect and its significance in electrical conduction. **05**

b) Describe the manufacturing process of silicon wafers for microelectronics. **05**

c) Differentiate between soft and hard magnetic materials, providing their applications. **05**

Q.6 Attempt Any Two Questions

a)	Explain the properties and applications of ferrites in magnetic recording materials.	**05**
b)	What are moderators in nuclear reactors? Describe the materials used as moderators and their properties.	**05**
c)	What are the applications of zirconium in nuclear reactors? Highlight its key properties.	**05**

Q.7 Write short notes on (Any Two)

a)	Explain why a low capture cross-section for neutrons is critical in the selection of nuclear materials.	**04**
b)	Explain the properties and applications of ferrites in magnetic recording materials.	**04**
c)	Define quantum efficiency in solar cells and explain its importance in device performance.	**04**

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat and proper diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) How do nanopore filters benefit water treatment?
a) Increase hardness b) Remove contaminants
c) Add minerals d) Change color

2) Why are nanomaterials suitable for self-cleaning surfaces?
a) High friction b) Hydrophobic properties
c) High absorption d) High conductivity

3) What is the effect of impurities on the resistivity of metals?
a) Increase resistivity b) Decrease resistivity
c) No effect d) Increase conductivity

4) CMOS technology is widely used in: _____.
a) Power generation b) Microelectronics
c) Chemical reactions d) Thermal conduction

5) Which of the following materials is ferromagnetic?
a) Copper b) Aluminum
c) Iron d) Glass

6) Saturation magnetization refers to: _____.
a) Maximum magnetic field
b) Maximum magnetic moment per unit volume
c) Zero magnetization
d) High resistance

7) What is the role of a coolant in a nuclear reactor?
a) Absorb neutrons
b) Transfer heat
c) Generate electricity
d) Contain radioactive waste

8) Which of the following is NOT a type of composite material?
a) Polymer matrix composites b) Carbon-carbon composites
c) Metal matrix composites d) Pure aluminum

9) The main role of the matrix in a composite material is to: _____.
a) Provide reinforcement
b) Transfer load and protect fibers
c) Reduce weight
d) Act as an insulator

10) What are organic matrix composites made of?
a) Metal alloys b) Ceramics
c) Polymers d) Natural fibers

11) What is a major advantage of nanoscale materials?
a) Lower durability b) High reactivity
c) Large weight d) Reduced surface energy

12) Why do nanoparticles exhibit different thermal properties compared to bulk materials?
a) They have high density b) Due to quantum size effects
c) They are less stable d) They are heavier

13) What property of nanomaterials makes them effective as antibacterial agents?
a) Electrical conductivity b) Large size
c) High surface energy d) Thermal conductivity

14) What is a nanofluid?
a) Solid fluid b) Fluid with nanoparticles
c) Gas-like fluid d) Pure liquid

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat and proper diagram wherever necessary.

Section – I

Q.2 Attempt Any Two Questions

a) Explain the classification of composites based on matrix materials, including polymer matrix composites (PMC) and carbon-carbon composites. **05**

b) What is the role of reinforcement materials in composites? How are they selected for specific applications? **05**

c) Explain the sol-gel method for making nanomaterials. **05**

Q.3 Attempt Any Two Questions

a) Explain with neat sketch is lithography. How is it different from chemical vapor deposition? **05**

b) Explain with neat sketch how does physical vapor deposition work as a bottom-up technique? **05**

c) Compare with neat sketches atomic layer deposition and combustion methods as bottom-up approaches. **05**

Q.4 Write short notes on (Any Two)

a) Explain the role of green chemistry in nanomaterial synthesis. **04**

b) List and explain different types of nanomaterials and give one example of each type. **04**

c) What are the key mechanical tests performed on composite materials? Explain tensile and compressive testing procedures. **04**

Section – II

Q.5 Attempt Any Two Questions

a) Explain with neat sketch the skin effect and its significance in electrical conduction. **05**

b) Describe the manufacturing process of silicon wafers for microelectronics. **05**

c) Differentiate between soft and hard magnetic materials, providing their applications. **05**

Q.6 Attempt Any Two Questions

a)	Explain the properties and applications of ferrites in magnetic recording materials.	**05**
b)	What are moderators in nuclear reactors? Describe the materials used as moderators and their properties.	**05**
c)	What are the applications of zirconium in nuclear reactors? Highlight its key properties.	**05**

Q.7 Write short notes on (Any Two)

a)	Explain why a low capture cross-section for neutrons is critical in the selection of nuclear materials.	**04**
b)	Explain the properties and applications of ferrites in magnetic recording materials.	**04**
c)	Define quantum efficiency in solar cells and explain its importance in device performance.	**04**

Seat No.	

Set R

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat and proper diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) CMOS technology is widely used in: _____.
a) Power generation b) Microelectronics
c) Chemical reactions d) Thermal conduction

2) Which of the following materials is ferromagnetic?
a) Copper b) Aluminum
c) Iron d) Glass

3) Saturation magnetization refers to: _____.
a) Maximum magnetic field
b) Maximum magnetic moment per unit volume
c) Zero magnetization
d) High resistance

4) What is the role of a coolant in a nuclear reactor?
a) Absorb neutrons
b) Transfer heat
c) Generate electricity
d) Contain radioactive waste

5) Which of the following is NOT a type of composite material?
a) Polymer matrix composites b) Carbon-carbon composites
c) Metal matrix composites d) Pure aluminum

6) The main role of the matrix in a composite material is to: _____.
a) Provide reinforcement
b) Transfer load and protect fibers
c) Reduce weight
d) Act as an insulator

7) What are organic matrix composites made of?
a) Metal alloys b) Ceramics
c) Polymers d) Natural fibers

8) What is a major advantage of nanoscale materials?
a) Lower durability b) High reactivity
c) Large weight d) Reduced surface energy

9) Why do nanoparticles exhibit different thermal properties compared to bulk materials?
a) They have high density b) Due to quantum size effects
c) They are less stable d) They are heavier

10) What property of nanomaterials makes them effective as antibacterial agents?
a) Electrical conductivity b) Large size
c) High surface energy d) Thermal conductivity

11) What is a nanofluid?
a) Solid fluid b) Fluid with nanoparticles
c) Gas-like fluid d) Pure liquid

12) How do nanopore filters benefit water treatment?
a) Increase hardness b) Remove contaminants
c) Add minerals d) Change color

13) Why are nanomaterials suitable for self-cleaning surfaces?
a) High friction b) Hydrophobic properties
c) High absorption d) High conductivity

14) What is the effect of impurities on the resistivity of metals?
a) Increase resistivity b) Decrease resistivity
c) No effect d) Increase conductivity

SLR-BD-101

Seat No.	

Set R

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat and proper diagram wherever necessary.

Section – I

Q.2 Attempt Any Two Questions

a) Explain the classification of composites based on matrix materials, including polymer matrix composites (PMC) and carbon-carbon composites. **05**

b) What is the role of reinforcement materials in composites? How are they selected for specific applications? **05**

c) Explain the sol-gel method for making nanomaterials. **05**

Q.3 Attempt Any Two Questions

a) Explain with neat sketch is lithography. How is it different from chemical vapor deposition? **05**

b) Explain with neat sketch how does physical vapor deposition work as a bottom-up technique? **05**

c) Compare with neat sketches atomic layer deposition and combustion methods as bottom-up approaches. **05**

Q.4 Write short notes on (Any Two)

a) Explain the role of green chemistry in nanomaterial synthesis. **04**

b) List and explain different types of nanomaterials and give one example of each type. **04**

c) What are the key mechanical tests performed on composite materials? Explain tensile and compressive testing procedures. **04**

Section – II

Q.5 Attempt Any Two Questions

a) Explain with neat sketch the skin effect and its significance in electrical conduction. **05**

b) Describe the manufacturing process of silicon wafers for microelectronics. **05**

c) Differentiate between soft and hard magnetic materials, providing their applications. **05**

Q.6 Attempt Any Two Questions

a)	Explain the properties and applications of ferrites in magnetic recording materials.	**05**
b)	What are moderators in nuclear reactors? Describe the materials used as moderators and their properties.	**05**
c)	What are the applications of zirconium in nuclear reactors? Highlight its key properties.	**05**

Q.7 Write short notes on (Any Two)

a)	Explain why a low capture cross-section for neutrons is critical in the selection of nuclear materials.	**04**
b)	Explain the properties and applications of ferrites in magnetic recording materials.	**04**
c)	Define quantum efficiency in solar cells and explain its importance in device performance.	**04**

Seat No.	

Set **S**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat and proper diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) What property of nanomaterials makes them effective as antibacterial agents?
a) Electrical conductivity b) Large size
c) High surface energy d) Thermal conductivity

2) What is a nanofluid?
a) Solid fluid b) Fluid with nanoparticles
c) Gas-like fluid d) Pure liquid

3) How do nanopore filters benefit water treatment?
a) Increase hardness b) Remove contaminants
c) Add minerals d) Change color

4) Why are nanomaterials suitable for self-cleaning surfaces?
a) High friction b) Hydrophobic properties
c) High absorption d) High conductivity

5) What is the effect of impurities on the resistivity of metals?
a) Increase resistivity b) Decrease resistivity
c) No effect d) Increase conductivity

6) CMOS technology is widely used in: _____.
a) Power generation b) Microelectronics
c) Chemical reactions d) Thermal conduction

7) Which of the following materials is ferromagnetic?
a) Copper b) Aluminum
c) Iron d) Glass

8) Saturation magnetization refers to: _____.
a) Maximum magnetic field
b) Maximum magnetic moment per unit volume
c) Zero magnetization
d) High resistance

9) What is the role of a coolant in a nuclear reactor?
a) Absorb neutrons
b) Transfer heat
c) Generate electricity
d) Contain radioactive waste

10) Which of the following is NOT a type of composite material?
a) Polymer matrix composites b) Carbon-carbon composites
c) Metal matrix composites d) Pure aluminum

11) The main role of the matrix in a composite material is to: _____.
a) Provide reinforcement
b) Transfer load and protect fibers
c) Reduce weight
d) Act as an insulator

12) What are organic matrix composites made of?
a) Metal alloys b) Ceramics
c) Polymers d) Natural fibers

13) What is a major advantage of nanoscale materials?
a) Lower durability b) High reactivity
c) Large weight d) Reduced surface energy

14) Why do nanoparticles exhibit different thermal properties compared to bulk materials?
a) They have high density b) Due to quantum size effects
c) They are less stable d) They are heavier

Seat No.		Set	S

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat and proper diagram wherever necessary.

Section – I

Q.2 Attempt Any Two Questions

a) Explain the classification of composites based on matrix materials, including polymer matrix composites (PMC) and carbon-carbon composites. **05**

b) What is the role of reinforcement materials in composites? How are they selected for specific applications? **05**

c) Explain the sol-gel method for making nanomaterials. **05**

Q.3 Attempt Any Two Questions

a) Explain with neat sketch is lithography. How is it different from chemical vapor deposition? **05**

b) Explain with neat sketch how does physical vapor deposition work as a bottom-up technique? **05**

c) Compare with neat sketches atomic layer deposition and combustion methods as bottom-up approaches. **05**

Q.4 Write short notes on (Any Two)

a) Explain the role of green chemistry in nanomaterial synthesis. **04**

b) List and explain different types of nanomaterials and give one example of each type. **04**

c) What are the key mechanical tests performed on composite materials? Explain tensile and compressive testing procedures. **04**

Section – II

Q.5 Attempt Any Two Questions

a) Explain with neat sketch the skin effect and its significance in electrical conduction. **05**

b) Describe the manufacturing process of silicon wafers for microelectronics. **05**

c) Differentiate between soft and hard magnetic materials, providing their applications. **05**

Q.6 Attempt Any Two Questions

a)	Explain the properties and applications of ferrites in magnetic recording materials.	**05**
b)	What are moderators in nuclear reactors? Describe the materials used as moderators and their properties.	**05**
c)	What are the applications of zirconium in nuclear reactors? Highlight its key properties.	**05**

Q.7 Write short notes on (Any Two)

a)	Explain why a low capture cross-section for neutrons is critical in the selection of nuclear materials.	**04**
b)	Explain the properties and applications of ferrites in magnetic recording materials.	**04**
c)	Define quantum efficiency in solar cells and explain its importance in device performance.	**04**

SLR-BD-101

Seat No.	

Set P

S.Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April- 2025
ELECTRICAL ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat and proper diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Which of the following is NOT a type of composite material?
a) Polymer matrix composites b) Carbon-carbon composites
c) Metal matrix composites d) Pure aluminum

2) The main role of the matrix in a composite material is to: _____.
a) Provide reinforcement
b) Transfer load and protect fibers
c) Reduce weight
d) Act as an insulator

3) What are organic matrix composites made of?
a) Metal alloys b) Ceramics
c) Polymers d) Natural fibers

4) What is a major advantage of nanoscale materials?
a) Lower durability b) High reactivity
c) Large weight d) Reduced surface energy

5) Why do nanoparticles exhibit different thermal properties compared to bulk materials?
a) They have high density b) Due to quantum size effects
c) They are less stable d) They are heavier

6) What property of nanomaterials makes them effective as antibacterial agents?
a) Electrical conductivity b) Large size
c) High surface energy d) Thermal conductivity

7) What is a nanofluid?
a) Solid fluid
b) Fluid with nanoparticles
c) Gas-like fluid
d) Pure liquid

8) How do nanopore filters benefit water treatment?
a) Increase hardness
b) Remove contaminants
c) Add minerals
d) Change color

9) Why are nanomaterials suitable for self-cleaning surfaces?
a) High friction
b) Hydrophobic properties
c) High absorption
d) High conductivity

10) What is the effect of impurities on the resistivity of metals?
a) Increase resistivity
b) Decrease resistivity
c) No effect
d) Increase conductivity

11) CMOS technology is widely used in: _____.
a) Power generation
b) Microelectronics
c) Chemical reactions
d) Thermal conduction

12) Which of the following materials is ferromagnetic?
a) Copper
b) Aluminum
c) Iron
d) Glass

13) Saturation magnetization refers to: _____.
a) Maximum magnetic field
b) Maximum magnetic moment per unit volume
c) Zero magnetization
d) High resistance

14) What is the role of a coolant in a nuclear reactor?
a) Absorb neutrons
b) Transfer heat
c) Generate electricity
d) Contain radioactive waste

Seat No.		Set	P

S.Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April- 2025
ELECTRICAL ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat and proper diagram wherever necessary.

Section – I

Q.2 Attempt Any Two Questions

a) Explain the classification of composites based on matrix materials, including polymer matrix composites (PMC) and carbon-carbon composites. **05**

b) What is the role of reinforcement materials in composites? How are they selected for specific applications? **05**

c) Explain the sol-gel method for making nanomaterials. **05**

Q.3 Attempt Any Two Questions

a) Explain with neat sketch is lithography. How is it different from chemical vapor deposition? **05**

b) Explain with neat sketch how does physical vapor deposition work as a bottom-up technique? **05**

c) Compare with neat sketches atomic layer deposition and combustion methods as bottom-up approaches. **05**

Q.4 Write short notes on (Any Two)

a) Explain the role of green chemistry in nanomaterial synthesis. **04**

b) List and explain different types of nanomaterials and give one example of each type. **04**

c) What are the key mechanical tests performed on composite materials? Explain tensile and compressive testing procedures. **04**

Section – II

Q.5 Attempt Any Two Questions

a) Explain with neat sketch the skin effect and its significance in electrical conduction. **05**

b) Describe the manufacturing process of silicon wafers for microelectronics. **05**

c) Differentiate between soft and hard magnetic materials, providing their applications. **05**

Q.6 Attempt Any Two Questions

a)	Explain the properties and applications of ferrites in magnetic recording materials.	**05**
b)	What are moderators in nuclear reactors? Describe the materials used as moderators and their properties.	**05**
c)	What are the applications of zirconium in nuclear reactors? Highlight its key properties.	**05**

Q.7 Write short notes on (Any Two)

a)	Explain why a low capture cross-section for neutrons is critical in the selection of nuclear materials.	**04**
b)	Explain the properties and applications of ferrites in magnetic recording materials.	**04**
c)	Define quantum efficiency in solar cells and explain its importance in device performance.	**04**

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April- 2025
ELECTRICAL ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat and proper diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) How do nanopore filters benefit water treatment?
a) Increase hardness b) Remove contaminants
c) Add minerals d) Change color

2) Why are nanomaterials suitable for self-cleaning surfaces?
a) High friction b) Hydrophobic properties
c) High absorption d) High conductivity

3) What is the effect of impurities on the resistivity of metals?
a) Increase resistivity b) Decrease resistivity
c) No effect d) Increase conductivity

4) CMOS technology is widely used in: _____.
a) Power generation b) Microelectronics
c) Chemical reactions d) Thermal conduction

5) Which of the following materials is ferromagnetic?
a) Copper b) Aluminum
c) Iron d) Glass

6) Saturation magnetization refers to: _____.
a) Maximum magnetic field
b) Maximum magnetic moment per unit volume
c) Zero magnetization
d) High resistance

7) What is the role of a coolant in a nuclear reactor?
a) Absorb neutrons
b) Transfer heat
c) Generate electricity
d) Contain radioactive waste

8) Which of the following is NOT a type of composite material?
a) Polymer matrix composites b) Carbon-carbon composites
c) Metal matrix composites d) Pure aluminum

9) The main role of the matrix in a composite material is to: _____.
a) Provide reinforcement
b) Transfer load and protect fibers
c) Reduce weight
d) Act as an insulator

10) What are organic matrix composites made of?
a) Metal alloys b) Ceramics
c) Polymers d) Natural fibers

11) What is a major advantage of nanoscale materials?
a) Lower durability b) High reactivity
c) Large weight d) Reduced surface energy

12) Why do nanoparticles exhibit different thermal properties compared to bulk materials?
a) They have high density b) Due to quantum size effects
c) They are less stable d) They are heavier

13) What property of nanomaterials makes them effective as antibacterial agents?
a) Electrical conductivity b) Large size
c) High surface energy d) Thermal conductivity

14) What is a nanofluid?
a) Solid fluid b) Fluid with nanoparticles
c) Gas-like fluid d) Pure liquid

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April- 2025
ELECTRICAL ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat and proper diagram wherever necessary.

Section – I

Q.2 Attempt Any Two Questions

a) Explain the classification of composites based on matrix materials, including polymer matrix composites (PMC) and carbon-carbon composites. **05**

b) What is the role of reinforcement materials in composites? How are they selected for specific applications? **05**

c) Explain the sol-gel method for making nanomaterials. **05**

Q.3 Attempt Any Two Questions

a) Explain with neat sketch is lithography. How is it different from chemical vapor deposition? **05**

b) Explain with neat sketch how does physical vapor deposition work as a bottom-up technique? **05**

c) Compare with neat sketches atomic layer deposition and combustion methods as bottom-up approaches. **05**

Q.4 Write short notes on (Any Two)

a) Explain the role of green chemistry in nanomaterial synthesis. **04**

b) List and explain different types of nanomaterials and give one example of each type. **04**

c) What are the key mechanical tests performed on composite materials? Explain tensile and compressive testing procedures. **04**

Section – II

Q.5 Attempt Any Two Questions

a) Explain with neat sketch the skin effect and its significance in electrical conduction. **05**

b) Describe the manufacturing process of silicon wafers for microelectronics. **05**

c) Differentiate between soft and hard magnetic materials, providing their applications. **05**

Q.6 Attempt Any Two Questions

a)	Explain the properties and applications of ferrites in magnetic recording materials.	**05**
b)	What are moderators in nuclear reactors? Describe the materials used as moderators and their properties.	**05**
c)	What are the applications of zirconium in nuclear reactors? Highlight its key properties.	**05**

Q.7 Write short notes on (Any Two)

a)	Explain why a low capture cross-section for neutrons is critical in the selection of nuclear materials.	**04**
b)	Explain the properties and applications of ferrites in magnetic recording materials.	**04**
c)	Define quantum efficiency in solar cells and explain its importance in device performance.	**04**

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April- 2025
ELECTRICAL ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat and proper diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) CMOS technology is widely used in: _____.
a) Power generation b) Microelectronics
c) Chemical reactions d) Thermal conduction

2) Which of the following materials is ferromagnetic?
a) Copper b) Aluminum
c) Iron d) Glass

3) Saturation magnetization refers to: _____.
a) Maximum magnetic field
b) Maximum magnetic moment per unit volume
c) Zero magnetization
d) High resistance

4) What is the role of a coolant in a nuclear reactor?
a) Absorb neutrons
b) Transfer heat
c) Generate electricity
d) Contain radioactive waste

5) Which of the following is NOT a type of composite material?
a) Polymer matrix composites b) Carbon-carbon composites
c) Metal matrix composites d) Pure aluminum

6) The main role of the matrix in a composite material is to: _____.
a) Provide reinforcement
b) Transfer load and protect fibers
c) Reduce weight
d) Act as an insulator

7) What are organic matrix composites made of?
a) Metal alloys b) Ceramics
c) Polymers d) Natural fibers

8) What is a major advantage of nanoscale materials?
a) Lower durability b) High reactivity
c) Large weight d) Reduced surface energy

9) Why do nanoparticles exhibit different thermal properties compared to bulk materials?
a) They have high density b) Due to quantum size effects
c) They are less stable d) They are heavier

10) What property of nanomaterials makes them effective as antibacterial agents?
a) Electrical conductivity b) Large size
c) High surface energy d) Thermal conductivity

11) What is a nanofluid?
a) Solid fluid b) Fluid with nanoparticles
c) Gas-like fluid d) Pure liquid

12) How do nanopore filters benefit water treatment?
a) Increase hardness b) Remove contaminants
c) Add minerals d) Change color

13) Why are nanomaterials suitable for self-cleaning surfaces?
a) High friction b) Hydrophobic properties
c) High absorption d) High conductivity

14) What is the effect of impurities on the resistivity of metals?
a) Increase resistivity b) Decrease resistivity
c) No effect d) Increase conductivity

SLR-BD-101

Seat No.	

Set R

S.Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April- 2025
ELECTRICAL ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat and proper diagram wherever necessary.

Section – I

Q.2 Attempt Any Two Questions

a) Explain the classification of composites based on matrix materials, including polymer matrix composites (PMC) and carbon-carbon composites. **05**

b) What is the role of reinforcement materials in composites? How are they selected for specific applications? **05**

c) Explain the sol-gel method for making nanomaterials. **05**

Q.3 Attempt Any Two Questions

a) Explain with neat sketch is lithography. How is it different from chemical vapor deposition? **05**

b) Explain with neat sketch how does physical vapor deposition work as a bottom-up technique? **05**

c) Compare with neat sketches atomic layer deposition and combustion methods as bottom-up approaches. **05**

Q.4 Write short notes on (Any Two)

a) Explain the role of green chemistry in nanomaterial synthesis. **04**

b) List and explain different types of nanomaterials and give one example of each type. **04**

c) What are the key mechanical tests performed on composite materials? Explain tensile and compressive testing procedures. **04**

Section – II

Q.5 Attempt Any Two Questions

a) Explain with neat sketch the skin effect and its significance in electrical conduction. **05**

b) Describe the manufacturing process of silicon wafers for microelectronics. **05**

c) Differentiate between soft and hard magnetic materials, providing their applications. **05**

Q.6 Attempt Any Two Questions

a)	Explain the properties and applications of ferrites in magnetic recording materials.	**05**
b)	What are moderators in nuclear reactors? Describe the materials used as moderators and their properties.	**05**
c)	What are the applications of zirconium in nuclear reactors? Highlight its key properties.	**05**

Q.7 Write short notes on (Any Two)

a)	Explain why a low capture cross-section for neutrons is critical in the selection of nuclear materials.	**04**
b)	Explain the properties and applications of ferrites in magnetic recording materials.	**04**
c)	Define quantum efficiency in solar cells and explain its importance in device performance.	**04**

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April- 2025
ELECTRICAL ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat and proper diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) What property of nanomaterials makes them effective as antibacterial agents?
a) Electrical conductivity b) Large size
c) High surface energy d) Thermal conductivity

2) What is a nanofluid?
a) Solid fluid b) Fluid with nanoparticles
c) Gas-like fluid d) Pure liquid

3) How do nanopore filters benefit water treatment?
a) Increase hardness b) Remove contaminants
c) Add minerals d) Change color

4) Why are nanomaterials suitable for self-cleaning surfaces?
a) High friction b) Hydrophobic properties
c) High absorption d) High conductivity

5) What is the effect of impurities on the resistivity of metals?
a) Increase resistivity b) Decrease resistivity
c) No effect d) Increase conductivity

6) CMOS technology is widely used in: _____.
a) Power generation b) Microelectronics
c) Chemical reactions d) Thermal conduction

7) Which of the following materials is ferromagnetic?
a) Copper b) Aluminum
c) Iron d) Glass

8) Saturation magnetization refers to: _____.
a) Maximum magnetic field
b) Maximum magnetic moment per unit volume
c) Zero magnetization
d) High resistance

9) What is the role of a coolant in a nuclear reactor?
a) Absorb neutrons
b) Transfer heat
c) Generate electricity
d) Contain radioactive waste

10) Which of the following is NOT a type of composite material?
a) Polymer matrix composites b) Carbon-carbon composites
c) Metal matrix composites d) Pure aluminum

11) The main role of the matrix in a composite material is to: _____.
a) Provide reinforcement
b) Transfer load and protect fibers
c) Reduce weight
d) Act as an insulator

12) What are organic matrix composites made of?
a) Metal alloys b) Ceramics
c) Polymers d) Natural fibers

13) What is a major advantage of nanoscale materials?
a) Lower durability b) High reactivity
c) Large weight d) Reduced surface energy

14) Why do nanoparticles exhibit different thermal properties compared to bulk materials?
a) They have high density b) Due to quantum size effects
c) They are less stable d) They are heavier

Seat No.		Set	S

S.Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April- 2025
ELECTRICAL ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat and proper diagram wherever necessary.

Section – I

Q.2 Attempt Any Two Questions

a) Explain the classification of composites based on matrix materials, including polymer matrix composites (PMC) and carbon-carbon composites. **05**

b) What is the role of reinforcement materials in composites? How are they selected for specific applications? **05**

c) Explain the sol-gel method for making nanomaterials. **05**

Q.3 Attempt Any Two Questions

a) Explain with neat sketch is lithography. How is it different from chemical vapor deposition? **05**

b) Explain with neat sketch how does physical vapor deposition work as a bottom-up technique? **05**

c) Compare with neat sketches atomic layer deposition and combustion methods as bottom-up approaches. **05**

Q.4 Write short notes on (Any Two)

a) Explain the role of green chemistry in nanomaterial synthesis. **04**

b) List and explain different types of nanomaterials and give one example of each type. **04**

c) What are the key mechanical tests performed on composite materials? Explain tensile and compressive testing procedures. **04**

Section – II

Q.5 Attempt Any Two Questions

a) Explain with neat sketch the skin effect and its significance in electrical conduction. **05**

b) Describe the manufacturing process of silicon wafers for microelectronics. **05**

c) Differentiate between soft and hard magnetic materials, providing their applications. **05**

Q.6 Attempt Any Two Questions

a)	Explain the properties and applications of ferrites in magnetic recording materials.	**05**
b)	What are moderators in nuclear reactors? Describe the materials used as moderators and their properties.	**05**
c)	What are the applications of zirconium in nuclear reactors? Highlight its key properties.	**05**

Q.7 Write short notes on (Any Two)

a)	Explain why a low capture cross-section for neutrons is critical in the selection of nuclear materials.	**04**
b)	Explain the properties and applications of ferrites in magnetic recording materials.	**04**
c)	Define quantum efficiency in solar cells and explain its importance in device performance.	**04**

SLR-BD-101

Seat No.	

Set P

S.Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April- 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat and proper diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Which of the following is NOT a type of composite material?
a) Polymer matrix composites b) Carbon-carbon composites
c) Metal matrix composites d) Pure aluminum

2) The main role of the matrix in a composite material is to: _____.
a) Provide reinforcement
b) Transfer load and protect fibers
c) Reduce weight
d) Act as an insulator

3) What are organic matrix composites made of?
a) Metal alloys b) Ceramics
c) Polymers d) Natural fibers

4) What is a major advantage of nanoscale materials?
a) Lower durability b) High reactivity
c) Large weight d) Reduced surface energy

5) Why do nanoparticles exhibit different thermal properties compared to bulk materials?
a) They have high density b) Due to quantum size effects
c) They are less stable d) They are heavier

6) What property of nanomaterials makes them effective as antibacterial agents?
a) Electrical conductivity b) Large size
c) High surface energy d) Thermal conductivity

7) What is a nanofluid?
a) Solid fluid
b) Fluid with nanoparticles
c) Gas-like fluid
d) Pure liquid

8) How do nanopore filters benefit water treatment?
a) Increase hardness
b) Remove contaminants
c) Add minerals
d) Change color

9) Why are nanomaterials suitable for self-cleaning surfaces?
a) High friction
b) Hydrophobic properties
c) High absorption
d) High conductivity

10) What is the effect of impurities on the resistivity of metals?
a) Increase resistivity
b) Decrease resistivity
c) No effect
d) Increase conductivity

11) CMOS technology is widely used in: _____.
a) Power generation
b) Microelectronics
c) Chemical reactions
d) Thermal conduction

12) Which of the following materials is ferromagnetic?
a) Copper
b) Aluminum
c) Iron
d) Glass

13) Saturation magnetization refers to: _____.
a) Maximum magnetic field
b) Maximum magnetic moment per unit volume
c) Zero magnetization
d) High resistance

14) What is the role of a coolant in a nuclear reactor?
a) Absorb neutrons
b) Transfer heat
c) Generate electricity
d) Contain radioactive waste

Seat No.	

Set | P

S.Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April- 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat and proper diagram wherever necessary.

Section – I

Q.2 Attempt Any Two Questions

a) Explain the classification of composites based on matrix materials, including polymer matrix composites (PMC) and carbon-carbon composites. **05**

b) What is the role of reinforcement materials in composites? How are they selected for specific applications? **05**

c) Explain the sol-gel method for making nanomaterials. **05**

Q.3 Attempt Any Two Questions

a) Explain with neat sketch is lithography. How is it different from chemical vapor deposition? **05**

b) Explain with neat sketch how does physical vapor deposition work as a bottom-up technique? **05**

c) Compare with neat sketches atomic layer deposition and combustion methods as bottom-up approaches. **05**

Q.4 Write short notes on (Any Two)

a) Explain the role of green chemistry in nanomaterial synthesis. **04**

b) List and explain different types of nanomaterials and give one example of each type. **04**

c) What are the key mechanical tests performed on composite materials? Explain tensile and compressive testing procedures. **04**

Section – II

Q.5 Attempt Any Two Questions

a) Explain with neat sketch the skin effect and its significance in electrical conduction. **05**

b) Describe the manufacturing process of silicon wafers for microelectronics. **05**

c) Differentiate between soft and hard magnetic materials, providing their applications. **05**

Q.6 Attempt Any Two Questions

a)	Explain the properties and applications of ferrites in magnetic recording materials.	**05**
b)	What are moderators in nuclear reactors? Describe the materials used as moderators and their properties.	**05**
c)	What are the applications of zirconium in nuclear reactors? Highlight its key properties.	**05**

Q.7 Write short notes on (Any Two)

a)	Explain why a low capture cross-section for neutrons is critical in the selection of nuclear materials.	**04**
b)	Explain the properties and applications of ferrites in magnetic recording materials.	**04**
c)	Define quantum efficiency in solar cells and explain its importance in device performance.	**04**

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April- 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat and proper diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) How do nanopore filters benefit water treatment?
a) Increase hardness b) Remove contaminants
c) Add minerals d) Change color

2) Why are nanomaterials suitable for self-cleaning surfaces?
a) High friction b) Hydrophobic properties
c) High absorption d) High conductivity

3) What is the effect of impurities on the resistivity of metals?
a) Increase resistivity b) Decrease resistivity
c) No effect d) Increase conductivity

4) CMOS technology is widely used in: _____.
a) Power generation b) Microelectronics
c) Chemical reactions d) Thermal conduction

5) Which of the following materials is ferromagnetic?
a) Copper b) Aluminum
c) Iron d) Glass

6) Saturation magnetization refers to: _____.
a) Maximum magnetic field
b) Maximum magnetic moment per unit volume
c) Zero magnetization
d) High resistance

7) What is the role of a coolant in a nuclear reactor?
a) Absorb neutrons
b) Transfer heat
c) Generate electricity
d) Contain radioactive waste

8) Which of the following is NOT a type of composite material?
a) Polymer matrix composites b) Carbon-carbon composites
c) Metal matrix composites d) Pure aluminum

9) The main role of the matrix in a composite material is to: _____.
a) Provide reinforcement
b) Transfer load and protect fibers
c) Reduce weight
d) Act as an insulator

10) What are organic matrix composites made of?
a) Metal alloys b) Ceramics
c) Polymers d) Natural fibers

11) What is a major advantage of nanoscale materials?
a) Lower durability b) High reactivity
c) Large weight d) Reduced surface energy

12) Why do nanoparticles exhibit different thermal properties compared to bulk materials?
a) They have high density b) Due to quantum size effects
c) They are less stable d) They are heavier

13) What property of nanomaterials makes them effective as antibacterial agents?
a) Electrical conductivity b) Large size
c) High surface energy d) Thermal conductivity

14) What is a nanofluid?
a) Solid fluid b) Fluid with nanoparticles
c) Gas-like fluid d) Pure liquid

Seat No.		Set	Q

S.Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April- 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat and proper diagram wherever necessary.

Section – I

Q.2 Attempt Any Two Questions

a) Explain the classification of composites based on matrix materials, including polymer matrix composites (PMC) and carbon-carbon composites. **05**

b) What is the role of reinforcement materials in composites? How are they selected for specific applications? **05**

c) Explain the sol-gel method for making nanomaterials. **05**

Q.3 Attempt Any Two Questions

a) Explain with neat sketch is lithography. How is it different from chemical vapor deposition? **05**

b) Explain with neat sketch how does physical vapor deposition work as a bottom-up technique? **05**

c) Compare with neat sketches atomic layer deposition and combustion methods as bottom-up approaches. **05**

Q.4 Write short notes on (Any Two)

a) Explain the role of green chemistry in nanomaterial synthesis. **04**

b) List and explain different types of nanomaterials and give one example of each type. **04**

c) What are the key mechanical tests performed on composite materials? Explain tensile and compressive testing procedures. **04**

Section – II

Q.5 Attempt Any Two Questions

a) Explain with neat sketch the skin effect and its significance in electrical conduction. **05**

b) Describe the manufacturing process of silicon wafers for microelectronics. **05**

c) Differentiate between soft and hard magnetic materials, providing their applications. **05**

Q.6 Attempt Any Two Questions

a)	Explain the properties and applications of ferrites in magnetic recording materials.	**05**
b)	What are moderators in nuclear reactors? Describe the materials used as moderators and their properties.	**05**
c)	What are the applications of zirconium in nuclear reactors? Highlight its key properties.	**05**

Q.7 Write short notes on (Any Two)

a)	Explain why a low capture cross-section for neutrons is critical in the selection of nuclear materials.	**04**
b)	Explain the properties and applications of ferrites in magnetic recording materials.	**04**
c)	Define quantum efficiency in solar cells and explain its importance in device performance.	**04**

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April- 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat and proper diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) CMOS technology is widely used in: _____.
a) Power generation b) Microelectronics
c) Chemical reactions d) Thermal conduction

2) Which of the following materials is ferromagnetic?
a) Copper b) Aluminum
c) Iron d) Glass

3) Saturation magnetization refers to: _____.
a) Maximum magnetic field
b) Maximum magnetic moment per unit volume
c) Zero magnetization
d) High resistance

4) What is the role of a coolant in a nuclear reactor?
a) Absorb neutrons
b) Transfer heat
c) Generate electricity
d) Contain radioactive waste

5) Which of the following is NOT a type of composite material?
a) Polymer matrix composites b) Carbon-carbon composites
c) Metal matrix composites d) Pure aluminum

6) The main role of the matrix in a composite material is to: _____.
a) Provide reinforcement
b) Transfer load and protect fibers
c) Reduce weight
d) Act as an insulator

7) What are organic matrix composites made of?
a) Metal alloys b) Ceramics
c) Polymers d) Natural fibers

8) What is a major advantage of nanoscale materials?
a) Lower durability b) High reactivity
c) Large weight d) Reduced surface energy

9) Why do nanoparticles exhibit different thermal properties compared to bulk materials?
a) They have high density b) Due to quantum size effects
c) They are less stable d) They are heavier

10) What property of nanomaterials makes them effective as antibacterial agents?
a) Electrical conductivity b) Large size
c) High surface energy d) Thermal conductivity

11) What is a nanofluid?
a) Solid fluid b) Fluid with nanoparticles
c) Gas-like fluid d) Pure liquid

12) How do nanopore filters benefit water treatment?
a) Increase hardness b) Remove contaminants
c) Add minerals d) Change color

13) Why are nanomaterials suitable for self-cleaning surfaces?
a) High friction b) Hydrophobic properties
c) High absorption d) High conductivity

14) What is the effect of impurities on the resistivity of metals?
a) Increase resistivity b) Decrease resistivity
c) No effect d) Increase conductivity

Seat No.	

Set | R

S.Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April- 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat and proper diagram wherever necessary.

Section – I

Q.2 Attempt Any Two Questions

a) Explain the classification of composites based on matrix materials, including polymer matrix composites (PMC) and carbon-carbon composites. **05**

b) What is the role of reinforcement materials in composites? How are they selected for specific applications? **05**

c) Explain the sol-gel method for making nanomaterials. **05**

Q.3 Attempt Any Two Questions

a) Explain with neat sketch is lithography. How is it different from chemical vapor deposition? **05**

b) Explain with neat sketch how does physical vapor deposition work as a bottom-up technique? **05**

c) Compare with neat sketches atomic layer deposition and combustion methods as bottom-up approaches. **05**

Q.4 Write short notes on (Any Two)

a) Explain the role of green chemistry in nanomaterial synthesis. **04**

b) List and explain different types of nanomaterials and give one example of each type. **04**

c) What are the key mechanical tests performed on composite materials? Explain tensile and compressive testing procedures. **04**

Section – II

Q.5 Attempt Any Two Questions

a) Explain with neat sketch the skin effect and its significance in electrical conduction. **05**

b) Describe the manufacturing process of silicon wafers for microelectronics. **05**

c) Differentiate between soft and hard magnetic materials, providing their applications. **05**

Q.6 Attempt Any Two Questions

a)	Explain the properties and applications of ferrites in magnetic recording materials.	**05**
b)	What are moderators in nuclear reactors? Describe the materials used as moderators and their properties.	**05**
c)	What are the applications of zirconium in nuclear reactors? Highlight its key properties.	**05**

Q.7 Write short notes on (Any Two)

a)	Explain why a low capture cross-section for neutrons is critical in the selection of nuclear materials.	**04**
b)	Explain the properties and applications of ferrites in magnetic recording materials.	**04**
c)	Define quantum efficiency in solar cells and explain its importance in device performance.	**04**

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April- 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat and proper diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) What property of nanomaterials makes them effective as antibacterial agents?
a) Electrical conductivity b) Large size
c) High surface energy d) Thermal conductivity

2) What is a nanofluid?
a) Solid fluid b) Fluid with nanoparticles
c) Gas-like fluid d) Pure liquid

3) How do nanopore filters benefit water treatment?
a) Increase hardness b) Remove contaminants
c) Add minerals d) Change color

4) Why are nanomaterials suitable for self-cleaning surfaces?
a) High friction b) Hydrophobic properties
c) High absorption d) High conductivity

5) What is the effect of impurities on the resistivity of metals?
a) Increase resistivity b) Decrease resistivity
c) No effect d) Increase conductivity

6) CMOS technology is widely used in: _____.
a) Power generation b) Microelectronics
c) Chemical reactions d) Thermal conduction

7) Which of the following materials is ferromagnetic?
a) Copper b) Aluminum
c) Iron d) Glass

8) Saturation magnetization refers to: _____.
a) Maximum magnetic field
b) Maximum magnetic moment per unit volume
c) Zero magnetization
d) High resistance

9) What is the role of a coolant in a nuclear reactor?
a) Absorb neutrons
b) Transfer heat
c) Generate electricity
d) Contain radioactive waste

10) Which of the following is NOT a type of composite material?
a) Polymer matrix composites b) Carbon-carbon composites
c) Metal matrix composites d) Pure aluminum

11) The main role of the matrix in a composite material is to: _____.
a) Provide reinforcement
b) Transfer load and protect fibers
c) Reduce weight
d) Act as an insulator

12) What are organic matrix composites made of?
a) Metal alloys b) Ceramics
c) Polymers d) Natural fibers

13) What is a major advantage of nanoscale materials?
a) Lower durability b) High reactivity
c) Large weight d) Reduced surface energy

14) Why do nanoparticles exhibit different thermal properties compared to bulk materials?
a) They have high density b) Due to quantum size effects
c) They are less stable d) They are heavier

Seat No.	

Set | S

S.Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April- 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat and proper diagram wherever necessary.

Section – I

Q.2 Attempt Any Two Questions

a) Explain the classification of composites based on matrix materials, including polymer matrix composites (PMC) and carbon-carbon composites. **05**

b) What is the role of reinforcement materials in composites? How are they selected for specific applications? **05**

c) Explain the sol-gel method for making nanomaterials. **05**

Q.3 Attempt Any Two Questions

a) Explain with neat sketch is lithography. How is it different from chemical vapor deposition? **05**

b) Explain with neat sketch how does physical vapor deposition work as a bottom-up technique? **05**

c) Compare with neat sketches atomic layer deposition and combustion methods as bottom-up approaches. **05**

Q.4 Write short notes on (Any Two)

a) Explain the role of green chemistry in nanomaterial synthesis. **04**

b) List and explain different types of nanomaterials and give one example of each type. **04**

c) What are the key mechanical tests performed on composite materials? Explain tensile and compressive testing procedures. **04**

Section – II

Q.5 Attempt Any Two Questions

a) Explain with neat sketch the skin effect and its significance in electrical conduction. **05**

b) Describe the manufacturing process of silicon wafers for microelectronics. **05**

c) Differentiate between soft and hard magnetic materials, providing their applications. **05**

Q.6 Attempt Any Two Questions

a)	Explain the properties and applications of ferrites in magnetic recording materials.	**05**
b)	What are moderators in nuclear reactors? Describe the materials used as moderators and their properties.	**05**
c)	What are the applications of zirconium in nuclear reactors? Highlight its key properties.	**05**

Q.7 Write short notes on (Any Two)

a)	Explain why a low capture cross-section for neutrons is critical in the selection of nuclear materials.	**04**
b)	Explain the properties and applications of ferrites in magnetic recording materials.	**04**
c)	Define quantum efficiency in solar cells and explain its importance in device performance.	**04**

SLR-BD-101

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat and proper diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Which of the following is NOT a type of composite material?
a) Polymer matrix composites b) Carbon-carbon composites
c) Metal matrix composites d) Pure aluminum

2) The main role of the matrix in a composite material is to: _____.
a) Provide reinforcement
b) Transfer load and protect fibers
c) Reduce weight
d) Act as an insulator

3) What are organic matrix composites made of?
a) Metal alloys b) Ceramics
c) Polymers d) Natural fibers

4) What is a major advantage of nanoscale materials?
a) Lower durability b) High reactivity
c) Large weight d) Reduced surface energy

5) Why do nanoparticles exhibit different thermal properties compared to bulk materials?
a) They have high density b) Due to quantum size effects
c) They are less stable d) They are heavier

6) What property of nanomaterials makes them effective as antibacterial agents?
a) Electrical conductivity b) Large size
c) High surface energy d) Thermal conductivity

7) What is a nanofluid?
a) Solid fluid
b) Fluid with nanoparticles
c) Gas-like fluid
d) Pure liquid

8) How do nanopore filters benefit water treatment?
a) Increase hardness
b) Remove contaminants
c) Add minerals
d) Change color

9) Why are nanomaterials suitable for self-cleaning surfaces?
a) High friction
b) Hydrophobic properties
c) High absorption
d) High conductivity

10) What is the effect of impurities on the resistivity of metals?
a) Increase resistivity
b) Decrease resistivity
c) No effect
d) Increase conductivity

11) CMOS technology is widely used in: _____.
a) Power generation
b) Microelectronics
c) Chemical reactions
d) Thermal conduction

12) Which of the following materials is ferromagnetic?
a) Copper
b) Aluminum
c) Iron
d) Glass

13) Saturation magnetization refers to: _____.
a) Maximum magnetic field
b) Maximum magnetic moment per unit volume
c) Zero magnetization
d) High resistance

14) What is the role of a coolant in a nuclear reactor?
a) Absorb neutrons
b) Transfer heat
c) Generate electricity
d) Contain radioactive waste

SLR-BD-101

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat and proper diagram wherever necessary.

Section – I

Q.2 Attempt Any Two Questions

a) Explain the classification of composites based on matrix materials, including polymer matrix composites (PMC) and carbon-carbon composites. **05**

b) What is the role of reinforcement materials in composites? How are they selected for specific applications? **05**

c) Explain the sol-gel method for making nanomaterials. **05**

Q.3 Attempt Any Two Questions

a) Explain with neat sketch is lithography. How is it different from chemical vapor deposition? **05**

b) Explain with neat sketch how does physical vapor deposition work as a bottom-up technique? **05**

c) Compare with neat sketches atomic layer deposition and combustion methods as bottom-up approaches. **05**

Q.4 Write short notes on (Any Two)

a) Explain the role of green chemistry in nanomaterial synthesis. **04**

b) List and explain different types of nanomaterials and give one example of each type. **04**

c) What are the key mechanical tests performed on composite materials? Explain tensile and compressive testing procedures. **04**

Section – II

Q.5 Attempt Any Two Questions

a) Explain with neat sketch the skin effect and its significance in electrical conduction. **05**

b) Describe the manufacturing process of silicon wafers for microelectronics. **05**

c) Differentiate between soft and hard magnetic materials, providing their applications. **05**

Q.6 Attempt Any Two Questions

a)	Explain the properties and applications of ferrites in magnetic recording materials.	**05**
b)	What are moderators in nuclear reactors? Describe the materials used as moderators and their properties.	**05**
c)	What are the applications of zirconium in nuclear reactors? Highlight its key properties.	**05**

Q.7 Write short notes on (Any Two)

a)	Explain why a low capture cross-section for neutrons is critical in the selection of nuclear materials.	**04**
b)	Explain the properties and applications of ferrites in magnetic recording materials.	**04**
c)	Define quantum efficiency in solar cells and explain its importance in device performance.	**04**

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat and proper diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) How do nanopore filters benefit water treatment?
a) Increase hardness b) Remove contaminants
c) Add minerals d) Change color

2) Why are nanomaterials suitable for self-cleaning surfaces?
a) High friction b) Hydrophobic properties
c) High absorption d) High conductivity

3) What is the effect of impurities on the resistivity of metals?
a) Increase resistivity b) Decrease resistivity
c) No effect d) Increase conductivity

4) CMOS technology is widely used in: _____.
a) Power generation b) Microelectronics
c) Chemical reactions d) Thermal conduction

5) Which of the following materials is ferromagnetic?
a) Copper b) Aluminum
c) Iron d) Glass

6) Saturation magnetization refers to: _____.
a) Maximum magnetic field
b) Maximum magnetic moment per unit volume
c) Zero magnetization
d) High resistance

7) What is the role of a coolant in a nuclear reactor?
a) Absorb neutrons
b) Transfer heat
c) Generate electricity
d) Contain radioactive waste

8) Which of the following is NOT a type of composite material?
a) Polymer matrix composites b) Carbon-carbon composites
c) Metal matrix composites d) Pure aluminum

9) The main role of the matrix in a composite material is to: _____.
a) Provide reinforcement
b) Transfer load and protect fibers
c) Reduce weight
d) Act as an insulator

10) What are organic matrix composites made of?
a) Metal alloys b) Ceramics
c) Polymers d) Natural fibers

11) What is a major advantage of nanoscale materials?
a) Lower durability b) High reactivity
c) Large weight d) Reduced surface energy

12) Why do nanoparticles exhibit different thermal properties compared to bulk materials?
a) They have high density b) Due to quantum size effects
c) They are less stable d) They are heavier

13) What property of nanomaterials makes them effective as antibacterial agents?
a) Electrical conductivity b) Large size
c) High surface energy d) Thermal conductivity

14) What is a nanofluid?
a) Solid fluid b) Fluid with nanoparticles
c) Gas-like fluid d) Pure liquid

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat and proper diagram wherever necessary.

Section – I

Q.2 Attempt Any Two Questions

a) Explain the classification of composites based on matrix materials, including polymer matrix composites (PMC) and carbon-carbon composites. **05**

b) What is the role of reinforcement materials in composites? How are they selected for specific applications? **05**

c) Explain the sol-gel method for making nanomaterials. **05**

Q.3 Attempt Any Two Questions

a) Explain with neat sketch is lithography. How is it different from chemical vapor deposition? **05**

b) Explain with neat sketch how does physical vapor deposition work as a bottom-up technique? **05**

c) Compare with neat sketches atomic layer deposition and combustion methods as bottom-up approaches. **05**

Q.4 Write short notes on (Any Two)

a) Explain the role of green chemistry in nanomaterial synthesis. **04**

b) List and explain different types of nanomaterials and give one example of each type. **04**

c) What are the key mechanical tests performed on composite materials? Explain tensile and compressive testing procedures. **04**

Section – II

Q.5 Attempt Any Two Questions

a) Explain with neat sketch the skin effect and its significance in electrical conduction. **05**

b) Describe the manufacturing process of silicon wafers for microelectronics. **05**

c) Differentiate between soft and hard magnetic materials, providing their applications. **05**

Q.6 Attempt Any Two Questions

a)	Explain the properties and applications of ferrites in magnetic recording materials.	**05**
b)	What are moderators in nuclear reactors? Describe the materials used as moderators and their properties.	**05**
c)	What are the applications of zirconium in nuclear reactors? Highlight its key properties.	**05**

Q.7 Write short notes on (Any Two)

a)	Explain why a low capture cross-section for neutrons is critical in the selection of nuclear materials.	**04**
b)	Explain the properties and applications of ferrites in magnetic recording materials.	**04**
c)	Define quantum efficiency in solar cells and explain its importance in device performance.	**04**

Seat No.	

Set R

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat and proper diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) CMOS technology is widely used in: _____.
a) Power generation b) Microelectronics
c) Chemical reactions d) Thermal conduction

2) Which of the following materials is ferromagnetic?
a) Copper b) Aluminum
c) Iron d) Glass

3) Saturation magnetization refers to: _____.
a) Maximum magnetic field
b) Maximum magnetic moment per unit volume
c) Zero magnetization
d) High resistance

4) What is the role of a coolant in a nuclear reactor?
a) Absorb neutrons
b) Transfer heat
c) Generate electricity
d) Contain radioactive waste

5) Which of the following is NOT a type of composite material?
a) Polymer matrix composites b) Carbon-carbon composites
c) Metal matrix composites d) Pure aluminum

6) The main role of the matrix in a composite material is to: _____.
a) Provide reinforcement
b) Transfer load and protect fibers
c) Reduce weight
d) Act as an insulator

7) What are organic matrix composites made of?
a) Metal alloys b) Ceramics
c) Polymers d) Natural fibers

8) What is a major advantage of nanoscale materials?
a) Lower durability b) High reactivity
c) Large weight d) Reduced surface energy

9) Why do nanoparticles exhibit different thermal properties compared to bulk materials?
a) They have high density b) Due to quantum size effects
c) They are less stable d) They are heavier

10) What property of nanomaterials makes them effective as antibacterial agents?
a) Electrical conductivity b) Large size
c) High surface energy d) Thermal conductivity

11) What is a nanofluid?
a) Solid fluid b) Fluid with nanoparticles
c) Gas-like fluid d) Pure liquid

12) How do nanopore filters benefit water treatment?
a) Increase hardness b) Remove contaminants
c) Add minerals d) Change color

13) Why are nanomaterials suitable for self-cleaning surfaces?
a) High friction b) Hydrophobic properties
c) High absorption d) High conductivity

14) What is the effect of impurities on the resistivity of metals?
a) Increase resistivity b) Decrease resistivity
c) No effect d) Increase conductivity

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat and proper diagram wherever necessary.

Section – I

Q.2 Attempt Any Two Questions

a) Explain the classification of composites based on matrix materials, including polymer matrix composites (PMC) and carbon-carbon composites. **05**

b) What is the role of reinforcement materials in composites? How are they selected for specific applications? **05**

c) Explain the sol-gel method for making nanomaterials. **05**

Q.3 Attempt Any Two Questions

a) Explain with neat sketch is lithography. How is it different from chemical vapor deposition? **05**

b) Explain with neat sketch how does physical vapor deposition work as a bottom-up technique? **05**

c) Compare with neat sketches atomic layer deposition and combustion methods as bottom-up approaches. **05**

Q.4 Write short notes on (Any Two)

a) Explain the role of green chemistry in nanomaterial synthesis. **04**

b) List and explain different types of nanomaterials and give one example of each type. **04**

c) What are the key mechanical tests performed on composite materials? Explain tensile and compressive testing procedures. **04**

Section – II

Q.5 Attempt Any Two Questions

a) Explain with neat sketch the skin effect and its significance in electrical conduction. **05**

b) Describe the manufacturing process of silicon wafers for microelectronics. **05**

c) Differentiate between soft and hard magnetic materials, providing their applications. **05**

Q.6 Attempt Any Two Questions

a)	Explain the properties and applications of ferrites in magnetic recording materials.	**05**
b)	What are moderators in nuclear reactors? Describe the materials used as moderators and their properties.	**05**
c)	What are the applications of zirconium in nuclear reactors? Highlight its key properties.	**05**

Q.7 Write short notes on (Any Two)

a)	Explain why a low capture cross-section for neutrons is critical in the selection of nuclear materials.	**04**
b)	Explain the properties and applications of ferrites in magnetic recording materials.	**04**
c)	Define quantum efficiency in solar cells and explain its importance in device performance.	**04**

Seat No.	

Set **S**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Draw neat and proper diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) What property of nanomaterials makes them effective as antibacterial agents?
a) Electrical conductivity b) Large size
c) High surface energy d) Thermal conductivity

2) What is a nanofluid?
a) Solid fluid b) Fluid with nanoparticles
c) Gas-like fluid d) Pure liquid

3) How do nanopore filters benefit water treatment?
a) Increase hardness b) Remove contaminants
c) Add minerals d) Change color

4) Why are nanomaterials suitable for self-cleaning surfaces?
a) High friction b) Hydrophobic properties
c) High absorption d) High conductivity

5) What is the effect of impurities on the resistivity of metals?
a) Increase resistivity b) Decrease resistivity
c) No effect d) Increase conductivity

6) CMOS technology is widely used in: _____.
a) Power generation b) Microelectronics
c) Chemical reactions d) Thermal conduction

7) Which of the following materials is ferromagnetic?
a) Copper b) Aluminum
c) Iron d) Glass

8) Saturation magnetization refers to: _____.
a) Maximum magnetic field
b) Maximum magnetic moment per unit volume
c) Zero magnetization
d) High resistance

9) What is the role of a coolant in a nuclear reactor?
a) Absorb neutrons
b) Transfer heat
c) Generate electricity
d) Contain radioactive waste

10) Which of the following is NOT a type of composite material?
a) Polymer matrix composites b) Carbon-carbon composites
c) Metal matrix composites d) Pure aluminum

11) The main role of the matrix in a composite material is to: _____.
a) Provide reinforcement
b) Transfer load and protect fibers
c) Reduce weight
d) Act as an insulator

12) What are organic matrix composites made of?
a) Metal alloys b) Ceramics
c) Polymers d) Natural fibers

13) What is a major advantage of nanoscale materials?
a) Lower durability b) High reactivity
c) Large weight d) Reduced surface energy

14) Why do nanoparticles exhibit different thermal properties compared to bulk materials?
a) They have high density b) Due to quantum size effects
c) They are less stable d) They are heavier

Seat No.		Set	S

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Materials for Technology Development (MECHMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat and proper diagram wherever necessary.

Section – I

Q.2 Attempt Any Two Questions

a) Explain the classification of composites based on matrix materials, including polymer matrix composites (PMC) and carbon-carbon composites. **05**

b) What is the role of reinforcement materials in composites? How are they selected for specific applications? **05**

c) Explain the sol-gel method for making nanomaterials. **05**

Q.3 Attempt Any Two Questions

a) Explain with neat sketch is lithography. How is it different from chemical vapor deposition? **05**

b) Explain with neat sketch how does physical vapor deposition work as a bottom-up technique? **05**

c) Compare with neat sketches atomic layer deposition and combustion methods as bottom-up approaches. **05**

Q.4 Write short notes on (Any Two)

a) Explain the role of green chemistry in nanomaterial synthesis. **04**

b) List and explain different types of nanomaterials and give one example of each type. **04**

c) What are the key mechanical tests performed on composite materials? Explain tensile and compressive testing procedures. **04**

Section – II

Q.5 Attempt Any Two Questions

a) Explain with neat sketch the skin effect and its significance in electrical conduction. **05**

b) Describe the manufacturing process of silicon wafers for microelectronics. **05**

c) Differentiate between soft and hard magnetic materials, providing their applications. **05**

Q.6 Attempt Any Two Questions

a)	Explain the properties and applications of ferrites in magnetic recording materials.	**05**
b)	What are moderators in nuclear reactors? Describe the materials used as moderators and their properties.	**05**
c)	What are the applications of zirconium in nuclear reactors? Highlight its key properties.	**05**

Q.7 Write short notes on (Any Two)

a)	Explain why a low capture cross-section for neutrons is critical in the selection of nuclear materials.	**04**
b)	Explain the properties and applications of ferrites in magnetic recording materials.	**04**
c)	Define quantum efficiency in solar cells and explain its importance in device performance.	**04**

SLR-BD-102

Seat No.		Set	P

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer **14**

1) When ordering cost is increased to 4 times, the EOQ will be increased to _____
a) 2 times b) 3 times
c) 8 times d) 4 times

2) The value of α (smoothening constant) in exponential smoothening method is _____.
a) Between -1 to +1 b) between 0 to 1
c) Between -2 to +2 d) can't be defined

3) JIT is targeted for _____.
a) Average inventory b) zero inventory
c) high inventory d) none of these

4) The length of time between placing an order & receipt of material is ____.
a) order time b) lead time
c) cycle time d) none

5) Comparing actual production output with production schedule reporting deviation is _____.
a) capacity planning b) forecasting
c) inventory management d) None

6) The control tool that keeps a close observation on the progress of the work is _____.
a) Routing b) Expediting
c) Dispatching d) none

7) The process of setting production activities in motion through release of orders & instructions is _____.

a) Dispatching b) Routing
c) Loading d) none

8) Preparation of machine loads & fixation of starting & completion dates for each of operation is _____.

a) Estimating b) Routing
c) Scheduling d) none

9) Condition Based Maintenance is used in _____ maintenance.

a) Breakdown b) Preventive
c) Predictive d) none of these

10) Penalty cost is included in _____

a) shortage cost b) ordering cost
c) holding cost d) none

11) In ABC Analysis, A items require _____

a) No safety stock b) low safety stock
c) moderate safety stock d) none

12) Which of these uses historical data for forecasting?

a) Associative models b) Time series forecasts
c) Judgmental forecast d) none

13) The word KANBAN is most appropriately associated with _____.

a) EOQ b) JIT
c) Capacity planning d) product design

14) Bill of Material does not consist of _____.

a) Part number b) Specification of part
c) Name of Part d) Price of Part

Seat No.		Set	P

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Slove any two questions from each Section.
2) Draw neat sketches wherever necessary.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 a) Define Manufacturing System. Explain classification of Manufacturing systems with one example of each. **07**

b) Discuss in detail procedure for Capacity Planning with block diagram. **07**

Q.3 a) What is forecasting? Explain in brief need of forecasting & also state various types of forecasting. **07**

b) The past data regarding the sales of a company for last five years is given. Using the least square method, fit a straight line, Estimate the sales for year 1996 & 1997. **07**

Year	1991	1992	1993	1994	1994
Sales('00)	35	56	79	80	40

Q.4 a) Discuss the objectives & Explain the functions of PPC in detail. **07**

b) Explain the objectives & scope of production & operations management in detail. **07**

Section – II

Q.5 a) A manufacturer has to supply his customers 3600 units of his product per year. Shortages are not permitted. Inventory carrying cost amounts Rs 1.2 per unit per annum. The set up cost is Rs 80. Find

i) EOQ **03**
ii) Optimum number of orders per annum **02**
iii) Average Annual Inventory cost **02**

b) Give in detail classification of Inventory models. Explain in detail EOQ Model with derivation. **07**

Q.6 a) Explain preventive maintenance & its benefits. **05**

b) Explain the need & objectives of Plant maintenance. **05**

c) Discuss in detail the working of KANBAN system. **04**

Q.7	**a)**	Explain the phases of Value Analysis.	**05**
	b)	Explain the concept of Six sigma in detail.	**05**
	c)	Write a short note on Just In Time concept.	**04**

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer **14**

1) Preparation of machine loads & fixation of starting & completion dates for each of operation is _____.
a) Estimating b) Routing
c) Scheduling d) none

2) Condition Based Maintenance is used in _____ maintenance.
a) Breakdown b) Preventive
c) Predictive d) none of these

3) Penalty cost is included in _____
a) shortage cost b) ordering cost
c) holding cost d) none

4) In ABC Analysis, A items require _____
a) No safety stock b) low safety stock
c) moderate safety stock d) none

5) Which of these uses historical data for forecasting?
a) Associative models b) Time series forecasts
c) Judgmental forecast d) none

6) The word KANBAN is most appropriately associated with _____.
a) EOQ b) JIT
c) Capacity planning d) product design

7) Bill of Material does not consist of _____.
a) Part number b) Specification of part
c) Name of Part d) Price of Part

8) When ordering cost is increased to 4 times, the EOQ will be increased to _____

a) 2 times b) 3 times
c) 8 times d) 4 times

9) The value of α (smoothening constant) in exponential smoothening method is _____.

a) Between -1 to +1 b) between 0 to 1
c) Between -2 to +2 d) can't be defined

10) JIT is targeted for _____.

a) Average inventory b) zero inventory
c) high inventory d) none of these

11) The length of time between placing an order & receipt of material is ____.

a) order time b) lead time
c) cycle time d) none

12) Comparing actual production output with production schedule reporting deviation is _____.

a) capacity planning b) forecasting
c) inventory management d) None

13) The control tool that keeps a close observation on the progress of the work is _____.

a) Routing b) Expediting
c) Dispatching d) none

14) The process of setting production activities in motion through release of orders & instructions is _____.

a) Dispatching b) Routing
c) Loading d) none

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Slove any two questions from each Section.
2) Draw neat sketches wherever necessary.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 **a)** Define Manufacturing System. Explain classification of Manufacturing systems with one example of each. **07**

b) Discuss in detail procedure for Capacity Planning with block diagram. **07**

Q.3 **a)** What is forecasting? Explain in brief need of forecasting & also state various types of forecasting. **07**

b) The past data regarding the sales of a company for last five years is given. Using the least square method, fit a straight line, Estimate the sales for year 1996 & 1997. **07**

Year	1991	1992	1993	1994	1994
Sales('00)	35	56	79	80	40

Q.4 **a)** Discuss the objectives & Explain the functions of PPC in detail. **07**

b) Explain the objectives & scope of production & operations management in detail. **07**

Section – II

Q.5 **a)** A manufacturer has to supply his customers 3600 units of his product per year. Shortages are not permitted. Inventory carrying cost amounts Rs 1.2 per unit per annum. The set up cost is Rs 80. Find

i) EOQ **03**
ii) Optimum number of orders per annum **02**
iii) Average Annual Inventory cost **02**

b) Give in detail classification of Inventory models. Explain in detail EOQ Model with derivation. **07**

Q.6 **a)** Explain preventive maintenance & its benefits. **05**

b) Explain the need & objectives of Plant maintenance. **05**

c) Discuss in detail the working of KANBAN system. **04**

Q.7	**a)**	Explain the phases of Value Analysis.	**05**
	b)	Explain the concept of Six sigma in detail.	**05**
	c)	Write a short note on Just In Time concept.	**04**

Seat No.		Set	R

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer **14**

1) In ABC Analysis, A items require _____
a) No safety stock b) low safety stock
c) moderate safety stock d) none

2) Which of these uses historical data for forecasting?
a) Associative models b) Time series forecasts
c) Judgmental forecast d) none

3) The word KANBAN is most appropriately associated with _____.
a) EOQ b) JIT
c) Capacity planning d) product design

4) Bill of Material does not consist of _____.
a) Part number b) Specification of part
c) Name of Part d) Price of Part

5) When ordering cost is increased to 4 times, the EOQ will be increased to _____
a) 2 times b) 3 times
c) 8 times d) 4 times

6) The value of α (smoothening constant) in exponential smoothening method is _____.
a) Between -1 to +1 b) between 0 to 1
c) Between -2 to +2 d) can't be defined

7) JIT is targeted for _____.
a) Average inventory b) zero inventory
c) high inventory d) none of these

8) The length of time between placing an order & receipt of material is ____.
a) order time b) lead time
c) cycle time d) none

9) Comparing actual production output with production schedule reporting deviation is _____.
a) capacity planning b) forecasting
c) inventory management d) None

10) The control tool that keeps a close observation on the progress of the work is _____.
a) Routing b) Expediting
c) Dispatching d) none

11) The process of setting production activities in motion through release of orders & instructions is _____.
a) Dispatching b) Routing
c) Loading d) none

12) Preparation of machine loads & fixation of starting & completion dates for each of operation is _____.
a) Estimating b) Routing
c) Scheduling d) none

13) Condition Based Maintenance is used in _____ maintenance.
a) Breakdown b) Preventive
c) Predictive d) none of these

14) Penalty cost is included in _____
a) shortage cost b) ordering cost
c) holding cost d) none

Seat No.		Set	R

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Slove any two questions from each Section.
2) Draw neat sketches wherever necessary.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 a) Define Manufacturing System. Explain classification of Manufacturing systems with one example of each. **07**

b) Discuss in detail procedure for Capacity Planning with block diagram. **07**

Q.3 a) What is forecasting? Explain in brief need of forecasting & also state various types of forecasting. **07**

b) The past data regarding the sales of a company for last five years is given. Using the least square method, fit a straight line, Estimate the sales for year 1996 & 1997. **07**

Year	1991	1992	1993	1994	1994
Sales('00)	35	56	79	80	40

Q.4 a) Discuss the objectives & Explain the functions of PPC in detail. **07**

b) Explain the objectives & scope of production & operations management in detail. **07**

Section – II

Q.5 a) A manufacturer has to supply his customers 3600 units of his product per year. Shortages are not permitted. Inventory carrying cost amounts Rs 1.2 per unit per annum. The set up cost is Rs 80. Find

i) EOQ **03**
ii) Optimum number of orders per annum **02**
iii) Average Annual Inventory cost **02**

b) Give in detail classification of Inventory models. Explain in detail EOQ Model with derivation. **07**

Q.6 a) Explain preventive maintenance & its benefits. **05**

b) Explain the need & objectives of Plant maintenance. **05**

c) Discuss in detail the working of KANBAN system. **04**

Q.7	**a)**	Explain the phases of Value Analysis.	**05**
	b)	Explain the concept of Six sigma in detail.	**05**
	c)	Write a short note on Just In Time concept.	**04**

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer **14**

1) The control tool that keeps a close observation on the progress of the work is _____.
a) Routing b) Expediting
c) Dispatching d) none

2) The process of setting production activities in motion through release of orders & instructions is _____.
a) Dispatching b) Routing
c) Loading d) none

3) Preparation of machine loads & fixation of starting & completion dates for each of operation is _____.
a) Estimating b) Routing
c) Scheduling d) none

4) Condition Based Maintenance is used in _____ maintenance.
a) Breakdown b) Preventive
c) Predictive d) none of these

5) Penalty cost is included in _____
a) shortage cost b) ordering cost
c) holding cost d) none

6) In ABC Analysis, A items require _____
a) No safety stock b) low safety stock
c) moderate safety stock d) none

7) Which of these uses historical data for forecasting?
a) Associative models b) Time series forecasts
c) Judgmental forecast d) none

8) The word KANBAN is most appropriately associated with _____.
a) EOQ b) JIT
c) Capacity planning d) product design

9) Bill of Material does not consist of _____.
a) Part number b) Specification of part
c) Name of Part d) Price of Part

10) When ordering cost is increased to 4 times, the EOQ will be increased to _____
a) 2 times b) 3 times
c) 8 times d) 4 times

11) The value of α (smoothening constant) in exponential smoothening method is _____.
a) Between -1 to +1 b) between 0 to 1
c) Between -2 to +2 d) can't be defined

12) JIT is targeted for _____.
a) Average inventory b) zero inventory
c) high inventory d) none of these

13) The length of time between placing an order & receipt of material is ____.
a) order time b) lead time
c) cycle time d) none

14) Comparing actual production output with production schedule reporting deviation is _____.
a) capacity planning b) forecasting
c) inventory management d) None

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Slove any two questions from each Section.
2) Draw neat sketches wherever necessary.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 a) Define Manufacturing System. Explain classification of Manufacturing systems with one example of each. **07**

b) Discuss in detail procedure for Capacity Planning with block diagram. **07**

Q.3 a) What is forecasting? Explain in brief need of forecasting & also state various types of forecasting. **07**

b) The past data regarding the sales of a company for last five years is given. Using the least square method, fit a straight line, Estimate the sales for year 1996 & 1997. **07**

Year	1991	1992	1993	1994	1994
Sales('00)	35	56	79	80	40

Q.4 a) Discuss the objectives & Explain the functions of PPC in detail. **07**

b) Explain the objectives & scope of production & operations management in detail. **07**

Section – II

Q.5 a) A manufacturer has to supply his customers 3600 units of his product per year. Shortages are not permitted. Inventory carrying cost amounts Rs 1.2 per unit per annum. The set up cost is Rs 80. Find

i) EOQ **03**
ii) Optimum number of orders per annum **02**
iii) Average Annual Inventory cost **02**

b) Give in detail classification of Inventory models. Explain in detail EOQ Model with derivation. **07**

Q.6 a) Explain preventive maintenance & its benefits. **05**

b) Explain the need & objectives of Plant maintenance. **05**

c) Discuss in detail the working of KANBAN system. **04**

Q.7	**a)**	Explain the phases of Value Analysis.	**05**
	b)	Explain the concept of Six sigma in detail.	**05**
	c)	Write a short note on Just In Time concept.	**04**

SLR-BD-102

Seat No.		Set	P

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer **14**

1) When ordering cost is increased to 4 times, the EOQ will be increased to _____
a) 2 times b) 3 times
c) 8 times d) 4 times

2) The value of α (smoothening constant) in exponential smoothening method is _____.
a) Between -1 to +1 b) between 0 to 1
c) Between -2 to +2 d) can't be defined

3) JIT is targeted for _____.
a) Average inventory b) zero inventory
c) high inventory d) none of these

4) The length of time between placing an order & receipt of material is ____.
a) order time b) lead time
c) cycle time d) none

5) Comparing actual production output with production schedule reporting deviation is _____.
a) capacity planning b) forecasting
c) inventory management d) None

6) The control tool that keeps a close observation on the progress of the work is _____.
a) Routing b) Expediting
c) Dispatching d) none

7) The process of setting production activities in motion through release of orders & instructions is _____.

a) Dispatching b) Routing
c) Loading d) none

8) Preparation of machine loads & fixation of starting & completion dates for each of operation is _____.

a) Estimating b) Routing
c) Scheduling d) none

9) Condition Based Maintenance is used in _____ maintenance.

a) Breakdown b) Preventive
c) Predictive d) none of these

10) Penalty cost is included in _____

a) shortage cost b) ordering cost
c) holding cost d) none

11) In ABC Analysis, A items require _____

a) No safety stock b) low safety stock
c) moderate safety stock d) none

12) Which of these uses historical data for forecasting?

a) Associative models b) Time series forecasts
c) Judgmental forecast d) none

13) The word KANBAN is most appropriately associated with _____.

a) EOQ b) JIT
c) Capacity planning d) product design

14) Bill of Material does not consist of _____.

a) Part number b) Specification of part
c) Name of Part d) Price of Part

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Slove any two questions from each Section.
2) Draw neat sketches wherever necessary.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 **a)** Define Manufacturing System. Explain classification of Manufacturing systems with one example of each. **07**

b) Discuss in detail procedure for Capacity Planning with block diagram. **07**

Q.3 **a)** What is forecasting? Explain in brief need of forecasting & also state various types of forecasting. **07**

b) The past data regarding the sales of a company for last five years is given. Using the least square method, fit a straight line, Estimate the sales for year 1996 & 1997. **07**

Year	1991	1992	1993	1994	1994
Sales('00)	35	56	79	80	40

Q.4 **a)** Discuss the objectives & Explain the functions of PPC in detail. **07**

b) Explain the objectives & scope of production & operations management in detail. **07**

Section – II

Q.5 **a)** A manufacturer has to supply his customers 3600 units of his product per year. Shortages are not permitted. Inventory carrying cost amounts Rs 1.2 per unit per annum. The set up cost is Rs 80. Find

i) EOQ **03**
ii) Optimum number of orders per annum **02**
iii) Average Annual Inventory cost **02**

b) Give in detail classification of Inventory models. Explain in detail EOQ Model with derivation. **07**

Q.6 **a)** Explain preventive maintenance & its benefits. **05**

b) Explain the need & objectives of Plant maintenance. **05**

c) Discuss in detail the working of KANBAN system. **04**

Q.7	**a)**	Explain the phases of Value Analysis.	**05**
	b)	Explain the concept of Six sigma in detail.	**05**
	c)	Write a short note on Just In Time concept.	**04**

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer **14**

1) Preparation of machine loads & fixation of starting & completion dates for each of operation is _____.
a) Estimating b) Routing
c) Scheduling d) none

2) Condition Based Maintenance is used in _____ maintenance.
a) Breakdown b) Preventive
c) Predictive d) none of these

3) Penalty cost is included in _____
a) shortage cost b) ordering cost
c) holding cost d) none

4) In ABC Analysis, A items require _____
a) No safety stock b) low safety stock
c) moderate safety stock d) none

5) Which of these uses historical data for forecasting?
a) Associative models b) Time series forecasts
c) Judgmental forecast d) none

6) The word KANBAN is most appropriately associated with _____.
a) EOQ b) JIT
c) Capacity planning d) product design

7) Bill of Material does not consist of _____.
a) Part number b) Specification of part
c) Name of Part d) Price of Part

8) When ordering cost is increased to 4 times, the EOQ will be increased to _____

a) 2 times b) 3 times
c) 8 times d) 4 times

9) The value of α (smoothening constant) in exponential smoothening method is _____.

a) Between -1 to +1 b) between 0 to 1
c) Between -2 to +2 d) can't be defined

10) JIT is targeted for _____.

a) Average inventory b) zero inventory
c) high inventory d) none of these

11) The length of time between placing an order & receipt of material is ____.

a) order time b) lead time
c) cycle time d) none

12) Comparing actual production output with production schedule reporting deviation is _____.

a) capacity planning b) forecasting
c) inventory management d) None

13) The control tool that keeps a close observation on the progress of the work is _____.

a) Routing b) Expediting
c) Dispatching d) none

14) The process of setting production activities in motion through release of orders & instructions is _____.

a) Dispatching b) Routing
c) Loading d) none

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Slove any two questions from each Section.
2) Draw neat sketches wherever necessary.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 **a)** Define Manufacturing System. Explain classification of Manufacturing systems with one example of each. **07**

b) Discuss in detail procedure for Capacity Planning with block diagram. **07**

Q.3 **a)** What is forecasting? Explain in brief need of forecasting & also state various types of forecasting. **07**

b) The past data regarding the sales of a company for last five years is given. Using the least square method, fit a straight line, Estimate the sales for year 1996 & 1997. **07**

Year	1991	1992	1993	1994	1994
Sales('00)	35	56	79	80	40

Q.4 **a)** Discuss the objectives & Explain the functions of PPC in detail. **07**

b) Explain the objectives & scope of production & operations management in detail. **07**

Section – II

Q.5 **a)** A manufacturer has to supply his customers 3600 units of his product per year. Shortages are not permitted. Inventory carrying cost amounts Rs 1.2 per unit per annum. The set up cost is Rs 80. Find

i) EOQ **03**
ii) Optimum number of orders per annum **02**
iii) Average Annual Inventory cost **02**

b) Give in detail classification of Inventory models. Explain in detail EOQ Model with derivation. **07**

Q.6 **a)** Explain preventive maintenance & its benefits. **05**

b) Explain the need & objectives of Plant maintenance. **05**

c) Discuss in detail the working of KANBAN system. **04**

Q.7	**a)**	Explain the phases of Value Analysis.	**05**
	b)	Explain the concept of Six sigma in detail.	**05**
	c)	Write a short note on Just In Time concept.	**04**

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer **14**

1) In ABC Analysis, A items require _____
a) No safety stock b) low safety stock
c) moderate safety stock d) none

2) Which of these uses historical data for forecasting?
a) Associative models b) Time series forecasts
c) Judgmental forecast d) none

3) The word KANBAN is most appropriately associated with _____.
a) EOQ b) JIT
c) Capacity planning d) product design

4) Bill of Material does not consist of _____.
a) Part number b) Specification of part
c) Name of Part d) Price of Part

5) When ordering cost is increased to 4 times, the EOQ will be increased to _____
a) 2 times b) 3 times
c) 8 times d) 4 times

6) The value of α (smoothening constant) in exponential smoothening method is _____.
a) Between -1 to +1 b) between 0 to 1
c) Between -2 to +2 d) can't be defined

7) JIT is targeted for _____.
a) Average inventory b) zero inventory
c) high inventory d) none of these

8) The length of time between placing an order & receipt of material is ____.
a) order time b) lead time
c) cycle time d) none

9) Comparing actual production output with production schedule reporting deviation is _____.
a) capacity planning b) forecasting
c) inventory management d) None

10) The control tool that keeps a close observation on the progress of the work is _____.
a) Routing b) Expediting
c) Dispatching d) none

11) The process of setting production activities in motion through release of orders & instructions is _____.
a) Dispatching b) Routing
c) Loading d) none

12) Preparation of machine loads & fixation of starting & completion dates for each of operation is _____.
a) Estimating b) Routing
c) Scheduling d) none

13) Condition Based Maintenance is used in _____ maintenance.
a) Breakdown b) Preventive
c) Predictive d) none of these

14) Penalty cost is included in _____
a) shortage cost b) ordering cost
c) holding cost d) none

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Slove any two questions from each Section.
2) Draw neat sketches wherever necessary.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 a) Define Manufacturing System. Explain classification of Manufacturing systems with one example of each. **07**

b) Discuss in detail procedure for Capacity Planning with block diagram. **07**

Q.3 a) What is forecasting? Explain in brief need of forecasting & also state various types of forecasting. **07**

b) The past data regarding the sales of a company for last five years is given. Using the least square method, fit a straight line, Estimate the sales for year 1996 & 1997. **07**

Year	1991	1992	1993	1994	1994
Sales('00)	35	56	79	80	40

Q.4 a) Discuss the objectives & Explain the functions of PPC in detail. **07**

b) Explain the objectives & scope of production & operations management in detail. **07**

Section – II

Q.5 a) A manufacturer has to supply his customers 3600 units of his product per year. Shortages are not permitted. Inventory carrying cost amounts Rs 1.2 per unit per annum. The set up cost is Rs 80. Find

i) EOQ **03**
ii) Optimum number of orders per annum **02**
iii) Average Annual Inventory cost **02**

b) Give in detail classification of Inventory models. Explain in detail EOQ Model with derivation. **07**

Q.6 a) Explain preventive maintenance & its benefits. **05**

b) Explain the need & objectives of Plant maintenance. **05**

c) Discuss in detail the working of KANBAN system. **04**

Q.7	**a)**	Explain the phases of Value Analysis.	**05**
	b)	Explain the concept of Six sigma in detail.	**05**
	c)	Write a short note on Just In Time concept.	**04**

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer **14**

1) The control tool that keeps a close observation on the progress of the work is _____.
a) Routing b) Expediting
c) Dispatching d) none

2) The process of setting production activities in motion through release of orders & instructions is _____.
a) Dispatching b) Routing
c) Loading d) none

3) Preparation of machine loads & fixation of starting & completion dates for each of operation is _____.
a) Estimating b) Routing
c) Scheduling d) none

4) Condition Based Maintenance is used in _____ maintenance.
a) Breakdown b) Preventive
c) Predictive d) none of these

5) Penalty cost is included in _____
a) shortage cost b) ordering cost
c) holding cost d) none

6) In ABC Analysis, A items require _____
a) No safety stock b) low safety stock
c) moderate safety stock d) none

7) Which of these uses historical data for forecasting?
a) Associative models b) Time series forecasts
c) Judgmental forecast d) none

8) The word KANBAN is most appropriately associated with _____.
a) EOQ b) JIT
c) Capacity planning d) product design

9) Bill of Material does not consist of _____.
a) Part number b) Specification of part
c) Name of Part d) Price of Part

10) When ordering cost is increased to 4 times, the EOQ will be increased to _____
a) 2 times b) 3 times
c) 8 times d) 4 times

11) The value of α (smoothening constant) in exponential smoothening method is _____.
a) Between -1 to +1 b) between 0 to 1
c) Between -2 to +2 d) can't be defined

12) JIT is targeted for _____.
a) Average inventory b) zero inventory
c) high inventory d) none of these

13) The length of time between placing an order & receipt of material is ____.
a) order time b) lead time
c) cycle time d) none

14) Comparing actual production output with production schedule reporting deviation is _____.
a) capacity planning b) forecasting
c) inventory management d) None

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Slove any two questions from each Section.
2) Draw neat sketches wherever necessary.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 a) Define Manufacturing System. Explain classification of Manufacturing systems with one example of each. **07**

b) Discuss in detail procedure for Capacity Planning with block diagram. **07**

Q.3 a) What is forecasting? Explain in brief need of forecasting & also state various types of forecasting. **07**

b) The past data regarding the sales of a company for last five years is given. Using the least square method, fit a straight line, Estimate the sales for year 1996 & 1997. **07**

Year	1991	1992	1993	1994	1994
Sales('00)	35	56	79	80	40

Q.4 a) Discuss the objectives & Explain the functions of PPC in detail. **07**

b) Explain the objectives & scope of production & operations management in detail. **07**

Section – II

Q.5 a) A manufacturer has to supply his customers 3600 units of his product per year. Shortages are not permitted. Inventory carrying cost amounts Rs 1.2 per unit per annum. The set up cost is Rs 80. Find

i) EOQ **03**
ii) Optimum number of orders per annum **02**
iii) Average Annual Inventory cost **02**

b) Give in detail classification of Inventory models. Explain in detail EOQ Model with derivation. **07**

Q.6 a) Explain preventive maintenance & its benefits. **05**

b) Explain the need & objectives of Plant maintenance. **05**

c) Discuss in detail the working of KANBAN system. **04**

Q.7	**a)**	Explain the phases of Value Analysis.	**05**
	b)	Explain the concept of Six sigma in detail.	**05**
	c)	Write a short note on Just In Time concept.	**04**

SLR-BD-102

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer **14**

1) When ordering cost is increased to 4 times, the EOQ will be increased to _____
a) 2 times b) 3 times
c) 8 times d) 4 times

2) The value of α (smoothening constant) in exponential smoothening method is _____.
a) Between -1 to +1 b) between 0 to 1
c) Between -2 to +2 d) can't be defined

3) JIT is targeted for _____.
a) Average inventory b) zero inventory
c) high inventory d) none of these

4) The length of time between placing an order & receipt of material is ____.
a) order time b) lead time
c) cycle time d) none

5) Comparing actual production output with production schedule reporting deviation is _____.
a) capacity planning b) forecasting
c) inventory management d) None

6) The control tool that keeps a close observation on the progress of the work is _____.
a) Routing b) Expediting
c) Dispatching d) none

7) The process of setting production activities in motion through release of orders & instructions is _____.

a) Dispatching b) Routing
c) Loading d) none

8) Preparation of machine loads & fixation of starting & completion dates for each of operation is _____.

a) Estimating b) Routing
c) Scheduling d) none

9) Condition Based Maintenance is used in _____ maintenance.

a) Breakdown b) Preventive
c) Predictive d) none of these

10) Penalty cost is included in _____

a) shortage cost b) ordering cost
c) holding cost d) none

11) In ABC Analysis, A items require _____

a) No safety stock b) low safety stock
c) moderate safety stock d) none

12) Which of these uses historical data for forecasting?

a) Associative models b) Time series forecasts
c) Judgmental forecast d) none

13) The word KANBAN is most appropriately associated with _____.

a) EOQ b) JIT
c) Capacity planning d) product design

14) Bill of Material does not consist of _____.

a) Part number b) Specification of part
c) Name of Part d) Price of Part

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Slove any two questions from each Section.
2) Draw neat sketches wherever necessary.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 a) Define Manufacturing System. Explain classification of Manufacturing systems with one example of each. **07**

b) Discuss in detail procedure for Capacity Planning with block diagram. **07**

Q.3 a) What is forecasting? Explain in brief need of forecasting & also state various types of forecasting. **07**

b) The past data regarding the sales of a company for last five years is given. Using the least square method, fit a straight line, Estimate the sales for year 1996 & 1997. **07**

Year	1991	1992	1993	1994	1994
Sales('00)	35	56	79	80	40

Q.4 a) Discuss the objectives & Explain the functions of PPC in detail. **07**

b) Explain the objectives & scope of production & operations management in detail. **07**

Section – II

Q.5 a) A manufacturer has to supply his customers 3600 units of his product per year. Shortages are not permitted. Inventory carrying cost amounts Rs 1.2 per unit per annum. The set up cost is Rs 80. Find

i) EOQ **03**
ii) Optimum number of orders per annum **02**
iii) Average Annual Inventory cost **02**

b) Give in detail classification of Inventory models. Explain in detail EOQ Model with derivation. **07**

Q.6 a) Explain preventive maintenance & its benefits. **05**

b) Explain the need & objectives of Plant maintenance. **05**

c) Discuss in detail the working of KANBAN system. **04**

Q.7	**a)**	Explain the phases of Value Analysis.	**05**
	b)	Explain the concept of Six sigma in detail.	**05**
	c)	Write a short note on Just In Time concept.	**04**

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer **14**

1) Preparation of machine loads & fixation of starting & completion dates for each of operation is _____.
a) Estimating b) Routing
c) Scheduling d) none

2) Condition Based Maintenance is used in _____ maintenance.
a) Breakdown b) Preventive
c) Predictive d) none of these

3) Penalty cost is included in _____
a) shortage cost b) ordering cost
c) holding cost d) none

4) In ABC Analysis, A items require _____
a) No safety stock b) low safety stock
c) moderate safety stock d) none

5) Which of these uses historical data for forecasting?
a) Associative models b) Time series forecasts
c) Judgmental forecast d) none

6) The word KANBAN is most appropriately associated with _____.
a) EOQ b) JIT
c) Capacity planning d) product design

7) Bill of Material does not consist of _____.
a) Part number b) Specification of part
c) Name of Part d) Price of Part

8) When ordering cost is increased to 4 times, the EOQ will be increased to _____

a) 2 times b) 3 times
c) 8 times d) 4 times

9) The value of α (smoothening constant) in exponential smoothening method is _____.

a) Between -1 to +1 b) between 0 to 1
c) Between -2 to +2 d) can't be defined

10) JIT is targeted for _____.

a) Average inventory b) zero inventory
c) high inventory d) none of these

11) The length of time between placing an order & receipt of material is ____.

a) order time b) lead time
c) cycle time d) none

12) Comparing actual production output with production schedule reporting deviation is _____.

a) capacity planning b) forecasting
c) inventory management d) None

13) The control tool that keeps a close observation on the progress of the work is _____.

a) Routing b) Expediting
c) Dispatching d) none

14) The process of setting production activities in motion through release of orders & instructions is _____.

a) Dispatching b) Routing
c) Loading d) none

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Slove any two questions from each Section.
2) Draw neat sketches wherever necessary.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 **a)** Define Manufacturing System. Explain classification of Manufacturing systems with one example of each. **07**

b) Discuss in detail procedure for Capacity Planning with block diagram. **07**

Q.3 **a)** What is forecasting? Explain in brief need of forecasting & also state various types of forecasting. **07**

b) The past data regarding the sales of a company for last five years is given. Using the least square method, fit a straight line, Estimate the sales for year 1996 & 1997. **07**

Year	1991	1992	1993	1994	1994
Sales('00)	35	56	79	80	40

Q.4 **a)** Discuss the objectives & Explain the functions of PPC in detail. **07**

b) Explain the objectives & scope of production & operations management in detail. **07**

Section – II

Q.5 **a)** A manufacturer has to supply his customers 3600 units of his product per year. Shortages are not permitted. Inventory carrying cost amounts Rs 1.2 per unit per annum. The set up cost is Rs 80. Find

i) EOQ **03**
ii) Optimum number of orders per annum **02**
iii) Average Annual Inventory cost **02**

b) Give in detail classification of Inventory models. Explain in detail EOQ Model with derivation. **07**

Q.6 **a)** Explain preventive maintenance & its benefits. **05**

b) Explain the need & objectives of Plant maintenance. **05**

c) Discuss in detail the working of KANBAN system. **04**

Q.7	**a)**	Explain the phases of Value Analysis.	**05**
	b)	Explain the concept of Six sigma in detail.	**05**
	c)	Write a short note on Just In Time concept.	**04**

Seat No.		Set	R

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer **14**

1) In ABC Analysis, A items require _____
a) No safety stock b) low safety stock
c) moderate safety stock d) none

2) Which of these uses historical data for forecasting?
a) Associative models b) Time series forecasts
c) Judgmental forecast d) none

3) The word KANBAN is most appropriately associated with _____.
a) EOQ b) JIT
c) Capacity planning d) product design

4) Bill of Material does not consist of _____.
a) Part number b) Specification of part
c) Name of Part d) Price of Part

5) When ordering cost is increased to 4 times, the EOQ will be increased to _____
a) 2 times b) 3 times
c) 8 times d) 4 times

6) The value of α (smoothening constant) in exponential smoothening method is _____.
a) Between -1 to +1 b) between 0 to 1
c) Between -2 to +2 d) can't be defined

7) JIT is targeted for _____.
a) Average inventory b) zero inventory
c) high inventory d) none of these

8) The length of time between placing an order & receipt of material is ____.
a) order time b) lead time
c) cycle time d) none

9) Comparing actual production output with production schedule reporting deviation is _____.
a) capacity planning b) forecasting
c) inventory management d) None

10) The control tool that keeps a close observation on the progress of the work is _____.
a) Routing b) Expediting
c) Dispatching d) none

11) The process of setting production activities in motion through release of orders & instructions is _____.
a) Dispatching b) Routing
c) Loading d) none

12) Preparation of machine loads & fixation of starting & completion dates for each of operation is _____.
a) Estimating b) Routing
c) Scheduling d) none

13) Condition Based Maintenance is used in _____ maintenance.
a) Breakdown b) Preventive
c) Predictive d) none of these

14) Penalty cost is included in _____
a) shortage cost b) ordering cost
c) holding cost d) none

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Slove any two questions from each Section.
2) Draw neat sketches wherever necessary.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 a) Define Manufacturing System. Explain classification of Manufacturing systems with one example of each. **07**

b) Discuss in detail procedure for Capacity Planning with block diagram. **07**

Q.3 a) What is forecasting? Explain in brief need of forecasting & also state various types of forecasting. **07**

b) The past data regarding the sales of a company for last five years is given. Using the least square method, fit a straight line, Estimate the sales for year 1996 & 1997. **07**

Year	1991	1992	1993	1994	1994
Sales('00)	35	56	79	80	40

Q.4 a) Discuss the objectives & Explain the functions of PPC in detail. **07**

b) Explain the objectives & scope of production & operations management in detail. **07**

Section – II

Q.5 a) A manufacturer has to supply his customers 3600 units of his product per year. Shortages are not permitted. Inventory carrying cost amounts Rs 1.2 per unit per annum. The set up cost is Rs 80. Find

i) EOQ **03**
ii) Optimum number of orders per annum **02**
iii) Average Annual Inventory cost **02**

b) Give in detail classification of Inventory models. Explain in detail EOQ Model with derivation. **07**

Q.6 a) Explain preventive maintenance & its benefits. **05**

b) Explain the need & objectives of Plant maintenance. **05**

c) Discuss in detail the working of KANBAN system. **04**

Q.7	**a)**	Explain the phases of Value Analysis.	**05**
	b)	Explain the concept of Six sigma in detail.	**05**
	c)	Write a short note on Just In Time concept.	**04**

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer **14**

1) The control tool that keeps a close observation on the progress of the work is _____.
a) Routing b) Expediting
c) Dispatching d) none

2) The process of setting production activities in motion through release of orders & instructions is _____.
a) Dispatching b) Routing
c) Loading d) none

3) Preparation of machine loads & fixation of starting & completion dates for each of operation is _____.
a) Estimating b) Routing
c) Scheduling d) none

4) Condition Based Maintenance is used in _____ maintenance.
a) Breakdown b) Preventive
c) Predictive d) none of these

5) Penalty cost is included in _____
a) shortage cost b) ordering cost
c) holding cost d) none

6) In ABC Analysis, A items require _____
a) No safety stock b) low safety stock
c) moderate safety stock d) none

7) Which of these uses historical data for forecasting?
a) Associative models b) Time series forecasts
c) Judgmental forecast d) none

8) The word KANBAN is most appropriately associated with _____.
a) EOQ b) JIT
c) Capacity planning d) product design

9) Bill of Material does not consist of _____.
a) Part number b) Specification of part
c) Name of Part d) Price of Part

10) When ordering cost is increased to 4 times, the EOQ will be increased to _____
a) 2 times b) 3 times
c) 8 times d) 4 times

11) The value of α (smoothening constant) in exponential smoothening method is _____.
a) Between -1 to +1 b) between 0 to 1
c) Between -2 to +2 d) can't be defined

12) JIT is targeted for _____.
a) Average inventory b) zero inventory
c) high inventory d) none of these

13) The length of time between placing an order & receipt of material is ____.
a) order time b) lead time
c) cycle time d) none

14) Comparing actual production output with production schedule reporting deviation is _____.
a) capacity planning b) forecasting
c) inventory management d) None

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Slove any two questions from each Section.
2) Draw neat sketches wherever necessary.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 a) Define Manufacturing System. Explain classification of Manufacturing systems with one example of each. **07**

b) Discuss in detail procedure for Capacity Planning with block diagram. **07**

Q.3 a) What is forecasting? Explain in brief need of forecasting & also state various types of forecasting. **07**

b) The past data regarding the sales of a company for last five years is given. Using the least square method, fit a straight line, Estimate the sales for year 1996 & 1997. **07**

Year	1991	1992	1993	1994	1994
Sales('00)	35	56	79	80	40

Q.4 a) Discuss the objectives & Explain the functions of PPC in detail. **07**

b) Explain the objectives & scope of production & operations management in detail. **07**

Section – II

Q.5 a) A manufacturer has to supply his customers 3600 units of his product per year. Shortages are not permitted. Inventory carrying cost amounts Rs 1.2 per unit per annum. The set up cost is Rs 80. Find

i) EOQ **03**
ii) Optimum number of orders per annum **02**
iii) Average Annual Inventory cost **02**

b) Give in detail classification of Inventory models. Explain in detail EOQ Model with derivation. **07**

Q.6 a) Explain preventive maintenance & its benefits. **05**

b) Explain the need & objectives of Plant maintenance. **05**

c) Discuss in detail the working of KANBAN system. **04**

Q.7	**a)**	Explain the phases of Value Analysis.	**05**
	b)	Explain the concept of Six sigma in detail.	**05**
	c)	Write a short note on Just In Time concept.	**04**

SLR-BD-102

Seat No.		Set	P

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer **14**

1) When ordering cost is increased to 4 times, the EOQ will be increased to _____
a) 2 times b) 3 times
c) 8 times d) 4 times

2) The value of α (smoothening constant) in exponential smoothening method is _____.
a) Between -1 to +1 b) between 0 to 1
c) Between -2 to +2 d) can't be defined

3) JIT is targeted for _____.
a) Average inventory b) zero inventory
c) high inventory d) none of these

4) The length of time between placing an order & receipt of material is ____.
a) order time b) lead time
c) cycle time d) none

5) Comparing actual production output with production schedule reporting deviation is _____.
a) capacity planning b) forecasting
c) inventory management d) None

6) The control tool that keeps a close observation on the progress of the work is _____.
a) Routing b) Expediting
c) Dispatching d) none

7) The process of setting production activities in motion through release of orders & instructions is _____.

a) Dispatching b) Routing
c) Loading d) none

8) Preparation of machine loads & fixation of starting & completion dates for each of operation is _____.

a) Estimating b) Routing
c) Scheduling d) none

9) Condition Based Maintenance is used in _____ maintenance.

a) Breakdown b) Preventive
c) Predictive d) none of these

10) Penalty cost is included in _____

a) shortage cost b) ordering cost
c) holding cost d) none

11) In ABC Analysis, A items require _____

a) No safety stock b) low safety stock
c) moderate safety stock d) none

12) Which of these uses historical data for forecasting?

a) Associative models b) Time series forecasts
c) Judgmental forecast d) none

13) The word KANBAN is most appropriately associated with _____.

a) EOQ b) JIT
c) Capacity planning d) product design

14) Bill of Material does not consist of _____.

a) Part number b) Specification of part
c) Name of Part d) Price of Part

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Slove any two questions from each Section.
2) Draw neat sketches wherever necessary.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 **a)** Define Manufacturing System. Explain classification of Manufacturing systems with one example of each. **07**

b) Discuss in detail procedure for Capacity Planning with block diagram. **07**

Q.3 **a)** What is forecasting? Explain in brief need of forecasting & also state various types of forecasting. **07**

b) The past data regarding the sales of a company for last five years is given. Using the least square method, fit a straight line, Estimate the sales for year 1996 & 1997. **07**

Year	1991	1992	1993	1994	1994
Sales('00)	35	56	79	80	40

Q.4 **a)** Discuss the objectives & Explain the functions of PPC in detail. **07**

b) Explain the objectives & scope of production & operations management in detail. **07**

Section – II

Q.5 **a)** A manufacturer has to supply his customers 3600 units of his product per year. Shortages are not permitted. Inventory carrying cost amounts Rs 1.2 per unit per annum. The set up cost is Rs 80. Find

i) EOQ **03**
ii) Optimum number of orders per annum **02**
iii) Average Annual Inventory cost **02**

b) Give in detail classification of Inventory models. Explain in detail EOQ Model with derivation. **07**

Q.6 **a)** Explain preventive maintenance & its benefits. **05**

b) Explain the need & objectives of Plant maintenance. **05**

c) Discuss in detail the working of KANBAN system. **04**

Q.7	**a)**	Explain the phases of Value Analysis.	**05**
	b)	Explain the concept of Six sigma in detail.	**05**
	c)	Write a short note on Just In Time concept.	**04**

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer **14**

1) Preparation of machine loads & fixation of starting & completion dates for each of operation is _____.
a) Estimating b) Routing
c) Scheduling d) none

2) Condition Based Maintenance is used in _____ maintenance.
a) Breakdown b) Preventive
c) Predictive d) none of these

3) Penalty cost is included in _____
a) shortage cost b) ordering cost
c) holding cost d) none

4) In ABC Analysis, A items require _____
a) No safety stock b) low safety stock
c) moderate safety stock d) none

5) Which of these uses historical data for forecasting?
a) Associative models b) Time series forecasts
c) Judgmental forecast d) none

6) The word KANBAN is most appropriately associated with _____.
a) EOQ b) JIT
c) Capacity planning d) product design

7) Bill of Material does not consist of _____.
a) Part number b) Specification of part
c) Name of Part d) Price of Part

8) When ordering cost is increased to 4 times, the EOQ will be increased to _____

a) 2 times b) 3 times
c) 8 times d) 4 times

9) The value of α (smoothening constant) in exponential smoothening method is _____.

a) Between -1 to +1 b) between 0 to 1
c) Between -2 to +2 d) can't be defined

10) JIT is targeted for _____.

a) Average inventory b) zero inventory
c) high inventory d) none of these

11) The length of time between placing an order & receipt of material is ____.

a) order time b) lead time
c) cycle time d) none

12) Comparing actual production output with production schedule reporting deviation is _____.

a) capacity planning b) forecasting
c) inventory management d) None

13) The control tool that keeps a close observation on the progress of the work is _____.

a) Routing b) Expediting
c) Dispatching d) none

14) The process of setting production activities in motion through release of orders & instructions is _____.

a) Dispatching b) Routing
c) Loading d) none

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Slove any two questions from each Section.
2) Draw neat sketches wherever necessary.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 **a)** Define Manufacturing System. Explain classification of Manufacturing systems with one example of each. **07**

b) Discuss in detail procedure for Capacity Planning with block diagram. **07**

Q.3 **a)** What is forecasting? Explain in brief need of forecasting & also state various types of forecasting. **07**

b) The past data regarding the sales of a company for last five years is given. Using the least square method, fit a straight line, Estimate the sales for year 1996 & 1997. **07**

Year	1991	1992	1993	1994	1994
Sales('00)	35	56	79	80	40

Q.4 **a)** Discuss the objectives & Explain the functions of PPC in detail. **07**

b) Explain the objectives & scope of production & operations management in detail. **07**

Section – II

Q.5 **a)** A manufacturer has to supply his customers 3600 units of his product per year. Shortages are not permitted. Inventory carrying cost amounts Rs 1.2 per unit per annum. The set up cost is Rs 80. Find

i) EOQ **03**
ii) Optimum number of orders per annum **02**
iii) Average Annual Inventory cost **02**

b) Give in detail classification of Inventory models. Explain in detail EOQ Model with derivation. **07**

Q.6 **a)** Explain preventive maintenance & its benefits. **05**

b) Explain the need & objectives of Plant maintenance. **05**

c) Discuss in detail the working of KANBAN system. **04**

Q.7	**a)**	Explain the phases of Value Analysis.	**05**
	b)	Explain the concept of Six sigma in detail.	**05**
	c)	Write a short note on Just In Time concept.	**04**

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer **14**

1) In ABC Analysis, A items require _____
a) No safety stock b) low safety stock
c) moderate safety stock d) none

2) Which of these uses historical data for forecasting?
a) Associative models b) Time series forecasts
c) Judgmental forecast d) none

3) The word KANBAN is most appropriately associated with _____.
a) EOQ b) JIT
c) Capacity planning d) product design

4) Bill of Material does not consist of _____.
a) Part number b) Specification of part
c) Name of Part d) Price of Part

5) When ordering cost is increased to 4 times, the EOQ will be increased to _____
a) 2 times b) 3 times
c) 8 times d) 4 times

6) The value of α (smoothening constant) in exponential smoothening method is _____.
a) Between -1 to +1 b) between 0 to 1
c) Between -2 to +2 d) can't be defined

7) JIT is targeted for _____.
a) Average inventory b) zero inventory
c) high inventory d) none of these

8) The length of time between placing an order & receipt of material is ____.
a) order time b) lead time
c) cycle time d) none

9) Comparing actual production output with production schedule reporting deviation is _____.
a) capacity planning b) forecasting
c) inventory management d) None

10) The control tool that keeps a close observation on the progress of the work is _____.
a) Routing b) Expediting
c) Dispatching d) none

11) The process of setting production activities in motion through release of orders & instructions is _____.
a) Dispatching b) Routing
c) Loading d) none

12) Preparation of machine loads & fixation of starting & completion dates for each of operation is _____.
a) Estimating b) Routing
c) Scheduling d) none

13) Condition Based Maintenance is used in _____ maintenance.
a) Breakdown b) Preventive
c) Predictive d) none of these

14) Penalty cost is included in _____
a) shortage cost b) ordering cost
c) holding cost d) none

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Slove any two questions from each Section.
2) Draw neat sketches wherever necessary.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 **a)** Define Manufacturing System. Explain classification of Manufacturing systems with one example of each. **07**

b) Discuss in detail procedure for Capacity Planning with block diagram. **07**

Q.3 **a)** What is forecasting? Explain in brief need of forecasting & also state various types of forecasting. **07**

b) The past data regarding the sales of a company for last five years is given. Using the least square method, fit a straight line, Estimate the sales for year 1996 & 1997. **07**

Year	1991	1992	1993	1994	1994
Sales('00)	35	56	79	80	40

Q.4 **a)** Discuss the objectives & Explain the functions of PPC in detail. **07**

b) Explain the objectives & scope of production & operations management in detail. **07**

Section – II

Q.5 **a)** A manufacturer has to supply his customers 3600 units of his product per year. Shortages are not permitted. Inventory carrying cost amounts Rs 1.2 per unit per annum. The set up cost is Rs 80. Find

i) EOQ **03**
ii) Optimum number of orders per annum **02**
iii) Average Annual Inventory cost **02**

b) Give in detail classification of Inventory models. Explain in detail EOQ Model with derivation. **07**

Q.6 **a)** Explain preventive maintenance & its benefits. **05**

b) Explain the need & objectives of Plant maintenance. **05**

c) Discuss in detail the working of KANBAN system. **04**

Q.7	**a)**	Explain the phases of Value Analysis.	**05**
	b)	Explain the concept of Six sigma in detail.	**05**
	c)	Write a short note on Just In Time concept.	**04**

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer **14**

1) The control tool that keeps a close observation on the progress of the work is _____.
a) Routing b) Expediting
c) Dispatching d) none

2) The process of setting production activities in motion through release of orders & instructions is _____.
a) Dispatching b) Routing
c) Loading d) none

3) Preparation of machine loads & fixation of starting & completion dates for each of operation is _____.
a) Estimating b) Routing
c) Scheduling d) none

4) Condition Based Maintenance is used in _____ maintenance.
a) Breakdown b) Preventive
c) Predictive d) none of these

5) Penalty cost is included in _____
a) shortage cost b) ordering cost
c) holding cost d) none

6) In ABC Analysis, A items require _____
a) No safety stock b) low safety stock
c) moderate safety stock d) none

7) Which of these uses historical data for forecasting?
a) Associative models b) Time series forecasts
c) Judgmental forecast d) none

8) The word KANBAN is most appropriately associated with _____.
a) EOQ b) JIT
c) Capacity planning d) product design

9) Bill of Material does not consist of _____.
a) Part number b) Specification of part
c) Name of Part d) Price of Part

10) When ordering cost is increased to 4 times, the EOQ will be increased to _____
a) 2 times b) 3 times
c) 8 times d) 4 times

11) The value of α (smoothening constant) in exponential smoothening method is _____.
a) Between -1 to +1 b) between 0 to 1
c) Between -2 to +2 d) can't be defined

12) JIT is targeted for _____.
a) Average inventory b) zero inventory
c) high inventory d) none of these

13) The length of time between placing an order & receipt of material is ____.
a) order time b) lead time
c) cycle time d) none

14) Comparing actual production output with production schedule reporting deviation is _____.
a) capacity planning b) forecasting
c) inventory management d) None

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Slove any two questions from each Section.
2) Draw neat sketches wherever necessary.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 **a)** Define Manufacturing System. Explain classification of Manufacturing systems with one example of each. **07**

b) Discuss in detail procedure for Capacity Planning with block diagram. **07**

Q.3 **a)** What is forecasting? Explain in brief need of forecasting & also state various types of forecasting. **07**

b) The past data regarding the sales of a company for last five years is given. Using the least square method, fit a straight line, Estimate the sales for year 1996 & 1997. **07**

Year	1991	1992	1993	1994	1994
Sales('00)	35	56	79	80	40

Q.4 **a)** Discuss the objectives & Explain the functions of PPC in detail. **07**

b) Explain the objectives & scope of production & operations management in detail. **07**

Section – II

Q.5 **a)** A manufacturer has to supply his customers 3600 units of his product per year. Shortages are not permitted. Inventory carrying cost amounts Rs 1.2 per unit per annum. The set up cost is Rs 80. Find

i) EOQ **03**
ii) Optimum number of orders per annum **02**
iii) Average Annual Inventory cost **02**

b) Give in detail classification of Inventory models. Explain in detail EOQ Model with derivation. **07**

Q.6 **a)** Explain preventive maintenance & its benefits. **05**

b) Explain the need & objectives of Plant maintenance. **05**

c) Discuss in detail the working of KANBAN system. **04**

Q.7	**a)**	Explain the phases of Value Analysis.	**05**
	b)	Explain the concept of Six sigma in detail.	**05**
	c)	Write a short note on Just In Time concept.	**04**

SLR-BD-102

Seat No.		Set	P

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer **14**

1) When ordering cost is increased to 4 times, the EOQ will be increased to _____
a) 2 times b) 3 times
c) 8 times d) 4 times

2) The value of α (smoothening constant) in exponential smoothening method is _____.
a) Between -1 to +1 b) between 0 to 1
c) Between -2 to +2 d) can't be defined

3) JIT is targeted for _____.
a) Average inventory b) zero inventory
c) high inventory d) none of these

4) The length of time between placing an order & receipt of material is ____.
a) order time b) lead time
c) cycle time d) none

5) Comparing actual production output with production schedule reporting deviation is _____.
a) capacity planning b) forecasting
c) inventory management d) None

6) The control tool that keeps a close observation on the progress of the work is _____.
a) Routing b) Expediting
c) Dispatching d) none

7) The process of setting production activities in motion through release of orders & instructions is _____.

a) Dispatching b) Routing
c) Loading d) none

8) Preparation of machine loads & fixation of starting & completion dates for each of operation is _____.

a) Estimating b) Routing
c) Scheduling d) none

9) Condition Based Maintenance is used in _____ maintenance.

a) Breakdown b) Preventive
c) Predictive d) none of these

10) Penalty cost is included in _____

a) shortage cost b) ordering cost
c) holding cost d) none

11) In ABC Analysis, A items require _____

a) No safety stock b) low safety stock
c) moderate safety stock d) none

12) Which of these uses historical data for forecasting?

a) Associative models b) Time series forecasts
c) Judgmental forecast d) none

13) The word KANBAN is most appropriately associated with _____.

a) EOQ b) JIT
c) Capacity planning d) product design

14) Bill of Material does not consist of _____.

a) Part number b) Specification of part
c) Name of Part d) Price of Part

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Slove any two questions from each Section.
2) Draw neat sketches wherever necessary.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 a) Define Manufacturing System. Explain classification of Manufacturing systems with one example of each. **07**

b) Discuss in detail procedure for Capacity Planning with block diagram. **07**

Q.3 a) What is forecasting? Explain in brief need of forecasting & also state various types of forecasting. **07**

b) The past data regarding the sales of a company for last five years is given. Using the least square method, fit a straight line, Estimate the sales for year 1996 & 1997. **07**

Year	1991	1992	1993	1994	1994
Sales('00)	35	56	79	80	40

Q.4 a) Discuss the objectives & Explain the functions of PPC in detail. **07**

b) Explain the objectives & scope of production & operations management in detail. **07**

Section – II

Q.5 a) A manufacturer has to supply his customers 3600 units of his product per year. Shortages are not permitted. Inventory carrying cost amounts Rs 1.2 per unit per annum. The set up cost is Rs 80. Find

i) EOQ **03**
ii) Optimum number of orders per annum **02**
iii) Average Annual Inventory cost **02**

b) Give in detail classification of Inventory models. Explain in detail EOQ Model with derivation. **07**

Q.6 a) Explain preventive maintenance & its benefits. **05**

b) Explain the need & objectives of Plant maintenance. **05**

c) Discuss in detail the working of KANBAN system. **04**

Q.7	**a)**	Explain the phases of Value Analysis.	**05**
	b)	Explain the concept of Six sigma in detail.	**05**
	c)	Write a short note on Just In Time concept.	**04**

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer **14**

1) Preparation of machine loads & fixation of starting & completion dates for each of operation is _____.
a) Estimating b) Routing
c) Scheduling d) none

2) Condition Based Maintenance is used in _____ maintenance.
a) Breakdown b) Preventive
c) Predictive d) none of these

3) Penalty cost is included in _____
a) shortage cost b) ordering cost
c) holding cost d) none

4) In ABC Analysis, A items require _____
a) No safety stock b) low safety stock
c) moderate safety stock d) none

5) Which of these uses historical data for forecasting?
a) Associative models b) Time series forecasts
c) Judgmental forecast d) none

6) The word KANBAN is most appropriately associated with _____.
a) EOQ b) JIT
c) Capacity planning d) product design

7) Bill of Material does not consist of _____.
a) Part number b) Specification of part
c) Name of Part d) Price of Part

8) When ordering cost is increased to 4 times, the EOQ will be increased to _____

a) 2 times b) 3 times
c) 8 times d) 4 times

9) The value of α (smoothening constant) in exponential smoothening method is _____.

a) Between -1 to +1 b) between 0 to 1
c) Between -2 to +2 d) can't be defined

10) JIT is targeted for _____.

a) Average inventory b) zero inventory
c) high inventory d) none of these

11) The length of time between placing an order & receipt of material is ____.

a) order time b) lead time
c) cycle time d) none

12) Comparing actual production output with production schedule reporting deviation is _____.

a) capacity planning b) forecasting
c) inventory management d) None

13) The control tool that keeps a close observation on the progress of the work is _____.

a) Routing b) Expediting
c) Dispatching d) none

14) The process of setting production activities in motion through release of orders & instructions is _____.

a) Dispatching b) Routing
c) Loading d) none

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Slove any two questions from each Section.
2) Draw neat sketches wherever necessary.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 **a)** Define Manufacturing System. Explain classification of Manufacturing systems with one example of each. **07**

b) Discuss in detail procedure for Capacity Planning with block diagram. **07**

Q.3 **a)** What is forecasting? Explain in brief need of forecasting & also state various types of forecasting. **07**

b) The past data regarding the sales of a company for last five years is given. Using the least square method, fit a straight line, Estimate the sales for year 1996 & 1997. **07**

Year	1991	1992	1993	1994	1994
Sales('00)	35	56	79	80	40

Q.4 **a)** Discuss the objectives & Explain the functions of PPC in detail. **07**

b) Explain the objectives & scope of production & operations management in detail. **07**

Section – II

Q.5 **a)** A manufacturer has to supply his customers 3600 units of his product per year. Shortages are not permitted. Inventory carrying cost amounts Rs 1.2 per unit per annum. The set up cost is Rs 80. Find

i) EOQ **03**
ii) Optimum number of orders per annum **02**
iii) Average Annual Inventory cost **02**

b) Give in detail classification of Inventory models. Explain in detail EOQ Model with derivation. **07**

Q.6 **a)** Explain preventive maintenance & its benefits. **05**

b) Explain the need & objectives of Plant maintenance. **05**

c) Discuss in detail the working of KANBAN system. **04**

Q.7	**a)**	Explain the phases of Value Analysis.	**05**
	b)	Explain the concept of Six sigma in detail.	**05**
	c)	Write a short note on Just In Time concept.	**04**

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer **14**

1) In ABC Analysis, A items require _____
a) No safety stock b) low safety stock
c) moderate safety stock d) none

2) Which of these uses historical data for forecasting?
a) Associative models b) Time series forecasts
c) Judgmental forecast d) none

3) The word KANBAN is most appropriately associated with _____.
a) EOQ b) JIT
c) Capacity planning d) product design

4) Bill of Material does not consist of _____.
a) Part number b) Specification of part
c) Name of Part d) Price of Part

5) When ordering cost is increased to 4 times, the EOQ will be increased to _____
a) 2 times b) 3 times
c) 8 times d) 4 times

6) The value of α (smoothening constant) in exponential smoothening method is _____.
a) Between -1 to +1 b) between 0 to 1
c) Between -2 to +2 d) can't be defined

7) JIT is targeted for _____.
a) Average inventory b) zero inventory
c) high inventory d) none of these

8) The length of time between placing an order & receipt of material is ____.
a) order time b) lead time
c) cycle time d) none

9) Comparing actual production output with production schedule reporting deviation is _____.
a) capacity planning b) forecasting
c) inventory management d) None

10) The control tool that keeps a close observation on the progress of the work is _____.
a) Routing b) Expediting
c) Dispatching d) none

11) The process of setting production activities in motion through release of orders & instructions is _____.
a) Dispatching b) Routing
c) Loading d) none

12) Preparation of machine loads & fixation of starting & completion dates for each of operation is _____.
a) Estimating b) Routing
c) Scheduling d) none

13) Condition Based Maintenance is used in _____ maintenance.
a) Breakdown b) Preventive
c) Predictive d) none of these

14) Penalty cost is included in _____
a) shortage cost b) ordering cost
c) holding cost d) none

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Slove any two questions from each Section.
2) Draw neat sketches wherever necessary.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 a) Define Manufacturing System. Explain classification of Manufacturing systems with one example of each. **07**

b) Discuss in detail procedure for Capacity Planning with block diagram. **07**

Q.3 a) What is forecasting? Explain in brief need of forecasting & also state various types of forecasting. **07**

b) The past data regarding the sales of a company for last five years is given. Using the least square method, fit a straight line, Estimate the sales for year 1996 & 1997. **07**

Year	1991	1992	1993	1994	1994
Sales('00)	35	56	79	80	40

Q.4 a) Discuss the objectives & Explain the functions of PPC in detail. **07**

b) Explain the objectives & scope of production & operations management in detail. **07**

Section – II

Q.5 a) A manufacturer has to supply his customers 3600 units of his product per year. Shortages are not permitted. Inventory carrying cost amounts Rs 1.2 per unit per annum. The set up cost is Rs 80. Find

i) EOQ **03**
ii) Optimum number of orders per annum **02**
iii) Average Annual Inventory cost **02**

b) Give in detail classification of Inventory models. Explain in detail EOQ Model with derivation. **07**

Q.6 a) Explain preventive maintenance & its benefits. **05**

b) Explain the need & objectives of Plant maintenance. **05**

c) Discuss in detail the working of KANBAN system. **04**

Q.7	**a)**	Explain the phases of Value Analysis.	**05**
	b)	Explain the concept of Six sigma in detail.	**05**
	c)	Write a short note on Just In Time concept.	**04**

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer **14**

1) The control tool that keeps a close observation on the progress of the work is _____.
a) Routing b) Expediting
c) Dispatching d) none

2) The process of setting production activities in motion through release of orders & instructions is _____.
a) Dispatching b) Routing
c) Loading d) none

3) Preparation of machine loads & fixation of starting & completion dates for each of operation is _____.
a) Estimating b) Routing
c) Scheduling d) none

4) Condition Based Maintenance is used in _____ maintenance.
a) Breakdown b) Preventive
c) Predictive d) none of these

5) Penalty cost is included in _____
a) shortage cost b) ordering cost
c) holding cost d) none

6) In ABC Analysis, A items require _____
a) No safety stock b) low safety stock
c) moderate safety stock d) none

7) Which of these uses historical data for forecasting?
a) Associative models b) Time series forecasts
c) Judgmental forecast d) none

8) The word KANBAN is most appropriately associated with _____.
a) EOQ b) JIT
c) Capacity planning d) product design

9) Bill of Material does not consist of _____.
a) Part number b) Specification of part
c) Name of Part d) Price of Part

10) When ordering cost is increased to 4 times, the EOQ will be increased to _____
a) 2 times b) 3 times
c) 8 times d) 4 times

11) The value of α (smoothening constant) in exponential smoothening method is _____.
a) Between -1 to +1 b) between 0 to 1
c) Between -2 to +2 d) can't be defined

12) JIT is targeted for _____.
a) Average inventory b) zero inventory
c) high inventory d) none of these

13) The length of time between placing an order & receipt of material is ____.
a) order time b) lead time
c) cycle time d) none

14) Comparing actual production output with production schedule reporting deviation is _____.
a) capacity planning b) forecasting
c) inventory management d) None

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Production and Operation Management (MECHMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Slove any two questions from each Section.
2) Draw neat sketches wherever necessary.
3) Figures to the right indicate full marks.
4) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 a) Define Manufacturing System. Explain classification of Manufacturing systems with one example of each. **07**

b) Discuss in detail procedure for Capacity Planning with block diagram. **07**

Q.3 a) What is forecasting? Explain in brief need of forecasting & also state various types of forecasting. **07**

b) The past data regarding the sales of a company for last five years is given. Using the least square method, fit a straight line, Estimate the sales for year 1996 & 1997. **07**

Year	1991	1992	1993	1994	1994
Sales('00)	35	56	79	80	40

Q.4 a) Discuss the objectives & Explain the functions of PPC in detail. **07**

b) Explain the objectives & scope of production & operations management in detail. **07**

Section – II

Q.5 a) A manufacturer has to supply his customers 3600 units of his product per year. Shortages are not permitted. Inventory carrying cost amounts Rs 1.2 per unit per annum. The set up cost is Rs 80. Find

i) EOQ **03**
ii) Optimum number of orders per annum **02**
iii) Average Annual Inventory cost **02**

b) Give in detail classification of Inventory models. Explain in detail EOQ Model with derivation. **07**

Q.6 a) Explain preventive maintenance & its benefits. **05**

b) Explain the need & objectives of Plant maintenance. **05**

c) Discuss in detail the working of KANBAN system. **04**

Q.7	**a)**	Explain the phases of Value Analysis.	**05**
	b)	Explain the concept of Six sigma in detail.	**05**
	c)	Write a short note on Just In Time concept.	**04**

Seat No.		Set	P

S.Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to Electric and Hybrid Vehicles (MechHon-02B)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Electric motor ratings arc typically specified in: ____.
a) Liters b) Miles per hour (mph)
c) Kilowatts (kW) d) Pounds

2) Volumetric energy density is the measure of: ____.
a) The speed of the vehicle
b) The weight of the battery
c) Energy stored per unit volume of a battery
d) Fuel efficiency

3) Swapped batteries in electric vehicles are used to: ____.
a) Allow for quick battery replacement and extend range
b) Reduce vehicle weight
c) Charge the vehicle at a slower rate
d) Increase motor efficiency

4) Tractive effort in electric vehicles is primarily responsible for: ____.
a) Fuel consumption b) Engine temperature
c) Propelling the vehicle forward d) Charging the battery

5) The performance of an electric vehicle is typically evaluated based on ____.
b) Noise levels b) Acceleration and top speed
c) Efficiency and range d) Vehicle size

6) Tractive effort in electric vehicles is primarily determined by: ____.
a) The motor torque and wheel size
b) The battery voltage
c) The color of the vehicle
d) The number of passengers

7) What is the main principle of operation of a DC motor?
a) Magnetic fields create a rotating magnetic field in the stator
b) Current-carrying conductors in a magnetic field experience a force
c) Current is induced in the rotor
d) The rotor creates a constant magnetic field

8) The rotor of a DC motor is connected to the: ____.
a) Stator b) Bearings
c) Armature d) Capacitor

9) In a synchronous motor, the rotor: ____.
a) Always moves at a speed slower than the synchronous speed
b) Rotates at the same speed as the magnetic field generated by the stator
c) Is completely independent of the stator's magnetic field
d) Is not necessary for operation

10) A chopper is used for: ____.
a) Converting DC to AC b) Converting DC voltage levels
c) Controlling motor speed d) Filtering high-frequency signals

11) An inverter is used to: ____.
a) Convert AC to DC b) Convert DC to AC
c) Increase the motor torque d) Control motor speed

12) A drive cycle is used to: ____.
a) Measure the efficiency of an internal combustion engine
b) Simulate vehicle conditions for testing energy consumption and emissions
c) Represent typical vehicle usage patterns for energy efficiency testing
d) Control the acceleration of electric vehicles

13) Regeneration efficiency in electric vehicles refers to: ____.
a) The effectiveness with which the vehicle converts braking energy into stored energy
b) The amount of energy used for acceleration
c) The amount of energy consumed during idling
d) The amount of energy lost in the motor

14) The traction energy for a drive cycle refers to: ____.
a) Energy used by the vehicle's accessories
b) The energy required to move the vehicle forward
c) Energy consumed during idle periods
d) Energy used in accelerating to top speed

Seat No.	

Set P

S.Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to Electric and Hybrid Vehicles (MechHon-02B)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicate full marks.

Section – I

Q.2	**a)**	What are the major components of an electric vehicle? Explain their functions.	**05**
	b)	Discuss the current market trends for electric vehicles globally and in India.	**05**
	c)	Explain the historical development of electric vehicles from the 19th century to the present day.	**04**
Q.3	**a)**	What are the different configurations of electric vehicles?	**05**
	b)	Define tractive effort and discuss its role in vehicle performance.	**05**
	c)	How does regenerative braking help in improving energy efficiency?	**04**
Q.4	**a)**	What are the key differences between series and parallel hybrid electric drive trains?	**05**
	b)	What is the significance of plug-in hybrid electric vehicles (PHEVs)?	**05**
	c)	What are the major components of an HEV powertrain?	**04**

Section – II

Q.5	**a)**	Explain the basic construction and working principle of a DC motor.	**05**
	b)	Explain the role of permanent magnets in BLDC and synchronous motors.	**05**
	c)	Discuss the construction and working principle of a Switch Reluctance Motor (SRM).	**04**
Q.6	**a)**	What is a chopper circuit? Explain its role in DC motor control.	**05**
	b)	What is a Variable Frequency Drive (VFD)? How does it control AC motor speed?	**05**
	c)	Describe the working of an inverter and its applications.	**04**
Q.7	**a)**	Explain how energy efficiency is measured in electric vehicle drive cycles.	**05**
	b)	What are the characteristics of the Indian Drive Cycle (IDC)?	**05**
	c)	Describe the energy consumption characteristics of an Electric Compact Sedan.	**04**

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to Electric and Hybrid Vehicles (MechHon-02B)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The rotor of a DC motor is connected to the: ____.
a) Stator b) Bearings
c) Armature d) Capacitor

2) In a synchronous motor, the rotor: ____.
a) Always moves at a speed slower than the synchronous speed
b) Rotates at the same speed as the magnetic field generated by the stator
c) Is completely independent of the stator's magnetic field
d) Is not necessary for operation

3) A chopper is used for: ____.
a) Converting DC to AC b) Converting DC voltage levels
c) Controlling motor speed d) Filtering high-frequency signals

4) An inverter is used to: ____.
a) Convert AC to DC b) Convert DC to AC
c) Increase the motor torque d) Control motor speed

5) A drive cycle is used to: ____.
a) Measure the efficiency of an internal combustion engine
b) Simulate vehicle conditions for testing energy consumption and emissions
c) Represent typical vehicle usage patterns for energy efficiency testing
d) Control the acceleration of electric vehicles

6) Regeneration efficiency in electric vehicles refers to: ____.
a) The effectiveness with which the vehicle converts braking energy into stored energy
b) The amount of energy used for acceleration
c) The amount of energy consumed during idling
d) The amount of energy lost in the motor

7) The traction energy for a drive cycle refers to: ____.
a) Energy used by the vehicle's accessories
b) The energy required to move the vehicle forward
c) Energy consumed during idle periods
d) Energy used in accelerating to top speed

8) Electric motor ratings arc typically specified in: ____.
a) Liters
b) Miles per hour (mph)
c) Kilowatts (kW)
d) Pounds

9) Volumetric energy density is the measure of: ____.
a) The speed of the vehicle
b) The weight of the battery
c) Energy stored per unit volume of a battery
d) Fuel efficiency

10) Swapped batteries in electric vehicles are used to: ____.
a) Allow for quick battery replacement and extend range
b) Reduce vehicle weight
c) Charge the vehicle at a slower rate
d) Increase motor efficiency

11) Tractive effort in electric vehicles is primarily responsible for: ____.
a) Fuel consumption
b) Engine temperature
c) Propelling the vehicle forward
d) Charging the battery

12) The performance of an electric vehicle is typically evaluated based on ____.
b) Noise levels
b) Acceleration and top speed
c) Efficiency and range
d) Vehicle size

13) Tractive effort in electric vehicles is primarily determined by: ____.
a) The motor torque and wheel size
b) The battery voltage
c) The color of the vehicle
d) The number of passengers

14) What is the main principle of operation of a DC motor?
a) Magnetic fields create a rotating magnetic field in the stator
b) Current-carrying conductors in a magnetic field experience a force
c) Current is induced in the rotor
d) The rotor creates a constant magnetic field

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to Electric and Hybrid Vehicles (MechHon-02B)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicate full marks.

Section – I

Q.2	**a)**	What are the major components of an electric vehicle? Explain their functions.	**05**
	b)	Discuss the current market trends for electric vehicles globally and in India.	**05**
	c)	Explain the historical development of electric vehicles from the 19th century to the present day.	**04**
Q.3	**a)**	What are the different configurations of electric vehicles?	**05**
	b)	Define tractive effort and discuss its role in vehicle performance.	**05**
	c)	How does regenerative braking help in improving energy efficiency?	**04**
Q.4	**a)**	What are the key differences between series and parallel hybrid electric drive trains?	**05**
	b)	What is the significance of plug-in hybrid electric vehicles (PHEVs)?	**05**
	c)	What are the major components of an HEV powertrain?	**04**

Section – II

Q.5	**a)**	Explain the basic construction and working principle of a DC motor.	**05**
	b)	Explain the role of permanent magnets in BLDC and synchronous motors.	**05**
	c)	Discuss the construction and working principle of a Switch Reluctance Motor (SRM).	**04**
Q.6	**a)**	What is a chopper circuit? Explain its role in DC motor control.	**05**
	b)	What is a Variable Frequency Drive (VFD)? How does it control AC motor speed?	**05**
	c)	Describe the working of an inverter and its applications.	**04**
Q.7	**a)**	Explain how energy efficiency is measured in electric vehicle drive cycles.	**05**
	b)	What are the characteristics of the Indian Drive Cycle (IDC)?	**05**
	c)	Describe the energy consumption characteristics of an Electric Compact Sedan.	**04**

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to Electric and Hybrid Vehicles (MechHon-02B)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) An inverter is used to: ____.
a) Convert AC to DC b) Convert DC to AC
c) Increase the motor torque d) Control motor speed

2) A drive cycle is used to: ____.
a) Measure the efficiency of an internal combustion engine
b) Simulate vehicle conditions for testing energy consumption and emissions
c) Represent typical vehicle usage patterns for energy efficiency testing
d) Control the acceleration of electric vehicles

3) Regeneration efficiency in electric vehicles refers to: ____.
a) The effectiveness with which the vehicle converts braking energy into stored energy
b) The amount of energy used for acceleration
c) The amount of energy consumed during idling
d) The amount of energy lost in the motor

4) The traction energy for a drive cycle refers to: ____.
a) Energy used by the vehicle's accessories
b) The energy required to move the vehicle forward
c) Energy consumed during idle periods
d) Energy used in accelerating to top speed

5) Electric motor ratings arc typically specified in: ____.
a) Liters b) Miles per hour (mph)
c) Kilowatts (kW) d) Pounds

6) Volumetric energy density is the measure of: ____.
a) The speed of the vehicle
b) The weight of the battery
c) Energy stored per unit volume of a battery
d) Fuel efficiency

7) Swapped batteries in electric vehicles are used to: ____.
a) Allow for quick battery replacement and extend range
b) Reduce vehicle weight
c) Charge the vehicle at a slower rate
d) Increase motor efficiency

8) Tractive effort in electric vehicles is primarily responsible for: ____.
a) Fuel consumption
b) Engine temperature
c) Propelling the vehicle forward
d) Charging the battery

9) The performance of an electric vehicle is typically evaluated based on ____.
b) Noise levels
b) Acceleration and top speed
c) Efficiency and range
d) Vehicle size

10) Tractive effort in electric vehicles is primarily determined by: ____.
a) The motor torque and wheel size
b) The battery voltage
c) The color of the vehicle
d) The number of passengers

11) What is the main principle of operation of a DC motor?
a) Magnetic fields create a rotating magnetic field in the stator
b) Current-carrying conductors in a magnetic field experience a force
c) Current is induced in the rotor
d) The rotor creates a constant magnetic field

12) The rotor of a DC motor is connected to the: ____.
a) Stator
b) Bearings
c) Armature
d) Capacitor

13) In a synchronous motor, the rotor: ____.
a) Always moves at a speed slower than the synchronous speed
b) Rotates at the same speed as the magnetic field generated by the stator
c) Is completely independent of the stator's magnetic field
d) Is not necessary for operation

14) A chopper is used for: ____.
a) Converting DC to AC
b) Converting DC voltage levels
c) Controlling motor speed
d) Filtering high-frequency signals

Seat No.	

Set R

S.Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to Electric and Hybrid Vehicles (MechHon-02B)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicate full marks.

Section – I

Q.2	**a)**	What are the major components of an electric vehicle? Explain their functions.	**05**
	b)	Discuss the current market trends for electric vehicles globally and in India.	**05**
	c)	Explain the historical development of electric vehicles from the 19th century to the present day.	**04**
Q.3	**a)**	What are the different configurations of electric vehicles?	**05**
	b)	Define tractive effort and discuss its role in vehicle performance.	**05**
	c)	How does regenerative braking help in improving energy efficiency?	**04**
Q.4	**a)**	What are the key differences between series and parallel hybrid electric drive trains?	**05**
	b)	What is the significance of plug-in hybrid electric vehicles (PHEVs)?	**05**
	c)	What are the major components of an HEV powertrain?	**04**

Section – II

Q.5	**a)**	Explain the basic construction and working principle of a DC motor.	**05**
	b)	Explain the role of permanent magnets in BLDC and synchronous motors.	**05**
	c)	Discuss the construction and working principle of a Switch Reluctance Motor (SRM).	**04**
Q.6	**a)**	What is a chopper circuit? Explain its role in DC motor control.	**05**
	b)	What is a Variable Frequency Drive (VFD)? How does it control AC motor speed?	**05**
	c)	Describe the working of an inverter and its applications.	**04**
Q.7	**a)**	Explain how energy efficiency is measured in electric vehicle drive cycles.	**05**
	b)	What are the characteristics of the Indian Drive Cycle (IDC)?	**05**
	c)	Describe the energy consumption characteristics of an Electric Compact Sedan.	**04**

Seat No.	

Set **S**

S.Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to Electric and Hybrid Vehicles (MechHon-02B)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Tractive effort in electric vehicles is primarily determined by: ____.
a) The motor torque and wheel size
b) The battery voltage
c) The color of the vehicle
d) The number of passengers

2) What is the main principle of operation of a DC motor?
a) Magnetic fields create a rotating magnetic field in the stator
b) Current-carrying conductors in a magnetic field experience a force
c) Current is induced in the rotor
d) The rotor creates a constant magnetic field

3) The rotor of a DC motor is connected to the: ____.
a) Stator b) Bearings
c) Armature d) Capacitor

4) In a synchronous motor, the rotor: ____.
a) Always moves at a speed slower than the synchronous speed
b) Rotates at the same speed as the magnetic field generated by the stator
c) Is completely independent of the stator's magnetic field
d) Is not necessary for operation

5) A chopper is used for: ____.
a) Converting DC to AC b) Converting DC voltage levels
c) Controlling motor speed d) Filtering high-frequency signals

6) An inverter is used to: ____.
a) Convert AC to DC b) Convert DC to AC
c) Increase the motor torque d) Control motor speed

7) A drive cycle is used to: ____.
- a) Measure the efficiency of an internal combustion engine
- b) Simulate vehicle conditions for testing energy consumption and emissions
- c) Represent typical vehicle usage patterns for energy efficiency testing
- d) Control the acceleration of electric vehicles

8) Regeneration efficiency in electric vehicles refers to: ____.
- a) The effectiveness with which the vehicle converts braking energy into stored energy
- b) The amount of energy used for acceleration
- c) The amount of energy consumed during idling
- d) The amount of energy lost in the motor

9) The traction energy for a drive cycle refers to: ____.
- a) Energy used by the vehicle's accessories
- b) The energy required to move the vehicle forward
- c) Energy consumed during idle periods
- d) Energy used in accelerating to top speed

10) Electric motor ratings arc typically specified in: ____.
- a) Liters
- b) Miles per hour (mph)
- c) Kilowatts (kW)
- d) Pounds

11) Volumetric energy density is the measure of: ____.
- a) The speed of the vehicle
- b) The weight of the battery
- c) Energy stored per unit volume of a battery
- d) Fuel efficiency

12) Swapped batteries in electric vehicles are used to: ____.
- a) Allow for quick battery replacement and extend range
- b) Reduce vehicle weight
- c) Charge the vehicle at a slower rate
- d) Increase motor efficiency

13) Tractive effort in electric vehicles is primarily responsible for: ____.
- a) Fuel consumption
- b) Engine temperature
- c) Propelling the vehicle forward
- d) Charging the battery

14) The performance of an electric vehicle is typically evaluated based on ____.
- b) Noise levels
- b) Acceleration and top speed
- c) Efficiency and range
- d) Vehicle size

SLR-BD-104

Seat No.		Set	S

S.Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to Electric and Hybrid Vehicles (MechHon-02B)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section.
2) Figures to the right indicate full marks.

Section – I

Q.2	**a)**	What are the major components of an electric vehicle? Explain their functions.	**05**
	b)	Discuss the current market trends for electric vehicles globally and in India.	**05**
	c)	Explain the historical development of electric vehicles from the 19th century to the present day.	**04**
Q.3	**a)**	What are the different configurations of electric vehicles?	**05**
	b)	Define tractive effort and discuss its role in vehicle performance.	**05**
	c)	How does regenerative braking help in improving energy efficiency?	**04**
Q.4	**a)**	What are the key differences between series and parallel hybrid electric drive trains?	**05**
	b)	What is the significance of plug-in hybrid electric vehicles (PHEVs)?	**05**
	c)	What are the major components of an HEV powertrain?	**04**

Section – II

Q.5	**a)**	Explain the basic construction and working principle of a DC motor.	**05**
	b)	Explain the role of permanent magnets in BLDC and synchronous motors.	**05**
	c)	Discuss the construction and working principle of a Switch Reluctance Motor (SRM).	**04**
Q.6	**a)**	What is a chopper circuit? Explain its role in DC motor control.	**05**
	b)	What is a Variable Frequency Drive (VFD)? How does it control AC motor speed?	**05**
	c)	Describe the working of an inverter and its applications.	**04**
Q.7	**a)**	Explain how energy efficiency is measured in electric vehicle drive cycles.	**05**
	b)	What are the characteristics of the Indian Drive Cycle (IDC)?	**05**
	c)	Describe the energy consumption characteristics of an Electric Compact Sedan.	**04**

SLR-BD-105

Seat No.		Set	P

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
Mechanical Engineering
Engineering Mathematics–III(BTN02401)

Day & Date: Monday, 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The complete solution of $(D^3 - 7D - 6)y = 0$ is _____.
a) $c_1e^x + c_2e^{-2x} + c_3e^{-3x}$ b) $c_1e^{-x} + c_2e^{-2x} + c_3e^{3x}$
c) $c_1e^{-x} + c_2e^{-2x} + c_3e^{-3x}$ d) None of these

2) The P.I. of $y'' - 3y' + 2y = 12$ is _____.
a) $c_1e^x + c_2e^{2x}$ b) $c_1e^{-x} + c_2e^{2x}$
c) 12 d) 6

3) $\frac{1}{D^2+a^2}\cos ax$ is equal to _____.
a) $\frac{x}{2a}\cos ax$ b) $\frac{x}{2a}\sin ax$
c) $\frac{x}{2a^2}\cos ax$ d) $\frac{x}{2a^2}\sin ax$

4) The solution of $q = 3p^2$ is _____.
a) $z = ax + 3a^2y + c$ b) $z = 3ax + a^2y + c$
c) $z = 3ax^2 + by$ d) $z = ax + \frac{a^2}{3}y + c$

5) Which of the following is Lagrange's equation?
a) $p^2x + q^2y = z$ b) $qy = px + z$
c) $px + q^2y = z$ d) $p^2x - qy = z^2$

6) The coefficient of $\cos(nx)$ in the Fourier series of $f(x) = x^3$ in $(-\pi, \pi)$ is _____.
a) 0 b) $\frac{1}{n}$
c) $\frac{4(-1)^n}{n^2}$ d) $\frac{-2(-1)^n}{n}$

7) In the interval $(0, \pi)$ the constant term in the half range consine series of $f(x) = x$ is _____.

a) π b) π^2

c) $\frac{\pi^2}{2}$ d) $\frac{\pi}{2}$

8) $L\{t^n e^{-at}\} =$ _____.

a) $\frac{n!}{(s+a)^{n+1}}$ b) $\frac{(n+1)!}{(s-a)^{n+1}}$

c) $\frac{n!}{(s+a)^n}$ d) $\frac{1}{(s+a)^n}$

9) $L^{-1}\left\{\frac{1}{(s-3)^2+16}\right\} =$ _____.

a) $\frac{e^{3t}}{4}\sin 4t$ b) $\frac{e^{-3t}}{4}sin4t$

c) $e^{3t}\cos 4t$ d) $e^{-3t}\cos 4t$

10) If $L\{f(t)\} = \varphi(s)$, then $L\{f(at)\} =$ _____.

a) $\varphi(s/a)$ b) $\frac{1}{s}\varphi(s/a)$

c) $\frac{1}{a}\varphi(s/a)$ d) None of these

11) For binomial distribution the mean in 2 and standard deviation is 1. Hence the value of n is equal to_____.

a) 2 b) 4

c) 3 d) 1

12) The lines of regression are given by $10y = x + 17$ and $x = 5y - 7$. Then mean x and mean y are _____.

a) 1 and 10 b) 1 and 5

c) 2 and 3 d) 3 and 2

13) The value of correlation coefficient r lies between _____

a) -1 and 1 b) $-\infty$ and ∞

c) 0 and ∞ d) none of these

14) The area under the standard normal curve from $z = -\infty$ to $z = 0$ is _____.

a) 1 b) 0

c) 1.5 d) 0.5

Seat No.	

Set P

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
Mechanical Engineering
Engineering Mathematics–III(BTN02401)

Day & Date: Monday, 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculate is allowed.

SECTION – I

Q.2 Solve any three of the following questions. **09**

a) Solve: $(D^2 + 2D + 4)y = e^{2x}$

b) Solve: $px - qy = y^2 - x^2$

c) Solve: $(D^2 + 4)y = \sin x$

d) Solve: $pq = x^4y^3z^4$

e) Find Fourier series of $f(x) = x^2$ in $(0, 2\pi)$

Q.3 Solve any three of the following questions. **09**

a) Solve: $(D^2 - 1)y = e^x \cos x$

b) Solve: $(p^3 + q^3) = 27z$

c) Solve: $(5z - 7y)p + (7x - 3z)q = 3y - 5x$

d) Solve: $(D^2 + 3D + 2)y = e^{e^x}$

e) Obtain half range cosine series for $f(x) = x - x^2, 0 \le x \le 1$

Q.4 Solve any two of the following questions. **10**

a) The deflection of a strut with one end built-in and other supported and subjected to end-thrust P satisfies the equation.
$\frac{d^2y}{dx^2} + a^2y = \frac{a^2R}{P}(l - x)$ Given that $\frac{dy}{dx} = 0, y = 0$
when $x = 0$ & $y = 0$ $when x = l$. Prove that $y = \frac{R}{P}\left[\frac{\sin ax}{a} - l\cos ax + l - x\right]$
where $al = \tan al$ and l is the length of the strut.

b) Find Fourier series of $f(x) = e^{-x}, 0 < x < 2\pi$. Hence deduce the value of $\sum_{n=1}^{\infty} \frac{(-1)^n}{(n^2 + 1)}$

c) Solve the P.D.E. $\frac{\partial u}{\partial x} - 4\frac{\partial u}{\partial t} = 0$, given $u(0, t) = 8e^{-3t}$ by the method of separation of variables.

SECTION - II

Q.5 Solve any three of the followings. **09**

a) Find $L\left\{\int_0^t e^{-3t}\sin 5t\sin 3t dt\right\}$

b) Find the Laplace Transform of $\int_0^t \frac{\sin u}{u}\,du$

c) Find a real positive root of the equation $x^3 - 2x - 5 = 0$ by false position method correct to three places of decimals.

d) Find The positive root of $x^4 - x = 10$ correct to three decimal places by Newton-Raphson method. Take $x_0 = 2$ as initial approximation (Perform three iterations).

e) To find correlation coefficient of bivariate data, following results were obtained:$n = 25, \sum x = 125, \sum y = 100, \sum x^2 = 650, \sum y^2 = 460,$ $\sum xy = 508$. At the time of checking it was discovered that two pairs of (x, y): $(8,12), (6,8)$ were wrongly recorded as $(6,14), (8,6)$. Find the correct correlation.

Q.6 Solve any three of the following questions. **09**

a) If 10% bolts produced by a machine are defective, calculate the probability that out of a sample selected at random of 10 bolts, not more than one bolt will be defective.

b) In a sample of 1000 students, the mean and standard deviation of marks obtained by the students in a certain test are 14 & 2.5 Assuming the distribution to be normal find the number of students getting marks between 12 & 15.

[Given: For S.N.V. z, area between $z = 0 \& z = 0.4$ is 0.1554 and that between $z = 0 \& z = 0.8$ is 0.2881, that between $z = 0 \& z = 1.6$ is 0.4452 and that between $z = 0 \& z = 2.4$ is 0.4918.]

c) Find $L\left\{\frac{\cos 2t \sin 2t}{t}\right\}$

d) Evaluate by using Laplace transform

$$\int_0^\infty e^{-3t}\,\frac{(e^{-2t} - e^{-t})}{t}\,dt$$

e) Compute

$\int_0^6 \frac{dx}{1+x^2}$ by using Trapezoidal rule.

Q.7 Solve any two of the following questions. **10**

a) Evaluate $\int_0^1 e^x dx$ by using Simpsons $\left(\frac{1}{3}\right)^{rd}$ and $\left(\frac{3}{8}\right)^{th}$ rule

b) Calculate inverse Laplace transform of $\frac{s^2}{(s^2+4)(s^2+9)}$ by using Convolution method.

c) Find the equations of both lines of regression and also the coefficient of correlation from the following data.

(x)	62	64	65	69	70	71	72	74
(y)	126	125	139	145	165	152	180	208

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
Mechanical Engineering
Engineering Mathematics–III(BTN02401)

Day & Date: Monday, 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) $L\{t^n e^{-at}\} =$ _____.

a) $\frac{n!}{(s+a)^{n+1}}$ b) $\frac{(n+1)!}{(s-a)^{n+1}}$

c) $\frac{n!}{(s+a)^n}$ d) $\frac{1}{(s+a)^n}$

2) $L^{-1}\left\{\frac{1}{(s-3)^2+16}\right\} =$ _____.

a) $\frac{e^{3t}}{4}\sin 4t$ b) $\frac{e^{-3t}}{4}sin4t$

c) $e^{3t}\cos 4t$ d) $e^{-3t}\cos 4t$

3) If $L\{f(t)\} = \varphi(s)$, then $L\{f(at)\} =$ _____.

a) $\varphi(s/a)$ b) $\frac{1}{s}\varphi(s/a)$

c) $\frac{1}{a}\varphi(s/a)$ d) None of these

4) For binomial distribution the mean in 2 and standard deviation is 1. Hence the value of n is equal to_____.

a) 2 b) 4
c) 3 d) 1

5) The lines of regression are given by $10y = x + 17$ and $x = 5y - 7$. Then mean x and mean y are _____.

a) 1 and 10 b) 1 and 5
c) 2 and 3 d) 3 and 2

6) The value of correlation coefficient r lies between _____

a) -1 and 1 b) $-\infty$ and ∞

c) 0 and ∞ d) none of these

7) The area under the standard normal curve from $z = -\infty$ to $z = 0$ is _____.

a) 1 b) 0

c) 1.5 d) 0.5

8) The complete solution of $(D^3 - 7D - 6)y = 0$ is _____.

a) $c_1e^x + c_2e^{-2x} + c_3e^{-3x}$ b) $c_1e^{-x} + c_2e^{-2x} + c_3e^{3x}$

c) $c_1e^{-x} + c_2e^{-2x} + c_3e^{-3x}$ d) None of these

9) The P.I. of $y'' - 3y' + 2y = 12$ is _____.

a) $c_1e^x + c_2e^{2x}$ b) $c_1e^{-x} + c_2e^{2x}$

c) 12 d) 6

10) $\frac{1}{D^2+a^2}\cos ax$ is equal to _____.

a) $\frac{x}{2a}\cos ax$ b) $\frac{x}{2a}\sin ax$

c) $\frac{x}{2a^2}\cos ax$ d) $\frac{x}{2a^2}\sin ax$

11) The solution of $q = 3p^2$ is _____.

a) $z = ax + 3a^2y + c$ b) $z = 3ax + a^2y + c$

c) $z = 3ax^2 + by$ d) $z = ax + \frac{a^2}{3}y + c$

12) Which of the following is Lagrange's equation?

a) $p^2x + q^2y = z$ b) $qy = px + z$

c) $px + q^2y = z$ d) $p^2x - qy = z^2$

13) The coefficient of $\cos(nx)$ in the Fourier series of $f(x) = x^3$ in $(-\pi, \pi)$ is _____.

a) 0 b) $\frac{1}{n}$

c) $\frac{4(-1)^n}{n^2}$ d) $\frac{-2(-1)^n}{n}$

14) In the interval $(0, \pi)$ the constant term in the half range consine series of $f(x) = x$ is _____.

a) π b) π^2

c) $\frac{\pi^2}{2}$ d) $\frac{\pi}{2}$

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
Mechanical Engineering
Engineering Mathematics–III(BTN02401)

Day & Date: Monday, 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculate is allowed.

SECTION – I

Q.2 Solve any three of the following questions. **09**

a) Solve: $(D^2 + 2D + 4)y = e^{2x}$

b) Solve: $px - qy = y^2 - x^2$

c) Solve: $(D^2 + 4)y = \sin x$

d) Solve: $pq = x^4y^3z^4$

e) Find Fourier series of $f(x) = x^2$ in $(0, 2\pi)$

Q.3 Solve any three of the following questions. **09**

a) Solve: $(D^2 - 1)y = e^x \cos x$

b) Solve: $(p^3 + q^3) = 27z$

c) Solve: $(5z - 7y)p + (7x - 3z)q = 3y - 5x$

d) Solve: $(D^2 + 3D + 2)y = e^{e^x}$

e) Obtain half range cosine series for $f(x) = x - x^2, 0 \le x \le 1$

Q.4 Solve any two of the following questions. **10**

a) The deflection of a strut with one end built-in and other supported and subjected to end-thrust P satisfies the equation.
$\frac{d^2y}{dx^2} + a^2y = \frac{a^2R}{P}(l - x)$ Given that $\frac{dy}{dx} = 0, y = 0$
when $x = 0$ & $y = 0$ $when x = l$. Prove that $y = \frac{R}{P}\left[\frac{\sin ax}{a} - l\cos ax + l - x\right]$
where $al = \tan al$ and l is the length of the strut.

b) Find Fourier series of $f(x) = e^{-x}, 0 < x < 2\pi$. Hence deduce the value of $\sum_{n=1}^{\infty} \frac{(-1)^n}{(n^2 + 1)}$

c) Solve the P.D.E. $\frac{\partial u}{\partial x} - 4\frac{\partial u}{\partial t} = 0$, given $u(0, t) = 8e^{-3t}$ by the method of separation of variables.

SECTION - II

Q.5 Solve any three of the followings. **09**

a) Find $L\left\{\int_0^t e^{-3t}\sin 5t\sin 3t dt\right\}$

b) Find the Laplace Transform of $\int_0^t \frac{\sin u}{u}\,du$

c) Find a real positive root of the equation $x^3 - 2x - 5 = 0$ by false position method correct to three places of decimals.

d) Find The positive root of $x^4 - x = 10$ correct to three decimal places by Newton-Raphson method. Take $x_0 = 2$ as initial approximation (Perform three iterations).

e) To find correlation coefficient of bivariate data, following results were obtained:$n = 25, \sum x = 125, \sum y = 100, \sum x^2 = 650, \sum y^2 = 460,$ $\sum xy = 508$. At the time of checking it was discovered that two pairs of (x, y): $(8,12), (6,8)$ were wrongly recorded as $(6,14), (8,6)$. Find the correct correlation.

Q.6 Solve any three of the following questions. **09**

a) If 10% bolts produced by a machine are defective, calculate the probability that out of a sample selected at random of 10 bolts, not more than one bolt will be defective.

b) In a sample of 1000 students, the mean and standard deviation of marks obtained by the students in a certain test are 14 & 2.5 Assuming the distribution to be normal find the number of students getting marks between 12 & 15.

[Given: For S.N.V. z, area between $z = 0 \& z = 0.4$ is 0.1554 and that between $z = 0 \& z = 0.8$ is 0.2881, that between $z = 0 \& z = 1.6$ is 0.4452 and that between $z = 0 \& z = 2.4$ is 0.4918.]

c) Find $L\left\{\frac{\cos 2t \sin 2t}{t}\right\}$

d) Evaluate by using Laplace transform

$$\int_0^\infty e^{-3t}\,\frac{(e^{-2t} - e^{-t})}{t}\,dt$$

e) Compute

$\int_0^6 \frac{dx}{1+x^2}$ by using Trapezoidal rule.

Q.7 Solve any two of the following questions. **10**

a) Evaluate $\int_0^1 e^x dx$ by using Simpsons $\left(\frac{1}{3}\right)^{rd}$ and $\left(\frac{3}{8}\right)^{th}$ rule

b) Calculate inverse Laplace transform of $\frac{s^2}{(s^2+4)(s^2+9)}$ by using Convolution method.

c) Find the equations of both lines of regression and also the coefficient of correlation from the following data.

(x)	62	64	65	69	70	71	72	74
(y)	126	125	139	145	165	152	180	208

Seat No.	

Set R

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
Mechanical Engineering
Engineering Mathematics–III(BTN02401)

Day & Date: Monday, 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) For binomial distribution the mean in 2 and standard deviation is 1. Hence the value of n is equal to_____.
a) 2 b) 4
c) 3 d) 1

2) The lines of regression are given by $10y = x + 17$ and $x = 5y - 7$. Then mean x and mean y are _____.
a) 1 and 10 b) 1 and 5
c) 2 and 3 d) 3 and 2

3) The value of correlation coefficient r lies between _____
a) -1 and 1 b) $-\infty$ and ∞
c) 0 and ∞ d) none of these

4) The area under the standard normal curve from $z = -\infty$ to $z = 0$ is _____.
a) 1 b) 0
c) 1.5 d) 0.5

5) The complete solution of $(D^3 - 7D - 6)y = 0$ is _____.
a) $c_1e^{x} + c_2e^{-2x} + c_3e^{-3x}$ b) $c_1e^{-x} + c_2e^{-2x} + c_3e^{3x}$
c) $c_1e^{-x} + c_2e^{-2x} + c_3e^{-3x}$ d) None of these

6) The P.I. of $y'' - 3y' + 2y = 12$ is _____.
a) $c_1e^{x} + c_2e^{2x}$ b) $c_1e^{-x} + c_2e^{2x}$
c) 12 d) 6

7) $\frac{1}{D^2+a^2}\cos ax$ is equal to _____.

a) $\frac{x}{2a}\cos ax$ b) $\frac{x}{2a}\sin ax$

c) $\frac{x}{2a^2}\cos ax$ d) $\frac{x}{2a^2}\sin ax$

8) The solution of $q = 3p^2$ is _____.

a) $z = ax + 3a^2y + c$ b) $z = 3ax + a^2y + c$

c) $z = 3ax^2 + by$ d) $z = ax + \frac{a^2}{3}y + c$

9) Which of the following is Lagrange's equation?

a) $p^2x + q^2y = z$ b) $qy = px + z$

c) $px + q^2y = z$ d) $p^2x - qy = z^2$

10) The coefficient of $\cos(nx)$ in the Fourier series of $f(x) = x^3$ in $(-\pi, \pi)$ is _____.

a) 0 b) $\frac{1}{n}$

c) $\frac{4(-1)^n}{n^2}$ d) $\frac{-2(-1)^n}{n}$

11) In the interval $(0, \pi)$ the constant term in the half range consine series of $f(x) = x$ is _____.

a) π b) π^2

c) $\frac{\pi^2}{2}$ d) $\frac{\pi}{2}$

12) $L\{t^n e^{-at}\} =$ _____.

a) $\frac{n!}{(s+a)^{n+1}}$ b) $\frac{(n+1)!}{(s-a)^{n+1}}$

c) $\frac{n!}{(s+a)^n}$ d) $\frac{1}{(s+a)^n}$

13) $L^{-1}\left\{\frac{1}{(s-3)^2+16}\right\} =$ _____.

a) $\frac{e^{3t}}{4}\sin 4t$ b) $\frac{e^{-3t}}{4}sin4t$

c) $e^{3t}\cos 4t$ d) $e^{-3t}\cos 4t$

14) If $L\{f(t)\} = \varphi(s)$, then $L\{f(at)\} =$ _____.

a) $\varphi(s/a)$ b) $\frac{1}{s}\varphi(s/a)$

c) $\frac{1}{a}\varphi(s/a)$ d) None of these

Seat No.	

Set R

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
Mechanical Engineering
Engineering Mathematics–III(BTN02401)

Day & Date: Monday, 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculate is allowed.

SECTION – I

Q.2 Solve any three of the following questions. **09**

a) Solve: $(D^2 + 2D + 4)y = e^{2x}$

b) Solve: $px - qy = y^2 - x^2$

c) Solve: $(D^2 + 4)y = \sin x$

d) Solve: $pq = x^4y^3z^4$

e) Find Fourier series of $f(x) = x^2$ in $(0, 2\pi)$

Q.3 Solve any three of the following questions. **09**

a) Solve: $(D^2 - 1)y = e^x \cos x$

b) Solve: $(p^3 + q^3) = 27z$

c) Solve: $(5z - 7y)p + (7x - 3z)q = 3y - 5x$

d) Solve: $(D^2 + 3D + 2)y = e^{e^x}$

e) Obtain half range cosine series for $f(x) = x - x^2, 0 \le x \le 1$

Q.4 Solve any two of the following questions. **10**

a) The deflection of a strut with one end built-in and other supported and subjected to end-thrust P satisfies the equation.
$\frac{d^2y}{dx^2} + a^2y = \frac{a^2R}{P}(l - x)$ Given that $\frac{dy}{dx} = 0, y = 0$
when $x = 0$ & $y = 0$ $when x = l$. Prove that $y = \frac{R}{P}\left[\frac{\sin ax}{a} - l\cos ax + l - x\right]$
where $al = \tan al$ and l is the length of the strut.

b) Find Fourier series of $f(x) = e^{-x}, 0 < x < 2\pi$. Hence deduce the value of $\sum_{n=1}^{\infty} \frac{(-1)^n}{(n^2 + 1)}$

c) Solve the P.D.E. $\frac{\partial u}{\partial x} - 4\frac{\partial u}{\partial t} = 0$, given $u(0, t) = 8e^{-3t}$ by the method of separation of variables.

SECTION - II

Q.5 Solve any three of the followings. **09**

a) Find $L\left\{\int_0^t e^{-3t}\sin 5t\sin 3t dt\right\}$

b) Find the Laplace Transform of $\int_0^t \frac{\sin u}{u}\,du$

c) Find a real positive root of the equation $x^3 - 2x - 5 = 0$ by false position method correct to three places of decimals.

d) Find The positive root of $x^4 - x = 10$ correct to three decimal places by Newton-Raphson method. Take $x_0 = 2$ as initial approximation (Perform three iterations).

e) To find correlation coefficient of bivariate data, following results were obtained:$n = 25, \sum x = 125, \sum y = 100, \sum x^2 = 650, \sum y^2 = 460,$ $\sum xy = 508$. At the time of checking it was discovered that two pairs of (x, y): $(8,12), (6,8)$ were wrongly recorded as $(6,14), (8,6)$. Find the correct correlation.

Q.6 Solve any three of the following questions. **09**

a) If 10% bolts produced by a machine are defective, calculate the probability that out of a sample selected at random of 10 bolts, not more than one bolt will be defective.

b) In a sample of 1000 students, the mean and standard deviation of marks obtained by the students in a certain test are 14 & 2.5 Assuming the distribution to be normal find the number of students getting marks between 12 & 15.

[Given: For S.N.V. z, area between $z = 0 \& z = 0.4$ is 0.1554 and that between $z = 0 \& z = 0.8$ is 0.2881, that between $z = 0 \& z = 1.6$ is 0.4452 and that between $z = 0 \& z = 2.4$ is 0.4918.]

c) Find $L\left\{\frac{\cos 2t \sin 2t}{t}\right\}$

d) Evaluate by using Laplace transform

$$\int_0^\infty e^{-3t}\,\frac{(e^{-2t} - e^{-t})}{t}\,dt$$

e) Compute

$\int_0^6 \frac{dx}{1+x^2}$ by using Trapezoidal rule.

Q.7 Solve any two of the following questions. **10**

a) Evaluate $\int_0^1 e^x dx$ by using Simpsons $\left(\frac{1}{3}\right)^{rd}$ and $\left(\frac{3}{8}\right)^{th}$ rule

b) Calculate inverse Laplace transform of $\frac{s^2}{(s^2+4)(s^2+9)}$ by using Convolution method.

c) Find the equations of both lines of regression and also the coefficient of correlation from the following data.

(x)	62	64	65	69	70	71	72	74
(y)	126	125	139	145	165	152	180	208

Seat No.		Set	S

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
Mechanical Engineering
Engineering Mathematics–III(BTN02401)

Day & Date: Monday, 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The coefficient of $\cos(nx)$ in the Fourier series of $f(x) = x^3$ in $(-\pi, \pi)$ is _____.

a) 0 b) $\frac{1}{n}$

c) $\frac{4(-1)^n}{n^2}$ d) $\frac{-2(-1)^n}{n}$

2) In the interval $(0, \pi)$ the constant term in the half range consine series of $f(x) = x$ is _____.

a) π b) π^2

c) $\frac{\pi^2}{2}$ d) $\frac{\pi}{2}$

3) $L\{t^n e^{-at}\} =$ _____.

a) $\frac{n!}{(s+a)^{n+1}}$ b) $\frac{(n+1)!}{(s-a)^{n+1}}$

c) $\frac{n!}{(s+a)^n}$ d) $\frac{1}{(s+a)^n}$

4) $L^{-1}\left\{\frac{1}{(s-3)^2+16}\right\} =$ _____.

a) $\frac{e^{3t}}{4}\sin 4t$ b) $\frac{e^{-3t}}{4}sin4t$

c) $e^{3t}\cos 4t$ d) $e^{-3t}\cos 4t$

5) If $L\{f(t)\} = \varphi(s)$, then $L\{f(at)\} =$ _____.

a) $\varphi(s/a)$ b) $\frac{1}{s}\varphi(s/a)$

c) $\frac{1}{a}\varphi(s/a)$ d) None of these

6) For binomial distribution the mean in 2 and standard deviation is 1. Hence the value of n is equal to_____.

a) 2 b) 4

c) 3 d) 1

7) The lines of regression are given by $10y = x + 17$ and $x = 5y - 7$. Then mean x and mean y are _____.

a) 1 and 10 b) 1 and 5

c) 2 and 3 d) 3 and 2

8) The value of correlation coefficient r lies between _____

a) -1 and 1 b) $-\infty$ and ∞

c) 0 and ∞ d) none of these

9) The area under the standard normal curve from $z = -\infty$ to $z = 0$ is _____.

a) 1 b) 0

c) 1.5 d) 0.5

10) The complete solution of $(D^3 - 7D - 6)y = 0$ is _____.

a) $c_1e^x + c_2e^{-2x} + c_3e^{-3x}$ b) $c_1e^{-x} + c_2e^{-2x} + c_3e^{3x}$

c) $c_1e^{-x} + c_2e^{-2x} + c_3e^{-3x}$ d) None of these

11) The P.I. of $y'' - 3y' + 2y = 12$ is _____.

a) $c_1e^x + c_2e^{2x}$ b) $c_1e^{-x} + c_2e^{2x}$

c) 12 d) 6

12) $\frac{1}{D^2+a^2}\cos ax$ is equal to _____.

a) $\frac{x}{2a}\cos ax$ b) $\frac{x}{2a}\sin ax$

c) $\frac{x}{2a^2}\cos ax$ d) $\frac{x}{2a^2}\sin ax$

13) The solution of $q = 3p^2$ is _____.

a) $z = ax + 3a^2y + c$ b) $z = 3ax + a^2y + c$

c) $z = 3ax^2 + by$ d) $z = ax + \frac{a^2}{3}y + c$

14) Which of the following is Lagrange's equation?

a) $p^2x + q^2y = z$ b) $qy = px + z$

c) $px + q^2y = z$ d) $p^2x - qy = z^2$

Seat No.	

Set **S**

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
Mechanical Engineering
Engineering Mathematics–III(BTN02401)

Day & Date: Monday, 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculate is allowed.

SECTION – I

Q.2 Solve any three of the following questions. **09**

a) Solve: $(D^2 + 2D + 4)y = e^{2x}$

b) Solve: $px - qy = y^2 - x^2$

c) Solve: $(D^2 + 4)y = \sin x$

d) Solve: $pq = x^4y^3z^4$

e) Find Fourier series of $f(x) = x^2$ in $(0, 2\pi)$

Q.3 Solve any three of the following questions. **09**

a) Solve: $(D^2 - 1)y = e^x \cos x$

b) Solve: $(p^3 + q^3) = 27z$

c) Solve: $(5z - 7y)p + (7x - 3z)q = 3y - 5x$

d) Solve: $(D^2 + 3D + 2)y = e^{e^x}$

e) Obtain half range cosine series for $f(x) = x - x^2, 0 \le x \le 1$

Q.4 Solve any two of the following questions. **10**

a) The deflection of a strut with one end built-in and other supported and subjected to end-thrust P satisfies the equation.
$\frac{d^2y}{dx^2} + a^2y = \frac{a^2R}{P}(l - x)$ Given that $\frac{dy}{dx} = 0, y = 0$
when $x = 0$ & $y = 0$ $when x = l$. Prove that $y = \frac{R}{P}\left[\frac{\sin ax}{a} - l\cos ax + l - x\right]$
where $al = \tan al$ and l is the length of the strut.

b) Find Fourier series of $f(x) = e^{-x}, 0 < x < 2\pi$. Hence deduce the value of $\sum_{n=1}^{\infty} \frac{(-1)^n}{(n^2 + 1)}$

c) Solve the P.D.E. $\frac{\partial u}{\partial x} - 4\frac{\partial u}{\partial t} = 0$, given $u(0, t) = 8e^{-3t}$ by the method of separation of variables.

SECTION - II

Q.5 Solve any three of the followings. **09**

a) Find $L\left\{\int_0^t e^{-3t}\sin 5t\sin 3t dt\right\}$

b) Find the Laplace Transform of $\int_0^t \frac{\sin u}{u}\,du$

c) Find a real positive root of the equation $x^3 - 2x - 5 = 0$ by false position method correct to three places of decimals.

d) Find The positive root of $x^4 - x = 10$ correct to three decimal places by Newton-Raphson method. Take $x_0 = 2$ as initial approximation (Perform three iterations).

e) To find correlation coefficient of bivariate data, following results were obtained:$n = 25, \sum x = 125, \sum y = 100, \sum x^2 = 650, \sum y^2 = 460,$ $\sum xy = 508$. At the time of checking it was discovered that two pairs of (x, y): $(8,12), (6,8)$ were wrongly recorded as $(6,14), (8,6)$. Find the correct correlation.

Q.6 Solve any three of the following questions. **09**

a) If 10% bolts produced by a machine are defective, calculate the probability that out of a sample selected at random of 10 bolts, not more than one bolt will be defective.

b) In a sample of 1000 students, the mean and standard deviation of marks obtained by the students in a certain test are 14 & 2.5 Assuming the distribution to be normal find the number of students getting marks between 12 & 15.

[Given: For S.N.V. z, area between $z = 0 \& z = 0.4$ is 0.1554 and that between $z = 0 \& z = 0.8$ is 0.2881, that between $z = 0 \& z = 1.6$ is 0.4452 and that between $z = 0 \& z = 2.4$ is 0.4918.]

c) Find $L\left\{\frac{\cos 2t \sin 2t}{t}\right\}$

d) Evaluate by using Laplace transform

$$\int_0^\infty e^{-3t}\,\frac{(e^{-2t} - e^{-t})}{t}\,dt$$

e) Compute

$\int_0^6 \frac{dx}{1+x^2}$ by using Trapezoidal rule.

Q.7 Solve any two of the following questions. **10**

a) Evaluate $\int_0^1 e^x dx$ by using Simpsons $\left(\frac{1}{3}\right)^{rd}$ and $\left(\frac{3}{8}\right)^{th}$ rule

b) Calculate inverse Laplace transform of $\frac{s^2}{(s^2+4)(s^2+9)}$ by using Convolution method.

c) Find the equations of both lines of regression and also the coefficient of correlation from the following data.

(x)	62	64	65	69	70	71	72	74
(y)	126	125	139	145	165	152	180	208

SLR-BD-106

Seat No.	

Set P

S. Y (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2024
MECHANICAL ENGINEERING
Manufacturing Technology (BTN02402)

Day & Date: Wednesday, 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes In Answer Book Page no 03 (Starting page of the Answer Book). Each Question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The gear shaving is the process of _____.
a) Gear generation b) Gear finishing
c) Gear forging d) Gear casting

2) The job reciprocates in _____.
a) Shaping machine b) Planing machine
c) Slotting machine d) All of the above

3) Up milling is a conventional milling and during process lot of heat is generated _____.
a) True b) False

4) The primary mechanism of material removal in electrochemical machining (ECM) is _____.
a) chemical corrosion b) etching
c) ionic dissolution d) spark erosion

5) In the grinding wheel specification, WC20M6V18 what V stands for?
a) Abrasive b) Structure
c) Grade d) Bond

6) Point to point (PTP) in CNC machines is the type of _____.
a) CNC drilling b) CNC turning
c) CNC milling d) CNC grinding

7) Table contains _____ slots.
a) L-slots b) T-Slots
c) H-Slots d) All of these

8) In simple indexing method, one complete rotation of spindle makes rotation of index crank _____.

a) 24 b) 40
c) 20 d) 30

9) Most widely used bond is _____.

a) Oxy chloride bond b) Vitrified bond
c) Rubber bond d) Shellac bond

10) The cylindrical work pieces are held in the drilling machine to carry the operations in _____.

a) C-clamp b) Machine Vice
c) V block d) T-bolt

11) The chips are maximum at the initial and minimum at end when cut terminates in _____.

a) Down Milling b) Form Milling
c) Side Milling d) Conventional Milling

12) The reaming is an operation which _____.

a) finish the drilled hole b) enlarge pre drilled hole
c) Internal thread d) form external thread

13) Tapping operation can perform in _____.

a) Lathe machine b) Slotting machine
c) Grinding machine d) Drilling machine

14) Grinding is the process of removing material by a _____action.

a) Rubbing b) Cutting
c) Polishing d) Wearing

Seat No.	

Set **P**

S. Y (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2024
MECHANICAL ENGINEERING
Manufacturing Technology (BTN02402)

Day & Date: Wednesday, 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In Section - 1. Q. 2 is compulsory. Attempt any two questions from the remaining questions.
2) In Section - II, attempt any two questions from given questions.
3) Figures to the right indicate full marks.
4) Make suitable assumptions, if required and state them clearly.
5) Use of non-programmable calculator is allowed.

Section – I

Q.2 Solve:
- **a)** Explain with neat diagram the taper turning by Swiveling compound rest. **05**
- **b)** List the different accessories used in lathe machine. Explain three jaw chuck. **05**

Q.3 Solve:
- **a)** Explain construction and working of vertical boring machine with neat sketch. **05**
- **b)** Compare shaper and planer machine. **04**

Q.4 Solve:
- **a)** Classify broaching machine and explain with neat sketch pull type broach. **05**
- **b)** Explain Slotting machine. **04**

Q.5 Answer the following questions. (Any Three) **09**
- **a)** Turret indexing mechanism
- **b)** Types of reciprocating machines
- **c)** Classification of CNC machine
- **d)** Capstan lathe
- **e)** Lathe attachments

Section – II

Q.6 Solve:

a)	With neat diagram explain construction a working of column a knee type of milling machine.	**05**
b)	Explain gear cutting on milling machine.	**05**
c)	Difference between up milling and down milling.	**04**

Q.7 Solve:

a)	Classify the grinding machines. Explain any one.	**05**
b)	Explain the construction and working of gear Hobbing machine?	**05**
c)	Explain jig boring machine.	**04**

Q.8 Write short notes. (Any Four) **14**

a) Gear shaving
b) ECM
c) Difference between Conventional and Non-conventional machining
d) EDM
e) A WJM

SLR-BD-106

Seat No.	

Set Q

S. Y (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2024
MECHANICAL ENGINEERING
Manufacturing Technology (BTN02402)

Day & Date: Wednesday, 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes In Answer Book Page no 03 (Starting page of the Answer Book). Each Question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) In simple indexing method, one complete rotation of spindle makes rotation of index crank _____.
a) 24 b) 40
c) 20 d) 30

2) Most widely used bond is _____.
a) Oxy chloride bond b) Vitrified bond
c) Rubber bond d) Shellac bond

3) The cylindrical work pieces are held in the drilling machine to carry the operations in _____.
a) C-clamp b) Machine Vice
c) V block d) T-bolt

4) The chips are maximum at the initial and minimum at end when cut terminates in _____.
a) Down Milling b) Form Milling
c) Side Milling d) Conventional Milling

5) The reaming is an operation which _____.
a) finish the drilled hole b) enlarge pre drilled hole
c) Internal thread d) form external thread

6) Tapping operation can perform in _____.
a) Lathe machine b) Slotting machine
c) Grinding machine d) Drilling machine

7) Grinding is the process of removing material by a _____action.
a) Rubbing b) Cutting
c) Polishing d) Wearing

8) The gear shaving is the process of _____.
a) Gear generation b) Gear finishing
c) Gear forging d) Gear casting

9) The job reciprocates in _____.
a) Shaping machine b) Planing machine
c) Slotting machine d) All of the above

10) Up milling is a conventional milling and during process lot of heat is generated _____.
a) True b) False

11) The primary mechanism of material removal in electrochemical machining (ECM) is _____.
a) chemical corrosion b) etching
c) ionic dissolution d) spark erosion

12) In the grinding wheel specification, WC20M6V18 what V stands for?
a) Abrasive b) Structure
c) Grade d) Bond

13) Point to point (PTP) in CNC machines is the type of _____.
a) CNC drilling b) CNC turning
c) CNC milling d) CNC grinding

14) Table contains _____ slots.
a) L-slots b) T-Slots
c) H-Slots d) All of these

Seat No.	

Set **Q**

S. Y (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2024
MECHANICAL ENGINEERING
Manufacturing Technology (BTN02402)

Day & Date: Wednesday, 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In Section - 1. Q. 2 is compulsory. Attempt any two questions from the remaining questions.
2) In Section - II, attempt any two questions from given questions.
3) Figures to the right indicate full marks.
4) Make suitable assumptions, if required and state them clearly.
5) Use of non-programmable calculator is allowed.

Section – I

Q.2 Solve:
- **a)** Explain with neat diagram the taper turning by Swiveling compound rest. **05**
- **b)** List the different accessories used in lathe machine. Explain three jaw chuck. **05**

Q.3 Solve:
- **a)** Explain construction and working of vertical boring machine with neat sketch. **05**
- **b)** Compare shaper and planer machine. **04**

Q.4 Solve:
- **a)** Classify broaching machine and explain with neat sketch pull type broach. **05**
- **b)** Explain Slotting machine. **04**

Q.5 Answer the following questions. (Any Three) **09**
- **a)** Turret indexing mechanism
- **b)** Types of reciprocating machines
- **c)** Classification of CNC machine
- **d)** Capstan lathe
- **e)** Lathe attachments

Section – II

Q.6 Solve:

a)	With neat diagram explain construction a working of column a knee type of milling machine.	**05**
b)	Explain gear cutting on milling machine.	**05**
c)	Difference between up milling and down milling.	**04**

Q.7 Solve:

a)	Classify the grinding machines. Explain any one.	**05**
b)	Explain the construction and working of gear Hobbing machine?	**05**
c)	Explain jig boring machine.	**04**

Q.8 Write short notes. (Any Four) **14**

a) Gear shaving
b) ECM
c) Difference between Conventional and Non-conventional machining
d) EDM
e) A WJM

Seat No.	

Set **R**

S. Y (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2024
MECHANICAL ENGINEERING
Manufacturing Technology (BTN02402)

Day & Date: Wednesday, 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes In Answer Book Page no 03 (Starting page of the Answer Book). Each Question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The chips are maximum at the initial and minimum at end when cut terminates in _____.
a) Down Milling b) Form Milling
c) Side Milling d) Conventional Milling

2) The reaming is an operation which _____.
a) finish the drilled hole b) enlarge pre drilled hole
c) Internal thread d) form external thread

3) Tapping operation can perform in _____.
a) Lathe machine b) Slotting machine
c) Grinding machine d) Drilling machine

4) Grinding is the process of removing material by a _____action.
a) Rubbing b) Cutting
c) Polishing d) Wearing

5) The gear shaving is the process of _____.
a) Gear generation b) Gear finishing
c) Gear forging d) Gear casting

6) The job reciprocates in _____.
a) Shaping machine b) Planing machine
c) Slotting machine d) All of the above

7) Up milling is a conventional milling and during process lot of heat is generated _____.
a) True b) False

8) The primary mechanism of material removal in electrochemical machining (ECM) is _____.

a) chemical corrosion b) etching
c) ionic dissolution d) spark erosion

9) In the grinding wheel specification, WC20M6V18 what V stands for?

a) Abrasive b) Structure
c) Grade d) Bond

10) Point to point (PTP) in CNC machines is the type of _____.

a) CNC drilling b) CNC turning
c) CNC milling d) CNC grinding

11) Table contains _____ slots.

a) L-slots b) T-Slots
c) H-Slots d) All of these

12) In simple indexing method, one complete rotation of spindle makes rotation of index crank _____.

a) 24 b) 40
c) 20 d) 30

13) Most widely used bond is _____.

a) Oxy chloride bond b) Vitrified bond
c) Rubber bond d) Shellac bond

14) The cylindrical work pieces are held in the drilling machine to carry the operations in _____.

a) C-clamp b) Machine Vice
c) V block d) T-bolt

Seat No.	

Set **R**

S. Y (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2024
MECHANICAL ENGINEERING
Manufacturing Technology (BTN02402)

Day & Date: Wednesday, 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In Section - 1. Q. 2 is compulsory. Attempt any two questions from the remaining questions.
2) In Section - II, attempt any two questions from given questions.
3) Figures to the right indicate full marks.
4) Make suitable assumptions, if required and state them clearly.
5) Use of non-programmable calculator is allowed.

Section – I

Q.2 Solve:
- **a)** Explain with neat diagram the taper turning by Swiveling compound rest. **05**
- **b)** List the different accessories used in lathe machine. Explain three jaw chuck. **05**

Q.3 Solve:
- **a)** Explain construction and working of vertical boring machine with neat sketch. **05**
- **b)** Compare shaper and planer machine. **04**

Q.4 Solve:
- **a)** Classify broaching machine and explain with neat sketch pull type broach. **05**
- **b)** Explain Slotting machine. **04**

Q.5 Answer the following questions. (Any Three) **09**
- **a)** Turret indexing mechanism
- **b)** Types of reciprocating machines
- **c)** Classification of CNC machine
- **d)** Capstan lathe
- **e)** Lathe attachments

Section – II

Q.6 Solve:

a) With neat diagram explain construction a working of column a knee type of milling machine. **05**

b) Explain gear cutting on milling machine. **05**

c) Difference between up milling and down milling. **04**

Q.7 Solve:

a) Classify the grinding machines. Explain any one. **05**

b) Explain the construction and working of gear Hobbing machine? **05**

c) Explain jig boring machine. **04**

Q.8 Write short notes. (Any Four) **14**

a) Gear shaving

b) ECM

c) Difference between Conventional and Non-conventional machining

d) EDM

e) A WJM

Seat No.	

Set **S**

S. Y (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2024
MECHANICAL ENGINEERING
Manufacturing Technology (BTN02402)

Day & Date: Wednesday, 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes In Answer Book Page no 03 (Starting page of the Answer Book). Each Question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Point to point (PTP) in CNC machines is the type of _____.
a) CNC drilling b) CNC turning
c) CNC milling d) CNC grinding

2) Table contains _____ slots.
a) L-slots b) T-Slots
c) H-Slots d) All of these

3) In simple indexing method, one complete rotation of spindle makes rotation of index crank _____.
a) 24 b) 40
c) 20 d) 30

4) Most widely used bond is _____.
a) Oxy chloride bond b) Vitrified bond
c) Rubber bond d) Shellac bond

5) The cylindrical work pieces are held in the drilling machine to carry the operations in _____.
a) C-clamp b) Machine Vice
c) V block d) T-bolt

6) The chips are maximum at the initial and minimum at end when cut terminates in _____.
a) Down Milling b) Form Milling
c) Side Milling d) Conventional Milling

7) The reaming is an operation which _____.
a) finish the drilled hole b) enlarge pre drilled hole
c) Internal thread d) form external thread

8) Tapping operation can perform in _____.
a) Lathe machine b) Slotting machine
c) Grinding machine d) Drilling machine

9) Grinding is the process of removing material by a _____action.
a) Rubbing b) Cutting
c) Polishing d) Wearing

10) The gear shaving is the process of _____.
a) Gear generation b) Gear finishing
c) Gear forging d) Gear casting

11) The job reciprocates in _____.
a) Shaping machine b) Planing machine
c) Slotting machine d) All of the above

12) Up milling is a conventional milling and during process lot of heat is generated _____.
a) True b) False

13) The primary mechanism of material removal in electrochemical machining (ECM) is _____.
a) chemical corrosion b) etching
c) ionic dissolution d) spark erosion

14) In the grinding wheel specification, WC20M6V18 what V stands for?
a) Abrasive b) Structure
c) Grade d) Bond

SLR-BD-106

Seat No.	

Set S

S. Y (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2024
MECHANICAL ENGINEERING
Manufacturing Technology (BTN02402)

Day & Date: Wednesday, 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) In Section - 1. Q. 2 is compulsory. Attempt any two questions from the remaining questions.
2) In Section - II, attempt any two questions from given questions.
3) Figures to the right indicate full marks.
4) Make suitable assumptions, if required and state them clearly.
5) Use of non-programmable calculator is allowed.

Section – I

Q.2 Solve:
- **a)** Explain with neat diagram the taper turning by Swiveling compound rest. **05**
- **b)** List the different accessories used in lathe machine. Explain three jaw chuck. **05**

Q.3 Solve:
- **a)** Explain construction and working of vertical boring machine with neat sketch. **05**
- **b)** Compare shaper and planer machine. **04**

Q.4 Solve:
- **a)** Classify broaching machine and explain with neat sketch pull type broach. **05**
- **b)** Explain Slotting machine. **04**

Q.5 Answer the following questions. (Any Three) **09**
- **a)** Turret indexing mechanism
- **b)** Types of reciprocating machines
- **c)** Classification of CNC machine
- **d)** Capstan lathe
- **e)** Lathe attachments

Section – II

Q.6 Solve:

a) With neat diagram explain construction a working of column a knee type of milling machine. **05**

b) Explain gear cutting on milling machine. **05**

c) Difference between up milling and down milling. **04**

Q.7 Solve:

a) Classify the grinding machines. Explain any one. **05**

b) Explain the construction and working of gear Hobbing machine? **05**

c) Explain jig boring machine. **04**

Q.8 Write short notes. (Any Four) **14**

a) Gear shaving

b) ECM

c) Difference between Conventional and Non-conventional machining

d) EDM

e) A WJM

SLR-BD-107

Seat No.		Set	P

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Fluid Mechanics & Fluid Machines (BTN02403)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The position of the Center of pressure for the inclined plane surface is always _____ the Centre of Gravity.
a) above b) below
c) coincide d) can't predict

2) The metacentric height is the distance between the _____.
a) centre of gravity of the floating body and the centre of buoyancy
b) centre of gravity of the floating body and the metacentre
c) metacentre and centre of buoyancy
d) original centre of buoyancy and new centre of buoyancy

3) Streamlines, path lines and streak lines are identical in _____.
a) uniform flow b) compressible flow
c) steady flow d) highly viscous flow

4) A negative derivative of the velocity function with respect to a given direction will give the _____.
a) Velocity in the perpendicular direction
b) Velocity in the same direction
c) Velocity in any direction
d) none of the above

5) The major loss of energy in long pipes is due to _____.
a) sudden enlargement
b) sudden contraction
c) gradual contraction on enlargement
d) friction

6) In Venturimeter, the velocity of the liquid at the throat is _____ as compared to the inlet velocity of the liquid.

a) higher b) lower
c) equal d) can't predict

7) For laminar flow in circular pipes, Darcy's friction factor f is equal to _____ where Re is Reynold's, number.

a) 16/Re b) 32/Re
c) 64/Re d) none of the above

8) The dimensions of the coefficient of viscosity (μ) are: _____.

a) ML^1T^{-2} b) $M^2L^1T^1$
c) $ML^{-1}T^{-1}$ d) $ML^{-1}T^{-2}$

9) When a pump casing is filled with liquid before it is started, it is called as _____.

a) Efficiency of pump b) Priming
c) Suction head d) Net positive suction head

10) Generally, the value of the specific speed of the Kaplan turbine is _____ that of the Pelton turbine.

a) lower than b) higher than
c) same as d) unpredictable

11) In the case of Francis Turbine _____ allow the water to strike the vanes fixed on a runner without shock at the inlet.

a) Casing b) Guide vanes
c) Runner d) Draft tube

12) The value of Drag Force & Lift Force is zero for _____.

a) Square Plate b) Triangular Plate
c) Sphere d) All of the above

13) The number of Buckets of the Pelton wheel is obtained by the equation _____.

a) Z = 15 + (2D/d) b) Z = 15 + (2d/D)
c) Z = 15 + (D/2d) d) Z = 15 + (d/2D)

14) The multistage centrifugal pump required for High Head is to be connected in _____.

a) parallel b) axial
c) radial d) series

Seat No.	

Set P

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Fluid Mechanics & Fluid Machines (BTN02403)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Slove any two questions from each section.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Solve the Followings.

a) What is a minor loss in case of flow through pipes? List all types of minor losses along with the formulae. **05**

b) Derive the expression for Total Pressure force & Position of centre of pressure for vertical Plane Surface. **05**

c) A pipe of diameter 300 mm and length 3500 m is used for the transmission of power by water. The total head at the inlet of the pipe is 500 m. Find the maximum power available at the outlet of the pipe, if the value of f=0.006. **04**

Q.3 Solve the Followings.

a) What is a Veturimeter? Derive an expression for the discharge through a venturimeter. **05**

b) A circular plate 1.5 m in diameter is immersed in water, its greatest and least depth below the free surface being 2 m and 0.75 m respectively. Find. **05**
1) The total pressure on one face of the plate
2) Position of centre of pressure

c) Explain Pipes in Series and Pipes in Parallel. **04**

Q.4 Solve the Followings.

a) With a neat sketch explain the conditions of the equilibrium for the Submerged body. **05**

b) In a two-dimensional incompressible flow, the fluid velocity components are given by $u = x - 4y$ and $v = -y - 4x$. **05**
Show that the velocity potential function exists and determine its form. Also, find the stream function.

c) Explain the different types of hydraulic coefficients. **04**

Section – II

Q.5 Solve the Followings.

a) Explain the construction and working of a centrifugal pump with a neat sketch. **05**

b) An inward-flow reaction turbine has external & internal diameters of 0.9 m & 0.45 m respectively. The turbine is running at 200 rpm & the width of the turbine at inlet is 200 mm. The velocity of flow through the runner is constant & is equal to 1.8 m/sec. The guide blade makes an angle of 10° to the tangent of the wheel & discharge at the outlet is radial. **05**

Draw inlet & outlet velocity triangle & determine

1) Absolute Velocity of Water at the inlet of Runner
2) Velocity of Whirl at Inlet
3) Runner blade angles
4) Width of the runner at the outlet

c) Write down the rules for selecting repeating variables in dimensional analysis. **04**

Q.6 Solve the Followings.

a) The resisting force (R) of the supersonic plane during the flight can be considered as dependent upon the length of the aircraft (L), velocity (V), dynamic viscosity (μ), air density (ρ) and bulk modulus of air (K). Express the functional relationship between these variables and resisting force. **05**

b) Obtain an expression for the work done per second by water on the runner of a Pelton wheel. **05**

c) Derive an expression for the minimum starting speed of the Centrifugal Pump. **04**

Q.7 Solve the Followings.

a) Why multistaging of centrifugal pumps required? Explain Pumps in Series & Pumps in Parallel. **05**

b) Explain governing of water turbines. **05**

c) A flat plate 2 m x 2 m moves at 40 km/hr in a stationary air of density 1.2 kg/m^3. If the co-efficient of drag and lift are 0.1 and 0.5 respectively, find: **04**

1) the lift force
2) the drag force
3) the resultant force, and
4) the power required to keep the plate in motion

Seat No.	

Set Q

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Fluid Mechanics & Fluid Machines (BTN02403)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The dimensions of the coefficient of viscosity (μ) are: _____.
a) ML^1T^{-2} b) $M^2L^1T^1$
c) $ML^{-1}T^{-1}$ d) $ML^{-1}T^{-2}$

2) When a pump casing is filled with liquid before it is started, it is called as _____.
a) Efficiency of pump b) Priming
c) Suction head d) Net positive suction head

3) Generally, the value of the specific speed of the Kaplan turbine is _____ that of the Pelton turbine.
a) lower than b) higher than
c) same as d) unpredictable

4) In the case of Francis Turbine _____ allow the water to strike the vanes fixed on a runner without shock at the inlet.
a) Casing b) Guide vanes
c) Runner d) Draft tube

5) The value of Drag Force & Lift Force is zero for _____.
a) Square Plate b) Triangular Plate
c) Sphere d) All of the above

6) The number of Buckets of the Pelton wheel is obtained by the equation _____.
a) Z = 15 + (2D/d) b) Z = 15 + (2d/D)
c) Z = 15 + (D/2d) d) Z = 15 + (d/2D)

7) The multistage centrifugal pump required for High Head is to be connected in _____.

a) parallel b) axial
c) radial d) series

8) The position of the Center of pressure for the inclined plane surface is always _____ the Centre of Gravity.

a) above b) below
c) coincide d) can't predict

9) The metacentric height is the distance between the _____.

a) centre of gravity of the floating body and the centre of buoyancy
b) centre of gravity of the floating body and the metacentre
c) metacentre and centre of buoyancy
d) original centre of buoyancy and new centre of buoyancy

10) Streamlines, path lines and streak lines are identical in _____.

a) uniform flow b) compressible flow
c) steady flow d) highly viscous flow

11) A negative derivative of the velocity function with respect to a given direction will give the _____.

a) Velocity in the perpendicular direction
b) Velocity in the same direction
c) Velocity in any direction
d) none of the above

12) The major loss of energy in long pipes is due to _____.

a) sudden enlargement
b) sudden contraction
c) gradual contraction on enlargement
d) friction

13) In Venturimeter, the velocity of the liquid at the throat is _____ as compared to the inlet velocity of the liquid.

a) higher b) lower
c) equal d) can't predict

14) For laminar flow in circular pipes, Darcy's friction factor f is equal to _____ where Re is Reynold's, number.

a) 16/Re b) 32/Re
c) 64/Re d) none of the above

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Fluid Mechanics & Fluid Machines (BTN02403)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Slove any two questions from each section.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Solve the Followings.

a) What is a minor loss in case of flow through pipes? List all types of minor losses along with the formulae. **05**

b) Derive the expression for Total Pressure force & Position of centre of pressure for vertical Plane Surface. **05**

c) A pipe of diameter 300 mm and length 3500 m is used for the transmission of power by water. The total head at the inlet of the pipe is 500 m. Find the maximum power available at the outlet of the pipe, if the value of f=0.006. **04**

Q.3 Solve the Followings.

a) What is a Veturimeter? Derive an expression for the discharge through a venturimeter. **05**

b) A circular plate 1.5 m in diameter is immersed in water, its greatest and least depth below the free surface being 2 m and 0.75 m respectively. Find. **05**
1) The total pressure on one face of the plate
2) Position of centre of pressure

c) Explain Pipes in Series and Pipes in Parallel. **04**

Q.4 Solve the Followings.

a) With a neat sketch explain the conditions of the equilibrium for the Submerged body. **05**

b) In a two-dimensional incompressible flow, the fluid velocity components are given by $u = x - 4y$ and $v = -y - 4x$. **05**
Show that the velocity potential function exists and determine its form. Also, find the stream function.

c) Explain the different types of hydraulic coefficients. **04**

Section – II

Q.5 Solve the Followings.

a) Explain the construction and working of a centrifugal pump with a neat sketch. **05**

b) An inward-flow reaction turbine has external & internal diameters of 0.9 m & 0.45 m respectively. The turbine is running at 200 rpm & the width of the turbine at inlet is 200 mm. The velocity of flow through the runner is constant & is equal to 1.8 m/sec. The guide blade makes an angle of 10° to the tangent of the wheel & discharge at the outlet is radial. **05**

Draw inlet & outlet velocity triangle & determine

1) Absolute Velocity of Water at the inlet of Runner
2) Velocity of Whirl at Inlet
3) Runner blade angles
4) Width of the runner at the outlet

c) Write down the rules for selecting repeating variables in dimensional analysis. **04**

Q.6 Solve the Followings.

a) The resisting force (R) of the supersonic plane during the flight can be considered as dependent upon the length of the aircraft (L), velocity (V), dynamic viscosity (μ), air density (ρ) and bulk modulus of air (K). Express the functional relationship between these variables and resisting force. **05**

b) Obtain an expression for the work done per second by water on the runner of a Pelton wheel. **05**

c) Derive an expression for the minimum starting speed of the Centrifugal Pump. **04**

Q.7 Solve the Followings.

a) Why multistaging of centrifugal pumps required? Explain Pumps in Series & Pumps in Parallel. **05**

b) Explain governing of water turbines. **05**

c) A flat plate 2 m x 2 m moves at 40 km/hr in a stationary air of density 1.2 kg/m^3. If the co-efficient of drag and lift are 0.1 and 0.5 respectively, find: **04**

1) the lift force
2) the drag force
3) the resultant force, and
4) the power required to keep the plate in motion

Seat No.	

Set R

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Fluid Mechanics & Fluid Machines (BTN02403)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) In the case of Francis Turbine _____ allow the water to strike the vanes fixed on a runner without shock at the inlet.
a) Casing b) Guide vanes
c) Runner d) Draft tube

2) The value of Drag Force & Lift Force is zero for _____.
a) Square Plate b) Triangular Plate
c) Sphere d) All of the above

3) The number of Buckets of the Pelton wheel is obtained by the equation _____.
a) Z = 15 + (2D/d) b) Z = 15 + (2d/D)
c) Z = 15 + (D/2d) d) Z = 15 + (d/2D)

4) The multistage centrifugal pump required for High Head is to be connected in _____.
a) parallel b) axial
c) radial d) series

5) The position of the Center of pressure for the inclined plane surface is always _____ the Centre of Gravity.
a) above b) below
c) coincide d) can't predict

6) The metacentric height is the distance between the _____.
a) centre of gravity of the floating body and the centre of buoyancy
b) centre of gravity of the floating body and the metacentre
c) metacentre and centre of buoyancy
d) original centre of buoyancy and new centre of buoyancy

7) Streamlines, path lines and streak lines are identical in _____.
a) uniform flow b) compressible flow
c) steady flow d) highly viscous flow

8) A negative derivative of the velocity function with respect to a given direction will give the _____.
a) Velocity in the perpendicular direction
b) Velocity in the same direction
c) Velocity in any direction
d) none of the above

9) The major loss of energy in long pipes is due to _____.
a) sudden enlargement
b) sudden contraction
c) gradual contraction on enlargement
d) friction

10) In Venturimeter, the velocity of the liquid at the throat is _____ as compared to the inlet velocity of the liquid.
a) higher b) lower
c) equal d) can't predict

11) For laminar flow in circular pipes, Darcy's friction factor f is equal to _____ where Re is Reynold's, number.
a) 16/Re b) 32/Re
c) 64/Re d) none of the above

12) The dimensions of the coefficient of viscosity (μ) are: _____.
a) ML^1T^{-2} b) $M^2L^1T^1$
c) $ML^{-1}T^{-1}$ d) $ML^{-1}T^{-2}$

13) When a pump casing is filled with liquid before it is started, it is called as _____.
a) Efficiency of pump b) Priming
c) Suction head d) Net positive suction head

14) Generally, the value of the specific speed of the Kaplan turbine is _____ that of the Pelton turbine.
a) lower than b) higher than
c) same as d) unpredictable

Seat No.	

Set R

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Fluid Mechanics & Fluid Machines (BTN02403)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Slove any two questions from each section.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Solve the Followings.

a) What is a minor loss in case of flow through pipes? List all types of minor losses along with the formulae. **05**

b) Derive the expression for Total Pressure force & Position of centre of pressure for vertical Plane Surface. **05**

c) A pipe of diameter 300 mm and length 3500 m is used for the transmission of power by water. The total head at the inlet of the pipe is 500 m. Find the maximum power available at the outlet of the pipe, if the value of f=0.006. **04**

Q.3 Solve the Followings.

a) What is a Veturimeter? Derive an expression for the discharge through a venturimeter. **05**

b) A circular plate 1.5 m in diameter is immersed in water, its greatest and least depth below the free surface being 2 m and 0.75 m respectively. Find. **05**
1) The total pressure on one face of the plate
2) Position of centre of pressure

c) Explain Pipes in Series and Pipes in Parallel. **04**

Q.4 Solve the Followings.

a) With a neat sketch explain the conditions of the equilibrium for the Submerged body. **05**

b) In a two-dimensional incompressible flow, the fluid velocity components are given by $u = x - 4y$ and $v = -y - 4x$. **05**
Show that the velocity potential function exists and determine its form. Also, find the stream function.

c) Explain the different types of hydraulic coefficients. **04**

Section – II

Q.5 Solve the Followings.

a) Explain the construction and working of a centrifugal pump with a neat sketch. **05**

b) An inward-flow reaction turbine has external & internal diameters of 0.9 m & 0.45 m respectively. The turbine is running at 200 rpm & the width of the turbine at inlet is 200 mm. The velocity of flow through the runner is constant & is equal to 1.8 m/sec. The guide blade makes an angle of 10° to the tangent of the wheel & discharge at the outlet is radial. **05**

Draw inlet & outlet velocity triangle & determine

1) Absolute Velocity of Water at the inlet of Runner
2) Velocity of Whirl at Inlet
3) Runner blade angles
4) Width of the runner at the outlet

c) Write down the rules for selecting repeating variables in dimensional analysis. **04**

Q.6 Solve the Followings.

a) The resisting force (R) of the supersonic plane during the flight can be considered as dependent upon the length of the aircraft (L), velocity (V), dynamic viscosity (μ), air density (ρ) and bulk modulus of air (K). Express the functional relationship between these variables and resisting force. **05**

b) Obtain an expression for the work done per second by water on the runner of a Pelton wheel. **05**

c) Derive an expression for the minimum starting speed of the Centrifugal Pump. **04**

Q.7 Solve the Followings.

a) Why multistaging of centrifugal pumps required? Explain Pumps in Series & Pumps in Parallel. **05**

b) Explain governing of water turbines. **05**

c) A flat plate 2 m x 2 m moves at 40 km/hr in a stationary air of density 1.2 kg/m^3. If the co-efficient of drag and lift are 0.1 and 0.5 respectively, find: **04**

1) the lift force
2) the drag force
3) the resultant force, and
4) the power required to keep the plate in motion

Seat No.		Set	S

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Fluid Mechanics & Fluid Machines (BTN02403)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) In Venturimeter, the velocity of the liquid at the throat is _____ as compared to the inlet velocity of the liquid.
a) higher b) lower
c) equal d) can't predict

2) For laminar flow in circular pipes, Darcy's friction factor f is equal to _____ where Re is Reynold's, number.
a) 16/Re b) 32/Re
c) 64/Re d) none of the above

3) The dimensions of the coefficient of viscosity (μ) are: _____.
a) ML^1T^{-2} b) $M^2L^1T^1$
c) $ML^{-1}T^{-1}$ d) $ML^{-1}T^{-2}$

4) When a pump casing is filled with liquid before it is started, it is called as _____.
a) Efficiency of pump b) Priming
c) Suction head d) Net positive suction head

5) Generally, the value of the specific speed of the Kaplan turbine is _____ that of the Pelton turbine.
a) lower than b) higher than
c) same as d) unpredictable

6) In the case of Francis Turbine _____ allow the water to strike the vanes fixed on a runner without shock at the inlet.
a) Casing b) Guide vanes
c) Runner d) Draft tube

7) The value of Drag Force & Lift Force is zero for _____.
a) Square Plate b) Triangular Plate
c) Sphere d) All of the above

8) The number of Buckets of the Pelton wheel is obtained by the equation _____.
a) Z = 15 + (2D/d) b) Z = 15 + (2d/D)
c) Z = 15 + (D/2d) d) Z = 15 + (d/2D)

9) The multistage centrifugal pump required for High Head is to be connected in _____.
a) parallel b) axial
c) radial d) series

10) The position of the Center of pressure for the inclined plane surface is always _____ the Centre of Gravity.
a) above b) below
c) coincide d) can't predict

11) The metacentric height is the distance between the _____.
a) centre of gravity of the floating body and the centre of buoyancy
b) centre of gravity of the floating body and the metacentre
c) metacentre and centre of buoyancy
d) original centre of buoyancy and new centre of buoyancy

12) Streamlines, path lines and streak lines are identical in _____.
a) uniform flow b) compressible flow
c) steady flow d) highly viscous flow

13) A negative derivative of the velocity function with respect to a given direction will give the _____.
a) Velocity in the perpendicular direction
b) Velocity in the same direction
c) Velocity in any direction
d) none of the above

14) The major loss of energy in long pipes is due to _____.
a) sudden enlargement
b) sudden contraction
c) gradual contraction on enlargement
d) friction

Seat No.	

Set **S**

S. Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Fluid Mechanics & Fluid Machines (BTN02403)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Slove any two questions from each section.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Solve the Followings.

a) What is a minor loss in case of flow through pipes? List all types of minor losses along with the formulae. **05**

b) Derive the expression for Total Pressure force & Position of centre of pressure for vertical Plane Surface. **05**

c) A pipe of diameter 300 mm and length 3500 m is used for the transmission of power by water. The total head at the inlet of the pipe is 500 m. Find the maximum power available at the outlet of the pipe, if the value of f=0.006. **04**

Q.3 Solve the Followings.

a) What is a Veturimeter? Derive an expression for the discharge through a venturimeter. **05**

b) A circular plate 1.5 m in diameter is immersed in water, its greatest and least depth below the free surface being 2 m and 0.75 m respectively. Find. **05**
1) The total pressure on one face of the plate
2) Position of centre of pressure

c) Explain Pipes in Series and Pipes in Parallel. **04**

Q.4 Solve the Followings.

a) With a neat sketch explain the conditions of the equilibrium for the Submerged body. **05**

b) In a two-dimensional incompressible flow, the fluid velocity components are given by $u = x - 4y$ and $v = -y - 4x$. **05**
Show that the velocity potential function exists and determine its form. Also, find the stream function.

c) Explain the different types of hydraulic coefficients. **04**

Section – II

Q.5 Solve the Followings.

a) Explain the construction and working of a centrifugal pump with a neat sketch. **05**

b) An inward-flow reaction turbine has external & internal diameters of 0.9 m & 0.45 m respectively. The turbine is running at 200 rpm & the width of the turbine at inlet is 200 mm. The velocity of flow through the runner is constant & is equal to 1.8 m/sec. The guide blade makes an angle of 10° to the tangent of the wheel & discharge at the outlet is radial. **05**

Draw inlet & outlet velocity triangle & determine

1) Absolute Velocity of Water at the inlet of Runner
2) Velocity of Whirl at Inlet
3) Runner blade angles
4) Width of the runner at the outlet

c) Write down the rules for selecting repeating variables in dimensional analysis. **04**

Q.6 Solve the Followings.

a) The resisting force (R) of the supersonic plane during the flight can be considered as dependent upon the length of the aircraft (L), velocity (V), dynamic viscosity (μ), air density (ρ) and bulk modulus of air (K). Express the functional relationship between these variables and resisting force. **05**

b) Obtain an expression for the work done per second by water on the runner of a Pelton wheel. **05**

c) Derive an expression for the minimum starting speed of the Centrifugal Pump. **04**

Q.7 Solve the Followings.

a) Why multistaging of centrifugal pumps required? Explain Pumps in Series & Pumps in Parallel. **05**

b) Explain governing of water turbines. **05**

c) A flat plate 2 m x 2 m moves at 40 km/hr in a stationary air of density 1.2 kg/m^3. If the co-efficient of drag and lift are 0.1 and 0.5 respectively, find: **04**

1) the lift force
2) the drag force
3) the resultant force, and
4) the power required to keep the plate in motion

SLR-BD-108

Seat No.	

Set P

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Kinematics &Theory of Machines (BTN02404)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) The mechanism forms a structure, when the number of degrees of freedom (n) is equal to _____.
a) 0 b) 1
c) 2 d) -1

2) The total number of instantaneous centres for a mechanism consisting of n links are _____.
a) n/2 b) n
c) n-1/2 d) n (n-1)/2

3) The motion of a piston in the cylinder of a steam engine is an example of _____.
a) completely constrained motion
b) incompletely constrained motion
c) successfully constrained motion
d) none of these

4) Which of the following is an inversion of double slider crank chain?
a) Coupling rod of a locomotive
b) Pendulum pump
c) Elliptical trammels
d) Oscillating cylinder engine

5) Which of the following is a turning pair?
a) Piston and cylinder of a reciprocating steam engine
b) Shaft with collars at both ends fitted in a circular hole
c) Lead screw of a lathe with nut
d) Ball and socket joint

6) Which of the following displacement diagrams should be chosen for better dynamic performance of a cam-follower mechanism?
a) simple harmonic motion b) parabolic motion
c) cycloidal motion d) None of these

7) In a radial cam, the follower moves _____.
a) in a direction perpendicular to the cam axis
b) in a direction parallel to the cam axis
c) in any direction irrespective of the cam axis
d) along the cam axis

8) The magnitude of linear velocity of a point B on a link AB relative to point A is _____.
a) $\omega . AB$ b) $\omega (AB)^2$
c) $\omega^2 . AB$ d) $(\omega^2 . AB)^2$

9) In a simple gear train, if the number of idle gears is odd, then the motion of driven gear will _____
a) be same as that of driving gear
b) be opposite as that of driving gear
c) depend upon the number of teeth on the driving gear
d) none of the above

10) A differential gear in automobiles is used to _____.
a) reduce speed
b) assist in changing speed
c) provide jerk-free movement of vehicle
d) help in turning

11) A Hartnell governor is a _____.
a) pendulum type governor b) spring loaded governor
c) dead weight governor d) Inertia governor

12) A hunting governor is _____.
a) more stable b) less sensitive
c) more sensitive d) None of these

13) For static balancing of a shaft, _____.
a) the net dynamic force acting on the shaft is equal to zero
b) the net couple due to the dynamic forces acting on the shaft is equal to zero
c) both (a) and (b)
d) none of the above

14) Secondary forces in reciprocating mass on engine frame are _____.
a) of same frequency as of primary forces
b) twice the frequency as of primary forces
c) four times the frequency as of primary forces
d) none of the above

Seat No.	

Set **P**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Kinematics &Theory of Machines (BTN02404)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from each section.
2) Make suitable assumptions if necessary and state them clearly.
3) Draw neat diagram wherever necessary.

Section – I

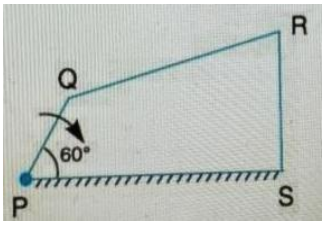
Q.2 **a)** Define Kinematic Pair and describe any 3 type of kinematic pairs. **04**

b) Define inversion of mechanism and draw any one inversion of double slider crank chain. **04**

c) Describe the following motions with neat sketches: **06**
1) Completely constrained motion
2) Incompletely constrained motions
3) Successfully constrained motion

Q.3 **a)** Locate the instantaneous centers and draw the circle diagram for the four bar mechanism. **06**

b) PQRS is a four bar chain with link PS fixed. The lengths of the links are PQ = 62.5 mm; QR = 175 mm; RS = 112.5 mm; and PS = 200 mm. The crank PQ rotates at 10 rad/s clockwise. Draw the velocity and acceleration diagram when angle QPS = 60° and Q and R lie on the same side of PS. Find the angular velocity and angular acceleration of links QR. **08**



Q.4 **a)** Define the following terms with reference to cams: **06**
1) Base circle 2) Pressure angle 3) Lift i

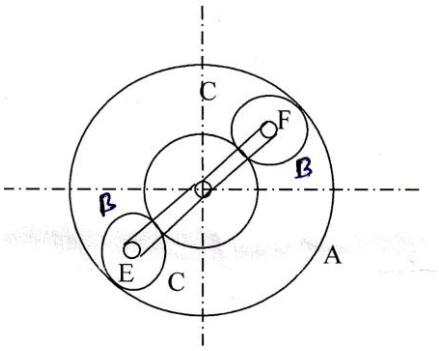
b) A cam, with a minimum radius of 50 mm, rotating clockwise at a uniform speed, is required to give a knife edge follower the motion as described below: **08**
1) To move outwards through 40 mm during 100° rotation of the cam;
2) To dwell for next 80°
3) To return to its starting position during next 90°, and
4) To dwell for the rest period of a revolution i.e. 90°

Draw the profile of the cam when the line of stroke of the follower passes through the centre of the cam shaft.

Section – II

Q.5 **a)** Compare cycloid and involute tooth profiles. **06**

b) An epicyclic gear consists of three gears A, B and C as shown in Fig. The gear A has 72 internal teeth and gear C has 32 external teeth. The gear B meshes with both A and C and is carried on an arm EF which rotates about the centre of A at 18 r.p.m. If the gear A is fixed, determine the speed of gears B and C. **08**



Q.6 **a)** For governors explain: **06**

1) Sensitiveness
2) stability
3) isochronism

b) The arms of a Porter governor are each 250 mm long and pivoted on the governor axis. The mass of each ball is 5 kg and the mass of the central sleeve is 30 kg. The radius of rotation of the balls is 150 mm when the sleeve begins to rise and reaches a value of 200 mm for maximum speed. Determine the speed range of the governor. If the friction at the sleeve is equivalent of 20 N of load at the sleeve, determine how the speed range is modified. **08**

Q.7 **a)** Describe balancing of several masses in several plain. **06**

b) A, B, C and D are four masses carried by a rotating shaft at radii 100, 125, 200 and 150 mm respectively. The planes in which the masses revolve are spaced 600 mm apart and the mass of B, C and D are 10 kg, 5 kg, and 4 kg respectively. **08**

Find the required mass A and the relative angular settings of the four masses so that the shaft shall be in complete balance.

Seat No.	

Set Q

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Kinematics &Theory of Machines (BTN02404)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The magnitude of linear velocity of a point B on a link AB relative to point A is _____.
a) $\omega.AB$ b) $\omega(AB)^2$
c) $\omega^2.AB$ d) $(\omega^2.AB)^2$

2) In a simple gear train, if the number of idle gears is odd, then the motion of driven gear will _____
a) be same as that of driving gear
b) be opposite as that of driving gear
c) depend upon the number of teeth on the driving gear
d) none of the above

3) A differential gear in automobiles is used to _____.
a) reduce speed
b) assist in changing speed
c) provide jerk-free movement of vehicle
d) help in turning

4) A Hartnell governor is a _____.
a) pendulum type governor b) spring loaded governor
c) dead weight governor d) Inertia governor

5) A hunting governor is _____.
a) more stable b) less sensitive
c) more sensitive d) None of these

6) For static balancing of a shaft, _____.
a) the net dynamic force acting on the shaft is equal to zero
b) the net couple due to the dynamic forces acting on the shaft is equal to zero
c) both (a) and (b)
d) none of the above

7) Secondary forces in reciprocating mass on engine frame are _____.
a) of same frequency as of primary forces
b) twice the frequency as of primary forces
c) four times the frequency as of primary forces
d) none of the above

8) The mechanism forms a structure, when the number of degrees of freedom (n) is equal to _____.
a) 0 b) 1
c) 2 d) -1

9) The total number of instantaneous centres for a mechanism consisting of n links are _____.
a) n/2 b) n
c) n-1/2 d) n (n-1)/2

10) The motion of a piston in the cylinder of a steam engine is an example of _____.
a) completely constrained motion
b) incompletely constrained motion
c) successfully constrained motion
d) none of these

11) Which of the following is an inversion of double slider crank chain?
a) Coupling rod of a locomotive
b) Pendulum pump
c) Elliptical trammels
d) Oscillating cylinder engine

12) Which of the following is a turning pair?
a) Piston and cylinder of a reciprocating steam engine
b) Shaft with collars at both ends fitted in a circular hole
c) Lead screw of a lathe with nut
d) Ball and socket joint

13) Which of the following displacement diagrams should be chosen for better dynamic performance of a cam-follower mechanism?
a) simple harmonic motion b) parabolic motion
c) cycloidal motion d) None of these

14) In a radial cam, the follower moves _____.

a) in a direction perpendicular to the cam axis
b) in a direction parallel to the cam axis
c) in any direction irrespective of the cam axis
d) along the cam axis

Seat No.	

Set **Q**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Kinematics &Theory of Machines (BTN02404)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from each section.
2) Make suitable assumptions if necessary and state them clearly.
3) Draw neat diagram wherever necessary.

Section – I

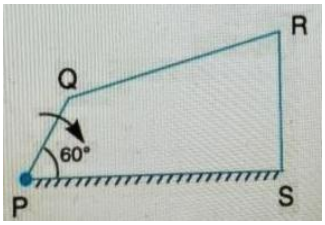
Q.2 **a)** Define Kinematic Pair and describe any 3 type of kinematic pairs. **04**

b) Define inversion of mechanism and draw any one inversion of double slider crank chain. **04**

c) Describe the following motions with neat sketches: **06**
1) Completely constrained motion
2) Incompletely constrained motions
3) Successfully constrained motion

Q.3 **a)** Locate the instantaneous centers and draw the circle diagram for the four bar mechanism. **06**

b) PQRS is a four bar chain with link PS fixed. The lengths of the links are PQ = 62.5 mm; QR = 175 mm; RS = 112.5 mm; and PS = 200 mm. The crank PQ rotates at 10 rad/s clockwise. Draw the velocity and acceleration diagram when angle QPS = 60° and Q and R lie on the same side of PS. Find the angular velocity and angular acceleration of links QR. **08**



Q.4 **a)** Define the following terms with reference to cams: **06**
1) Base circle 2) Pressure angle 3) Lift i

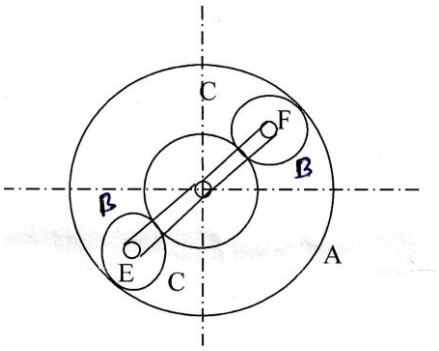
b) A cam, with a minimum radius of 50 mm, rotating clockwise at a uniform speed, is required to give a knife edge follower the motion as described below: **08**
1) To move outwards through 40 mm during 100° rotation of the cam;
2) To dwell for next 80°
3) To return to its starting position during next 90°, and
4) To dwell for the rest period of a revolution i.e. 90°

Draw the profile of the cam when the line of stroke of the follower passes through the centre of the cam shaft.

Section – II

Q.5 **a)** Compare cycloid and involute tooth profiles. **06**

b) An epicyclic gear consists of three gears A, B and C as shown in Fig. The gear A has 72 internal teeth and gear C has 32 external teeth. The gear B meshes with both A and C and is carried on an arm EF which rotates about the centre of A at 18 r.p.m. If the gear A is fixed, determine the speed of gears B and C. **08**



Q.6 **a)** For governors explain: **06**

1) Sensitiveness
2) stability
3) isochronism

b) The arms of a Porter governor are each 250 mm long and pivoted on the governor axis. The mass of each ball is 5 kg and the mass of the central sleeve is 30 kg. The radius of rotation of the balls is 150 mm when the sleeve begins to rise and reaches a value of 200 mm for maximum speed. Determine the speed range of the governor. If the friction at the sleeve is equivalent of 20 N of load at the sleeve, determine how the speed range is modified. **08**

Q.7 **a)** Describe balancing of several masses in several plain. **06**

b) A, B, C and D are four masses carried by a rotating shaft at radii 100, 125, 200 and 150 mm respectively. The planes in which the masses revolve are spaced 600 mm apart and the mass of B, C and D are 10 kg, 5 kg, and 4 kg respectively. **08**

Find the required mass A and the relative angular settings of the four masses so that the shaft shall be in complete balance.

SLR-BD-108

Seat No.	

Set R

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Kinematics &Theory of Machines (BTN02404)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) A Hartnell governor is a _____.
a) pendulum type governor b) spring loaded governor
c) dead weight governor d) Inertia governor

2) A hunting governor is _____.
a) more stable b) less sensitive
c) more sensitive d) None of these

3) For static balancing of a shaft, _____.
a) the net dynamic force acting on the shaft is equal to zero
b) the net couple due to the dynamic forces acting on the shaft is equal to zero
c) both (a) and (b)
d) none of the above

4) Secondary forces in reciprocating mass on engine frame are _____.
a) of same frequency as of primary forces
b) twice the frequency as of primary forces
c) four times the frequency as of primary forces
d) none of the above

5) The mechanism forms a structure, when the number of degrees of freedom (n) is equal to _____.
a) 0 b) 1
c) 2 d) -1

6) The total number of instantaneous centres for a mechanism consisting of n links are _____.
a) n/2 b) n
c) n-1/2 d) n (n-1)/2

7) The motion of a piston in the cylinder of a steam engine is an example of _____.
a) completely constrained motion
b) incompletely constrained motion
c) successfully constrained motion
d) none of these

8) Which of the following is an inversion of double slider crank chain?
a) Coupling rod of a locomotive
b) Pendulum pump
c) Elliptical trammels
d) Oscillating cylinder engine

9) Which of the following is a turning pair?
a) Piston and cylinder of a reciprocating steam engine
b) Shaft with collars at both ends fitted in a circular hole
c) Lead screw of a lathe with nut
d) Ball and socket joint

10) Which of the following displacement diagrams should be chosen for better dynamic performance of a cam-follower mechanism?
a) simple harmonic motion b) parabolic motion
c) cycloidal motion d) None of these

11) In a radial cam, the follower moves _____.
a) in a direction perpendicular to the cam axis
b) in a direction parallel to the cam axis
c) in any direction irrespective of the cam axis
d) along the cam axis

12) The magnitude of linear velocity of a point B on a link AB relative to point A is _____.
a) $\omega.AB$ b) $\omega(AB)^2$
c) $\omega^2.AB$ d) $(\omega^2.AB)^2$

13) In a simple gear train, if the number of idle gears is odd, then the motion of driven gear will _____
a) be same as that of driving gear
b) be opposite as that of driving gear
c) depend upon the number of teeth on the driving gear
d) none of the above

14) A differential gear in automobiles is used to _____.
a) reduce speed
b) assist in changing speed
c) provide jerk-free movement of vehicle
d) help in turning

Seat No.	

Set **R**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Kinematics &Theory of Machines (BTN02404)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from each section.
2) Make suitable assumptions if necessary and state them clearly.
3) Draw neat diagram wherever necessary.

Section – I

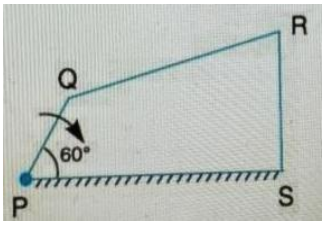
Q.2 **a)** Define Kinematic Pair and describe any 3 type of kinematic pairs. **04**

b) Define inversion of mechanism and draw any one inversion of double slider crank chain. **04**

c) Describe the following motions with neat sketches: **06**
1) Completely constrained motion
2) Incompletely constrained motions
3) Successfully constrained motion

Q.3 **a)** Locate the instantaneous centers and draw the circle diagram for the four bar mechanism. **06**

b) PQRS is a four bar chain with link PS fixed. The lengths of the links are PQ = 62.5 mm; QR = 175 mm; RS = 112.5 mm; and PS = 200 mm. The crank PQ rotates at 10 rad/s clockwise. Draw the velocity and acceleration diagram when angle QPS = 60° and Q and R lie on the same side of PS. Find the angular velocity and angular acceleration of links QR. **08**



Q.4 **a)** Define the following terms with reference to cams: **06**
1) Base circle 2) Pressure angle 3) Lift i

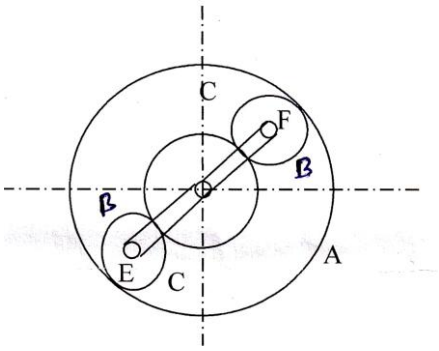
b) A cam, with a minimum radius of 50 mm, rotating clockwise at a uniform speed, is required to give a knife edge follower the motion as described below: **08**
1) To move outwards through 40 mm during 100° rotation of the cam;
2) To dwell for next 80°
3) To return to its starting position during next 90°, and
4) To dwell for the rest period of a revolution i.e. 90°

Draw the profile of the cam when the line of stroke of the follower passes through the centre of the cam shaft.

Section – II

Q.5 **a)** Compare cycloid and involute tooth profiles. **06**

b) An epicyclic gear consists of three gears A, B and C as shown in Fig. The gear A has 72 internal teeth and gear C has 32 external teeth. The gear B meshes with both A and C and is carried on an arm EF which rotates about the centre of A at 18 r.p.m. If the gear A is fixed, determine the speed of gears B and C. **08**



Q.6 **a)** For governors explain: **06**

1) Sensitiveness
2) stability
3) isochronism

b) The arms of a Porter governor are each 250 mm long and pivoted on the governor axis. The mass of each ball is 5 kg and the mass of the central sleeve is 30 kg. The radius of rotation of the balls is 150 mm when the sleeve begins to rise and reaches a value of 200 mm for maximum speed. Determine the speed range of the governor. If the friction at the sleeve is equivalent of 20 N of load at the sleeve, determine how the speed range is modified. **08**

Q.7 **a)** Describe balancing of several masses in several plain. **06**

b) A, B, C and D are four masses carried by a rotating shaft at radii 100, 125, 200 and 150 mm respectively. The planes in which the masses revolve are spaced 600 mm apart and the mass of B, C and D are 10 kg, 5 kg, and 4 kg respectively. **08**

Find the required mass A and the relative angular settings of the four masses so that the shaft shall be in complete balance.

Seat No.		Set	S

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Kinematics &Theory of Machines (BTN02404)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following displacement diagrams should be chosen for better dynamic performance of a cam-follower mechanism?
a) simple harmonic motion b) parabolic motion
c) cycloidal motion d) None of these

2) In a radial cam, the follower moves _____.
a) in a direction perpendicular to the cam axis
b) in a direction parallel to the cam axis
c) in any direction irrespective of the cam axis
d) along the cam axis

3) The magnitude of linear velocity of a point B on a link AB relative to point A is _____.
a) $\omega.AB$ b) $\omega(AB)^2$
c) $\omega^2.AB$ d) $(\omega^2.AB)^2$

4) In a simple gear train, if the number of idle gears is odd, then the motion of driven gear will _____
a) be same as that of driving gear
b) be opposite as that of driving gear
c) depend upon the number of teeth on the driving gear
d) none of the above

5) A differential gear in automobiles is used to _____.
a) reduce speed
b) assist in changing speed
c) provide jerk-free movement of vehicle
d) help in turning

6) A Hartnell governor is a _____.
a) pendulum type governor b) spring loaded governor
c) dead weight governor d) Inertia governor

7) A hunting governor is _____.
a) more stable b) less sensitive
c) more sensitive d) None of these

8) For static balancing of a shaft, _____.
a) the net dynamic force acting on the shaft is equal to zero
b) the net couple due to the dynamic forces acting on the shaft is equal to zero
c) both (a) and (b)
d) none of the above

9) Secondary forces in reciprocating mass on engine frame are _____.
a) of same frequency as of primary forces
b) twice the frequency as of primary forces
c) four times the frequency as of primary forces
d) none of the above

10) The mechanism forms a structure, when the number of degrees of freedom (n) is equal to _____.
a) 0 b) 1
c) 2 d) -1

11) The total number of instantaneous centres for a mechanism consisting of n links are _____.
a) n/2 b) n
c) n-1/2 d) n (n-1)/2

12) The motion of a piston in the cylinder of a steam engine is an example of _____.
a) completely constrained motion
b) incompletely constrained motion
c) successfully constrained motion
d) none of these

13) Which of the following is an inversion of double slider crank chain?
a) Coupling rod of a locomotive
b) Pendulum pump
c) Elliptical trammels
d) Oscillating cylinder engine

14) Which of the following is a turning pair?
a) Piston and cylinder of a reciprocating steam engine
b) Shaft with collars at both ends fitted in a circular hole
c) Lead screw of a lathe with nut
d) Ball and socket joint

Seat No.		Set	S

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Kinematics &Theory of Machines (BTN02404)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from each section.
2) Make suitable assumptions if necessary and state them clearly.
3) Draw neat diagram wherever necessary.

Section – I

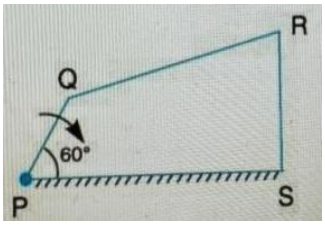
Q.2 **a)** Define Kinematic Pair and describe any 3 type of kinematic pairs. **04**

b) Define inversion of mechanism and draw any one inversion of double slider crank chain. **04**

c) Describe the following motions with neat sketches: **06**
1) Completely constrained motion
2) Incompletely constrained motions
3) Successfully constrained motion

Q.3 **a)** Locate the instantaneous centers and draw the circle diagram for the four bar mechanism. **06**

b) PQRS is a four bar chain with link PS fixed. The lengths of the links are PQ = 62.5 mm; QR = 175 mm; RS = 112.5 mm; and PS = 200 mm. The crank PQ rotates at 10 rad/s clockwise. Draw the velocity and acceleration diagram when angle QPS = 60° and Q and R lie on the same side of PS. Find the angular velocity and angular acceleration of links QR. **08**



Q.4 **a)** Define the following terms with reference to cams: **06**
1) Base circle 2) Pressure angle 3) Lift i

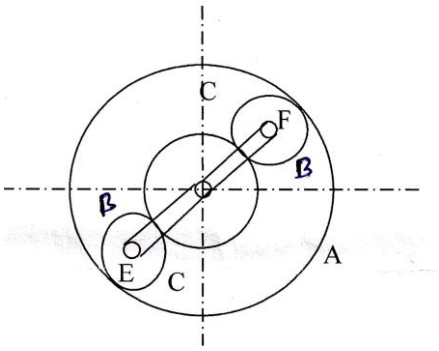
b) A cam, with a minimum radius of 50 mm, rotating clockwise at a uniform speed, is required to give a knife edge follower the motion as described below: **08**
1) To move outwards through 40 mm during 100° rotation of the cam;
2) To dwell for next 80°
3) To return to its starting position during next 90°, and
4) To dwell for the rest period of a revolution i.e. 90°

Draw the profile of the cam when the line of stroke of the follower passes through the centre of the cam shaft.

Section – II

Q.5 **a)** Compare cycloid and involute tooth profiles. **06**

b) An epicyclic gear consists of three gears A, B and C as shown in Fig. The gear A has 72 internal teeth and gear C has 32 external teeth. The gear B meshes with both A and C and is carried on an arm EF which rotates about the centre of A at 18 r.p.m. If the gear A is fixed, determine the speed of gears B and C. **08**



Q.6 **a)** For governors explain: **06**

1) Sensitiveness
2) stability
3) isochronism

b) The arms of a Porter governor are each 250 mm long and pivoted on the governor axis. The mass of each ball is 5 kg and the mass of the central sleeve is 30 kg. The radius of rotation of the balls is 150 mm when the sleeve begins to rise and reaches a value of 200 mm for maximum speed. Determine the speed range of the governor. If the friction at the sleeve is equivalent of 20 N of load at the sleeve, determine how the speed range is modified. **08**

Q.7 **a)** Describe balancing of several masses in several plain. **06**

b) A, B, C and D are four masses carried by a rotating shaft at radii 100, 125, 200 and 150 mm respectively. The planes in which the masses revolve are spaced 600 mm apart and the mass of B, C and D are 10 kg, 5 kg, and 4 kg respectively. **08**

Find the required mass A and the relative angular settings of the four masses so that the shaft shall be in complete balance.

SLR-BD-109

Seat No.	

Set P

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mechatronic Systems (BTN02408)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is a key element of Mechatronics?
a) Purely mechanical systems
b) Only electrical systems
c) Integration of mechanical, electrical, and computer systems
d) Chemical systems

2) What is a characteristic of Industry 4.0?
a) Manual labor-intensive processes
b) Decentralized decision-making
c) Limited use of automation
d) Isolated systems

3) Which of the following is an example of a Mechatronics system?
a) Traditional clock b) Basic electrical circuit
c) CNC machine d) Simple lever

4) What is the function of ABS in modem automobiles?
a) Air Bag System b) Automatic Braking System
c) Audio Broadcasting System d) Advanced Battery System

5) Which sensor is used to measure distance without physical contact?
a) Force sensor b) Temperature sensor
c) Ultrasonic sensor d) Acceleration sensor

6) What type of actuator is commonly used in hydraulic systems?
a) Stepper motor b) Piezoelectric actuator
c) DC motor d) Hydraulic cylinder

7) Which sensor is suitable for measuring rotational motion?
a) Acceleration sensor b) Temperature sensor
c) Linear sensor d) Gyroscope sensor

8) What type of actuator is an AC motor?
a) Hydraulic actuator b) Pneumatic actuator
c) Electrical actuator d) Mechanical actuator

9) Which microcontroller is commonly used in embedded systems?
a) 8085 microprocessors b) 8051 microcontrollers
c) Arduino Uno d) Raspberry Pi

10) What is the main function of a microcontroller?
a) Data storage b) Data processing
c) Data transmission d) Data conversion

11) Which development board is commonly used for prototyping mechatronic systems?
a) Arduino b) Raspberry Pi
c) Beagle Bone d) ESP32

12) What is the purpose of ADC?
a) Analog-to-Digital Conversion b) Digital-to-Analog Conversion
c) Data Compression d) Data Encryption

13) Which protocol is commonly used for serial communication?
a) USB b) RS232
c) Ethernet d) HDMI

14) What is the primary function of PLC in automation?
a) Process control b) Data storage
c) Web browsing d) Word processing

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mechatronic Systems (BTN02408)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION - I

Q.2 Solve the following: (Any Four) **16**

a) Define mechatronics and outline its key elements.
b) Classify sensors based on their principle of operation and provide examples of each type.
c) Differentiate between microprocessors and microcontrollers.
d) Discuss the role of Arduino and Raspberry Pi development boards in mechatronics.
e) Explain the operation of LVDT. Draw net diagram of LVDT.

Q.3 Solve the following: (Any Two) **12**

a) What are the types of Flow Meters? Explain the Operation of Ultrasonic Flow Meters.
b) Draw net diagram to Interface the ultrasonic sensor to Arduino. And write program to glow led connected at pin no 4 of Arduino, if the distance measured is below 30cm.
c) Draw and explain the block diagram of 8051 Microcontroller.

SECTION - II

Q.4 Attempt the following: (Any Four) **16**

a) Explain the concept of Pull up and pull-down Register.
b) Write a short note on USB.
c) Compare LAN, WAN, and MAN technologies.
d) What is network topology? Explain types of topologies with net diagram.
e) Write a short note on Ladder Programming in PLC.

Q.5 Attempt the following: (Any Two) **12**

a) Draw the net Diagram of OSI Model. Explain the function of Each layer.
b) Explain the logical AND, OR Functions in PLC Programming.
c) Explain the Following Serial Standards.
A) RS232 B) RS422 C) RS485

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mechatronic Systems (BTN02408)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What type of actuator is an AC motor?
a) Hydraulic actuator b) Pneumatic actuator
c) Electrical actuator d) Mechanical actuator

2) Which microcontroller is commonly used in embedded systems?
a) 8085 microprocessors b) 8051 microcontrollers
c) Arduino Uno d) Raspberry Pi

3) What is the main function of a microcontroller?
a) Data storage b) Data processing
c) Data transmission d) Data conversion

4) Which development board is commonly used for prototyping mechatronic systems?
a) Arduino b) Raspberry Pi
c) Beagle Bone d) ESP32

5) What is the purpose of ADC?
a) Analog-to-Digital Conversion b) Digital-to-Analog Conversion
c) Data Compression d) Data Encryption

6) Which protocol is commonly used for serial communication?
a) USB b) RS232
c) Ethernet d) HDMI

7) What is the primary function of PLC in automation?
a) Process control b) Data storage
c) Web browsing d) Word processing

8) Which of the following is a key element of Mechatronics?
a) Purely mechanical systems
b) Only electrical systems
c) Integration of mechanical, electrical, and computer systems
d) Chemical systems

9) What is a characteristic of Industry 4.0?
a) Manual labor-intensive processes
b) Decentralized decision-making
c) Limited use of automation
d) Isolated systems

10) Which of the following is an example of a Mechatronics system?
a) Traditional clock
b) Basic electrical circuit
c) CNC machine
d) Simple lever

11) What is the function of ABS in modem automobiles?
a) Air Bag System
b) Automatic Braking System
c) Audio Broadcasting System
d) Advanced Battery System

12) Which sensor is used to measure distance without physical contact?
a) Force sensor
b) Temperature sensor
c) Ultrasonic sensor
d) Acceleration sensor

13) What type of actuator is commonly used in hydraulic systems?
a) Stepper motor
b) Piezoelectric actuator
c) DC motor
d) Hydraulic cylinder

14) Which sensor is suitable for measuring rotational motion?
a) Acceleration sensor
b) Temperature sensor
c) Linear sensor
d) Gyroscope sensor

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mechatronic Systems (BTN02408)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION - I

Q.2 Solve the following: (Any Four) **16**

a) Define mechatronics and outline its key elements.
b) Classify sensors based on their principle of operation and provide examples of each type.
c) Differentiate between microprocessors and microcontrollers.
d) Discuss the role of Arduino and Raspberry Pi development boards in mechatronics.
e) Explain the operation of LVDT. Draw net diagram of LVDT.

Q.3 Solve the following: (Any Two) **12**

a) What are the types of Flow Meters? Explain the Operation of Ultrasonic Flow Meters.
b) Draw net diagram to Interface the ultrasonic sensor to Arduino. And write program to glow led connected at pin no 4 of Arduino, if the distance measured is below 30cm.
c) Draw and explain the block diagram of 8051 Microcontroller.

SECTION - II

Q.4 Attempt the following: (Any Four) **16**

a) Explain the concept of Pull up and pull-down Register.
b) Write a short note on USB.
c) Compare LAN, WAN, and MAN technologies.
d) What is network topology? Explain types of topologies with net diagram.
e) Write a short note on Ladder Programming in PLC.

Q.5 Attempt the following: (Any Two) **12**

a) Draw the net Diagram of OSI Model. Explain the function of Each layer.
b) Explain the logical AND, OR Functions in PLC Programming.
c) Explain the Following Serial Standards.
A) RS232 B) RS422 C) RS485

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mechatronic Systems (BTN02408)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which development board is commonly used for prototyping mechatronic systems?
a) Arduino b) Raspberry Pi
c) Beagle Bone d) ESP32

2) What is the purpose of ADC?
a) Analog-to-Digital Conversion b) Digital-to-Analog Conversion
c) Data Compression d) Data Encryption

3) Which protocol is commonly used for serial communication?
a) USB b) RS232
c) Ethernet d) HDMI

4) What is the primary function of PLC in automation?
a) Process control b) Data storage
c) Web browsing d) Word processing

5) Which of the following is a key element of Mechatronics?
a) Purely mechanical systems
b) Only electrical systems
c) Integration of mechanical, electrical, and computer systems
d) Chemical systems

6) What is a characteristic of Industry 4.0?
a) Manual labor-intensive processes
b) Decentralized decision-making
c) Limited use of automation
d) Isolated systems

7) Which of the following is an example of a Mechatronics system?
a) Traditional clock b) Basic electrical circuit
c) CNC machine d) Simple lever

8) What is the function of ABS in modem automobiles?
a) Air Bag System b) Automatic Braking System
c) Audio Broadcasting System d) Advanced Battery System

9) Which sensor is used to measure distance without physical contact?
a) Force sensor b) Temperature sensor
c) Ultrasonic sensor d) Acceleration sensor

10) What type of actuator is commonly used in hydraulic systems?
a) Stepper motor b) Piezoelectric actuator
c) DC motor d) Hydraulic cylinder

11) Which sensor is suitable for measuring rotational motion?
a) Acceleration sensor b) Temperature sensor
c) Linear sensor d) Gyroscope sensor

12) What type of actuator is an AC motor?
a) Hydraulic actuator b) Pneumatic actuator
c) Electrical actuator d) Mechanical actuator

13) Which microcontroller is commonly used in embedded systems?
a) 8085 microprocessors b) 8051 microcontrollers
c) Arduino Uno d) Raspberry Pi

14) What is the main function of a microcontroller?
a) Data storage b) Data processing
c) Data transmission d) Data conversion

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mechatronic Systems (BTN02408)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION - I

Q.2 Solve the following: (Any Four) **16**

a) Define mechatronics and outline its key elements.
b) Classify sensors based on their principle of operation and provide examples of each type.
c) Differentiate between microprocessors and microcontrollers.
d) Discuss the role of Arduino and Raspberry Pi development boards in mechatronics.
e) Explain the operation of LVDT. Draw net diagram of LVDT.

Q.3 Solve the following: (Any Two) **12**

a) What are the types of Flow Meters? Explain the Operation of Ultrasonic Flow Meters.
b) Draw net diagram to Interface the ultrasonic sensor to Arduino. And write program to glow led connected at pin no 4 of Arduino, if the distance measured is below 30cm.
c) Draw and explain the block diagram of 8051 Microcontroller.

SECTION - II

Q.4 Attempt the following: (Any Four) **16**

a) Explain the concept of Pull up and pull-down Register.
b) Write a short note on USB.
c) Compare LAN, WAN, and MAN technologies.
d) What is network topology? Explain types of topologies with net diagram.
e) Write a short note on Ladder Programming in PLC.

Q.5 Attempt the following: (Any Two) **12**

a) Draw the net Diagram of OSI Model. Explain the function of Each layer.
b) Explain the logical AND, OR Functions in PLC Programming.
c) Explain the Following Serial Standards.
A) RS232 B) RS422 C) RS485

Seat No.	

Set | S

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mechatronic Systems (BTN02408)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What type of actuator is commonly used in hydraulic systems?
a) Stepper motor b) Piezoelectric actuator
c) DC motor d) Hydraulic cylinder

2) Which sensor is suitable for measuring rotational motion?
a) Acceleration sensor b) Temperature sensor
c) Linear sensor d) Gyroscope sensor

3) What type of actuator is an AC motor?
a) Hydraulic actuator b) Pneumatic actuator
c) Electrical actuator d) Mechanical actuator

4) Which microcontroller is commonly used in embedded systems?
a) 8085 microprocessors b) 8051 microcontrollers
c) Arduino Uno d) Raspberry Pi

5) What is the main function of a microcontroller?
a) Data storage b) Data processing
c) Data transmission d) Data conversion

6) Which development board is commonly used for prototyping mechatronic systems?
a) Arduino b) Raspberry Pi
c) Beagle Bone d) ESP32

7) What is the purpose of ADC?
a) Analog-to-Digital Conversion b) Digital-to-Analog Conversion
c) Data Compression d) Data Encryption

8) Which protocol is commonly used for serial communication?
a) USB b) RS232
c) Ethernet d) HDMI

9) What is the primary function of PLC in automation?

a) Process control b) Data storage
c) Web browsing d) Word processing

10) Which of the following is a key element of Mechatronics?

a) Purely mechanical systems
b) Only electrical systems
c) Integration of mechanical, electrical, and computer systems
d) Chemical systems

11) What is a characteristic of Industry 4.0?

a) Manual labor-intensive processes
b) Decentralized decision-making
c) Limited use of automation
d) Isolated systems

12) Which of the following is an example of a Mechatronics system?

a) Traditional clock b) Basic electrical circuit
c) CNC machine d) Simple lever

13) What is the function of ABS in modem automobiles?

a) Air Bag System b) Automatic Braking System
c) Audio Broadcasting System d) Advanced Battery System

14) Which sensor is used to measure distance without physical contact?

a) Force sensor b) Temperature sensor
c) Ultrasonic sensor d) Acceleration sensor

SLR-BD-109

Seat No.	

Set S

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Mechatronic Systems (BTN02408)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION - I

Q.2 Solve the following: (Any Four) **16**

a) Define mechatronics and outline its key elements.
b) Classify sensors based on their principle of operation and provide examples of each type.
c) Differentiate between microprocessors and microcontrollers.
d) Discuss the role of Arduino and Raspberry Pi development boards in mechatronics.
e) Explain the operation of LVDT. Draw net diagram of LVDT.

Q.3 Solve the following: (Any Two) **12**

a) What are the types of Flow Meters? Explain the Operation of Ultrasonic Flow Meters.
b) Draw net diagram to Interface the ultrasonic sensor to Arduino. And write program to glow led connected at pin no 4 of Arduino, if the distance measured is below 30cm.
c) Draw and explain the block diagram of 8051 Microcontroller.

SECTION - II

Q.4 Attempt the following: (Any Four) **16**

a) Explain the concept of Pull up and pull-down Register.
b) Write a short note on USB.
c) Compare LAN, WAN, and MAN technologies.
d) What is network topology? Explain types of topologies with net diagram.
e) Write a short note on Ladder Programming in PLC.

Q.5 Attempt the following: (Any Two) **12**

a) Draw the net Diagram of OSI Model. Explain the function of Each layer.
b) Explain the logical AND, OR Functions in PLC Programming.
c) Explain the Following Serial Standards.
A) RS232 B) RS422 C) RS485

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Power Plant and Energy Engineering (BTN02409)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Annual depreciation cost calculated by ____.
a) sinking fund method b) straight method
c) both (a) and (b) d) estimates values

2) A pyranometer is used for measurement of ____.
a) Direct radiation only
b) Diffuse radiation only
c) Direct as well as diffuse radiation
d) All of the above

3) Kinetic energy that results from the oscillation of water is called____.
a) Ocean thermal energy b) Tidal energy
c) Wave energy d) Hydro energy

4) Identify the non-renewable energy resource from the following: ____.
a) Wave power b) Coal
c) Wind power d) Fuel cells

5) The objective of energy management includes ____.
a) Minimizing energy costs
b) Minimizing waste
c) Minimizing environmental degradation
d) All the above

6) Economizer is used to heat ____.
a) Flue gases b) Air
c) Feed water d) All of the above

7) What does WECS stands for?
a) Wind engine comparison system
b) Wind engine control system
c) Wind energy combined system
d) Wind energy conversion system

8) The solar constant value is ____.
a) 1366 W/m^2 b) 1327 W/m^2
c) 1357 W/m^2 d) 1377 W/m^2

9) A load curve is a plot of ____.
a) Load versus generation capacity
b) Load versus current
c) Load versus time
d) Load versus cost of power

10) The Function of solar collectors to convert ____.
a) Solar energy into thermal energy
b) Solar energy into radiations
c) Solar energy into electricity
d) none of these

11) Which one of the following is the maximum energy producing sector in India?
a) Nuclear b) Hydro
c) Thermal d) Diesel

12) Reflecting mirrors used for exploiting solar energy are called ____.
a) Mantle b) Ponds
c) Diffusers d) Heliostats

13) An energy audit team is formed during ____.
a) post audit phase b) pre-audit phase
c) audit phase d) the time of study

14) If there is one power plant only, the installed capacity of that power plant should be equal to ____.
a) Average load b) Base load
c) Peak load d) Minimum load

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Power Plant and Energy Engineering (BTN02409)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section.
2) Use of a calculator is allowed.
3) Figures to the right indicate full marks.
4) Assume additional data if, required and mention it clearly.

Section – I

Q.2	**a)**	What is meant by Load Curve? Explain any two load curves with neat sketch.	**07**
	b)	What are the various factors considered during Selection of Site for Power Station?	**07**
Q.3	**a)**	Write a short note on Depreciation Cost.	**04**
	b)	What is Tariff? What are the objectives of Tariff? Explain any one Tariff Method.	**05**
	c)	Write a short note on Selection of Boilers for Prime Mover.	**05**
Q.4	**a)**	Explain the role of NTPC and NPCIL in Power Development.	**07**
	b)	Give the difference between Renewable & Non-Renewable Energy Sources.	**07**

Section – II

Q.5	**a)**	What are the different types of Concentrators? Explain any two with neat sketch.	**07**
	b)	Explain Liquid Flat Plate Collector with neat sketch. Give its advantages & disadvantages.	**07**
Q.6	**a)**	What is Energy Audit? Give the objectives of Energy Audit. Explain Energy Audit methods in short.	**07**
	b)	What is Energy Conservation? Give the various levels for conservation of energy. Explain Energy Conservation Act 2001.	**07**
Q.7	**a)**	What is Tidal Energy? Explain Single Basin System Tidal Power Plant.	**05**
	b)	Write a short not on OTEC Cycle Power Plant.	**04**
	c)	Explain the basic components of the Wind Energy Conversion System with a neat sketch.	**05**

SLR-BD-110

Seat No.		Set	Q

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Power Plant and Energy Engineering (BTN02409)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The solar constant value is ____.
a) 1366 W/m^2 b) 1327 W/m^2
c) 1357 W/m^2 d) 1377 W/m^2

2) A load curve is a plot of ____.
a) Load versus generation capacity
b) Load versus current
c) Load versus time
d) Load versus cost of power

3) The Function of solar collectors to convert ____.
a) Solar energy into thermal energy
b) Solar energy into radiations
c) Solar energy into electricity
d) none of these

4) Which one of the following is the maximum energy producing sector in India?
a) Nuclear b) Hydro
c) Thermal d) Diesel

5) Reflecting mirrors used for exploiting solar energy are called ____.
a) Mantle b) Ponds
c) Diffusers d) Heliostats

6) An energy audit team is formed during ____.
a) post audit phase b) pre-audit phase
c) audit phase d) the time of study

7) If there is one power plant only, the installed capacity of that power plant should be equal to ____.

a) Average load b) Base load
c) Peak load d) Minimum load

8) Annual depreciation cost calculated by ____.

a) sinking fund method b) straight method
c) both (a) and (b) d) estimates values

9) A pyranometer is used for measurement of ____.

a) Direct radiation only
b) Diffuse radiation only
c) Direct as well as diffuse radiation
d) All of the above

10) Kinetic energy that results from the oscillation of water is called____.

a) Ocean thermal energy b) Tidal energy
c) Wave energy d) Hydro energy

11) Identify the non-renewable energy resource from the following: ____.

a) Wave power b) Coal
c) Wind power d) Fuel cells

12) The objective of energy management includes ____.

a) Minimizing energy costs
b) Minimizing waste
c) Minimizing environmental degradation
d) All the above

13) Economizer is used to heat ____.

a) Flue gases b) Air
c) Feed water d) All of the above

14) What does WECS stands for?

a) Wind engine comparison system
b) Wind engine control system
c) Wind energy combined system
d) Wind energy conversion system

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Power Plant and Energy Engineering (BTN02409)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section.
2) Use of a calculator is allowed.
3) Figures to the right indicate full marks.
4) Assume additional data if, required and mention it clearly.

Section – I

Q.2	**a)**	What is meant by Load Curve? Explain any two load curves with neat sketch.	**07**
	b)	What are the various factors considered during Selection of Site for Power Station?	**07**
Q.3	**a)**	Write a short note on Depreciation Cost.	**04**
	b)	What is Tariff? What are the objectives of Tariff? Explain any one Tariff Method.	**05**
	c)	Write a short note on Selection of Boilers for Prime Mover.	**05**
Q.4	**a)**	Explain the role of NTPC and NPCIL in Power Development.	**07**
	b)	Give the difference between Renewable & Non-Renewable Energy Sources.	**07**

Section – II

Q.5	**a)**	What are the different types of Concentrators? Explain any two with neat sketch.	**07**
	b)	Explain Liquid Flat Plate Collector with neat sketch. Give its advantages & disadvantages.	**07**
Q.6	**a)**	What is Energy Audit? Give the objectives of Energy Audit. Explain Energy Audit methods in short.	**07**
	b)	What is Energy Conservation? Give the various levels for conservation of energy. Explain Energy Conservation Act 2001.	**07**
Q.7	**a)**	What is Tidal Energy? Explain Single Basin System Tidal Power Plant.	**05**
	b)	Write a short not on OTEC Cycle Power Plant.	**04**
	c)	Explain the basic components of the Wind Energy Conversion System with a neat sketch.	**05**

Seat No.		Set	R

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Power Plant and Energy Engineering (BTN02409)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which one of the following is the maximum energy producing sector in India?
a) Nuclear b) Hydro
c) Thermal d) Diesel

2) Reflecting mirrors used for exploiting solar energy are called ____.
a) Mantle b) Ponds
c) Diffusers d) Heliostats

3) An energy audit team is formed during ____.
a) post audit phase b) pre-audit phase
c) audit phase d) the time of study

4) If there is one power plant only, the installed capacity of that power plant should be equal to ____.
a) Average load b) Base load
c) Peak load d) Minimum load

5) Annual depreciation cost calculated by ____.
a) sinking fund method b) straight method
c) both (a) and (b) d) estimates values

6) A pyranometer is used for measurement of ____.
a) Direct radiation only
b) Diffuse radiation only
c) Direct as well as diffuse radiation
d) All of the above

7) Kinetic energy that results from the oscillation of water is called____.
a) Ocean thermal energy b) Tidal energy
c) Wave energy d) Hydro energy

8) Identify the non-renewable energy resource from the following: ____.
a) Wave power b) Coal
c) Wind power d) Fuel cells

9) The objective of energy management includes ____.
a) Minimizing energy costs
b) Minimizing waste
c) Minimizing environmental degradation
d) All the above

10) Economizer is used to heat ____.
a) Flue gases b) Air
c) Feed water d) All of the above

11) What does WECS stands for?
a) Wind engine comparison system
b) Wind engine control system
c) Wind energy combined system
d) Wind energy conversion system

12) The solar constant value is ____.
a) 1366 W/m^2 b) 1327 W/m^2
c) 1357 W/m^2 d) 1377 W/m^2

13) A load curve is a plot of ____.
a) Load versus generation capacity
b) Load versus current
c) Load versus time
d) Load versus cost of power

14) The Function of solar collectors to convert ____.
a) Solar energy into thermal energy
b) Solar energy into radiations
c) Solar energy into electricity
d) none of these

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Power Plant and Energy Engineering (BTN02409)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section.
2) Use of a calculator is allowed.
3) Figures to the right indicate full marks.
4) Assume additional data if, required and mention it clearly.

Section – I

Q.2	**a)**	What is meant by Load Curve? Explain any two load curves with neat sketch.	**07**
	b)	What are the various factors considered during Selection of Site for Power Station?	**07**
Q.3	**a)**	Write a short note on Depreciation Cost.	**04**
	b)	What is Tariff? What are the objectives of Tariff? Explain any one Tariff Method.	**05**
	c)	Write a short note on Selection of Boilers for Prime Mover.	**05**
Q.4	**a)**	Explain the role of NTPC and NPCIL in Power Development.	**07**
	b)	Give the difference between Renewable & Non-Renewable Energy Sources.	**07**

Section – II

Q.5	**a)**	What are the different types of Concentrators? Explain any two with neat sketch.	**07**
	b)	Explain Liquid Flat Plate Collector with neat sketch. Give its advantages & disadvantages.	**07**
Q.6	**a)**	What is Energy Audit? Give the objectives of Energy Audit. Explain Energy Audit methods in short.	**07**
	b)	What is Energy Conservation? Give the various levels for conservation of energy. Explain Energy Conservation Act 2001.	**07**
Q.7	**a)**	What is Tidal Energy? Explain Single Basin System Tidal Power Plant.	**05**
	b)	Write a short not on OTEC Cycle Power Plant.	**04**
	c)	Explain the basic components of the Wind Energy Conversion System with a neat sketch.	**05**

Seat No.	

Set S

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Power Plant and Energy Engineering (BTN02409)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Economizer is used to heat ____.
a) Flue gases b) Air
c) Feed water d) All of the above

2) What does WECS stands for?
a) Wind engine comparison system
b) Wind engine control system
c) Wind energy combined system
d) Wind energy conversion system

3) The solar constant value is ____.
a) 1366 W/m^2 b) 1327 W/m^2
c) 1357 W/m^2 d) 1377 W/m^2

4) A load curve is a plot of ____.
a) Load versus generation capacity
b) Load versus current
c) Load versus time
d) Load versus cost of power

5) The Function of solar collectors to convert ____.
a) Solar energy into thermal energy
b) Solar energy into radiations
c) Solar energy into electricity
d) none of these

6) Which one of the following is the maximum energy producing sector in India?
a) Nuclear b) Hydro
c) Thermal d) Diesel

7) Reflecting mirrors used for exploiting solar energy are called ____.
a) Mantle b) Ponds
c) Diffusers d) Heliostats

8) An energy audit team is formed during ____.
a) post audit phase b) pre-audit phase
c) audit phase d) the time of study

9) If there is one power plant only, the installed capacity of that power plant should be equal to ____.
a) Average load b) Base load
c) Peak load d) Minimum load

10) Annual depreciation cost calculated by ____.
a) sinking fund method b) straight method
c) both (a) and (b) d) estimates values

11) A pyranometer is used for measurement of ____.
a) Direct radiation only
b) Diffuse radiation only
c) Direct as well as diffuse radiation
d) All of the above

12) Kinetic energy that results from the oscillation of water is called____.
a) Ocean thermal energy b) Tidal energy
c) Wave energy d) Hydro energy

13) Identify the non-renewable energy resource from the following: ____.
a) Wave power b) Coal
c) Wind power d) Fuel cells

14) The objective of energy management includes ____.
a) Minimizing energy costs
b) Minimizing waste
c) Minimizing environmental degradation
d) All the above

Seat No.	

Set | **S**

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Power Plant and Energy Engineering (BTN02409)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Solve any two questions from each section.
2) Use of a calculator is allowed.
3) Figures to the right indicate full marks.
4) Assume additional data if, required and mention it clearly.

Section – I

Q.2	**a)**	What is meant by Load Curve? Explain any two load curves with neat sketch.	**07**
	b)	What are the various factors considered during Selection of Site for Power Station?	**07**
Q.3	**a)**	Write a short note on Depreciation Cost.	**04**
	b)	What is Tariff? What are the objectives of Tariff? Explain any one Tariff Method.	**05**
	c)	Write a short note on Selection of Boilers for Prime Mover.	**05**
Q.4	**a)**	Explain the role of NTPC and NPCIL in Power Development.	**07**
	b)	Give the difference between Renewable & Non-Renewable Energy Sources.	**07**

Section – II

Q.5	**a)**	What are the different types of Concentrators? Explain any two with neat sketch.	**07**
	b)	Explain Liquid Flat Plate Collector with neat sketch. Give its advantages & disadvantages.	**07**
Q.6	**a)**	What is Energy Audit? Give the objectives of Energy Audit. Explain Energy Audit methods in short.	**07**
	b)	What is Energy Conservation? Give the various levels for conservation of energy. Explain Energy Conservation Act 2001.	**07**
Q.7	**a)**	What is Tidal Energy? Explain Single Basin System Tidal Power Plant.	**05**
	b)	Write a short not on OTEC Cycle Power Plant.	**04**
	c)	Explain the basic components of the Wind Energy Conversion System with a neat sketch.	**05**

Seat No.		Set	P

S.Y. (B. Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Solid Mechanics (BTN02410)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Following are the basic types of stress except _____
a) Tensile stress b) Compressive stress
c) Shear stress d) Volumetric stress

2) The property of a material by which it can be beaten or rolled into thin sheets, is called _____
a) Elasticity b) Malleability
c) Plasticity d) Ductility

3) If a material has different properties in all directions, it is called _____
a) Elastic b) Plastic
c) Isotropic d) None of these

4) Which of the following is a dimensionless quantity?
a) Strain b) Poisson's ratio
c) a & b d) None of these

5) The stress function was introduced by _____
a) G.B. Airy b) Terzaghi
c) Darcy d) None of these

6) A thin spherical shell under internal pressure will fail under _____
a) Maximum shear stress
b) Principal compressive stress
c) Principal tensile stress
d) None

7) Lame's Equation is applicable to _____
a) Pressure vessels b) Thin cylinders
c) Thick cylinders d) All of the above

8) Which of the following statements about the shear center is true?
- a) The shear center always lies at the centroid of the cross-section of the member.
- b) For a symmetrical solid section (e.g. a circular or square section), the shear center coincides with the centroid.
- c) The shear center is always located at the center of gravity of the section.
- d) The shear center is a point where the shear force can be applied without causing bending.

9) For a symmetric I-beam cross-section the shear center is located _____
- a) At the centroid of the cross-section
- b) At the mid-height of the web
- c) At the top flange
- d) Outside the cross-section

10) For a thin-walled open section, the shear center is determined by _____
- a) Distribution of normal stresses
- b) Geometry of the cross-section and the distribution of shear flow
- c) Position of the centroid
- d) Material properties of the section

11) The critical load at which a slender column will buckle is given by _____
- a) Euler's formula
- b) Hooke's law
- c) Newton's second law
- d) Bernoulli's principle

12) Which of the following statements about slenderness ratio is true?
- a) A higher slenderness ratio indicates that the column is more resistant to buckling.
- b) A lower slenderness ratio indicates that the column is more likely to buckle under compression.
- c) A higher slenderness ratio indicates that the column is more susceptible to buckling
- d) Slenderness ratio is not a factor in determining a column buckling behavior.

13) The principle of virtual work states that, for a body to be in equilibrium, the virtual work should be _____
- a) Any value between zero and one
- b) Zero
- c) Maximum
- d) Minimum

14) In virtual work Principle, the work done by self-weight of the body is taken into consideration, when _____
- a) Center of gravity moves vertically
- b) Center of gravity moves horizontally
- c) Shear center moves horizontally
- d) Shear center moves vertically

SLR-BD-111

Seat No.	

Set P

S.Y. (B. Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Solid Mechanics (BTN02410)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if required and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 **a)** Explain Mohr's Circle method with an example. **06**

b) A steel rod of length 1.6 m and uniform cross-sectional area is secured between two walls. Take $\alpha = 11.7 \times 10^{-6}/°C, \Delta T = 80°C$ and $E = 205$ GPa. Calculate the stresses when **08**
i) walls are fixed and ii) walls move apart by 0.6 mm.

Q.3 **a)** Explain Saint Venant's Principle with a neat sketch and example **06**

b) Investigate what problem solved by the stress function φ **08**

$$\varphi = \frac{F}{d^3} xy^2(3d - 2y)$$

applied to the region included by $y = 0$ to $y = d$ and $x = 0$ to $x = l$

Q.4 **a)** Explain a thick-walled cylinder subjected to external pressure with a neat sketch. **06**

b) Write a short note on stresses in the disk with uniform strength. **08**

Section – II

Q.5 **a)** What is a shear center? Explain the importance of a shear center. **06**

b) Determine position of the shear center of the section of a beam shown in Fig. I. **08**

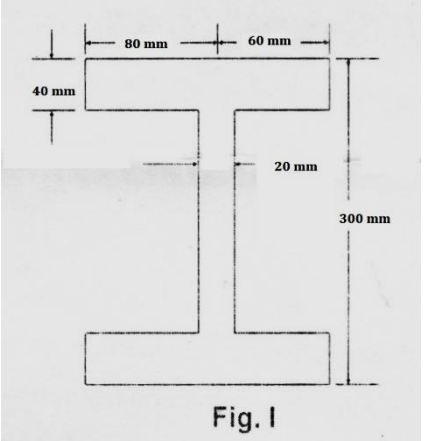


Fig. I

Q.6 **a)** Explain in detail the crippling and crushing stresses. **06**

b) A steel column is of length 8.5 m and diameter 650 mm with both ends hinged. Determine the crippling load by Euler's formula. **08**
$E = 2.1 \times 10^5$ N/mm^2

Q.7 **a)** Explain Castigliano's Theorem. **06**

b) Write a short note on the following: **08**

i) Euler and Ranking theory

ii) Theorem of Virtual Displacements

Seat No.	

Set **Q**

S.Y. (B. Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Solid Mechanics (BTN02410)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following statements about the shear center is true?
a) The shear center always lies at the centroid of the cross-section of the member.
b) For a symmetrical solid section (e.g. a circular or square section), the shear center coincides with the centroid.
c) The shear center is always located at the center of gravity of the section.
d) The shear center is a point where the shear force can be applied without causing bending.

2) For a symmetric I-beam cross-section the shear center is located _____
a) At the centroid of the cross-section
b) At the mid-height of the web
c) At the top flange
d) Outside the cross-section

3) For a thin-walled open section, the shear center is determined by _____
a) Distribution of normal stresses
b) Geometry of the cross-section and the distribution of shear flow
c) Position of the centroid
d) Material properties of the section

4) The critical load at which a slender column will buckle is given by _____
a) Euler's formula b) Hooke's law
c) Newton's second law d) Bernoulli's principle

5) Which of the following statements about slenderness ratio is true?
a) A higher slenderness ratio indicates that the column is more resistant to buckling.
b) A lower slenderness ratio indicates that the column is more likely to buckle under compression.
c) A higher slenderness ratio indicates that the column is more susceptible to buckling
d) Slenderness ratio is not a factor in determining a column buckling behavior.

6) The principle of virtual work states that, for a body to be in equilibrium, the virtual work should be _____
a) Any value between zero and one
b) Zero
c) Maximum
d) Minimum

7) In virtual work Principle, the work done by self-weight of the body is taken into consideration, when _____
a) Center of gravity moves vertically
b) Center of gravity moves horizontally
c) Shear center moves horizontally
d) Shear center moves vertically

8) Following are the basic types of stress except _____
a) Tensile stress
b) Compressive stress
c) Shear stress
d) Volumetric stress

9) The property of a material by which it can be beaten or rolled into thin sheets, is called _____
a) Elasticity
b) Malleability
c) Plasticity
d) Ductility

10) If a material has different properties in all directions, it is called _____
a) Elastic
b) Plastic
c) Isotropic
d) None of these

11) Which of the following is a dimensionless quantity?
a) Strain
b) Poisson's ratio
c) a & b
d) None of these

12) The stress function was introduced by _____
a) G.B. Airy
b) Terzaghi
c) Darcy
d) None of these

13) A thin spherical shell under internal pressure will fail under _____

a) Maximum shear stress
b) Principal compressive stress
c) Principal tensile stress
d) None

14) Lame's Equation is applicable to _____

a) Pressure vessels
b) Thin cylinders
c) Thick cylinders
d) All of the above

SLR-BD-111

Seat No.	

Set Q

S.Y. (B. Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Solid Mechanics (BTN02410)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if required and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 **a)** Explain Mohr's Circle method with an example. **06**

b) A steel rod of length 1.6 m and uniform cross-sectional area is secured between two walls. Take $\alpha = 11.7 \times 10^{-6}/°C, \Delta T = 80°C$ and $E = 205$ GPa. Calculate the stresses when **08**
i) walls are fixed and ii) walls move apart by 0.6 mm.

Q.3 **a)** Explain Saint Venant's Principle with a neat sketch and example **06**

b) Investigate what problem solved by the stress function φ **08**

$$\varphi = \frac{F}{d^3} xy^2(3d - 2y)$$

applied to the region included by $y = 0$ to $y = d$ and $x = 0$ to $x = l$

Q.4 **a)** Explain a thick-walled cylinder subjected to external pressure with a neat sketch. **06**

b) Write a short note on stresses in the disk with uniform strength. **08**

Section – II

Q.5 **a)** What is a shear center? Explain the importance of a shear center. **06**

b) Determine position of the shear center of the section of a beam shown in Fig. I. **08**

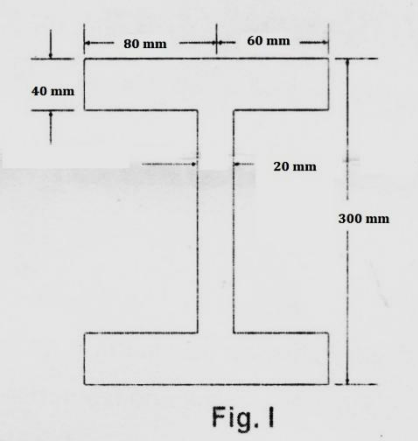


Fig. I

Q.6 **a)** Explain in detail the crippling and crushing stresses. **06**

b) A steel column is of length 8.5 m and diameter 650 mm with both ends hinged. Determine the crippling load by Euler's formula. **08**
$E = 2.1 \times 10^5$ N/mm^2

Q.7 **a)** Explain Castigliano's Theorem. **06**

b) Write a short note on the following: **08**

i) Euler and Ranking theory

ii) Theorem of Virtual Displacements

Seat No.	

Set R

S.Y. (B. Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Solid Mechanics (BTN02410)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) The critical load at which a slender column will buckle is given by _____
a) Euler's formula b) Hooke's law
c) Newton's second law d) Bernoulli's principle

2) Which of the following statements about slenderness ratio is true?
a) A higher slenderness ratio indicates that the column is more resistant to buckling.
b) A lower slenderness ratio indicates that the column is more likely to buckle under compression.
c) A higher slenderness ratio indicates that the column is more susceptible to buckling
d) Slenderness ratio is not a factor in determining a column buckling behavior.

3) The principle of virtual work states that, for a body to be in equilibrium, the virtual work should be _____
a) Any value between zero and one
b) Zero
c) Maximum
d) Minimum

4) In virtual work Principle, the work done by self-weight of the body is taken into consideration, when _____
a) Center of gravity moves vertically
b) Center of gravity moves horizontally
c) Shear center moves horizontally
d) Shear center moves vertically

5) Following are the basic types of stress except _____
a) Tensile stress b) Compressive stress
c) Shear stress d) Volumetric stress

6) The property of a material by which it can be beaten or rolled into thin sheets, is called _____

a) Elasticity b) Malleability
c) Plasticity d) Ductility

7) If a material has different properties in all directions, it is called _____

a) Elastic b) Plastic
c) Isotropic d) None of these

8) Which of the following is a dimensionless quantity?

a) Strain b) Poisson's ratio
c) a & b d) None of these

9) The stress function was introduced by _____

a) G.B. Airy b) Terzaghi
c) Darcy d) None of these

10) A thin spherical shell under internal pressure will fail under _____

a) Maximum shear stress
b) Principal compressive stress
c) Principal tensile stress
d) None

11) Lame's Equation is applicable to _____

a) Pressure vessels b) Thin cylinders
c) Thick cylinders d) All of the above

12) Which of the following statements about the shear center is true?

a) The shear center always lies at the centroid of the cross-section of the member.
b) For a symmetrical solid section (e.g. a circular or square section), the shear center coincides with the centroid.
c) The shear center is always located at the center of gravity of the section.
d) The shear center is a point where the shear force can be applied without causing bending.

13) For a symmetric I-beam cross-section the shear center is located _____

a) At the centroid of the cross-section
b) At the mid-height of the web
c) At the top flange
d) Outside the cross-section

14) For a thin-walled open section, the shear center is determined by _____

a) Distribution of normal stresses
b) Geometry of the cross-section and the distribution of shear flow
c) Position of the centroid
d) Material properties of the section

Seat No.	

Set **R**

S.Y. (B. Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Solid Mechanics (BTN02410)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if required and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 **a)** Explain Mohr's Circle method with an example. **06**

b) A steel rod of length 1.6 m and uniform cross-sectional area is secured between two walls. Take $\mathrm{a} = 11.7 \times 10^{-6}/°\mathrm{C}, \Delta\mathrm{T} = 80°\mathrm{C}$ and $\mathrm{E} = 205$ GPa. Calculate the stresses when **08**
i) walls are fixed and ii) walls move apart by 0.6 mm.

Q.3 **a)** Explain Saint Venant's Principle with a neat sketch and example **06**

b) Investigate what problem solved by the stress function φ **08**

$$\varphi = \frac{F}{d^3} xy^2(3d - 2y)$$

applied to the region included by $y = 0$ to $y = d$ and $x = 0$ to $x = l$

Q.4 **a)** Explain a thick-walled cylinder subjected to external pressure with a neat sketch. **06**

b) Write a short note on stresses in the disk with uniform strength. **08**

Section – II

Q.5 **a)** What is a shear center? Explain the importance of a shear center. **06**

b) Determine position of the shear center of the section of a beam shown in Fig. I. **08**

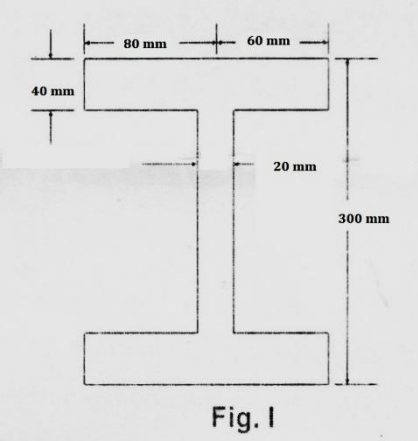


Fig. I

Q.6 **a)** Explain in detail the crippling and crushing stresses. **06**

b) A steel column is of length 8.5 m and diameter 650 mm with both ends hinged. Determine the crippling load by Euler's formula. **08**
$E = 2.1 \times 10^5$ N/mm^2

Q.7 **a)** Explain Castigliano's Theorem. **06**

b) Write a short note on the following: **08**

i) Euler and Ranking theory

ii) Theorem of Virtual Displacements

Seat No.		Set	S

S.Y. (B. Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Solid Mechanics (BTN02410)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) A thin spherical shell under internal pressure will fail under _____
a) Maximum shear stress
b) Principal compressive stress
c) Principal tensile stress
d) None

2) Lame's Equation is applicable to _____
a) Pressure vessels b) Thin cylinders
c) Thick cylinders d) All of the above

3) Which of the following statements about the shear center is true?
a) The shear center always lies at the centroid of the cross-section of the member.
b) For a symmetrical solid section (e.g. a circular or square section), the shear center coincides with the centroid.
c) The shear center is always located at the center of gravity of the section.
d) The shear center is a point where the shear force can be applied without causing bending.

4) For a symmetric I-beam cross-section the shear center is located _____
a) At the centroid of the cross-section
b) At the mid-height of the web
c) At the top flange
d) Outside the cross-section

5) For a thin-walled open section, the shear center is determined by _____
a) Distribution of normal stresses
b) Geometry of the cross-section and the distribution of shear flow
c) Position of the centroid
d) Material properties of the section

6) The critical load at which a slender column will buckle is given by _____
a) Euler's formula
b) Hooke's law
c) Newton's second law
d) Bernoulli's principle

7) Which of the following statements about slenderness ratio is true?
a) A higher slenderness ratio indicates that the column is more resistant to buckling.
b) A lower slenderness ratio indicates that the column is more likely to buckle under compression.
c) A higher slenderness ratio indicates that the column is more susceptible to buckling
d) Slenderness ratio is not a factor in determining a column buckling behavior.

8) The principle of virtual work states that, for a body to be in equilibrium, the virtual work should be _____
a) Any value between zero and one
b) Zero
c) Maximum
d) Minimum

9) In virtual work Principle, the work done by self-weight of the body is taken into consideration, when _____
a) Center of gravity moves vertically
b) Center of gravity moves horizontally
c) Shear center moves horizontally
d) Shear center moves vertically

10) Following are the basic types of stress except _____
a) Tensile stress
b) Compressive stress
c) Shear stress
d) Volumetric stress

11) The property of a material by which it can be beaten or rolled into thin sheets, is called _____
a) Elasticity
b) Malleability
c) Plasticity
d) Ductility

12) If a material has different properties in all directions, it is called _____
a) Elastic
b) Plastic
c) Isotropic
d) None of these

13) Which of the following is a dimensionless quantity?
a) Strain
b) Poisson's ratio
c) a & b
d) None of these

14) The stress function was introduced by _____

a) G.B. Airy
b) Terzaghi
c) Darcy
d) None of these

Seat No.		Set	S

S.Y. (B. Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Solid Mechanics (BTN02410)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if required and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 **a)** Explain Mohr's Circle method with an example. **06**

b) A steel rod of length 1.6 m and uniform cross-sectional area is secured between two walls. Take $\alpha = 11.7 \times 10^{-6}/°C, \Delta T = 80°C$ and $E = 205$ GPa. Calculate the stresses when **08**
i) walls are fixed and ii) walls move apart by 0.6 mm.

Q.3 **a)** Explain Saint Venant's Principle with a neat sketch and example **06**

b) Investigate what problem solved by the stress function φ **08**

$$\varphi = \frac{F}{d^3} xy^2(3d - 2y)$$

applied to the region included by $y = 0$ to $y = d$ and $x = 0$ to $x = l$

Q.4 **a)** Explain a thick-walled cylinder subjected to external pressure with a neat sketch. **06**

b) Write a short note on stresses in the disk with uniform strength. **08**

Section – II

Q.5 **a)** What is a shear center? Explain the importance of a shear center. **06**

b) Determine position of the shear center of the section of a beam shown in Fig. I. **08**

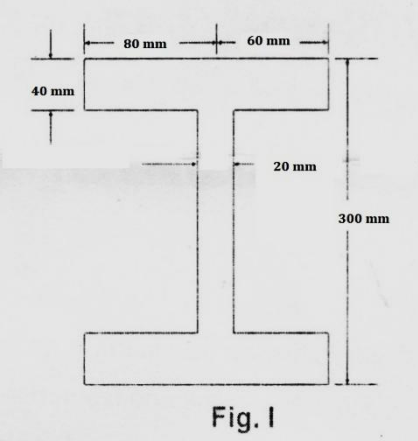


Fig. I

Q.6 **a)** Explain in detail the crippling and crushing stresses. **06**

b) A steel column is of length 8.5 m and diameter 650 mm with both ends hinged. Determine the crippling load by Euler's formula. **08**
$E = 2.1 \times 10^5$ N/mm^2

Q.7 **a)** Explain Castigliano's Theorem. **06**

b) Write a short note on the following: **08**

i) Euler and Ranking theory

ii) Theorem of Virtual Displacements

Seat No.	

Set **P**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Industrial Robotics (BTN02411)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).
5) Use of non-programmable scientific calculator is allowed.
6) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the function of a frame grabber?
a) Sensing the object b) Digitizing
c) Storing d) None of these

2) When the joint angles and the different configurations of manipulator are derived from the position orientation, the scheme is known as ____.
a) Forward kinematics b) Inverse kinematics
c) Transformation d) None of these

3) The process of finding the position of the end effector when the joint variable are known is called ____.
a) Forward Kinematics b) Inverse Kinematics
c) Forward Dynamics d) Inverse Dynamics

4) Trajectory planning is done in ____.
a) Joint Space & Cartesian Space
b) Joint Space & Local Space
c) Joint Space & Global Space
d) Global Space & Cartesian Space

5) When the determinant of the manipulator Jacobian is zero, the configuration of the manipulator is said to be ____.
a) Angular b) Rectangular
c) Singular d) Spiral

6) The process of transforming variable from tool configuration space to joint space is called kinematics.
a) Forward b) Inward
c) Inverse d) Reverse

7) The order of the polynomial used for formulating the robot trajectory is usually a order polynomial.

a) First b) Second
c) Third d) Fourth

8) A gripper used in assembly operations needs to be equipped with an arrangement which will allow a certain amount of flexibility in its wrist. This is to ensure assembly even if the axis of the part during insertion is slightly off-center. This type of compliance is compliance.

a) Active b) Passive
c) Mutual d) Progressive

9) The minimum number of wheels required for both static and dynamic balance of wheeled robots is ____.

a) 2 b) 3
c) 4 d) 6

10) Binary sensors have ____ as the contact device.

a) Fingers b) Micro switch
c) Wrist d) None of these

11) Suction or vacuum grippers are used for ____ objects.

a) Magnetic b) Flat
c) Hole d) None of these

12) Which type of robot used for assembly purpose?

a) Jointed arm b) PUMA
c) SCARA d) None of these

13) For short range distance measurements, which type of sensor in more suitable?

a) Tactile sensor b) Ultrasonic sensor
c) Optical sensor d) Laser sensor

14) Majority of industrial robots used in welding are built in ___ configuration.

a) Cylindrical b) Spherical
c) Jointed arm d) SCARA

Seat No.		Set	P

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Industrial Robotics (BTN02411)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

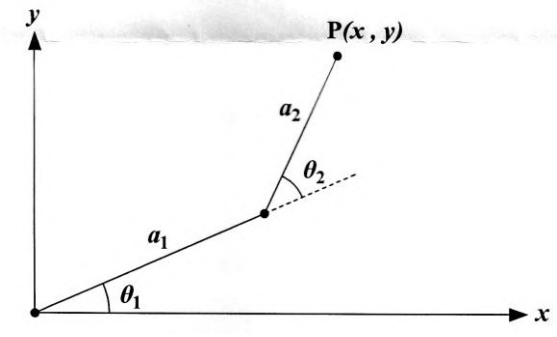
Instructions: 1) Answer any two questions from Section I and Section II.
2) Figures to the right indicate full marks.
3) Use of non-programmable scientific calculator is allowed.
4) Assume suitable data if necessary.

SECTION-I

Q.2 **a)** Define robot and explain basic components of robots with functions. **08**
b) Derive the inverse kinematic equations for a 2 DOF jointed arm robot. **06**

Q.3 **a)** A vector $\overline{v} = 2\hat{\imath} + 5\hat{\jmath} + 3\hat{k}$ is rotated by 45^o about the x axis of the reference frame. It is then translated by 3,4 and 5 units in $x, y \; and \; z$ direction respectively. Find the vector with reference to the reference frame. **08**
b) What are the different factors to be considered when selecting grippers as EOAT (End of Arm Tooling) attachment for industrial robots? **06**

Q.4 **a)** Derive the equation for the Jacobian of a 2 DOF jointed arm manipulator. In the figure given. below the lengths of the links a_1 and a_2 of the manipulator are 200 mm each. Link angles θ_1 and θ_2 measure 20° and 30° respectively. If the tool velocity is 100 mm/s in both x and y directions calculate rotational speeds of link 1 and link 2 in degrees/sec. **08**



b) Define the following terms: Workspace, forward kinematics, inverse kinematics, Jacobian (of the manipulator), trajectory, repeatability. **06**

Section-II

Q.5	**a)**	Explain with the help of block diagram the control of a DC servomotor used as actuator for robot joints.	**08**
	b)	Explain with the help of neat sketch a typical control architecture for industrial robots.	**06**
Q.6	**a)**	What is an AGV? Discuss the different navigation techniques used for industrial AGVs.	**08**
	b)	Compare wheeled robot and tracked robot in detail.	**06**
Q.7	**a)**	Discuss use of industrial robots for welding applications. State the robot configuration DOF, choice of drives and sensors clearly and given justification for the same.	**08**
	b)	Discuss in detail various applications of mobile robots.	**06**

Seat No.	

Set **Q**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Industrial Robotics (BTN02411)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).
5) Use of non-programmable scientific calculator is allowed.
6) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) A gripper used in assembly operations needs to be equipped with an arrangement which will allow a certain amount of flexibility in its wrist. This is to ensure assembly even if the axis of the part during insertion is slightly off-center. This type of compliance is compliance.
a) Active b) Passive
c) Mutual d) Progressive

2) The minimum number of wheels required for both static and dynamic balance of wheeled robots is ____.
a) 2 b) 3
c) 4 d) 6

3) Binary sensors have ____ as the contact device.
a) Fingers b) Micro switch
c) Wrist d) None of these

4) Suction or vacuum grippers are used for ____ objects.
a) Magnetic b) Flat
c) Hole d) None of these

5) Which type of robot used for assembly purpose?
a) Jointed arm b) PUMA
c) SCARA d) None of these

6) For short range distance measurements, which type of sensor in more suitable?
a) Tactile sensor b) Ultrasonic sensor
c) Optical sensor d) Laser sensor

7) Majority of industrial robots used in welding are built in ___ configuration.
a) Cylindrical b) Spherical
c) Jointed arm d) SCARA

8) What is the function of a frame grabber?
a) Sensing the object b) Digitizing
c) Storing d) None of these

9) When the joint angles and the different configurations of manipulator are derived from the position orientation, the scheme is known as ____.
a) Forward kinematics b) Inverse kinematics
c) Transformation d) None of these

10) The process of finding the position of the end effector when the joint variable are known is called ____.
a) Forward Kinematics b) Inverse Kinematics
c) Forward Dynamics d) Inverse Dynamics

11) Trajectory planning is done in ____.
a) Joint Space & Cartesian Space
b) Joint Space & Local Space
c) Joint Space & Global Space
d) Global Space & Cartesian Space

12) When the determinant of the manipulator Jacobian is zero, the configuration of the manipulator is said to be ____.
a) Angular b) Rectangular
c) Singular d) Spiral

13) The process of transforming variable from tool configuration space to joint space is called kinematics.
a) Forward b) Inward
c) Inverse d) Reverse

14) The order of the polynomial used for formulating the robot trajectory is usually a order polynomial.
a) First b) Second
c) Third d) Fourth

Seat No.	

Set **Q**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Industrial Robotics (BTN02411)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

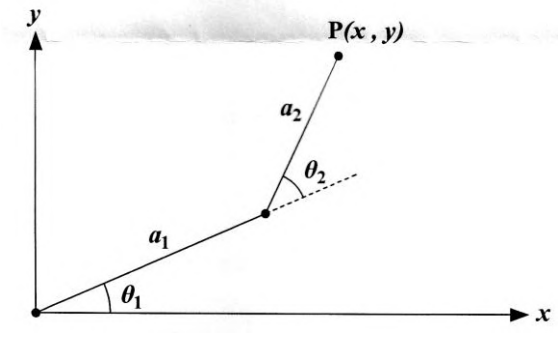
Instructions: 1) Answer any two questions from Section I and Section II.
2) Figures to the right indicate full marks.
3) Use of non-programmable scientific calculator is allowed.
4) Assume suitable data if necessary.

SECTION-I

Q.2 **a)** Define robot and explain basic components of robots with functions. **08**
b) Derive the inverse kinematic equations for a 2 DOF jointed arm robot. **06**

Q.3 **a)** A vector $\overline{v} = 2\hat{\imath} + 5\hat{\jmath} + 3\hat{k}$ is rotated by 45^o about the x axis of the reference frame. It is then translated by 3,4 and 5 units in $x, y \; and \; z$ direction respectively. Find the vector with reference to the reference frame. **08**
b) What are the different factors to be considered when selecting grippers as EOAT (End of Arm Tooling) attachment for industrial robots? **06**

Q.4 **a)** Derive the equation for the Jacobian of a 2 DOF jointed arm manipulator. In the figure given. below the lengths of the links a_1 and a_2 of the manipulator are 200 mm each. Link angles θ_1 and θ_2 measure 20° and 30° respectively. If the tool velocity is 100 mm/s in both x and y directions calculate rotational speeds of link 1 and link 2 in degrees/sec. **08**



b) Define the following terms: Workspace, forward kinematics, inverse kinematics, Jacobian (of the manipulator), trajectory, repeatability. **06**

Section-II

Q.5	**a)**	Explain with the help of block diagram the control of a DC servomotor used as actuator for robot joints.	**08**
	b)	Explain with the help of neat sketch a typical control architecture for industrial robots.	**06**
Q.6	**a)**	What is an AGV? Discuss the different navigation techniques used for industrial AGVs.	**08**
	b)	Compare wheeled robot and tracked robot in detail.	**06**
Q.7	**a)**	Discuss use of industrial robots for welding applications. State the robot configuration DOF, choice of drives and sensors clearly and given justification for the same.	**08**
	b)	Discuss in detail various applications of mobile robots.	**06**

Seat No.	

Set R

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Industrial Robotics (BTN02411)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).
5) Use of non-programmable scientific calculator is allowed.
6) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Suction or vacuum grippers are used for ____ objects.
a) Magnetic b) Flat
c) Hole d) None of these

2) Which type of robot used for assembly purpose?
a) Jointed arm b) PUMA
c) SCARA d) None of these

3) For short range distance measurements, which type of sensor in more suitable?
a) Tactile sensor b) Ultrasonic sensor
c) Optical sensor d) Laser sensor

4) Majority of industrial robots used in welding are built in ___ configuration.
a) Cylindrical b) Spherical
c) Jointed arm d) SCARA

5) What is the function of a frame grabber?
a) Sensing the object b) Digitizing
c) Storing d) None of these

6) When the joint angles and the different configurations of manipulator are derived from the position orientation, the scheme is known as ____.
a) Forward kinematics b) Inverse kinematics
c) Transformation d) None of these

7) The process of finding the position of the end effector when the joint variable are known is called ____.
a) Forward Kinematics b) Inverse Kinematics
c) Forward Dynamics d) Inverse Dynamics

8) Trajectory planning is done in ____.
a) Joint Space & Cartesian Space
b) Joint Space & Local Space
c) Joint Space & Global Space
d) Global Space & Cartesian Space

9) When the determinant of the manipulator Jacobian is zero, the configuration of the manipulator is said to be ____.
a) Angular b) Rectangular
c) Singular d) Spiral

10) The process of transforming variable from tool configuration space to joint space is called kinematics.
a) Forward b) Inward
c) Inverse d) Reverse

11) The order of the polynomial used for formulating the robot trajectory is usually a order polynomial.
a) First b) Second
c) Third d) Fourth

12) A gripper used in assembly operations needs to be equipped with an arrangement which will allow a certain amount of flexibility in its wrist. This is to ensure assembly even if the axis of the part during insertion is slightly off-center. This type of compliance is compliance.
a) Active b) Passive
c) Mutual d) Progressive

13) The minimum number of wheels required for both static and dynamic balance of wheeled robots is ____.
a) 2 b) 3
c) 4 d) 6

14) Binary sensors have ____ as the contact device.
a) Fingers b) Micro switch
c) Wrist d) None of these

Seat No.	

Set **R**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Industrial Robotics (BTN02411)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

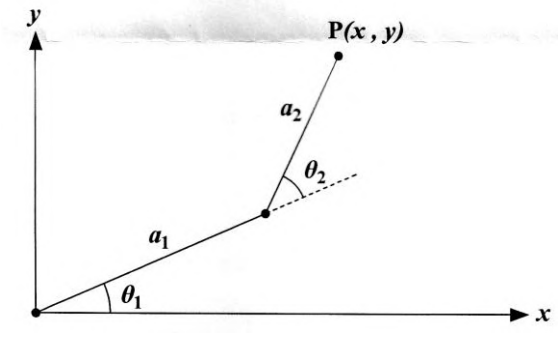
Instructions: 1) Answer any two questions from Section I and Section II.
2) Figures to the right indicate full marks.
3) Use of non-programmable scientific calculator is allowed.
4) Assume suitable data if necessary.

SECTION-I

Q.2 **a)** Define robot and explain basic components of robots with functions. **08**
b) Derive the inverse kinematic equations for a 2 DOF jointed arm robot. **06**

Q.3 **a)** A vector $\overline{v} = 2\hat{\imath} + 5\hat{\jmath} + 3\hat{k}$ is rotated by 45^o about the x axis of the reference frame. It is then translated by 3,4 and 5 units in $x, y \; and \; z$ direction respectively. Find the vector with reference to the reference frame. **08**
b) What are the different factors to be considered when selecting grippers as EOAT (End of Arm Tooling) attachment for industrial robots? **06**

Q.4 **a)** Derive the equation for the Jacobian of a 2 DOF jointed arm manipulator. In the figure given. below the lengths of the links a_1 and a_2 of the manipulator are 200 mm each. Link angles θ_1 and θ_2 measure 20° and 30° respectively. If the tool velocity is 100 mm/s in both x and y directions calculate rotational speeds of link 1 and link 2 in degrees/sec. **08**



b) Define the following terms: Workspace, forward kinematics, inverse kinematics, Jacobian (of the manipulator), trajectory, repeatability. **06**

Section-II

Q.5	**a)**	Explain with the help of block diagram the control of a DC servomotor used as actuator for robot joints.	**08**
	b)	Explain with the help of neat sketch a typical control architecture for industrial robots.	**06**
Q.6	**a)**	What is an AGV? Discuss the different navigation techniques used for industrial AGVs.	**08**
	b)	Compare wheeled robot and tracked robot in detail.	**06**
Q.7	**a)**	Discuss use of industrial robots for welding applications. State the robot configuration DOF, choice of drives and sensors clearly and given justification for the same.	**08**
	b)	Discuss in detail various applications of mobile robots.	**06**

Seat No.	

Set **S**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Industrial Robotics (BTN02411)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).
5) Use of non-programmable scientific calculator is allowed.
6) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The process of transforming variable from tool configuration space to joint space is called kinematics.
a) Forward b) Inward
c) Inverse d) Reverse

2) The order of the polynomial used for formulating the robot trajectory is usually a order polynomial.
a) First b) Second
c) Third d) Fourth

3) A gripper used in assembly operations needs to be equipped with an arrangement which will allow a certain amount of flexibility in its wrist. This is to ensure assembly even if the axis of the part during insertion is slightly off-center. This type of compliance is compliance.
a) Active b) Passive
c) Mutual d) Progressive

4) The minimum number of wheels required for both static and dynamic balance of wheeled robots is ____.
a) 2 b) 3
c) 4 d) 6

5) Binary sensors have ____ as the contact device.
a) Fingers b) Micro switch
c) Wrist d) None of these

6) Suction or vacuum grippers are used for ____ objects.
a) Magnetic b) Flat
c) Hole d) None of these

7) Which type of robot used for assembly purpose?
a) Jointed arm b) PUMA
c) SCARA d) None of these

8) For short range distance measurements, which type of sensor in more suitable?
a) Tactile sensor b) Ultrasonic sensor
c) Optical sensor d) Laser sensor

9) Majority of industrial robots used in welding are built in ___ configuration.
a) Cylindrical b) Spherical
c) Jointed arm d) SCARA

10) What is the function of a frame grabber?
a) Sensing the object b) Digitizing
c) Storing d) None of these

11) When the joint angles and the different configurations of manipulator are derived from the position orientation, the scheme is known as ____.
a) Forward kinematics b) Inverse kinematics
c) Transformation d) None of these

12) The process of finding the position of the end effector when the joint variable are known is called ____.
a) Forward Kinematics b) Inverse Kinematics
c) Forward Dynamics d) Inverse Dynamics

13) Trajectory planning is done in ____.
a) Joint Space & Cartesian Space
b) Joint Space & Local Space
c) Joint Space & Global Space
d) Global Space & Cartesian Space

14) When the determinant of the manipulator Jacobian is zero, the configuration of the manipulator is said to be ____.
a) Angular b) Rectangular
c) Singular d) Spiral

Seat No.	

Set **S**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Industrial Robotics (BTN02411)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

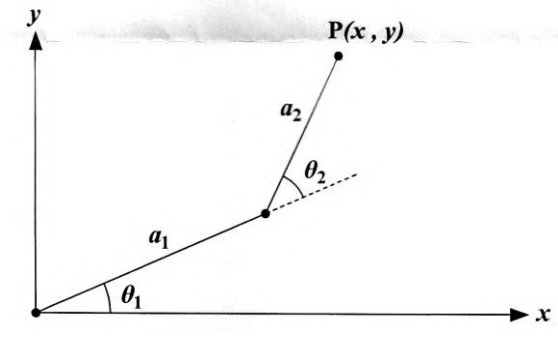
Instructions: 1) Answer any two questions from Section I and Section II.
2) Figures to the right indicate full marks.
3) Use of non-programmable scientific calculator is allowed.
4) Assume suitable data if necessary.

SECTION-I

Q.2 **a)** Define robot and explain basic components of robots with functions. **08**
b) Derive the inverse kinematic equations for a 2 DOF jointed arm robot. **06**

Q.3 **a)** A vector $\overline{v} = 2\hat{\imath} + 5\hat{\jmath} + 3\hat{k}$ is rotated by 45^o about the x axis of the reference frame. It is then translated by 3,4 and 5 units in $x, y \; and \; z$ direction respectively. Find the vector with reference to the reference frame. **08**
b) What are the different factors to be considered when selecting grippers as EOAT (End of Arm Tooling) attachment for industrial robots? **06**

Q.4 **a)** Derive the equation for the Jacobian of a 2 DOF jointed arm manipulator. In the figure given. below the lengths of the links a_1 and a_2 of the manipulator are 200 mm each. Link angles θ_1 and θ_2 measure 20° and 30° respectively. If the tool velocity is 100 mm/s in both x and y directions calculate rotational speeds of link 1 and link 2 in degrees/sec. **08**



b) Define the following terms: Workspace, forward kinematics, inverse kinematics, Jacobian (of the manipulator), trajectory, repeatability. **06**

Section-II

Q.5	**a)**	Explain with the help of block diagram the control of a DC servomotor used as actuator for robot joints.	**08**
	b)	Explain with the help of neat sketch a typical control architecture for industrial robots.	**06**
Q.6	**a)**	What is an AGV? Discuss the different navigation techniques used for industrial AGVs.	**08**
	b)	Compare wheeled robot and tracked robot in detail.	**06**
Q.7	**a)**	Discuss use of industrial robots for welding applications. State the robot configuration DOF, choice of drives and sensors clearly and given justification for the same.	**08**
	b)	Discuss in detail various applications of mobile robots.	**06**

SLR-BD-113

Seat No.		Set	P

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to 3D Printing (BTN02412)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.
5) Use of scientific calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The process of obtaining a geometric CAD model from 3D points acquired by scanning/digitizing existing parts products is best known as: ____.
a) Forward Engineering b) Backward Engineering
c) Reverse Engineering d) Product Engineering

2) In the entire reverse engineering process for product design, which one is the first step?
a) CAD model updating b) CAD modeling
c) Data pre-processing d) Data capturing

3) Which of the following RP system is not developed by 3D systems?
a) Selective Laser Sintering (SLS)
b) Multi-Jet Modeling System (MJM)
c) Paper Lamination Technology (PLT)
d) Stereolithography Apparatus (SLA)

4) Which of the following is used as base material in Stereolithography (SLA) process?
a) Thermoplastics, Metals powders
b) Thermoplastics, Eutectic metals.
c) Photopolymer
d) Titanium alloys

5) What is the third step in Reverse Engineering?
a) Digitization of the object b) Creation of CAD model
c) Prototype d) None of these

6) Which of the following advantage does not possess by the rapid prototyping process over the traditional prototyping process?
   a) It consumes less time
   b) Gives better quality
   c) Reduces product launch time
   d) It's cheaper

7) STL file format is represented by interaction of ____.
   a) lines and hexagons
   b) lines and rectangles
   c) lines and triangles
   d) lines and circles

8) Which material can be efficiently used as a support material?
   a) ABS
   b) PLA
   c) Nylon
   d) INF

9) The starting material of the Stereolithography method is ____.
   a) Solid
   b) Liquid
   c) Powder
   d) Gas

10) Which one of the processes is subtractive prototyping?
   a) 5 axis CNC Milling
   b) Fused Deposition Modeling
   c) Digital Light Process (DLP)
   d) Stereolithography Apparatus

11) Which of the following is the process of pre-processing stage?
   a) Remove support
   b) Checking 3D CAD data
   c) De-powdering loose material
   d) Dip in binder to strengthen the part

12) What were the variable we used in Tinkercad?
   a) x,y,z
   b) a,b,c
   c) x,y
   d) none of the above

13) Creation, analysis, modification and optimization is ____.
   a) CAD
   b) CAM
   c) CAE
   d) None of above

14) Geometric modelling corresponds to ____.
   a) Synthesis phase of CAD
   b) Analysis phase of CAD
   c) Synthesis and Analysis phase of CAD
   d) None of the above

SLR-BD-113

Seat No.	

Set P

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to 3D Printing (BTN02412)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining and
2) Question no. 6 is compulsory in section II. and solve any two questions from the remaining
3) Use of scientific calculator is allowed.
4) Figures to the right indicate full marks.
5) Assume suitable data if required.

Section – I

	Solve Any Three from Q. No. 2 to Q. No.5.	**28**
Q.2	Explain the need of additive manufacturing with respect to industry applications.	**10**
Q.3	Describe the methodologies of Additive manufacturing.	**09**
Q.4	Discuss Stereolithography Additive manufacturing machine with specification and applications.	**09**
Q.5	What is meant by Computer Aided Design (CAD)? Explain importance of CAD in industries with applications?	**09**

Section – II

	Solve Any Three from Q. No. 6 to Q. No.9	**28**
Q.6	Discuss the importance of parametric modeling in CAD software and how it can benefit the additive manufacturing process.	**10**
Q.7	Illustrate feature-based modeling in CAD for 3D printing?	**09**
Q.8	Enlist different polymer materials used in 3D printing and explain any 02 with applications.	**09**
Q.9	Describe different applications of 3D printing in the field of Automobile, Medical and Aerospace sector.	**09**

SLR-BD-113

Seat No.	

Set Q

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to 3D Printing (BTN02412)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.
5) Use of scientific calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Which material can be efficiently used as a support material?
a) ABS b) PLA
c) Nylon d) INF

2) The starting material of the Stereolithography method is ____.
a) Solid b) Liquid
c) Powder d) Gas

3) Which one of the processes is subtractive prototyping?
a) 5 axis CNC Milling
b) Fused Deposition Modeling
c) Digital Light Process (DLP)
d) Stereolithography Apparatus

4) Which of the following is the process of pre-processing stage?
a) Remove support
b) Checking 3D CAD data
c) De-powdering loose material
d) Dip in binder to strengthen the part

5) What were the variable we used in Tinkercad?
a) x,y,z b) a,b,c
c) x,y d) none of the above

6) Creation, analysis, modification and optimization is ____.
a) CAD b) CAM
c) CAE d) None of above

7) Geometric modelling corresponds to ____.
   a) Synthesis phase of CAD
   b) Analysis phase of CAD
   c) Synthesis and Analysis phase of CAD
   d) None of the above

8) The process of obtaining a geometric CAD model from 3D points acquired by scanning/digitizing existing parts products is best known as: ____.
   a) Forward Engineering
   b) Backward Engineering
   c) Reverse Engineering
   d) Product Engineering

9) In the entire reverse engineering process for product design, which one is the first step?
   a) CAD model updating
   b) CAD modeling
   c) Data pre-processing
   d) Data capturing

10) Which of the following RP system is not developed by 3D systems?
   a) Selective Laser Sintering (SLS)
   b) Multi-Jet Modeling System (MJM)
   c) Paper Lamination Technology (PLT)
   d) Stereolithography Apparatus (SLA)

11) Which of the following is used as base material in Stereolithography (SLA) process?
   a) Thermoplastics, Metals powders
   b) Thermoplastics, Eutectic metals.
   c) Photopolymer
   d) Titanium alloys

12) What is the third step in Reverse Engineering?
   a) Digitization of the object
   b) Creation of CAD model
   c) Prototype
   d) None of these

13) Which of the following advantage does not possess by the rapid prototyping process over the traditional prototyping process?
   a) It consumes less time
   b) Gives better quality
   c) Reduces product launch time
   d) It's cheaper

14) STL file format is represented by interaction of ____.
   a) lines and hexagons
   b) lines and rectangles
   c) lines and triangles
   d) lines and circles

SLR-BD-113

Seat No.	

Set Q

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to 3D Printing (BTN02412)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining and
2) Question no. 6 is compulsory in section II. and solve any two questions from the remaining
3) Use of scientific calculator is allowed.
4) Figures to the right indicate full marks.
5) Assume suitable data if required.

Section – I

	Solve Any Three from Q. No. 2 to Q. No.5.	**28**
Q.2	Explain the need of additive manufacturing with respect to industry applications.	**10**
Q.3	Describe the methodologies of Additive manufacturing.	**09**
Q.4	Discuss Stereolithography Additive manufacturing machine with specification and applications.	**09**
Q.5	What is meant by Computer Aided Design (CAD)? Explain importance of CAD in industries with applications?	**09**

Section – II

	Solve Any Three from Q. No. 6 to Q. No.9	**28**
Q.6	Discuss the importance of parametric modeling in CAD software and how it can benefit the additive manufacturing process.	**10**
Q.7	Illustrate feature-based modeling in CAD for 3D printing?	**09**
Q.8	Enlist different polymer materials used in 3D printing and explain any 02 with applications.	**09**
Q.9	Describe different applications of 3D printing in the field of Automobile, Medical and Aerospace sector.	**09**

Seat No.	

Set **R**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to 3D Printing (BTN02412)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.
5) Use of scientific calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is the process of pre-processing stage?
a) Remove support
b) Checking 3D CAD data
c) De-powdering loose material
d) Dip in binder to strengthen the part

2) What were the variable we used in Tinkercad?
a) x,y,z b) a,b,c
c) x,y d) none of the above

3) Creation, analysis, modification and optimization is ____.
a) CAD b) CAM
c) CAE d) None of above

4) Geometric modelling corresponds to ____.
a) Synthesis phase of CAD
b) Analysis phase of CAD
c) Synthesis and Analysis phase of CAD
d) None of the above

5) The process of obtaining a geometric CAD model from 3D points acquired by scanning/digitizing existing parts products is best known as: ____.
a) Forward Engineering b) Backward Engineering
c) Reverse Engineering d) Product Engineering

6) In the entire reverse engineering process for product design, which one is the first step?
a) CAD model updating b) CAD modeling
c) Data pre-processing d) Data capturing

7) Which of the following RP system is not developed by 3D systems?
a) Selective Laser Sintering (SLS)
b) Multi-Jet Modeling System (MJM)
c) Paper Lamination Technology (PLT)
d) Stereolithography Apparatus (SLA)

8) Which of the following is used as base material in Stereolithography (SLA) process?
a) Thermoplastics, Metals powders
b) Thermoplastics, Eutectic metals.
c) Photopolymer
d) Titanium alloys

9) What is the third step in Reverse Engineering?
a) Digitization of the object b) Creation of CAD model
c) Prototype d) None of these

10) Which of the following advantage does not possess by the rapid prototyping process over the traditional prototyping process?
a) It consumes less time
b) Gives better quality
c) Reduces product launch time
d) It's cheaper

11) STL file format is represented by interaction of ____.
a) lines and hexagons b) lines and rectangles
c) lines and triangles d) lines and circles

12) Which material can be efficiently used as a support material?
a) ABS b) PLA
c) Nylon d) INF

13) The starting material of the Stereolithography method is ____.
a) Solid b) Liquid
c) Powder d) Gas

14) Which one of the processes is subtractive prototyping?
a) 5 axis CNC Milling
b) Fused Deposition Modeling
c) Digital Light Process (DLP)
d) Stereolithography Apparatus

SLR-BD-113

Seat No.	

Set R

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to 3D Printing (BTN02412)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining and
2) Question no. 6 is compulsory in section II. and solve any two questions from the remaining
3) Use of scientific calculator is allowed.
4) Figures to the right indicate full marks.
5) Assume suitable data if required.

Section – I

	Solve Any Three from Q. No. 2 to Q. No.5.	**28**
Q.2	Explain the need of additive manufacturing with respect to industry applications.	**10**
Q.3	Describe the methodologies of Additive manufacturing.	**09**
Q.4	Discuss Stereolithography Additive manufacturing machine with specification and applications.	**09**
Q.5	What is meant by Computer Aided Design (CAD)? Explain importance of CAD in industries with applications?	**09**

Section – II

	Solve Any Three from Q. No. 6 to Q. No.9	**28**
Q.6	Discuss the importance of parametric modeling in CAD software and how it can benefit the additive manufacturing process.	**10**
Q.7	Illustrate feature-based modeling in CAD for 3D printing?	**09**
Q.8	Enlist different polymer materials used in 3D printing and explain any 02 with applications.	**09**
Q.9	Describe different applications of 3D printing in the field of Automobile, Medical and Aerospace sector.	**09**

Seat No.	

Set **S**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to 3D Printing (BTN02412)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.
5) Use of scientific calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following advantage does not possess by the rapid prototyping process over the traditional prototyping process?
a) It consumes less time
b) Gives better quality
c) Reduces product launch time
d) It's cheaper

2) STL file format is represented by interaction of ____.
a) lines and hexagons b) lines and rectangles
c) lines and triangles d) lines and circles

3) Which material can be efficiently used as a support material?
a) ABS b) PLA
c) Nylon d) INF

4) The starting material of the Stereolithography method is ____.
a) Solid b) Liquid
c) Powder d) Gas

5) Which one of the processes is subtractive prototyping?
a) 5 axis CNC Milling
b) Fused Deposition Modeling
c) Digital Light Process (DLP)
d) Stereolithography Apparatus

6) Which of the following is the process of pre-processing stage?
   a) Remove support
   b) Checking 3D CAD data
   c) De-powdering loose material
   d) Dip in binder to strengthen the part

7) What were the variable we used in Tinkercad?
   a) x,y,z
   b) a,b,c
   c) x,y
   d) none of the above

8) Creation, analysis, modification and optimization is ____.
   a) CAD
   b) CAM
   c) CAE
   d) None of above

9) Geometric modelling corresponds to ____.
   a) Synthesis phase of CAD
   b) Analysis phase of CAD
   c) Synthesis and Analysis phase of CAD
   d) None of the above

10) The process of obtaining a geometric CAD model from 3D points acquired by scanning/digitizing existing parts products is best known as: ____.
   a) Forward Engineering
   b) Backward Engineering
   c) Reverse Engineering
   d) Product Engineering

11) In the entire reverse engineering process for product design, which one is the first step?
   a) CAD model updating
   b) CAD modeling
   c) Data pre-processing
   d) Data capturing

12) Which of the following RP system is not developed by 3D systems?
   a) Selective Laser Sintering (SLS)
   b) Multi-Jet Modeling System (MJM)
   c) Paper Lamination Technology (PLT)
   d) Stereolithography Apparatus (SLA)

13) Which of the following is used as base material in Stereolithography (SLA) process?
   a) Thermoplastics, Metals powders
   b) Thermoplastics, Eutectic metals.
   c) Photopolymer
   d) Titanium alloys

14) What is the third step in Reverse Engineering?
   a) Digitization of the object
   b) Creation of CAD model
   c) Prototype
   d) None of these

SLR-BD-113

Seat No.	

Set S

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to 3D Printing (BTN02412)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Question no. 2 is compulsory in section I, and solve any two questions from the remaining and
2) Question no. 6 is compulsory in section II. and solve any two questions from the remaining
3) Use of scientific calculator is allowed.
4) Figures to the right indicate full marks.
5) Assume suitable data if required.

Section – I

	Solve Any Three from Q. No. 2 to Q. No.5.	**28**
Q.2	Explain the need of additive manufacturing with respect to industry applications.	**10**
Q.3	Describe the methodologies of Additive manufacturing.	**09**
Q.4	Discuss Stereolithography Additive manufacturing machine with specification and applications.	**09**
Q.5	What is meant by Computer Aided Design (CAD)? Explain importance of CAD in industries with applications?	**09**

Section – II

	Solve Any Three from Q. No. 6 to Q. No.9	**28**
Q.6	Discuss the importance of parametric modeling in CAD software and how it can benefit the additive manufacturing process.	**10**
Q.7	Illustrate feature-based modeling in CAD for 3D printing?	**09**
Q.8	Enlist different polymer materials used in 3D printing and explain any 02 with applications.	**09**
Q.9	Describe different applications of 3D printing in the field of Automobile, Medical and Aerospace sector.	**09**

Seat No.	

Set **P**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Renewable Energy Sources (BTN02413)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of a calculator is allowed.
5) Assume additional suitable data, if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the primary advantage of using solar energy as a renewable resource?
a) It produces no greenhouse gas emissions
b) It requires minimal land area for installation
c) It is available 24/7, regardless of weather conditions
d) It is the most cost-effective renewable energy source

2) Photovoltaic cells convert sunlight directly into: ____.
a) Mechanical energy b) Thermal energy
c) Electrical energy d) Chemical energy

3) Which of the following is NOT a type of solar thermal collector?
a) Flat plate collector b) Photovoltaic collector
c) Evacuated tube collector d) Compound parabolic collector

4) Solar ponds utilize the principle of: ____.
a) Reflection b) Convection
c) Conduction d) Absorption

5) The manufacturing process of solar cells typically involves: ____.
a) Injection molding b) Chemical vapor deposition
c) Extrusion d) Casting

6) Balance of System (BoS) in a PV system includes: ____.
a) Only the solar panels
b) All components excluding the solar panels
c) Only the electrical wiring
d) The support structure for the solar panels

7) Standalone PV systems are primarily used: ____.
a) In urban areas with access to grid electricity
b) In rural areas without access to grid electricity
c) For large-scale industrial applications
d) For backup power generation in case of grid failures

8) Biomass energy is derived from: ____.
a) Fossilized plants and animals
b) Sunlight
c) Organic matter such as wood and crop residues
d) Nuclear reactions

9) Gasification is a process that converts organic materials into: ____.
a) Liquid fuels
b) Gaseous fuels
c) Solid fuels
d) Electricity

10) Which of the following is NOT a type of digester used in bioenergy production?
a) Anaerobic lagoon
b) Plug flow digester
c) Batch digester
d) Aerobic digester

11) Selection of components in a wind turbine system involves consideration of: ____.
a) Blade materials only
b) Tower height only
c) Generator type and capacity, blade design, and tower specifications
d) Electrical wiring only

12) Various methods of controlling wind turbines include: ____.
a) Pitch control and yaw control
b) Sun tracking and moon tracking
c) Rainwater harvesting and irrigation control
d) Animal deterrent and pest control

13) Which renewable energy source relies on the heat stored beneath the Earth's surface?
a) Biomass energy
b) Wind power
c) Geothermal energy
d) Hydropower

14) Which renewable energy source harnesses the kinetic energy of ocean currents and tides?
a) Geothermal energy
b) Hydroelectric power
c) Tidal energy
d) Wave energy

Seat No.	

Set P

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Renewable Energy Sources (BTN02413)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of a calculator is allowed.
4) Assume additional suitable data, if necessary and mention it clearly.

Section - I

Q.2 Solve the following: (Any Four) **16**

a) Differentiate between Renewable and Non-Renewable Sources of Energy.
b) Compare and contrast the world energy status with the energy scenario in India.
c) Discuss types of solar thermal collectors and their applications.
d) Explore methods of solar power generation, focusing on power towers.
e) Explain the physics underlying the operation of solar cells.
f) Explain the concept of solar energy and its derivation from the Sun.

Q.3 Solve the following: (Any Two) **12**

a) Describe the instruments used for measuring solar radiation. Explain their principles of operation and the parameters they measure to quantify solar radiation.
b) Explore the applications of solar air heaters, solar dryers, and solar stills in thermal energy generation.
c) Describe the applications of photovoltaic systems in standalone and grid- connected configurations.

Section - II

Q.4 Solve the following: (Any Four) **16**

a) Discuss the process of energy generation through fermentation.
b) Compare and contrast various types of gasifiers used in the gasification process.
c) Describe different types of wind turbines used in wind energy generation.
d) Explore the concept of offshore wind farms and their advantages over onshore wind farms.
e) Discuss the introduction of small hydropower (SHP) systems, highlighting their significance in renewable energy generation.
f) Explain the concept of energy generation through waves and tides.

Q.5 Attempt the following: (Any Two) **12**

a) Explain the process of site selection for wind farm development.
b) Explore power generation through Ocean Thermal Energy Conversion (OTEC) systems.
c) Describe different types of digesters used in anaerobic digestion processes.

Seat No.	

Set **Q**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Renewable Energy Sources (BTN02413)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of a calculator is allowed.
5) Assume additional suitable data, if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Biomass energy is derived from: ____.
a) Fossilized plants and animals
b) Sunlight
c) Organic matter such as wood and crop residues
d) Nuclear reactions

2) Gasification is a process that converts organic materials into: ____.
a) Liquid fuels b) Gaseous fuels
c) Solid fuels d) Electricity

3) Which of the following is NOT a type of digester used in bioenergy production?
a) Anaerobic lagoon b) Plug flow digester
c) Batch digester d) Aerobic digester

4) Selection of components in a wind turbine system involves consideration of: ____.
a) Blade materials only
b) Tower height only
c) Generator type and capacity, blade design, and tower specifications
d) Electrical wiring only

5) Various methods of controlling wind turbines include: ____.
a) Pitch control and yaw control
b) Sun tracking and moon tracking
c) Rainwater harvesting and irrigation control
d) Animal deterrent and pest control

6) Which renewable energy source relies on the heat stored beneath the Earth's surface?
a) Biomass energy
b) Wind power
c) Geothermal energy
d) Hydropower

7) Which renewable energy source harnesses the kinetic energy of ocean currents and tides?
a) Geothermal energy
b) Hydroelectric power
c) Tidal energy
d) Wave energy

8) What is the primary advantage of using solar energy as a renewable resource?
a) It produces no greenhouse gas emissions
b) It requires minimal land area for installation
c) It is available 24/7, regardless of weather conditions
d) It is the most cost-effective renewable energy source

9) Photovoltaic cells convert sunlight directly into: ____.
a) Mechanical energy
b) Thermal energy
c) Electrical energy
d) Chemical energy

10) Which of the following is NOT a type of solar thermal collector?
a) Flat plate collector
b) Photovoltaic collector
c) Evacuated tube collector
d) Compound parabolic collector

11) Solar ponds utilize the principle of: ____.
a) Reflection
b) Convection
c) Conduction
d) Absorption

12) The manufacturing process of solar cells typically involves: ____.
a) Injection molding
b) Chemical vapor deposition
c) Extrusion
d) Casting

13) Balance of System (BoS) in a PV system includes: ____.
a) Only the solar panels
b) All components excluding the solar panels
c) Only the electrical wiring
d) The support structure for the solar panels

14) Standalone PV systems are primarily used: ____.
a) In urban areas with access to grid electricity
b) In rural areas without access to grid electricity
c) For large-scale industrial applications
d) For backup power generation in case of grid failures

Seat No.	

Set Q

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Renewable Energy Sources (BTN02413)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of a calculator is allowed.
4) Assume additional suitable data, if necessary and mention it clearly.

Section - I

Q.2 Solve the following: (Any Four) 16

a) Differentiate between Renewable and Non-Renewable Sources of Energy.
b) Compare and contrast the world energy status with the energy scenario in India.
c) Discuss types of solar thermal collectors and their applications.
d) Explore methods of solar power generation, focusing on power towers.
e) Explain the physics underlying the operation of solar cells.
f) Explain the concept of solar energy and its derivation from the Sun.

Q.3 Solve the following: (Any Two) 12

a) Describe the instruments used for measuring solar radiation. Explain their principles of operation and the parameters they measure to quantify solar radiation.
b) Explore the applications of solar air heaters, solar dryers, and solar stills in thermal energy generation.
c) Describe the applications of photovoltaic systems in standalone and grid- connected configurations.

Section - II

Q.4 Solve the following: (Any Four) 16

a) Discuss the process of energy generation through fermentation.
b) Compare and contrast various types of gasifiers used in the gasification process.
c) Describe different types of wind turbines used in wind energy generation.
d) Explore the concept of offshore wind farms and their advantages over onshore wind farms.
e) Discuss the introduction of small hydropower (SHP) systems, highlighting their significance in renewable energy generation.
f) Explain the concept of energy generation through waves and tides.

Q.5 Attempt the following: (Any Two) 12

a) Explain the process of site selection for wind farm development.
b) Explore power generation through Ocean Thermal Energy Conversion (OTEC) systems.
c) Describe different types of digesters used in anaerobic digestion processes.

Seat No.	

Set **R**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Renewable Energy Sources (BTN02413)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of a calculator is allowed.
5) Assume additional suitable data, if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Selection of components in a wind turbine system involves consideration of: ____.
a) Blade materials only
b) Tower height only
c) Generator type and capacity, blade design, and tower specifications
d) Electrical wiring only

2) Various methods of controlling wind turbines include: ____.
a) Pitch control and yaw control
b) Sun tracking and moon tracking
c) Rainwater harvesting and irrigation control
d) Animal deterrent and pest control

3) Which renewable energy source relies on the heat stored beneath the Earth's surface?
a) Biomass energy b) Wind power
c) Geothermal energy d) Hydropower

4) Which renewable energy source harnesses the kinetic energy of ocean currents and tides?
a) Geothermal energy b) Hydroelectric power
c) Tidal energy d) Wave energy

5) What is the primary advantage of using solar energy as a renewable resource?
a) It produces no greenhouse gas emissions
b) It requires minimal land area for installation
c) It is available 24/7, regardless of weather conditions
d) It is the most cost-effective renewable energy source

6) Photovoltaic cells convert sunlight directly into: ____.
a) Mechanical energy b) Thermal energy
c) Electrical energy d) Chemical energy

7) Which of the following is NOT a type of solar thermal collector?
a) Flat plate collector b) Photovoltaic collector
c) Evacuated tube collector d) Compound parabolic collector

8) Solar ponds utilize the principle of: ____.
a) Reflection b) Convection
c) Conduction d) Absorption

9) The manufacturing process of solar cells typically involves: ____.
a) Injection molding b) Chemical vapor deposition
c) Extrusion d) Casting

10) Balance of System (BoS) in a PV system includes: ____.
a) Only the solar panels
b) All components excluding the solar panels
c) Only the electrical wiring
d) The support structure for the solar panels

11) Standalone PV systems are primarily used: ____.
a) In urban areas with access to grid electricity
b) In rural areas without access to grid electricity
c) For large-scale industrial applications
d) For backup power generation in case of grid failures

12) Biomass energy is derived from: ____.
a) Fossilized plants and animals
b) Sunlight
c) Organic matter such as wood and crop residues
d) Nuclear reactions

13) Gasification is a process that converts organic materials into: ____.
a) Liquid fuels b) Gaseous fuels
c) Solid fuels d) Electricity

14) Which of the following is NOT a type of digester used in bioenergy production?
a) Anaerobic lagoon b) Plug flow digester
c) Batch digester d) Aerobic digester

Seat No.	

Set R

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Renewable Energy Sources (BTN02413)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of a calculator is allowed.
4) Assume additional suitable data, if necessary and mention it clearly.

Section - I

Q.2 Solve the following: (Any Four) **16**

a) Differentiate between Renewable and Non-Renewable Sources of Energy.
b) Compare and contrast the world energy status with the energy scenario in India.
c) Discuss types of solar thermal collectors and their applications.
d) Explore methods of solar power generation, focusing on power towers.
e) Explain the physics underlying the operation of solar cells.
f) Explain the concept of solar energy and its derivation from the Sun.

Q.3 Solve the following: (Any Two) **12**

a) Describe the instruments used for measuring solar radiation. Explain their principles of operation and the parameters they measure to quantify solar radiation.
b) Explore the applications of solar air heaters, solar dryers, and solar stills in thermal energy generation.
c) Describe the applications of photovoltaic systems in standalone and grid- connected configurations.

Section - II

Q.4 Solve the following: (Any Four) **16**

a) Discuss the process of energy generation through fermentation.
b) Compare and contrast various types of gasifiers used in the gasification process.
c) Describe different types of wind turbines used in wind energy generation.
d) Explore the concept of offshore wind farms and their advantages over onshore wind farms.
e) Discuss the introduction of small hydropower (SHP) systems, highlighting their significance in renewable energy generation.
f) Explain the concept of energy generation through waves and tides.

Q.5 Attempt the following: (Any Two) **12**

a) Explain the process of site selection for wind farm development.
b) Explore power generation through Ocean Thermal Energy Conversion (OTEC) systems.
c) Describe different types of digesters used in anaerobic digestion processes.

Seat No.	

Set **S**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Renewable Energy Sources (BTN02413)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of a calculator is allowed.
5) Assume additional suitable data, if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Balance of System (BoS) in a PV system includes: ____.
a) Only the solar panels
b) All components excluding the solar panels
c) Only the electrical wiring
d) The support structure for the solar panels

2) Standalone PV systems are primarily used: ____.
a) In urban areas with access to grid electricity
b) In rural areas without access to grid electricity
c) For large-scale industrial applications
d) For backup power generation in case of grid failures

3) Biomass energy is derived from: ____.
a) Fossilized plants and animals
b) Sunlight
c) Organic matter such as wood and crop residues
d) Nuclear reactions

4) Gasification is a process that converts organic materials into: ____.
a) Liquid fuels b) Gaseous fuels
c) Solid fuels d) Electricity

5) Which of the following is NOT a type of digester used in bioenergy production?
a) Anaerobic lagoon b) Plug flow digester
c) Batch digester d) Aerobic digester

6) Selection of components in a wind turbine system involves consideration of: ____.
a) Blade materials only
b) Tower height only
c) Generator type and capacity, blade design, and tower specifications
d) Electrical wiring only

7) Various methods of controlling wind turbines include: ____.
a) Pitch control and yaw control
b) Sun tracking and moon tracking
c) Rainwater harvesting and irrigation control
d) Animal deterrent and pest control

8) Which renewable energy source relies on the heat stored beneath the Earth's surface?
a) Biomass energy
b) Wind power
c) Geothermal energy
d) Hydropower

9) Which renewable energy source harnesses the kinetic energy of ocean currents and tides?
a) Geothermal energy
b) Hydroelectric power
c) Tidal energy
d) Wave energy

10) What is the primary advantage of using solar energy as a renewable resource?
a) It produces no greenhouse gas emissions
b) It requires minimal land area for installation
c) It is available 24/7, regardless of weather conditions
d) It is the most cost-effective renewable energy source

11) Photovoltaic cells convert sunlight directly into: ____.
a) Mechanical energy
b) Thermal energy
c) Electrical energy
d) Chemical energy

12) Which of the following is NOT a type of solar thermal collector?
a) Flat plate collector
b) Photovoltaic collector
c) Evacuated tube collector
d) Compound parabolic collector

13) Solar ponds utilize the principle of: ____.
a) Reflection
b) Convection
c) Conduction
d) Absorption

14) The manufacturing process of solar cells typically involves: ____.
a) Injection molding
b) Chemical vapor deposition
c) Extrusion
d) Casting

Seat No.	

Set | S

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Renewable Energy Sources (BTN02413)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of a calculator is allowed.
4) Assume additional suitable data, if necessary and mention it clearly.

Section - I

Q.2 Solve the following: (Any Four) **16**

a) Differentiate between Renewable and Non-Renewable Sources of Energy.
b) Compare and contrast the world energy status with the energy scenario in India.
c) Discuss types of solar thermal collectors and their applications.
d) Explore methods of solar power generation, focusing on power towers.
e) Explain the physics underlying the operation of solar cells.
f) Explain the concept of solar energy and its derivation from the Sun.

Q.3 Solve the following: (Any Two) **12**

a) Describe the instruments used for measuring solar radiation. Explain their principles of operation and the parameters they measure to quantify solar radiation.
b) Explore the applications of solar air heaters, solar dryers, and solar stills in thermal energy generation.
c) Describe the applications of photovoltaic systems in standalone and grid- connected configurations.

Section - II

Q.4 Solve the following: (Any Four) **16**

a) Discuss the process of energy generation through fermentation.
b) Compare and contrast various types of gasifiers used in the gasification process.
c) Describe different types of wind turbines used in wind energy generation.
d) Explore the concept of offshore wind farms and their advantages over onshore wind farms.
e) Discuss the introduction of small hydropower (SHP) systems, highlighting their significance in renewable energy generation.
f) Explain the concept of energy generation through waves and tides.

Q.5 Attempt the following: (Any Two) **12**

a) Explain the process of site selection for wind farm development.
b) Explore power generation through Ocean Thermal Energy Conversion (OTEC) systems.
c) Describe different types of digesters used in anaerobic digestion processes.

Seat No.	

Set **P**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to Automobile Engineering (BTN02414)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Which of the following parts of the cover assembly that hold the pressure plate against the clutch plate?
a) Springs b) Thrust bearings
c) Struts d) Lever

2) Where is the over drive located?
a) Between transmission and engine
b) Between transmission and rear axle
c) Between transmission and propeller shaft
d) Between transmission and differential

3) The gear shift lever requires two separate motions to shift gears, and the first movement?
a) moves the synchronizer b) selects the synchronizer
c) meshes the gears d) operates the clutch

4) Which one of the following statements correctly describes the construction of a planetary gear type differential?
a) The six planetary pinions rotate in constant mesh with the internal gears
b) One drive shaft is splined to the central gear and the other to the planetary gear.
c) Each planetary pinion gear meshes with both the central gear and the internal gear.
d) The internal gear is fixed to the planetary gear

5) The device for smoothening out the power impulses from the engine is called ____.
a) clutch b) differentia
c) flywheel d) torque converter

6) Clutch facings are usually attached to the plate by ____.
- a) steel rivets
- b) brass rivets
- c) aluminum screws
- d) steel screws

7) The torque converter uses ____ to transfer torque.
- a) air
- b) automatic transmission fluid (ATF)
- c) gears
- d) steel belt

8) The sequence in which the force is transmitted through a brake system when the brake pedal is depressed is ____.
- a) brake pedal - master cylinder - brake lines - vacuum servo mechanism - brake pads
- b) brake pedal - vacuum servo mechanism - master cylinder - brake lines - brake pads
- c) brake pedal - master cylinder - vacuum servo mechanism - brake lines - brake pads
- d) brake pedal - brake lines - vacuum servo mechanism - master cylinder - brake pads

9) Which is the of the following disadvantage of the open differential?
- a) High in cost
- b) Not reliable
- c) Complex design
- d) Sends most of the power to the wheel having less traction

10) Which types of wheels cannot be used with a tubeless tire?
- a) Disc wheel
- b) Light alloy wheel
- c) Composite wheel
- d) Wire wheel

11) If the of front wheels is inside and rear of fro are apart when the vehicle is at rest, then the configuration is called? front of the front wheels is inside and rear ____.
- a) Toe-in
- b) Toe out
- c) Positive camber
- d) Positive castor

12) What is called the cornering force over the slip angle?
- a) Castor trail
- b) Cornering power
- c) Self-righting torque
- d) Pneumatic trail

13) What is actual power delivered by the engine known as?
- a) Shaft power
- b) Horse power
- c) Brake power
- d) None of the mentioned

14) What is the differential located?
- a) Between engine and transmission
- b) Between transmission and rear axle
- c) Between two propeller shafts
- d) Between steering wheel and steering column

Seat No.	

Set P

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to Automobile Engineering (BTN02414)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from Section I and Section II.
2) Figures to the right indicate full marks.

Section – I

Q.2 Descriptive Question

a) Discuss HEV with block diagram. **04**
b) Explain Construction and working of 2 stoke Diesel Engine. **05**
c) Write short note on Rear Engine Rear Wheel drive Layout and their Applications. **05**

Q.3 Descriptive Question

a) Explain differential with neat sketch. **04**
b) Draw neat sketch of constant mesh Gear Box and also write constructions and working. **05**
c) Explain centrifugal Clutch with Neat Sketch. **05**

Q.4 Descriptive Question

a) Explain Hydraulic Braking system with neat sketch. **04**
b) Draw a neat sketch of wheel Cylinder and explain in brief. **05**
c) Explain Disc Braking System with neat sketch. **05**

Section – II

Q.5 Descriptive Question

a) Write short note on Hydraulic Power steering system. **05**
b) Explain Steering Geometry with sketch. **04**
1) King pin inclination
2) Camber angle
c) Explain Rack and pinion steering Gear box with neat sketch. **05**

Q.6 Descriptive Question

a) Write down Difference between Tubed and Tubeless tyre. **04**
b) Write a note on independent suspension systems. **05**
c) Explain MacPherson strut type suspension system. **05**

Q.7 Descriptive Question

a) Write a short note on sensors and actuators used in automobiles. **05**
b) Explain the spark plug? Explain with neat sketch. **05**
c) Why is CNG replacing petroleum fuels in automobiles? Justify answer. **04**

Seat No.	

Set **Q**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to Automobile Engineering (BTN02414)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) The sequence in which the force is transmitted through a brake system when the brake pedal is depressed is ____.
a) brake pedal - master cylinder - brake lines - vacuum servo mechanism - brake pads
b) brake pedal - vacuum servo mechanism - master cylinder - brake lines - brake pads
c) brake pedal - master cylinder - vacuum servo mechanism - brake lines - brake pads
d) brake pedal - brake lines - vacuum servo mechanism - master cylinder - brake pads

2) Which is the of the following disadvantage of the open differential?
a) High in cost
b) Not reliable
c) Complex design
d) Sends most of the power to the wheel having less traction

3) Which types of wheels cannot be used with a tubeless tire?
a) Disc wheel b) Light alloy wheel
c) Composite wheel d) Wire wheel

4) If the of front wheels is inside and rear of fro are apart when the vehicle is at rest, then the configuration is called? front of the front wheels is inside and rear ____.
a) Toe-in b) Toe out
c) Positive camber d) Positive castor

5) What is called the cornering force over the slip angle?
a) Castor trail b) Cornering power
c) Self-righting torque d) Pneumatic trail

6) What is actual power delivered by the engine known as?
a) Shaft power b) Horse power
c) Brake power d) None of the mentioned

7) What is the differential located?
a) Between engine and transmission
b) Between transmission and rear axle
c) Between two propeller shafts
d) Between steering wheel and steering column

8) Which of the following parts of the cover assembly that hold the pressure plate against the clutch plate?
a) Springs b) Thrust bearings
c) Struts d) Lever

9) Where is the over drive located?
a) Between transmission and engine
b) Between transmission and rear axle
c) Between transmission and propeller shaft
d) Between transmission and differential

10) The gear shift lever requires two separate motions to shift gears, and the first movement?
a) moves the synchronizer b) selects the synchronizer
c) meshes the gears d) operates the clutch

11) Which one of the following statements correctly describes the construction of a planetary gear type differential?
a) The six planetary pinions rotate in constant mesh with the internal gears
b) One drive shaft is splined to the central gear and the other to the planetary gear.
c) Each planetary pinion gear meshes with both the central gear and the internal gear.
d) The internal gear is fixed to the planetary gear

12) The device for smoothening out the power impulses from the engine is called ____.
a) clutch b) differentia
c) flywheel d) torque converter

13) Clutch facings are usually attached to the plate by ____.
a) steel rivets b) brass rivets
c) aluminum screws d) steel screws

14) The torque converter uses ____ to transfer torque.
a) air b) automatic transmission fluid (ATF)
c) gears d) steel belt

Seat No.	

Set Q

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to Automobile Engineering (BTN02414)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from Section I and Section II.
2) Figures to the right indicate full marks.

Section – I

Q.2 Descriptive Question

a) Discuss HEV with block diagram. **04**
b) Explain Construction and working of 2 stoke Diesel Engine. **05**
c) Write short note on Rear Engine Rear Wheel drive Layout and their Applications. **05**

Q.3 Descriptive Question

a) Explain differential with neat sketch. **04**
b) Draw neat sketch of constant mesh Gear Box and also write constructions and working. **05**
c) Explain centrifugal Clutch with Neat Sketch. **05**

Q.4 Descriptive Question

a) Explain Hydraulic Braking system with neat sketch. **04**
b) Draw a neat sketch of wheel Cylinder and explain in brief. **05**
c) Explain Disc Braking System with neat sketch. **05**

Section – II

Q.5 Descriptive Question

a) Write short note on Hydraulic Power steering system. **05**
b) Explain Steering Geometry with sketch. **04**
1) King pin inclination
2) Camber angle
c) Explain Rack and pinion steering Gear box with neat sketch. **05**

Q.6 Descriptive Question

a) Write down Difference between Tubed and Tubeless tyre. **04**
b) Write a note on independent suspension systems. **05**
c) Explain MacPherson strut type suspension system. **05**

Q.7 Descriptive Question

a) Write a short note on sensors and actuators used in automobiles. **05**
b) Explain the spark plug? Explain with neat sketch. **05**
c) Why is CNG replacing petroleum fuels in automobiles? Justify answer. **04**

Seat No.	

Set **R**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to Automobile Engineering (BTN02414)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) If the of front wheels is inside and rear of fro are apart when the vehicle is at rest, then the configuration is called? front of the front wheels is inside and rear ____.
a) Toe-in b) Toe out
c) Positive camber d) Positive castor

2) What is called the cornering force over the slip angle?
a) Castor trail b) Cornering power
c) Self-righting torque d) Pneumatic trail

3) What is actual power delivered by the engine known as?
a) Shaft power b) Horse power
c) Brake power d) None of the mentioned

4) What is the differential located?
a) Between engine and transmission
b) Between transmission and rear axle
c) Between two propeller shafts
d) Between steering wheel and steering column

5) Which of the following parts of the cover assembly that hold the pressure plate against the clutch plate?
a) Springs b) Thrust bearings
c) Struts d) Lever

6) Where is the over drive located?
a) Between transmission and engine
b) Between transmission and rear axle
c) Between transmission and propeller shaft
d) Between transmission and differential

7) The gear shift lever requires two separate motions to shift gears, and the first movement?

a) moves the synchronizer
b) selects the synchronizer
c) meshes the gears
d) operates the clutch

8) Which one of the following statements correctly describes the construction of a planetary gear type differential?

a) The six planetary pinions rotate in constant mesh with the internal gears
b) One drive shaft is splined to the central gear and the other to the planetary gear.
c) Each planetary pinion gear meshes with both the central gear and the internal gear.
d) The internal gear is fixed to the planetary gear

9) The device for smoothening out the power impulses from the engine is called ____.

a) clutch
b) differentia
c) flywheel
d) torque converter

10) Clutch facings are usually attached to the plate by ____.

a) steel rivets
b) brass rivets
c) aluminum screws
d) steel screws

11) The torque converter uses ____ to transfer torque.

a) air
b) automatic transmission fluid (ATF)
c) gears
d) steel belt

12) The sequence in which the force is transmitted through a brake system when the brake pedal is depressed is ____.

a) brake pedal - master cylinder - brake lines - vacuum servo mechanism - brake pads
b) brake pedal - vacuum servo mechanism - master cylinder - brake lines - brake pads
c) brake pedal - master cylinder - vacuum servo mechanism - brake lines - brake pads
d) brake pedal - brake lines - vacuum servo mechanism - master cylinder - brake pads

13) Which is the of the following disadvantage of the open differential?

a) High in cost
b) Not reliable
c) Complex design
d) Sends most of the power to the wheel having less traction

14) Which types of wheels cannot be used with a tubeless tire?

a) Disc wheel
b) Light alloy wheel
c) Composite wheel
d) Wire wheel

Seat No.		Set	R

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to Automobile Engineering (BTN02414)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from Section I and Section II.
2) Figures to the right indicate full marks.

Section – I

Q.2 Descriptive Question
- **a)** Discuss HEV with block diagram. **04**
- **b)** Explain Construction and working of 2 stoke Diesel Engine. **05**
- **c)** Write short note on Rear Engine Rear Wheel drive Layout and their Applications. **05**

Q.3 Descriptive Question
- **a)** Explain differential with neat sketch. **04**
- **b)** Draw neat sketch of constant mesh Gear Box and also write constructions and working. **05**
- **c)** Explain centrifugal Clutch with Neat Sketch. **05**

Q.4 Descriptive Question
- **a)** Explain Hydraulic Braking system with neat sketch. **04**
- **b)** Draw a neat sketch of wheel Cylinder and explain in brief. **05**
- **c)** Explain Disc Braking System with neat sketch. **05**

Section – II

Q.5 Descriptive Question
- **a)** Write short note on Hydraulic Power steering system. **05**
- **b)** Explain Steering Geometry with sketch. **04**
  1) King pin inclination
  2) Camber angle
- **c)** Explain Rack and pinion steering Gear box with neat sketch. **05**

Q.6 Descriptive Question
- **a)** Write down Difference between Tubed and Tubeless tyre. **04**
- **b)** Write a note on independent suspension systems. **05**
- **c)** Explain MacPherson strut type suspension system. **05**

Q.7 Descriptive Question
- **a)** Write a short note on sensors and actuators used in automobiles. **05**
- **b)** Explain the spark plug? Explain with neat sketch. **05**
- **c)** Why is CNG replacing petroleum fuels in automobiles? Justify answer. **04**

Seat No.	

Set **S**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to Automobile Engineering (BTN02414)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Clutch facings are usually attached to the plate by ____.
a) steel rivets b) brass rivets
c) aluminum screws d) steel screws

2) The torque converter uses ____ to transfer torque.
a) air b) automatic transmission fluid (ATF)
c) gears d) steel belt

3) The sequence in which the force is transmitted through a brake system when the brake pedal is depressed is ____.
a) brake pedal - master cylinder - brake lines - vacuum servo mechanism - brake pads
b) brake pedal - vacuum servo mechanism - master cylinder - brake lines - brake pads
c) brake pedal - master cylinder - vacuum servo mechanism - brake lines - brake pads
d) brake pedal - brake lines - vacuum servo mechanism - master cylinder - brake pads

4) Which is the of the following disadvantage of the open differential?
a) High in cost
b) Not reliable
c) Complex design
d) Sends most of the power to the wheel having less traction

5) Which types of wheels cannot be used with a tubeless tire?
a) Disc wheel b) Light alloy wheel
c) Composite wheel d) Wire wheel

6) If the of front wheels is inside and rear of fro are apart when the vehicle is at rest, then the configuration is called? front of the front wheels is inside and rear ____.

a) Toe-in b) Toe out
c) Positive camber d) Positive castor

7) What is called the cornering force over the slip angle?

a) Castor trail b) Cornering power
c) Self-righting torque d) Pneumatic trail

8) What is actual power delivered by the engine known as?

a) Shaft power b) Horse power
c) Brake power d) None of the mentioned

9) What is the differential located?

a) Between engine and transmission
b) Between transmission and rear axle
c) Between two propeller shafts
d) Between steering wheel and steering column

10) Which of the following parts of the cover assembly that hold the pressure plate against the clutch plate?

a) Springs b) Thrust bearings
c) Struts d) Lever

11) Where is the over drive located?

a) Between transmission and engine
b) Between transmission and rear axle
c) Between transmission and propeller shaft
d) Between transmission and differential

12) The gear shift lever requires two separate motions to shift gears, and the first movement?

a) moves the synchronizer b) selects the synchronizer
c) meshes the gears d) operates the clutch

13) Which one of the following statements correctly describes the construction of a planetary gear type differential?

a) The six planetary pinions rotate in constant mesh with the internal gears
b) One drive shaft is splined to the central gear and the other to the planetary gear.
c) Each planetary pinion gear meshes with both the central gear and the internal gear.
d) The internal gear is fixed to the planetary gear

14) The device for smoothening out the power impulses from the engine is called ____.

a) clutch
b) differentia
c) flywheel
d) torque converter

Seat No.	

Set **S**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Introduction to Automobile Engineering (BTN02414)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer any two questions from Section I and Section II.
2) Figures to the right indicate full marks.

Section – I

Q.2 Descriptive Question

a) Discuss HEV with block diagram. **04**
b) Explain Construction and working of 2 stoke Diesel Engine. **05**
c) Write short note on Rear Engine Rear Wheel drive Layout and their Applications. **05**

Q.3 Descriptive Question

a) Explain differential with neat sketch. **04**
b) Draw neat sketch of constant mesh Gear Box and also write constructions and working. **05**
c) Explain centrifugal Clutch with Neat Sketch. **05**

Q.4 Descriptive Question

a) Explain Hydraulic Braking system with neat sketch. **04**
b) Draw a neat sketch of wheel Cylinder and explain in brief. **05**
c) Explain Disc Braking System with neat sketch. **05**

Section – II

Q.5 Descriptive Question

a) Write short note on Hydraulic Power steering system. **05**
b) Explain Steering Geometry with sketch. **04**
1) King pin inclination
2) Camber angle
c) Explain Rack and pinion steering Gear box with neat sketch. **05**

Q.6 Descriptive Question

a) Write down Difference between Tubed and Tubeless tyre. **04**
b) Write a note on independent suspension systems. **05**
c) Explain MacPherson strut type suspension system. **05**

Q.7 Descriptive Question

a) Write a short note on sensors and actuators used in automobiles. **05**
b) Explain the spark plug? Explain with neat sketch. **05**
c) Why is CNG replacing petroleum fuels in automobiles? Justify answer. **04**

SLR-BD-116

Seat No.		Set	P

S.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April - 2025
ELECTRONICS ENGINEERING
Engineering Mathematics – III(BTN04301)

Day & Date: Saturday 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).
5) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) The P.I of $(D^2 + 4D + 3)y = 3e^{2x}$ is _____.

a) $\frac{1}{15}e^{2x}$ b) $3e^{2x}$

c) $\frac{1}{5}e^{2x}$ d) $C_1e^{-x} + C_2e^{-2x}$

2) If the characteristic equation of the differential equation $\frac{d^2y}{dx^2} + 2\alpha\frac{dy}{dx} + y = 0$ has two equal roots then the values of α are

a) ± 1 b) 0,0

c) $\pm i$ d) $\pm\frac{1}{2}$

3) If $Z\{f(k)\} = F(z)$, then $Z\{kf(k)\} =$ _____.

a) $\frac{d}{dz}F(z)$, b) $-z\frac{d}{dz}F(z)$,

c) $-\frac{d}{dz}F(z)$ d) $z\frac{d}{dz}F(z)$

4) The Laplace Transform of $\sin h\,(at)$ is

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

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

5) If $L\{f(t)\} = \phi(s)$, then $L\{e^{-at}f(t)\} =$ _____.

a) $\phi(s - a)$ b) $\frac{1}{a}\phi(s)$

c) $\phi(sa)$ d) $\phi(s + a)$

6) The value of coefficient of correlation r lies between

a) 0 and 1 b) -1 and 0

c) 0 and 2 d) -1 and 1

7) Which of the following is true?

a) $r = b_{xy} \cdot b_{yx}$ b) $r = b_{xy} + b_{yx}$

c) $r = \sqrt{b_{xy} \cdot b_{yx}}$ d) $r = \sqrt{b_{xy} + b_{yx}}$

8) The conditions for expansion of a function as a Fourier series are known as _____.

a) Harmonic b) Periodic

c) Dirichlet's conditions d) Riemann conditions

9) In solving simultaneous linear equations $AX = B$ in which method as soon as getting the value of unknown is immediately used to compute the next unknown?

a) Jacobi b) Gauss-Seidal

c) Gauss elimination d) Euler's

10) If $\{1\} = \frac{z}{z-1}$, then $Z\{a^k\} =$ _____, for $k \geq 0$

a) $\frac{z}{z-a}$ b) $\frac{z}{a(z-1)}$

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

11) The order of convergence by Newton-Raphson method is _____.

a) 1.6 b) 2

c) 1 d) 0

12) The value of $L^{-1}\left\{\frac{1}{s}\right\}$ is _____.

a) t b) 1

c) 0 d) 0

13) The equation of line of Regression of y on x is given by _____.

a) $y - \bar{Y} = b_{yx}(x - \bar{x})$ b) $y - \bar{y} = b_{xy}(x - \bar{x})$

c) $x - \bar{x} = b_{xy}(y - \bar{y})$ d) $x - \bar{y} = b_{xy}(y - \bar{y}$

14) The relation between mean and variance of Binomial distribution is _____.

a) $Mean < Variance$ b) $Mean = Variance$

c) $Mean > Variance$ d) $Mean = \frac{1}{2} Variance$

SLR-BD-116

Seat No.	

Set P

S.Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April - 2025
ELECTRONICS ENGINEERING
Engineering Mathematics– III(BTN04301)

Day & Date: Saturday 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any Three of the following. **09**

a) Solve $(D^3 + D^2 + D + 1)y = sin2x.$

b) Solve $(D^2 - 1)y = e^x cosx$

c) Obtain Fourier series of $f(x) = x\ in\ (-1,1)$

d) Find z-transform of $f(x) = 2^{|k|}$ for all k.

e) Find inverse z-transform of $\frac{1}{(z-3)(z-2)}$ if its Region of Convergence is $|z| < 2$

Q.3 Attempt any Three of the following. **09**

a) Solve $(D^3 + 3D^2 + 3D + 1)y = e^{-x}$

b) Obtain half range Fourier sine series for $f(x) = \begin{cases} x & ; \quad 0 \le x \le 1 \\ 2 - x & ; \quad 1 \le x \le 2 \end{cases}$

c) Find Fourier series for $f(x) = \begin{cases} -k & ; -\pi < x < 0 \\ k & ; \ 0 < x < \pi \end{cases}$

d) Solve $(D^2 + 2D + 1)y = xsinx$

e) Find z-transform of $\{3^k\}$ for $k \ge 0$. Express its region of convergence.

Q.4 Attempt any Two of the following. **10**

a) Solve $(D^2 + D)y = x^2 + 2x + 4$

b) Find Z-transform of $f(k) = \cos(\alpha k)\,, for\ k \ge 0$

c) Find Fourier series for $f(x) = \begin{cases} -\pi & ; -\pi < x < 0 \\ x & ; 0 < x \le \pi \end{cases}$

Section – II

Q.5 Attempt any Three of the following. **09**

a) Find Laplace transform of $f(t) = tsint$

b) Find Laplace transform of $\frac{1}{t}\ (1 - cost)$

c) If the mean of Binomial distribution is 2 and variance is $\frac{4}{3}$ then find the probability of i) Two success, ii) Less than two successes.

d) Weights of 4000 students are found to be normally distributed with mean 50 kgs and S.D. 5kgs. Find the number of students with weight between 45 and 60 kgs. (Given for SNV z area under curve between $z = 0$ and $z = 1$ is 0.3431 and between $z = 0$ and $z = 2$ is 0.4772).

e) Find the positive root of $x^4 - x = 10$ correct to three decimal places by Newton-Raphson method by taking $x_0 = 2$ (perform only three iterations)

Q.6 Attempt any three of the following. **09**

a) Find $L\{te^{-4t}\sin(3t)\}$

b) Solve the following system of linear equations by using Jacobi's method (performance only three iterations).

$$10x - 5y - 2z = 3, 4x - 10y + 3z = -3, x + 6y + 10z = -3$$

c) Solve the following system of linear equations by using Gauss elimination method

$$x + y + z = 9, 2x - 3y + 4z = 13, 3x + 4y + 5z = 40$$

d) Find equation of line regression of Y on X from the following data

X	10	14	18	22	26	30
Y	18	12	24	6	30	36

e) Solve the equation by Regula-Falsi method $x\log_{10} x - 1.2 = 0$ (perform only two iterations)

Q.7 Attempt any two of the following. **10**

a) Find inverse Laplace transform of $\frac{1}{S(S+1)}$ by Convolution theorem.

b) Calculate coefficient of correlation r from the following data

x	64	65	66	67	68	69	70
y	66	67	65	68	70	68	71

c) Find inverse Laplace transform of $\frac{1}{s}\log\left(1 + \frac{1}{S^2}\right)$

SLR-BD-117

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Network Theory and Analysis (BTN04303)

Day & Date: Monday, 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Tick marks the correct answer: **14**

1) Quality factor of series circuit RLC circuit is _____.

a) $\frac{\omega R}{L}$ b) $\frac{\omega L}{R}$

c) $\frac{\omega C}{R}$ d) $\frac{\omega R}{C}$

2) The time constant of a series RC circuit is _____.

a) RC b) $\frac{C}{R}$

c) $\frac{R}{C}$ d) e^{-tRC}

3) Maximum power is transferred when the load impedance is equal To _____.

a) Source impedance b) Zero
c) Half of Source Impedance d) None

4) Which of the following circuits appears as a very low resistance at resonance?

a) series & parallel resonant b) series resonant
c) parallel resonant d) none of the above

5) The h parameters h_{12} and h_{22} are obtained by _____.

a) by shorting input terminals b) by shorting output terminals
c) by opening input terminals d) by opening output terminals

6) Which of the following circuits appears as a very high resistance at resonance?
a) series & parallel resonant
b) series resonant
c) parallel resonant
d) none of the above

7) The reciprocity theorem is applicable to _____.
a) linear networks
b) linear & bilateral networks
c) bilateral networks only
d) none of above

8) When two port networks are connected in series, the parameters of the interconnected network can be conveniently expressed with help of _____.
a) Z parameter
b) h parameter
c) Y parameter
d) Transmission parameter

9) A band elimination filter is the one _____.
a) which attenuates all the frequencies less than lower cut off frequency
b) which attenuates all the frequencies greater than upper cut off frequency
c) frequencies lying between f1 and f2 are attenuated and all other frequencies are passed
d) frequencies lying between LC are passed and all other are attenuated

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

11) The driving admittance $(Y_{11}(S))$ is defined as _____.
a) The ratio of transform voltage to transform current at the same port
b) The ratio of transform voltage at one port to transform current at the other port
c) The ratio of transform current at one port to transform voltage at the same port
d) The ratio of transform voltage at one port to transform voltage at the other port

12) If a high pass filter having L=47.74mH and C=0.133 μF then design impedance K will be _____.
a) 400 ohm
b) 500 ohm
c) 600 ohm
d) 650 ohm

13) In the m-derived high pass filters the resonant frequency is to be chosen so that it is _____.
a) Above the cut-off frequency
b) Below the cut-off frequency
c) Equal to the cut-off frequency
d) None of the above

14) The system is said to be unstable if _____.

a) all the poles lie on right half of s plane
b) all the poles lie on left half of s plane
c) all poles does not lie on right half of s plane
d) both a and b

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Network Theory and Analysis (BTN04303)

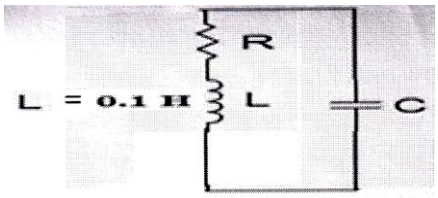
Day & Date: Monday, 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Assume suitable data if required.
3) Figures to right indicate maximum marks.

Section – I

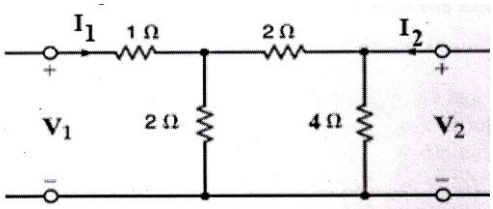
Q.2 Attempt any four. **16**

a) For above circuit an inductance of 0.1H having quality factor of 5 is in parallel with capacitor. Determine value of C and coil resistance at resonant frequency 500 rad/sec.

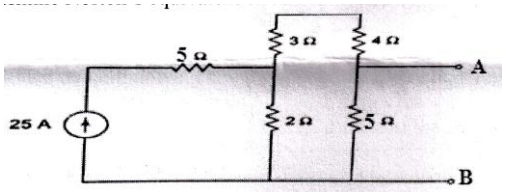


b) A Series RLC Circuit has a quality factor of 5 at 50 rad/sec. The current flowing through the circuit at resonance is 10A and the supply voltage is 100 V. The total impedance of the circuit is 20 Ω. Find the circuit constants R, L & C.

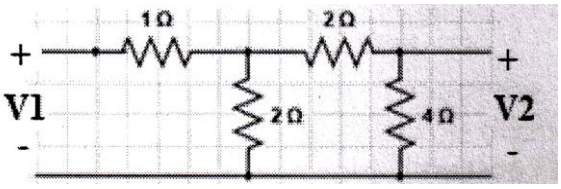
c) Find Z parameters of above circuit.



d) Determine Norton's equivalent circuit for above circuit.



e) Find h parameter for above network.

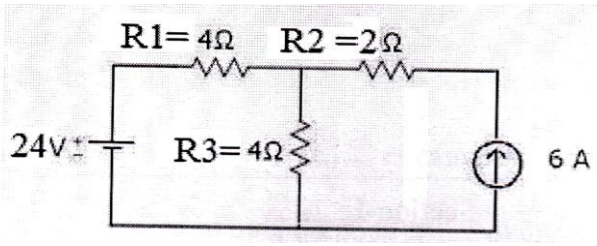


Q.3 Attempt any two. **12**

a) Prove that bandwidth of series RLC circuit is $BW = \frac{R}{2\pi L}$ and $Q = \frac{fr}{BW}$

b) Derive ABCD parameters in terms of Z and Y parameters.

c) Find current in various branches using superposition theorem.



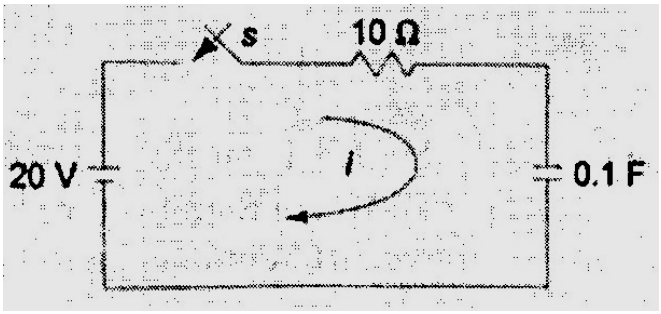
Section – II

Q.4 Attempt any four. **16**

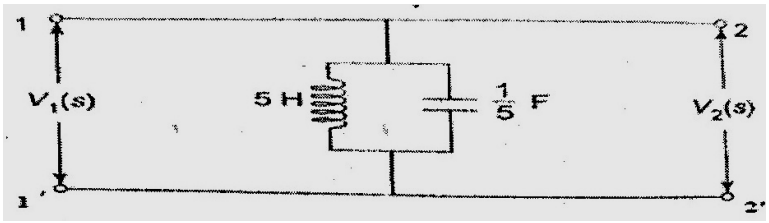
a) Prove that cut off frequency for constant K low pass filter is $F_c = \frac{1}{\pi\sqrt{LC}}$

b) Design a π type attenuator to give 20dB attenuation & to have characteristics impedance of 100Ω.

c) A series RC circuit consists of resistor of 10 Ω and capacitor of 0.1 F as shown in figure. A constant voltage of 20V is applied to the circuit at t=0. Obtain the current equation. Determine the voltage across the resistor and the capacitor.



d) For above network determine $Z_{21(S)}, G_{21(S)}, Y_{12(S)}$



e) Check stability of following polynomial by applying Routh criteria $Q(S) = S^3 + S^2 + 3S + 8$

Q.5 Attempt any two. **12**

a) Derive an expression of current, V_R & V_C for dc response of series RC circuit.

b) Derive the design equation for L, C & Z_{OT} for constant K high pass filter.

c) Draw the pole-zero plot for the given network function and hence obtain $V(t)$.

$$V(s) = \frac{10s}{(s+3)(S+2)}$$

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Network Theory and Analysis (BTN04303)

Day & Date: Monday, 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Tick marks the correct answer: **14**

1) When two port networks are connected in series, the parameters of the interconnected network can be conveniently expressed with help of _____.
a) Z parameter b) h parameter
c) Y parameter d) Transmission parameter

2) A band elimination filter is the one _____.
a) which attenuates all the frequencies less than lower cut off frequency
b) which attenuates all the frequencies greater than upper cut off frequency
c) frequencies lying between f1 and f2 are attenuated and all other frequencies are passed
d) frequencies lying between LC are passed and all other are attenuated

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

4) The driving admittance $(Y_{11}(S))$ is defined as _____.
a) The ratio of transform voltage to transform current at the same port
b) The ratio of transform voltage at one port to transform current at the other port
c) The ratio of transform current at one port to transform voltage at the same port
d) The ratio of transform voltage at one port to transform voltage at the other port

5) If a high pass filter having L=47.74mH and C=0.133 μF then design impedance K will be _____.

a) 400 ohm b) 500 ohm
c) 600 ohm d) 650 ohm

6) In the m-derived high pass filters the resonant frequency is to be chosen so that it is _____.

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

7) The system is said to be unstable if _____.

a) all the poles lie on right half of s plane
b) all the poles lie on left half of s plane
c) all poles does not lie on right half of s plane
d) both a and b

8) Quality factor of series circuit RLC circuit is _____.

a) $\frac{\omega R}{L}$ b) $\frac{\omega L}{R}$
c) $\frac{\omega C}{R}$ d) $\frac{\omega R}{C}$

9) The time constant of a series RC circuit is _____.

a) RC b) $\frac{C}{R}$
c) $\frac{R}{C}$ d) e^{-tRC}

10) Maximum power is transferred when the load impedance is equal To _____.

a) Source impedance b) Zero
c) Half of Source Impedance d) None

11) Which of the following circuits appears as a very low resistance at resonance?

a) series & parallel resonant b) series resonant
c) parallel resonant d) none of the above

12) The h parameters h_{12} and h_{22} are obtained by _____.

a) by shorting input terminals b) by shorting output terminals
c) by opening input terminals d) by opening output terminals

13) Which of the following circuits appears as a very high resistance at resonance?

a) series & parallel resonant b) series resonant
c) parallel resonant d) none of the above

14) The reciprocity theorem is applicable to _____.

a) linear networks
b) linear & bilateral networks
c) bilateral networks only
d) none of above

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Network Theory and Analysis (BTN04303)

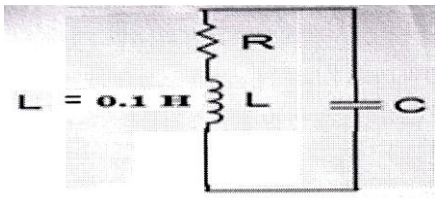
Day & Date: Monday, 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Assume suitable data if required.
3) Figures to right indicate maximum marks.

Section – I

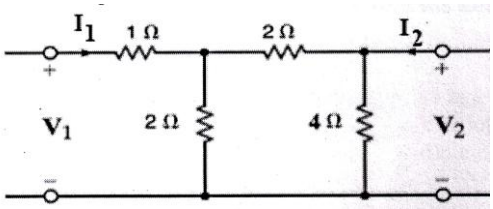
Q.2 Attempt any four. **16**

a) For above circuit an inductance of 0.1H having quality factor of 5 is in parallel with capacitor. Determine value of C and coil resistance at resonant frequency 500 rad/sec.

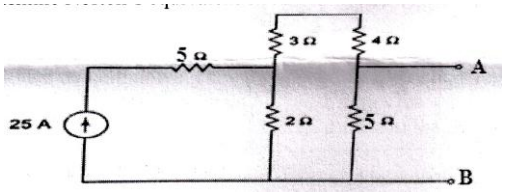


b) A Series RLC Circuit has a quality factor of 5 at 50 rad/sec. The current flowing through the circuit at resonance is 10A and the supply voltage is 100 V. The total impedance of the circuit is 20 Ω. Find the circuit constants R, L & C.

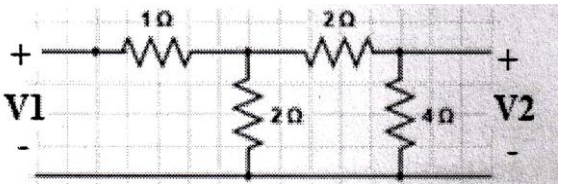
c) Find Z parameters of above circuit.



d) Determine Norton's equivalent circuit for above circuit.



e) Find h parameter for above network.

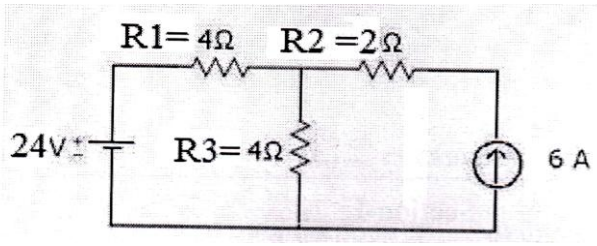


Q.3 Attempt any two. **12**

a) Prove that bandwidth of series RLC circuit is $BW = \frac{R}{2\pi L}$ and $Q = \frac{fr}{BW}$

b) Derive ABCD parameters in terms of Z and Y parameters.

c) Find current in various branches using superposition theorem.



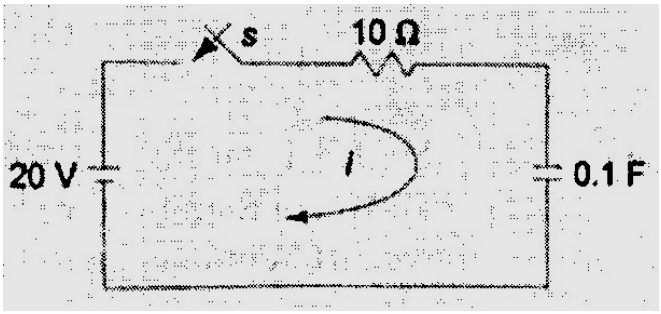
Section – II

Q.4 Attempt any four. **16**

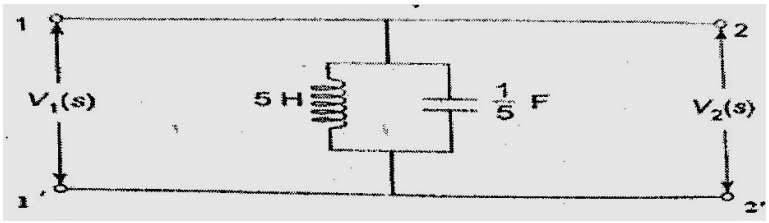
a) Prove that cut off frequency for constant K low pass filter is $F_c = \frac{1}{\pi\sqrt{LC}}$

b) Design a π type attenuator to give 20dB attenuation & to have characteristics impedance of 100Ω.

c) A series RC circuit consists of resistor of 10 Ω and capacitor of 0.1 F as shown in figure. A constant voltage of 20V is applied to the circuit at t=0. Obtain the current equation. Determine the voltage across the resistor and the capacitor.



d) For above network determine $Z_{21(S)}, G_{21(S)}, Y_{12(S)}$



e) Check stability of following polynomial by applying Routh criteria $Q(S) = S^3 + S^2 + 3S + 8$

Q.5 Attempt any two. **12**

a) Derive an expression of current, V_R & V_C for dc response of series RC circuit.

b) Derive the design equation for L, C & Z_{OT} for constant K high pass filter.

c) Draw the pole-zero plot for the given network function and hence obtain $V(t)$.

$$V(s) = \frac{10s}{(s+3)(s+2)}$$

SLR-BD-117

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Network Theory and Analysis (BTN04303)

Day & Date: Monday, 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Tick marks the correct answer: 14

1) The driving admittance $(Y_{11}(S))$ is defined as _____.
a) The ratio of transform voltage to transform current at the same port
b) The ratio of transform voltage at one port to transform current at the other port
c) The ratio of transform current at one port to transform voltage at the same port
d) The ratio of transform voltage at one port to transform voltage at the other port

2) If a high pass filter having L=47.74mH and C=0.133 μF then design impedance K will be _____.
a) 400 ohm b) 500 ohm
c) 600 ohm d) 650 ohm

3) In the m-derived high pass filters the resonant frequency is to be chosen so that it is _____.
a) Above the cut-off frequency
b) Below the cut-off frequency
c) Equal to the cut-off frequency
d) None of the above

4) The system is said to be unstable if _____.
a) all the poles lie on right half of s plane
b) all the poles lie on left half of s plane
c) all poles does not lie on right half of s plane
d) both a and b

5) Quality factor of series circuit RLC circuit is _____.

a) $\frac{\omega R}{L}$ b) $\frac{\omega L}{R}$

c) $\frac{\omega C}{R}$ d) $\frac{\omega R}{C}$

6) The time constant of a series RC circuit is _____.

a) RC b) $\frac{C}{R}$

c) $\frac{R}{C}$ d) e^{-tRC}

7) Maximum power is transferred when the load impedance is equal To _____.

a) Source impedance b) Zero

c) Half of Source Impedance d) None

8) Which of the following circuits appears as a very low resistance at resonance?

a) series & parallel resonant b) series resonant

c) parallel resonant d) none of the above

9) The h parameters h_{12} and h_{22} are obtained by _____.

a) by shorting input terminals b) by shorting output terminals

c) by opening input terminals d) by opening output terminals

10) Which of the following circuits appears as a very high resistance at resonance?

a) series & parallel resonant b) series resonant

c) parallel resonant d) none of the above

11) The reciprocity theorem is applicable to _____.

a) linear networks b) linear & bilateral networks

c) bilateral networks only d) none of above

12) When two port networks are connected in series, the parameters of the interconnected network can be conveniently expressed with help of _____.

a) Z parameter b) h parameter

c) Y parameter d) Transmission parameter

13) A band elimination filter is the one _____.

a) which attenuates all the frequencies less than lower cut off frequency

b) which attenuates all the frequencies greater than upper cut off frequency

c) frequencies lying between f1 and f2 are attenuated and all other frequencies are passed

d) frequencies lying between LC are passed and all other are attenuated

14) The transient current in loss free LC circuit when excited from AC source is an ____ Sine wave.

a) un damped
b) over damped
c) under damped
d) critically damped

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Network Theory and Analysis (BTN04303)

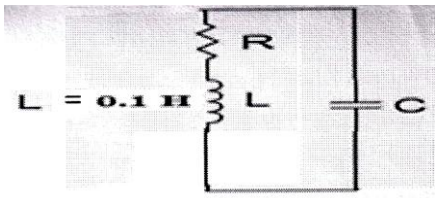
Day & Date: Monday, 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Assume suitable data if required.
3) Figures to right indicate maximum marks.

Section – I

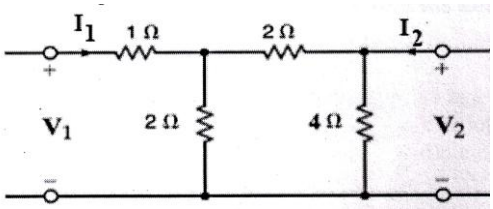
Q.2 Attempt any four. **16**

a) For above circuit an inductance of 0.1H having quality factor of 5 is in parallel with capacitor. Determine value of C and coil resistance at resonant frequency 500 rad/sec.

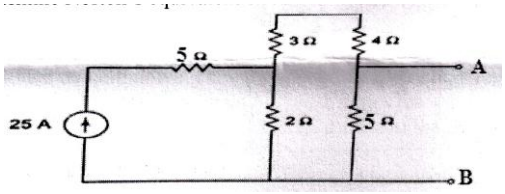


b) A Series RLC Circuit has a quality factor of 5 at 50 rad/sec. The current flowing through the circuit at resonance is 10A and the supply voltage is 100 V. The total impedance of the circuit is 20 Ω. Find the circuit constants R, L & C.

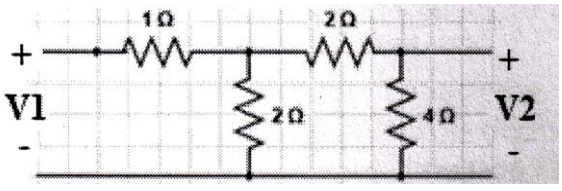
c) Find Z parameters of above circuit.



d) Determine Norton's equivalent circuit for above circuit.



e) Find h parameter for above network.

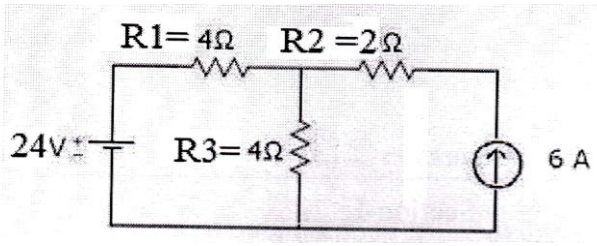


Q.3 Attempt any two. **12**

a) Prove that bandwidth of series RLC circuit is $BW = \frac{R}{2\pi L}$ and $Q = \frac{fr}{BW}$

b) Derive ABCD parameters in terms of Z and Y parameters.

c) Find current in various branches using superposition theorem.



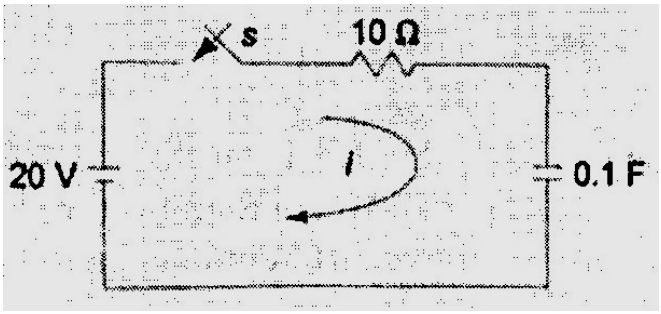
Section – II

Q.4 Attempt any four. **16**

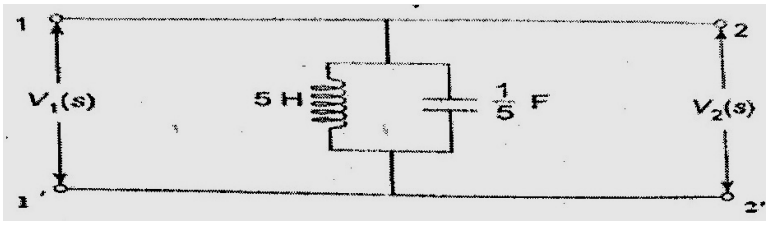
a) Prove that cut off frequency for constant K low pass filter is $F_c = \frac{1}{\pi\sqrt{LC}}$

b) Design a π type attenuator to give 20dB attenuation & to have characteristics impedance of 100Ω.

c) A series RC circuit consists of resistor of 10 Ω and capacitor of 0.1 F as shown in figure. A constant voltage of 20V is applied to the circuit at t=0. Obtain the current equation. Determine the voltage across the resistor and the capacitor.



d) For above network determine $Z_{21(S)}, G_{21(S)}, Y_{12(S)}$



e) Check stability of following polynomial by applying Routh criteria $Q(S) = S^3 + S^2 + 3S + 8$

Q.5 Attempt any two. **12**

a) Derive an expression of current, V_R & V_C for dc response of series RC circuit.

b) Derive the design equation for L, C & Z_{OT} for constant K high pass filter.

c) Draw the pole-zero plot for the given network function and hence obtain $V(t)$.

$$V(s) = \frac{10s}{(s+3)(S+2)}$$

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Network Theory and Analysis (BTN04303)

Day & Date: Monday, 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicate full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Tick marks the correct answer: **14**

1) Which of the following circuits appears as a very high resistance at resonance?
a) series & parallel resonant b) series resonant
c) parallel resonant d) none of the above

2) The reciprocity theorem is applicable to _____.
a) linear networks b) linear & bilateral networks
c) bilateral networks only d) none of above

3) When two port networks are connected in series, the parameters of the interconnected network can be conveniently expressed with help of _____.
a) Z parameter b) h parameter
c) Y parameter d) Transmission parameter

4) A band elimination filter is the one _____.
a) which attenuates all the frequencies less than lower cut off frequency
b) which attenuates all the frequencies greater than upper cut off frequency
c) frequencies lying between f1 and f2 are attenuated and all other frequencies are passed
d) frequencies lying between LC are passed and all other are attenuated

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

6) The driving admittance $(Y_{11}(S))$ is defined as _____.
a) The ratio of transform voltage to transform current at the same port
b) The ratio of transform voltage at one port to transform current at the other port
c) The ratio of transform current at one port to transform voltage at the same port
d) The ratio of transform voltage at one port to transform voltage at the other port

7) If a high pass filter having L=47.74mH and C=0.133 μF then design impedance K will be _____.
a) 400 ohm b) 500 ohm
c) 600 ohm d) 650 ohm

8) In the m-derived high pass filters the resonant frequency is to be chosen so that it is _____.
a) Above the cut-off frequency
b) Below the cut-off frequency
c) Equal to the cut-off frequency
d) None of the above

9) The system is said to be unstable if _____.
a) all the poles lie on right half of s plane
b) all the poles lie on left half of s plane
c) all poles does not lie on right half of s plane
d) both a and b

10) Quality factor of series circuit RLC circuit is _____.
a) $\frac{\omega R}{L}$ b) $\frac{\omega L}{R}$
c) $\frac{\omega C}{R}$ d) $\frac{\omega R}{C}$

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

12) Maximum power is transferred when the load impedance is equal To _____.
a) Source impedance b) Zero
c) Half of Source Impedance d) None

13) Which of the following circuits appears as a very low resistance at resonance?
a) series & parallel resonant b) series resonant
c) parallel resonant d) none of the above

14) The h parameters h_{12} and h_{22} are obtained by _____.

a) by shorting input terminals b) by shorting output terminals

c) by opening input terminals d) by opening output terminals

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Network Theory and Analysis (BTN04303)

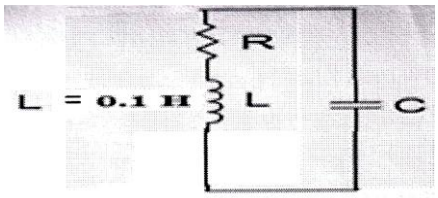
Day & Date: Monday, 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Assume suitable data if required.
3) Figures to right indicate maximum marks.

Section – I

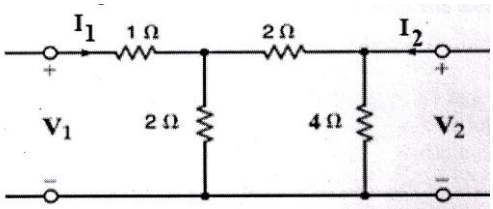
Q.2 Attempt any four. **16**

a) For above circuit an inductance of 0.1H having quality factor of 5 is in parallel with capacitor. Determine value of C and coil resistance at resonant frequency 500 rad/sec.

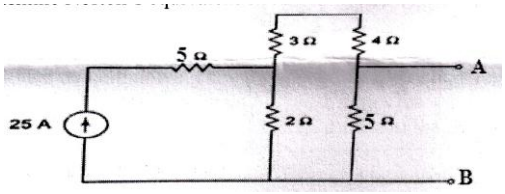


b) A Series RLC Circuit has a quality factor of 5 at 50 rad/sec. The current flowing through the circuit at resonance is 10A and the supply voltage is 100 V. The total impedance of the circuit is 20 Ω. Find the circuit constants R, L & C.

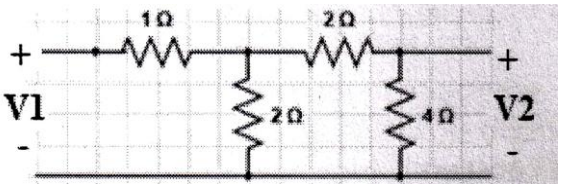
c) Find Z parameters of above circuit.



d) Determine Norton's equivalent circuit for above circuit.



e) Find h parameter for above network.

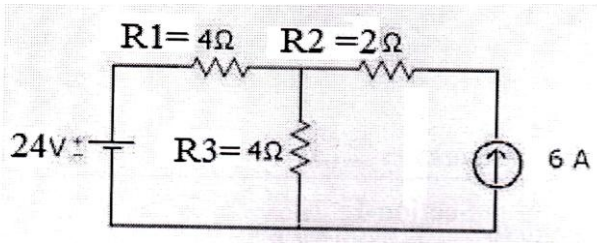


Q.3 Attempt any two. **12**

a) Prove that bandwidth of series RLC circuit is $BW = \frac{R}{2\pi L}$ and $Q = \frac{fr}{BW}$

b) Derive ABCD parameters in terms of Z and Y parameters.

c) Find current in various branches using superposition theorem.



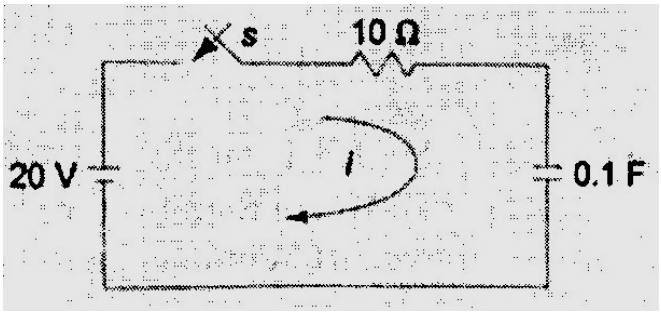
Section – II

Q.4 Attempt any four. **16**

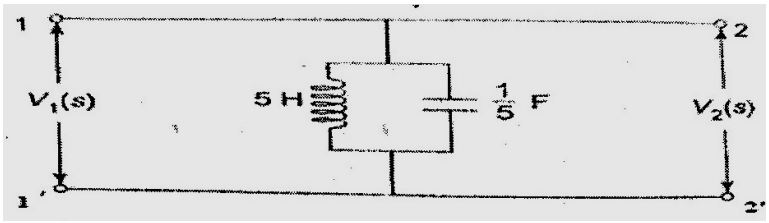
a) Prove that cut off frequency for constant K low pass filter is $F_c = \frac{1}{\pi\sqrt{LC}}$

b) Design a π type attenuator to give 20dB attenuation & to have characteristics impedance of 100Ω.

c) A series RC circuit consists of resistor of 10 Ω and capacitor of 0.1 F as shown in figure. A constant voltage of 20V is applied to the circuit at t=0. Obtain the current equation. Determine the voltage across the resistor and the capacitor.



d) For above network determine $Z_{21(S)}, G_{21(S)}, Y_{12(S)}$



e) Check stability of following polynomial by applying Routh criteria $Q(S) = S^3 + S^2 + 3S + 8$

Q.5 Attempt any two. **12**

a) Derive an expression of current, V_R & V_C for dc response of series RC circuit.

b) Derive the design equation for L, C & Z_{OT} for constant K high pass filter.

c) Draw the pole-zero plot for the given network function and hence obtain $V(t)$.

$$V(s) = \frac{10s}{(s+3)(S+2)}$$

Seat No.	

Set **P**

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Electrical Machnies (BTN04304)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) In a split-phase motor, the running winding should have ____
a) High resistance and low inductance
b) High resistance and High inductance
c) Low resistance and high inductance
d) Low resistance and low inductance

2) If the capacitor of a single-phase motor is short-circuited ____
a) The motor will not start
b) The motor will run in the same direction at a reduced speed
c) The motor will run in the reverse direction
d) None of the above

3) In a D.C. generator the critical resistance can be increased by ____
a) Increasing its field resistance
b) Decreasing its field resistance
c) Increasing its speed
d) Decreasing its speed

4) One D.C. motor drives another D.C. motor. The second D.C. motor when excited and driven ____
a) Does not run as a generator
b) Also runs as a motor comes to stop after sometime
c) Runs as a generator
d) None of these

5) D.C. generator works on the principle of ____
a) Lenz's law
b) Ohm's law
c) Faraday's law of electromagnetic induction
d) None of the above

6) In a low power factor wattmeter, the compensating coil is connected ____
a) In series with current coil
b) In parallel with current coil
c) In series with pressure coil
d) In parallel with pressure coil

7) The transformer which is more feasible to use in the distribution ends should be ____
a) star-delta b) delta-star
c) Scott d) delta-delta

8) The open delta connection (V-V) is frequently used for ____
a) two auto-transformers
b) three auto-transformers
c) four auto-transformers
d) five auto-transformers

9) In a 3-phase power measurement by two wattmeter method, both the wattmeter's had identical readings. The power factor of the load was ____.
a) Unity b) 0.8 lagging
c) 0.8 leading d) Zero

10) A 3-phase 440 V, 50 Hz induction motor has 4% slip. The frequency of rotor current will be ____.
a) 50 Hz b) 25 Hz
c) 5 Hz d) 2 Hz

11) A 50 Hz, 3-phase induction motor has a full load speed of 1500 rpm. The number of poles in the motor is ____.
a) 2 poles b) 4 poles
c) 6 poles d) 8 poles

12) As compared to DOL starting method the star delta starting method should have ____.
a) High torque b) Low starting current
c) High starting current d) Smooth acceleration

13) In a D.C. generator the critical resistance refers to the resistance of ____
a) Brushes b) Field
c) Armature d) Load

14) Which of the following law/rule can he used to determine the direction of rotation of D.C. motor?
a) Lenz's law b) Faraday's law
c) Coulomb's law d) Fleming's left-hand rule

SLR-BD-118

Seat No.		Set	P

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Electrical Machines (BTN04304)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figure to right indicate full marks.
3) Assume suitable data if required.

Section – I

Q.2 Solve the following (Any Four) **16**

a) Derive the torque equation of a DC motor.
b) Explain working principle of DC generator? Derive the EMF equation of a DC generator.
c) A dc shunt motor takes a load current of 50A from a 240V dc power supply the armature and field resistance are 0.25 Ω and 220 Ω respectively. Find the armature torque when the motor runs at 960rpm.
d) A dc generator generates an EMF of 2000V and has 900 armature conductors, flux per pole of 0.014 wb, speed of 1400 rpm and the armature winding has 4 parallel paths, find the number of poles.
e) Discuss the power factor and causes of low power factor.

Q.3 Solve the following (Any Two) **12**

a) An 8 pole d.c. shunt generator with 780 wave connected armature conductors and running at 600 rpm supplies load of 14.5 Ω resistance at terminal voltage of 50V. The armature resistance is 0.24 Ω and field resistance is 450 Ω. Find armature current, induced emf and flux per pole.
b) Describe various schemes of speed control of dc motor.
c) Explain two wattmeter method for three phase power measurement

Section – II

Q.4 Solve the following. (Any Four) **16**

a) A 3ph delta/star connected 11000/440V, 50Hz transformer takes line current of 5 amp, when secondary load of 0.8 Lagging power factor is connected. Determine each coil current and output of transformer.
b) Explain working of capacitor start single phase induction motor.
c) A 4 pole, 60 (Hz) three phase induction motor running with speed 1500 (rpm). Find synchronous speed, slip speed, slip for this condition.
d) Draw neat diagram of star delta starter and explain its operation.
e) On which factor the speed of three phase induction motor depends? And how to control the speed of three phase induction motor?

Q.5 Solve the following. (Any Two) **12**

a) Discuss about the working, types, characteristics, and applications of universal motor.

b) A 3-phase induction motor is wound for 4 poles, & is supplied from 50HZ system calculate a) The synchronous speed b) The speed of motor when the slip is 4% c) The rotor current frequency when the motor runs at 600rpm

c) Explain star- delta three phase transformer connections with suitable diagram. Compare star delta and delta- star three phase transformer connection.

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Electrical Machines (BTN04304)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. **14**

1) The open delta connection (V-V) is frequently used for ____
a) two auto-transformers
b) three auto-transformers
c) four auto-transformers
d) five auto-transformers

2) In a 3-phase power measurement by two wattmeter method, both the wattmeter's had identical readings. The power factor of the load was ____.
a) Unity b) 0.8 lagging
c) 0.8 leading d) Zero

3) A 3-phase 440 V, 50 Hz induction motor has 4% slip. The frequency of rotor current will be ____.
a) 50 Hz b) 25 Hz
c) 5 Hz d) 2 Hz

4) A 50 Hz, 3-phase induction motor has a full load speed of 1500 rpm. The number of poles in the motor is ____.
a) 2 poles b) 4 poles
c) 6 poles d) 8 poles

5) As compared to DOL starting method the star delta starting method should have ____.
a) High torque b) Low starting current
c) High starting current d) Smooth acceleration

6) In a D.C. generator the critical resistance refers to the resistance of ____
a) Brushes b) Field
c) Armature d) Load

7) Which of the following law/rule can he used to determine the direction of rotation of D.C. motor?
a) Lenz's law
b) Faraday's law
c) Coulomb's law
d) Fleming's left-hand rule

8) In a split-phase motor, the running winding should have ____
a) High resistance and low inductance
b) High resistance and High inductance
c) Low resistance and high inductance
d) Low resistance and low inductance

9) If the capacitor of a single-phase motor is short-circuited ____
a) The motor will not start
b) The motor will run in the same direction at a reduced speed
c) The motor will run in the reverse direction
d) None of the above

10) In a D.C. generator the critical resistance can be increased by ____
a) Increasing its field resistance
b) Decreasing its field resistance
c) Increasing its speed
d) Decreasing its speed

11) One D.C. motor drives another D.C. motor. The second D.C. motor when excited and driven ____
a) Does not run as a generator
b) Also runs as a motor comes to stop after sometime
c) Runs as a generator
d) None of these

12) D.C. generator works on the principle of ____
a) Lenz's law
b) Ohm's law
c) Faraday's law of electromagnetic induction
d) None of the above

13) In a low power factor wattmeter, the compensating coil is connected ____
a) In series with current coil
b) In parallel with current coil
c) In series with pressure coil
d) In parallel with pressure coil

14) The transformer which is more feasible to use in the distribution ends should be ____
a) star-delta
b) delta-star
c) Scott
d) delta-delta

SLR-BD-118

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Electrical Machines (BTN04304)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figure to right indicate full marks.
3) Assume suitable data if required.

Section – I

Q.2 Solve the following (Any Four) **16**

a) Derive the torque equation of a DC motor.
b) Explain working principle of DC generator? Derive the EMF equation of a DC generator.
c) A dc shunt motor takes a load current of 50A from a 240V dc power supply the armature and field resistance are 0.25 Ω and 220 Ω respectively. Find the armature torque when the motor runs at 960rpm.
d) A dc generator generates an EMF of 2000V and has 900 armature conductors, flux per pole of 0.014 wb, speed of 1400 rpm and the armature winding has 4 parallel paths, find the number of poles.
e) Discuss the power factor and causes of low power factor.

Q.3 Solve the following (Any Two) **12**

a) An 8 pole d.c. shunt generator with 780 wave connected armature conductors and running at 600 rpm supplies load of 14.5 Ω resistance at terminal voltage of 50V. The armature resistance is 0.24 Ω and field resistance is 450 Ω. Find armature current, induced emf and flux per pole.
b) Describe various schemes of speed control of dc motor.
c) Explain two wattmeter method for three phase power measurement

Section – II

Q.4 Solve the following. (Any Four) **16**

a) A 3ph delta/star connected 11000/440V, 50Hz transformer takes line current of 5 amp, when secondary load of 0.8 Lagging power factor is connected. Determine each coil current and output of transformer.
b) Explain working of capacitor start single phase induction motor.
c) A 4 pole, 60 (Hz) three phase induction motor running with speed 1500 (rpm). Find synchronous speed, slip speed, slip for this condition.
d) Draw neat diagram of star delta starter and explain its operation.
e) On which factor the speed of three phase induction motor depends? And how to control the speed of three phase induction motor?

Q.5 Solve the following. (Any Two) **12**

a) Discuss about the working, types, characteristics, and applications of universal motor.

b) A 3-phase induction motor is wound for 4 poles, & is supplied from 50HZ system calculate a) The synchronous speed b) The speed of motor when the slip is 4% c) The rotor current frequency when the motor runs at 600rpm

c) Explain star- delta three phase transformer connections with suitable diagram. Compare star delta and delta- star three phase transformer connection.

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Electrical Machines (BTN04304)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) A 50 Hz, 3-phase induction motor has a full load speed of 1500 rpm. The number of poles in the motor is ____.
a) 2 poles b) 4 poles
c) 6 poles d) 8 poles

2) As compared to DOL starting method the star delta starting method should have ____.
a) High torque b) Low starting current
c) High starting current d) Smooth acceleration

3) In a D.C. generator the critical resistance refers to the resistance of ____
a) Brushes b) Field
c) Armature d) Load

4) Which of the following law/rule can he used to determine the direction of rotation of D.C. motor?
a) Lenz's law b) Faraday's law
c) Coulomb's law d) Fleming's left-hand rule

5) In a split-phase motor, the running winding should have ____
a) High resistance and low inductance
b) High resistance and High inductance
c) Low resistance and high inductance
d) Low resistance and low inductance

6) If the capacitor of a single-phase motor is short-circuited ____
a) The motor will not start
b) The motor will run in the same direction at a reduced speed
c) The motor will run in the reverse direction
d) None of the above

7) In a D.C. generator the critical resistance can be increased by ____
a) Increasing its field resistance
b) Decreasing its field resistance
c) Increasing its speed
d) Decreasing its speed

8) One D.C. motor drives another D.C. motor. The second D.C. motor when excited and driven ____
a) Does not run as a generator
b) Also runs as a motor comes to stop after sometime
c) Runs as a generator
d) None of these

9) D.C. generator works on the principle of ____
a) Lenz's law
b) Ohm's law
c) Faraday's law of electromagnetic induction
d) None of the above

10) In a low power factor wattmeter, the compensating coil is connected ____
a) In series with current coil
b) In parallel with current coil
c) In series with pressure coil
d) In parallel with pressure coil

11) The transformer which is more feasible to use in the distribution ends should be ____
a) star-delta
b) delta-star
c) Scott
d) delta-delta

12) The open delta connection (V-V) is frequently used for ____
a) two auto-transformers
b) three auto-transformers
c) four auto-transformers
d) five auto-transformers

13) In a 3-phase power measurement by two wattmeter method, both the wattmeter's had identical readings. The power factor of the load was ____.
a) Unity
b) 0.8 lagging
c) 0.8 leading
d) Zero

14) A 3-phase 440 V, 50 Hz induction motor has 4% slip. The frequency of rotor current will be ____.
a) 50 Hz
b) 25 Hz
c) 5 Hz
d) 2 Hz

SLR-BD-118

Seat No.	

Set R

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Electrical Machines (BTN04304)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figure to right indicate full marks.
3) Assume suitable data if required.

Section – I

Q.2 Solve the following (Any Four) **16**

a) Derive the torque equation of a DC motor.
b) Explain working principle of DC generator? Derive the EMF equation of a DC generator.
c) A dc shunt motor takes a load current of 50A from a 240V dc power supply the armature and field resistance are 0.25 Ω and 220 Ω respectively. Find the armature torque when the motor runs at 960rpm.
d) A dc generator generates an EMF of 2000V and has 900 armature conductors, flux per pole of 0.014 wb, speed of 1400 rpm and the armature winding has 4 parallel paths, find the number of poles.
e) Discuss the power factor and causes of low power factor.

Q.3 Solve the following (Any Two) **12**

a) An 8 pole d.c. shunt generator with 780 wave connected armature conductors and running at 600 rpm supplies load of 14.5 Ω resistance at terminal voltage of 50V. The armature resistance is 0.24 Ω and field resistance is 450 Ω. Find armature current, induced emf and flux per pole.
b) Describe various schemes of speed control of dc motor.
c) Explain two wattmeter method for three phase power measurement

Section – II

Q.4 Solve the following. (Any Four) **16**

a) A 3ph delta/star connected 11000/440V, 50Hz transformer takes line current of 5 amp, when secondary load of 0.8 Lagging power factor is connected. Determine each coil current and output of transformer.
b) Explain working of capacitor start single phase induction motor.
c) A 4 pole, 60 (Hz) three phase induction motor running with speed 1500 (rpm). Find synchronous speed, slip speed, slip for this condition.
d) Draw neat diagram of star delta starter and explain its operation.
e) On which factor the speed of three phase induction motor depends? And how to control the speed of three phase induction motor?

Q.5 Solve the following. (Any Two) **12**

a) Discuss about the working, types, characteristics, and applications of universal motor.

b) A 3-phase induction motor is wound for 4 poles, & is supplied from 50HZ system calculate a) The synchronous speed b) The speed of motor when the slip is 4% c) The rotor current frequency when the motor runs at 600rpm

c) Explain star- delta three phase transformer connections with suitable diagram. Compare star delta and delta- star three phase transformer connection.

Seat No.		Set	S

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Electrical Machines (BTN04304)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the given options. 14

1) In a low power factor wattmeter, the compensating coil is connected ____
a) In series with current coil
b) In parallel with current coil
c) In series with pressure coil
d) In parallel with pressure coil

2) The transformer which is more feasible to use in the distribution ends should be ____
a) star-delta b) delta-star
c) Scott d) delta-delta

3) The open delta connection (V-V) is frequently used for ____
a) two auto-transformers
b) three auto-transformers
c) four auto-transformers
d) five auto-transformers

4) In a 3-phase power measurement by two wattmeter method, both the wattmeter's had identical readings. The power factor of the load was ____.
a) Unity b) 0.8 lagging
c) 0.8 leading d) Zero

5) A 3-phase 440 V, 50 Hz induction motor has 4% slip. The frequency of rotor current will be ____.
a) 50 Hz b) 25 Hz
c) 5 Hz d) 2 Hz

6) A 50 Hz, 3-phase induction motor has a full load speed of 1500 rpm. The number of poles in the motor is ____.

a) 2 poles b) 4 poles
c) 6 poles d) 8 poles

7) As compared to DOL starting method the star delta starting method should have ____.

a) High torque b) Low starting current
c) High starting current d) Smooth acceleration

8) In a D.C. generator the critical resistance refers to the resistance of ____

a) Brushes b) Field
c) Armature d) Load

9) Which of the following law/rule can he used to determine the direction of rotation of D.C. motor?

a) Lenz's law b) Faraday's law
c) Coulomb’s law d) Fleming's left-hand rule

10) In a split-phase motor, the running winding should have ____

a) High resistance and low inductance
b) High resistance and High inductance
c) Low resistance and high inductance
d) Low resistance and low inductance

11) If the capacitor of a single-phase motor is short-circuited ____

a) The motor will not start
b) The motor will run in the same direction at a reduced speed
c) The motor will run in the reverse direction
d) None of the above

12) In a D.C. generator the critical resistance can be increased by ____

a) Increasing its field resistance
b) Decreasing its field resistance
c) Increasing its speed
d) Decreasing its speed

13) One D.C. motor drives another D.C. motor. The second D.C. motor when excited and driven ____

a) Does not run as a generator
b) Also runs as a motor comes to stop after sometime
c) Runs as a generator
d) None of these

14) D.C. generator works on the principle of ____

a) Lenz's law
b) Ohm's law
c) Faraday's law of electromagnetic induction
d) None of the above

SLR-BD-118

Seat No.	

Set S

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Electrical Machines (BTN04304)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figure to right indicate full marks.
3) Assume suitable data if required.

Section – I

Q.2 Solve the following (Any Four) **16**

a) Derive the torque equation of a DC motor.
b) Explain working principle of DC generator? Derive the EMF equation of a DC generator.
c) A dc shunt motor takes a load current of 50A from a 240V dc power supply the armature and field resistance are 0.25 Ω and 220 Ω respectively. Find the armature torque when the motor runs at 960rpm.
d) A dc generator generates an EMF of 2000V and has 900 armature conductors, flux per pole of 0.014 wb, speed of 1400 rpm and the armature winding has 4 parallel paths, find the number of poles.
e) Discuss the power factor and causes of low power factor.

Q.3 Solve the following (Any Two) **12**

a) An 8 pole d.c. shunt generator with 780 wave connected armature conductors and running at 600 rpm supplies load of 14.5 Ω resistance at terminal voltage of 50V. The armature resistance is 0.24 Ω and field resistance is 450 Ω. Find armature current, induced emf and flux per pole.
b) Describe various schemes of speed control of dc motor.
c) Explain two wattmeter method for three phase power measurement

Section – II

Q.4 Solve the following. (Any Four) **16**

a) A 3ph delta/star connected 11000/440V, 50Hz transformer takes line current of 5 amp, when secondary load of 0.8 Lagging power factor is connected. Determine each coil current and output of transformer.
b) Explain working of capacitor start single phase induction motor.
c) A 4 pole, 60 (Hz) three phase induction motor running with speed 1500 (rpm). Find synchronous speed, slip speed, slip for this condition.
d) Draw neat diagram of star delta starter and explain its operation.
e) On which factor the speed of three phase induction motor depends? And how to control the speed of three phase induction motor?

Q.5 Solve the following. (Any Two) **12**

a) Discuss about the working, types, characteristics, and applications of universal motor.

b) A 3-phase induction motor is wound for 4 poles, & is supplied from 50HZ system calculate a) The synchronous speed b) The speed of motor when the slip is 4% c) The rotor current frequency when the motor runs at 600rpm

c) Explain star- delta three phase transformer connections with suitable diagram. Compare star delta and delta- star three phase transformer connection.

SLR-BD-119

Seat No.	

Set P

S. Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Digital Techniques (BTN04305)

Day & Date: Wednesday, 21-05-2024 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Tick marks the correct answer: **14**

1) A bulb in a staircase has two switches, one switch being at the ground floor and the other one at the first floor. The bulb can be turned ON and also can be turned OFF by any one of the switches irrespective of the state of the other switch. The logic of switching of the bulb resembles ____

a) AND gate b) OR gate
c) XOR gate d) NAND gate

2) The equation of the cumulative law is ____

a) $A + B = B + A$
b) $A + (B + C) = (A + B) + C$
c) $A(B - C) = AB - AC$
d) None of the given options

3) If both inputs are high, out is low in ____ gate.

a) OR b) AND
c) NOR and NAND d) None of the given options

4) Which of the following correctly describes the distributive law.

a) $(A + B)(C + D) = AB + CD$
b) $(A + B).C = AC + BC$
c) $(AB)(A + B) = AB$
d) $(A.B)C - AC.AB$

5) What is the function of an enable input on a multiplexer chip?

a) To apply Vcc
b) To connect ground
c) To active the entire chip
d) To active one half of the chip

6) In a multiplexer, the selection of a particular input line is controlled by ____
a) Data controller
b) Selected lines
c) Logic gates
d) Both data controller and selected lines

7) How many NOT gates are required for the construction of a 4-to-1 multiplexer?
a) 3 b) 4
c) 2 d) 5

8) A Karnaugh map (K-map) is an abstract form of _____ diagram organized matrix of squares.
a) Venn Diagram b) Cycle Diagram
c) Block diagram d) Triangular Diagram

9) A basic S-R flip-flop can be constructed by cross-coupling of which basic logic gates?
a) AND or OR gates b) XOR or XNOR gates
c) NOR or NAND gates d) AND or NOR gates

10) In a JK-Flip Flop, when J=1 and K=1 then it will be considered as ____
a) Set condition b) Reset condition
c) No Change d) Toggle condition

11) Mealy machine is ____
a) Complex in design b) Easy to design
c) Reacts slower to input d) None of the given options

12) Moore machine is ____
a) Complex in design b) Easy to design
c) Reacts faster to input d) None of the given options

13) A Digital word has even parity ____
a) if it has even numbers of 1s
b) if it has even numbers of 0s
c) if the decimal value of word is even
d) None of these

14) The output of two input NOR is high ____
a) Only if both the inputs are high
b) Only if both the inputs are low
c) Only if one of the inputs is high and the other is low
d) None

Seat No.	

Set | P

S. Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Digital Techniques (BTN04305)

Day & Date: Wednesday, 21-05-2024 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figure to right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 Attempt the following (Any Four) **16**

a) Convert binary equivalent 10111011 to Gray code number.
Convert gray equivalent 100111 to binary code number.

b) Simplify using K – map.

$\overline{A}B\overline{C}\overline{D} + AB\overline{C}\overline{D}$

c) Construct half adder using logic gates.

d) Design and implement a 2-line to 4-line deoder using basic gates.

e) Design and implement 1 bit magnitude comparator using basic gates.

Q.3 Attempt the following (Any Two) **12**

a) The message coded in 7-bit Hamming code 0111001 is transmitted through noisy channel. Decode the message assuming that at most a single error occurred.

b) Minimize the following Boolean expression using K map and realize it using basic gates
$Y = \Sigma m\ (1,3,5,9,11,13)$

c) What is multiplexer? Design and implement 4:1 multiplexer using basic gates.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) What is Mealy machine? Explain with suitable logic diagram. Compare Moore and Mealy machine.

b) Construct positive level triggered SR latch using NAND gate and tabulate characteristics table

c) Discuss a 3 bit asynchronous up counter. Draw neat logic diagram and waveforms.

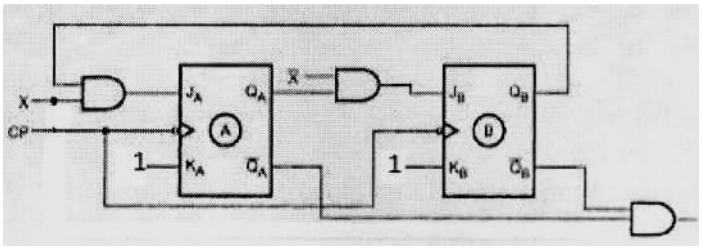
d) Construct T flip flop using JK flip flop and tabulate characteristics table.

e) Construct positive level triggered D flip flop and tabulate characteristics table.

Q.5 Attempt the following. (Any Two) **12**

a) Implement following minters expression using PROM
F_1 (A, B, C) = ∑m (0,1,5,6,7) F_2 (A, B, C) = ∑m (0,1,3,5,6,7)

b) Identify the given circuit, construct the excitation table, transition table and state diagram for circuit given below.



c) The initial content of 4-bit serial-in-serial out, right shift, shift register is 1111. How data is transferred? Draw neat logic diagram and waveforms.

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Digital Techniques (BTN04305)

Day & Date: Wednesday, 21-05-2024 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Tick marks the correct answer: **14**

1) A Karnaugh map (K-map) is an abstract form of _____ diagram organized matrix of squares.
a) Venn Diagram b) Cycle Diagram
c) Block diagram d) Triangular Diagram

2) A basic S-R flip-flop can be constructed by cross-coupling of which basic logic gates?
a) AND or OR gates b) XOR or XNOR gates
c) NOR or NAND gates d) AND or NOR gates

3) In a JK-Flip Flop, when J=1 and K=1 then it will be considered as ____
a) Set condition b) Reset condition
c) No Change d) Toggle condition

4) Mealy machine is ____
a) Complex in design b) Easy to design
c) Reacts slower to input d) None of the given options

5) Moore machine is ____
a) Complex in design b) Easy to design
c) Reacts faster to input d) None of the given options

6) A Digital word has even parity ____
a) if it has even numbers of 1s
b) if it has even numbers of 0s
c) if the decimal value of word is even
d) None of these

7) The output of two input NOR is high ____
a) Only if both the inputs are high
b) Only if both the inputs are low
c) Only if one of the inputs is high and the other is low
d) None

8) A bulb in a staircase has two switches, one switch being at the ground floor and the other one at the first floor. The bulb can be turned ON and also can be turned OFF by any one of the switches irrespective of the state of the other switch. The logic of switching of the bulb resembles ____
a) AND gate
b) OR gate
c) XOR gate
d) NAND gate

9) The equation of the cumulative law is ____
a) $A + B = B + A$
b) $A + (B + C) = (A + B) + C$
c) $A(B - C) = AB - AC$
d) None of the given options

10) If both inputs are high, out is low in ____ gate.
a) OR
b) AND
c) NOR and NAND
d) None of the given options

11) Which of the following correctly describes the distributive law.
a) $(A + B)(C + D) = AB + CD$
b) $(A + B).C = AC + BC$
c) $(AB)(A + B) = AB$
d) $(A.B)C - AC.AB$

12) What is the function of an enable input on a multiplexer chip?
a) To apply Vcc
b) To connect ground
c) To active the entire chip
d) To active one half of the chip

13) In a multiplexer, the selection of a particular input line is controlled by ____
a) Data controller
b) Selected lines
c) Logic gates
d) Both data controller and selected lines

14) How many NOT gates are required for the construction of a 4-to-1 multiplexer?
a) 3
b) 4
c) 2
d) 5

SLR-BD-119

Seat No.	

Set Q

S. Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Digital Techniques (BTN04305)

Day & Date: Wednesday, 21-05-2024 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory .
2) Figure to right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 Attempt the following (Any Four) **16**

a) Convert binary equivalent 10111011 to Gray code number.
Convert gray equivalent 100111 to binary code number.

b) Simplify using K – map.

$\overline{A}B\overline{C}\overline{D} + AB\overline{C}\overline{D}$

c) Construct half adder using logic gates.

d) Design and implement a 2-line to 4-line deoder using basic gates.

e) Design and implement 1 bit magnitude comparator using basic gates.

Q.3 Attempt the following (Any Two) **12**

a) The message coded in 7-bit Hamming code 0111001 is transmitted through noisy channel. Decode the message assuming that at most a single error occurred.

b) Minimize the following Boolean expression using K map and realize it using basic gates
$Y = \Sigma m\ (1,3,5,9,11,13)$

c) What is multiplexer? Design and implement 4:1 multiplexer using basic gates.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) What is Mealy machine? Explain with suitable logic diagram. Compare Moore and Mealy machine.

b) Construct positive level triggered SR latch using NAND gate and tabulate characteristics table

c) Discuss a 3 bit asynchronous up counter. Draw neat logic diagram and waveforms.

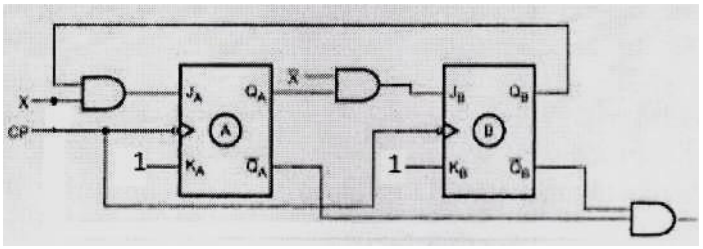
d) Construct T flip flop using JK flip flop and tabulate characteristics table.

e) Construct positive level triggered D flip flop and tabulate characteristics table.

Q.5 Attempt the following. (Any Two) **12**

a) Implement following minters expression using PROM
F_1 (A, B, C) = ∑m (0,1,5,6,7) F_2 (A, B, C) = ∑m (0,1,3,5,6,7)

b) Identify the given circuit, construct the excitation table, transition table and state diagram for circuit given below.



c) The initial content of 4-bit serial-in-serial out, right shift, shift register is 1111. How data is transferred? Draw neat logic diagram and waveforms.

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Digital Techniques (BTN04305)

Day & Date: Wednesday, 21-05-2024 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Tick marks the correct answer: **14**

1) Mealy machine is ____
a) Complex in design
b) Easy to design
c) Reacts slower to input
d) None of the given options

2) Moore machine is ____
a) Complex in design
b) Easy to design
c) Reacts faster to input
d) None of the given options

3) A Digital word has even parity ____
a) if it has even numbers of 1s
b) if it has even numbers of 0s
c) if the decimal value of word is even
d) None of these

4) The output of two input NOR is high ____
a) Only if both the inputs are high
b) Only if both the inputs are low
c) Only if one of the inputs is high and the other is low
d) None

5) A bulb in a staircase has two switches, one switch being at the ground floor and the other one at the first floor. The bulb can be turned ON and also can be turned OFF by any one of the switches irrespective of the state of the other switch. The logic of switching of the bulb resembles ____
a) AND gate
b) OR gate
c) XOR gate
d) NAND gate

6) The equation of the cumulative law is _____
a) $A + B = B + A$
b) $A + (B + C) = (A + B) + C$
c) $A(B - C) = AB - AC$
d) None of the given options

7) If both inputs are high, out is low in _____ gate.
a) OR
b) AND
c) NOR and NAND
d) None of the given options

8) Which of the following correctly describes the distributive law.
a) $(A + B)(C + D) = AB + CD$
b) $(A + B).C = AC + BC$
c) $(AB)(A + B) = AB$
d) $(A.B)C - AC.AB$

9) What is the function of an enable input on a multiplexer chip?
a) To apply Vcc
b) To connect ground
c) To active the entire chip
d) To active one half of the chip

10) In a multiplexer, the selection of a particular input line is controlled by _____
a) Data controller
b) Selected lines
c) Logic gates
d) Both data controller and selected lines

11) How many NOT gates are required for the construction of a 4-to-1 multiplexer?
a) 3
b) 4
c) 2
d) 5

12) A Karnaugh map (K-map) is an abstract form of _____ diagram organized matrix of squares.
a) Venn Diagram
b) Cycle Diagram
c) Block diagram
d) Triangular Diagram

13) A basic S-R flip-flop can be constructed by cross-coupling of which basic logic gates?
a) AND or OR gates
b) XOR or XNOR gates
c) NOR or NAND gates
d) AND or NOR gates

14) In a JK-Flip Flop, when J=1 and K=1 then it will be considered as _____
a) Set condition
b) Reset condition
c) No Change
d) Toggle condition

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Digital Techniques (BTN04305)

Day & Date: Wednesday, 21-05-2024 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figure to right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 Attempt the following (Any Four) **16**

a) Convert binary equivalent 10111011 to Gray code number.
Convert gray equivalent 100111 to binary code number.

b) Simplify using K – map.

$\overline{A}B\overline{C}\overline{D} + AB\overline{C}\overline{D}$

c) Construct half adder using logic gates.

d) Design and implement a 2-line to 4-line deoder using basic gates.

e) Design and implement 1 bit magnitude comparator using basic gates.

Q.3 Attempt the following (Any Two) **12**

a) The message coded in 7-bit Hamming code 0111001 is transmitted through noisy channel. Decode the message assuming that at most a single error occurred.

b) Minimize the following Boolean expression using K map and realize it using basic gates
$Y = \Sigma m\ (1,3,5,9,11,13)$

c) What is multiplexer? Design and implement 4:1 multiplexer using basic gates.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) What is Mealy machine? Explain with suitable logic diagram. Compare Moore and Mealy machine.

b) Construct positive level triggered SR latch using NAND gate and tabulate characteristics table

c) Discuss a 3 bit asynchronous up counter. Draw neat logic diagram and waveforms.

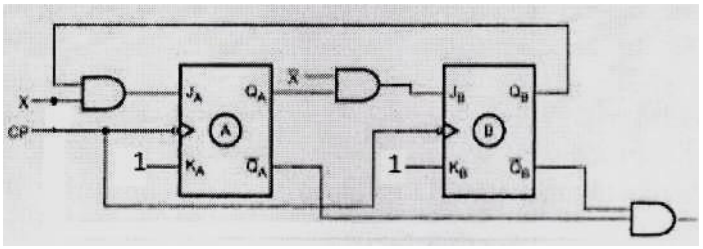
d) Construct T flip flop using JK flip flop and tabulate characteristics table.

e) Construct positive level triggered D flip flop and tabulate characteristics table.

Q.5 Attempt the following. (Any Two) **12**

a) Implement following minters expression using PROM
F_1 (A, B, C) = ∑m (0,1,5,6,7) F_2 (A, B, C) = ∑m (0,1,3,5,6,7)

b) Identify the given circuit, construct the excitation table, transition table and state diagram for circuit given below.



c) The initial content of 4-bit serial-in-serial out, right shift, shift register is 1111. How data is transferred? Draw neat logic diagram and waveforms.

Seat No.	

Set **S**

S. Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Digital Techniques (BTN04305)

Day & Date: Wednesday, 21-05-2024 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Tick marks the correct answer: **14**

1) In a multiplexer, the selection of a particular input line is controlled by ____
a) Data controller
b) Selected lines
c) Logic gates
d) Both data controller and selected lines

2) How many NOT gates are required for the construction of a 4-to-1 multiplexer?
a) 3 b) 4
c) 2 d) 5

3) A Karnaugh map (K-map) is an abstract form of _____ diagram organized matrix of squares.
a) Venn Diagram b) Cycle Diagram
c) Block diagram d) Triangular Diagram

4) A basic S-R flip-flop can be constructed by cross-coupling of which basic logic gates?
a) AND or OR gates b) XOR or XNOR gates
c) NOR or NAND gates d) AND or NOR gates

5) In a JK-Flip Flop, when J=1 and K=1 then it will be considered as ____
a) Set condition b) Reset condition
c) No Change d) Toggle condition

6) Mealy machine is ____
a) Complex in design
b) Easy to design
c) Reacts slower to input
d) None of the given options

7) Moore machine is ____
a) Complex in design
b) Easy to design
c) Reacts faster to input
d) None of the given options

8) A Digital word has even parity ____
a) if it has even numbers of 1s
b) if it has even numbers of 0s
c) if the decimal value of word is even
d) None of these

9) The output of two input NOR is high ____
a) Only if both the inputs are high
b) Only if both the inputs are low
c) Only if one of the inputs is high and the other is low
d) None

10) A bulb in a staircase has two switches, one switch being at the ground floor and the other one at the first floor. The bulb can be turned ON and also can be turned OFF by any one of the switches irrespective of the state of the other switch. The logic of switching of the bulb resembles ____
a) AND gate
b) OR gate
c) XOR gate
d) NAND gate

11) The equation of the cumulative law is ____
a) $A + B = B + A$
b) $A + (B + C) = (A + B) + C$
c) $A(B - C) = AB - AC$
d) None of the given options

12) If both inputs are high, out is low in ____ gate.
a) OR
b) AND
c) NOR and NAND
d) None of the given options

13) Which of the following correctly describes the distributive law.
a) $(A + B)(C + D) = AB + CD$
b) $(A + B).C = AC + BC$
c) $(AB)(A + B) = AB$
d) $(A.B)C - AC.AB$

14) What is the function of an enable input on a multiplexer chip?
a) To apply Vcc
b) To connect ground
c) To active the entire chip
d) To active one half of the chip

SLR-BD-119

Seat No.		Set	S

S. Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Digital Techniques (BTN04305)

Day & Date: Wednesday, 21-05-2024 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figure to right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly.

Section – I

Q.2 Attempt the following (Any Four) **16**

a) Convert binary equivalent 10111011 to Gray code number.
Convert gray equivalent 100111 to binary code number.

b) Simplify using K – map.

$\overline{A}B\overline{C}\overline{D} + AB\overline{C}\overline{D}$

c) Construct half adder using logic gates.

d) Design and implement a 2-line to 4-line deoder using basic gates.

e) Design and implement 1 bit magnitude comparator using basic gates.

Q.3 Attempt the following (Any Two) **12**

a) The message coded in 7-bit Hamming code 0111001 is transmitted through noisy channel. Decode the message assuming that at most a single error occurred.

b) Minimize the following Boolean expression using K map and realize it using basic gates
$Y = \Sigma m\ (1,3,5,9,11,13)$

c) What is multiplexer? Design and implement 4:1 multiplexer using basic gates.

Section – II

Q.4 Attempt the following. (Any Four) **16**

a) What is Mealy machine? Explain with suitable logic diagram. Compare Moore and Mealy machine.

b) Construct positive level triggered SR latch using NAND gate and tabulate characteristics table

c) Discuss a 3 bit asynchronous up counter. Draw neat logic diagram and waveforms.

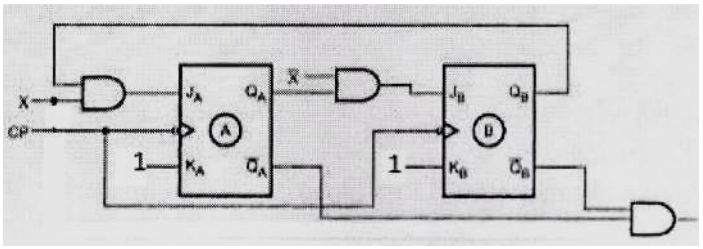
d) Construct T flip flop using JK flip flop and tabulate characteristics table.

e) Construct positive level triggered D flip flop and tabulate characteristics table.

Q.5 Attempt the following. (Any Two) **12**

a) Implement following minters expression using PROM
F_1 (A, B, C) = ∑m (0,1,5,6,7) F_2 (A, B, C) = ∑m (0,1,3,5,6,7)

b) Identify the given circuit, construct the excitation table, transition table and state diagram for circuit given below.



c) The initial content of 4-bit serial-in-serial out, right shift, shift register is 1111. How data is transferred? Draw neat logic diagram and waveforms.

SLR-BD-120

Seat No.	

Set P

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Electronic Circuit Analysis and Design (BTN04302)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) The ripple by a capacitor filter to heavy loads is _____.
a) high b) depends on temperature
c) low d) no ripple at all

2) The main reason of bleeder resistor in LC filter is to _____.
a) improve filtering action
b) improve voltage regulation
c) ensure continuous current in load resistor
d) both (a) and (b)

3) Which of the following is not a necessary component in a clamper circuit?
a) Diode b) Capacitor
c) Resistor d) independent DC supply

4) The charge (q) lost by the capacitor during the discharge time for shunt capacitor filter.
a) I_{DC}*T b) I_{DC} /T
c) I_{DC}*2T d) I_{DC}/2T

5) The ripple factor for an 1 section filter is _____.
a) $r = 1/6\sqrt{2}\omega 2LC$ b) $r = 6\sqrt{2}\omega 2LC$
c) $r = 6\sqrt{3}\omega 2LC$ d) $r = 1/6\sqrt{3}\omega 2LC$

6) A JFET is a _____ driven device.
a) voltage b) current
c) both current and voltage d) none of the above

7) For a condition, drain voltage equals the pinch-off-voltage, the drain current _____ with the increase in drain voltage.

a) decreases b) increases
c) remains constant d) none of the above

8) For VVR application MOSFET is operated in _____region.

a) ohmic b) saturation
c) pinch-off d) both b& c

9) With the E-MOSFET, when gate input voltage is zero, drain current is _____.

a) saturation current
b) zero
c) steady state drain current (IDSS)
d) widening the channel

10) In a LC filter, the ripple factor, _____.

a) increases with the load current
b) increases with the load resistance
c) independent of load current
d) has the lowest value

11) When negative voltage feedback is applied to an amplifier, its voltage gain _____.

a) is increased b) is reduced
c) remains the same d) none of the above

12) A feedback circuit usually employs _____ network.

a) resistive b) capacitive
c) inductive d) none of the above

13) Emitter follower is a _____ circuit.

a) voltage feedback
b) current feedback
c) both voltage and current feedback
d) none of the above

14) The dc current gain in common base configuration is given by _____.

a) α b) β
c) $\beta + 1$ d) $\alpha + 1$

Seat No.	

Set P

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Electronic Circuit Analysis and Design (BTN04302)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

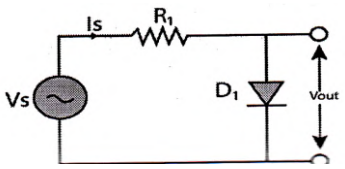
Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Attempt any Four **16**

a) What is α and β in the case of BJT. Find the relation between α and β.

b) Plot the output voltage waveforms of circuit shown below supplied with 20 V peat to peak (Vs) sinusoidal voltage. Justify the output voltages levels with proper analysis. Assume ideal diode in the circuit.



c) Draw circuit diagram of LC filter with FWR. What is the critical inductor in LC filter?

d) Explain procedure to draw dc load-line in case of CE BJT amplifier.

e) Draw voltage divider bias circuit and derive formula of its stability factor.

Q.3 Attempt any two. **12**

a) Draw circuit diagram of capacitor shunt filter connected with full wave rectifier and describe its functioning. Draw the waveform of voltage across load resistor and current through diode.

b) Describe thermal runaway related to BJT. How thermal runaway consequences can be avoided?

c) What is bias stabilization in BJT? Describe different bias compensation techniques for BJT.

Section – II

Q.4 Attempt any Four. **16**

a) Draw single stage CE amplifier diagram and describe its functioning.

b) What are different types of couplings in multistage amplifiers? Describe RC coupled CE amplifier.

c) Draw block diagram for negative feedback in amplifier and derive generalized expression for gain with feedback. What is loop gain?

d) Compare JFET and MOSFET.

e) Draw circuit of emitter follower and determine its voltage gain.

Q.5 Attempt any two. **12**

a) Describe thermal runaway and punch through effect related to BJT. How these effects can be avoided?

b) An amplifier with 5K input resistance and 50 K output resistance has a voltage-gain of 50.
The amplifier has now provided with 15 % negative feedback, calculate-

1) Voltage-gain with feedback
2) Input resistance with feedback
3) Output resistance with feedback
4) loop-gain

c) Draw drain characteristics and transfer characteristics in case of FET. Define different FET parameters.

SLR-BD-120

Seat No.	

Set Q

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Electronic Circuit Analysis and Design (BTN04302)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) For VVR application MOSFET is operated in _____region.
a) ohmic b) saturation
c) pinch-off d) both b& c

2) With the E-MOSFET, when gate input voltage is zero, drain current is _____.
a) saturation current
b) zero
c) steady state drain current (IDSS)
d) widening the channel

3) In a LC filter, the ripple factor, _____.
a) increases with the load current
b) increases with the load resistance
c) independent of load current
d) has the lowest value

4) When negative voltage feedback is applied to an amplifier, its voltage gain _____.
a) is increased b) is reduced
c) remains the same d) none of the above

5) A feedback circuit usually employs _____ network.
a) resistive b) capacitive
c) inductive d) none of the above

6) Emitter follower is a _____ circuit.
a) voltage feedback
b) current feedback
c) both voltage and current feedback
d) none of the above

7) The dc current gain in common base configuration is given by _____.
a) α b) β
c) $\beta + 1$ d) $\alpha + 1$

8) The ripple by a capacitor filter to heavy loads is _____.
a) high b) depends on temperature
c) low d) no ripple at all

9) The main reason of bleeder resistor in LC filter is to _____.
a) improve filtering action
b) improve voltage regulation
c) ensure continuous current in load resistor
d) both (a) and (b)

10) Which of the following is not a necessary component in a clamper circuit?
a) Diode b) Capacitor
c) Resistor d) independent DC supply

11) The charge (q) lost by the capacitor during the discharge time for shunt capacitor filter.
a) I_{DC}*T b) I_{DC} /T
c) I_{DC}*2T d) I_{DC}/2T

12) The ripple factor for an 1 section filter is _____.
a) $r = 1/6\sqrt{2}\omega 2LC$ b) $r = 6\sqrt{2}\omega 2LC$
c) $r = 6\sqrt{3}\omega 2LC$ d) $r = 1/6\sqrt{3}\omega 2LC$

13) A JFET is a _____ driven device.
a) voltage b) current
c) both current and voltage d) none of the above

14) For a condition, drain voltage equals the pinch-off-voltage, the drain current _____ with the increase in drain voltage.
a) decreases b) increases
c) remains constant d) none of the above

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Electronic Circuit Analysis and Design (BTN04302)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

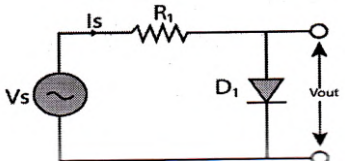
Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Attempt any Four **16**

a) What is α and β in the case of BJT. Find the relation between α and β.

b) Plot the output voltage waveforms of circuit shown below supplied with 20 V peat to peak (Vs) sinusoidal voltage. Justify the output voltages levels with proper analysis. Assume ideal diode in the circuit.



c) Draw circuit diagram of LC filter with FWR. What is the critical inductor in LC filter?

d) Explain procedure to draw dc load-line in case of CE BJT amplifier.

e) Draw voltage divider bias circuit and derive formula of its stability factor.

Q.3 Attempt any two. **12**

a) Draw circuit diagram of capacitor shunt filter connected with full wave rectifier and describe its functioning. Draw the waveform of voltage across load resistor and current through diode.

b) Describe thermal runaway related to BJT. How thermal runaway consequences can be avoided?

c) What is bias stabilization in BJT? Describe different bias compensation techniques for BJT.

Section – II

Q.4 Attempt any Four. **16**

a) Draw single stage CE amplifier diagram and describe its functioning.

b) What are different types of couplings in multistage amplifiers? Describe RC coupled CE amplifier.

c) Draw block diagram for negative feedback in amplifier and derive generalized expression for gain with feedback. What is loop gain?

d) Compare JFET and MOSFET.

e) Draw circuit of emitter follower and determine its voltage gain.

Q.5 Attempt any two. **12**

a) Describe thermal runaway and punch through effect related to BJT. How these effects can be avoided?

b) An amplifier with 5K input resistance and 50 K output resistance has a voltage-gain of 50.
The amplifier has now provided with 15 % negative feedback, calculate-

1) Voltage-gain with feedback
2) Input resistance with feedback
3) Output resistance with feedback
4) loop-gain

c) Draw drain characteristics and transfer characteristics in case of FET. Define different FET parameters.

SLR-BD-120

Seat No.	

Set R

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Electronic Circuit Analysis and Design (BTN04302)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) When negative voltage feedback is applied to an amplifier, its voltage gain _____.
a) is increased b) is reduced
c) remains the same d) none of the above

2) A feedback circuit usually employs _____ network.
a) resistive b) capacitive
c) inductive d) none of the above

3) Emitter follower is a _____ circuit.
a) voltage feedback
b) current feedback
c) both voltage and current feedback
d) none of the above

4) The dc current gain in common base configuration is given by _____.
a) α b) β
c) $\beta + 1$ d) $\alpha + 1$

5) The ripple by a capacitor filter to heavy loads is _____.
a) high b) depends on temperature
c) low d) no ripple at all

6) The main reason of bleeder resistor in LC filter is to _____.
a) improve filtering action
b) improve voltage regulation
c) ensure continuous current in load resistor
d) both (a) and (b)

7) Which of the following is not a necessary component in a clamper circuit?

a) Diode
b) Capacitor
c) Resistor
d) independent DC supply

8) The charge (q) lost by the capacitor during the discharge time for shunt capacitor filter.

a) I_{DC}*T
b) I_{DC} /T
c) I_{DC}*2T
d) I_{DC}/2T

9) The ripple factor for an 1 section filter is _____.

a) $r = 1/6\sqrt{2}\omega 2LC$
b) $r = 6\sqrt{2}\omega 2LC$
c) $r = 6\sqrt{3}\omega 2LC$
d) $r = 1/6\sqrt{3}\omega 2LC$

10) A JFET is a _____ driven device.

a) voltage
b) current
c) both current and voltage
d) none of the above

11) For a condition, drain voltage equals the pinch-off-voltage, the drain current _____ with the increase in drain voltage.

a) decreases
b) increases
c) remains constant
d) none of the above

12) For VVR application MOSFET is operated in _____region.

a) ohmic
b) saturation
c) pinch-off
d) both b& c

13) With the E-MOSFET, when gate input voltage is zero, drain current is _____.

a) saturation current
b) zero
c) steady state drain current (IDSS)
d) widening the channel

14) In a LC filter, the ripple factor, _____.

a) increases with the load current
b) increases with the load resistance
c) independent of load current
d) has the lowest value

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Electronic Circuit Analysis and Design (BTN04302)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

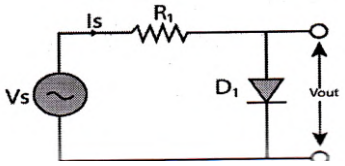
Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Attempt any Four **16**

a) What is α and β in the case of BJT. Find the relation between α and β.

b) Plot the output voltage waveforms of circuit shown below supplied with 20 V peat to peak (Vs) sinusoidal voltage. Justify the output voltages levels with proper analysis. Assume ideal diode in the circuit.



c) Draw circuit diagram of LC filter with FWR. What is the critical inductor in LC filter?

d) Explain procedure to draw dc load-line in case of CE BJT amplifier.

e) Draw voltage divider bias circuit and derive formula of its stability factor.

Q.3 Attempt any two. **12**

a) Draw circuit diagram of capacitor shunt filter connected with full wave rectifier and describe its functioning. Draw the waveform of voltage across load resistor and current through diode.

b) Describe thermal runaway related to BJT. How thermal runaway consequences can be avoided?

c) What is bias stabilization in BJT? Describe different bias compensation techniques for BJT.

Section – II

Q.4 Attempt any Four. **16**

a) Draw single stage CE amplifier diagram and describe its functioning.

b) What are different types of couplings in multistage amplifiers? Describe RC coupled CE amplifier.

c) Draw block diagram for negative feedback in amplifier and derive generalized expression for gain with feedback. What is loop gain?

d) Compare JFET and MOSFET.

e) Draw circuit of emitter follower and determine its voltage gain.

Q.5 Attempt any two. **12**

a) Describe thermal runaway and punch through effect related to BJT. How these effects can be avoided?

b) An amplifier with 5K input resistance and 50 K output resistance has a voltage-gain of 50.
The amplifier has now provided with 15 % negative feedback, calculate-

1) Voltage-gain with feedback
2) Input resistance with feedback
3) Output resistance with feedback
4) loop-gain

c) Draw drain characteristics and transfer characteristics in case of FET. Define different FET parameters.

SLR-BD-120

Seat No.		Set	S

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Electronic Circuit Analysis and Design (BTN04302)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) A JFET is a _____ driven device.
a) voltage b) current
c) both current and voltage d) none of the above

2) For a condition, drain voltage equals the pinch-off-voltage, the drain current _____ with the increase in drain voltage.
a) decreases b) increases
c) remains constant d) none of the above

3) For VVR application MOSFET is operated in _____region.
a) ohmic b) saturation
c) pinch-off d) both b& c

4) With the E-MOSFET, when gate input voltage is zero, drain current is _____.
a) saturation current
b) zero
c) steady state drain current (IDSS)
d) widening the channel

5) In a LC filter, the ripple factor, _____.
a) increases with the load current
b) increases with the load resistance
c) independent of load current
d) has the lowest value

6) When negative voltage feedback is applied to an amplifier, its voltage gain _____.

a) is increased
b) is reduced
c) remains the same
d) none of the above

7) A feedback circuit usually employs _____ network.

a) resistive
b) capacitive
c) inductive
d) none of the above

8) Emitter follower is a _____ circuit.

a) voltage feedback
b) current feedback
c) both voltage and current feedback
d) none of the above

9) The dc current gain in common base configuration is given by _____.

a) α
b) β
c) $\beta + 1$
d) $\alpha + 1$

10) The ripple by a capacitor filter to heavy loads is _____.

a) high
b) depends on temperature
c) low
d) no ripple at all

11) The main reason of bleeder resistor in LC filter is to _____.

a) improve filtering action
b) improve voltage regulation
c) ensure continuous current in load resistor
d) both (a) and (b)

12) Which of the following is not a necessary component in a clamper circuit?

a) Diode
b) Capacitor
c) Resistor
d) independent DC supply

13) The charge (q) lost by the capacitor during the discharge time for shunt capacitor filter.

a) I_{DC}*T
b) I_{DC} /T
c) I_{DC}*2T
d) I_{DC}/2T

14) The ripple factor for an 1 section filter is _____.

a) $r = 1/6\sqrt{2}\omega 2LC$
b) $r = 6\sqrt{2}\omega 2LC$
c) $r = 6\sqrt{3}\omega 2LC$
d) $r = 1/6\sqrt{3}\omega 2LC$

Seat No.	

Set **S**

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Electronic Circuit Analysis and Design (BTN04302)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

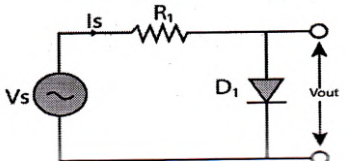
Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Attempt any Four **16**

a) What is α and β in the case of BJT. Find the relation between α and β.

b) Plot the output voltage waveforms of circuit shown below supplied with 20 V peat to peak (Vs) sinusoidal voltage. Justify the output voltages levels with proper analysis. Assume ideal diode in the circuit.



c) Draw circuit diagram of LC filter with FWR. What is the critical inductor in LC filter?

d) Explain procedure to draw dc load-line in case of CE BJT amplifier.

e) Draw voltage divider bias circuit and derive formula of its stability factor.

Q.3 Attempt any two. **12**

a) Draw circuit diagram of capacitor shunt filter connected with full wave rectifier and describe its functioning. Draw the waveform of voltage across load resistor and current through diode.

b) Describe thermal runaway related to BJT. How thermal runaway consequences can be avoided?

c) What is bias stabilization in BJT? Describe different bias compensation techniques for BJT.

Section – II

Q.4 Attempt any Four. **16**

a) Draw single stage CE amplifier diagram and describe its functioning.

b) What are different types of couplings in multistage amplifiers? Describe RC coupled CE amplifier.

c) Draw block diagram for negative feedback in amplifier and derive generalized expression for gain with feedback. What is loop gain?

d) Compare JFET and MOSFET.

e) Draw circuit of emitter follower and determine its voltage gain.

Q.5 Attempt any two. **12**

a) Describe thermal runaway and punch through effect related to BJT. How these effects can be avoided?

b) An amplifier with 5K input resistance and 50 K output resistance has a voltage-gain of 50.
The amplifier has now provided with 15 % negative feedback, calculate-

1) Voltage-gain with feedback
2) Input resistance with feedback
3) Output resistance with feedback
4) loop-gain

c) Draw drain characteristics and transfer characteristics in case of FET. Define different FET parameters.

SLR-BD-121

Seat No.		Set	P

S. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGGNIRING
Signals & Systems (BTN04401)

Day & Date: Monday 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The output of LTI system with input $x(t) = u(t)$ and impulse response $h(t) = \delta(t-1)$ is _____

a) $u(t)$ b) $u(t-1)$
c) $u(t-4)$ d) $\delta(t-2)$

2) A memory less system is also known as _____ System

a) Casual b) Static
c) Dynamic d) Non casual

3) Fourier transform of unity is _____.

a) $\delta(w)$ b) $\pi\,\delta(w)$
c) $2\pi\,\delta(w)$ d) Unit step signal

4) A discrete time LTI system is casual if _____

a) $h[n] = 0$ for $n = 0$ b) $h[n] = 0$ for $n < 0$
c) $h[n] = 0$ for $n \neq 0$ d) $h[n] = 0$ for $n > 0$

5) The signal $u(t) - u(t-10)$ is _____

a) Periodic b) A periodic
c) Casual d) Aperiodic & casual

6) If $x[n] = \{1,2,3\}$ and $h[n] = \{3,4,5\}$ and $y[n] = x[n]^* h[n]$, the length of $y[n]$ is _____

a) 5 b) 6
c) 7 d) 3

7) Which of the following is the method used for reconstruction of signal from its samples?

a) Zero order hold
b) Linear interpolation
c) Both a and b
d) None of these

8) What is the Nyquist frequency for the signal $x(t) = 3\cos 50\,\pi t + 10\sin 300\pi t - \cos 100\pi t$?

a) 50Hz
b) 100Hz
c) 200Hz
d) 300Hz

9) The DC coefficient a_0 for the signal $x(t) = 5\cos(2t)$ is _____

a) 2
b) 5
c) 0
d) None of these

10) A system is having impulse response $h(t)$ will be BIBO stable if _____

a) $\int_{-\infty}^{\infty}|h(t)| > \infty$
b) $\int_{-\infty}^{\infty}|h(t)| < \infty$
c) $\int_{-\infty}^{\infty}|h(t)| = 0$
d) $\int_{-\infty}^{\infty}|h(t)| = 1$

11) A signal $x(t)$ is said to be even if _____

a) $x(t) = -x(t)$
b) $x(t) = x(-t)$
c) $x(t) = -x(-t)$
d) $-x(t) = x(-t)$

12) An LTI system is stable if and only if the ROC of its system function $H(z)$ _____

a) Exterior to a circle
b) Interior of a circle
c) Includes unity circle
d) None of these

13) If $X(\omega)$ is the Fourier transform of the signal $x(n)$, then what is the Fourier transform of the signal $x(n-k)$?

a) $e^{j\omega k}.X(-\omega)$
b) $e^{j\omega k}.X(\omega)$
c) $e^{-j\omega k}.X(-\omega)$
d) $e^{-j\omega k}.X(\omega)$

14) A function having frequency f is to be sampled. The sampling time T should be _____

a) $T = \frac{1}{2f}$
b) $T > \frac{1}{2f}$
c) $T < \frac{1}{2f}$
d) $T \geq \frac{1}{2f}$

Seat No.	

Set P

S. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGGNIRING
Signals & Systems (BTN04401)

Day & Date: Monday 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume Suitable data if required & state the assumptions.

Section – I

Q.2 Solve the following (Any Four) **16**

a) Obtain and sketch the even and odd parts of the discrete time signal $x[n]$ shown below

$$x[n] = \{5,2,1,4\}$$
$$\uparrow$$

b) Determine whether or not the following signals are periodic or not. If the signal is periodic determine the fundamental period.

i) $3\cos(3t + \pi/4)$

ii) $x[n] = \sin(2\pi n/5 + 2)$

c) Give expression for Exponential Fourier series & derive the expression for computing the coefficients a_0 and a_k of Exponential Fourier Series

d) If $u(t)$ is unit step signal and $\delta(t)$ is unit impulse sequence sketch & label following signals

i) $u(t+1)$

ii) $\delta(t+1) - \delta(t+2)$

iii) $u(t) + u(t-1)$

iv) $u(t) - u(t-2)$

e) Consider the signal $x(t)$ as given below.

$$x(t) = \begin{cases} 1 & 0 < t < 1 \\ -1 & 1 \leq t \leq 3 \end{cases}$$

Sketch and label following signals

i) $x(t+1)$

ii) $x(-t)$

iii) $x(t)u(t-1)$

Q.3 Solve the following (Any Two) **12**

a) Obtain the convolution sum of following signals

$x[n] = \{1,2,\}$ and $h[n] = \{3,2,1\}$

$\uparrow$ $\uparrow$

b) Determine the Exponential Fourier series representation for the following signals

$x(t)$ periodic with period 2 and

$$x(t) = \begin{cases} 1 & 0 < t < 1 \\ -1 & 1 \leq t \leq 2 \end{cases}$$

c) Consider the cascade connection of two LTI systems with impulse responses $h1(t)$ and $h2(t)$ where

$h1(t) = u(t-1)$ and $h2(t) = u(t)$

Compute the impulse response of overall system

Section – II

Q.4 Solve the following (Any Four) **16**

a) Explain in brief sample with zero order hold.

b) State the conditions for ROC of system function $H(z)$ of an LTI system for stable system. Obtain impulse response of system if following system is stable.

$$H(z) = \frac{z}{z-2} + \frac{z}{z-1/4}$$

c) The analog signal $x(t)$ is given below

$$x(t) = 3\sin(2000\pi t) + 10\cos(1400\pi t) - \sin(2500\pi t)$$

Calculate the Nyquist sampling rate for the signal. Also find the discrete time signal if sampled with $Fs = 3000\text{Hz}$

d) Given the Fourier transform of $x(t)$ as $X(j\omega)$, express the Fourier transform of following signal in terms of $X(j\omega)$ using the suitable properties of Fourier transform. State the properties used.

$$x1(t) = x(t-1)$$

e) State & prove following properties of continuous time Fourier transform

i) Time Shifting

ii) Time and frequency Scaling

Q.5 Solve the following (Any Two) **12**

a) State sampling theorem. Explain with suitable equations & diagrams how the original signal can be reconstructed from the samples using ideal low pass filter

b) Consider an LTI system with the system function

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

Obtain the impulse response $h(t)$ of the system and state the region of convergence of the system if the system is

i) casual

ii) anti casual & stable

c) Obtain the Fourier transform of following signals

i) $x(t) = e^{-3|t|}$

ii) $x(t) = \delta(t-3)$

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGGNIRING
Signals & Systems (BTN04401)

Day & Date: Monday 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the Nyquist frequency for the signal $x(t) = 3\cos 50\,\pi t + 10\sin 300\pi t - \cos 100\pi t$?
a) 50Hz b) 100Hz
c) 200Hz d) 300Hz

2) The DC coefficient a_0 for the signal $x(t) = 5\cos(2t)$ is _____
a) 2 b) 5
c) 0 d) None of these

3) A system is having impulse response $h(t)$ will be BIBO stable if _____
a) $\int_{-\infty}^{\infty}|h(t)| > \infty$ b) $\int_{-\infty}^{\infty}|h(t)| < \infty$
c) $\int_{-\infty}^{\infty}|h(t)| = 0$ d) $\int_{-\infty}^{\infty}|h(t)| = 1$

4) A signal $x(t)$ is said to be even if _____
a) $x(t) = -x(t)$ b) $x(t) = x(-t)$
c) $x(t) = -x(-t)$ d) $-x(t) = x(-t)$

5) An LTI system is stable if and only if the ROC of its system function $H(z)$ _____
a) Exterior to a circle b) Interior of a circle
c) Includes unity circle d) None of these

6) If $X(\omega)$ is the Fourier transform of the signal $x(n)$, then what is the Fourier transform of the signal $x(n-k)$?
a) $e^{j\omega k}.X(-\omega)$ b) $e^{j\omega k}.X(\omega)$
c) $e^{-j\omega k}.X(-\omega)$ d) $e^{-j\omega k}.X(\omega)$

7) A function having frequency f is to be sampled. The sampling time T should be _____

a) $T = \frac{1}{2f}$ b) $T > \frac{1}{2f}$

c) $T < \frac{1}{2f}$ d) $T \geq \frac{1}{2f}$

8) The output of LTI system with input $x(t) = u(t)$ and impulse response $h(t) = \delta(t-1)$ is _____

a) $u(t)$ b) $u(t-1)$

c) $u(t-4)$ d) $\delta(t-2)$

9) A memory less system is also known as _____ System

a) Casual b) Static

c) Dynamic d) Non casual

10) Fourier transform of unity is _____.

a) $\delta(w)$ b) $\pi\,\delta(w)$

c) $2\pi\,\delta(w)$ d) Unit step signal

11) A discrete time LTI system is casual if _____

a) $h[n] = 0$ for $n = 0$ b) $h[n] = 0$ for $n < 0$

c) $h[n] = 0$ for $n \neq 0$ d) $h[n] = 0$ for $n > 0$

12) The signal $u(t) - u(t-10)$ is _____

a) Periodic b) A periodic

c) Casual d) Aperiodic & casual

13) If $x[n] = \{1,2,3\}$ and $h[n] = \{3,4,5\}$ and $y[n] = x[n]^* h[n]$, the length of $y[n]$ is _____

a) 5 b) 6

c) 7 d) 3

14) Which of the following is the method used for reconstruction of signal from its samples?

a) Zero order hold b) Linear interpolation

c) Both a and b d) None of these

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGGNIRING
Signals & Systems (BTN04401)

Day & Date: Monday 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume Suitable data if required & state the assumptions.

Section – I

Q.2 Solve the following (Any Four) **16**

a) Obtain and sketch the even and odd parts of the discrete time signal $x[n]$ shown below

$$x[n] = \{5,2,1,4\}$$
$$\uparrow$$

b) Determine whether or not the following signals are periodic or not. If the signal is periodic determine the fundamental period.

i) $3\cos(3t + \pi/4)$

ii) $x[n] = \sin(2\pi n/5 + 2)$

c) Give expression for Exponential Fourier series & derive the expression for computing the coefficients a_0 and a_k of Exponential Fourier Series

d) If $u(t)$ is unit step signal and $\delta(t)$ is unit impulse sequence sketch & label following signals

i) $u(t+1)$

ii) $\delta(t+1) - \delta(t+2)$

iii) $u(t) + u(t-1)$

iv) $u(t) - u(t-2)$

e) Consider the signal $x(t)$ as given below.

$$x(t) = \begin{cases} 1 & 0 < t < 1 \\ -1 & 1 \leq t \leq 3 \end{cases}$$

Sketch and label following signals

i) $x(t+1)$

ii) $x(-t)$

iii) $x(t)u(t-1)$

Q.3 Solve the following (Any Two) **12**

a) Obtain the convolution sum of following signals

$x[n] = \{1,2,\}$ and $h[n] = \{3,2,1\}$

$\uparrow$ $\uparrow$

b) Determine the Exponential Fourier series representation for the following signals

$x(t)$ periodic with period 2 and

$$x(t) = \begin{cases} 1 & 0 < t < 1 \\ -1 & 1 \leq t \leq 2 \end{cases}$$

c) Consider the cascade connection of two LTI systems with impulse responses $h1(t)$ and $h2(t)$ where

$h1(t) = u(t-1)$ and $h2(t) = u(t)$

Compute the impulse response of overall system

Section – II

Q.4 Solve the following (Any Four) **16**

a) Explain in brief sample with zero order hold.

b) State the conditions for ROC of system function $H(z)$ of an LTI system for stable system. Obtain impulse response of system if following system is stable.

$$H(z) = \frac{z}{z-2} + \frac{z}{z-1/4}$$

c) The analog signal $x(t)$ is given below

$$x(t) = 3\sin(2000\pi t) + 10\cos(1400\pi t) - \sin(2500\pi t)$$

Calculate the Nyquist sampling rate for the signal. Also find the discrete time signal if sampled with $Fs = 3000\text{Hz}$

d) Given the Fourier transform of $x(t)$ as $X(j\omega)$, express the Fourier transform of following signal in terms of $X(j\omega)$ using the suitable properties of Fourier transform. State the properties used.

$$x1(t) = x(t-1)$$

e) State & prove following properties of continuous time Fourier transform

i) Time Shifting

ii) Time and frequency Scaling

Q.5 Solve the following (Any Two) **12**

a) State sampling theorem. Explain with suitable equations & diagrams how the original signal can be reconstructed from the samples using ideal low pass filter

b) Consider an LTI system with the system function

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

Obtain the impulse response $h(t)$ of the system and state the region of convergence of the system if the system is

i) casual

ii) anti casual & stable

c) Obtain the Fourier transform of following signals

i) $x(t) = e^{-3|t|}$

ii) $x(t) = \delta(t-3)$

Seat No.	

Set R

S. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGGNIRING
Signals & Systems (BTN04401)

Day & Date: Monday 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) A signal $x(t)$ is said to be even if _____
a) $x(t) = -x(t)$ b) $x(t) = x(-t)$
c) $x(t) = -x(-t)$ d) $-x(t) = x(-t)$

2) An LTI system is stable if and only if the ROC of its system function $H(z)$ _____
a) Exterior to a circle b) Interior of a circle
c) Includes unity circle d) None of these

3) If $X(\omega)$ is the Fourier transform of the signal $x(n)$, then what is the Fourier transform of the signal $x(n-k)$?
a) $e^{j\omega k}.X(-\omega)$ b) $e^{j\omega k}.X(\omega)$
c) $e^{-j\omega k}.X(-\omega)$ d) $e^{-j\omega k}.X(\omega)$

4) A function having frequency f is to be sampled. The sampling time T should be _____
a) $T = \frac{1}{2f}$ b) $T > \frac{1}{2f}$
c) $T < \frac{1}{2f}$ d) $T \geq \frac{1}{2f}$

5) The output of LTI system with input $x(t) = u(t)$ and impulse response $h(t) = \delta(t-1)$ is _____
a) $u(t)$ b) $u(t-1)$
c) $u(t-4)$ d) $\delta(t-2)$

6) A memory less system is also known as _____ System
a) Casual b) Static
c) Dynamic d) Non casual

7) Fourier transform of unity is _____.

a) $\delta(w)$ b) $\pi\,\delta(w)$

c) $2\pi\,\delta(w)$ d) Unit step signal

8) A discrete time LTI system is casual if _____

a) $h[n] = 0$ for $n = 0$ b) $h[n] = 0$ for $n < 0$

c) $h[n] = 0$ for $n \neq 0$ d) $h[n] = 0$ for $n > 0$

9) The signal $u(t) - u(t-10)$ is _____

a) Periodic b) A periodic

c) Casual d) Aperiodic & casual

10) If $x[n] = \{1,2,3\}$ and $h[n] = \{3,4,5\}$ and $y[n] = x[n]^* h[n]$, the length of $y[n]$ is _____

a) 5 b) 6

c) 7 d) 3

11) Which of the following is the method used for reconstruction of signal from its samples?

a) Zero order hold b) Linear interpolation

c) Both a and b d) None of these

12) What is the Nyquist frequency for the signal $x(t) = 3\cos 50\,\pi t + 10\sin 300\pi t - \cos 100\pi t$?

a) 50Hz b) 100Hz

c) 200Hz d) 300Hz

9) The DC coefficient a_0 for the signal $x(t) = 5\cos(2t)$ is _____

a) 2 b) 5

c) 0 d) None of these

10) A system is having impulse response $h(t)$ will be BIBO stable if _____

a) $\int_{-\infty}^{\infty} |h(t)| > \infty$ b) $\int_{-\infty}^{\infty} |h(t)| < \infty$

c) $\int_{-\infty}^{\infty} |h(t)| = 0$ d) $\int_{-\infty}^{\infty} |h(t)| = 1$

Seat No.	

Set R

S. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGGNIRING
Signals & Systems (BTN04401)

Day & Date: Monday 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume Suitable data if required & state the assumptions.

Section – I

Q.2 Solve the following (Any Four) **16**

a) Obtain and sketch the even and odd parts of the discrete time signal $x[n]$ shown below

$$x[n] = \{5,2,1,4\}$$
$$\uparrow$$

b) Determine whether or not the following signals are periodic or not. If the signal is periodic determine the fundamental period.

i) $3\cos(3t + \pi/4)$

ii) $x[n] = \sin(2\pi n/5 + 2)$

c) Give expression for Exponential Fourier series & derive the expression for computing the coefficients a_0 and a_k of Exponential Fourier Series

d) If $u(t)$ is unit step signal and $\delta(t)$ is unit impulse sequence sketch & label following signals

i) $u(t+1)$

ii) $\delta(t+1) - \delta(t+2)$

iii) $u(t) + u(t-1)$

iv) $u(t) - u(t-2)$

e) Consider the signal $x(t)$ as given below.

$$x(t) = \begin{cases} 1 & 0 < t < 1 \\ -1 & 1 \leq t \leq 3 \end{cases}$$

Sketch and label following signals

i) $x(t+1)$

ii) $x(-t)$

iii) $x(t)u(t-1)$

Q.3 Solve the following (Any Two) **12**

a) Obtain the convolution sum of following signals

$x[n] = \{1,2,\}$ and $h[n] = \{3,2,1\}$

$\uparrow$ $\uparrow$

b) Determine the Exponential Fourier series representation for the following signals

$x(t)$ periodic with period 2 and

$$x(t) = \begin{cases} 1 & 0 < t < 1 \\ -1 & 1 \leq t \leq 2 \end{cases}$$

c) Consider the cascade connection of two LTI systems with impulse responses $h1(t)$ and $h2(t)$ where

$h1(t) = u(t-1)$ and $h2(t) = u(t)$

Compute the impulse response of overall system

Section – II

Q.4 Solve the following (Any Four) **16**

a) Explain in brief sample with zero order hold.

b) State the conditions for ROC of system function $H(z)$ of an LTI system for stable system. Obtain impulse response of system if following system is stable.

$$H(z) = \frac{z}{z-2} + \frac{z}{z-1/4}$$

c) The analog signal $x(t)$ is given below

$$x(t) = 3\sin(2000\pi t) + 10\cos(1400\pi t) - \sin(2500\pi t)$$

Calculate the Nyquist sampling rate for the signal. Also find the discrete time signal if sampled with $Fs = 3000\text{Hz}$

d) Given the Fourier transform of $x(t)$ as $X(j\omega)$, express the Fourier transform of following signal in terms of $X(j\omega)$ using the suitable properties of Fourier transform. State the properties used.

$$x1(t) = x(t-1)$$

e) State & prove following properties of continuous time Fourier transform

i) Time Shifting

ii) Time and frequency Scaling

Q.5 Solve the following (Any Two) **12**

a) State sampling theorem. Explain with suitable equations & diagrams how the original signal can be reconstructed from the samples using ideal low pass filter

b) Consider an LTI system with the system function

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

Obtain the impulse response $h(t)$ of the system and state the region of convergence of the system if the system is

i) casual

ii) anti casual & stable

c) Obtain the Fourier transform of following signals

i) $x(t) = e^{-3|t|}$

ii) $x(t) = \delta(t-3)$

Seat No.		Set	S

S. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGGNIRING
Signals & Systems (BTN04401)

Day & Date: Monday 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) If $x[n] = \{1,2,3\}$ and $h[n] = \{3,4,5\}$ and $y[n] = x[n]^* h[n]$, the length of $y[n]$ is _____
a) 5 b) 6
c) 7 d) 3

2) Which of the following is the method used for reconstruction of signal from its samples?
a) Zero order hold b) Linear interpolation
c) Both a and b d) None of these

3) What is the Nyquist frequency for the signal $x(t) = 3\cos 50\,\pi t + 10\sin 300\pi t - \cos 100\pi t$?
a) 50Hz b) 100Hz
c) 200Hz d) 300Hz

4) The DC coefficient a_0 for the signal $x(t) = 5\cos(2t)$ is _____
a) 2 b) 5
c) 0 d) None of these

5) A system is having impulse response $h(t)$ will be BIBO stable if _____
a) $\int_{-\infty}^{\infty} |h(t)| > \infty$ b) $\int_{-\infty}^{\infty} |h(t)| < \infty$
c) $\int_{-\infty}^{\infty} |h(t)| = 0$ d) $\int_{-\infty}^{\infty} |h(t)| = 1$

6) A signal $x(t)$ is said to be even if _____
a) $x(t) = -x(t)$ b) $x(t) = x(-t)$
c) $x(t) = -x(-t)$ d) $-x(t) = x(-t)$

7) An LTI system is stable if and only if the ROC of its system function $H(z)$ _____

a) Exterior to a circle
b) Interior of a circle
c) Includes unity circle
d) None of these

8) If $X(\omega)$ is the Fourier transform of the signal $x(n)$, then what is the Fourier transform of the signal $x(n-k)$?

a) $e^{j\omega k}.X(-\omega)$
b) $e^{j\omega k}.X(\omega)$
c) $e^{-j\omega k}.X(-\omega)$
d) $e^{-j\omega k}.X(\omega)$

9) A function having frequency f is to be sampled. The sampling time T should be _____

a) $T = \frac{1}{2f}$
b) $T > \frac{1}{2f}$
c) $T < \frac{1}{2f}$
d) $T \geq \frac{1}{2f}$

10) The output of LTI system with input $x(t) = u(t)$ and impulse response $h(t) = \delta(t-1)$ is _____

a) $u(t)$
b) $u(t-1)$
c) $u(t-4)$
d) $\delta(t-2)$

11) A memory less system is also known as _____ System

a) Casual
b) Static
c) Dynamic
d) Non casual

12) Fourier transform of unity is _____.

a) $\delta(w)$
b) $\pi\ \delta(w)$
c) $2\pi\ \delta(w)$
d) Unit step signal

13) A discrete time LTI system is casual if _____

a) $h[n] = 0$ for $n = 0$
b) $h[n] = 0$ for $n < 0$
c) $h[n] = 0$ for $n \neq 0$
d) $h[n] = 0$ for $n > 0$

14) The signal $u(t) - u(t-10)$ is _____

a) Periodic
b) A periodic
c) Casual
d) Aperiodic & casual

Seat No.	

Set **S**

S. Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGGNIRING
Signals & Systems (BTN04401)

Day & Date: Monday 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume Suitable data if required & state the assumptions.

Section – I

Q.2 Solve the following (Any Four) **16**

a) Obtain and sketch the even and odd parts of the discrete time signal $x[n]$ shown below

$$x[n] = \{5,2,1,4\}$$
$$\uparrow$$

b) Determine whether or not the following signals are periodic or not. If the signal is periodic determine the fundamental period.

i) $3\cos(3t + \pi/4)$

ii) $x[n] = \sin(2\pi n/5 + 2)$

c) Give expression for Exponential Fourier series & derive the expression for computing the coefficients a_0 and a_k of Exponential Fourier Series

d) If $u(t)$ is unit step signal and $\delta(t)$ is unit impulse sequence sketch & label following signals

i) $u(t+1)$

ii) $\delta(t+1) - \delta(t+2)$

iii) $u(t) + u(t-1)$

iv) $u(t) - u(t-2)$

e) Consider the signal $x(t)$ as given below.

$$x(t) = \begin{cases} 1 & 0 < t < 1 \\ -1 & 1 \leq t \leq 3 \end{cases}$$

Sketch and label following signals

i) $x(t+1)$

ii) $x(-t)$

iii) $x(t)u(t-1)$

Q.3 Solve the following (Any Two) **12**

a) Obtain the convolution sum of following signals

$x[n] = \{1,2,\}$ and $h[n] = \{3,2,1\}$

$\uparrow$ $\uparrow$

b) Determine the Exponential Fourier series representation for the following signals

$x(t)$ periodic with period 2 and

$$x(t) = \begin{cases} 1 & 0 < t < 1 \\ -1 & 1 \leq t \leq 2 \end{cases}$$

c) Consider the cascade connection of two LTI systems with impulse responses $h1(t)$ and $h2(t)$ where

$h1(t) = u(t-1)$ and $h2(t) = u(t)$

Compute the impulse response of overall system

Section – II

Q.4 Solve the following (Any Four) **16**

a) Explain in brief sample with zero order hold.

b) State the conditions for ROC of system function $H(z)$ of an LTI system for stable system. Obtain impulse response of system if following system is stable.

$$H(z) = \frac{z}{z-2} + \frac{z}{z-1/4}$$

c) The analog signal $x(t)$ is given below

$$x(t) = 3\sin(2000\pi t) + 10\cos(1400\pi t) - \sin(2500\pi t)$$

Calculate the Nyquist sampling rate for the signal. Also find the discrete time signal if sampled with $Fs = 3000\text{Hz}$

d) Given the Fourier transform of $x(t)$ as $X(j\omega)$, express the Fourier transform of following signal in terms of $X(j\omega)$ using the suitable properties of Fourier transform. State the properties used.

$$x1(t) = x(t-1)$$

e) State & prove following properties of continuous time Fourier transform

i) Time Shifting

ii) Time and frequency Scaling

Q.5 Solve the following (Any Two) **12**

a) State sampling theorem. Explain with suitable equations & diagrams how the original signal can be reconstructed from the samples using ideal low pass filter

b) Consider an LTI system with the system function

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

Obtain the impulse response $h(t)$ of the system and state the region of convergence of the system if the system is

i) casual

ii) anti casual & stable

c) Obtain the Fourier transform of following signals

i) $x(t) = e^{-3|t|}$

ii) $x(t) = \delta(t-3)$

SLR-BD-122

Seat No.	

Set P

S.Y (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Control Systems (BTN04402)

Day & Date: Wednesday 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each Question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

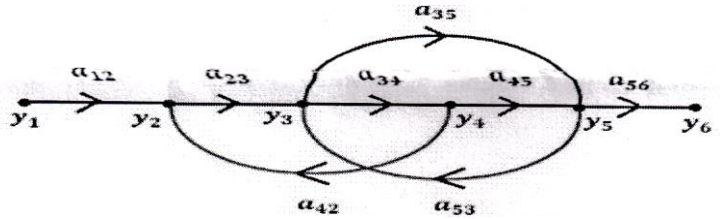
Q.1 Tick marks the correct answer: 14

1) The output of the closed loop control systems is the function of _____.
a) Input b) Output
c) Input and feedback signal d) Output and feedback signal

2) A stepping motor is a _____ device.
a) mechanical b) electrical
c) analogue d) incremental

3) Which of the following synchro's are used for error detection in a servo control system?
a) control transmitter b) control transformer
c) control receiver d) both (a) and (b)

4) The _____ number of forward paths and number of loops _____ are present in given SFG.



a) 2, 2 b) 2, 3
c) 1, 2 d) 1, 3

5) Loops which do not possess any common node are called as _____.
a) Forward loops b) Feedback loops
c) Touching loops d) Nontouching loops

6) A control system having damping factor between 0 and 1, will give ____.
a) Critically damped response b) Underdamped response
c) Undamped response d) No response

7) As type of system is increased _____.
a) More errors are eliminated b) More errors are introduced
c) there is no effect on errors d) none of these

8) The phase lead compensation is used to _____.
a) Increase rise time and decrease overshoot
b) Decrease both rise time and overshoot
c) Increase both rise time and overshoot
d) Decrease rise time and increase overshoot

9) Bandwidth is increased when compensator used is _____.
a) Lead b) Lag
c) Lag-Lead d) None of these

10) Consider the loop transfer function $\frac{K(s+4)}{(s+3)(s+3)}$ in the root locus diagram the centroid will be located at _____.
a) -4 b) -1
c) -2 d) -3

11) The gain margin of a system is 0dB. It represents a _____.
a) stable system b) unstable system
c) marginally stable systems d) conditionally stable system

12) At the gain crossover frequency $|G(j\omega)H(j\omega)| =$ _____.
a) 0db b) 1dB
c) -20dB d) 20dB

13) At which frequency does the magnitude of the system becomes zero dB?
a) Resonant frequency b) Cut-off frequency
c) Gain crossover frequency d) Phase crossover frequency

14) The phase margin of a system is 0^0. It represents a _____.
a) stable system b) unstable system
c) marginally stable systems d) conditionally stable system

Seat No.	

Set **P**

S.Y (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Control Systems (BTN04402)

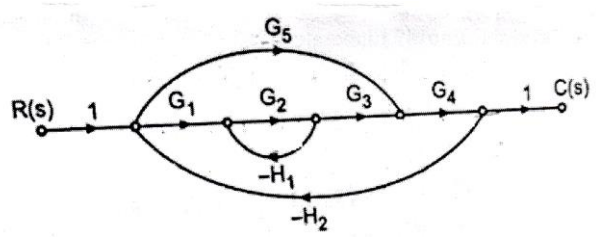
Day & Date: Wednesday 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to right indicate maximum marks.
3) Assume suitable data if required.

Section – I

Q.2 Solve: (Any Four) **16**

a) Using Masons gain formula find the gain of the following system



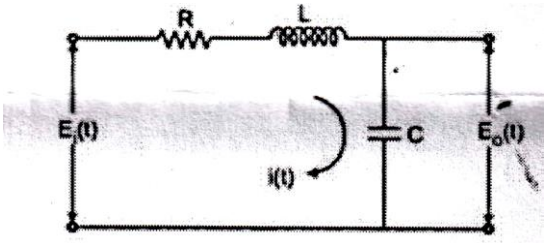
b) A unity feedback control system has $G(S) = \frac{24(s+1)}{s(s+3)(s+4)}$ Determine

i) Type of system
ii) All error coefficients
iii) Error for ramp input with magnitude 4.

c) Derive the expressions of steady state error for Type 0, Type 1 system for step input.

d) Describe construction and working of permanent magnet stepper motor.

e) Determine transfer function of following electrical system.

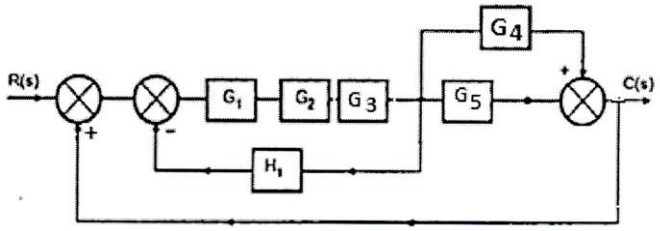


Q.3 Solve: (Any Two) **12**

a) Derive transfer function of armature controlled D.C servometer. Prove that it acts as a closed loop system.

b) A second order system is given by $\frac{C(S)}{R(S)} = \frac{25}{(s^2+6s+25)}$
Find its rise time, percentage over shoot, peak time and settling time.

c) Obtain transfer function for the given system by using block diagram reduction technique.



Section – II

Q.4 Attempt the following. (Any Four) **16**

a) What do you mean by proportional control? Elaborate effect of proportional controller on the performance of system.

b) What is polar plot? Sketch polar plot for Type two system.

c) Consider characteristics equation $s^5 + s^4 + 3s^3 + 2s^2 + 6s + 25 = 0$. Determine stability using Rouths's criterion.

d) Explain frequency domain specifications.

e) Consider a system $G(s)H(s) = \frac{K}{S(S+4)}$ Test a point $S = -3 + j6$ for its existence on root locus and also find corresponding K.

Q.5 Attempt the following. (Any Two) **12**

a) Sketch root locus for system $G(s)H(s) = \frac{K}{s(s+2)(s+4)}$ Comment on stability.

b) A feedback system has $G(s)H(s) = \frac{600(s+4)}{s^2(s+8)(s+24)}$ Sketch the Bode plot and comment on stability.

c) What is compensator? Derive transfer function of lag lead compensator and also explain its polar plot.

Seat No.	

Set **Q**

S.Y (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Control Systems (BTN04402)

Day & Date: Wednesday 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each Question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Tick marks the correct answer: **14**

1) The phase lead compensation is used to _____.
a) Increase rise time and decrease overshoot
b) Decrease both rise time and overshoot
c) Increase both rise time and overshoot
d) Decrease rise time and increase overshoot

2) Bandwidth is increased when compensator used is _____.
a) Lead b) Lag
c) Lag-Lead d) None of these

3) Consider the loop transfer function $\frac{K(s+4)}{(s+3)(s+3)}$ in the root locus diagram the centroid will be located at _____.
a) -4 b) -1
c) -2 d) -3

4) The gain margin of a system is 0dB. It represents a _____.
a) stable system b) unstable system
c) marginally stable systems d) conditionally stable system

5) At the gain crossover frequency $|G(j\omega)H(j\omega)| =$ _____.
a) 0db b) 1dB
c) -20dB d) 20dB

6) At which frequency does the magnitude of the system becomes zero dB?
a) Resonant frequency b) Cut-off frequency
c) Gain crossover frequency d) Phase crossover frequency

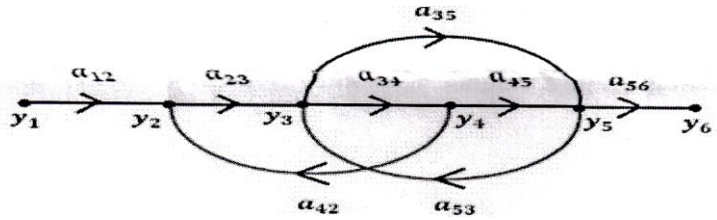
7) The phase margin of a system is 0^0. It represents a _____.
a) stable system b) unstable system
c) marginally stable systems d) conditionally stable system

8) The output of the closed loop control systems is the function of _____.
a) Input b) Output
c) Input and feedback signal d) Output and feedback signal

9) A stepping motor is a _____ device.
a) mechanical b) electrical
c) analogue d) incremental

10) Which of the following synchro's are used for error detection in a servo control system?
a) control transmitter b) control transformer
c) control receiver d) both (a) and (b)

11) The _____ number of forward paths and number of loops _____ are present in given SFG.



a) 2, 2 b) 2, 3
c) 1, 2 d) 1, 3

12) Loops which do not possess any common node are called as _____.
a) Forward loops b) Feedback loops
c) Touching loops d) Nontouching loops

13) A control system having damping factor between 0 and 1, will give ____.
a) Critically damped response b) Underdamped response
c) Undamped response d) No response

14) As type of system is increased _____.
a) More errors are eliminated b) More errors are introduced
c) there is no effect on errors d) none of these

Seat No.	

Set **Q**

S.Y (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Control Systems (BTN04402)

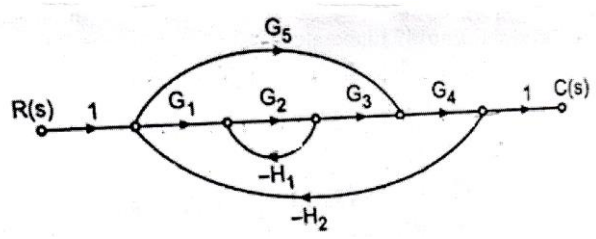
Day & Date: Wednesday 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to right indicate maximum marks.
3) Assume suitable data if required.

Section – I

Q.2 Solve: (Any Four) **16**

a) Using Masons gain formula find the gain of the following system



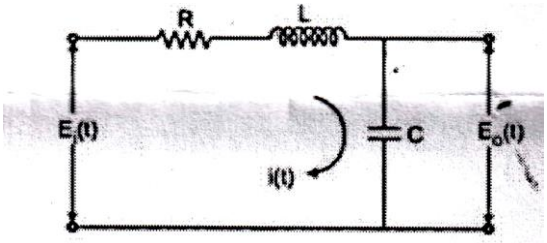
b) A unity feedback control system has $G(S) = \frac{24(s+1)}{s(s+3)(s+4)}$ Determine

i) Type of system
ii) All error coefficients
iii) Error for ramp input with magnitude 4.

c) Derive the expressions of steady state error for Type 0, Type 1 system for step input.

d) Describe construction and working of permanent magnet stepper motor.

e) Determine transfer function of following electrical system.

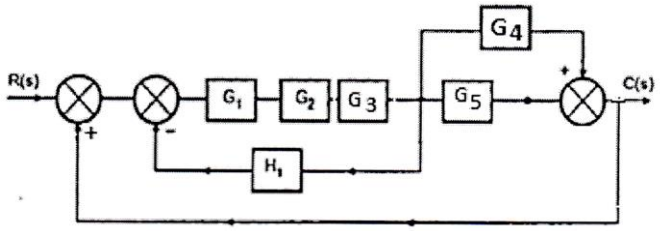


Q.3 Solve: (Any Two) **12**

a) Derive transfer function of armature controlled D.C servometer. Prove that it acts as a closed loop system.

b) A second order system is given by $\frac{C(S)}{R(S)} = \frac{25}{(s^2+6s+25)}$
Find its rise time, percentage over shoot, peak time and settling time.

c) Obtain transfer function for the given system by using block diagram reduction technique.



Section – II

Q.4 Attempt the following. (Any Four) **16**

a) What do you mean by proportional control? Elaborate effect of proportional controller on the performance of system.

b) What is polar plot? Sketch polar plot for Type two system.

c) Consider characteristics equation $s^5 + s^4 + 3s^3 + 2s^2 + 6s + 25 = 0$. Determine stability using Rouths's criterion.

d) Explain frequency domain specifications.

e) Consider a system $G(s)H(s) = \frac{K}{S(S+4)}$ Test a point $S = -3 + j6$ for its existence on root locus and also find corresponding K.

Q.5 Attempt the following. (Any Two) **12**

a) Sketch root locus for system $G(s)H(s) = \frac{K}{s(s+2)(s+4)}$ Comment on stability.

b) A feedback system has $G(s)H(s) = \frac{600(s+4)}{s^2(s+8)(s+24)}$ Sketch the Bode plot and comment on stability.

c) What is compensator? Derive transfer function of lag lead compensator and also explain its polar plot.

Seat No.	

Set R

S.Y (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Control Systems (BTN04402)

Day & Date: Wednesday 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each Question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Tick marks the correct answer: 14

1) The gain margin of a system is 0dB. It represents a _____.
a) stable system b) unstable system
c) marginally stable systems d) conditionally stable system

2) At the gain crossover frequency $|G(j\omega)H(j\omega)| =$ _____.
a) 0db b) 1dB
c) -20dB d) 20dB

3) At which frequency does the magnitude of the system becomes zero dB?
a) Resonant frequency b) Cut-off frequency
c) Gain crossover frequency d) Phase crossover frequency

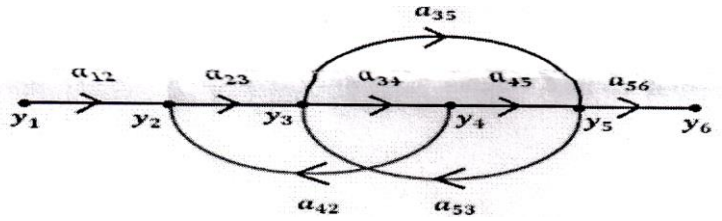
4) The phase margin of a system is 0^0. It represents a _____.
a) stable system b) unstable system
c) marginally stable systems d) conditionally stable system

5) The output of the closed loop control systems is the function of _____.
a) Input b) Output
c) Input and feedback signal d) Output and feedback signal

6) A stepping motor is a _____ device.
a) mechanical b) electrical
c) analogue d) incremental

7) Which of the following synchro's are used for error detection in a servo control system?
a) control transmitter b) control transformer
c) control receiver d) both (a) and (b)

8) The _____ number of forward paths and number of loops _____ are present in given SFG.



a) 2, 2 b) 2, 3
c) 1, 2 d) 1, 3

9) Loops which do not possess any common node are called as _____.
a) Forward loops b) Feedback loops
c) Touching loops d) Nontouching loops

10) A control system having damping factor between 0 and 1, will give ____.
a) Critically damped response b) Underdamped response
c) Undamped response d) No response

11) As type of system is increased _____.
a) More errors are eliminated b) More errors are introduced
c) there is no effect on errors d) none of these

12) The phase lead compensation is used to _____.
a) Increase rise time and decrease overshoot
b) Decrease both rise time and overshoot
c) Increase both rise time and overshoot
d) Decrease rise time and increase overshoot

13) Bandwidth is increased when compensator used is _____.
a) Lead b) Lag
c) Lag-Lead d) None of these

14) Consider the loop transfer function $\frac{K(s+4)}{(s+3)(s+3)}$ in the root locus diagram the centroid will be located at _____.
a) -4 b) -1
c) -2 d) -3

Seat No.	

Set **R**

S.Y (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Control Systems (BTN04402)

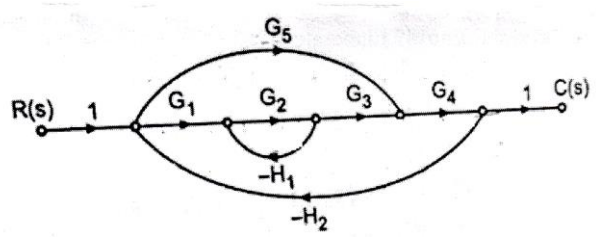
Day & Date: Wednesday 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to right indicate maximum marks.
3) Assume suitable data if required.

Section – I

Q.2 Solve: (Any Four) **16**

a) Using Masons gain formula find the gain of the following system



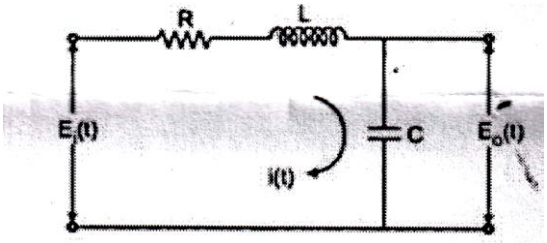
b) A unity feedback control system has $G(S) = \frac{24(s+1)}{s(s+3)(s+4)}$ Determine

i) Type of system
ii) All error coefficients
iii) Error for ramp input with magnitude 4.

c) Derive the expressions of steady state error for Type 0, Type 1 system for step input.

d) Describe construction and working of permanent magnet stepper motor.

e) Determine transfer function of following electrical system.

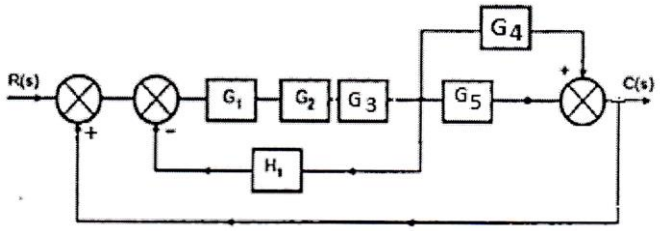


Q.3 Solve: (Any Two) **12**

a) Derive transfer function of armature controlled D.C servometer. Prove that it acts as a closed loop system.

b) A second order system is given by $\frac{C(S)}{R(S)} = \frac{25}{(s^2+6s+25)}$
Find its rise time, percentage over shoot, peak time and settling time.

c) Obtain transfer function for the given system by using block diagram reduction technique.



Section – II

Q.4 Attempt the following. (Any Four) **16**

a) What do you mean by proportional control? Elaborate effect of proportional controller on the performance of system.

b) What is polar plot? Sketch polar plot for Type two system.

c) Consider characteristics equation $s^5 + s^4 + 3s^3 + 2s^2 + 6s + 25 = 0$. Determine stability using Rouths's criterion.

d) Explain frequency domain specifications.

e) Consider a system $G(s)H(s) = \frac{K}{S(S+4)}$ Test a point $S = -3 + j6$ for its existence on root locus and also find corresponding K.

Q.5 Attempt the following. (Any Two) **12**

a) Sketch root locus for system $G(s)H(s) = \frac{K}{s(s+2)(s+4)}$ Comment on stability.

b) A feedback system has $G(s)H(s) = \frac{600(s+4)}{s^2(s+8)(s+24)}$ Sketch the Bode plot and comment on stability.

c) What is compensator? Derive transfer function of lag lead compensator and also explain its polar plot.

Seat No.	

Set **S**

S.Y (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Control Systems (BTN04402)

Day & Date: Wednesday 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each Question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Tick marks the correct answer: 14

1) A control system having damping factor between 0 and 1, will give ____.
a) Critically damped response b) Underdamped response
c) Undamped response d) No response

2) As type of system is increased _____.
a) More errors are eliminated b) More errors are introduced
c) there is no effect on errors d) none of these

3) The phase lead compensation is used to _____.
a) Increase rise time and decrease overshoot
b) Decrease both rise time and overshoot
c) Increase both rise time and overshoot
d) Decrease rise time and increase overshoot

4) Bandwidth is increased when compensator used is _____.
a) Lead b) Lag
c) Lag-Lead d) None of these

5) Consider the loop transfer function $\frac{K(s+4)}{(s+3)(s+3)}$ in the root locus diagram the centroid will be located at _____.
a) -4 b) -1
c) -2 d) -3

6) The gain margin of a system is 0dB. It represents a _____.
a) stable system b) unstable system
c) marginally stable systems d) conditionally stable system

7) At the gain crossover frequency $|G(j\omega)H(j\omega)| =$ _____.
a) 0db b) 1dB
c) -20dB d) 20dB

8) At which frequency does the magnitude of the system becomes zero dB?
a) Resonant frequency b) Cut-off frequency
c) Gain crossover frequency d) Phase crossover frequency

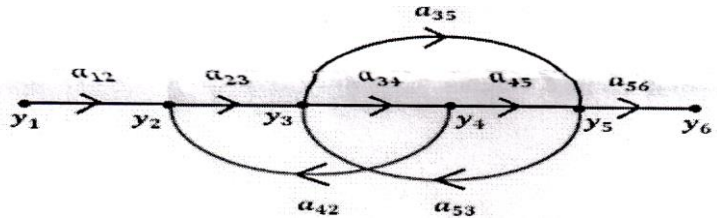
9) The phase margin of a system is 0^0. It represents a _____.
a) stable system b) unstable system
c) marginally stable systems d) conditionally stable system

10) The output of the closed loop control systems is the function of _____.
a) Input b) Output
c) Input and feedback signal d) Output and feedback signal

11) A stepping motor is a _____ device.
a) mechanical b) electrical
c) analogue d) incremental

12) Which of the following synchro's are used for error detection in a servo control system?
a) control transmitter b) control transformer
c) control receiver d) both (a) and (b)

13) The _____ number of forward paths and number of loops _____ are present in given SFG.



a) 2, 2 b) 2, 3
c) 1, 2 d) 1, 3

14) Loops which do not possess any common node are called as _____.
a) Forward loops b) Feedback loops
c) Touching loops d) Nontouching loops

Seat No.	

Set **S**

S.Y (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Control Systems (BTN04402)

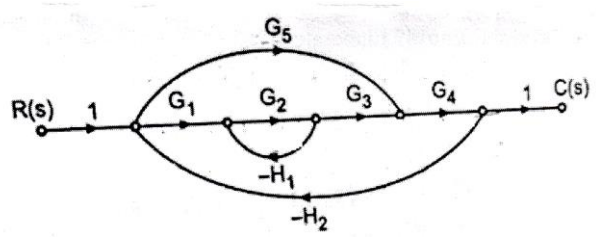
Day & Date: Wednesday 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to right indicate maximum marks.
3) Assume suitable data if required.

Section – I

Q.2 Solve: (Any Four) **16**

a) Using Masons gain formula find the gain of the following system



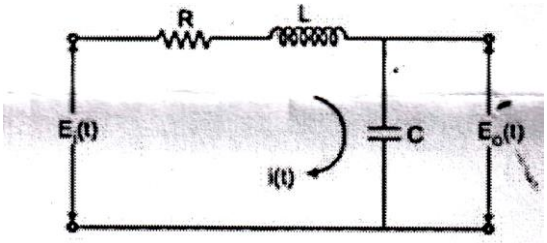
b) A unity feedback control system has $G(S) = \frac{24(s+1)}{s(s+3)(s+4)}$ Determine

i) Type of system
ii) All error coefficients
iii) Error for ramp input with magnitude 4.

c) Derive the expressions of steady state error for Type 0, Type 1 system for step input.

d) Describe construction and working of permanent magnet stepper motor.

e) Determine transfer function of following electrical system.

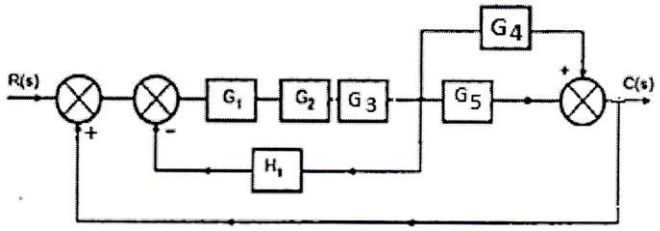


Q.3 Solve: (Any Two) **12**

a) Derive transfer function of armature controlled D.C servometer. Prove that it acts as a closed loop system.

b) A second order system is given by $\frac{C(S)}{R(S)} = \frac{25}{(s^2+6s+25)}$
Find its rise time, percentage over shoot, peak time and settling time.

c) Obtain transfer function for the given system by using block diagram reduction technique.



Section – II

Q.4 Attempt the following. (Any Four) **16**

a) What do you mean by proportional control? Elaborate effect of proportional controller on the performance of system.

b) What is polar plot? Sketch polar plot for Type two system.

c) Consider characteristics equation $s^5 + s^4 + 3s^3 + 2s^2 + 6s + 25 = 0$. Determine stability using Rouths's criterion.

d) Explain frequency domain specifications.

e) Consider a system $G(s)H(s) = \frac{K}{S(S+4)}$ Test a point $S = -3 + j6$ for its existence on root locus and also find corresponding K.

Q.5 Attempt the following. (Any Two) **12**

a) Sketch root locus for system $G(s)H(s) = \frac{K}{s(s+2)(s+4)}$ Comment on stability.

b) A feedback system has $G(s)H(s) = \frac{600(s+4)}{s^2(s+8)(s+24)}$ Sketch the Bode plot and comment on stability.

c) What is compensator? Derive transfer function of lag lead compensator and also explain its polar plot.

SLR-BD-123

Seat No.	

Set P

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Data Structures and Algorithms (BTN04405)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Pushing an element into stack already having five elements and stack size of 5, then stack becomes _____.
a) Overflow b) Crash
c) Underflow d) User flow

2) In linked list implementation of a queue, from where is the item deleted?
a) At the tail of the link list
b) At the centre position in the link list
c) At the head of link list
d) None of the mentioned

3) What is the need for a circular queue?
a) effective usage of memory b) easier computations
c) all of the mentioned d) none of the mentioned

4) The result of evaluating the postfix expression 5, 4, 6, +, *, 4, 9, 3, /, +, * is?
a) 600 b) 350
c) 650 d) 588

5) In linked list each node contains minimum of two fields. One field is data field to store the data second field is?
a) Pointer to character b) Pointer to integer
c) Pointer to node d) Node

6) Which of these is an application of linked lists?
a) To implement file systems
b) For separate chaining in hash-tables
c) To implement non-binary trees
d) All of the mentioned

7) Which of the following statements is true?
a) Recursion is always better than iteration
b) Recursion uses more memory compared to iteration
c) Recursion uses less memory compared to iteration
d) Iteration is always better and simpler than recursion

8) The number of edges from the root to the node is called _____ of the tree.
a) Height b) Depth
c) Length d) None of the mentioned

9) What is a hash function?
a) A function has allocated memory to keys
b) A function that computes the location of the key in the array
c) A function that creates an array
d) None of the mentioned

10) Binary Search can be categorized into which of the following?
a) Brute Force technique b) Divide and conquer
c) Greedy algorithm d) Dynamic programming

11) What is the worst case for linear search?
a) O(nlogn) b) O(logn)
c) O(n) d) O(1)

12) What is the specialty about the inorder traversal of a binary search tree?
a) It traverses in a non increasing order
b) It traverses in an increasing order
c) It traverses in a random fashion
d) None of the mentioned

13) The number of elements in the adjacency matrix of a graph having 7 vertices is _____.
a) 7 b) 14
c) 36 d) 49

14) Which traversal algorithm is typically implemented using a stack data structure?
a) Depth First Search b) Breadth First Search
c) Both a) and b) d) Neither a) nor b)

Seat No.	

Set **P**

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Data Structures and Algorithms (BTN04405)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

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

a) What is Avail List? Elaborate with getnode and freenode algorithm.
b) Convert the following infix expression to postfix expression using stack:
(A + B) / (C - D) + E
c) Define queue. Explain the different type of queues with suitable diagram.
d) Write a C program to find the factorial of a number with recursive functions.
e) Explain the addition of two polynomials using linked list.

Q.3 Attempt any two: **12**

a) Evaluate the following postfix expression using stack.
1) 9, 2, 3, +, -, 4, /
2) 6, 2, 2, *, +, 2, /
b) Draw the recursive flowchart. Write a C program to find the multiplication of two numbers with recursive functions.
c) Write a ‘C’ program to implement circular queue using array to perform the operations like enq, deq and display the elements of a queue.

Section – II

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

a) Define the following terms of tree:
1) Siblings
2) Leaf node
3) Root node
4) Parent node
b) Explain the algorithm of linear search with example.
c) Explain any two hashing functions with example.
d) Describe the adjacency matrix representation of a graph with example.
e) Explain bubble sort method. Sort the following using bubble sort and show all the iterations.
25, 22,16, 42, 32

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

a) What are the different tree traversal methods? Elaborate it with example.

b) Explain any one graph traversal method with flowchart and example.

c) Explain quick sort? Sort the following sequence in ascending order using quick sort.
48, 44, 19, 59, 72, 80, 42, 65, 83, 18, 95, 68

Seat No.	

Set **Q**

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Data Structures and Algorithms (BTN04405)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) The number of edges from the root to the node is called _____ of the tree.
a) Height b) Depth
c) Length d) None of the mentioned

2) What is a hash function?
a) A function has allocated memory to keys
b) A function that computes the location of the key in the array
c) A function that creates an array
d) None of the mentioned

3) Binary Search can be categorized into which of the following?
a) Brute Force technique b) Divide and conquer
c) Greedy algorithm d) Dynamic programming

4) What is the worst case for linear search?
a) O(nlogn) b) O(logn)
c) O(n) d) O(1)

5) What is the specialty about the inorder traversal of a binary search tree?
a) It traverses in a non increasing order
b) It traverses in an increasing order
c) It traverses in a random fashion
d) None of the mentioned

6) The number of elements in the adjacency matrix of a graph having 7 vertices is _____.
a) 7 b) 14
c) 36 d) 49

7) Which traversal algorithm is typically implemented using a stack data structure?

a) Depth First Search b) Breadth First Search
c) Both a) and b) d) Neither a) nor b)

8) Pushing an element into stack already having five elements and stack size of 5, then stack becomes _____.

a) Overflow b) Crash
c) Underflow d) User flow

9) In linked list implementation of a queue, from where is the item deleted?

a) At the tail of the link list
b) At the centre position in the link list
c) At the head of link list
d) None of the mentioned

10) What is the need for a circular queue?

a) effective usage of memory b) easier computations
c) all of the mentioned d) none of the mentioned

11) The result of evaluating the postfix expression 5, 4, 6, +, *, 4, 9, 3, /, +, * is?

a) 600 b) 350
c) 650 d) 588

12) In linked list each node contains minimum of two fields. One field is data field to store the data second field is?

a) Pointer to character b) Pointer to integer
c) Pointer to node d) Node

13) Which of these is an application of linked lists?

a) To implement file systems
b) For separate chaining in hash-tables
c) To implement non-binary trees
d) All of the mentioned

14) Which of the following statements is true?

a) Recursion is always better than iteration
b) Recursion uses more memory compared to iteration
c) Recursion uses less memory compared to iteration
d) Iteration is always better and simpler than recursion

Seat No.	

Set **Q**

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Data Structures and Algorithms (BTN04405)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

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

a) What is Avail List? Elaborate with getnode and freenode algorithm.
b) Convert the following infix expression to postfix expression using stack:
(A + B) / (C - D) + E
c) Define queue. Explain the different type of queues with suitable diagram.
d) Write a C program to find the factorial of a number with recursive functions.
e) Explain the addition of two polynomials using linked list.

Q.3 Attempt any two: **12**

a) Evaluate the following postfix expression using stack.
1) 9, 2, 3, +, -, 4, /
2) 6, 2, 2, *, +, 2, /
b) Draw the recursive flowchart. Write a C program to find the multiplication of two numbers with recursive functions.
c) Write a ‘C’ program to implement circular queue using array to perform the operations like enq, deq and display the elements of a queue.

Section – II

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

a) Define the following terms of tree:
1) Siblings
2) Leaf node
3) Root node
4) Parent node
b) Explain the algorithm of linear search with example.
c) Explain any two hashing functions with example.
d) Describe the adjacency matrix representation of a graph with example.
e) Explain bubble sort method. Sort the following using bubble sort and show all the iterations.
25, 22,16, 42, 32

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

a) What are the different tree traversal methods? Elaborate it with example.

b) Explain any one graph traversal method with flowchart and example.

c) Explain quick sort? Sort the following sequence in ascending order using quick sort.
48, 44, 19, 59, 72, 80, 42, 65, 83, 18, 95, 68

Seat No.	

Set R

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Data Structures and Algorithms (BTN04405)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) What is the worst case for linear search?
a) O(nlogn) b) O(logn)
c) O(n) d) O(1)

2) What is the specialty about the inorder traversal of a binary search tree?
a) It traverses in a non increasing order
b) It traverses in an increasing order
c) It traverses in a random fashion
d) None of the mentioned

3) The number of elements in the adjacency matrix of a graph having 7 vertices is _____.
a) 7 b) 14
c) 36 d) 49

4) Which traversal algorithm is typically implemented using a stack data structure?
a) Depth First Search b) Breadth First Search
c) Both a) and b) d) Neither a) nor b)

5) Pushing an element into stack already having five elements and stack size of 5, then stack becomes _____.
a) Overflow b) Crash
c) Underflow d) User flow

6) In linked list implementation of a queue, from where is the item deleted?
a) At the tail of the link list
b) At the centre position in the link list
c) At the head of link list
d) None of the mentioned

7) What is the need for a circular queue?
a) effective usage of memory b) easier computations
c) all of the mentioned d) none of the mentioned

8) The result of evaluating the postfix expression 5, 4, 6, +, *, 4, 9, 3, /, +, * is?
a) 600 b) 350
c) 650 d) 588

9) In linked list each node contains minimum of two fields. One field is data field to store the data second field is?
a) Pointer to character b) Pointer to integer
c) Pointer to node d) Node

10) Which of these is an application of linked lists?
a) To implement file systems
b) For separate chaining in hash-tables
c) To implement non-binary trees
d) All of the mentioned

11) Which of the following statements is true?
a) Recursion is always better than iteration
b) Recursion uses more memory compared to iteration
c) Recursion uses less memory compared to iteration
d) Iteration is always better and simpler than recursion

12) The number of edges from the root to the node is called _____ of the tree.
a) Height b) Depth
c) Length d) None of the mentioned

13) What is a hash function?
a) A function has allocated memory to keys
b) A function that computes the location of the key in the array
c) A function that creates an array
d) None of the mentioned

14) Binary Search can be categorized into which of the following?
a) Brute Force technique b) Divide and conquer
c) Greedy algorithm d) Dynamic programming

SLR-BD-123

Seat No.	

Set R

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Data Structures and Algorithms (BTN04405)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

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

a) What is Avail List? Elaborate with getnode and freenode algorithm.
b) Convert the following infix expression to postfix expression using stack:
(A + B) / (C - D) + E
c) Define queue. Explain the different type of queues with suitable diagram.
d) Write a C program to find the factorial of a number with recursive functions.
e) Explain the addition of two polynomials using linked list.

Q.3 Attempt any two: **12**

a) Evaluate the following postfix expression using stack.
1) 9, 2, 3, +, -, 4, /
2) 6, 2, 2, *, +, 2, /
b) Draw the recursive flowchart. Write a C program to find the multiplication of two numbers with recursive functions.
c) Write a ‘C’ program to implement circular queue using array to perform the operations like enq, deq and display the elements of a queue.

Section – II

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

a) Define the following terms of tree:
1) Siblings
2) Leaf node
3) Root node
4) Parent node
b) Explain the algorithm of linear search with example.
c) Explain any two hashing functions with example.
d) Describe the adjacency matrix representation of a graph with example.
e) Explain bubble sort method. Sort the following using bubble sort and show all the iterations.
25, 22,16, 42, 32

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

a) What are the different tree traversal methods? Elaborate it with example.

b) Explain any one graph traversal method with flowchart and example.

c) Explain quick sort? Sort the following sequence in ascending order using quick sort.
48, 44, 19, 59, 72, 80, 42, 65, 83, 18, 95, 68

Seat No.		Set	S

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Data Structures and Algorithms (BTN04405)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of these is an application of linked lists?
a) To implement file systems
b) For separate chaining in hash-tables
c) To implement non-binary trees
d) All of the mentioned

2) Which of the following statements is true?
a) Recursion is always better than iteration
b) Recursion uses more memory compared to iteration
c) Recursion uses less memory compared to iteration
d) Iteration is always better and simpler than recursion

3) The number of edges from the root to the node is called _____ of the tree.
a) Height b) Depth
c) Length d) None of the mentioned

4) What is a hash function?
a) A function has allocated memory to keys
b) A function that computes the location of the key in the array
c) A function that creates an array
d) None of the mentioned

5) Binary Search can be categorized into which of the following?
a) Brute Force technique b) Divide and conquer
c) Greedy algorithm d) Dynamic programming

6) What is the worst case for linear search?
a) O(nlogn) b) O(logn)
c) O(n) d) O(1)

7) What is the specialty about the inorder traversal of a binary search tree?
a) It traverses in a non increasing order
b) It traverses in an increasing order
c) It traverses in a random fashion
d) None of the mentioned

8) The number of elements in the adjacency matrix of a graph having 7 vertices is _____.
a) 7 b) 14
c) 36 d) 49

9) Which traversal algorithm is typically implemented using a stack data structure?
a) Depth First Search b) Breadth First Search
c) Both a) and b) d) Neither a) nor b)

10) Pushing an element into stack already having five elements and stack size of 5, then stack becomes _____.
a) Overflow b) Crash
c) Underflow d) User flow

11) In linked list implementation of a queue, from where is the item deleted?
a) At the tail of the link list
b) At the centre position in the link list
c) At the head of link list
d) None of the mentioned

12) What is the need for a circular queue?
a) effective usage of memory b) easier computations
c) all of the mentioned d) none of the mentioned

13) The result of evaluating the postfix expression 5, 4, 6, +, *, 4, 9, 3, /, +, * is?
a) 600 b) 350
c) 650 d) 588

14) In linked list each node contains minimum of two fields. One field is data field to store the data second field is?
a) Pointer to character b) Pointer to integer
c) Pointer to node d) Node

SLR-BD-123

Seat No.		Set	S

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Data Structures and Algorithms (BTN04405)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

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

a) What is Avail List? Elaborate with getnode and freenode algorithm.
b) Convert the following infix expression to postfix expression using stack:
(A + B) / (C - D) + E
c) Define queue. Explain the different type of queues with suitable diagram.
d) Write a C program to find the factorial of a number with recursive functions.
e) Explain the addition of two polynomials using linked list.

Q.3 Attempt any two: **12**

a) Evaluate the following postfix expression using stack.
1) 9, 2, 3, +, -, 4, /
2) 6, 2, 2, *, +, 2, /
b) Draw the recursive flowchart. Write a C program to find the multiplication of two numbers with recursive functions.
c) Write a ‘C’ program to implement circular queue using array to perform the operations like enq, deq and display the elements of a queue.

Section – II

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

a) Define the following terms of tree:
1) Siblings
2) Leaf node
3) Root node
4) Parent node
b) Explain the algorithm of linear search with example.
c) Explain any two hashing functions with example.
d) Describe the adjacency matrix representation of a graph with example.
e) Explain bubble sort method. Sort the following using bubble sort and show all the iterations.
25, 22,16, 42, 32

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

a) What are the different tree traversal methods? Elaborate it with example.

b) Explain any one graph traversal method with flowchart and example.

c) Explain quick sort? Sort the following sequence in ascending order using quick sort.
48, 44, 19, 59, 72, 80, 42, 65, 83, 18, 95, 68

SLR-BD-124

Seat No.	

Set P

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Analog Integrated Circuits (BTN04403)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Draw neat diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The OP-AMP is basically _____ amplifier.
a) Voltage b) Current
c) Power d) Trans resistance

2) The type of feedback used in closed loop inverting amplifier is _____.
a) Voltage series b) Current series
c) Current shunt d) Voltage shunt

3) I to V converter is special case of _____ amplifier.
a) Non-inverting b) Inverting
c) Differential d) Scaling

4) For IC 741 maximum Input bias current at supply voltage ±15 volts dc is _____.
a) 75 nA b) 100 nA
c) 750 nA d) 500 nA

5) The level shifting stage of Operational amplifier is used to _____.
a) Increase voltage level b) Reduce voltage to zero
c) Increase current level d) None of these

6) Slew rate for op-amp is considered for _____.
a) AC applications b) DC applications
c) Both a & b d) None of these

7) Zero crossing detector is special case of _____.
a) Schmitt trigger b) Peak detector
c) Basic comparator d) Window detector

8) OP-AMP Non inverting buffer is nothing but _____.

a) Inverter
b) Voltage follower
c) Comparator
d) Differentiator

9) The output voltage of op-amp triangular wave generator decreases with _____ frequency.

a) Increase in
b) Decrease in
c) constant
d) Can't say

10) What will be the frequency of output waveform of a square wave generator if R2 = 1.16 R1?

a) $\text{fo} = (1/2\text{RC})$
b) $\text{fo} = (\text{In}/2\text{RC})$
c) $\text{fo} = (\text{In}/2 \times \sqrt{\text{RC}})$
d) $\text{fo} = (\text{In}/(2\sqrt{\text{RC}}))$

11) For Wien bridge oscillator if Fo = 965Hz & C =0.05 μF then R=?

a) $10\ \text{k}\Omega$
b) $3.3\ \text{k}\Omega$
c) $1\ \text{k}\Omega$
d) $15.9\ \text{k}\Omega$

12) Square wave generator is also called as _____.

a) Astable Multivibrator
b) Monostable Multivibrator
c) Bistable Multivibrator
d) None of these

13) Select advantages of Active Filter from following: _____.

a) Frequency adjustment flexibility
b) Gain adjustment flexibility
c) No loading effect
d) All of mentioned

14) In phase shift oscillator _____ RC cascaded networks act as feedback circuit.

a) 2
b) 4
c) 3
d) 1

SLR-BD-124

Seat No.	

Set P

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Analog Integrated Circuits (BTN04403)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagram wherever necessary.

Section – I

Q.2 Attempt any Four **16**

a) Define CMRR. How to improve CMRR?
b) Derive equation for ideal voltage gain of non-inverting amplifier using virtual ground concept.
c) Define the following electrical parameters of IC 741 with practical & ideal values:
1) Input Offset Current
2) Total output offset voltage
3) Thermal Drift
4) PSRR
d) Explain differentiator and its frequency response.
e) Explain the concept of grounded load V-I converter.

Q.3 Attempt any two. **12**

a) Derive expressions for differential voltage gain. R_{in} and R_{out} for DIBO differential amplifier using AC equivalent circuit.
b) Determine the slew rate of a frequency compensated OP-AMP at room temperature, which has a unity cross-over frequency of 5MHz (Assume V_m = 1 V).
c) Draw high frequency equivalent circuit of op-amp & obtain expression for $A_{OL(f)}$ open loop gain as function of frequency.

Section – II

Q.4 Attempt any Four. **16**

a) Explain with neat diagram operation of OP-AMP as Comparator.
b) Explain with neat diagram the basic concept of antilog amplifier using transistor.
c) What are the design procedures for a first order low pass filter.
d) Explain the concept of Wien Bridge Oscillator with neat diagrams.
e) Explain R -2R Ladder DAC technique with circuit diagram & waveforms.

Q.5 Attempt any two. **12**

a) Explain the concept of positive and negative clippers.

b) Design a second order low-pass filter for a cut-off frequency of 1 kHz with a pass band gain of 1.586
(Assume $C_2 = C_3 = 0.005\mu F$ and $R_1 = 33k\Omega$).

c) Explain the operation of Successive Approximation ADC with neat diagrams.

Seat No.	

Set Q

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Analog Integrated Circuits (BTN04403)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Draw neat diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) OP-AMP Non inverting buffer is nothing but _____.
a) Inverter b) Voltage follower
c) Comparator d) Differentiator

2) The output voltage of op-amp triangular wave generator decreases with _____ frequency.
a) Increase in b) Decrease in
c) constant d) Can't say

3) What will be the frequency of output waveform of a square wave generator if R2 = 1.16 R1?
a) $\mathrm{fo} = (1/2\mathrm{RC})$ b) $\mathrm{fo} = (\mathrm{In}/2\mathrm{RC})$
c) $\mathrm{fo} = (\mathrm{In}/2 \times \sqrt{\mathrm{RC}})$ d) $\mathrm{fo} = (\mathrm{In}/(2\sqrt{\mathrm{RC}}))$

4) For Wien bridge oscillator if Fo = 965Hz & C =0.05 $\mu\mathrm{F}$ then R=?
a) $10\ \mathrm{k\Omega}$ b) $3.3\ \mathrm{k\Omega}$
c) $1\ \mathrm{k\Omega}$ d) $15.9\ \mathrm{k\Omega}$

5) Square wave generator is also called as _____.
a) Astable Multivibrator b) Monostable Multivibrator
c) Bistable Multivibrator d) None of these

6) Select advantages of Active Filter from following: _____.
a) Frequency adjustment flexibility
b) Gain adjustment flexibility
c) No loading effect
d) All of mentioned

7) In phase shift oscillator _____ RC cascaded networks act as feedback circuit.

a) 2 b) 4
c) 3 d) 1

8) The OP-AMP is basically _____ amplifier.

a) Voltage b) Current
c) Power d) Trans resistance

9) The type of feedback used in closed loop inverting amplifier is _____.

a) Voltage series b) Current series
c) Current shunt d) Voltage shunt

10) I to V converter is special case of _____ amplifier.

a) Non-inverting b) Inverting
c) Differential d) Scaling

11) For IC 741 maximum Input bias current at supply voltage ±15 volts dc is _____.

a) 75 nA b) 100 nA
c) 750 nA d) 500 nA

12) The level shifting stage of Operational amplifier is used to _____.

a) Increase voltage level b) Reduce voltage to zero
c) Increase current level d) None of these

13) Slew rate for op-amp is considered for _____.

a) AC applications b) DC applications
c) Both a & b d) None of these

14) Zero crossing detector is special case of _____.

a) Schmitt trigger b) Peak detector
c) Basic comparator d) Window detector

SLR-BD-124

Seat No.	

Set Q

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Analog Integrated Circuits (BTN04403)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagram wherever necessary.

Section – I

Q.2 Attempt any Four **16**

a) Define CMRR. How to improve CMRR?
b) Derive equation for ideal voltage gain of non-inverting amplifier using virtual ground concept.
c) Define the following electrical parameters of IC 741 with practical & ideal values:
1) Input Offset Current
2) Total output offset voltage
3) Thermal Drift
4) PSRR
d) Explain differentiator and its frequency response.
e) Explain the concept of grounded load V-I converter.

Q.3 Attempt any two. **12**

a) Derive expressions for differential voltage gain. R_{in} and R_{out} for DIBO differential amplifier using AC equivalent circuit.
b) Determine the slew rate of a frequency compensated OP-AMP at room temperature, which has a unity cross-over frequency of 5MHz (Assume V_m = 1 V).
c) Draw high frequency equivalent circuit of op-amp & obtain expression for $A_{OL(f)}$ open loop gain as function of frequency.

Section – II

Q.4 Attempt any Four. **16**

a) Explain with neat diagram operation of OP-AMP as Comparator.
b) Explain with neat diagram the basic concept of antilog amplifier using transistor.
c) What are the design procedures for a first order low pass filter.
d) Explain the concept of Wien Bridge Oscillator with neat diagrams.
e) Explain R -2R Ladder DAC technique with circuit diagram & waveforms.

Q.5 Attempt any two. **12**

a) Explain the concept of positive and negative clippers.

b) Design a second order low-pass filter for a cut-off frequency of 1 kHz with a pass band gain of 1.586
(Assume $C_2 = C_3 = 0.005\mu F$ and $R_1 = 33k\Omega$).

c) Explain the operation of Successive Approximation ADC with neat diagrams.

Seat No.	

Set **R**

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Analog Integrated Circuits (BTN04403)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Draw neat diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) For Wien bridge oscillator if Fo = 965Hz & C =0.05 μF then R=?
a) $10\ k\Omega$ b) $3.3\ k\Omega$
c) $1\ k\Omega$ d) $15.9\ k\Omega$

2) Square wave generator is also called as _____.
a) Astable Multivibrator b) Monostable Multivibrator
c) Bistable Multivibrator d) None of these

3) Select advantages of Active Filter from following: _____.
a) Frequency adjustment flexibility
b) Gain adjustment flexibility
c) No loading effect
d) All of mentioned

4) In phase shift oscillator _____ RC cascaded networks act as feedback circuit.
a) 2 b) 4
c) 3 d) 1

5) The OP-AMP is basically _____ amplifier.
a) Voltage b) Current
c) Power d) Trans resistance

6) The type of feedback used in closed loop inverting amplifier is _____.
a) Voltage series b) Current series
c) Current shunt d) Voltage shunt

7) I to V converter is special case of _____ amplifier.
a) Non-inverting b) Inverting
c) Differential d) Scaling

8) For IC 741 maximum Input bias current at supply voltage ±15 volts dc is _____.

a) 75 nA b) 100 nA
c) 750 nA d) 500 nA

9) The level shifting stage of Operational amplifier is used to _____.

a) Increase voltage level b) Reduce voltage to zero
c) Increase current level d) None of these

10) Slew rate for op-amp is considered for _____.

a) AC applications b) DC applications
c) Both a & b d) None of these

11) Zero crossing detector is special case of _____.

a) Schmitt trigger b) Peak detector
c) Basic comparator d) Window detector

12) OP-AMP Non inverting buffer is nothing but _____.

a) Inverter b) Voltage follower
c) Comparator d) Differentiator

13) The output voltage of op-amp triangular wave generator decreases with _____ frequency.

a) Increase in b) Decrease in
c) constant d) Can't say

14) What will be the frequency of output waveform of a square wave generator if R2 = 1.16 R1?

a) $\mathrm{fo} = (1/2\mathrm{RC})$ b) $\mathrm{fo} = (\mathrm{In}/2\mathrm{RC})$
c) $\mathrm{fo} = (\mathrm{In}/2 \times \sqrt{\mathrm{RC}})$ d) $\mathrm{fo} = (\mathrm{In}/(2\sqrt{\mathrm{RC}}))$

SLR-BD-124

Seat No.	

Set R

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Analog Integrated Circuits (BTN04403)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagram wherever necessary.

Section – I

Q.2 Attempt any Four **16**

a) Define CMRR. How to improve CMRR?
b) Derive equation for ideal voltage gain of non-inverting amplifier using virtual ground concept.
c) Define the following electrical parameters of IC 741 with practical & ideal values:
1) Input Offset Current
2) Total output offset voltage
3) Thermal Drift
4) PSRR
d) Explain differentiator and its frequency response.
e) Explain the concept of grounded load V-I converter.

Q.3 Attempt any two. **12**

a) Derive expressions for differential voltage gain. R_{in} and R_{out} for DIBO differential amplifier using AC equivalent circuit.
b) Determine the slew rate of a frequency compensated OP-AMP at room temperature, which has a unity cross-over frequency of 5MHz (Assume V_m = 1 V).
c) Draw high frequency equivalent circuit of op-amp & obtain expression for $A_{OL(f)}$ open loop gain as function of frequency.

Section – II

Q.4 Attempt any Four. **16**

a) Explain with neat diagram operation of OP-AMP as Comparator.
b) Explain with neat diagram the basic concept of antilog amplifier using transistor.
c) What are the design procedures for a first order low pass filter.
d) Explain the concept of Wien Bridge Oscillator with neat diagrams.
e) Explain R -2R Ladder DAC technique with circuit diagram & waveforms.

Q.5 Attempt any two. **12**

a) Explain the concept of positive and negative clippers.

b) Design a second order low-pass filter for a cut-off frequency of 1 kHz with a pass band gain of 1.586
(Assume $C_2 = C_3 = 0.005\mu F$ and $R_1 = 33k\Omega$).

c) Explain the operation of Successive Approximation ADC with neat diagrams.

Seat No.	

Set S

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Analog Integrated Circuits (BTN04403)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Draw neat diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Slew rate for op-amp is considered for _____.
a) AC applications b) DC applications
c) Both a & b d) None of these

2) Zero crossing detector is special case of _____.
a) Schmitt trigger b) Peak detector
c) Basic comparator d) Window detector

3) OP-AMP Non inverting buffer is nothing but _____.
a) Inverter b) Voltage follower
c) Comparator d) Differentiator

4) The output voltage of op-amp triangular wave generator decreases with _____ frequency.
a) Increase in b) Decrease in
c) constant d) Can't say

5) What will be the frequency of output waveform of a square wave generator if R2 = 1.16 R1?
a) $\mathrm{fo} = (1/2\mathrm{RC})$ b) $\mathrm{fo} = (\mathrm{In}/2\mathrm{RC})$
c) $\mathrm{fo} = (\mathrm{In}/2 \times \sqrt{\mathrm{RC}})$ d) $\mathrm{fo} = (\mathrm{In}/(2\sqrt{\mathrm{RC}}))$

6) For Wien bridge oscillator if Fo = 965Hz & C =0.05 $\mu\mathrm{F}$ then R=?
a) $10\ \mathrm{k\Omega}$ b) $3.3\ \mathrm{k\Omega}$
c) $1\ \mathrm{k\Omega}$ d) $15.9\ \mathrm{k\Omega}$

7) Square wave generator is also called as _____.
a) Astable Multivibrator b) Monostable Multivibrator
c) Bistable Multivibrator d) None of these

8) Select advantages of Active Filter from following: _____.
- a) Frequency adjustment flexibility
- b) Gain adjustment flexibility
- c) No loading effect
- d) All of mentioned

9) In phase shift oscillator _____ RC cascaded networks act as feedback circuit.
- a) 2
- b) 4
- c) 3
- d) 1

10) The OP-AMP is basically _____ amplifier.
- a) Voltage
- b) Current
- c) Power
- d) Trans resistance

11) The type of feedback used in closed loop inverting amplifier is _____.
- a) Voltage series
- b) Current series
- c) Current shunt
- d) Voltage shunt

12) I to V converter is special case of _____ amplifier.
- a) Non-inverting
- b) Inverting
- c) Differential
- d) Scaling

13) For IC 741 maximum Input bias current at supply voltage ±15 volts dc is _____.
- a) 75 nA
- b) 100 nA
- c) 750 nA
- d) 500 nA

14) The level shifting stage of Operational amplifier is used to _____.
- a) Increase voltage level
- b) Reduce voltage to zero
- c) Increase current level
- d) None of these

SLR-BD-124

Seat No.	

Set S

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Analog Integrated Circuits (BTN04403)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagram wherever necessary.

Section – I

Q.2 Attempt any Four **16**

a) Define CMRR. How to improve CMRR?
b) Derive equation for ideal voltage gain of non-inverting amplifier using virtual ground concept.
c) Define the following electrical parameters of IC 741 with practical & ideal values:
1) Input Offset Current
2) Total output offset voltage
3) Thermal Drift
4) PSRR
d) Explain differentiator and its frequency response.
e) Explain the concept of grounded load V-I converter.

Q.3 Attempt any two. **12**

a) Derive expressions for differential voltage gain. R_{in} and R_{out} for DIBO differential amplifier using AC equivalent circuit.
b) Determine the slew rate of a frequency compensated OP-AMP at room temperature, which has a unity cross-over frequency of 5MHz (Assume V_m = 1 V).
c) Draw high frequency equivalent circuit of op-amp & obtain expression for $A_{OL(f)}$ open loop gain as function of frequency.

Section – II

Q.4 Attempt any Four. **16**

a) Explain with neat diagram operation of OP-AMP as Comparator.
b) Explain with neat diagram the basic concept of antilog amplifier using transistor.
c) What are the design procedures for a first order low pass filter.
d) Explain the concept of Wien Bridge Oscillator with neat diagrams.
e) Explain R -2R Ladder DAC technique with circuit diagram & waveforms.

Q.5 Attempt any two. **12**

a) Explain the concept of positive and negative clippers.

b) Design a second order low-pass filter for a cut-off frequency of 1 kHz with a pass band gain of 1.586
(Assume $C_2 = C_3 = 0.005\mu F$ and $R_1 = 33k\Omega$).

c) Explain the operation of Successive Approximation ADC with neat diagrams.

SLR-BD-126

Seat No.	

Set P

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Computational Statistics (BTN04407)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Three companies A, B and C supply 25%, 35% and 40% of the notebooks to a school. Past experience shows that 5%, 4% and 2% of the notebooks produced by these companies are defective. If a notebook was found to be defective, what is the probability that the notebook was supplied by A?

a) $^{44}/_{69}$ b) $^{25}/_{69}$

c) $^{13}/_{24}$ d) $^{11}/_{24}$

2) What is the probability of getting a number greater than 6 on dice?

a) 1 b) 1/3

c) $^{1}/_{2}$ d) 0

3) ____ is an incredibly powerful tool for analyzing data.

a) Linear regression b) Logistic regression

c) Gradient Descent d) Greedy algorithms

4) In syntax of linear model 1m(formula, data,), data refers to ____.

a) Matrix b) Vector

c) Array d) List

5) The matrix which follows the conditions m=n is called?

a) Square matrix b) Rectangular matrix

c) Scalar matrix d) Diagonal matrix

6) How many coefficients do you need to estimate in a simple linear regression model (One independent variable)?

a) 1 b) 2

c) 3 d) 4

7) How many outcomes are possible when drawing a card from deck of cards?

a) 1 b) 13
c) 52 d) 26

8) PCA reduce dimensionality of the data using feature extraction.

a) True b) False

9) If machine learning model output doesn't involve target variable, then that model is called as ____.

a) predictive model b) descriptive model
c) reinforcement learning d) all of the above

10) Identify the kind of learning algorithm for “facial identities for facial expressions”.

a) Prediction b) Pattern recognition
c) Recognize anomalies d) Generating Pattern

11) Identify the type of learning in which labelled training data is used.

a) Semi supervised b) Supervised learning
c) Reinforcement learning d) Unsupervised learning

12) Which of the following are common classes of problems in machine learning?

a) Regression b) Classification
c) Clustering d) All of above

13) Choose a disadvantage of decision trees among the following.

a) Decision trees are robust to outliers
b) Factor analysis
c) Decision trees are prone to overfit
d) All of above

14) What will happen when eigenvalues are roughly equal?

a) PCA will perform outstandingly b) PCA will perform badly
c) Can't Say d) None of above

Seat No.	

Set **P**

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Computational Statistics (BTN04407)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION - I

Q.2 Solve the following questions. (Any Four) **16**

a) Define the following terms:
i) Learning
ii) LMS weight update rule
iii) Consistent Hypothesis
iv) General Boundary

b) Explain various rules in probability with proper example

c) Explain Gaussian process with example.

d) Write note of Problem Formulation

e) Differentiate between regression and classification.

Q.3 Solve the following questions. (Any Two) **12**

a) Enlist & explain steps involved in development of regression model.

b) Write short note on construction of probability space. Explain Discrete and Continuous Probabilities.

c) Develop procedure in parameter estimation for Bayesian parameter estimation.

SECTION - II

Q.4 Solve the following questions. (Any Four) **16**

a) Differentiate between Supervised, Unsupervised in detail.

b) Explain overfitting and under fitting with an example.

c) What is training data, labeled data & unlabeled data? What are key steps involved in developing training data?

d) Explain curse of dimensionality with suitable diagram.

e) What are the basic design issues and approaches to machine learning?

Q.5 Solve the following questions. (Any Two) **12**

a) What do you mean by a well-posed learning problem? Explain the important features that are required to well-define a learning problem.

b) Write a note on Decision theory and Information Theory.

c) What is principal component analysis? Explain the sort of problems you would use PCA for? Also explain its limitations as a method.

Seat No.	

Set **Q**

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Computational Statistics (BTN04407)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) PCA reduce dimensionality of the data using feature extraction.
a) True b) False

2) If machine learning model output doesn't involve target variable, then that model is called as ____.
a) predictive model b) descriptive model
c) reinforcement learning d) all of the above

3) Identify the kind of learning algorithm for "facial identities for facial expressions".
a) Prediction b) Pattern recognition
c) Recognize anomalies d) Generating Pattern

4) Identify the type of learning in which labelled training data is used.
a) Semi supervised b) Supervised learning
c) Reinforcement learning d) Unsupervised learning

5) Which of the following are common classes of problems in machine learning?
a) Regression b) Classification
c) Clustering d) All of above

6) Choose a disadvantage of decision trees among the following.
a) Decision trees are robust to outliers
b) Factor analysis
c) Decision trees are prone to overfit
d) All of above

7) What will happen when eigenvalues are roughly equal?
a) PCA will perform outstandingly b) PCA will perform badly
c) Can't Say d) None of above

8) Three companies A, B and C supply 25%, 35% and 40% of the notebooks to a school. Past experience shows that 5%, 4% and 2% of the notebooks produced by these companies are defective. If a notebook was found to be defective, what is the probability that the notebook was supplied by A?

a) $^{44}/_{69}$ b) $^{25}/_{69}$

c) $^{13}/_{24}$ d) $^{11}/_{24}$

9) What is the probability of getting a number greater than 6 on dice?

a) 1 b) 1/3

c) $^{1}/_{2}$ d) 0

10) ____ is an incredibly powerful tool for analyzing data.

a) Linear regression b) Logistic regression

c) Gradient Descent d) Greedy algorithms

11) In syntax of linear model 1m(formula, data,), data refers to ____.

a) Matrix b) Vector

c) Array d) List

12) The matrix which follows the conditions m=n is called?

a) Square matrix b) Rectangular matrix

c) Scalar matrix d) Diagonal matrix

13) How many coefficients do you need to estimate in a simple linear regression model (One independent variable)?

a) 1 b) 2

c) 3 d) 4

14) How many outcomes are possible when drawing a card from deck of cards?

a) 1 b) 13

c) 52 d) 26

Seat No.	

Set **Q**

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Computational Statistics (BTN04407)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION - I

Q.2 Solve the following questions. (Any Four) **16**

a) Define the following terms:
i) Learning
ii) LMS weight update rule
iii) Consistent Hypothesis
iv) General Boundary

b) Explain various rules in probability with proper example

c) Explain Gaussian process with example.

d) Write note of Problem Formulation

e) Differentiate between regression and classification.

Q.3 Solve the following questions. (Any Two) **12**

a) Enlist & explain steps involved in development of regression model.

b) Write short note on construction of probability space. Explain Discrete and Continuous Probabilities.

c) Develop procedure in parameter estimation for Bayesian parameter estimation.

SECTION - II

Q.4 Solve the following questions. (Any Four) **16**

a) Differentiate between Supervised, Unsupervised in detail.

b) Explain overfitting and under fitting with an example.

c) What is training data, labeled data & unlabeled data? What are key steps involved in developing training data?

d) Explain curse of dimensionality with suitable diagram.

e) What are the basic design issues and approaches to machine learning?

Q.5 Solve the following questions. (Any Two) **12**

a) What do you mean by a well-posed learning problem? Explain the important features that are required to well-define a learning problem.

b) Write a note on Decision theory and Information Theory.

c) What is principal component analysis? Explain the sort of problems you would use PCA for? Also explain its limitations as a method.

Seat No.	

Set R

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Computational Statistics (BTN04407)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Identify the type of learning in which labelled training data is used.
a) Semi supervised b) Supervised learning
c) Reinforcement learning d) Unsupervised learning

2) Which of the following are common classes of problems in machine learning?
a) Regression b) Classification
c) Clustering d) All of above

3) Choose a disadvantage of decision trees among the following.
a) Decision trees are robust to outliers
b) Factor analysis
c) Decision trees are prone to overfit
d) All of above

4) What will happen when eigenvalues are roughly equal?
a) PCA will perform outstandingly b) PCA will perform badly
c) Can't Say d) None of above

5) Three companies A, B and C supply 25%, 35% and 40% of the notebooks to a school. Past experience shows that 5%, 4% and 2% of the notebooks produced by these companies are defective. If a notebook was found to be defective, what is the probability that the notebook was supplied by A?
a) $^{44}/_{69}$ b) $^{25}/_{69}$
c) $^{13}/_{24}$ d) $^{11}/_{24}$

6) What is the probability of getting a number greater than 6 on dice?

a) 1 b) 1/3

c) $^1/_2$ d) 0

7) ____ is an incredibly powerful tool for analyzing data.

a) Linear regression b) Logistic regression

c) Gradient Descent d) Greedy algorithms

8) In syntax of linear model 1m(formula, data,), data refers to ____.

a) Matrix b) Vector

c) Array d) List

9) The matrix which follows the conditions m=n is called?

a) Square matrix b) Rectangular matrix

c) Scalar matrix d) Diagonal matrix

10) How many coefficients do you need to estimate in a simple linear regression model (One independent variable)?

a) 1 b) 2

c) 3 d) 4

11) How many outcomes are possible when drawing a card from deck of cards?

a) 1 b) 13

c) 52 d) 26

12) PCA reduce dimensionality of the data using feature extraction.

a) True b) False

13) If machine learning model output doesn't involve target variable, then that model is called as ____.

a) predictive model b) descriptive model

c) reinforcement learning d) all of the above

14) Identify the kind of learning algorithm for “facial identities for facial expressions”.

a) Prediction b) Pattern recognition

c) Recognize anomalies d) Generating Pattern

Seat No.	

Set **R**

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Computational Statistics (BTN04407)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION - I

Q.2 Solve the following questions. (Any Four) **16**

a) Define the following terms:
i) Learning
ii) LMS weight update rule
iii) Consistent Hypothesis
iv) General Boundary

b) Explain various rules in probability with proper example

c) Explain Gaussian process with example.

d) Write note of Problem Formulation

e) Differentiate between regression and classification.

Q.3 Solve the following questions. (Any Two) **12**

a) Enlist & explain steps involved in development of regression model.

b) Write short note on construction of probability space. Explain Discrete and Continuous Probabilities.

c) Develop procedure in parameter estimation for Bayesian parameter estimation.

SECTION - II

Q.4 Solve the following questions. (Any Four) **16**

a) Differentiate between Supervised, Unsupervised in detail.

b) Explain overfitting and under fitting with an example.

c) What is training data, labeled data & unlabeled data? What are key steps involved in developing training data?

d) Explain curse of dimensionality with suitable diagram.

e) What are the basic design issues and approaches to machine learning?

Q.5 Solve the following questions. (Any Two) **12**

a) What do you mean by a well-posed learning problem? Explain the important features that are required to well-define a learning problem.

b) Write a note on Decision theory and Information Theory.

c) What is principal component analysis? Explain the sort of problems you would use PCA for? Also explain its limitations as a method.

Seat No.	

Set **S**

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Computational Statistics (BTN04407)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) How many coefficients do you need to estimate in a simple linear regression model (One independent variable)?
a) 1 b) 2
c) 3 d) 4

2) How many outcomes are possible when drawing a card from deck of cards?
a) 1 b) 13
c) 52 d) 26

3) PCA reduce dimensionality of the data using feature extraction.
a) True b) False

4) If machine learning model output doesn't involve target variable, then that model is called as ____.
a) predictive model b) descriptive model
c) reinforcement learning d) all of the above

5) Identify the kind of learning algorithm for "facial identities for facial expressions".
a) Prediction b) Pattern recognition
c) Recognize anomalies d) Generating Pattern

6) Identify the type of learning in which labelled training data is used.
a) Semi supervised b) Supervised learning
c) Reinforcement learning d) Unsupervised learning

7) Which of the following are common classes of problems in machine learning?
a) Regression b) Classification
c) Clustering d) All of above

8) Choose a disadvantage of decision trees among the following.
a) Decision trees are robust to outliers
b) Factor analysis
c) Decision trees are prone to overfit
d) All of above

9) What will happen when eigenvalues are roughly equal?
a) PCA will perform outstandingly b) PCA will perform badly
c) Can't Say d) None of above

10) Three companies A, B and C supply 25%, 35% and 40% of the notebooks to a school. Past experience shows that 5%, 4% and 2% of the notebooks produced by these companies are defective. If a notebook was found to be defective, what is the probability that the notebook was supplied by A?
a) $^{44}/_{69}$ b) $^{25}/_{69}$
c) $^{13}/_{24}$ d) $^{11}/_{24}$

11) What is the probability of getting a number greater than 6 on dice?
a) 1 b) 1/3
c) $^{1}/_{2}$ d) 0

12) ____ is an incredibly powerful tool for analyzing data.
a) Linear regression b) Logistic regression
c) Gradient Descent d) Greedy algorithms

13) In syntax of linear model 1m(formula, data,), data refers to ____.
a) Matrix b) Vector
c) Array d) List

14) The matrix which follows the conditions m=n is called?
a) Square matrix b) Rectangular matrix
c) Scalar matrix d) Diagonal matrix

Seat No.		Set	S

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Computational Statistics (BTN04407)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION - I

Q.2 Solve the following questions. (Any Four) **16**

a) Define the following terms:
i) Learning
ii) LMS weight update rule
iii) Consistent Hypothesis
iv) General Boundary

b) Explain various rules in probability with proper example

c) Explain Gaussian process with example.

d) Write note of Problem Formulation

e) Differentiate between regression and classification.

Q.3 Solve the following questions. (Any Two) **12**

a) Enlist & explain steps involved in development of regression model.

b) Write short note on construction of probability space. Explain Discrete and Continuous Probabilities.

c) Develop procedure in parameter estimation for Bayesian parameter estimation.

SECTION - II

Q.4 Solve the following questions. (Any Four) **16**

a) Differentiate between Supervised, Unsupervised in detail.

b) Explain overfitting and under fitting with an example.

c) What is training data, labeled data & unlabeled data? What are key steps involved in developing training data?

d) Explain curse of dimensionality with suitable diagram.

e) What are the basic design issues and approaches to machine learning?

Q.5 Solve the following questions. (Any Two) **12**

a) What do you mean by a well-posed learning problem? Explain the important features that are required to well-define a learning problem.

b) Write a note on Decision theory and Information Theory.

c) What is principal component analysis? Explain the sort of problems you would use PCA for? Also explain its limitations as a method.

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Database Management Systems (BTN04408)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) DDL stands for ____.
a) Data declaration language
b) Declaration data language
c) Document declaration language
d) Data definition language

2) _____ operation can be visualized as a horizontal partition of the relation into two set of tuples.
a) JOIN b) PARTITION
c) SELECT d) PROJECT

3) 'AS' clause is used in SQL for ____.
a) selection b) rename
c) join d) projection

4) What key links records from one database table to a record or records in another database table?
a) Primary key b) Principal Key
c) Foreign key d) Link key

5) Which of the following contains information about the structure of a database?
a) Database management system
b) Data dictionary
c) Data repository
d) Data warehouse

6) The language which has recently become the defacto standard for interfacing application programs with relational database system is _____.
a) Oracle b) SQL
c) DBase d) 4GL

7) By normalizing relations or sets of relations, one minimizes ____.
a) Data b) Fields
c) Redundancy d) Database

8) Which of the following is a type of Normal Form?
a) ACNF b) BCNF
c) CCNF d) DCNF

9) Domain constraints, functional dependency and referential integrity are special forms of ____.
a) Foreign key b) Primary key
c) Assertion d) Referential constraint

10) The database administrator who authorizes all the new users, modifies the database, and takes grants privilege is ____.
a) Super user b) Administrator
c) Operator of operating system d) All

11) If we wish to grant a privilege and to allow the recipient to pass the privilege on to other users, we append the ____ clause to the appropriate grant command.
a) With grant b) Grant user
c) Grant pass privilege d) With grant option

12) Which of the following is the syntax for views where v is view name?
a) Create view v as “query name”;
b) Create “query expression” as view;
c) Create view v as “query expression”;
d) Create view “query expression”;

13) Key value pairs are usually seen in ____.
a) Hash tables b) Heaps
c) Both Hash tables and Heaps d) Skip list

14) A system is in a ____ state if there exists a set of transactions such that every transaction in the set is waiting for another transaction in the set.
a) Idle b) Waiting
c) Deadlock d) Ready

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Database Management Systems (BTN04408)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section - I

Q.2 Solve the following: (Any Four) **16**

a) What is DBMS? And which are the application database system?
b) Which are the constraints in DBMS explain with example.
c) Explain Relational Query languages.
d) What are the different design issues in ER model?
e) Explain view in SQL with example.

Q.3 Solve the following: (Any Two) **12**

a) Which are the types of Database Languages? Explain with its commands.
b) Explain Basic SQL clauses.
c) Explain Extended Relational Algebra operation with example.

Section - II

Q.4 Attempt the following: (Any Four) **16**

a) Write a short note on Nested subqueries with example.
b) Explain Atomic Domains.
c) Explain ordered indices in detail.
d) Explain the transaction states with neat diagram.
e) What is functional dependency? Give example.

Q.5 Attempt the following: (Any Two) **12**

a) List the different Aggregate operations in SQL? Explain any 3 Aggregate operations with queries.
b) Differentiate between B+ tree and B tree index files.
c) Explain Time stamp ordering protocol with example.

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Database Management Systems (BTN04408)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is a type of Normal Form?
a) ACNF b) BCNF
c) CCNF d) DCNF

2) Domain constraints, functional dependency and referential integrity are special forms of ____.
a) Foreign key b) Primary key
c) Assertion d) Referential constraint

3) The database administrator who authorizes all the new users, modifies the database, and takes grants privilege is ____.
a) Super user b) Administrator
c) Operator of operating system d) All

4) If we wish to grant a privilege and to allow the recipient to pass the privilege on to other users, we append the ____ clause to the appropriate grant command.
a) With grant b) Grant user
c) Grant pass privilege d) With grant option

5) Which of the following is the syntax for views where v is view name?
a) Create view v as "query name";
b) Create "query expression" as view;
c) Create view v as "query expression";
d) Create view "query expression";

6) Key value pairs are usually seen in ____.
a) Hash tables b) Heaps
c) Both Hash tables and Heaps d) Skip list

7) A system is in a ____ state if there exists a set of transactions such that every transaction in the set is waiting for another transaction in the set.

a) Idle b) Waiting
c) Deadlock d) Ready

8) DDL stands for ____.

a) Data declaration language
b) Declaration data language
c) Document declaration language
d) Data definition language

9) _____ operation can be visualized as a horizontal partition of the relation into two set of tuples.

a) JOIN b) PARTITION
c) SELECT d) PROJECT

10) 'AS' clause is used in SQL for ____.

a) selection b) rename
c) join d) projection

11) What key links records from one database table to a record or records in another database table?

a) Primary key b) Principal Key
c) Foreign key d) Link key

12) Which of the following contains information about the structure of a database?

a) Database management system
b) Data dictionary
c) Data repository
d) Data warehouse

13) The language which has recently become the defacto standard for interfacing application programs with relational database system is _____.

a) Oracle b) SQL
c) DBase d) 4GL

14) By normalizing relations or sets of relations, one minimizes ____.

a) Data b) Fields
c) Redundancy d) Database

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Database Management Systems (BTN04408)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section - I

Q.2 Solve the following: (Any Four) **16**

a) What is DBMS? And which are the application database system?
b) Which are the constraints in DBMS explain with example.
c) Explain Relational Query languages.
d) What are the different design issues in ER model?
e) Explain view in SQL with example.

Q.3 Solve the following: (Any Two) **12**

a) Which are the types of Database Languages? Explain with its commands.
b) Explain Basic SQL clauses.
c) Explain Extended Relational Algebra operation with example.

Section - II

Q.4 Attempt the following: (Any Four) **16**

a) Write a short note on Nested subqueries with example.
b) Explain Atomic Domains.
c) Explain ordered indices in detail.
d) Explain the transaction states with neat diagram.
e) What is functional dependency? Give example.

Q.5 Attempt the following: (Any Two) **12**

a) List the different Aggregate operations in SQL? Explain any 3 Aggregate operations with queries.
b) Differentiate between B+ tree and B tree index files.
c) Explain Time stamp ordering protocol with example.

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Database Management Systems (BTN04408)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) If we wish to grant a privilege and to allow the recipient to pass the privilege on to other users, we append the ____ clause to the appropriate grant command.
a) With grant b) Grant user
c) Grant pass privilege d) With grant option

2) Which of the following is the syntax for views where v is view name?
a) Create view v as "query name";
b) Create "query expression" as view;
c) Create view v as "query expression";
d) Create view "query expression";

3) Key value pairs are usually seen in ____.
a) Hash tables b) Heaps
c) Both Hash tables and Heaps d) Skip list

4) A system is in a ____ state if there exists a set of transactions such that every transaction in the set is waiting for another transaction in the set.
a) Idle b) Waiting
c) Deadlock d) Ready

5) DDL stands for ____.
a) Data declaration language
b) Declaration data language
c) Document declaration language
d) Data definition language

6) _____ operation can be visualized as a horizontal partition of the relation into two set of tuples.
a) JOIN b) PARTITION
c) SELECT d) PROJECT

7) 'AS' clause is used in SQL for ____.

a) selection b) rename
c) join d) projection

8) What key links records from one database table to a record or records in another database table?

a) Primary key b) Principal Key
c) Foreign key d) Link key

9) Which of the following contains information about the structure of a database?

a) Database management system
b) Data dictionary
c) Data repository
d) Data warehouse

10) The language which has recently become the defacto standard for interfacing application programs with relational database system is _____.

a) Oracle b) SQL
c) DBase d) 4GL

11) By normalizing relations or sets of relations, one minimizes ____.

a) Data b) Fields
c) Redundancy d) Database

12) Which of the following is a type of Normal Form?

a) ACNF b) BCNF
c) CCNF d) DCNF

13) Domain constraints, functional dependency and referential integrity are special forms of ____.

a) Foreign key b) Primary key
c) Assertion d) Referential constraint

14) The database administrator who authorizes all the new users, modifies the database, and takes grants privilege is ____.

a) Super user b) Administrator
c) Operator of operating system d) All

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Database Management Systems (BTN04408)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section - I

Q.2 Solve the following: (Any Four) **16**

a) What is DBMS? And which are the application database system?
b) Which are the constraints in DBMS explain with example.
c) Explain Relational Query languages.
d) What are the different design issues in ER model?
e) Explain view in SQL with example.

Q.3 Solve the following: (Any Two) **12**

a) Which are the types of Database Languages? Explain with its commands.
b) Explain Basic SQL clauses.
c) Explain Extended Relational Algebra operation with example.

Section - II

Q.4 Attempt the following: (Any Four) **16**

a) Write a short note on Nested subqueries with example.
b) Explain Atomic Domains.
c) Explain ordered indices in detail.
d) Explain the transaction states with neat diagram.
e) What is functional dependency? Give example.

Q.5 Attempt the following: (Any Two) **12**

a) List the different Aggregate operations in SQL? Explain any 3 Aggregate operations with queries.
b) Differentiate between B+ tree and B tree index files.
c) Explain Time stamp ordering protocol with example.

Seat No.	

Set **S**

S.Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Database Management Systems (BTN04408)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The language which has recently become the defacto standard for interfacing application programs with relational database system is _____.
a) Oracle b) SQL
c) DBase d) 4GL

2) By normalizing relations or sets of relations, one minimizes ____.
a) Data b) Fields
c) Redundancy d) Database

3) Which of the following is a type of Normal Form?
a) ACNF b) BCNF
c) CCNF d) DCNF

4) Domain constraints, functional dependency and referential integrity are special forms of ____.
a) Foreign key b) Primary key
c) Assertion d) Referential constraint

5) The database administrator who authorizes all the new users, modifies the database, and takes grants privilege is ____.
a) Super user b) Administrator
c) Operator of operating system d) All

6) If we wish to grant a privilege and to allow the recipient to pass the privilege on to other users, we append the ____ clause to the appropriate grant command.
a) With grant b) Grant user
c) Grant pass privilege d) With grant option

7) Which of the following is the syntax for views where v is view name?
   a) Create view v as “query name”;
   b) Create “query expression” as view;
   c) Create view v as “query expression”;
   d) Create view “query expression”;

8) Key value pairs are usually seen in ____.
   a) Hash tables
   b) Heaps
   c) Both Hash tables and Heaps
   d) Skip list

9) A system is in a ____ state if there exists a set of transactions such that every transaction in the set is waiting for another transaction in the set.
   a) Idle
   b) Waiting
   c) Deadlock
   d) Ready

10) DDL stands for ____.
   a) Data declaration language
   b) Declaration data language
   c) Document declaration language
   d) Data definition language

11) _____ operation can be visualized as a horizontal partition of the relation into two set of tuples.
   a) JOIN
   b) PARTITION
   c) SELECT
   d) PROJECT

12) ‘AS’ clause is used in SQL for ____.
   a) selection
   b) rename
   c) join
   d) projection

13) What key links records from one database table to a record or records in another database table?
   a) Primary key
   b) Principal Key
   c) Foreign key
   d) Link key

14) Which of the following contains information about the structure of a database?
   a) Database management system
   b) Data dictionary
   c) Data repository
   d) Data warehouse

Seat No.	

Set **S**

S.Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Database Management Systems (BTN04408)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section - I

Q.2 Solve the following: (Any Four) **16**

a) What is DBMS? And which are the application database system?
b) Which are the constraints in DBMS explain with example.
c) Explain Relational Query languages.
d) What are the different design issues in ER model?
e) Explain view in SQL with example.

Q.3 Solve the following: (Any Two) **12**

a) Which are the types of Database Languages? Explain with its commands.
b) Explain Basic SQL clauses.
c) Explain Extended Relational Algebra operation with example.

Section - II

Q.4 Attempt the following: (Any Four) **16**

a) Write a short note on Nested subqueries with example.
b) Explain Atomic Domains.
c) Explain ordered indices in detail.
d) Explain the transaction states with neat diagram.
e) What is functional dependency? Give example.

Q.5 Attempt the following: (Any Two) **12**

a) List the different Aggregate operations in SQL? Explain any 3 Aggregate operations with queries.
b) Differentiate between B+ tree and B tree index files.
c) Explain Time stamp ordering protocol with example.

Seat No.	

Set **P**

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Fundamentals of IOT(BTN04409)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) How does IoT contribute to the development of smart cities?
a) By promoting online gaming
b) By enhancing communication systems
c) By improving urban infrastructure and management
d) By increasing social media usage

2) What is the role of communication systems in IoT?
a) Real-time processing
b) Data storage in the cloud
c) Interconnecting devices
d) Embedded system development

3) What are the challenges associated with developing embedded systems for IoT?
a) Increased power consumption
b) Real-time requirements, resource constraints
c) Limited communication options
d) Lack of sensor integration

4) What is firmware in the context of embedded systems?
a) A type of hardware component
b) An embedded operating system
c) A type of software that provides low-level control for the device's specific hardware
d) Cloud-based storage system

5) Which of the following is NOT a type of sensor?
a) Accelerometer b) Light detector
c) Communication system d) Humidity sensor

6) Which type of noise can affect sensor measurements?
a) Social noise b) Environmental noise
c) Power noise d) Data noise

7) In which domain are displacement sensors commonly used?
a) Healthcare b) Manufacturing
c) Entertainment d) Social networking

8) How do temperature sensors contribute to energy efficiency in IoT applications?
a) Adjusting ambient light
b) Regulating heating and cooling systems
c) Monitoring human presence
d) Enhancing communication between devices

9) Which of the following is NOT a characteristic of sensors?
a) Sensitivity b) Accuracy
c) Speed d) Resolution

10) Which communication technology is commonly used for long-range communication in IoT devices?
a) Bluetooth Low Energy (BLE) b) RFID
c) WiFi d) Zigbee

11) What is the primary role of Zigbee technology in home automation systems?
a) Long communication range b) High data transfer speed
c) Low power consumption d) Real-time data transfer

12) Which communication technology is commonly used for IoT applications in environmental monitoring?
a) Cellular b) Zigbee
c) LoRa (Long Range) d) Bluetooth Low Energy (BLE)

13) In the context of IoT development, what advantage does Python offer over other languages?
a) Efficiency b) Low-level control
c) Simplicity d) Real-time processing

14) What future advancements could address challenges in IoT development with Raspberry Pi?
a) Enhanced hardware security b) Reduction in Python support
c) Decreased device compatibility d) Limited community support

Seat No.	

Set **P**

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Fundamentals of IOT(BTN04409)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve the following: (Any Four) **16**

a) Discuss the impact of IoT on smart cities.
b) Identify and discuss the challenges and security considerations associated with the implementation of IoT in various domains.
c) Describe the components of an embedded system.
d) Discuss the challenges associated with developing embedded systems for IoT, including power consumption, real-time requirements, and resource constraints.
e) Discuss the fundamentals of signals and systems in the context of sensors.

Q.3 Solve the following: (Any Two) **12**

a) Explain the role of cloud computing in supporting IoT applications. How does cloud computing enhance the capabilities of IoT devices?
b) Explain the significance of integrated development environments (IDEs) in embedded development. Discuss different IDEs used for embedded systems and their features, emphasizing their role in simplifying the development process.
c) Explain the units of measurement commonly used in sensor technology. Discuss the significance of standard units and the importance of consistent measurement in IoT applications.

Section – II

Q.4 Attempt the following: (Any Four) **16**

a) Discuss the challenges and considerations in implementing sensor applications in real-world scenarios.
b) Discuss the role of temperature sensors in various IoT applications.
c) Discuss the applications of occupancy and motion detectors in IoT.
d) Examine the principles of Radio-Frequency Identification (RFID) technology.
e) Detail the process of installing Raspbian OS on a Raspberry Pi.

Q.5 Attempt the following: (Any Two) **12**

a) Discuss the power consumption parameters of communication technologies in IoT. Explore strategies to optimize power consumption, especially in battery-operated IoT devices, and address the trade-offs between power efficiency and communication performance.

b) Explain the applications of light detectors in different domains. Discuss how light sensors are used for tasks such as ambient light adjustment, security, and in consumer electronics.

c) Discuss the structure of the file system in Raspberry Pi, highlighting the importance of specific directories.

Seat No.	

Set **Q**

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Fundamentals of IOT(BTN04409)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) How do temperature sensors contribute to energy efficiency in IoT applications?
a) Adjusting ambient light
b) Regulating heating and cooling systems
c) Monitoring human presence
d) Enhancing communication between devices

2) Which of the following is NOT a characteristic of sensors?
a) Sensitivity b) Accuracy
c) Speed d) Resolution

3) Which communication technology is commonly used for long-range communication in IoT devices?
a) Bluetooth Low Energy (BLE) b) RFID
c) WiFi d) Zigbee

4) What is the primary role of Zigbee technology in home automation systems?
a) Long communication range b) High data transfer speed
c) Low power consumption d) Real-time data transfer

5) Which communication technology is commonly used for IoT applications in environmental monitoring?
a) Cellular b) Zigbee
c) LoRa (Long Range) d) Bluetooth Low Energy (BLE)

6) In the context of IoT development, what advantage does Python offer over other languages?
a) Efficiency b) Low-level control
c) Simplicity d) Real-time processing

7) What future advancements could address challenges in IoT development with Raspberry Pi?
   a) Enhanced hardware security b) Reduction in Python support
   c) Decreased device compatibility d) Limited community support

8) How does IoT contribute to the development of smart cities?
   a) By promoting online gaming
   b) By enhancing communication systems
   c) By improving urban infrastructure and management
   d) By increasing social media usage

9) What is the role of communication systems in IoT?
   a) Real-time processing
   b) Data storage in the cloud
   c) Interconnecting devices
   d) Embedded system development

10) What are the challenges associated with developing embedded systems for IoT?
   a) Increased power consumption
   b) Real-time requirements, resource constraints
   c) Limited communication options
   d) Lack of sensor integration

11) What is firmware in the context of embedded systems?
   a) A type of hardware component
   b) An embedded operating system
   c) A type of software that provides low-level control for the device's specific hardware
   d) Cloud-based storage system

12) Which of the following is NOT a type of sensor?
   a) Accelerometer b) Light detector
   c) Communication system d) Humidity sensor

13) Which type of noise can affect sensor measurements?
   a) Social noise b) Environmental noise
   c) Power noise d) Data noise

14) In which domain are displacement sensors commonly used?
   a) Healthcare b) Manufacturing
   c) Entertainment d) Social networking

Seat No.	

Set **Q**

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Fundamentals of IOT(BTN04409)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve the following: (Any Four) **16**

a) Discuss the impact of IoT on smart cities.
b) Identify and discuss the challenges and security considerations associated with the implementation of IoT in various domains.
c) Describe the components of an embedded system.
d) Discuss the challenges associated with developing embedded systems for IoT, including power consumption, real-time requirements, and resource constraints.
e) Discuss the fundamentals of signals and systems in the context of sensors.

Q.3 Solve the following: (Any Two) **12**

a) Explain the role of cloud computing in supporting IoT applications. How does cloud computing enhance the capabilities of IoT devices?
b) Explain the significance of integrated development environments (IDEs) in embedded development. Discuss different IDEs used for embedded systems and their features, emphasizing their role in simplifying the development process.
c) Explain the units of measurement commonly used in sensor technology. Discuss the significance of standard units and the importance of consistent measurement in IoT applications.

Section – II

Q.4 Attempt the following: (Any Four) **16**

a) Discuss the challenges and considerations in implementing sensor applications in real-world scenarios.
b) Discuss the role of temperature sensors in various IoT applications.
c) Discuss the applications of occupancy and motion detectors in IoT.
d) Examine the principles of Radio-Frequency Identification (RFID) technology.
e) Detail the process of installing Raspbian OS on a Raspberry Pi.

Q.5 Attempt the following: (Any Two) **12**

a) Discuss the power consumption parameters of communication technologies in IoT. Explore strategies to optimize power consumption, especially in battery-operated IoT devices, and address the trade-offs between power efficiency and communication performance.

b) Explain the applications of light detectors in different domains. Discuss how light sensors are used for tasks such as ambient light adjustment, security, and in consumer electronics.

c) Discuss the structure of the file system in Raspberry Pi, highlighting the importance of specific directories.

Seat No.	

Set **R**

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Fundamentals of IOT(BTN04409)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the primary role of Zigbee technology in home automation systems?
a) Long communication range b) High data transfer speed
c) Low power consumption d) Real-time data transfer

2) Which communication technology is commonly used for IoT applications in environmental monitoring?
a) Cellular b) Zigbee
c) LoRa (Long Range) d) Bluetooth Low Energy (BLE)

3) In the context of IoT development, what advantage does Python offer over other languages?
a) Efficiency b) Low-level control
c) Simplicity d) Real-time processing

4) What future advancements could address challenges in IoT development with Raspberry Pi?
a) Enhanced hardware security b) Reduction in Python support
c) Decreased device compatibility d) Limited community support

5) How does IoT contribute to the development of smart cities?
a) By promoting online gaming
b) By enhancing communication systems
c) By improving urban infrastructure and management
d) By increasing social media usage

6) What is the role of communication systems in IoT?
a) Real-time processing
b) Data storage in the cloud
c) Interconnecting devices
d) Embedded system development

7) What are the challenges associated with developing embedded systems for IoT?
   a) Increased power consumption
   b) Real-time requirements, resource constraints
   c) Limited communication options
   d) Lack of sensor integration

8) What is firmware in the context of embedded systems?
   a) A type of hardware component
   b) An embedded operating system
   c) A type of software that provides low-level control for the device's specific hardware
   d) Cloud-based storage system

9) Which of the following is NOT a type of sensor?
   a) Accelerometer
   b) Light detector
   c) Communication system
   d) Humidity sensor

10) Which type of noise can affect sensor measurements?
   a) Social noise
   b) Environmental noise
   c) Power noise
   d) Data noise

11) In which domain are displacement sensors commonly used?
   a) Healthcare
   b) Manufacturing
   c) Entertainment
   d) Social networking

12) How do temperature sensors contribute to energy efficiency in IoT applications?
   a) Adjusting ambient light
   b) Regulating heating and cooling systems
   c) Monitoring human presence
   d) Enhancing communication between devices

13) Which of the following is NOT a characteristic of sensors?
   a) Sensitivity
   b) Accuracy
   c) Speed
   d) Resolution

14) Which communication technology is commonly used for long-range communication in IoT devices?
   a) Bluetooth Low Energy (BLE)
   b) RFID
   c) WiFi
   d) Zigbee

Seat No.	

Set **R**

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Fundamentals of IOT(BTN04409)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve the following: (Any Four) **16**

a) Discuss the impact of IoT on smart cities.
b) Identify and discuss the challenges and security considerations associated with the implementation of IoT in various domains.
c) Describe the components of an embedded system.
d) Discuss the challenges associated with developing embedded systems for IoT, including power consumption, real-time requirements, and resource constraints.
e) Discuss the fundamentals of signals and systems in the context of sensors.

Q.3 Solve the following: (Any Two) **12**

a) Explain the role of cloud computing in supporting IoT applications. How does cloud computing enhance the capabilities of IoT devices?
b) Explain the significance of integrated development environments (IDEs) in embedded development. Discuss different IDEs used for embedded systems and their features, emphasizing their role in simplifying the development process.
c) Explain the units of measurement commonly used in sensor technology. Discuss the significance of standard units and the importance of consistent measurement in IoT applications.

Section – II

Q.4 Attempt the following: (Any Four) **16**

a) Discuss the challenges and considerations in implementing sensor applications in real-world scenarios.
b) Discuss the role of temperature sensors in various IoT applications.
c) Discuss the applications of occupancy and motion detectors in IoT.
d) Examine the principles of Radio-Frequency Identification (RFID) technology.
e) Detail the process of installing Raspbian OS on a Raspberry Pi.

Q.5 Attempt the following: (Any Two) **12**

a) Discuss the power consumption parameters of communication technologies in IoT. Explore strategies to optimize power consumption, especially in battery-operated IoT devices, and address the trade-offs between power efficiency and communication performance.

b) Explain the applications of light detectors in different domains. Discuss how light sensors are used for tasks such as ambient light adjustment, security, and in consumer electronics.

c) Discuss the structure of the file system in Raspberry Pi, highlighting the importance of specific directories.

Seat No.	

Set **S**

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Fundamentals of IOT(BTN04409)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which type of noise can affect sensor measurements?
a) Social noise b) Environmental noise
c) Power noise d) Data noise

2) In which domain are displacement sensors commonly used?
a) Healthcare b) Manufacturing
c) Entertainment d) Social networking

3) How do temperature sensors contribute to energy efficiency in IoT applications?
a) Adjusting ambient light
b) Regulating heating and cooling systems
c) Monitoring human presence
d) Enhancing communication between devices

4) Which of the following is NOT a characteristic of sensors?
a) Sensitivity b) Accuracy
c) Speed d) Resolution

5) Which communication technology is commonly used for long-range communication in IoT devices?
a) Bluetooth Low Energy (BLE) b) RFID
c) WiFi d) Zigbee

6) What is the primary role of Zigbee technology in home automation systems?
a) Long communication range b) High data transfer speed
c) Low power consumption d) Real-time data transfer

7) Which communication technology is commonly used for IoT applications in environmental monitoring?

a) Cellular
b) Zigbee
c) LoRa (Long Range)
d) Bluetooth Low Energy (BLE)

8) In the context of IoT development, what advantage does Python offer over other languages?

a) Efficiency
b) Low-level control
c) Simplicity
d) Real-time processing

9) What future advancements could address challenges in IoT development with Raspberry Pi?

a) Enhanced hardware security
b) Reduction in Python support
c) Decreased device compatibility
d) Limited community support

10) How does IoT contribute to the development of smart cities?

a) By promoting online gaming
b) By enhancing communication systems
c) By improving urban infrastructure and management
d) By increasing social media usage

11) What is the role of communication systems in IoT?

a) Real-time processing
b) Data storage in the cloud
c) Interconnecting devices
d) Embedded system development

12) What are the challenges associated with developing embedded systems for IoT?

a) Increased power consumption
b) Real-time requirements, resource constraints
c) Limited communication options
d) Lack of sensor integration

13) What is firmware in the context of embedded systems?

a) A type of hardware component
b) An embedded operating system
c) A type of software that provides low-level control for the device's specific hardware
d) Cloud-based storage system

14) Which of the following is NOT a type of sensor?

a) Accelerometer
b) Light detector
c) Communication system
d) Humidity sensor

Seat No.		Set	S

S.Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
ELECTRONICS ENGINEERING
Fundamentals of IOT(BTN04409)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve the following: (Any Four) **16**

a) Discuss the impact of IoT on smart cities.
b) Identify and discuss the challenges and security considerations associated with the implementation of IoT in various domains.
c) Describe the components of an embedded system.
d) Discuss the challenges associated with developing embedded systems for IoT, including power consumption, real-time requirements, and resource constraints.
e) Discuss the fundamentals of signals and systems in the context of sensors.

Q.3 Solve the following: (Any Two) **12**

a) Explain the role of cloud computing in supporting IoT applications. How does cloud computing enhance the capabilities of IoT devices?
b) Explain the significance of integrated development environments (IDEs) in embedded development. Discuss different IDEs used for embedded systems and their features, emphasizing their role in simplifying the development process.
c) Explain the units of measurement commonly used in sensor technology. Discuss the significance of standard units and the importance of consistent measurement in IoT applications.

Section – II

Q.4 Attempt the following: (Any Four) **16**

a) Discuss the challenges and considerations in implementing sensor applications in real-world scenarios.
b) Discuss the role of temperature sensors in various IoT applications.
c) Discuss the applications of occupancy and motion detectors in IoT.
d) Examine the principles of Radio-Frequency Identification (RFID) technology.
e) Detail the process of installing Raspbian OS on a Raspberry Pi.

Q.5 Attempt the following: (Any Two) **12**

a) Discuss the power consumption parameters of communication technologies in IoT. Explore strategies to optimize power consumption, especially in battery-operated IoT devices, and address the trade-offs between power efficiency and communication performance.

b) Explain the applications of light detectors in different domains. Discuss how light sensors are used for tasks such as ambient light adjustment, security, and in consumer electronics.

c) Discuss the structure of the file system in Raspberry Pi, highlighting the importance of specific directories.

Seat No.	

Set P

S.Y. (B.Tech.) (Computer Science & Engg.) (Semester - I) (New) (CBCS)
Examination: March/April - 2025
Discrete Mathematical Structure (CSEPCC-01)

Day & Date: Saturday 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The Duality Law states that:
a) The negation of a conjunction is always a disjunction
b) A formula can be dual by interchanging ∧ and ∨, and replacing T with F and F with T
c) The negation of a disjunction is always a conjunction
d) If a formula is a tautology, its dual is a contradiction

2) A Partial order relation is Transitive, reflexive & _____.
a) Anti symmetric b) Irreflexive
c) Symmetric d) none of these

3) Let $f(x) = 2x$ and $g(x) = 2x$, what is $(g\ o\ f)(3) =$
a) 16 b) 12
c) 24 d) 27

4) The function of $f: N \to N$(N is set of natural numbers) is defined by $f(n) = 2n + 3$ is _____.
a) one to one b) into
c) Onto d) Both a & b

5) Condition for monoid is _____.
a) $(a + e) = a$ b) $(a^{*}e) = (a + e)$
c) $a = (a^{*}(a + e)$ d) $(a^{*}e) = (e^{*}a) = a$

6) Which of the following is the correct truth table for the conditional statement $p \rightarrow q$?
a) True if p is true and q is false
b) True if p is false and q is true
c) False if p is true and q is false
d) False if p is false and q is true

7) A Poset in which every pair of elements has both a least upper bound and a greatest lower bound is termed as _____.
a) sublattice b) lattice
c) trail d) walk

8) The binary relation {(1,1), (2,1), (2,2), (2,3), (2,4), (3,1), (3,2)} on the set {1,2, 3} is _____.
a) reflective, symmetric and transitive
b) irreflexive, symmetric and transitive
c) neither reflective, nor irreflexive but transitive
d) irreflexive and antisymmetric

9) A cyclic group is always _____.
a) abelian group b) monoid
c) semigroup d) subgroup

10) Which of the following is the Cartesian product of two sets $A = \{1,2\}$ and $B = \{a, b\}$?
a) $A \times B = \{(1, a), (1, b), (2, a), (2, b)\}$
b) $A \times B = \{1a, 1b, 2a, 2b\}$
c) $A \times B = \{(1,1), (2,2)\}$
d) $A \times B = \{1,2, a, b\}$

11) Identify the valid conclusion from the premises $Pv\ Q, Q \rightarrow R, P \rightarrow M, \urcorner M$
a) $P \wedge (R \vee R)$ b) $P \wedge (P \wedge R)$
c) $\mathrm{R} \wedge (P \vee Q)$ d) $Q \wedge (P \vee R)$

12) The members of the set $S = \{x | x$ is the square of an integer and $x < 100\}$ is _____.
a) $\{0, 2,4, 5, 9,58, 49, 56, 99, 12\}$ b) $\{0, 1,4,9, 16,25,36,49, 64,81\}$
c) $\{1,4, 9, 16,25,36,64,81,85,99\}$ d) $\{0, 1,4,9, 16,25, 36, 49, 64, 121\}$

13) Let $X = \{2, 3, 6, 12, 24\}$, and $\leq$ be the partial order defined by $X \leq Y$ if X divides Y. Number of edges in the Hasse diagram of $(X, \leq)$ is
a) 3 b) 4
c) 5 d) None of these

14) Which of the following properties of relations is characterized by a matrix with only 1's along the diagonal?
a) Symmetric b) Reflexive
c) Transitive d) Anti-symmetric

Seat No.	

Set P

S.Y. (B.Tech.) (Computer Science & Engg.) (Semester - I) (New) (CBCS)
Examination: March/April - 2025
Discrete Mathematical Structure (CSEPCC-01)

Day & Date: Saturday 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions (if necessary and state them clearly).

Section – I

Q.2 Solve the following. (Any Three) **12**

a) Explain conjunctive normal from and disjunctive normal form.

b) What is equivalence of formula? Show that following equivalence without constructing truth table $(\neg P \wedge \neg Q \wedge R) \vee Q \wedge R \vee (P \wedge R) \Leftrightarrow R$

c) Define the following terms
i) Set inclusion and equality of sets
ii) Partition and covering of sets

d) Consider the relation
$R = \{< 1,3 >, < 1,4 >, < 3,2 >, < 3,3 >, < 3,4 >\} on\ A = \{1,2,3,4\}$
i) Find the matrix M_R of R
ii) Find the Domain and Range of R

Q.3 a) Let $A = \{4,5,6,7,8\}$. State whether following are covering or partition along with reason. **16**
1) $\{\{4,5\},\{6\},\{7,8,4\}\}$
2) $\{\{4\},\{7,6\},\{5\}\}$
3) $\{\{4,5\},\{7\},\{6,8\}\}$
4) $\{\{4,5\},\{5,6\},\{4,7,8\}\}$

b) 1) $(\urcorner p \rightarrow \urcorner q) \rightarrow (p \leftrightarrow \urcorner q)$
2) $p \vee (\urcorner p \rightarrow (q \vee (\urcorner q \rightarrow r))$

Q.4 Attempt the Following. (Any Three) **12**

a) What are the different type of functions?
b) Explain subgroup with an example.
c) Define sub lattice, complete lattice. Bounded lattice, Lattice
d) Explain properties of Algebraic system

Q.5 Solve any TWO. **16**

a) Define polish expression and translate the infix string $(a + b \uparrow c \uparrow d)^*(e + f/g)$ to reverse polish (suffix) expression.

b) Define functions: Consider $X = \{a, b, c\} Y = \{0,1\}$ are sets for the mapping set X to set Y. List all the possible function. Indicate in each whether the function is one-to-one. is on to. or is one- to-one on to.

c) Consider the poset $(X, \leq)$where $X = \{1, 2, 3, 5, 30\}$ and the partial ordered relation $\leq$ is defined as i.e. if x and y then $y \in X$ means $x \leq y$ divides x. Then show that poset (X. <) is a lattice.

Seat No.	

Set Q

S.Y. (B.Tech.) (Computer Science & Engg.) (Semester - I) (New) (CBCS)
Examination: March/April - 2025
Discrete Mathematical Structure (CSEPCC-01)

Day & Date: Saturday 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) The binary relation {(1,1), (2,1), (2,2), (2,3), (2,4), (3,1), (3,2)} on the set {1,2, 3} is _____.
a) reflective, symmetric and transitive
b) irreflexive, symmetric and transitive
c) neither reflective, nor irreflexive but transitive
d) irreflexive and antisymmetric

2) A cyclic group is always _____.
a) abelian group b) monoid
c) semigroup d) subgroup

3) Which of the following is the Cartesian product of two sets $A = \{1,2\}$ and $B = \{a, b\}$?
a) $A \times B = \{(1, a), (1, b), (2, a), (2, b)\}$
b) $A \times B = \{1a, 1b, 2a, 2b\}$
c) $A \times B = \{(1,1), (2,2)\}$
d) $A \times B = \{1,2, a, b\}$

4) Identify the valid conclusion from the premises $Pv\ Q, Q \rightarrow R, P \rightarrow M, \urcorner M$
a) $P^{\wedge}(R \vee R)$ b) $P^{\wedge}(P^{\wedge}R)$
c) $\mathrm{R}^{\wedge}(P \vee Q)$ d) $Q^{\wedge}(P \vee R)$

5) The members of the set $S = \{x | x$ is the square of an integer and $x < 100\}$ is _____.
a) $\{0, 2,4, 5, 9,58, 49, 56, 99, 12\}$ b) $\{0, 1,4,9, 16,25,36,49, 64,81\}$
c) $\{1,4, 9, 16,25,36,64,81,85,99\}$ d) $\{0, 1,4,9, 16,25, 36, 49, 64, 121\}$

6) Let $X = \{2, 3, 6, 12, 24\}$, and $\leq$ be the partial order defined by $X \leq Y$ if X divides Y. Number of edges in the Hasse diagram of $(X, \leq)$ is
a) 3 b) 4
c) 5 d) None of these

7) Which of the following properties of relations is characterized by a matrix with only 1's along the diagonal?
a) Symmetric b) Reflexive
c) Transitive d) Anti-symmetric

8) The Duality Law states that:
a) The negation of a conjunction is always a disjunction
b) A formula can be dual by interchanging ∧ and ∨, and replacing T with F and F with T
c) The negation of a disjunction is always a conjunction
d) If a formula is a tautology, its dual is a contradiction

9) A Partial order relation is Transitive, reflexive & _____.
a) Anti symmetric b) Irreflexive
c) Symmetric d) none of these

10) Let $f(x) = 2x$ and $g(x) = 2x$, what is $(g\ o\ f)(3) =$
a) 16 b) 12
c) 24 d) 27

11) The function of $f: N \to N$(N is set of natural numbers) is defined by $f(n) = 2n + 3$ is _____.
a) one to one b) into
c) Onto d) Both a & b

12) Condition for monoid is _____.
a) $(a + e) = a$ b) $(a^* e) = (a + e)$
c) $a = (a^*(a + e)$ d) $(a^* e) = (e^* a) = a$

13) Which of the following is the correct truth table for the conditional statement $p \to q$?
a) True if p is true and q is false
b) True if p is false and q is true
c) False if p is true and q is false
d) False if p is false and q is true

14) A Poset in which every pair of elements has both a least upper bound and a greatest lower bound is termed as _____.
a) sublattice b) lattice
c) trail d) walk

Seat No.	

Set Q

S.Y. (B.Tech.) (Computer Science & Engg.) (Semester - I) (New) (CBCS)
Examination: March/April - 2025
Discrete Mathematical Structure (CSEPCC-01)

Day & Date: Saturday 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions (if necessary and state them clearly).

Section – I

Q.2 Solve the following. (Any Three) **12**

a) Explain conjunctive normal from and disjunctive normal form.

b) What is equivalence of formula? Show that following equivalence without constructing truth table $(\neg P \wedge \neg Q \wedge R) \vee Q \wedge R \vee (P \wedge R) \Leftrightarrow R$

c) Define the following terms
i) Set inclusion and equality of sets
ii) Partition and covering of sets

d) Consider the relation
$R = \{< 1,3 >, < 1,4 >, < 3,2 >, < 3,3 >, < 3,4 >\} on\ A = \{1,2,3,4\}$
i) Find the matrix M_R of R
ii) Find the Domain and Range of R

Q.3 a) Let $A = \{4,5,6,7,8\}$. State whether following are covering or partition along with reason. **16**
1) $\{\{4,5\},\{6\},\{7,8,4\}\}$
2) $\{\{4\},\{7,6\},\{5\}\}$
3) $\{\{4,5\},\{7\},\{6,8\}\}$
4) $\{\{4,5\},\{5,6\},\{4,7,8\}\}$

b) 1) $(\urcorner p \rightarrow \urcorner q) \rightarrow (p \leftrightarrow \urcorner q)$
2) $p \vee (\urcorner p \rightarrow (q \vee (\urcorner q \rightarrow r))$

Q.4 Attempt the Following. (Any Three) **12**

a) What are the different type of functions?
b) Explain subgroup with an example.
c) Define sub lattice, complete lattice. Bounded lattice, Lattice
d) Explain properties of Algebraic system

Q.5 Solve any TWO. **16**

a) Define polish expression and translate the infix string $(a + b \uparrow c \uparrow d)^*(e + f/g)$ to reverse polish (suffix) expression.

b) Define functions: Consider $X = \{a, b, c\} Y = \{0,1\}$ are sets for the mapping set X to set Y. List all the possible function. Indicate in each whether the function is one-to-one. is on to. or is one- to-one on to.

c) Consider the poset $(X, \leq)$where $X = \{1, 2, 3, 5, 30\}$ and the partial ordered relation $\leq$ is defined as i.e. if x and y then $y \in X$ means $x \leq y$ divides x. Then show that poset (X. <) is a lattice.

Seat No.	

Set R

S.Y. (B.Tech.) (Computer Science & Engg.) (Semester - I) (New) (CBCS)
Examination: March/April - 2025
Discrete Mathematical Structure (CSEPCC-01)

Day & Date: Saturday 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Identify the valid conclusion from the premises $Pv\ Q, Q \rightarrow R, P \rightarrow M, \urcorner M$
a) $P \wedge (R \vee R)$ b) $P \wedge (P \wedge R)$
c) $\mathrm{R} \wedge (P \vee Q)$ d) $Q \wedge (P \vee R)$

2) The members of the set $S = \{x | x$ is the square of an integer and $x < 100\}$ is _____.
a) $\{0, 2, 4, 5, 9, 58, 49, 56, 99, 12\}$ b) $\{0, 1, 4, 9, 16, 25, 36, 49, 64, 81\}$
c) $\{1, 4, 9, 16, 25, 36, 64, 81, 85, 99\}$ d) $\{0, 1, 4, 9, 16, 25, 36, 49, 64, 121\}$

3) Let $X = \{2, 3, 6, 12, 24\}$, and $\leq$ be the partial order defined by $X \leq Y$ if X divides Y. Number of edges in the Hasse diagram of $(X, \leq)$ is
a) 3 b) 4
c) 5 d) None of these

4) Which of the following properties of relations is characterized by a matrix with only 1's along the diagonal?
a) Symmetric b) Reflexive
c) Transitive d) Anti-symmetric

5) The Duality Law states that:
a) The negation of a conjunction is always a disjunction
b) A formula can be dual by interchanging ∧ and ∨, and replacing T with F and F with T
c) The negation of a disjunction is always a conjunction
d) If a formula is a tautology, its dual is a contradiction

6) A Partial order relation is Transitive, reflexive & _____.
a) Anti symmetric b) Irreflexive
c) Symmetric d) none of these

7) Let $f(x) = 2x$ and $g(x) = 2x$, what is $(g\ o\ f)(3) =$
a) 16 b) 12
c) 24 d) 27

8) The function of $f: N \to N$(N is set of natural numbers) is defined by $f(n) = 2n + 3$ is _____.
a) one to one b) into
c) Onto d) Both a & b

9) Condition for monoid is _____.
a) $(a + e) = a$ b) $(a\ ^* e) = (a + e)$
c) $a = (a\ ^*(a + e)$ d) $(a\ ^* e) = (e\ ^* a) = a$

10) Which of the following is the correct truth table for the conditional statement $p \to q$?
a) True if p is true and q is false
b) True if p is false and q is true
c) False if p is true and q is false
d) False if p is false and q is true

11) A Poset in which every pair of elements has both a least upper bound and a greatest lower bound is termed as _____.
a) sublattice b) lattice
c) trail d) walk

12) The binary relation {(1,1), (2,1), (2,2), (2,3), (2,4), (3,1), (3,2)} on the set {1,2, 3} is _____.
a) reflective, symmetric and transitive
b) irreflexive, symmetric and transitive
c) neither reflective, nor irreflexive but transitive
d) irreflexive and antisymmetric

13) A cyclic group is always _____.
a) abelian group b) monoid
c) semigroup d) subgroup

14) Which of the following is the Cartesian product of two sets $A = \{1,2\}$ and $B = \{a, b\}$?
a) $A \times B = \{(1, a), (1, b), (2, a), (2, b)\}$
b) $A \times B = \{1a, 1b, 2a, 2b\}$
c) $A \times B = \{(1,1), (2,2)\}$
d) $A \times B = \{1,2, a, b\}$

Seat No.	

Set R

S.Y. (B.Tech.) (Computer Science & Engg.) (Semester - I) (New) (CBCS)
Examination: March/April - 2025
Discrete Mathematical Structure (CSEPCC-01)

Day & Date: Saturday 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions (if necessary and state them clearly).

Section – I

Q.2 Solve the following. (Any Three) **12**

a) Explain conjunctive normal from and disjunctive normal form.

b) What is equivalence of formula? Show that following equivalence without constructing truth table $(\neg P \wedge \neg Q \wedge R) \vee Q \wedge R \vee (P \wedge R) \Leftrightarrow R$

c) Define the following terms
i) Set inclusion and equality of sets
ii) Partition and covering of sets

d) Consider the relation
$R = \{< 1,3 >, < 1,4 >, < 3,2 >, < 3,3 >, < 3,4 >\} on\ A = \{1,2,3,4\}$
i) Find the matrix M_R of R
ii) Find the Domain and Range of R

Q.3 a) Let $A = \{4,5,6,7,8\}$. State whether following are covering or partition along with reason. **16**
1) $\{\{4,5\},\{6\},\{7,8,4\}\}$
2) $\{\{4\},\{7,6\},\{5\}\}$
3) $\{\{4,5\},\{7\},\{6,8\}\}$
4) $\{\{4,5\},\{5,6\},\{4,7,8\}\}$

b) 1) $(\urcorner p \rightarrow \urcorner q) \rightarrow (p \leftrightarrow \urcorner q)$
2) $p \vee (\urcorner p \rightarrow (q \vee (\urcorner q \rightarrow r))$

Q.4 Attempt the Following. (Any Three) **12**

a) What are the different type of functions?
b) Explain subgroup with an example.
c) Define sub lattice, complete lattice. Bounded lattice, Lattice
d) Explain properties of Algebraic system

Q.5 Solve any TWO. **16**

a) Define polish expression and translate the infix string $(a + b \uparrow c \uparrow d)^*(e + f/g)$ to reverse polish (suffix) expression.

b) Define functions: Consider $X = \{a, b, c\} Y = \{0,1\}$ are sets for the mapping set X to set Y. List all the possible function. Indicate in each whether the function is one-to-one. is on to. or is one- to-one on to.

c) Consider the poset $(X, \leq)$where $X = \{1, 2, 3, 5, 30\}$ and the partial ordered relation $\leq$ is defined as i.e. if x and y then $y \in X$ means $x \leq y$ divides x. Then show that poset (X. <) is a lattice.

Seat No.	

Set S

S.Y. (B.Tech.) (Computer Science & Engg.) (Semester - I) (New) (CBCS)
Examination: March/April - 2025
Discrete Mathematical Structure (CSEPCC-01)

Day & Date: Saturday 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Which of the following is the correct truth table for the conditional statement $p \rightarrow q$?
a) True if p is true and q is false
b) True if p is false and q is true
c) False if p is true and q is false
d) False if p is false and q is true

2) A Poset in which every pair of elements has both a least upper bound and a greatest lower bound is termed as _____.
a) sublattice b) lattice
c) trail d) walk

3) The binary relation {(1,1), (2,1), (2,2), (2,3), (2,4), (3,1), (3,2)} on the set {1,2, 3} is _____.
a) reflective, symmetric and transitive
b) irreflexive, symmetric and transitive
c) neither reflective, nor irreflexive but transitive
d) irreflexive and antisymmetric

4) A cyclic group is always _____.
a) abelian group b) monoid
c) semigroup d) subgroup

5) Which of the following is the Cartesian product of two sets $A = \{1,2\}$ and $B = \{a, b\}$?
a) $A \times B = \{(1, a), (1, b), (2, a), (2, b)\}$
b) $A \times B = \{1a, 1b, 2a, 2b\}$
c) $A \times B = \{(1,1), (2,2)\}$
d) $A \times B = \{1,2, a, b\}$

6) Identify the valid conclusion from the premises $Pv\ Q, Q \rightarrow R, P \rightarrow M, \urcorner M$
a) $P^{\wedge}(R \vee R)$ b) $P^{\wedge}(P^{\wedge}R)$
c) $\mathrm{R}^{\wedge}(P \vee Q)$ d) $Q^{\wedge}(P \vee R)$

7) The members of the set $S = \{x | x$ is the square of an integer and $x < 100\}$ is _____.
a) $\{0, 2,4, 5, 9,58, 49, 56, 99, 12\}$ b) $\{0, 1,4,9, 16,25,36,49, 64,81\}$
c) $\{1,4, 9, 16,25,36,64,81,85,99\}$ d) $\{0, 1,4,9, 16,25, 36, 49, 64, 121\}$

8) Let $X = \{2, 3, 6, 12, 24\}$, and $\leq$ be the partial order defined by $X \leq Y$ if X divides Y. Number of edges in the Hasse diagram of $(X, \leq)$ is
a) 3 b) 4
c) 5 d) None of these

9) Which of the following properties of relations is characterized by a matrix with only 1's along the diagonal?
a) Symmetric b) Reflexive
c) Transitive d) Anti-symmetric

10) The Duality Law states that:
a) The negation of a conjunction is always a disjunction
b) A formula can be dual by interchanging ∧ and ∨, and replacing T with F and F with T
c) The negation of a disjunction is always a conjunction
d) If a formula is a tautology, its dual is a contradiction

11) A Partial order relation is Transitive, reflexive & _____.
a) Anti symmetric b) Irreflexive
c) Symmetric d) none of these

12) Let $f(x) = 2x$ and $g(x) = 2x$, what is $(g\ o\ f)(3) =$
a) 16 b) 12
c) 24 d) 27

13) The function of $f: N \rightarrow N$(N is set of natural numbers) is defined by $f(n) = 2n + 3$ is _____.
a) one to one b) into
c) Onto d) Both a & b

14) Condition for monoid is _____.

a) $(a + e) = a$ b) $(a\,^{*}e) = (a + e)$

c) $a = (a\,^{*}(a + e)$ d) $(a\,^{*}e) = (e\,^{*}a) = a$

Seat No.		Set	S

S.Y. (B.Tech.) (Computer Science & Engg.) (Semester - I) (New) (CBCS)
Examination: March/April - 2025
Discrete Mathematical Structure (CSEPCC-01)

Day & Date: Saturday 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions (if necessary and state them clearly).

Section – I

Q.2 Solve the following. (Any Three) **12**

a) Explain conjunctive normal from and disjunctive normal form.

b) What is equivalence of formula? Show that following equivalence without constructing truth table $(\neg P \wedge \neg Q \wedge R) \vee Q \wedge R \vee (P \wedge R) \Leftrightarrow R$

c) Define the following terms
i) Set inclusion and equality of sets
ii) Partition and covering of sets

d) Consider the relation
$R = \{< 1,3 >, < 1,4 >, < 3,2 >, < 3,3 >, < 3,4 >\} on\ A = \{1,2,3,4\}$
i) Find the matrix M_R of R
ii) Find the Domain and Range of R

Q.3 a) Let $A = \{4,5,6,7,8\}$. State whether following are covering or partition along with reason. **16**
1) $\{\{4,5\},\{6\},\{7,8,4\}\}$
2) $\{\{4\},\{7,6\},\{5\}\}$
3) $\{\{4,5\},\{7\},\{6,8\}\}$
4) $\{\{4,5\},\{5,6\},\{4,7,8\}\}$

b) 1) $(\urcorner p \rightarrow \urcorner q) \rightarrow (p \leftrightarrow \urcorner q)$
2) $p \vee (\urcorner p \rightarrow (q \vee (\urcorner q \rightarrow r))$

Q.4 Attempt the Following. (Any Three) **12**

a) What are the different type of functions?
b) Explain subgroup with an example.
c) Define sub lattice, complete lattice. Bounded lattice, Lattice
d) Explain properties of Algebraic system

Q.5 Solve any TWO. **16**

a) Define polish expression and translate the infix string $(a + b \uparrow c \uparrow d)^*(e + f/g)$ to reverse polish (suffix) expression.

b) Define functions: Consider $X = \{a, b, c\} Y = \{0,1\}$ are sets for the mapping set X to set Y. List all the possible function. Indicate in each whether the function is one-to-one. is on to. or is one- to-one on to.

c) Consider the poset $(X, \leq)$where $X = \{1, 2, 3, 5, 30\}$ and the partial ordered relation $\leq$ is defined as i.e. if x and y then $y \in X$ means $x \leq y$ divides x. Then show that poset (X. <) is a lattice.

SLR-BD-130

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING.
Computer Graphics (CSEPCC-02)

Day & Date: Monday, 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Assume suitable data if necessary and state it clearly.
4) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Interactive graphics is useful in ____.
a) Training pilots b) Computer aided design
c) Process control d) All of these

2) At end of each scan line the electron beam return to the left side on the screen to begin next scan line is called, ____.
a) Vertical refresh b) Horizontal refresh
c) Scanning d) Both a & b

3) The process of determining the suitable or appropriate pixels for representing image or graphic object is called ____
a) Animation b) Rasterization
c) Scan-Conversion d) Quantization

4) In the generation of circle by Bresnahan's algorithm, it is simple to generate ____
a) All octants
b) One octant first and others by successive reflection
c) One octant first and others by successive rotation
d) None of these

5) The basic geometric transformations are ____.
a) Translation b) Rotation
c) Scaling d) All of the mentioned

6) ____ is the ratio of horizontal points to vertical points necessary to produce equal length lines in both directions.
a) Aspect Ratio b) Dot Pitch
c) Resolution d) Height-Width Ratio

7) The end point of polygon are called as ____.
a) Edges b) Line
c) Vertices d) None of these

8) Cohen-Sutherland subdivision line clipping algorithm uses regions with different codes ____
a) 8 b) 6
c) 4 d) 9

9) The process of selecting and viewing the picture with different views is called ___.
a) Clipping b) Windowing
c) Segmenting d) All of above

10) A closed polyline is called a ____.
a) Polychain b) Polygon
c) Polyclosed d) Closed chain

11) The shape of the Bezier curve is controlled by ____.
a) control points b) Knots
c) end points d) All of the mentioned

12) What should be sequence of transformations that are required to perform rotation of an object around an arbitrary point?
a) Inverse Translation, Rotation, Translation
b) Scaling, Translation, Rotation
c) Translation, Rotation. Inverse Translation
d) Rotation, Translation, Scaling

13) Cohen-Sutherland clipping is an example of ____.
a) polygon clipping b) text clipping
c) line clipping d) curve clipping

14) Window Port In computer graphics Window Port is ____.
a) It represents real world coordinate system
b) A window port can be defined with the help of a GWINDOW statement
c) Window port is the coordinate area specially selected for the display
d) All of the above

SLR-BD-130

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING.
Computer Graphics (CSEPCC-02)

Day & Date: Monday, 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following questions: (Any Four) **16**

a) Explain Raster Scan display.
b) Explain 2D Scaling.
c) Define Aspect Ratio and Resolution.
d) Translate the polygon with coordinates P(2,5), Q(7,10), C(10,2) by 2 units in both x and 3 units in y direction.
e) Explain various Interactive devices.

Q.3 Attempt the following questions: (Any Two) **12**

a) Consider a line from (6,6) to (12,10). Use Bresenham's line drawing algorithm to rasterize this line.
b) Write a C program for Bresenham's Circle generation algorithm.
c) Explain CRT and Shadow Mask Technique.

Section – II

Q.4 Attempt the following questions: (Any Three) **12**

a) Write a note on Half toning.
b) Write note on Antialiasing.
c) State advantages and disadvantages of Z-Buffer.
d) Explain Warnock Algorithm.
e) What is line clipping? Explain categories of lines.

Q.5 Attempt the following questions: (Any Two) **16**

a) Explain Cohen-Sutherland line clipping algorithm.
b) Explain Bezier curve in detail along with its properties.
c) What is Curve? Explain B-spline curves.

SLR-BD-130

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING.
Computer Graphics (CSEPCC-02)

Day & Date: Monday, 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Assume suitable data if necessary and state it clearly.
4) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Cohen-Sutherland subdivision line clipping algorithm uses regions with different codes ____
a) 8 b) 6
c) 4 d) 9

2) The process of selecting and viewing the picture with different views is called ___.
a) Clipping b) Windowing
c) Segmenting d) All of above

3) A closed polyline is called a ____.
a) Polychain b) Polygon
c) Polyclosed d) Closed chain

4) The shape of the Bezier curve is controlled by ____.
a) control points b) Knots
c) end points d) All of the mentioned

5) What should be sequence of transformations that are required to perform rotation of an object around an arbitrary point?
a) Inverse Translation, Rotation, Translation
b) Scaling, Translation, Rotation
c) Translation, Rotation. Inverse Translation
d) Rotation, Translation, Scaling

6) Cohen-Sutherland clipping is an example of ____.
a) polygon clipping b) text clipping
c) line clipping d) curve clipping

7) Window Port In computer graphics Window Port is ____.
a) It represents real world coordinate system
b) A window port can be defined with the help of a GWINDOW statement
c) Window port is the coordinate area specially selected for the display
d) All of the above

8) Interactive graphics is useful in ____.
a) Training pilots b) Computer aided design
c) Process control d) All of these

9) At end of each scan line the electron beam return to the left side on the screen to begin next scan line is called, ____.
a) Vertical refresh b) Horizontal refresh
c) Scanning d) Both a & b

10) The process of determining the suitable or appropriate pixels for representing image or graphic object is called ____
a) Animation b) Rasterization
c) Scan-Conversion d) Quantization

11) In the generation of circle by Bresnahan's algorithm, it is simple to generate ____
a) All octants
b) One octant first and others by successive reflection
c) One octant first and others by successive rotation
d) None of these

12) The basic geometric transformations are ____.
a) Translation b) Rotation
c) Scaling d) All of the mentioned

13) ____ is the ratio of horizontal points to vertical points necessary to produce equal length lines in both directions.
a) Aspect Ratio b) Dot Pitch
c) Resolution d) Height-Width Ratio

14) The end point of polygon are called as ____.
a) Edges b) Line
c) Vertices d) None of these

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING.
Computer Graphics (CSEPCC-02)

Day & Date: Monday, 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following questions: (Any Four) **16**
- **a)** Explain Raster Scan display.
- **b)** Explain 2D Scaling.
- **c)** Define Aspect Ratio and Resolution.
- **d)** Translate the polygon with coordinates P(2,5), Q(7,10), C(10,2) by 2 units in both x and 3 units in y direction.
- **e)** Explain various Interactive devices.

Q.3 Attempt the following questions: (Any Two) **12**
- **a)** Consider a line from (6,6) to (12,10). Use Bresenham's line drawing algorithm to rasterize this line.
- **b)** Write a C program for Bresenham's Circle generation algorithm.
- **c)** Explain CRT and Shadow Mask Technique.

Section – II

Q.4 Attempt the following questions: (Any Three) **12**
- **a)** Write a note on Half toning.
- **b)** Write note on Antialiasing.
- **c)** State advantages and disadvantages of Z-Buffer.
- **d)** Explain Warnock Algorithm.
- **e)** What is line clipping? Explain categories of lines.

Q.5 Attempt the following questions: (Any Two) **16**
- **a)** Explain Cohen-Sutherland line clipping algorithm.
- **b)** Explain Bezier curve in detail along with its properties.
- **c)** What is Curve? Explain B-spline curves.

SLR-BD-130

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING.
Computer Graphics (CSEPCC-02)

Day & Date: Monday, 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Assume suitable data if necessary and state it clearly.
4) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The shape of the Bezier curve is controlled by ____.
a) control points b) Knots
c) end points d) All of the mentioned

2) What should be sequence of transformations that are required to perform rotation of an object around an arbitrary point?
a) Inverse Translation, Rotation, Translation
b) Scaling, Translation, Rotation
c) Translation, Rotation. Inverse Translation
d) Rotation, Translation, Scaling

3) Cohen-Sutherland clipping is an example of ____.
a) polygon clipping b) text clipping
c) line clipping d) curve clipping

4) Window Port In computer graphics Window Port is ____.
a) It represents real world coordinate system
b) A window port can be defined with the help of a GWINDOW statement
c) Window port is the coordinate area specially selected for the display
d) All of the above

5) Interactive graphics is useful in ____.
a) Training pilots b) Computer aided design
c) Process control d) All of these

6) At end of each scan line the electron beam return to the left side on the screen to begin next scan line is called, ____.

a) Vertical refresh b) Horizontal refresh
c) Scanning d) Both a & b

7) The process of determining the suitable or appropriate pixels for representing image or graphic object is called ____

a) Animation b) Rasterization
c) Scan-Conversion d) Quantization

8) In the generation of circle by Bresnahan's algorithm, it is simple to generate ____

a) All octants
b) One octant first and others by successive reflection
c) One octant first and others by successive rotation
d) None of these

9) The basic geometric transformations are ____.

a) Translation b) Rotation
c) Scaling d) All of the mentioned

10) ____ is the ratio of horizontal points to vertical points necessary to produce equal length lines in both directions.

a) Aspect Ratio b) Dot Pitch
c) Resolution d) Height-Width Ratio

11) The end point of polygon are called as ____.

a) Edges b) Line
c) Vertices d) None of these

12) Cohen-Sutherland subdivision line clipping algorithm uses regions with different codes ____

a) 8 b) 6
c) 4 d) 9

13) The process of selecting and viewing the picture with different views is called ___.

a) Clipping b) Windowing
c) Segmenting d) All of above

14) A closed polyline is called a ____.

a) Polychain b) Polygon
c) Polyclosed d) Closed chain

SLR-BD-130

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING.
Computer Graphics (CSEPCC-02)

Day & Date: Monday, 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following questions: (Any Four) **16**

a) Explain Raster Scan display.
b) Explain 2D Scaling.
c) Define Aspect Ratio and Resolution.
d) Translate the polygon with coordinates P(2,5), Q(7,10), C(10,2) by 2 units in both x and 3 units in y direction.
e) Explain various Interactive devices.

Q.3 Attempt the following questions: (Any Two) **12**

a) Consider a line from (6,6) to (12,10). Use Bresenham's line drawing algorithm to rasterize this line.
b) Write a C program for Bresenham's Circle generation algorithm.
c) Explain CRT and Shadow Mask Technique.

Section – II

Q.4 Attempt the following questions: (Any Three) **12**

a) Write a note on Half toning.
b) Write note on Antialiasing.
c) State advantages and disadvantages of Z-Buffer.
d) Explain Warnock Algorithm.
e) What is line clipping? Explain categories of lines.

Q.5 Attempt the following questions: (Any Two) **16**

a) Explain Cohen-Sutherland line clipping algorithm.
b) Explain Bezier curve in detail along with its properties.
c) What is Curve? Explain B-spline curves.

SLR-BD-130

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING.
Computer Graphics (CSEPCC-02)

Day & Date: Monday, 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Assume suitable data if necessary and state it clearly.
4) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) ____ is the ratio of horizontal points to vertical points necessary to produce equal length lines in both directions.
a) Aspect Ratio b) Dot Pitch
c) Resolution d) Height-Width Ratio

2) The end point of polygon are called as ____.
a) Edges b) Line
c) Vertices d) None of these

3) Cohen-Sutherland subdivision line clipping algorithm uses regions with different codes ____
a) 8 b) 6
c) 4 d) 9

4) The process of selecting and viewing the picture with different views is called ___.
a) Clipping b) Windowing
c) Segmenting d) All of above

5) A closed polyline is called a ____.
a) Polychain b) Polygon
c) Polyclosed d) Closed chain

6) The shape of the Bezier curve is controlled by ____.
a) control points b) Knots
c) end points d) All of the mentioned

7) What should be sequence of transformations that are required to perform rotation of an object around an arbitrary point?
a) Inverse Translation, Rotation, Translation
b) Scaling, Translation, Rotation
c) Translation, Rotation. Inverse Translation
d) Rotation, Translation, Scaling

8) Cohen-Sutherland clipping is an example of ____.
a) polygon clipping b) text clipping
c) line clipping d) curve clipping

9) Window Port In computer graphics Window Port is ____.
a) It represents real world coordinate system
b) A window port can be defined with the help of a GWINDOW statement
c) Window port is the coordinate area specially selected for the display
d) All of the above

10) Interactive graphics is useful in ____.
a) Training pilots b) Computer aided design
c) Process control d) All of these

11) At end of each scan line the electron beam return to the left side on the screen to begin next scan line is called, ____.
a) Vertical refresh b) Horizontal refresh
c) Scanning d) Both a & b

12) The process of determining the suitable or appropriate pixels for representing image or graphic object is called ____
a) Animation b) Rasterization
c) Scan-Conversion d) Quantization

13) In the generation of circle by Bresnahan's algorithm, it is simple to generate ____
a) All octants
b) One octant first and others by successive reflection
c) One octant first and others by successive rotation
d) None of these

14) The basic geometric transformations are ____.
a) Translation b) Rotation
c) Scaling d) All of the mentioned

SLR-BD-130

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING.
Computer Graphics (CSEPCC-02)

Day & Date: Monday, 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following questions: (Any Four) **16**
- **a)** Explain Raster Scan display.
- **b)** Explain 2D Scaling.
- **c)** Define Aspect Ratio and Resolution.
- **d)** Translate the polygon with coordinates P(2,5), Q(7,10), C(10,2) by 2 units in both x and 3 units in y direction.
- **e)** Explain various Interactive devices.

Q.3 Attempt the following questions: (Any Two) **12**
- **a)** Consider a line from (6,6) to (12,10). Use Bresenham's line drawing algorithm to rasterize this line.
- **b)** Write a C program for Bresenham's Circle generation algorithm.
- **c)** Explain CRT and Shadow Mask Technique.

Section – II

Q.4 Attempt the following questions: (Any Three) **12**
- **a)** Write a note on Half toning.
- **b)** Write note on Antialiasing.
- **c)** State advantages and disadvantages of Z-Buffer.
- **d)** Explain Warnock Algorithm.
- **e)** What is line clipping? Explain categories of lines.

Q.5 Attempt the following questions: (Any Two) **16**
- **a)** Explain Cohen-Sutherland line clipping algorithm.
- **b)** Explain Bezier curve in detail along with its properties.
- **c)** What is Curve? Explain B-spline curves.

SLR-BD-131

Seat No.	

Set P

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Data Structure (CSEPCC-03)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers. **14**

1) Which of the following is non-linear data structure?
a) Trees b) Array
c) Stacks d) Linked List

2) ____ sort is the method used by card sorter.
a) Quick b) Radix
c) Selection d) Bubble

3) What is a hash table?
a) A structure that maps values to keys
b) A structure that maps keys to values
c) A structure used for storage
d) A structure used to implement stack and queue

4) What is the primary function of a Stack data structure?
a) FIFO operation b) LIFO operation
c) Both LIFO & FIFO d) LILO operation

5) In a stack, if a user tries to remove an element from empty stack it is called ____.
a) Underflow b) Empty collection
c) Overflow d) Garbage Collection

6) If the elements "A", "B", "C" and "D" are placed in a queue and are deleted one at a time, in what order will they be removed?
a) ABCD b) DCBA
c) DCAB d) ABDC

7) Linked list is considered as an example of ____ type of memory.
a) Compile time b) Static
c) Dynamic d) None of the mentioned

8) A complete binary tree of level 5 has how many nodes?
a) 15 b) 63
c) 25 d) 30

9) A multi-way search tree has n items. The number of external nodes is _____
a) n^2 b) $\log n$
c) n d) $n+1$

10) What is the maximum height of an AVL tree with p nodes?
a) p b) log(p)
c) log(p)/2 d) p/2

11) Why we need to a binary tree which is height balanced?
a) to avoid formation of skew trees
b) to save memory
c) to attain faster memory access
d) to simplify storing

12) Which of the following is the most widely used external memory data structure.
a) AVL tree b) B-tree
c) Red-black tree d) Both AVL tree and Red-black tree

13) Graphs are represented using ____.
a) Adjacency tree b) Adjacency linked list
c) Adjacency graph d) Adjacency queue

14) Which of the following properties does a simple graph not hold?
a) Must be connected
b) Must have no loops or multiple edges
c) Must be unweighted
d) Must have no multiple edges

SLR-BD-131

Seat No.	

Set P

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Data Structure (CSEPCC-03)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Attempt the following questions: (Any Two) **10**

a) Define data structure. Explain its types along with example.
b) Define queue. Explain its operations using array.
c) Describe circular linked list with suitable diagram. Also state advantage of circular linked list over linear linked list.

Q.3 Attempt the following: (Any Three) **18**

a) Write a menu-driven program to implement a stack showing operations.
i) Insertion
ii) Deletion
iii) Display

b) Write a program to implement a doubly linked list.
i) Insert a node at the beginning of the list.
ii) Insert a node at the end of the list.
iii) Display the linked list.

c) Elaborate the steps for performing bubble sort for given elements of array.
A={54,26,93,17,77,31,44,55,20}

d) Define Hashing. List collision resolution technique? Explain Linear Probing with example.

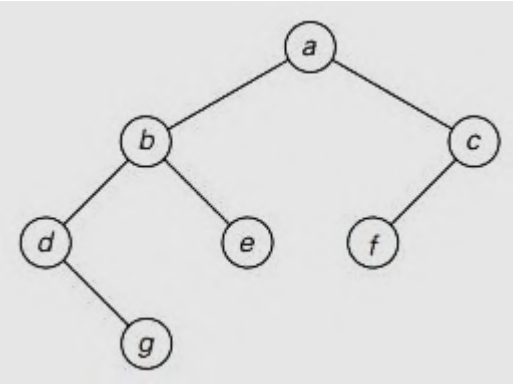
Section – II

Q.4 Attempt the following: (Any Two) **10**

a) Construct a binary search tree for following elements: 30,100,90,15,2,25,36,72,78,10 show each step of construction of BST.
b) Explain DFS & BFS in Graph with example.
c) Compare B tree & B+ tree with an example.

Q.5 Attempt the following: (Any Three) **18**

a) Traverse the following tree by the in-order, pre-order and post-order methods:



b) Define following terminologies in Graph

a) Neighbors
b) degree of a node
c) regular graph
d) Path
e) Cycle
f) Complete graph

c) Construct AVL tree for the following elements.
21, 26, 30, 09, 04, 14, 28, 18, 15,10, 2, 3, 7

d) Explain B tree. Show the growth of the B tree of order 4 by inserting the following keys (show each step).
01, 05, 06, 02, 08, 12, 14, 15, 20, 07, 10

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Data Structure (CSEPCC-03)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers. **14**

1) A complete binary tree of level 5 has how many nodes?
a) 15 b) 63
c) 25 d) 30

2) A multi-way search tree has n items. The number of external nodes is _____
a) n^2 b) $\log n$
c) n d) $n+1$

3) What is the maximum height of an AVL tree with p nodes?
a) p b) log(p)
c) log(p)/2 d) p/2

4) Why we need to a binary tree which is height balanced?
a) to avoid formation of skew trees
b) to save memory
c) to attain faster memory access
d) to simplify storing

5) Which of the following is the most widely used external memory data structure.
a) AVL tree b) B-tree
c) Red-black tree d) Both AVL tree and Red-black tree

6) Graphs are represented using ____.
a) Adjacency tree b) Adjacency linked list
c) Adjacency graph d) Adjacency queue

7) Which of the following properties does a simple graph not hold?
a) Must be connected
b) Must have no loops or multiple edges
c) Must be unweighted
d) Must have no multiple edges

8) Which of the following is non-linear data structure?
a) Trees b) Array
c) Stacks d) Linked List

9) ____ sort is the method used by card sorter.
a) Quick b) Radix
c) Selection d) Bubble

10) What is a hash table?
a) A structure that maps values to keys
b) A structure that maps keys to values
c) A structure used for storage
d) A structure used to implement stack and queue

11) What is the primary function of a Stack data structure?
a) FIFO operation b) LIFO operation
c) Both LIFO & FIFO d) LILO operation

12) In a stack, if a user tries to remove an element from empty stack it is called ____.
a) Underflow b) Empty collection
c) Overflow d) Garbage Collection

13) If the elements “A”, “B”, “C” and “D” are placed in a queue and are deleted one at a time, in what order will they be removed?
a) ABCD b) DCBA
c) DCAB d) ABDC

14) Linked list is considered as an example of ____ type of memory.
a) Compile time b) Static
c) Dynamic d) None of the mentioned

SLR-BD-131

Seat No.	

Set Q

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Data Structure (CSEPCC-03)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Attempt the following questions: (Any Two) **10**

a) Define data structure. Explain its types along with example.
b) Define queue. Explain its operations using array.
c) Describe circular linked list with suitable diagram. Also state advantage of circular linked list over linear linked list.

Q.3 Attempt the following: (Any Three) **18**

a) Write a menu-driven program to implement a stack showing operations.
i) Insertion
ii) Deletion
iii) Display

b) Write a program to implement a doubly linked list.
i) Insert a node at the beginning of the list.
ii) Insert a node at the end of the list.
iii) Display the linked list.

c) Elaborate the steps for performing bubble sort for given elements of array.
A={54,26,93,17,77,31,44,55,20}

d) Define Hashing. List collision resolution technique? Explain Linear Probing with example.

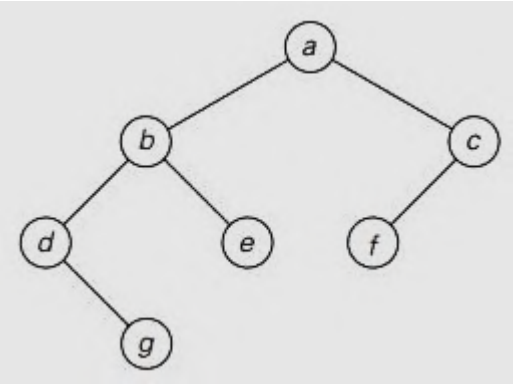
Section – II

Q.4 Attempt the following: (Any Two) **10**

a) Construct a binary search tree for following elements: 30,100,90,15,2,25,36,72,78,10 show each step of construction of BST.
b) Explain DFS & BFS in Graph with example.
c) Compare B tree & B+ tree with an example.

Q.5 Attempt the following: (Any Three) **18**

a) Traverse the following tree by the in-order, pre-order and post-order methods:



b) Define following terminologies in Graph

a) Neighbors
b) degree of a node
c) regular graph
d) Path
e) Cycle
f) Complete graph

c) Construct AVL tree for the following elements.
21, 26, 30, 09, 04, 14, 28, 18, 15,10, 2, 3, 7

d) Explain B tree. Show the growth of the B tree of order 4 by inserting the following keys (show each step).
01, 05, 06, 02, 08, 12, 14, 15, 20, 07, 10

Seat No.	

Set R

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Data Structure (CSEPCC-03)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers. **14**

1) Why we need to a binary tree which is height balanced?
a) to avoid formation of skew trees
b) to save memory
c) to attain faster memory access
d) to simplify storing

2) Which of the following is the most widely used external memory data structure.
a) AVL tree b) B-tree
c) Red-black tree d) Both AVL tree and Red-black tree

3) Graphs are represented using ____.
a) Adjacency tree b) Adjacency linked list
c) Adjacency graph d) Adjacency queue

4) Which of the following properties does a simple graph not hold?
a) Must be connected
b) Must have no loops or multiple edges
c) Must be unweighted
d) Must have no multiple edges

5) Which of the following is non-linear data structure?
a) Trees b) Array
c) Stacks d) Linked List

6) ____ sort is the method used by card sorter.
a) Quick b) Radix
c) Selection d) Bubble

7) What is a hash table?
a) A structure that maps values to keys
b) A structure that maps keys to values
c) A structure used for storage
d) A structure used to implement stack and queue

8) What is the primary function of a Stack data structure?
a) FIFO operation b) LIFO operation
c) Both LIFO & FIFO d) LILO operation

9) In a stack, if a user tries to remove an element from empty stack it is called ____.
a) Underflow b) Empty collection
c) Overflow d) Garbage Collection

10) If the elements “A”, “B”, “C” and “D” are placed in a queue and are deleted one at a time, in what order will they be removed?
a) ABCD b) DCBA
c) DCAB d) ABDC

11) Linked list is considered as an example of ____ type of memory.
a) Compile time b) Static
c) Dynamic d) None of the mentioned

12) A complete binary tree of level 5 has how many nodes?
a) 15 b) 63
c) 25 d) 30

13) A multi-way search tree has n items. The number of external nodes is _____
a) n^2 b) $\log n$
c) n d) $n + 1$

14) What is the maximum height of an AVL tree with p nodes?
a) p b) log(p)
c) log(p)/2 d) p/2

SLR-BD-131

Seat No.	

Set R

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Data Structure (CSEPCC-03)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Attempt the following questions: (Any Two) **10**

a) Define data structure. Explain its types along with example.
b) Define queue. Explain its operations using array.
c) Describe circular linked list with suitable diagram. Also state advantage of circular linked list over linear linked list.

Q.3 Attempt the following: (Any Three) **18**

a) Write a menu-driven program to implement a stack showing operations.
i) Insertion
ii) Deletion
iii) Display

b) Write a program to implement a doubly linked list.
i) Insert a node at the beginning of the list.
ii) Insert a node at the end of the list.
iii) Display the linked list.

c) Elaborate the steps for performing bubble sort for given elements of array.
A={54,26,93,17,77,31,44,55,20}

d) Define Hashing. List collision resolution technique? Explain Linear Probing with example.

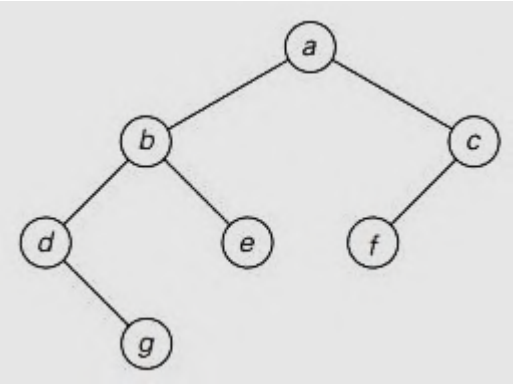
Section – II

Q.4 Attempt the following: (Any Two) **10**

a) Construct a binary search tree for following elements: 30,100,90,15,2,25,36,72,78,10 show each step of construction of BST.
b) Explain DFS & BFS in Graph with example.
c) Compare B tree & B+ tree with an example.

Q.5 Attempt the following: (Any Three) **18**

a) Traverse the following tree by the in-order, pre-order and post-order methods:



b) Define following terminologies in Graph

a) Neighbors
b) degree of a node
c) regular graph
d) Path
e) Cycle
f) Complete graph

c) Construct AVL tree for the following elements.
21, 26, 30, 09, 04, 14, 28, 18, 15,10, 2, 3, 7

d) Explain B tree. Show the growth of the B tree of order 4 by inserting the following keys (show each step).
01, 05, 06, 02, 08, 12, 14, 15, 20, 07, 10

SLR-BD-131

Seat No.		Set	S

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Data Structure (CSEPCC-03)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers. **14**

1) If the elements "A", "B", "C" and "D" are placed in a queue and are deleted one at a time, in what order will they be removed?
a) ABCD b) DCBA
c) DCAB d) ABDC

2) Linked list is considered as an example of ____ type of memory.
a) Compile time b) Static
c) Dynamic d) None of the mentioned

3) A complete binary tree of level 5 has how many nodes?
a) 15 b) 63
c) 25 d) 30

4) A multi-way search tree has n items. The number of external nodes is _____
a) n^2 b) $\log n$
c) n d) $n+1$

5) What is the maximum height of an AVL tree with p nodes?
a) p b) log(p)
c) log(p)/2 d) p/2

6) Why we need to a binary tree which is height balanced?
a) to avoid formation of skew trees
b) to save memory
c) to attain faster memory access
d) to simplify storing

7) Which of the following is the most widely used external memory data structure.
a) AVL tree b) B-tree
c) Red-black tree d) Both AVL tree and Red-black tree

8) Graphs are represented using ____.
a) Adjacency tree b) Adjacency linked list
c) Adjacency graph d) Adjacency queue

9) Which of the following properties does a simple graph not hold?
a) Must be connected
b) Must have no loops or multiple edges
c) Must be unweighted
d) Must have no multiple edges

10) Which of the following is non-linear data structure?
a) Trees b) Array
c) Stacks d) Linked List

11) ____ sort is the method used by card sorter.
a) Quick b) Radix
c) Selection d) Bubble

12) What is a hash table?
a) A structure that maps values to keys
b) A structure that maps keys to values
c) A structure used for storage
d) A structure used to implement stack and queue

13) What is the primary function of a Stack data structure?
a) FIFO operation b) LIFO operation
c) Both LIFO & FIFO d) LILO operation

14) In a stack, if a user tries to remove an element from empty stack it is called ____.
a) Underflow b) Empty collection
c) Overflow d) Garbage Collection

SLR-BD-131

Seat No.		Set	S

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Data Structure (CSEPCC-03)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Attempt the following questions: (Any Two) **10**

a) Define data structure. Explain its types along with example.
b) Define queue. Explain its operations using array.
c) Describe circular linked list with suitable diagram. Also state advantage of circular linked list over linear linked list.

Q.3 Attempt the following: (Any Three) **18**

a) Write a menu-driven program to implement a stack showing operations.
i) Insertion
ii) Deletion
iii) Display

b) Write a program to implement a doubly linked list.
i) Insert a node at the beginning of the list.
ii) Insert a node at the end of the list.
iii) Display the linked list.

c) Elaborate the steps for performing bubble sort for given elements of array.
A={54,26,93,17,77,31,44,55,20}

d) Define Hashing. List collision resolution technique? Explain Linear Probing with example.

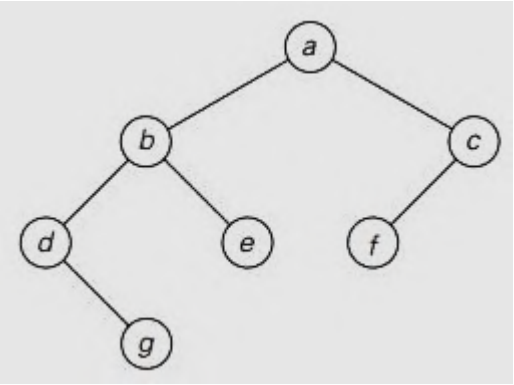
Section – II

Q.4 Attempt the following: (Any Two) **10**

a) Construct a binary search tree for following elements: 30,100,90,15,2,25,36,72,78,10 show each step of construction of BST.
b) Explain DFS & BFS in Graph with example.
c) Compare B tree & B+ tree with an example.

Q.5 Attempt the following: (Any Three) **18**

a) Traverse the following tree by the in-order, pre-order and post-order methods:



b) Define following terminologies in Graph

a) Neighbors
b) degree of a node
c) regular graph
d) Path
e) Cycle
f) Complete graph

c) Construct AVL tree for the following elements.
21, 26, 30, 09, 04, 14, 28, 18, 15,10, 2, 3, 7

d) Explain B tree. Show the growth of the B tree of order 4 by inserting the following keys (show each step).
01, 05, 06, 02, 08, 12, 14, 15, 20, 07, 10

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) If a linear differential equation with constant coefficients and r.h.s. equal to zero has a real root m_1 repeated Two times, then the corresponding part of the integral is _____.

a) $(c_1 + c_2)e^{m_1 X}$ b) $(c_1 + c_2 x)e^{m_1 X}$

c) $(c_1 x + c_2 x^2)e^{m_1 X}$ d) $(c_1 + c_2 x^3)e^{m_1 X}$

2) $\frac{1}{D-a}X$ is equal to _____.

a) $\int Xe^{ax}dx$ b) $e^{ax}\int X.e^{-ax}dx$

c) $\int Xe^{-ax}dx$ d) $e^{-ax}\int Xe^{-ax}dx$

3) $\frac{1}{D+1}(\log x + \frac{1}{x})$ is equal to _____.

a) e^x b) 1

c) x d) $\log x$

4) The solution of $q = e^{-p}$ is _____.

a) $z = ax + by + c$ b) $z = a^x + b^y + c$

c) $z = ax + y^{-b} + c$ d) $z = ax + e^{-a}y + c$

5) The solution of the equation $pq = p + q$ is _____.

a) $z = ax + (a+1)y + c$

b) $z = (a+1)x + a(a-1)y + c$

c) $z = (a-1)x + a(a+1)y + c$

d) $z(a-1) = a(a-1)x + ay + c$

6) If μ_1', μ_2', μ_3', μ_4' are the first four moments of the distribution about certain number then fourth moment μ_4 of the distribution about the arithmetic mean is given by _____.

a) $\mu_4' + 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^4 + 3(\mu_1')^4$

b) $\mu_4' - 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^2 - 3(\mu_1')^4$

c) $\mu_4' + 4\mu_3'\mu_1' - 6\mu_2'(\mu_1')^4 - 3(\mu_1')^4$

d) $\mu_4' + 2\mu_3'\mu_1' + 6\mu_2'(\mu_1')^4 - 3(\mu_1')^4$

7) Coefficient of kurtosis β_2 is given by _____.

a) $\frac{\mu_4}{\mu_3}$ b) $\frac{\mu_4}{\mu_2^2}$

c) $\frac{\mu_3}{\mu_2^2}$ d) $\frac{\mu_4}{\mu_2^3}$

8) If value of x for normal distribution is 35, mean of normal distribution is 65 and standard deviation is 25 then standardized random variable is ___.

a) -1.5 b) -1.7

c) -1.2 d) -4

9) A continuous random variable has the following probability density function $f(x) = kx(1-x), 0 \le x \le 1$ then $k =$ _____.

a) 6 b) 2

c) 3 d) 5

10) The area under the standard normal curve from $z = -\infty$ to $z = 0$ is ___.

a) 1 b) ½

c) 3/2 d) 0

11) If X, Y denotes the deviations from their means and if $\sum X^2 = 40, \sum Y^2 = 100, \sum XY = 50,$ then $r =$ _____.

a) 0.63 b) 0.82

c) 0.91 d) 0.79

12) The line of regression of x and y is given by _____.

a) $x - \bar{x} = b_{xy}(y - \bar{y})$ b) $x - \bar{y} = b_{xy}(x - \bar{x})$

c) $x - \bar{x} = b_{xx}(y - \bar{y})$ d) $x - \bar{x} = b_{yx}(y - \bar{y})$

13) The following mistakes per page were found in a book.

No. of mistakes:	0	1	2	3	4
Pages:	211	90	19	5	0

Then χ^2 is _____.

a) 0.59 b) 0.069

c) 0.81 d) 0.79

14) The 't-statistic' is defined as _____.

a) $\frac{\bar{x}-\mu}{\sigma/\sqrt{n}}$ b) $\frac{\bar{x}-\mu}{s/\sqrt{n}}$

c) $\frac{\bar{x}-\mu}{\sigma/n}$ d) $\frac{\bar{x}-\mu}{s/n}$

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **09**

a) Find the Arithmetic mean, Median and standard deviation for the following frequency distribution.

x	5	9	12	15	20	24	30	35	42	49
f	3	6	8	8	9	10	8	7	6	2

b) Solve $(D^2 - 4D + 4)y = 8.x^2e^{2x}\sin 2x$

c) Solve $(D^2 + D + 1)y = \sin 2x$

d) Calculate Mode for the following frequency distribution.

C.I.	00-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency (f)	4	7	8	12	25	18	10

e) Solve $p^2q^3 = x^2y^3$

Q.3 Attempt any Three. **09**

a) Solve: $(2D + 1)^2y = 4e^{-x/2}$

b) Solve: $p + q = pqz$

c) Find Q_1, Q_2, Q_3 from the following data.
5,7,12,14,15,22,25,30,36,42,53

d) Solve $x(y - z)p + y(z - x)q = z(x - y)$

e) Solve $(D^3 - 3D + 2)y = x$

Q.4 Attempt any Two **10**

a) The first four moments of a distribution about the value 5 are 2,20,40 and 50. from the given information obtain the first four central moments, coefficient of skewness and kurtosis.

b) Solve the following differential equation by the method of separation of variables.
$\frac{\partial z}{\partial x} - 2\frac{\partial z}{\partial y} = z$ given that $z(x, 0) = 3e^{-5x}$

c) Solve: $(D^2 - D - 2)y = 2\log x + \frac{1}{x} + \frac{1}{x^2}$

Section – II

Q.5 Attempt any three of the following. **09**

a) Find the value of k if each of the following functions is a probability density function.

$$f(x) = \begin{cases} kx^2(1-x^3), & 0 \le x \le 1 \\ 0, & \text{otherwise} \end{cases}$$

b) The mean life time of 100 fluorescent light bulbs produced by a Company is computed to be 1570 Hrs. with S.D. of 120 Hrs. If μ is the mean lifetime of all the bulbs produced by the Company, Test the Hypothesis $\mu = 1600$ Hrs. Against the alternative Hypothesis $\mu \neq 1600$ Hrs. using 5% level of Significance.
(Given Expected value at 5% LOS is 1.96)

c) Calculate the coefficient of correlation between height of father and height of son from the following data.

Height of father	64	65	66	67	68	69	70
Height of son	66	67	65	68	70	68	71

d) Two independent random sample have the following data,
$\overline{x_1} = 110, \sigma_1 = 25, n_1 = 16$
$\overline{x_2} = 120, \sigma_2 = 30, n_2 = 9$
If σ_1 and σ_2 are the S. D. of the populations. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance. (The table value of t at $\alpha = 0.05$ for $v = 23$ degrees of freedom is 2.069)

e) If in a lot of 500 solenoids 25 are defective, find the probability that there will be 0, 1, 2 defective solenoids in a random sample of 20 solenoids.

Q.6 Attempt any three of the following. **09**

a) If two independent random samples of sizes 15 and 8 have respectively the following mean and population standard deviations, $\overline{x_1} = 980, \overline{x_2} = 1012; \sigma_1 = 75, \sigma_2 = 80$. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance.
(Given Expected value at 5% LOS with 21 DF is 2.080)

b) The number of telephone calls received by an operator in a ten-minute interval follows a Poisson distribution with mean 1. What is the probability of receiving (i) no call, (ii) less than four calls, in the interval? What is the most likely number of calls?

c) Calculate the equations of the lines of regression. Given
Mean of $x = 50.07$, S.D. of $x = 5.26$
Mean of $y = 9.98$, S.D. of $y = 2.59$
$r = 0.898$

d) In an intelligence test administered to 1000 children the mean score was, 42 with s.d. 24. Find the number of children (i) scoring more than 60 and (ii) between 20 and 40 assuming the distribution to be normal.
(Given: For S.N.V. z area from z = 0 to z = 0.75 is 0.2734, that between z = 0 and z = 0.9167 is 0.3202 and that between z = 0 to z = 0.08333 is 0.0332.)

e) Fit a Straight line $y = a + bx$ to the following data.

x	0	1	2	3	4	5
y	1	2	3	4.5	6	7.5

Q.7 Attempt any Two. **10**

a) Fit a Poisson's distribution to the following data :

X	0	1	2	3	4	Total
f	112	63	20	4	1	200

b) Obtain a second-degree curve to the following data.

Year	1965	1966	1967	1968	1969	1970	1971	1972
Profit (in Corers Rs.)	125	140	165	195	200	215	220	230

Also estimate the profit in 1973.

c) Ten school boys were given a test in Statistics and their scores were recorded. They were given a month's special coaching and a second test was given to them in the same subject at the end of the coaching period. Test if the marks given below give evidence to the fact that the students are benefitted by coaching.
Marks in test I: 70, 68, 56, 75, 80, 90, 68, 75, 56, 58
Marks in Test II: 68, 70, 52, 73, 75, 78, 80, 92, 54, 55
(Given that value of t_α at 5 % LOS for v = 9 degrees of freedom is 1.86 for one tailed test)

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) If value of x for normal distribution is 35, mean of normal distribution is 65 and standard deviation is 25 then standardized random variable is ___.
a) -1.5 b) -1.7
c) -1.2 d) -4

2) A continuous random variable has the following probability density function $f(x) = kx(1-x), 0 \le x \le 1$ then $k =$ _____.
a) 6 b) 2
c) 3 d) 5

3) The area under the standard normal curve from $z = -\infty$ to $z = 0$ is ___.
a) 1 b) ½
c) 3/2 d) 0

4) If X, Y denotes the deviations from their means and if $\sum X^2 = 40, \sum Y^2 = 100, \sum XY = 50,$ then $r =$ _____.
a) 0.63 b) 0.82
c) 0.91 d) 0.79

5) The line of regression of x and y is given by _____.
a) $x - \bar{x} = b_{xy}(y - \bar{y})$ b) $x - \bar{y} = b_{xy}(x - \bar{x})$
c) $x - \bar{x} = b_{xx}(y - \bar{y})$ d) $x - \bar{x} = b_{yx}(y - \bar{y})$

6) The following mistakes per page were found in a book.

No. of mistakes:	0	1	2	3	4
Pages:	211	90	19	5	0

Then χ^2 is _____.
a) 0.59 b) 0.069
c) 0.81 d) 0.79

7) The 't-statistic' is defined as _____.

a) $\frac{\bar{x}-\mu}{\sigma/\sqrt{n}}$ b) $\frac{\bar{x}-\mu}{s/\sqrt{n}}$

c) $\frac{\bar{x}-\mu}{\sigma/n}$ d) $\frac{\bar{x}-\mu}{s/n}$

8) If a linear differential equation with constant coefficients and r.h.s. equal to zero has a real root m_1 repeated Two times, then the corresponding part of the integral is _____.

a) $(c_1 + c_2)e^{m_1 X}$ b) $(c_1 + c_2 x)e^{m_1 X}$

c) $(c_1 x + c_2 x^2)e^{m_1 X}$ d) $(c_1 + c_2 x^3)e^{m_1 X}$

9) $\frac{1}{D-a}X$ is equal to _____.

a) $\int Xe^{ax}dx$ b) $e^{ax}\int X.e^{-ax}dx$

c) $\int Xe^{-ax}dx$ d) $e^{-ax}\int Xe^{-ax}dx$

10) $\frac{1}{D+1}(\log x + \frac{1}{x})$ is equal to _____.

a) e^x b) 1

c) x d) $\log x$

11) The solution of $q = e^{-p}$ is _____.

a) $z = ax + by + c$ b) $z = a^x + b^y + c$

c) $z = ax + y^{-b} + c$ d) $z = ax + e^{-a}y + c$

12) The solution of the equation $pq = p + q$ is _____.

a) $z = ax + (a+1)y + c$

b) $z = (a+1)x + a(a-1)y + c$

c) $z = (a-1)x + a(a+1)y + c$

d) $z(a-1) = a(a-1)x + ay + c$

13) If μ_1', μ_2', μ_3', μ_4' are the first four moments of the distribution about certain number then fourth moment μ_4 of the distribution about the arithmetic mean is given by _____.

a) $\mu_4' + 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^4 + 3(\mu_1')^4$

b) $\mu_4' - 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^2 - 3(\mu_1')^4$

c) $\mu_4' + 4\mu_3'\mu_1' - 6\mu_2'(\mu_1')^4 - 3(\mu_1')^4$

d) $\mu_4' + 2\mu_3'\mu_1' + 6\mu_2'(\mu_1')^4 - 3(\mu_1')^4$

14) Coefficient of kurtosis β_2 is given by _____.

a) $\frac{\mu_4}{\mu_3}$ b) $\frac{\mu_4}{\mu_2^2}$

c) $\frac{\mu_3}{\mu_2^2}$ d) $\frac{\mu_4}{\mu_2^3}$

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **09**

a) Find the Arithmetic mean, Median and standard deviation for the following frequency distribution.

x	5	9	12	15	20	24	30	35	42	49
f	3	6	8	8	9	10	8	7	6	2

b) Solve $(D^2 - 4D + 4)y = 8.x^2e^{2x}\sin 2x$

c) Solve $(D^2 + D + 1)y = \sin 2x$

d) Calculate Mode for the following frequency distribution.

C.I.	00-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency (f)	4	7	8	12	25	18	10

e) Solve $p^2q^3 = x^2y^3$

Q.3 Attempt any Three. **09**

a) Solve: $(2D + 1)^2y = 4e^{-x/2}$

b) Solve: $p + q = pqz$

c) Find Q_1, Q_2, Q_3 from the following data.
5,7,12,14,15,22,25,30,36,42,53

d) Solve $x(y - z)p + y(z - x)q = z(x - y)$

e) Solve $(D^3 - 3D + 2)y = x$

Q.4 Attempt any Two **10**

a) The first four moments of a distribution about the value 5 are 2,20,40 and 50. from the given information obtain the first four central moments, coefficient of skewness and kurtosis.

b) Solve the following differential equation by the method of separation of variables.
$\frac{\partial z}{\partial x} - 2\frac{\partial z}{\partial y} = z$ given that $z(x, 0) = 3e^{-5x}$

c) Solve: $(D^2 - D - 2)y = 2\log x + \frac{1}{x} + \frac{1}{x^2}$

Section – II

Q.5 Attempt any three of the following. **09**

a) Find the value of k if each of the following functions is a probability density function.

$$f(x) = \begin{cases} kx^2(1-x^3), & 0 \le x \le 1 \\ 0, & \text{otherwise} \end{cases}$$

b) The mean life time of 100 fluorescent light bulbs produced by a Company is computed to be 1570 Hrs. with S.D. of 120 Hrs. If μ is the mean lifetime of all the bulbs produced by the Company, Test the Hypothesis $\mu = 1600$ Hrs. Against the alternative Hypothesis $\mu \neq 1600$ Hrs. using 5% level of Significance.
(Given Expected value at 5% LOS is 1.96)

c) Calculate the coefficient of correlation between height of father and height of son from the following data.

Height of father	64	65	66	67	68	69	70
Height of son	66	67	65	68	70	68	71

d) Two independent random sample have the following data,
$\overline{x_1} = 110, \sigma_1 = 25, n_1 = 16$
$\overline{x_2} = 120, \sigma_2 = 30, n_2 = 9$
If σ_1 and σ_2 are the S. D. of the populations. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance. (The table value of t at $\alpha = 0.05$ for $v = 23$ degrees of freedom is 2.069)

e) If in a lot of 500 solenoids 25 are defective, find the probability that there will be 0, 1, 2 defective solenoids in a random sample of 20 solenoids.

Q.6 Attempt any three of the following. **09**

a) If two independent random samples of sizes 15 and 8 have respectively the following mean and population standard deviations, $\overline{x_1} = 980, \overline{x_2} = 1012; \sigma_1 = 75, \sigma_2 = 80$. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance.
(Given Expected value at 5% LOS with 21 DF is 2.080)

b) The number of telephone calls received by an operator in a ten-minute interval follows a Poisson distribution with mean 1. What is the probability of receiving (i) no call, (ii) less than four calls, in the interval? What is the most likely number of calls?

c) Calculate the equations of the lines of regression. Given
Mean of $x = 50.07$, S.D. of $x = 5.26$
Mean of $y = 9.98$, S.D. of $y = 2.59$
$r = 0.898$

d) In an intelligence test administered to 1000 children the mean score was, 42 with s.d. 24. Find the number of children (i) scoring more than 60 and (ii) between 20 and 40 assuming the distribution to be normal.
(Given: For S.N.V. z area from z = 0 to z = 0.75 is 0.2734, that between z = 0 and z = 0.9167 is 0.3202 and that between z = 0 to z = 0.08333 is 0.0332.)

e) Fit a Straight line $y = a + bx$ to the following data.

x	0	1	2	3	4	5
y	1	2	3	4.5	6	7.5

Q.7 Attempt any Two. **10**

a) Fit a Poisson's distribution to the following data :

X	0	1	2	3	4	Total
f	112	63	20	4	1	200

b) Obtain a second-degree curve to the following data.

Year	1965	1966	1967	1968	1969	1970	1971	1972
Profit (in Corers Rs.)	125	140	165	195	200	215	220	230

Also estimate the profit in 1973.

c) Ten school boys were given a test in Statistics and their scores were recorded. They were given a month's special coaching and a second test was given to them in the same subject at the end of the coaching period. Test if the marks given below give evidence to the fact that the students are benefitted by coaching.
Marks in test I: 70, 68, 56, 75, 80, 90, 68, 75, 56, 58
Marks in Test II: 68, 70, 52, 73, 75, 78, 80, 92, 54, 55
(Given that value of t_α at 5 % LOS for v = 9 degrees of freedom is 1.86 for one tailed test)

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) If X, Y denotes the deviations from their means and if $\sum X^2 = 40, \sum Y^2 = 100, \sum XY = 50,$ then $r =$ _____.
a) 0.63 b) 0.82
c) 0.91 d) 0.79

2) The line of regression of x and y is given by _____.
a) $x - \bar{x} = b_{xy}(y - \bar{y})$ b) $x - \bar{y} = b_{xy}(x - \bar{x})$
c) $x - \bar{x} = b_{xx}(y - \bar{y})$ d) $x - \bar{x} = b_{yx}(y - \bar{y})$

3) The following mistakes per page were found in a book.

No. of mistakes:	0	1	2	3	4
Pages:	211	90	19	5	0

Then χ^2 is _____.
a) 0.59 b) 0.069
c) 0.81 d) 0.79

4) The 't-statistic' is defined as _____.
a) $\frac{\bar{x}-\mu}{\sigma/\sqrt{n}}$ b) $\frac{\bar{x}-\mu}{s/\sqrt{n}}$
c) $\frac{\bar{x}-\mu}{\sigma/n}$ d) $\frac{\bar{x}-\mu}{s/n}$

5) If a linear differential equation with constant coefficients and r.h.s. equal to zero has a real root m_1 repeated Two times, then the corresponding part of the integral is _____.
a) $(c_1 + c_2)e^{m_1 X}$ b) $(c_1 + c_2 x)e^{m_1 X}$
c) $(c_1 x + c_2 x^2)e^{m_1 X}$ d) $(c_1 + c_2 x^3)e^{m_1 X}$

6) $\frac{1}{D-a}X$ is equal to _____.

a) $\int Xe^{ax}dx$ b) $e^{ax}\int X.e^{-ax}dx$

c) $\int Xe^{-ax}dx$ d) $e^{-ax}\int Xe^{-ax}dx$

7) $\frac{1}{D+1}(\log x+\frac{1}{x})$ is equal to _____.

a) e^x b) 1

c) x d) $\log x$

8) The solution of $q=e^{-p}$ is _____.

a) $z=ax+by+c$ b) $z=a^x+b^y+c$

c) $z=ax+y^{-b}+c$ d) $z=ax+e^{-a}y+c$

9) The solution of the equation $pq=p+q$ is _____.

a) $z=ax+(a+1)y+c$

b) $z=(a+1)x+a(a-1)y+c$

c) $z=(a-1)x+a(a+1)y+c$

d) $z(a-1)=a(a-1)x+ay+c$

10) If μ_1', μ_2', μ_3', μ_4' are the first four moments of the distribution about certain number then fourth moment μ_4 of the distribution about the arithmetic mean is given by _____.

a) $\mu_4'+4\mu_3'\mu_1'+6\mu_2'(\mu_1')^4+3(\mu_1')^4$

b) $\mu_4'-4\mu_3'\mu_1'+6\mu_2'(\mu_1')^2-3(\mu_1')^4$

c) $\mu_4'+4\mu_3'\mu_1'-6\mu_2'(\mu_1')^4-3(\mu_1')^4$

d) $\mu_4'+2\mu_3'\mu_1'+6\mu_2'(\mu_1')^4-3(\mu_1')^4$

11) Coefficient of kurtosis β_2 is given by _____.

a) $\frac{\mu_4}{\mu_3}$ b) $\frac{\mu_4}{\mu_2^2}$

c) $\frac{\mu_3}{\mu_2^2}$ d) $\frac{\mu_4}{\mu_2^3}$

12) If value of x for normal distribution is 35, mean of normal distribution is 65 and standard deviation is 25 then standardized random variable is ___.

a) -1.5 b) -1.7

c) -1.2 d) -4

13) A continuous random variable has the following probability density function $f(x)=kx(1-x),0\leq x\leq 1$ then $k=$ _____.

a) 6 b) 2

c) 3 d) 5

14) The area under the standard normal curve from $z = -\infty$ to $z = 0$ is ___.

a) 1 b) ½

c) 3/2 d) 0

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **09**

a) Find the Arithmetic mean, Median and standard deviation for the following frequency distribution.

x	5	9	12	15	20	24	30	35	42	49
f	3	6	8	8	9	10	8	7	6	2

b) Solve $(D^2 - 4D + 4)y = 8.x^2e^{2x}\sin 2x$

c) Solve $(D^2 + D + 1)y = \sin 2x$

d) Calculate Mode for the following frequency distribution.

C.I.	00-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency (f)	4	7	8	12	25	18	10

e) Solve $p^2q^3 = x^2y^3$

Q.3 Attempt any Three. **09**

a) Solve: $(2D + 1)^2y = 4e^{-x/2}$

b) Solve: $p + q = pqz$

c) Find Q_1, Q_2, Q_3 from the following data.
5,7,12,14,15,22,25,30,36,42,53

d) Solve $x(y - z)p + y(z - x)q = z(x - y)$

e) Solve $(D^3 - 3D + 2)y = x$

Q.4 Attempt any Two **10**

a) The first four moments of a distribution about the value 5 are 2,20,40 and 50. from the given information obtain the first four central moments, coefficient of skewness and kurtosis.

b) Solve the following differential equation by the method of separation of variables.
$\frac{\partial z}{\partial x} - 2\frac{\partial z}{\partial y} = z$ given that $z(x, 0) = 3e^{-5x}$

c) Solve: $(D^2 - D - 2)y = 2\log x + \frac{1}{x} + \frac{1}{x^2}$

Section – II

Q.5 Attempt any three of the following. **09**

a) Find the value of k if each of the following functions is a probability density function.

$$f(x) = \begin{cases} kx^2(1-x^3), & 0 \le x \le 1 \\ 0, & \text{otherwise} \end{cases}$$

b) The mean life time of 100 fluorescent light bulbs produced by a Company is computed to be 1570 Hrs. with S.D. of 120 Hrs. If μ is the mean lifetime of all the bulbs produced by the Company, Test the Hypothesis $\mu = 1600$ Hrs. Against the alternative Hypothesis $\mu \neq 1600$ Hrs. using 5% level of Significance.
(Given Expected value at 5% LOS is 1.96)

c) Calculate the coefficient of correlation between height of father and height of son from the following data.

Height of father	64	65	66	67	68	69	70
Height of son	66	67	65	68	70	68	71

d) Two independent random sample have the following data,
$\overline{x_1} = 110, \sigma_1 = 25, n_1 = 16$
$\overline{x_2} = 120, \sigma_2 = 30, n_2 = 9$
If σ_1 and σ_2 are the S. D. of the populations. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance. (The table value of t at $\alpha = 0.05$ for $v = 23$ degrees of freedom is 2.069)

e) If in a lot of 500 solenoids 25 are defective, find the probability that there will be 0, 1, 2 defective solenoids in a random sample of 20 solenoids.

Q.6 Attempt any three of the following. **09**

a) If two independent random samples of sizes 15 and 8 have respectively the following mean and population standard deviations, $\overline{x_1} = 980, \overline{x_2} = 1012; \sigma_1 = 75, \sigma_2 = 80$. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance.
(Given Expected value at 5% LOS with 21 DF is 2.080)

b) The number of telephone calls received by an operator in a ten-minute interval follows a Poisson distribution with mean 1. What is the probability of receiving (i) no call, (ii) less than four calls, in the interval? What is the most likely number of calls?

c) Calculate the equations of the lines of regression. Given
Mean of $x = 50.07$, S.D. of $x = 5.26$
Mean of $y = 9.98$, S.D. of $y = 2.59$
$r = 0.898$

d) In an intelligence test administered to 1000 children the mean score was, 42 with s.d. 24. Find the number of children (i) scoring more than 60 and (ii) between 20 and 40 assuming the distribution to be normal.
(Given: For S.N.V. z area from z = 0 to z = 0.75 is 0.2734, that between z = 0 and z = 0.9167 is 0.3202 and that between z = 0 to z = 0.08333 is 0.0332.)

e) Fit a Straight line $y = a + bx$ to the following data.

x	0	1	2	3	4	5
y	1	2	3	4.5	6	7.5

Q.7 Attempt any Two. **10**

a) Fit a Poisson's distribution to the following data :

X	0	1	2	3	4	Total
f	112	63	20	4	1	200

b) Obtain a second-degree curve to the following data.

Year	1965	1966	1967	1968	1969	1970	1971	1972
Profit (in Corers Rs.)	125	140	165	195	200	215	220	230

Also estimate the profit in 1973.

c) Ten school boys were given a test in Statistics and their scores were recorded. They were given a month's special coaching and a second test was given to them in the same subject at the end of the coaching period. Test if the marks given below give evidence to the fact that the students are benefitted by coaching.
Marks in test I: 70, 68, 56, 75, 80, 90, 68, 75, 56, 58
Marks in Test II: 68, 70, 52, 73, 75, 78, 80, 92, 54, 55
(Given that value of t_α at 5 % LOS for v = 9 degrees of freedom is 1.86 for one tailed test)

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) If $\mu_1', \mu_2', \mu_3', \mu_4'$ are the first four moments of the distribution about certain number then fourth moment μ_4 of the distribution about the arithmetic mean is given by _____.

a) $\mu_4' + 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^4 + 3(\mu_1')^4$

b) $\mu_4' - 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^2 - 3(\mu_1')^4$

c) $\mu_4' + 4\mu_3'\mu_1' - 6\mu_2'(\mu_1')^4 - 3(\mu_1')^4$

d) $\mu_4' + 2\mu_3'\mu_1' + 6\mu_2'(\mu_1')^4 - 3(\mu_1')^4$

2) Coefficient of kurtosis β_2 is given by _____.

a) $\frac{\mu_4}{\mu_3}$ b) $\frac{\mu_4}{\mu_2^2}$

c) $\frac{\mu_3}{\mu_2^2}$ d) $\frac{\mu_4}{\mu_2^3}$

3) If value of x for normal distribution is 35, mean of normal distribution is 65 and standard deviation is 25 then standardized random variable is ___.

a) -1.5 b) -1.7
c) -1.2 d) -4

4) A continuous random variable has the following probability density function $f(x) = kx(1-x), 0 \le x \le 1$ then $k =$ _____.

a) 6 b) 2
c) 3 d) 5

5) The area under the standard normal curve from $z = -\infty$ to $z = 0$ is ___.

a) 1 b) ½
c) 3/2 d) 0

6) If X, Y denotes the deviations from their means and if $\sum X^2 = 40, \sum Y^2 = 100, \sum XY = 50,$ then $r =$ _____.

a) 0.63 b) 0.82
c) 0.91 d) 0.79

7) The line of regression of x and y is given by _____.

a) $x - \bar{x} = b_{xy}(y - \bar{y})$ b) $x - \bar{y} = b_{xy}(x - \bar{x})$
c) $x - \bar{x} = b_{xx}(y - \bar{y})$ d) $x - \bar{x} = b_{yx}(y - \bar{y})$

8) The following mistakes per page were found in a book.

No. of mistakes:	0	1	2	3	4
Pages:	211	90	19	5	0

Then χ^2 is _____.

a) 0.59 b) 0.069
c) 0.81 d) 0.79

9) The 't-statistic' is defined as _____.

a) $\frac{\bar{x}-\mu}{\sigma/\sqrt{n}}$ b) $\frac{\bar{x}-\mu}{s/\sqrt{n}}$
c) $\frac{\bar{x}-\mu}{\sigma/n}$ d) $\frac{\bar{x}-\mu}{s/n}$

10) If a linear differential equation with constant coefficients and r.h.s. equal to zero has a real root m_1 repeated Two times, then the corresponding part of the integral is _____.

a) $(c_1 + c_2)e^{m_1 X}$ b) $(c_1 + c_2 x)e^{m_1 X}$
c) $(c_1 x + c_2 x^2)e^{m_1 X}$ d) $(c_1 + c_2 x^3)e^{m_1 X}$

11) $\frac{1}{D-a}X$ is equal to _____.

a) $\int Xe^{ax}dx$ b) $e^{ax}\int X.e^{-ax}dx$
c) $\int Xe^{-ax}dx$ d) $e^{-ax}\int Xe^{-ax}dx$

12) $\frac{1}{D+1}(\log x + \frac{1}{x})$ is equal to _____.

a) e^x b) 1
c) x d) $\log x$

13) The solution of $q = e^{-p}$ is _____.

a) $z = ax + by + c$ b) $z = a^x + b^y + c$
c) $z = ax + y^{-b} + c$ d) $z = ax + e^{-a}y + c$

14) The solution of the equation $pq = p + q$ is _____.

a) $z = ax + (a+1)y + c$
b) $z = (a+1)x + a(a-1)y + c$
c) $z = (a-1)x + a(a+1)y + c$

d) $z(a-1) = a(a-1)x + ay + c$

SLR-BD-132

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **09**

a) Find the Arithmetic mean, Median and standard deviation for the following frequency distribution.

x	5	9	12	15	20	24	30	35	42	49
f	3	6	8	8	9	10	8	7	6	2

b) Solve $(D^2 - 4D + 4)y = 8.x^2e^{2x}\sin 2x$

c) Solve $(D^2 + D + 1)y = \sin 2x$

d) Calculate Mode for the following frequency distribution.

C.I.	00-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency (f)	4	7	8	12	25	18	10

e) Solve $p^2q^3 = x^2y^3$

Q.3 Attempt any Three. **09**

a) Solve: $(2D + 1)^2y = 4e^{-x/2}$

b) Solve: $p + q = pqz$

c) Find Q_1, Q_2, Q_3 from the following data.
5,7,12,14,15,22,25,30,36,42,53

d) Solve $x(y - z)p + y(z - x)q = z(x - y)$

e) Solve $(D^3 - 3D + 2)y = x$

Q.4 Attempt any Two **10**

a) The first four moments of a distribution about the value 5 are 2,20,40 and 50. from the given information obtain the first four central moments, coefficient of skewness and kurtosis.

b) Solve the following differential equation by the method of separation of variables.
$\frac{\partial z}{\partial x} - 2\frac{\partial z}{\partial y} = z$ given that $z(x, 0) = 3e^{-5x}$

c) Solve: $(D^2 - D - 2)y = 2\log x + \frac{1}{x} + \frac{1}{x^2}$

Section – II

Q.5 Attempt any three of the following. **09**

a) Find the value of k if each of the following functions is a probability density function.

$$f(x) = \begin{cases} kx^2(1-x^3), & 0 \le x \le 1 \\ 0, & \text{otherwise} \end{cases}$$

b) The mean life time of 100 fluorescent light bulbs produced by a Company is computed to be 1570 Hrs. with S.D. of 120 Hrs. If μ is the mean lifetime of all the bulbs produced by the Company, Test the Hypothesis $\mu = 1600$ Hrs. Against the alternative Hypothesis $\mu \neq 1600$ Hrs. using 5% level of Significance.
(Given Expected value at 5% LOS is 1.96)

c) Calculate the coefficient of correlation between height of father and height of son from the following data.

Height of father	64	65	66	67	68	69	70
Height of son	66	67	65	68	70	68	71

d) Two independent random sample have the following data,
$\overline{x_1} = 110, \sigma_1 = 25, n_1 = 16$
$\overline{x_2} = 120, \sigma_2 = 30, n_2 = 9$
If σ_1 and σ_2 are the S. D. of the populations. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance. (The table value of t at $\alpha = 0.05$ for $v = 23$ degrees of freedom is 2.069)

e) If in a lot of 500 solenoids 25 are defective, find the probability that there will be 0, 1, 2 defective solenoids in a random sample of 20 solenoids.

Q.6 Attempt any three of the following. **09**

a) If two independent random samples of sizes 15 and 8 have respectively the following mean and population standard deviations, $\overline{x_1} = 980, \overline{x_2} = 1012; \sigma_1 = 75, \sigma_2 = 80$. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance.
(Given Expected value at 5% LOS with 21 DF is 2.080)

b) The number of telephone calls received by an operator in a ten-minute interval follows a Poisson distribution with mean 1. What is the probability of receiving (i) no call, (ii) less than four calls, in the interval? What is the most likely number of calls?

c) Calculate the equations of the lines of regression. Given
Mean of $x = 50.07$, S.D. of $x = 5.26$
Mean of $y = 9.98$, S.D. of $y = 2.59$
$r = 0.898$

d) In an intelligence test administered to 1000 children the mean score was, 42 with s.d. 24. Find the number of children (i) scoring more than 60 and (ii) between 20 and 40 assuming the distribution to be normal.
(Given: For S.N.V. z area from z = 0 to z = 0.75 is 0.2734, that between z = 0 and z = 0.9167 is 0.3202 and that between z = 0 to z = 0.08333 is 0.0332.)

e) Fit a Straight line $y = a + bx$ to the following data.

x	0	1	2	3	4	5
y	1	2	3	4.5	6	7.5

Q.7 Attempt any Two. **10**

a) Fit a Poisson's distribution to the following data :

X	0	1	2	3	4	Total
f	112	63	20	4	1	200

b) Obtain a second-degree curve to the following data.

Year	1965	1966	1967	1968	1969	1970	1971	1972
Profit (in Corers Rs.)	125	140	165	195	200	215	220	230

Also estimate the profit in 1973.

c) Ten school boys were given a test in Statistics and their scores were recorded. They were given a month's special coaching and a second test was given to them in the same subject at the end of the coaching period. Test if the marks given below give evidence to the fact that the students are benefitted by coaching.
Marks in test I: 70, 68, 56, 75, 80, 90, 68, 75, 56, 58
Marks in Test II: 68, 70, 52, 73, 75, 78, 80, 92, 54, 55
(Given that value of t_α at 5 % LOS for v = 9 degrees of freedom is 1.86 for one tailed test)

SLR-BD-133

Seat No.		Set	P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which dimension of e-commerce enables commerce beyond the boundaries of the country?
a) Richness b) Interactivity
c) Global Reach d) Ubiquity

2) Which of the following describes the definition of electronic commerce?
a) Doing business
b) Sale and purchase of goods
c) Doing business electronically
d) All of the above mentioned

3) Which e-commerce model involves the sale of goods or services from businesses to the general public?
a) Business to Government b) Business to Consumer
c) Business to Business d) Consumer to Business

4) All of the following are major B2C business models except _____.
a) content provider b) industry consortium
c) transaction broker d) service provider

5) Which of the following advantage of E-commerce?
a) Ability to operate 24/7
b) Inability to personalize the shopping
c) Higher operational cost
d) Limited reach CO1 I

6) Which e-commerce transaction provides the benefits of eliminating the requirement of a middleman?

a) Business to Business b) Business to Government
c) Consumer to Business d) Business to Consumer

7) After completing an E-Commerce transaction, the seller and buyer should be provided an opportunity to _____ their transaction experience.

a) undo b) regret
c) provide rating for d) forget

8) Which of the following is a common digital marketing strategy used in E-commerce?

a) Search Engine Optimization (SEO)
b) Traditional print advertising
c) Cold-calling potential customers
d) Distributing flyers in local neighborhoods

9) Digital Cash has following characteristic _____.

a) Anonymity b) Security
c) Confidentiality d) All above

10) Which component of E-commerce ensures secure online transactions and customer data protection?

a) Payment gateways b) Shopping carts
c) Product catalogs d) Data warehouses

11) Which type of attack is a method of defeating a cryptographic scheme of trying a large number of possibilities?

a) Teardrop attack b) Brute force attack
c) Phlashing d) Smurf attack

12) What is the another name called PDoS?

a) Brute force attack b) Non technical attack
c) Phlashing d) Smurf attack

13) What does the term “data security” refer to in E-commerce?

a) The use of cookies to track customer behavior
b) The protection of customer data from unauthorized access and breaches
c) The analysis of customer browsing history for personalized recommendations
d) The process of categorizing customer data for marketing purposes

14) Which of the following is a characteristic of E-commerce marketplaces?

a) They only allow B2C transactions
b) They sell physical products exclusively
c) They are limited to a specific geographical area
d) Multiple sellers can list their products to reach a broader audience

SLR-BD-133

Seat No.		Set	P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve any four of the following. **16**

a) What is electronic commerce? Explain its applications?
b) Describe the web 2.0 in detail.
c) What do you mean by Supply Chain Execution Framework?
d) Discuss in brief virtual auction. Explain the differences between virtual auction and reverse auction.
e) Give the types of E payment methods. Explain in detail the EPS?

Q.3 Solve any two of the following. **12**

a) Define Electronic Data Interchange. What are the components of Electronic Data Interchange?
b) Explain in detail Business to consumer e-Commerce model.
c) What are the key technologies for B2B E-commerce? Explain architectural models of B2B E-commerce.

Section – II

Q.4 Solve any four of the following. **16**

a) What is the purpose of using social media in E-commerce marketing?
b) Explain technical malware attack method related to different services.
c) Explain E-Commerce micro payments in detail.
d) Explain SEO in detail.
e) Explain web advertising types in detail.

Q.5 Solve any two of the following. **12**

a) Define digital cash or e-cash. Explain with example how an online banking system works.
b) What are the different strategies to increase the sale?
c) What are the security challenges and protection measure available to any e business?

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is a common digital marketing strategy used in E-commerce?
a) Search Engine Optimization (SEO)
b) Traditional print advertising
c) Cold-calling potential customers
d) Distributing flyers in local neighborhoods

2) Digital Cash has following characteristic _____.
a) Anonymity b) Security
c) Confidentiality d) All above

3) Which component of E-commerce ensures secure online transactions and customer data protection?
a) Payment gateways b) Shopping carts
c) Product catalogs d) Data warehouses

4) Which type of attack is a method of defeating a cryptographic scheme of trying a large number of possibilities?
a) Teardrop attack b) Brute force attack
c) Phlashing d) Smurf attack

5) What is the another name called PDoS?
a) Brute force attack b) Non technical attack
c) Phlashing d) Smurf attack

6) What does the term “data security” refer to in E-commerce?
a) The use of cookies to track customer behavior
b) The protection of customer data from unauthorized access and breaches
c) The analysis of customer browsing history for personalized recommendations
d) The process of categorizing customer data for marketing purposes

7) Which of the following is a characteristic of E-commerce marketplaces?
a) They only allow B2C transactions
b) They sell physical products exclusively
c) They are limited to a specific geographical area
d) Multiple sellers can list their products to reach a broader audience

8) Which dimension of e-commerce enables commerce beyond the boundaries of the country?
a) Richness b) Interactivity
c) Global Reach d) Ubiquity

9) Which of the following describes the definition of electronic commerce?
a) Doing business
b) Sale and purchase of goods
c) Doing business electronically
d) All of the above mentioned

10) Which e-commerce model involves the sale of goods or services from businesses to the general public?
a) Business to Government b) Business to Consumer
c) Business to Business d) Consumer to Business

11) All of the following are major B2C business models except _____.
a) content provider b) industry consortium
c) transaction broker d) service provider

12) Which of the following advantage of E-commerce?
a) Ability to operate 24/7
b) Inability to personalize the shopping
c) Higher operational cost
d) Limited reach CO1 I

13) Which e-commerce transaction provides the benefits of eliminating the requirement of a middleman?
a) Business to Business b) Business to Government
c) Consumer to Business d) Business to Consumer

14) After completing an E-Commerce transaction, the seller and buyer should be provided an opportunity to _____ their transaction experience.
a) undo b) regret
c) provide rating for d) forget

SLR-BD-133

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve any four of the following. **16**

a) What is electronic commerce? Explain its applications?
b) Describe the web 2.0 in detail.
c) What do you mean by Supply Chain Execution Framework?
d) Discuss in brief virtual auction. Explain the differences between virtual auction and reverse auction.
e) Give the types of E payment methods. Explain in detail the EPS?

Q.3 Solve any two of the following. **12**

a) Define Electronic Data Interchange. What are the components of Electronic Data Interchange?
b) Explain in detail Business to consumer e-Commerce model.
c) What are the key technologies for B2B E-commerce? Explain architectural models of B2B E-commerce.

Section – II

Q.4 Solve any four of the following. **16**

a) What is the purpose of using social media in E-commerce marketing?
b) Explain technical malware attack method related to different services.
c) Explain E-Commerce micro payments in detail.
d) Explain SEO in detail.
e) Explain web advertising types in detail.

Q.5 Solve any two of the following. **12**

a) Define digital cash or e-cash. Explain with example how an online banking system works.
b) What are the different strategies to increase the sale?
c) What are the security challenges and protection measure available to any e business?

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Which type of attack is a method of defeating a cryptographic scheme of trying a large number of possibilities?
a) Teardrop attack b) Brute force attack
c) Phlashing d) Smurf attack

2) What is the another name called PDoS?
a) Brute force attack b) Non technical attack
c) Phlashing d) Smurf attack

3) What does the term "data security" refer to in E-commerce?
a) The use of cookies to track customer behavior
b) The protection of customer data from unauthorized access and breaches
c) The analysis of customer browsing history for personalized recommendations
d) The process of categorizing customer data for marketing purposes

4) Which of the following is a characteristic of E-commerce marketplaces?
a) They only allow B2C transactions
b) They sell physical products exclusively
c) They are limited to a specific geographical area
d) Multiple sellers can list their products to reach a broader audience

5) Which dimension of e-commerce enables commerce beyond the boundaries of the country?
a) Richness b) Interactivity
c) Global Reach d) Ubiquity

6) Which of the following describes the definition of electronic commerce?
a) Doing business
b) Sale and purchase of goods
c) Doing business electronically
d) All of the above mentioned

7) Which e-commerce model involves the sale of goods or services from businesses to the general public?
a) Business to Government b) Business to Consumer
c) Business to Business d) Consumer to Business

8) All of the following are major B2C business models except _____.
a) content provider b) industry consortium
c) transaction broker d) service provider

9) Which of the following advantage of E-commerce?
a) Ability to operate 24/7
b) Inability to personalize the shopping
c) Higher operational cost
d) Limited reach CO1 I

10) Which e-commerce transaction provides the benefits of eliminating the requirement of a middleman?
a) Business to Business b) Business to Government
c) Consumer to Business d) Business to Consumer

11) After completing an E-Commerce transaction, the seller and buyer should be provided an opportunity to _____ their transaction experience.
a) undo b) regret
c) provide rating for d) forget

12) Which of the following is a common digital marketing strategy used in E-commerce?
a) Search Engine Optimization (SEO)
b) Traditional print advertising
c) Cold-calling potential customers
d) Distributing flyers in local neighborhoods

13) Digital Cash has following characteristic _____.
a) Anonymity b) Security
c) Confidentiality d) All above

14) Which component of E-commerce ensures secure online transactions and customer data protection?
a) Payment gateways b) Shopping carts
c) Product catalogs d) Data warehouses

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve any four of the following. **16**

a) What is electronic commerce? Explain its applications?
b) Describe the web 2.0 in detail.
c) What do you mean by Supply Chain Execution Framework?
d) Discuss in brief virtual auction. Explain the differences between virtual auction and reverse auction.
e) Give the types of E payment methods. Explain in detail the EPS?

Q.3 Solve any two of the following. **12**

a) Define Electronic Data Interchange. What are the components of Electronic Data Interchange?
b) Explain in detail Business to consumer e-Commerce model.
c) What are the key technologies for B2B E-commerce? Explain architectural models of B2B E-commerce.

Section – II

Q.4 Solve any four of the following. **16**

a) What is the purpose of using social media in E-commerce marketing?
b) Explain technical malware attack method related to different services.
c) Explain E-Commerce micro payments in detail.
d) Explain SEO in detail.
e) Explain web advertising types in detail.

Q.5 Solve any two of the following. **12**

a) Define digital cash or e-cash. Explain with example how an online banking system works.
b) What are the different strategies to increase the sale?
c) What are the security challenges and protection measure available to any e business?

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which e-commerce transaction provides the benefits of eliminating the requirement of a middleman?
a) Business to Business b) Business to Government
c) Consumer to Business d) Business to Consumer

2) After completing an E-Commerce transaction, the seller and buyer should be provided an opportunity to _____ their transaction experience.
a) undo b) regret
c) provide rating for d) forget

3) Which of the following is a common digital marketing strategy used in E-commerce?
a) Search Engine Optimization (SEO)
b) Traditional print advertising
c) Cold-calling potential customers
d) Distributing flyers in local neighborhoods

4) Digital Cash has following characteristic _____.
a) Anonymity b) Security
c) Confidentiality d) All above

5) Which component of E-commerce ensures secure online transactions and customer data protection?
a) Payment gateways b) Shopping carts
c) Product catalogs d) Data warehouses

6) Which type of attack is a method of defeating a cryptographic scheme of trying a large number of possibilities?
a) Teardrop attack b) Brute force attack
c) Phlashing d) Smurf attack

7) What is the another name called PDoS?
a) Brute force attack b) Non technical attack
c) Phlashing d) Smurf attack

8) What does the term “data security” refer to in E-commerce?
a) The use of cookies to track customer behavior
b) The protection of customer data from unauthorized access and breaches
c) The analysis of customer browsing history for personalized recommendations
d) The process of categorizing customer data for marketing purposes

9) Which of the following is a characteristic of E-commerce marketplaces?
a) They only allow B2C transactions
b) They sell physical products exclusively
c) They are limited to a specific geographical area
d) Multiple sellers can list their products to reach a broader audience

10) Which dimension of e-commerce enables commerce beyond the boundaries of the country?
a) Richness b) Interactivity
c) Global Reach d) Ubiquity

11) Which of the following describes the definition of electronic commerce?
a) Doing business
b) Sale and purchase of goods
c) Doing business electronically
d) All of the above mentioned

12) Which e-commerce model involves the sale of goods or services from businesses to the general public?
a) Business to Government b) Business to Consumer
c) Business to Business d) Consumer to Business

13) All of the following are major B2C business models except _____.
a) content provider b) industry consortium
c) transaction broker d) service provider

14) Which of the following advantage of E-commerce?
a) Ability to operate 24/7
b) Inability to personalize the shopping
c) Higher operational cost
d) Limited reach CO1 I

SLR-BD-133

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve any four of the following. **16**

a) What is electronic commerce? Explain its applications?
b) Describe the web 2.0 in detail.
c) What do you mean by Supply Chain Execution Framework?
d) Discuss in brief virtual auction. Explain the differences between virtual auction and reverse auction.
e) Give the types of E payment methods. Explain in detail the EPS?

Q.3 Solve any two of the following. **12**

a) Define Electronic Data Interchange. What are the components of Electronic Data Interchange?
b) Explain in detail Business to consumer e-Commerce model.
c) What are the key technologies for B2B E-commerce? Explain architectural models of B2B E-commerce.

Section – II

Q.4 Solve any four of the following. **16**

a) What is the purpose of using social media in E-commerce marketing?
b) Explain technical malware attack method related to different services.
c) Explain E-Commerce micro payments in detail.
d) Explain SEO in detail.
e) Explain web advertising types in detail.

Q.5 Solve any two of the following. **12**

a) Define digital cash or e-cash. Explain with example how an online banking system works.
b) What are the different strategies to increase the sale?
c) What are the security challenges and protection measure available to any e business?

SLR-BD-134

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The main focus of the humanities is: _____.
a) Scientific experiments
b) Human culture and expression
c) Market trends and economies
d) Medical advancements

2) Which of the following does not come under the humanities?
a) Philosophy b) Literature
c) Physics d) Art History

3) The main focus of social sciences is on:
a) The physical and natural world
b) Human society and social relationships
c) Ancient artifacts
d) Chemical compositions

4) The study of language structure and its evolution is called: _____.
a) Sociology b) Linguistics
c) Psychology d) Anthropology

5) Identify the key person in philosophy _____.
a) Isaac Newton b) Leonardo da Vinci
c) Aristotle d) Charles Darwin

6) The archaeology focuses on: _____.
a) Economic theories
b) The study of celestial bodies
c) Material remains of past societies
d) Genetic research

7) Which of the following disciplines deals with political systems and governance?

a) Economics b) Political Science
c) Sociology d) Cultural Studies

8) Sociology mainly focuses on: _____.

a) Artistic techniques
b) Social behaviour and societal structures
c) Social economics
d) Historical events

9) Which discipline studies the production, distribution, and consumption of goods and services?

a) Sociology b) Political Science
c) Economics d) History

10) In which ancient civilization did the term "democracy" originate?

a) Ancient Egypt b) Ancient Greece
c) Ancient Rome d) Mesopotamia

11) Identify the primary focus of ethics in philosophy _____.

a) Logic and reasoning b) Moral principles and conduct
c) Aesthetics and beauty d) Scientific discovery

12) Feminism primarily addresses issues related to: _____.

a) Economic inequality
b) Gender equality and women's rights
c) Political ideologies
d) Technological advancements

13) What is the fundamental problem of economics?

a) Production of goods b) Scarcity of resources
c) Inflation d) Trade barriers

14) Dr. Sigmund Freud is best known for his contributions to: _____.

a) Political science b) Psychoanalysis
c) Economic theory d) Structural linguistics

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **12**

a) Explain the interdisciplinary nature of disciplines under humanities and social sciences.
b) Write a short note on: Scope of humanities.
c) Explain how perceptual processes shape human behaviour.
d) Write a short note on: Different aspects of perception.
e) Write a short note on: Major philosophical movements and their impact.

Q.3 Attempt any Two. **16**

a) Explain the advantages and disadvantages of democracy.
b) Explain major theories of psychology.
c) Explain how different psychological aspects affect social communication.

Section – II

Q.4 Attempt any Three. **12**

a) Write a short note on: Social Institutions.
b) Explain different elements of culture and society.
c) Write a short note on: Contributions of ancient civilizations to modern society.
d) How did industrial revolution contribute to technical advancements?
e) Write a short note on: Ethics in Engineering.

Q.5 Attempt any Two. **16**

a) What is industrialization? Explain the social and economic consequences of industrialization.
b) Describe different economic theories and thinkers.
c) Explain the technological innovations in 18^{th} & 19^{th} century.

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Sociology mainly focuses on: _____.
a) Artistic techniques
b) Social behaviour and societal structures
c) Social economics
d) Historical events

2) Which discipline studies the production, distribution, and consumption of goods and services?
a) Sociology b) Political Science
c) Economics d) History

3) In which ancient civilization did the term "democracy" originate?
a) Ancient Egypt b) Ancient Greece
c) Ancient Rome d) Mesopotamia

4) Identify the primary focus of ethics in philosophy _____.
a) Logic and reasoning b) Moral principles and conduct
c) Aesthetics and beauty d) Scientific discovery

5) Feminism primarily addresses issues related to: _____.
a) Economic inequality
b) Gender equality and women's rights
c) Political ideologies
d) Technological advancements

6) What is the fundamental problem of economics?
a) Production of goods b) Scarcity of resources
c) Inflation d) Trade barriers

7) Dr. Sigmund Freud is best known for his contributions to: _____.
a) Political science b) Psychoanalysis
c) Economic theory d) Structural linguistics

8) The main focus of the humanities is: _____.
a) Scientific experiments
b) Human culture and expression
c) Market trends and economies
d) Medical advancements

9) Which of the following does not come under the humanities?
a) Philosophy b) Literature
c) Physics d) Art History

10) The main focus of social sciences is on:
a) The physical and natural world
b) Human society and social relationships
c) Ancient artifacts
d) Chemical compositions

11) The study of language structure and its evolution is called: _____.
a) Sociology b) Linguistics
c) Psychology d) Anthropology

12) Identify the key person in philosophy _____.
a) Isaac Newton b) Leonardo da Vinci
c) Aristotle d) Charles Darwin

13) The archaeology focuses on: _____.
a) Economic theories
b) The study of celestial bodies
c) Material remains of past societies
d) Genetic research

14) Which of the following disciplines deals with political systems and governance?
a) Economics b) Political Science
c) Sociology d) Cultural Studies

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **12**

a) Explain the interdisciplinary nature of disciplines under humanities and social sciences.
b) Write a short note on: Scope of humanities.
c) Explain how perceptual processes shape human behaviour.
d) Write a short note on: Different aspects of perception.
e) Write a short note on: Major philosophical movements and their impact.

Q.3 Attempt any Two. **16**

a) Explain the advantages and disadvantages of democracy.
b) Explain major theories of psychology.
c) Explain how different psychological aspects affect social communication.

Section – II

Q.4 Attempt any Three. **12**

a) Write a short note on: Social Institutions.
b) Explain different elements of culture and society.
c) Write a short note on: Contributions of ancient civilizations to modern society.
d) How did industrial revolution contribute to technical advancements?
e) Write a short note on: Ethics in Engineering.

Q.5 Attempt any Two. **16**

a) What is industrialization? Explain the social and economic consequences of industrialization.
b) Describe different economic theories and thinkers.
c) Explain the technological innovations in 18^{th} & 19^{th} century.

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Identify the primary focus of ethics in philosophy _____.
a) Logic and reasoning b) Moral principles and conduct
c) Aesthetics and beauty d) Scientific discovery

2) Feminism primarily addresses issues related to: _____.
a) Economic inequality
b) Gender equality and women's rights
c) Political ideologies
d) Technological advancements

3) What is the fundamental problem of economics?
a) Production of goods b) Scarcity of resources
c) Inflation d) Trade barriers

4) Dr. Sigmund Freud is best known for his contributions to: _____.
a) Political science b) Psychoanalysis
c) Economic theory d) Structural linguistics

5) The main focus of the humanities is: _____.
a) Scientific experiments
b) Human culture and expression
c) Market trends and economies
d) Medical advancements

6) Which of the following does not come under the humanities?
a) Philosophy b) Literature
c) Physics d) Art History

7) The main focus of social sciences is on:
a) The physical and natural world
b) Human society and social relationships
c) Ancient artifacts
d) Chemical compositions

8) The study of language structure and its evolution is called: _____.
a) Sociology b) Linguistics
c) Psychology d) Anthropology

9) Identify the key person in philosophy _____.
a) Isaac Newton b) Leonardo da Vinci
c) Aristotle d) Charles Darwin

10) The archaeology focuses on: _____.
a) Economic theories
b) The study of celestial bodies
c) Material remains of past societies
d) Genetic research

11) Which of the following disciplines deals with political systems and governance?
a) Economics b) Political Science
c) Sociology d) Cultural Studies

12) Sociology mainly focuses on: _____.
a) Artistic techniques
b) Social behaviour and societal structures
c) Social economics
d) Historical events

13) Which discipline studies the production, distribution, and consumption of goods and services?
a) Sociology b) Political Science
c) Economics d) History

14) In which ancient civilization did the term "democracy" originate?
a) Ancient Egypt b) Ancient Greece
c) Ancient Rome d) Mesopotamia

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **12**

a) Explain the interdisciplinary nature of disciplines under humanities and social sciences.
b) Write a short note on: Scope of humanities.
c) Explain how perceptual processes shape human behaviour.
d) Write a short note on: Different aspects of perception.
e) Write a short note on: Major philosophical movements and their impact.

Q.3 Attempt any Two. **16**

a) Explain the advantages and disadvantages of democracy.
b) Explain major theories of psychology.
c) Explain how different psychological aspects affect social communication.

Section – II

Q.4 Attempt any Three. **12**

a) Write a short note on: Social Institutions.
b) Explain different elements of culture and society.
c) Write a short note on: Contributions of ancient civilizations to modern society.
d) How did industrial revolution contribute to technical advancements?
e) Write a short note on: Ethics in Engineering.

Q.5 Attempt any Two. **16**

a) What is industrialization? Explain the social and economic consequences of industrialization.
b) Describe different economic theories and thinkers.
c) Explain the technological innovations in 18^{th} & 19^{th} century.

Seat No.	

Set **S**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The archaeology focuses on: _____.

a) Economic theories
b) The study of celestial bodies
c) Material remains of past societies
d) Genetic research

2) Which of the following disciplines deals with political systems and governance?

a) Economics b) Political Science
c) Sociology d) Cultural Studies

3) Sociology mainly focuses on: _____.

a) Artistic techniques
b) Social behaviour and societal structures
c) Social economics
d) Historical events

4) Which discipline studies the production, distribution, and consumption of goods and services?

a) Sociology b) Political Science
c) Economics d) History

5) In which ancient civilization did the term "democracy" originate?

a) Ancient Egypt b) Ancient Greece
c) Ancient Rome d) Mesopotamia

6) Identify the primary focus of ethics in philosophy _____.

a) Logic and reasoning b) Moral principles and conduct
c) Aesthetics and beauty d) Scientific discovery

7) Feminism primarily addresses issues related to: _____.
a) Economic inequality
b) Gender equality and women's rights
c) Political ideologies
d) Technological advancements

8) What is the fundamental problem of economics?
a) Production of goods
b) Scarcity of resources
c) Inflation
d) Trade barriers

9) Dr. Sigmund Freud is best known for his contributions to: _____.
a) Political science
b) Psychoanalysis
c) Economic theory
d) Structural linguistics

10) The main focus of the humanities is: _____.
a) Scientific experiments
b) Human culture and expression
c) Market trends and economies
d) Medical advancements

11) Which of the following does not come under the humanities?
a) Philosophy
b) Literature
c) Physics
d) Art History

12) The main focus of social sciences is on:
a) The physical and natural world
b) Human society and social relationships
c) Ancient artifacts
d) Chemical compositions

13) The study of language structure and its evolution is called: _____.
a) Sociology
b) Linguistics
c) Psychology
d) Anthropology

14) Identify the key person in philosophy _____.
a) Isaac Newton
b) Leonardo da Vinci
c) Aristotle
d) Charles Darwin

SLR-BD-134

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **12**

a) Explain the interdisciplinary nature of disciplines under humanities and social sciences.
b) Write a short note on: Scope of humanities.
c) Explain how perceptual processes shape human behaviour.
d) Write a short note on: Different aspects of perception.
e) Write a short note on: Major philosophical movements and their impact.

Q.3 Attempt any Two. **16**

a) Explain the advantages and disadvantages of democracy.
b) Explain major theories of psychology.
c) Explain how different psychological aspects affect social communication.

Section – II

Q.4 Attempt any Three. **12**

a) Write a short note on: Social Institutions.
b) Explain different elements of culture and society.
c) Write a short note on: Contributions of ancient civilizations to modern society.
d) How did industrial revolution contribute to technical advancements?
e) Write a short note on: Ethics in Engineering.

Q.5 Attempt any Two. **16**

a) What is industrialization? Explain the social and economic consequences of industrialization.
b) Describe different economic theories and thinkers.
c) Explain the technological innovations in 18^{th} & 19^{th} century.

SLR-BD-135

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ is defined as "the discipline dealing with what is good & bad & with moral duty & obligation".
a) Rule b) Organisation culture
c) Protocol d) Ethics

2) _____ involves establishing the amount of work to be done & the time when each element of the work will start.
a) Planning b) Routing
c) Scheduling d) Organizing

3) In _____ concept product enjoys the supreme importance.
a) Selling b) Marketing
c) Manufacturing d) Business

4) _____ are the greatest importance at the supervisory level.
a) Supervisory skills b) Human relation skills
c) Technical skills d) Planning skills

5) The responsibilities of the operations manager include _____.
a) Planning , organizing , staffing , procuring , and reviewing
b) Forecasting , designing , planning , organizing , and controlling
c) Forecasting , designing , operating , procuring , and reviewing
d) Planning , organizing , staffing , leading , and controlling
e) Designing & operating

6) Self-esteem, status affiliation with others, affection those come under _____ needs.
a) Basic b) Primary
c) Third level of d) Secondary

7) _____ is ability of individual or group to induce or influence the beliefs or action of other person or group.

a) Power b) Authority
c) Post d) Leadership

8) The basic objective of quality control in any organization is to _____.

a) Quality development, quality maintenance and quality improvement activities in organization
b) Achieve optimum cost
c) Achieve customer's satisfaction
d) Achieve all the above

9) Cost associated with defective products being shipped to the customers are called as _____.

a) Cost of internal failure b) Total cost of failure
c) Rejection cost d) Cost of external failure

10) For identification of vital few for the given data, the tool used is _____.

a) Cause-Effect diagram b) Scatter diagram
c) Pareto Analysis d) Check Sheet

11) Total quality management (TQM) mainly aims for _____.

a) Control for quality b) Usefulness of product
c) Customer satisfaction d) Cost control

12) The statistician who invented the control chart for use in industrial quality control was: _____.

a) Deming b) Taguchi
c) Pareto d) Shewhart
e) None of the above

13) The method of accepting or rejecting the lot is known as _____.

a) Lot sampling b) Acceptance sampling
c) Batch sampling d) Quality control

14) In double sampling plan, second sample is taken when the number of defectives _____.

a) > C1 but < C2 b) > C1
c) > C1 and C2 d) < C2

SLR-BD-135

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2	**a)**	Explain the Social responsibilities and ethics in management.	**07**
	b)	Explain decision making process with types of decision.	**07**
Q.3	**a)**	What is planning process? Explain steps in planning.	**07**
	b)	What is leadership? Explain any four styles.	**07**
Q.4	**a)**	Explain communication and Various types of communications.	**07**
	b)	What is motivation? Explain Maslow's theory of motivation.	**07**

Section – II

Q.5	**a)**	Define quality and state the Steps in quality control.	**07**
	b)	Explain Benchmarking with advantages and disadvantages.	**07**
Q.6	**a)**	Explain Deming Wheel with suitable example.	**07**
	b)	Explain the following as applied to quality control: 1) Appraisal costs 2) Prevention costs 3) Failure costs 4) Optimum costs	**07**

Q.7 **a)** In a manufacturing process the number of defectives found in the inspection of 20 lots of 100 samples is given below. **07**

1) Determine the control limit of P chart and state whether the process is in control or not.
2) Determine the new value of mean fraction defective if some points are out of control. Compute the corresponding control limits and state whether the process is still in control or not.

Lot No.	No. of defectives	Lot No.	No. of Defectives
1	5	11	7
2	4	12	6
3	3	13	3
4	5	14	5
5	4	15	4
6	6	16	2
7	9	17	8
8	15	18	7
9	11	19	6
10	6	20	4

b) Differentiate between single sampling plan & double sampling plan. **07**

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The basic objective of quality control in any organization is to _____.
a) Quality development, quality maintenance and quality improvement activities in organization
b) Achieve optimum cost
c) Achieve customer's satisfaction
d) Achieve all the above

2) Cost associated with defective products being shipped to the customers are called as _____.
a) Cost of internal failure b) Total cost of failure
c) Rejection cost d) Cost of external failure

3) For identification of vital few for the given data, the tool used is _____.
a) Cause-Effect diagram b) Scatter diagram
c) Pareto Analysis d) Check Sheet

4) Total quality management (TQM) mainly aims for _____.
a) Control for quality b) Usefulness of product
c) Customer satisfaction d) Cost control

5) The statistician who invented the control chart for use in industrial quality control was: _____.
a) Deming b) Taguchi
c) Pareto d) Shewhart
e) None of the above

6) The method of accepting or rejecting the lot is known as _____.
a) Lot sampling b) Acceptance sampling
c) Batch sampling d) Quality control

7) In double sampling plan, second sample is taken when the number of defectives _____.

a) > C1 but < C2 b) > C1
c) > C1 and C2 d) < C2

8) _____ is defined as “the discipline dealing with what is good & bad & with moral duty & obligation”.

a) Rule b) Organisation culture
c) Protocol d) Ethics

9) _____ involves establishing the amount of work to be done & the time when each element of the work will start.

a) Planning b) Routing
c) Scheduling d) Organizing

10) In _____ concept product enjoys the supreme importance.

a) Selling b) Marketing
c) Manufacturing d) Business

11) _____ are the greatest importance at the supervisory level.

a) Supervisory skills b) Human relation skills
c) Technical skills d) Planning skills

12) The responsibilities of the operations manager include _____.

a) Planning , organizing , staffing , procuring , and reviewing
b) Forecasting , designing , planning , organizing , and controlling
c) Forecasting , designing , operating , procuring , and reviewing
d) Planning , organizing , staffing , leading , and controlling
e) Designing & operating

13) Self-esteem, status affiliation with others, affection those come under _____ needs.

a) Basic b) Primary
c) Third level of d) Secondary

14) _____ is ability of individual or group to induce or influence the beliefs or action of other person or group.

a) Power b) Authority
c) Post d) Leadership

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2	**a)**	Explain the Social responsibilities and ethics in management.	**07**
	b)	Explain decision making process with types of decision.	**07**
Q.3	**a)**	What is planning process? Explain steps in planning.	**07**
	b)	What is leadership? Explain any four styles.	**07**
Q.4	**a)**	Explain communication and Various types of communications.	**07**
	b)	What is motivation? Explain Maslow's theory of motivation.	**07**

Section – II

Q.5	**a)**	Define quality and state the Steps in quality control.	**07**
	b)	Explain Benchmarking with advantages and disadvantages.	**07**
Q.6	**a)**	Explain Deming Wheel with suitable example.	**07**
	b)	Explain the following as applied to quality control: 1) Appraisal costs 2) Prevention costs 3) Failure costs 4) Optimum costs	**07**

Q.7 **a)** In a manufacturing process the number of defectives found in the inspection of 20 lots of 100 samples is given below. **07**

1) Determine the control limit of P chart and state whether the process is in control or not.
2) Determine the new value of mean fraction defective if some points are out of control. Compute the corresponding control limits and state whether the process is still in control or not.

Lot No.	No. of defectives	Lot No.	No. of Defectives
1	5	11	7
2	4	12	6
3	3	13	3
4	5	14	5
5	4	15	4
6	6	16	2
7	9	17	8
8	15	18	7
9	11	19	6
10	6	20	4

b) Differentiate between single sampling plan & double sampling plan. **07**

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Total quality management (TQM) mainly aims for _____.
a) Control for quality b) Usefulness of product
c) Customer satisfaction d) Cost control

2) The statistician who invented the control chart for use in industrial quality control was: _____.
a) Deming b) Taguchi
c) Pareto d) Shewhart
e) None of the above

3) The method of accepting or rejecting the lot is known as _____.
a) Lot sampling b) Acceptance sampling
c) Batch sampling d) Quality control

4) In double sampling plan, second sample is taken when the number of defectives _____.
a) > C1 but < C2 b) > C1
c) > C1 and C2 d) < C2

5) _____ is defined as "the discipline dealing with what is good & bad & with moral duty & obligation".
a) Rule b) Organisation culture
c) Protocol d) Ethics

6) _____ involves establishing the amount of work to be done & the time when each element of the work will start.
a) Planning b) Routing
c) Scheduling d) Organizing

7) In _____ concept product enjoys the supreme importance.
a) Selling b) Marketing
c) Manufacturing d) Business

8) _____ are the greatest importance at the supervisory level.
a) Supervisory skills b) Human relation skills
c) Technical skills d) Planning skills

9) The responsibilities of the operations manager include _____.
a) Planning , organizing , staffing , procuring , and reviewing
b) Forecasting , designing , planning , organizing , and controlling
c) Forecasting , designing , operating , procuring , and reviewing
d) Planning , organizing , staffing , leading , and controlling
e) Designing & operating

10) Self-esteem, status affiliation with others, affection those come under _____ needs.
a) Basic b) Primary
c) Third level of d) Secondary

11) _____ is ability of individual or group to induce or influence the beliefs or action of other person or group.
a) Power b) Authority
c) Post d) Leadership

12) The basic objective of quality control in any organization is to _____.
a) Quality development, quality maintenance and quality improvement activities in organization
b) Achieve optimum cost
c) Achieve customer's satisfaction
d) Achieve all the above

13) Cost associated with defective products being shipped to the customers are called as _____.
a) Cost of internal failure b) Total cost of failure
c) Rejection cost d) Cost of external failure

14) For identification of vital few for the given data, the tool used is _____.
a) Cause-Effect diagram b) Scatter diagram
c) Pareto Analysis d) Check Sheet

SLR-BD-135

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2	**a)**	Explain the Social responsibilities and ethics in management.	**07**
	b)	Explain decision making process with types of decision.	**07**
Q.3	**a)**	What is planning process? Explain steps in planning.	**07**
	b)	What is leadership? Explain any four styles.	**07**
Q.4	**a)**	Explain communication and Various types of communications.	**07**
	b)	What is motivation? Explain Maslow's theory of motivation.	**07**

Section – II

Q.5	**a)**	Define quality and state the Steps in quality control.	**07**
	b)	Explain Benchmarking with advantages and disadvantages.	**07**
Q.6	**a)**	Explain Deming Wheel with suitable example.	**07**
	b)	Explain the following as applied to quality control: 1) Appraisal costs 2) Prevention costs 3) Failure costs 4) Optimum costs	**07**

Q.7 **a)** In a manufacturing process the number of defectives found in the inspection of 20 lots of 100 samples is given below. **07**

1) Determine the control limit of P chart and state whether the process is in control or not.
2) Determine the new value of mean fraction defective if some points are out of control. Compute the corresponding control limits and state whether the process is still in control or not.

Lot No.	No. of defectives	Lot No.	No. of Defectives
1	5	11	7
2	4	12	6
3	3	13	3
4	5	14	5
5	4	15	4
6	6	16	2
7	9	17	8
8	15	18	7
9	11	19	6
10	6	20	4

b) Differentiate between single sampling plan & double sampling plan. **07**

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Self-esteem, status affiliation with others, affection those come under _____ needs.
a) Basic b) Primary
c) Third level of d) Secondary

2) _____ is ability of individual or group to induce or influence the beliefs or action of other person or group.
a) Power b) Authority
c) Post d) Leadership

3) The basic objective of quality control in any organization is to _____.
a) Quality development, quality maintenance and quality improvement activities in organization
b) Achieve optimum cost
c) Achieve customer's satisfaction
d) Achieve all the above

4) Cost associated with defective products being shipped to the customers are called as _____.
a) Cost of internal failure b) Total cost of failure
c) Rejection cost d) Cost of external failure

5) For identification of vital few for the given data, the tool used is _____.
a) Cause-Effect diagram b) Scatter diagram
c) Pareto Analysis d) Check Sheet

6) Total quality management (TQM) mainly aims for _____.
a) Control for quality b) Usefulness of product
c) Customer satisfaction d) Cost control

7) The statistician who invented the control chart for use in industrial quality control was: _____.

a) Deming b) Taguchi
c) Pareto d) Shewhart
e) None of the above

8) The method of accepting or rejecting the lot is known as _____.

a) Lot sampling b) Acceptance sampling
c) Batch sampling d) Quality control

9) In double sampling plan, second sample is taken when the number of defectives _____.

a) > C1 but < C2 b) > C1
c) > C1 and C2 d) < C2

10) _____ is defined as “the discipline dealing with what is good & bad & with moral duty & obligation”.

a) Rule b) Organisation culture
c) Protocol d) Ethics

11) _____ involves establishing the amount of work to be done & the time when each element of the work will start.

a) Planning b) Routing
c) Scheduling d) Organizing

12) In _____ concept product enjoys the supreme importance.

a) Selling b) Marketing
c) Manufacturing d) Business

13) _____ are the greatest importance at the supervisory level.

a) Supervisory skills b) Human relation skills
c) Technical skills d) Planning skills

14) The responsibilities of the operations manager include _____.

a) Planning , organizing , staffing , procuring , and reviewing
b) Forecasting , designing , planning , organizing , and controlling
c) Forecasting , designing , operating , procuring , and reviewing
d) Planning , organizing , staffing , leading , and controlling
e) Designing & operating

SLR-BD-18

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2	**a)**	Explain the Social responsibilities and ethics in management.	**07**
	b)	Explain decision making process with types of decision.	**07**
Q.3	**a)**	What is planning process? Explain steps in planning.	**07**
	b)	What is leadership? Explain any four styles.	**07**
Q.4	**a)**	Explain communication and Various types of communications.	**07**
	b)	What is motivation? Explain Maslow's theory of motivation.	**07**

Section – II

Q.5	**a)**	Define quality and state the Steps in quality control.	**07**
	b)	Explain Benchmarking with advantages and disadvantages.	**07**
Q.6	**a)**	Explain Deming Wheel with suitable example.	**07**
	b)	Explain the following as applied to quality control: 1) Appraisal costs 2) Prevention costs 3) Failure costs 4) Optimum costs	**07**

Q.7 **a)** In a manufacturing process the number of defectives found in the inspection of 20 lots of 100 samples is given below. **07**

1) Determine the control limit of P chart and state whether the process is in control or not.
2) Determine the new value of mean fraction defective if some points are out of control. Compute the corresponding control limits and state whether the process is still in control or not.

Lot No.	No. of defectives	Lot No.	No. of Defectives
1	5	11	7
2	4	12	6
3	3	13	3
4	5	14	5
5	4	15	4
6	6	16	2
7	9	17	8
8	15	18	7
9	11	19	6
10	6	20	4

b) Differentiate between single sampling plan & double sampling plan. **07**

Seat No.	

Set P

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Laplace transform of $\int_0^t u^3 du =$_____.

a) $\frac{3}{s^5}$ b) $\frac{6}{s^5}$

c) $\frac{1}{s^5}$ d) $\frac{6}{s^4}$

2) If $L\{f(t)\} = \emptyset(s)$, then $L\{f(at)\} =$ _____.

a) $\emptyset\left(\frac{s}{a}\right)$ b) $\frac{1}{s}\emptyset\left(\frac{s}{a}\right)$

c) $\emptyset'\left(\frac{s}{a}\right)$ d) $\frac{1}{a}\emptyset\left(\frac{s}{a}\right)$

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

a) $\frac{1}{3}\sin 3t$ b) $\frac{1}{3}\cos 3t$

c) $\frac{1}{3}\cosh 3t$ d) $\frac{1}{3}\sinh 3t$

4) For $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 3y = 3e^{2x}$, the particular integral is _____.

a) $\frac{1}{15}e^{2x}$ b) $3e^{2x}$

c) $\frac{1}{5}e^{2x}$ d) $C_1e^{-x} + C_2e^{-2x}$

5) The general solution of the equation $(D^3 - 7D - 6)y = 0$ is _____.

a) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{-3x}$

b) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{3x}$

c) $y = c_1e^{-x} + c_2e^{-2x} + c_3e^{-3x}$

d) None of these

6) $z\{k\} =$_____ for $|z| > 1$

a) $\frac{z}{z-1}$ b) $\frac{1}{(z-1)^2}$

c) $\frac{z}{(z-1)^2}$ d) $\frac{z}{(z+1)^2}$

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

a) $f\left(\frac{a}{z}\right)$ b) $f\left(\frac{z}{a}\right)$

c) $\frac{1}{a}f\left(\frac{z}{a}\right)$ d) None

8) $Z\left\{\frac{1}{k!}\right\} =?$ for $k \geq 0$

a) e^z b) $e^{\frac{1}{z}}$

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

9) The Fourier sine transform of $f(x)$ is given by _____.

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

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

10) From the result $\int_{-\infty}^{\infty} \frac{\cos sx.\sin sk}{s} ds = \begin{cases} \pi & , \ |x| < k \\ 0 & , \ |x| > k \end{cases}$ we can deduce that $\int_0^{\infty} \frac{\sin sk}{s}\, ds =$ _____.

a) 0 b) 1

c) π d) $\frac{\pi}{2}$

11) The first real positive root of $x^3 = 6x - 4$ by Newton Raphson method near $x_0 = 1$ is _____.

a) 0.6667 b) 0.6

c) 0.4 d) 0.3

12) How many steps does the fourth-order Runge-Kutta method use?

a) Two steps b) Five steps

c) Four steps d) Three steps

13) In the interval $(0, a)$ the constant term in the Fourier series of $f(x) = \frac{a}{2} - x$ is _____.

a) 0 b) 1

c) $\frac{a^2}{2\pi}$ d) $\frac{a^2}{4\pi}$

14) Fourier series of $f(x) = x\ in(-\pi, \pi)$ will contain ____

a) No sine term b) No cosine term

c) Both cosine and sine term d) None of these

Seat No.	

Set P

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any three **09**

a) Solve : $(D^2 + 4D + 5)y = -2\cos hx + 2^x$

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

c) Find Z-transform of $x_k = 2^k \cos(3k + 2)\,, k \geq 0$

d) Find Z-transform of $x_k = k^2 e^{-ak}, k \geq 0$

e) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{1}{s(s^2+4)}\right]$

Q.3 Attempt any three of the following. **09**

a) Evaluate by using Laplace transform $\int_0^\infty \left(\frac{e^{-t}-e^{-3t}}{t}\right) dt$

b) Find the inverse Z-transform of $f(k) = \begin{cases} 4^k, & k < 0 \\ 3^k, & k \geq 0 \end{cases}$

c) Find $Z\{e^{-3k}\sin 2k\}, k \geq 0$

d) Solve $(D^2 - 1)y = (1 + e^{-x})^2$

e) Find Laplace Transform of $\{t\cos 2t\}$

Q.4 Attempt any two **10**

a) Find the inverse Z-transform of $\frac{1}{(z-a)^2}$ if

1) $|z| < a$,
2) $|z| > a$,

b) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$

c) Solve $(D^2 - 6D + 13)y = e^{x\log 2} + 8e^{3x}\sin 4x$

Section – II

Q.5 Attempt any three **09**

a) Evaluate $\int_0^5 \frac{1}{4x+5} dx$ using $n = 5$ by Trapezoidal rule.

b) Evaluate $I = \int_0^2 e^{-x} dx$ by using the Simpson's 1/3rd rule given h= 0.5

c) Obtain half range cosine series $f(x) = x$ in $0 < x < 1$

d) Find the Fourier series expansion of $f(x) = x^2$ in $(-\pi, \pi)$

e) Find the Fourier transform of $f(x) = \begin{cases} \frac{1}{2\epsilon}, & |x| \leq \epsilon \\ 0, & |x| > \epsilon \end{cases}$

Q.6 Attempt any three **09**

a) Find f(x) if its Fourier sine transform e^{-as}

b) Find the Fourier cosine transform of

$f(x)$, if $f(x) = \begin{cases} 1, & 0 \leq x < 1 \\ 0, & x \geq 1 \end{cases}$

c) Find the Fourier series expansion of $f(x) = x$ in $(-\pi, \pi)$

d) Solve by Newton Raphson method $x^4 - x = 10$ correct to four decimal places. (perform two iterations only)

e) Find $\int_0^6 \frac{1}{1+x^2} dx\ n = 6$ using Simpson's 3/8th rule.

Q.7 Attempt any two. **10**

a) Find $\int_1^8 \frac{1}{1+x} dx\ h = 1$ by using Trapezoidal rule and Simpson's 1/3rd rule.

b) Find Fourier transform of

$f(x) = 1\ |x| < k$

$= 0\ |x| > k$ and

Hence evaluate i) $\int_{-\infty}^{\infty} \frac{\sin sk . \cos sk}{s} ds$ ii) $\int_{-\infty}^{\infty} \frac{sin\ ks}{s} ds$

c) Find the Fourier series expansion of the function $f(x) = e^{-\alpha x}$ in $(0, 2\pi)$

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) $Z\left\{\frac{1}{k!}\right\} = ?$ for $k \geq 0$

a) e^z b) $e^{\frac{1}{z}}$

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

2) The Fourier sine transform of $f(x)$ is given by _____.

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

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

3) From the result $\int_{-\infty}^{\infty}\frac{\cos sx.\sin sk}{s}ds = \begin{cases}\pi & , \ |x| < k \\ 0 & , \ |x| > k\end{cases}$ we can deduce that $\int_0^{\infty}\frac{\sin sk}{s}\, ds =$ _____.

a) 0 b) 1

c) π d) $\frac{\pi}{2}$

4) The first real positive root of $x^3 = 6x - 4$ by Newton Raphson method near $x_0 = 1$ is _____.

a) 0.6667 b) 0.6

c) 0.4 d) 0.3

5) How many steps does the fourth-order Runge-Kutta method use?

a) Two steps b) Five steps

c) Four steps d) Three steps

6) In the interval $(0, a)$ the constant term in the Fourier series of $f(x) = \frac{a}{2} - x$ is _____.

a) 0 b) 1

c) $\frac{a^2}{2\pi}$ d) $\frac{a^2}{4\pi}$

7) Fourier series of $f(x) = x\ in(-\pi, \pi)$ will contain _____

a) No sine term b) No cosine term

c) Both cosine and sine term d) None of these

8) Laplace transform of $\int_0^t u^3 du =$_____.

a) $\frac{3}{s^5}$ b) $\frac{6}{s^5}$

c) $\frac{1}{s^5}$ d) $\frac{6}{s^4}$

9) If $L\{f(t)\} = \emptyset(s)$, then $L\{f(at)\} =$ _____.

a) $\emptyset\left(\frac{s}{a}\right)$ b) $\frac{1}{s}\emptyset\left(\frac{s}{a}\right)$

c) $\emptyset'\left(\frac{s}{a}\right)$ d) $\frac{1}{a}\emptyset\left(\frac{s}{a}\right)$

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

a) $\frac{1}{3}\sin 3t$ b) $\frac{1}{3}\cos 3t$

c) $\frac{1}{3}\cosh 3t$ d) $\frac{1}{3}\sinh 3t$

11) For $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 3y = 3e^{2x}$, the particular integral is _____.

a) $\frac{1}{15}e^{2x}$ b) $3e^{2x}$

c) $\frac{1}{5}e^{2x}$ d) $C_1e^{-x} + C_2e^{-2x}$

12) The general solution of the equation $(D^3 - 7D - 6)y = 0$ is _____.

a) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{-3x}$

b) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{3x}$

c) $y = c_1e^{-x} + c_2e^{-2x} + c_3e^{-3x}$

d) None of these

13) $z\{k\} =$_____ for $|z| > 1$

a) $\frac{z}{z-1}$ b) $\frac{1}{(z-1)^2}$

c) $\frac{z}{(z-1)^2}$ d) $\frac{z}{(z+1)^2}$

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

a) $f\left(\frac{a}{z}\right)$ b) $f\left(\frac{z}{a}\right)$

c) $\frac{1}{a} f\left(\frac{z}{a}\right)$ d) None

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any three **09**

a) Solve : $(D^2 + 4D + 5)y = -2\cos hx + 2^x$

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

c) Find Z-transform of $x_k = 2^k \cos(3k + 2)\,, k \geq 0$

d) Find Z-transform of $x_k = k^2 e^{-ak}, k \geq 0$

e) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{1}{s(s^2+4)}\right]$

Q.3 Attempt any three of the following. **09**

a) Evaluate by using Laplace transform $\int_0^\infty \left(\frac{e^{-t}-e^{-3t}}{t}\right) dt$

b) Find the inverse Z-transform of $f(k) = \begin{cases} 4^k, & k < 0 \\ 3^k, & k \geq 0 \end{cases}$

c) Find $Z\{e^{-3k}\sin 2k\}, k \geq 0$

d) Solve $(D^2 - 1)y = (1 + e^{-x})^2$

e) Find Laplace Transform of $\{t\cos 2t\}$

Q.4 Attempt any two **10**

a) Find the inverse Z-transform of $\frac{1}{(z-a)^2}$ if

1) $|z| < a$,
2) $|z| > a$,

b) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$

c) Solve $(D^2 - 6D + 13)y = e^{x\log 2} + 8e^{3x}\sin 4x$

Section – II

Q.5 Attempt any three **09**

a) Evaluate $\int_0^5 \frac{1}{4x+5} dx$ using $n = 5$ by Trapezoidal rule.

b) Evaluate $I = \int_0^2 e^{-x} dx$ by using the Simpson's 1/3rd rule given h= 0.5

c) Obtain half range cosine series $f(x) = x$ in $0 < x < 1$

d) Find the Fourier series expansion of $f(x) = x^2$ in $(-\pi, \pi)$

e) Find the Fourier transform of $f(x) = \begin{cases} \frac{1}{2\epsilon}, & |x| \leq \epsilon \\ 0, & |x| > \epsilon \end{cases}$

Q.6 Attempt any three **09**

a) Find f(x) if its Fourier sine transform e^{-as}

b) Find the Fourier cosine transform of

$f(x)$, if $f(x) = \begin{cases} 1, & 0 \leq x < 1 \\ 0, & x \geq 1 \end{cases}$

c) Find the Fourier series expansion of $f(x) = x$ in $(-\pi, \pi)$

d) Solve by Newton Raphson method $x^4 - x = 10$ correct to four decimal places. (perform two iterations only)

e) Find $\int_0^6 \frac{1}{1+x^2} dx \; n = 6$ using Simpson's 3/8th rule.

Q.7 Attempt any two. **10**

a) Find $\int_1^8 \frac{1}{1+x} dx \; h = 1$ by using Trapezoidal rule and Simpson's 1/3rd rule.

b) Find Fourier transform of

$f(x) = 1 \; |x| < k$

$= 0 \; |x| > k$ and

Hence evaluate i) $\int_{-\infty}^{\infty} \frac{\sin sk . \cos sk}{s} ds$ ii) $\int_{-\infty}^{\infty} \frac{\sin ks}{s} ds$

c) Find the Fourier series expansion of the function $f(x) = e^{-\alpha x}$ in $(0, 2\pi)$

Seat No.	

Set R

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The first real positive root of $x^3 = 6x - 4$ by Newton Raphson method near $x_0 = 1$ is _____.

a) 0.6667 b) 0.6
c) 0.4 d) 0.3

2) How many steps does the fourth-order Runge-Kutta method use?

a) Two steps b) Five steps
c) Four steps d) Three steps

3) In the interval $(0, a)$ the constant term in the Fourier series of $f(x) = \frac{a}{2} - x$ is _____.

a) 0 b) 1
c) $\frac{a^2}{2\pi}$ d) $\frac{a^2}{4\pi}$

4) Fourier series of $f(x) = x\ in(-\pi, \pi)$ will contain ____

a) No sine term b) No cosine term
c) Both cosine and sine term d) None of these

5) Laplace transform of $\int_0^t u^3 du$ =_____.

a) $\frac{3}{s^5}$ b) $\frac{6}{s^5}$
c) $\frac{1}{s^5}$ d) $\frac{6}{s^4}$

6) If $L\{f(t)\} = \emptyset(s)$, then $L\{f(at)\} =$ _____.

a) $\emptyset\left(\frac{s}{a}\right)$ b) $\frac{1}{s}\emptyset\left(\frac{s}{a}\right)$

c) $\emptyset'\left(\frac{s}{a}\right)$ d) $\frac{1}{a}\emptyset\left(\frac{s}{a}\right)$

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

a) $\frac{1}{3}\sin 3t$ b) $\frac{1}{3}\cos 3t$

c) $\frac{1}{3}\cosh 3t$ d) $\frac{1}{3}\sinh 3t$

8) For $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 3y = 3e^{2x}$, the particular integral is _____.

a) $\frac{1}{15}e^{2x}$ b) $3e^{2x}$

c) $\frac{1}{5}e^{2x}$ d) $C_1e^{-x} + C_2e^{-2x}$

9) The general solution of the equation $(D^3 - 7D - 6)y = 0$ is _____.

a) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{-3x}$

b) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{3x}$

c) $y = c_1e^{-x} + c_2e^{-2x} + c_3e^{-3x}$

d) None of these

10) $z\{k\} =$_____ for $|z| > 1$

a) $\frac{z}{z-1}$ b) $\frac{1}{(z-1)^2}$

c) $\frac{z}{(z-1)^2}$ d) $\frac{z}{(z+1)^2}$

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

a) $f\left(\frac{a}{z}\right)$ b) $f\left(\frac{z}{a}\right)$

c) $\frac{1}{a}f\left(\frac{z}{a}\right)$ d) None

12) $Z\left\{\frac{1}{k!}\right\} =$? for $k \geq 0$

a) e^z b) $e^{\frac{1}{z}}$

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

13) The Fourier sine transform of $f(x)$ is given by _____.

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

b) $\int_{-\infty}^{\infty} f(x)\cos sx\ dx$

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

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

14) From the result $\int_{-\infty}^{\infty}\frac{\cos sx.\sin sk}{s}ds = \begin{cases}\pi & , \ |x| < k \\ 0 & , \ |x| > k\end{cases}$ we can deduce that $\int_{0}^{\infty}\frac{\sin sk}{s}\ ds =$ _____.

a) 0

b) 1

c) π

d) $\frac{\pi}{2}$

Seat No.	

Set R

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any three **09**

a) Solve : $(D^2 + 4D + 5)y = -2\cos hx + 2^x$

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

c) Find Z-transform of $x_k = 2^k \cos(3k + 2)\,, k \geq 0$

d) Find Z-transform of $x_k = k^2 e^{-ak}, k \geq 0$

e) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{1}{s(s^2+4)}\right]$

Q.3 Attempt any three of the following. **09**

a) Evaluate by using Laplace transform $\int_0^\infty \left(\frac{e^{-t}-e^{-3t}}{t}\right) dt$

b) Find the inverse Z-transform of $f(k) = \begin{cases} 4^k, & k < 0 \\ 3^k, & k \geq 0 \end{cases}$

c) Find $Z\{e^{-3k}\sin 2k\}, k \geq 0$

d) Solve $(D^2 - 1)y = (1 + e^{-x})^2$

e) Find Laplace Transform of $\{t\cos 2t\}$

Q.4 Attempt any two **10**

a) Find the inverse Z-transform of $\frac{1}{(z-a)^2}$ if

1) $|z| < a$,
2) $|z| > a$,

b) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$

c) Solve $(D^2 - 6D + 13)y = e^{x\log 2} + 8e^{3x}\sin 4x$

Section – II

Q.5 Attempt any three **09**

a) Evaluate $\int_0^5 \frac{1}{4x+5} dx$ using $n = 5$ by Trapezoidal rule.

b) Evaluate $I = \int_0^2 e^{-x} dx$ by using the Simpson's 1/3rd rule given h= 0.5

c) Obtain half range cosine series $f(x) = x$ in $0 < x < 1$

d) Find the Fourier series expansion of $f(x) = x^2$ in $(-\pi, \pi)$

e) Find the Fourier transform of $f(x) = \begin{cases} \frac{1}{2\epsilon}, & |x| \leq \epsilon \\ 0, & |x| > \epsilon \end{cases}$

Q.6 Attempt any three **09**

a) Find f(x) if its Fourier sine transform e^{-as}

b) Find the Fourier cosine transform of

$f(x)$, if $f(x) = \begin{cases} 1, & 0 \leq x < 1 \\ 0, & x \geq 1 \end{cases}$

c) Find the Fourier series expansion of $f(x) = x$ in $(-\pi, \pi)$

d) Solve by Newton Raphson method $x^4 - x = 10$ correct to four decimal places. (perform two iterations only)

e) Find $\int_0^6 \frac{1}{1+x^2} dx \; n = 6$ using Simpson's 3/8th rule.

Q.7 Attempt any two. **10**

a) Find $\int_1^8 \frac{1}{1+x} dx \; h = 1$ by using Trapezoidal rule and Simpson's 1/3rd rule.

b) Find Fourier transform of

$f(x) = 1 \; |x| < k$

$= 0 \; |x| > k$ and

Hence evaluate i) $\int_{-\infty}^{\infty} \frac{\sin sk . \cos sk}{s} ds$ ii) $\int_{-\infty}^{\infty} \frac{sin\, ks}{s} ds$

c) Find the Fourier series expansion of the function $f(x) = e^{-\alpha x}$ in $(0, 2\pi)$

Seat No.	

Set S

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) $z\{k\} =$_____ for $|z| > 1$

a) $\frac{z}{z-1}$ b) $\frac{1}{(z-1)^2}$

c) $\frac{z}{(z-1)^2}$ d) $\frac{z}{(z+1)^2}$

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

a) $f\left(\frac{a}{z}\right)$ b) $f\left(\frac{z}{a}\right)$

c) $\frac{1}{a} f\left(\frac{z}{a}\right)$ d) None

3) $Z\left\{\frac{1}{k!}\right\} =?$ for $k \geq 0$

a) e^z b) $e^{\frac{1}{z}}$

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

4) The Fourier sine transform of $f(x)$ is given by _____.

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

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

5) From the result $\int_{-\infty}^{\infty} \frac{\cos sx.\sin sk}{s} ds = \begin{cases} \pi & , \ |x| < k \\ 0 & , \ |x| > k \end{cases}$ we can deduce that $\int_0^{\infty} \frac{\sin sk}{s} \, ds =$ _____.

a) 0 b) 1

c) π d) $\frac{\pi}{2}$

6) The first real positive root of $x^3 = 6x - 4$ by Newton Raphson method near $x_0 = 1$ is _____.

a) 0.6667 b) 0.6

c) 0.4 d) 0.3

7) How many steps does the fourth-order Runge-Kutta method use?

a) Two steps b) Five steps

c) Four steps d) Three steps

8) In the interval $(0, a)$ the constant term in the Fourier series of $f(x) = \frac{a}{2} - x$ is _____.

a) 0 b) 1

c) $\frac{a^2}{2\pi}$ d) $\frac{a^2}{4\pi}$

9) Fourier series of $f(x) = x \ in(-\pi, \pi)$ will contain ____

a) No sine term b) No cosine term

c) Both cosine and sine term d) None of these

10) Laplace transform of $\int_0^t u^3 du =$_____.

a) $\frac{3}{s^5}$ b) $\frac{6}{s^5}$

c) $\frac{1}{s^5}$ d) $\frac{6}{s^4}$

11) If $L\{f(t)\} = \emptyset(s)$, then $L\{f(at)\} =$ _____.

a) $\emptyset\left(\frac{s}{a}\right)$ b) $\frac{1}{s}\emptyset\left(\frac{s}{a}\right)$

c) $\emptyset'\left(\frac{s}{a}\right)$ d) $\frac{1}{a}\emptyset\left(\frac{s}{a}\right)$

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

a) $\frac{1}{3}\sin 3t$ b) $\frac{1}{3}\cos 3t$

c) $\frac{1}{3}\cosh 3t$ d) $\frac{1}{3}\sinh 3t$

13) For $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 3y = 3e^{2x}$, the particular integral is _____.

a) $\frac{1}{15}e^{2x}$ b) $3e^{2x}$

c) $\frac{1}{5}e^{2x}$ d) $C_1e^{-x} + C_2e^{-2x}$

14) The general solution of the equation $(D^3 - 7D - 6)y = 0$ is _____.

a) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{-3x}$

b) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{3x}$

c) $y = c_1e^{-x} + c_2e^{-2x} + c_3e^{-3x}$

d) None of these

Seat No.	

Set **S**

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any three **09**

a) Solve : $(D^2 + 4D + 5)y = -2\cos hx + 2^x$

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

c) Find Z-transform of $x_k = 2^k \cos(3k + 2)\,, k \geq 0$

d) Find Z-transform of $x_k = k^2 e^{-ak}, k \geq 0$

e) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{1}{s(s^2+4)}\right]$

Q.3 Attempt any three of the following. **09**

a) Evaluate by using Laplace transform $\int_0^\infty \left(\frac{e^{-t}-e^{-3t}}{t}\right) dt$

b) Find the inverse Z-transform of $f(k) = \begin{cases} 4^k, & k < 0 \\ 3^k, & k \geq 0 \end{cases}$

c) Find $Z\{e^{-3k}\sin 2k\}, k \geq 0$

d) Solve $(D^2 - 1)y = (1 + e^{-x})^2$

e) Find Laplace Transform of $\{t\cos 2t\}$

Q.4 Attempt any two **10**

a) Find the inverse Z-transform of $\frac{1}{(z-a)^2}$ if

1) $|z| < a$,
2) $|z| > a$,

b) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$

c) Solve $(D^2 - 6D + 13)y = e^{x\log 2} + 8e^{3x}\sin 4x$

Section – II

Q.5 Attempt any three **09**

a) Evaluate $\int_0^5 \frac{1}{4x+5} dx$ using $n = 5$ by Trapezoidal rule.

b) Evaluate $I = \int_0^2 e^{-x} dx$ by using the Simpson's 1/3rd rule given h= 0.5

c) Obtain half range cosine series $f(x) = x$ in $0 < x < 1$

d) Find the Fourier series expansion of $f(x) = x^2$ in $(-\pi, \pi)$

e) Find the Fourier transform of $f(x) = \begin{cases} \frac{1}{2\epsilon}, & |x| \leq \epsilon \\ 0, & |x| > \epsilon \end{cases}$

Q.6 Attempt any three **09**

a) Find f(x) if its Fourier sine transform e^{-as}

b) Find the Fourier cosine transform of

$f(x)$, if $f(x) = \begin{cases} 1, & 0 \leq x < 1 \\ 0, & x \geq 1 \end{cases}$

c) Find the Fourier series expansion of $f(x) = x$ in $(-\pi, \pi)$

d) Solve by Newton Raphson method $x^4 - x = 10$ correct to four decimal places. (perform two iterations only)

e) Find $\int_0^6 \frac{1}{1+x^2} dx \; n = 6$ using Simpson's 3/8th rule.

Q.7 Attempt any two. **10**

a) Find $\int_1^8 \frac{1}{1+x} dx \; h = 1$ by using Trapezoidal rule and Simpson's 1/3rd rule.

b) Find Fourier transform of

$f(x) = 1 \; |x| < k$

$= 0 \; |x| > k$ and

Hence evaluate i) $\int_{-\infty}^{\infty} \frac{\sin sk . \cos sk}{s} ds$ ii) $\int_{-\infty}^{\infty} \frac{sin\, ks}{s} ds$

c) Find the Fourier series expansion of the function $f(x) = e^{-\alpha x}$ in $(0, 2\pi)$

SLR-BD-137

Seat No.		Set	P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is feedback in communication?
a) The process of encoding a message.
b) The process of transmitting the message.
c) The response or reaction to a message.
d) The process of decoding a message.

2) In the process of communication 'Encoding' means _____.
a) Using symbol to express an idea
b) Deciphering the message
c) Creating noise in the communication
d) Interpreting the meaning of message

3) Empathy refers to: _____.
a) Capacity to understand or feel what another person feels
b) Having better understanding of partner's emotions
c) The higher the likelihood of self harm
d) Getting what one wants out of the relationship

4) Repots, suggestions, appeals grievances etc. are examples of: _____.
a) Down ward communication
b) Upward communication
c) Horizontal communication
d) Informal communication

5) Informal communication is commonly known as: _____.
a) Down ward communication b) Upward communication
c) Horizontal communication d) Grapevine

6) _____ is not a communication barrier?
a) Language b) Culture
c) Habits d) Physical

7) Which of the following is NOT a component of communication?
a) Sender b) Message
c) Receiver d) Translator

8) Emotional Intelligence primarily refers to the ability to: _____.
a) Understand and manage one's own emotions and the emotions of others
b) Solve mathematical problems
c) Memorize large amounts of information
d) Make logical decisions without emotions

9) Time management can help reduce stress by: _____
a) Creating unnecessary pressure
b) Organizing tasks and prioritizing effectively
c) Avoiding responsibilities altogether
d) Increasing the workload

10) The term “self-regulation” in Emotional Intelligence means: _____.
a) Hiding your emotions from others
b) Controlling impulsive behaviours and adapting to changing circumstances
c) Ignoring your emotional responses
d) Following strict rules without considering emotions

11) What is the primary purpose of a job interview?
a) To test the candidate's academic knowledge
b) To compare the candidate's qualifications with others
c) To discuss salary expectations only
d) To assess the candidate’s suitability for the job role

12) What kind of information will you collect before going to an interview?
a) About the job you are applying for
b) About the company
c) About the work culture
d) All of the above

13) Which of the following is an effective stress management technique?
a) Procrastination
b) Deep breathing and relaxation exercises
c) Avoiding physical activity
d) Excessive multitasking

14) Which of the following is an important step to prepare for an interview?
a) Memorizing answers word for word
b) Arriving late to showcase confidence
c) Avoiding practice to appear natural
d) Researching the company and role

SLR-BD-137

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Two. **12**

a) Define human communication and explain importance of communication.
b) Explain in brief:
1) Personal Barrier
2) Social Barrier
c) Enlighten in a brief strategy to improve emotional intelligence.

Q.3 Attempt any Four. **16**

a) Explain importance of emotional intelligence.
b) State advantages and disadvantages of informal communication.
c) Describe different modes of communication.
d) Highlight role of social awareness as key factor of emotional intelligence.
e) Explain relationship management as key factor of emotional intelligence.

Section – II

Q.4 Attempt any Two. **12**

a) What is interview? Explain various steps in the process of interview.
b) Explain importance of time management.
c) Explain the four P's of effective presentation.

Q.5 Attempt any Four. **16**

a) Explain importance of stress management.
b) Explain various types of interviews.
c) Describe various strategies for effective time management.
d) Explain various strategies of stress management.
e) Write short note on: Non- verbal aspects of presentation.

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Emotional Intelligence primarily refers to the ability to: _____.
a) Understand and manage one's own emotions and the emotions of others
b) Solve mathematical problems
c) Memorize large amounts of information
d) Make logical decisions without emotions

2) Time management can help reduce stress by: _____
a) Creating unnecessary pressure
b) Organizing tasks and prioritizing effectively
c) Avoiding responsibilities altogether
d) Increasing the workload

3) The term "self-regulation" in Emotional Intelligence means: _____.
a) Hiding your emotions from others
b) Controlling impulsive behaviours and adapting to changing circumstances
c) Ignoring your emotional responses
d) Following strict rules without considering emotions

4) What is the primary purpose of a job interview?
a) To test the candidate's academic knowledge
b) To compare the candidate's qualifications with others
c) To discuss salary expectations only
d) To assess the candidate's suitability for the job role

5) What kind of information will you collect before going to an interview?
a) About the job you are applying for
b) About the company
c) About the work culture
d) All of the above

6) Which of the following is an effective stress management technique?
a) Procrastination
b) Deep breathing and relaxation exercises
c) Avoiding physical activity
d) Excessive multitasking

7) Which of the following is an important step to prepare for an interview?
a) Memorizing answers word for word
b) Arriving late to showcase confidence
c) Avoiding practice to appear natural
d) Researching the company and role

8) What is feedback in communication?
a) The process of encoding a message.
b) The process of transmitting the message.
c) The response or reaction to a message.
d) The process of decoding a message.

9) In the process of communication 'Encoding' means _____.
a) Using symbol to express an idea
b) Deciphering the message
c) Creating noise in the communication
d) Interpreting the meaning of message

10) Empathy refers to: _____.
a) Capacity to understand or feel what another person feels
b) Having better understanding of partner's emotions
c) The higher the likelihood of self harm
d) Getting what one wants out of the relationship

11) Repots, suggestions, appeals grievances etc. are examples of: _____.
a) Down ward communication
b) Upward communication
c) Horizontal communication
d) Informal communication

12) Informal communication is commonly known as: _____.
a) Down ward communication b) Upward communication
c) Horizontal communication d) Grapevine

13) _____ is not a communication barrier?
a) Language b) Culture
c) Habits d) Physical

14) Which of the following is NOT a component of communication?
a) Sender b) Message
c) Receiver d) Translator

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Two. **12**

a) Define human communication and explain importance of communication.
b) Explain in brief:
1) Personal Barrier
2) Social Barrier
c) Enlighten in a brief strategy to improve emotional intelligence.

Q.3 Attempt any Four. **16**

a) Explain importance of emotional intelligence.
b) State advantages and disadvantages of informal communication.
c) Describe different modes of communication.
d) Highlight role of social awareness as key factor of emotional intelligence.
e) Explain relationship management as key factor of emotional intelligence.

Section – II

Q.4 Attempt any Two. **12**

a) What is interview? Explain various steps in the process of interview.
b) Explain importance of time management.
c) Explain the four P's of effective presentation.

Q.5 Attempt any Four. **16**

a) Explain importance of stress management.
b) Explain various types of interviews.
c) Describe various strategies for effective time management.
d) Explain various strategies of stress management.
e) Write short note on: Non- verbal aspects of presentation.

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the primary purpose of a job interview?
a) To test the candidate's academic knowledge
b) To compare the candidate's qualifications with others
c) To discuss salary expectations only
d) To assess the candidate's suitability for the job role

2) What kind of information will you collect before going to an interview?
a) About the job you are applying for
b) About the company
c) About the work culture
d) All of the above

3) Which of the following is an effective stress management technique?
a) Procrastination
b) Deep breathing and relaxation exercises
c) Avoiding physical activity
d) Excessive multitasking

4) Which of the following is an important step to prepare for an interview?
a) Memorizing answers word for word
b) Arriving late to showcase confidence
c) Avoiding practice to appear natural
d) Researching the company and role

5) What is feedback in communication?
a) The process of encoding a message.
b) The process of transmitting the message.
c) The response or reaction to a message.
d) The process of decoding a message.

6) In the process of communication 'Encoding' means _____.
a) Using symbol to express an idea
b) Deciphering the message
c) Creating noise in the communication
d) Interpreting the meaning of message

7) Empathy refers to: _____.
a) Capacity to understand or feel what another person feels
b) Having better understanding of partner's emotions
c) The higher the likelihood of self harm
d) Getting what one wants out of the relationship

8) Repots, suggestions, appeals grievances etc. are examples of: _____.
a) Down ward communication
b) Upward communication
c) Horizontal communication
d) Informal communication

9) Informal communication is commonly known as: _____.
a) Down ward communication b) Upward communication
c) Horizontal communication d) Grapevine

10) _____ is not a communication barrier?
a) Language b) Culture
c) Habits d) Physical

11) Which of the following is NOT a component of communication?
a) Sender b) Message
c) Receiver d) Translator

12) Emotional Intelligence primarily refers to the ability to: _____.
a) Understand and manage one's own emotions and the emotions of others
b) Solve mathematical problems
c) Memorize large amounts of information
d) Make logical decisions without emotions

13) Time management can help reduce stress by: _____
a) Creating unnecessary pressure
b) Organizing tasks and prioritizing effectively
c) Avoiding responsibilities altogether
d) Increasing the workload

14) The term "self-regulation" in Emotional Intelligence means: _____.
a) Hiding your emotions from others
b) Controlling impulsive behaviours and adapting to changing circumstances
c) Ignoring your emotional responses
d) Following strict rules without considering emotions

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Two. **12**

a) Define human communication and explain importance of communication.
b) Explain in brief:
1) Personal Barrier
2) Social Barrier
c) Enlighten in a brief strategy to improve emotional intelligence.

Q.3 Attempt any Four. **16**

a) Explain importance of emotional intelligence.
b) State advantages and disadvantages of informal communication.
c) Describe different modes of communication.
d) Highlight role of social awareness as key factor of emotional intelligence.
e) Explain relationship management as key factor of emotional intelligence.

Section – II

Q.4 Attempt any Two. **12**

a) What is interview? Explain various steps in the process of interview.
b) Explain importance of time management.
c) Explain the four P's of effective presentation.

Q.5 Attempt any Four. **16**

a) Explain importance of stress management.
b) Explain various types of interviews.
c) Describe various strategies for effective time management.
d) Explain various strategies of stress management.
e) Write short note on: Non- verbal aspects of presentation.

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ is not a communication barrier?
a) Language b) Culture
c) Habits d) Physical

2) Which of the following is NOT a component of communication?
a) Sender b) Message
c) Receiver d) Translator

3) Emotional Intelligence primarily refers to the ability to: _____.
a) Understand and manage one's own emotions and the emotions of others
b) Solve mathematical problems
c) Memorize large amounts of information
d) Make logical decisions without emotions

4) Time management can help reduce stress by: _____
a) Creating unnecessary pressure
b) Organizing tasks and prioritizing effectively
c) Avoiding responsibilities altogether
d) Increasing the workload

5) The term "self-regulation" in Emotional Intelligence means: _____.
a) Hiding your emotions from others
b) Controlling impulsive behaviours and adapting to changing circumstances
c) Ignoring your emotional responses
d) Following strict rules without considering emotions

6) What is the primary purpose of a job interview?
a) To test the candidate's academic knowledge
b) To compare the candidate's qualifications with others
c) To discuss salary expectations only
d) To assess the candidate's suitability for the job role

7) What kind of information will you collect before going to an interview?
a) About the job you are applying for
b) About the company
c) About the work culture
d) All of the above

8) Which of the following is an effective stress management technique?
a) Procrastination
b) Deep breathing and relaxation exercises
c) Avoiding physical activity
d) Excessive multitasking

9) Which of the following is an important step to prepare for an interview?
a) Memorizing answers word for word
b) Arriving late to showcase confidence
c) Avoiding practice to appear natural
d) Researching the company and role

10) What is feedback in communication?
a) The process of encoding a message.
b) The process of transmitting the message.
c) The response or reaction to a message.
d) The process of decoding a message.

11) In the process of communication 'Encoding' means _____.
a) Using symbol to express an idea
b) Deciphering the message
c) Creating noise in the communication
d) Interpreting the meaning of message

12) Empathy refers to: _____.
a) Capacity to understand or feel what another person feels
b) Having better understanding of partner's emotions
c) The higher the likelihood of self harm
d) Getting what one wants out of the relationship

13) Repots, suggestions, appeals grievances etc. are examples of: _____.
a) Down ward communication
b) Upward communication
c) Horizontal communication
d) Informal communication

14) Informal communication is commonly known as: _____.
a) Down ward communication b) Upward communication
c) Horizontal communication d) Grapevine

SLR-BD-137

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Two. **12**

a) Define human communication and explain importance of communication.
b) Explain in brief:
1) Personal Barrier
2) Social Barrier
c) Enlighten in a brief strategy to improve emotional intelligence.

Q.3 Attempt any Four. **16**

a) Explain importance of emotional intelligence.
b) State advantages and disadvantages of informal communication.
c) Describe different modes of communication.
d) Highlight role of social awareness as key factor of emotional intelligence.
e) Explain relationship management as key factor of emotional intelligence.

Section – II

Q.4 Attempt any Two. **12**

a) What is interview? Explain various steps in the process of interview.
b) Explain importance of time management.
c) Explain the four P's of effective presentation.

Q.5 Attempt any Four. **16**

a) Explain importance of stress management.
b) Explain various types of interviews.
c) Describe various strategies for effective time management.
d) Explain various strategies of stress management.
e) Write short note on: Non- verbal aspects of presentation.

Seat No.	

Set **P**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the primary focus of Design Thinking?
a) Maximizing shareholder
b) Developing innovative and user-centered solutions
c) Streamlining manufacturing processes
d) Enhancing employee productivity

2) Which of the following correctly lists the first three phases of the Design Thinking process?
a) Empathize, Ideate, Prototype
b) Define, Ideate, Test
c) Empathize, Define, Ideate
d) Prototype, Test, Implement

3) In the context of Design Thinking, what is "brainstorming" used for?
a) Generating a wide range of ideas
b) Testing final products
c) Developing financial models
d) Identifying user pain points

4) What does a "customer journey map" help to visualize?
a) The financial cost of product development
b) The steps a customer goes through while interacting with a product or service
c) The design specifications of a product
d) The competitive landscape of a market

5) Which tool in Design Thinking helps in understanding the target user's needs and behaviors?
a) Prototype b) Persona
c) SWOT analysis d) Business model canvas

6) What is the final phase in the Design Thinking process?
a) Test b) Implement
c) Prototype d) Ideate

7) Which of the following is NOT an objective of design thinking?
a) To create user-friendly products
b) To streamline manufacturing processes
c) To encourage iterative prototyping
d) To enhance collaboration among teams

8) Which of the following is a benefit of using design thinking?
a) Reduces product variety b) Increases customer satisfaction
c) Limits team collaboration d) Eliminates risk in decision-making

9) What role does technology play in innovation management?
a) It complicates processes
b) It is irrelevant to innovation
c) It serves as a tool for enhancing efficiency and creativity
d) It replaces human input

10) Which leadership style involves making decisions based on input from team members?
a) Autocratic b) Laissez-faire
c) Democratic d) Transactional

11) What does "Product Solution Fit" refer to?
a) The alignment of the product with customer needs and problems
b) The product's price in relation to competitors
c) The marketing strategy for the product
d) The technical specifications of the product

12) Which of the following best defines "Product Market Fit"?
a) The degree to which a product meets the demands of a specific market
b) The number of products available in the market
c) The financial performance of a product
d) The product's popularity on social media

13) What is the primary goal of service design?
a) To reduce costs
b) To enhance customer experience
c) To standardize services
d) To simplify service offerings

14) Which of the following is a key principle of service design?
a) Focus on profitability over customer satisfaction
b) User-centered design
c) Minimal feedback from users
d) Rigid service processes

Seat No.	

Set | P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Describe each phase of the Design Thinking process in detail, explaining how they contribute to the overall methodology. **06**

b) Provide a comprehensive definition of Design Thinking, including its essential characteristics and principles. **04**

Q.3 **Attempt any three.** **18**

a) Discuss the role of creativity and innovation in organizations and their impact on business performance.

b) What is the importance of empathy in Design Thinking?

c) Define leadership and explain its different types. How can effective leadership influence the success of an organization? Provide examples.

d) Explain the utilization of cognitive technology in decision-making processes.

e) Explain exemplary practices of effective leadership with relevant case studies.

Section – II

Q.4 **a)** Explain exemplary practices of effective leadership with relevant case studies. **06**

b) What is product solution fit, and how does it differ from product market fit? **04**

Q.5 **Attempt any three.** **18**

a) Define the development lifecycle and explain its significance in product development.

b) What are the benefits of implementing service design in organizations?

c) How can organizations effectively design a service to meet customer needs?

d) How does Intellectual Property (IP) play a role in product development and design thinking?

e) Explain any two successful case studies demonstrating design thinking in various engineering sectors.

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is a benefit of using design thinking?
a) Reduces product variety b) Increases customer satisfaction
c) Limits team collaboration d) Eliminates risk in decision-making

2) What role does technology play in innovation management?
a) It complicates processes
b) It is irrelevant to innovation
c) It serves as a tool for enhancing efficiency and creativity
d) It replaces human input

3) Which leadership style involves making decisions based on input from team members?
a) Autocratic b) Laissez-faire
c) Democratic d) Transactional

4) What does "Product Solution Fit" refer to?
a) The alignment of the product with customer needs and problems
b) The product's price in relation to competitors
c) The marketing strategy for the product
d) The technical specifications of the product

5) Which of the following best defines "Product Market Fit"?
a) The degree to which a product meets the demands of a specific market
b) The number of products available in the market
c) The financial performance of a product
d) The product's popularity on social media

6) What is the primary goal of service design?
a) To reduce costs
b) To enhance customer experience
c) To standardize services
d) To simplify service offerings

7) Which of the following is a key principle of service design?
a) Focus on profitability over customer satisfaction
b) User-centered design
c) Minimal feedback from users
d) Rigid service processes

8) What is the primary focus of Design Thinking?
a) Maximizing shareholder
b) Developing innovative and user-centered solutions
c) Streamlining manufacturing processes
d) Enhancing employee productivity

9) Which of the following correctly lists the first three phases of the Design Thinking process?
a) Empathize, Ideate, Prototype
b) Define, Ideate, Test
c) Empathize, Define, Ideate
d) Prototype, Test, Implement

10) In the context of Design Thinking, what is "brainstorming" used for?
a) Generating a wide range of ideas
b) Testing final products
c) Developing financial models
d) Identifying user pain points

11) What does a "customer journey map" help to visualize?
a) The financial cost of product development
b) The steps a customer goes through while interacting with a product or service
c) The design specifications of a product
d) The competitive landscape of a market

12) Which tool in Design Thinking helps in understanding the target user's needs and behaviors?
a) Prototype
b) Persona
c) SWOT analysis
d) Business model canvas

13) What is the final phase in the Design Thinking process?
a) Test
b) Implement
c) Prototype
d) Ideate

14) Which of the following is NOT an objective of design thinking?

a) To create user-friendly products
b) To streamline manufacturing processes
c) To encourage iterative prototyping
d) To enhance collaboration among teams

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Describe each phase of the Design Thinking process in detail, explaining how they contribute to the overall methodology. **06**

b) Provide a comprehensive definition of Design Thinking, including its essential characteristics and principles. **04**

Q.3 **Attempt any three.** **18**

a) Discuss the role of creativity and innovation in organizations and their impact on business performance.

b) What is the importance of empathy in Design Thinking?

c) Define leadership and explain its different types. How can effective leadership influence the success of an organization? Provide examples.

d) Explain the utilization of cognitive technology in decision-making processes.

e) Explain exemplary practices of effective leadership with relevant case studies.

Section – II

Q.4 **a)** Explain exemplary practices of effective leadership with relevant case studies. **06**

b) What is product solution fit, and how does it differ from product market fit? **04**

Q.5 **Attempt any three.** **18**

a) Define the development lifecycle and explain its significance in product development.

b) What are the benefits of implementing service design in organizations?

c) How can organizations effectively design a service to meet customer needs?

d) How does Intellectual Property (IP) play a role in product development and design thinking?

e) Explain any two successful case studies demonstrating design thinking in various engineering sectors.

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What does "Product Solution Fit" refer to?
a) The alignment of the product with customer needs and problems
b) The product's price in relation to competitors
c) The marketing strategy for the product
d) The technical specifications of the product

2) Which of the following best defines "Product Market Fit"?
a) The degree to which a product meets the demands of a specific market
b) The number of products available in the market
c) The financial performance of a product
d) The product's popularity on social media

3) What is the primary goal of service design?
a) To reduce costs
b) To enhance customer experience
c) To standardize services
d) To simplify service offerings

4) Which of the following is a key principle of service design?
a) Focus on profitability over customer satisfaction
b) User-centered design
c) Minimal feedback from users
d) Rigid service processes

5) What is the primary focus of Design Thinking?
a) Maximizing shareholder
b) Developing innovative and user-centered solutions
c) Streamlining manufacturing processes
d) Enhancing employee productivity

6) Which of the following correctly lists the first three phases of the Design Thinking process?
a) Empathize, Ideate, Prototype
b) Define, Ideate, Test
c) Empathize, Define, Ideate
d) Prototype, Test, Implement

7) In the context of Design Thinking, what is "brainstorming" used for?
a) Generating a wide range of ideas
b) Testing final products
c) Developing financial models
d) Identifying user pain points

8) What does a "customer journey map" help to visualize?
a) The financial cost of product development
b) The steps a customer goes through while interacting with a product or service
c) The design specifications of a product
d) The competitive landscape of a market

9) Which tool in Design Thinking helps in understanding the target user's needs and behaviors?
a) Prototype b) Persona
c) SWOT analysis d) Business model canvas

10) What is the final phase in the Design Thinking process?
a) Test b) Implement
c) Prototype d) Ideate

11) Which of the following is NOT an objective of design thinking?
a) To create user-friendly products
b) To streamline manufacturing processes
c) To encourage iterative prototyping
d) To enhance collaboration among teams

12) Which of the following is a benefit of using design thinking?
a) Reduces product variety b) Increases customer satisfaction
c) Limits team collaboration d) Eliminates risk in decision-making

13) What role does technology play in innovation management?
a) It complicates processes
b) It is irrelevant to innovation
c) It serves as a tool for enhancing efficiency and creativity
d) It replaces human input

14) Which leadership style involves making decisions based on input from team members?
a) Autocratic b) Laissez-faire
c) Democratic d) Transactional

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Describe each phase of the Design Thinking process in detail, explaining how they contribute to the overall methodology. **06**

b) Provide a comprehensive definition of Design Thinking, including its essential characteristics and principles. **04**

Q.3 **Attempt any three.** **18**

a) Discuss the role of creativity and innovation in organizations and their impact on business performance.

b) What is the importance of empathy in Design Thinking?

c) Define leadership and explain its different types. How can effective leadership influence the success of an organization? Provide examples.

d) Explain the utilization of cognitive technology in decision-making processes.

e) Explain exemplary practices of effective leadership with relevant case studies.

Section – II

Q.4 **a)** Explain exemplary practices of effective leadership with relevant case studies. **06**

b) What is product solution fit, and how does it differ from product market fit? **04**

Q.5 **Attempt any three.** **18**

a) Define the development lifecycle and explain its significance in product development.

b) What are the benefits of implementing service design in organizations?

c) How can organizations effectively design a service to meet customer needs?

d) How does Intellectual Property (IP) play a role in product development and design thinking?

e) Explain any two successful case studies demonstrating design thinking in various engineering sectors.

Seat No.	

Set **S**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the final phase in the Design Thinking process?
a) Test b) Implement
c) Prototype d) Ideate

2) Which of the following is NOT an objective of design thinking?
a) To create user-friendly products
b) To streamline manufacturing processes
c) To encourage iterative prototyping
d) To enhance collaboration among teams

3) Which of the following is a benefit of using design thinking?
a) Reduces product variety b) Increases customer satisfaction
c) Limits team collaboration d) Eliminates risk in decision-making

4) What role does technology play in innovation management?
a) It complicates processes
b) It is irrelevant to innovation
c) It serves as a tool for enhancing efficiency and creativity
d) It replaces human input

5) Which leadership style involves making decisions based on input from team members?
a) Autocratic b) Laissez-faire
c) Democratic d) Transactional

6) What does "Product Solution Fit" refer to?
a) The alignment of the product with customer needs and problems
b) The product's price in relation to competitors
c) The marketing strategy for the product
d) The technical specifications of the product

7) Which of the following best defines "Product Market Fit"?
- a) The degree to which a product meets the demands of a specific market
- b) The number of products available in the market
- c) The financial performance of a product
- d) The product's popularity on social media

8) What is the primary goal of service design?
- a) To reduce costs
- b) To enhance customer experience
- c) To standardize services
- d) To simplify service offerings

9) Which of the following is a key principle of service design?
- a) Focus on profitability over customer satisfaction
- b) User-centered design
- c) Minimal feedback from users
- d) Rigid service processes

10) What is the primary focus of Design Thinking?
- a) Maximizing shareholder
- b) Developing innovative and user-centered solutions
- c) Streamlining manufacturing processes
- d) Enhancing employee productivity

11) Which of the following correctly lists the first three phases of the Design Thinking process?
- a) Empathize, Ideate, Prototype
- b) Define, Ideate, Test
- c) Empathize, Define, Ideate
- d) Prototype, Test, Implement

12) In the context of Design Thinking, what is "brainstorming" used for?
- a) Generating a wide range of ideas
- b) Testing final products
- c) Developing financial models
- d) Identifying user pain points

13) What does a "customer journey map" help to visualize?
- a) The financial cost of product development
- b) The steps a customer goes through while interacting with a product or service
- c) The design specifications of a product
- d) The competitive landscape of a market

14) Which tool in Design Thinking helps in understanding the target user's needs and behaviors?
- a) Prototype
- b) Persona
- c) SWOT analysis
- d) Business model canvas

SLR-BD-138

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Describe each phase of the Design Thinking process in detail, explaining how they contribute to the overall methodology. **06**

b) Provide a comprehensive definition of Design Thinking, including its essential characteristics and principles. **04**

Q.3 **Attempt any three.** **18**

a) Discuss the role of creativity and innovation in organizations and their impact on business performance.

b) What is the importance of empathy in Design Thinking?

c) Define leadership and explain its different types. How can effective leadership influence the success of an organization? Provide examples.

d) Explain the utilization of cognitive technology in decision-making processes.

e) Explain exemplary practices of effective leadership with relevant case studies.

Section – II

Q.4 **a)** Explain exemplary practices of effective leadership with relevant case studies. **06**

b) What is product solution fit, and how does it differ from product market fit? **04**

Q.5 **Attempt any three.** **18**

a) Define the development lifecycle and explain its significance in product development.

b) What are the benefits of implementing service design in organizations?

c) How can organizations effectively design a service to meet customer needs?

d) How does Intellectual Property (IP) play a role in product development and design thinking?

e) Explain any two successful case studies demonstrating design thinking in various engineering sectors.

SLR-BD-139

Seat No.	

Set P

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options. 14

1) What does GIS integrate spatial data with?
a) Other data resources b) Only tabular data
c) Only hard copy maps d) Only digital maps

2) What is the purpose of GIS software?
a) Data management and analysis
b) Creating physical maps
c) Collecting data only
d) Storing non-spatial data

3) Which of the following is a key function of an information system?
a) Data storage only
b) Data collection and processing
c) Document shredding
d) Manual calculations

4) Statistical data in GIS is primarily used for _____.
a) Data visualization b) Data analysis and interpretation
c) Data storage d) Data collection

5) Satellite data is most commonly used in GIS for _____.
a) Remote sensing b) Data entry
c) Statistical analysis d) Map digitization

6) A zone with a width created around a spatial feature is called as ____.
a) dissolve b) buffer
c) relation d) overlay

7) Network databases is to support relationships of _____.
a) many to many b) one to many
c) none of above d) all of above

8) The sensitivity of a sensor to detect slight differences in energy (brightness) is _____.
a) Spectral resolution b) Spatial resolution
c) Temporal resolution d) Radiometric resolution

9) Descriptive information provides qualitative data about the characteristics and conditions of Earth's surface features _____.
a) qualitative b) quantitative
c) both d) none

10) The instruments which provide electromagnetic radiation of specified wave length or a band of wave lengths to illuminate the earth surface, are called _____.
a) scanner b) passive sensors
c) active sensors d) none of these

11) Canal site selection using GIS is primarily concerned with _____.
a) Mapping the soil composition along the canal route
b) Studying land use in the surrounding areas
c) Identifying areas with the most water flow potential
d) Both a and c

12) What is the primary application of GIS in map revision?
a) To create new maps from scratch
b) To update and modify existing maps with current data
c) To design and print physical maps
d) To analyze spatial data for new projects

13) Which phase of GIS project planning involves the most detailed work on defining technical requirements and hardware/software needs?
a) feasibility study
b) planning and requirements analysis
c) design phase
d) testing phase

14) Which of the following is an example of a GIS design project task?
a) data model development
b) stakeholder consultation
c) site analysis and requirement definition
d) all of these

Seat No.	

Set | P

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch whenever necessary.

Section - I

Q.2 Attempt any four from the following. **16**
a) Describe commercial & open source GIS softwares.
b) Describe in detail data organisation method-layered based approach.
c) Describe field data & its collection methods.
d) Discuss advantages & disadvantages of aerial photographs.
e) Describe in detail run-length encoding.
f) Describe in detail about data analysis.

Q.3 Attempt any two from the following. **12**
a) Describe in detail digitizers, its process, advantages & disadvantages.
b) Describe the organisation of data in GIS.
c) Explain various data models used in DBMS in detail.

Section - II

Q.4 Attempt any four from the following. **16**
a) Explain in detail passive & active remote sensing with sketch.
b) Describe in detail metric information.
c) Describe application of GIS in dam site selection.
d) Describe application of GIS in soil erosion.
e) Explain in detail phases of planning & implementation.
f) Describe characteristics of advanced GIS projects.

Q.5 Attempt any two from the following. **12**
a) Describe need of integration of remote sensing & GIS in detail.
b) Describe key application of GIS in map revision.
c) Describe benefits of GIS implementation plan.

Seat No.	

Set **Q**

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options. **14**

1) The sensitivity of a sensor to detect slight differences in energy (brightness) is _____.
a) Spectral resolution b) Spatial resolution
c) Temporal resolution d) Radiometric resolution

2) Descriptive information provides qualitative data about the characteristics and conditions of Earth's surface features _____.
a) qualitative b) quantitative
c) both d) none

3) The instruments which provide electromagnetic radiation of specified wave length or a band of wave lengths to illuminate the earth surface, are called _____.
a) scanner b) passive sensors
c) active sensors d) none of these

4) Canal site selection using GIS is primarily concerned with _____.
a) Mapping the soil composition along the canal route
b) Studying land use in the surrounding areas
c) Identifying areas with the most water flow potential
d) Both a and c

5) What is the primary application of GIS in map revision?
a) To create new maps from scratch
b) To update and modify existing maps with current data
c) To design and print physical maps
d) To analyze spatial data for new projects

6) Which phase of GIS project planning involves the most detailed work on defining technical requirements and hardware/software needs?
a) feasibility study
b) planning and requirements analysis
c) design phase
d) testing phase

7) Which of the following is an example of a GIS design project task?
a) data model development
b) stakeholder consultation
c) site analysis and requirement definition
d) all of these

8) What does GIS integrate spatial data with?
a) Other data resources
b) Only tabular data
c) Only hard copy maps
d) Only digital maps

9) What is the purpose of GIS software?
a) Data management and analysis
b) Creating physical maps
c) Collecting data only
d) Storing non-spatial data

10) Which of the following is a key function of an information system?
a) Data storage only
b) Data collection and processing
c) Document shredding
d) Manual calculations

11) Statistical data in GIS is primarily used for _____.
a) Data visualization
b) Data analysis and interpretation
c) Data storage
d) Data collection

12) Satellite data is most commonly used in GIS for _____.
a) Remote sensing
b) Data entry
c) Statistical analysis
d) Map digitization

13) A zone with a width created around a spatial feature is called as ____.
a) dissolve
b) buffer
c) relation
d) overlay

14) Network databases is to support relationships of _____.
a) many to many
b) one to many
c) none of above
d) all of above

Seat No.	

Set **Q**

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch whenever necessary.

Section - I

Q.2 Attempt any four from the following. **16**
a) Describe commercial & open source GIS softwares.
b) Describe in detail data organisation method-layered based approach.
c) Describe field data & its collection methods.
d) Discuss advantages & disadvantages of aerial photographs.
e) Describe in detail run-length encoding.
f) Describe in detail about data analysis.

Q.3 Attempt any two from the following. **12**
a) Describe in detail digitizers, its process, advantages & disadvantages.
b) Describe the organisation of data in GIS.
c) Explain various data models used in DBMS in detail.

Section - II

Q.4 Attempt any four from the following. **16**
a) Explain in detail passive & active remote sensing with sketch.
b) Describe in detail metric information.
c) Describe application of GIS in dam site selection.
d) Describe application of GIS in soil erosion.
e) Explain in detail phases of planning & implementation.
f) Describe characteristics of advanced GIS projects.

Q.5 Attempt any two from the following. **12**
a) Describe need of integration of remote sensing & GIS in detail.
b) Describe key application of GIS in map revision.
c) Describe benefits of GIS implementation plan.

Seat No.	

Set **R**

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options. 14

1) Canal site selection using GIS is primarily concerned with _____.
a) Mapping the soil composition along the canal route
b) Studying land use in the surrounding areas
c) Identifying areas with the most water flow potential
d) Both a and c

2) What is the primary application of GIS in map revision?
a) To create new maps from scratch
b) To update and modify existing maps with current data
c) To design and print physical maps
d) To analyze spatial data for new projects

3) Which phase of GIS project planning involves the most detailed work on defining technical requirements and hardware/software needs?
a) feasibility study
b) planning and requirements analysis
c) design phase
d) testing phase

4) Which of the following is an example of a GIS design project task?
a) data model development
b) stakeholder consultation
c) site analysis and requirement definition
d) all of these

5) What does GIS integrate spatial data with?
a) Other data resources b) Only tabular data
c) Only hard copy maps d) Only digital maps

6) What is the purpose of GIS software?
a) Data management and analysis
b) Creating physical maps
c) Collecting data only
d) Storing non-spatial data

7) Which of the following is a key function of an information system?
a) Data storage only
b) Data collection and processing
c) Document shredding
d) Manual calculations

8) Statistical data in GIS is primarily used for _____.
a) Data visualization b) Data analysis and interpretation
c) Data storage d) Data collection

9) Satellite data is most commonly used in GIS for _____.
a) Remote sensing b) Data entry
c) Statistical analysis d) Map digitization

10) A zone with a width created around a spatial feature is called as ____.
a) dissolve b) buffer
c) relation d) overlay ___

11) Network databases is to support relationships of _____.
a) many to many b) one to many
c) none of above d) all of above

12) The sensitivity of a sensor to detect slight differences in energy (brightness) is _____.
a) Spectral resolution b) Spatial resolution
c) Temporal resolution d) Radiometric resolution

13) Descriptive information provides qualitative data about the characteristics and conditions of Earth's surface features _____.
a) qualitative b) quantitative
c) both d) none

14) The instruments which provide electromagnetic radiation of specified wave length or a band of wave lengths to illuminate the earth surface, are called _____.
a) scanner b) passive sensors
c) active sensors d) none of these

Seat No.	

Set **R**

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch whenever necessary.

Section - I

Q.2 Attempt any four from the following. **16**

a) Describe commercial & open source GIS softwares.
b) Describe in detail data organisation method-layered based approach.
c) Describe field data & its collection methods.
d) Discuss advantages & disadvantages of aerial photographs.
e) Describe in detail run-length encoding.
f) Describe in detail about data analysis.

Q.3 Attempt any two from the following. **12**

a) Describe in detail digitizers, its process, advantages & disadvantages.
b) Describe the organisation of data in GIS.
c) Explain various data models used in DBMS in detail.

Section - II

Q.4 Attempt any four from the following. **16**

a) Explain in detail passive & active remote sensing with sketch.
b) Describe in detail metric information.
c) Describe application of GIS in dam site selection.
d) Describe application of GIS in soil erosion.
e) Explain in detail phases of planning & implementation.
f) Describe characteristics of advanced GIS projects.

Q.5 Attempt any two from the following. **12**

a) Describe need of integration of remote sensing & GIS in detail.
b) Describe key application of GIS in map revision.
c) Describe benefits of GIS implementation plan.

Seat No.		Set	S

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options. 14

1) A zone with a width created around a spatial feature is called as ____.
a) dissolve b) buffer
c) relation d) overlay

2) Network databases is to support relationships of _____.
a) many to many b) one to many
c) none of above d) all of above

3) The sensitivity of a sensor to detect slight differences in energy (brightness) is _____.
a) Spectral resolution b) Spatial resolution
c) Temporal resolution d) Radiometric resolution

4) Descriptive information provides qualitative data about the characteristics and conditions of Earth's surface features _____.
a) qualitative b) quantitative
c) both d) none

5) The instruments which provide electromagnetic radiation of specified wave length or a band of wave lengths to illuminate the earth surface, are called _____.
a) scanner b) passive sensors
c) active sensors d) none of these

6) Canal site selection using GIS is primarily concerned with _____.
a) Mapping the soil composition along the canal route
b) Studying land use in the surrounding areas
c) Identifying areas with the most water flow potential
d) Both a and c

7) What is the primary application of GIS in map revision?
a) To create new maps from scratch
b) To update and modify existing maps with current data
c) To design and print physical maps
d) To analyze spatial data for new projects

8) Which phase of GIS project planning involves the most detailed work on defining technical requirements and hardware/software needs?
a) feasibility study
b) planning and requirements analysis
c) design phase
d) testing phase

9) Which of the following is an example of a GIS design project task?
a) data model development
b) stakeholder consultation
c) site analysis and requirement definition
d) all of these

10) What does GIS integrate spatial data with?
a) Other data resources
b) Only tabular data
c) Only hard copy maps
d) Only digital maps

11) What is the purpose of GIS software?
a) Data management and analysis
b) Creating physical maps
c) Collecting data only
d) Storing non-spatial data

12) Which of the following is a key function of an information system?
a) Data storage only
b) Data collection and processing
c) Document shredding
d) Manual calculations

13) Statistical data in GIS is primarily used for _____.
a) Data visualization
b) Data analysis and interpretation
c) Data storage
d) Data collection

14) Satellite data is most commonly used in GIS for _____.
a) Remote sensing
b) Data entry
c) Statistical analysis
d) Map digitization

SLR-BD-139

Seat No.	

Set S

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch whenever necessary.

Section - I

Q.2 Attempt any four from the following. **16**
a) Describe commercial & open source GIS softwares.
b) Describe in detail data organisation method-layered based approach.
c) Describe field data & its collection methods.
d) Discuss advantages & disadvantages of aerial photographs.
e) Describe in detail run-length encoding.
f) Describe in detail about data analysis.

Q.3 Attempt any two from the following. **12**
a) Describe in detail digitizers, its process, advantages & disadvantages.
b) Describe the organisation of data in GIS.
c) Explain various data models used in DBMS in detail.

Section - II

Q.4 Attempt any four from the following. **16**
a) Explain in detail passive & active remote sensing with sketch.
b) Describe in detail metric information.
c) Describe application of GIS in dam site selection.
d) Describe application of GIS in soil erosion.
e) Explain in detail phases of planning & implementation.
f) Describe characteristics of advanced GIS projects.

Q.5 Attempt any two from the following. **12**
a) Describe need of integration of remote sensing & GIS in detail.
b) Describe key application of GIS in map revision.
c) Describe benefits of GIS implementation plan.

SLR-BD-140

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is not a primary classification of engineering materials?
a) Metals b) Ceramics
c) Gases d) Polymers

2) Which property is most associated with metals?
a) High electrical conductivity b) High brittleness
c) Low melting point d) Low density

3) The Gibbs phase rule is given by:
a) $P + F = C - 1$ b) $P + F = C + 1$
c) $F = C - P + 2$ d) $F = C + P - 2$

4) Non-ferrous metals are primarily used for their:
a) High strength
b) High corrosion resistance and low density
c) Magnetic properties
d) Low melting point

5) In the eutectic transformation, liquid transforms into:
a) One solid phase b) Two solid phases
c) One liquid and one solid phase d) Three solid phases

6) Which of the following is a characteristic of brass alloy?
a) Primarily composed of copper and tin
b) Primarily composed of copper and zinc
c) Primarily composed, of copper and aluminum
d) Primarily composed of copper ana nickel

7) Bronze alloys are primarily composed of copper and:
a) Zinc b) Aluminum
c) Nickel d) Tin

8) Which of the following is an example of a thermoplastic polymer?
a) Bakelite b) Epoxy resin
c) Polystyrene d) Rubber

9) The ability of a polymer to return to its original shape after deformation is known as:
a) Ductility b) Elasticity
c) Malleability d) Toughness

10) Which of the following properties is enhanced by vulcanization of rubber?
a) High flexibility
b) Increased strength and resistance to wear
c) Decreased thermal stability
d) Decreased electrical resistance

11) Which of the following is NOT a characteristic of ceramic materials?
a) High melting points b) High electrical conductivity
c) Brittle nature d) Good wear resistance

12) Advanced ceramics are typically characterized by:
a) High ductility
b) Low strength
c) High thermal and electrical conductivity
d) High performance at high temperatures

13) Composite materials are widely used in the aerospace industry because they:
a) Are cost-effective and easily available
b) Provide high strength-to-weight ratio
c) Have low thermal resistance
d) Are magnetic in nature

14) Nanomaterials are commonly used in which of the following fields?
a) Drug delivery systems
b) Large-scale structural applications
c) Agricultural machinery
d) Waste disposal

Seat No.	

Set **P**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two full questions from each section.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

SECTION – I

Q.2	**a)**	What are engineering materials, and how are they classified?	**07**
	b)	What is a phase diagram? Explain the different types of phase diagrams.	**07**
Q.3	**a)**	Discuss the phases present in the Fe-Fe_3C diagram at different compositions of carbon.	**07**
	b)	Discuss the composition and properties of plain carbon steels.	**07**
Q.4	**a)**	Discuss the composition and properties of brass and bronze.	**07**
	b)	Explain the properties and applications of Al-Cu alloys.	**07**

SECTION – II

Q.5	**a)**	Discuss the differences between thermoplastic and thermosetting polymers.	**07**
	b)	Explain how vulcanization is used to modify the physical properties of natural rubber.	**07**
Q.6	**a)**	What are ceramics, and what makes them different from metals and polymers?	**07**
	b)	Discuss the role of ceramics in the aerospace industry.	**07**
Q.7	**a)**	Explain the classification of composite materials.	**07**
	b)	Explain the role of nanomaterials in electronics and semiconductors.	**07**

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is an example of a thermoplastic polymer?
a) Bakelite b) Epoxy resin
c) Polystyrene d) Rubber

2) The ability of a polymer to return to its original shape after deformation is known as:
a) Ductility b) Elasticity
c) Malleability d) Toughness

3) Which of the following properties is enhanced by vulcanization of rubber?
a) High flexibility
b) Increased strength and resistance to wear
c) Decreased thermal stability
d) Decreased electrical resistance

4) Which of the following is NOT a characteristic of ceramic materials?
a) High melting points b) High electrical conductivity
c) Brittle nature d) Good wear resistance

5) Advanced ceramics are typically characterized by:
a) High ductility
b) Low strength
c) High thermal and electrical conductivity
d) High performance at high temperatures

6) Composite materials are widely used in the aerospace industry because they:
a) Are cost-effective and easily available
b) Provide high strength-to-weight ratio
c) Have low thermal resistance
d) Are magnetic in nature

7) Nanomaterials are commonly used in which of the following fields?
a) Drug delivery systems
b) Large-scale structural applications
c) Agricultural machinery
d) Waste disposal

8) Which of the following is not a primary classification of engineering materials?
a) Metals
b) Ceramics
c) Gases
d) Polymers

9) Which property is most associated with metals?
a) High electrical conductivity
b) High brittleness
c) Low melting point
d) Low density

10) The Gibbs phase rule is given by:
a) $\mathrm{P} + \mathrm{F} = \mathrm{C} - 1$
b) $\mathrm{P} + \mathrm{F} = \mathrm{C} + 1$
c) $\mathrm{F} = \mathrm{C} - \mathrm{P} + 2$
d) $\mathrm{F} = \mathrm{C} + \mathrm{P} - 2$

11) Non-ferrous metals are primarily used for their:
a) High strength
b) High corrosion resistance and low density
c) Magnetic properties
d) Low melting point

12) In the eutectic transformation, liquid transforms into:
a) One solid phase
b) Two solid phases
c) One liquid and one solid phase
d) Three solid phases

13) Which of the following is a characteristic of brass alloy?
a) Primarily composed of copper and tin
b) Primarily composed of copper and zinc
c) Primarily composed, of copper and aluminum
d) Primarily composed of copper ana nickel

14) Bronze alloys are primarily composed of copper and:
a) Zinc
b) Aluminum
c) Nickel
d) Tin

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two full questions from each section.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

SECTION – I

Q.2	**a)**	What are engineering materials, and how are they classified?	**07**
	b)	What is a phase diagram? Explain the different types of phase diagrams.	**07**
Q.3	**a)**	Discuss the phases present in the Fe-Fe_3C diagram at different compositions of carbon.	**07**
	b)	Discuss the composition and properties of plain carbon steels.	**07**
Q.4	**a)**	Discuss the composition and properties of brass and bronze.	**07**
	b)	Explain the properties and applications of Al-Cu alloys.	**07**

SECTION – II

Q.5	**a)**	Discuss the differences between thermoplastic and thermosetting polymers.	**07**
	b)	Explain how vulcanization is used to modify the physical properties of natural rubber.	**07**
Q.6	**a)**	What are ceramics, and what makes them different from metals and polymers?	**07**
	b)	Discuss the role of ceramics in the aerospace industry.	**07**
Q.7	**a)**	Explain the classification of composite materials.	**07**
	b)	Explain the role of nanomaterials in electronics and semiconductors.	**07**

Seat No.		Set	R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is NOT a characteristic of ceramic materials?
a) High melting points b) High electrical conductivity
c) Brittle nature d) Good wear resistance

2) Advanced ceramics are typically characterized by:
a) High ductility
b) Low strength
c) High thermal and electrical conductivity
d) High performance at high temperatures

3) Composite materials are widely used in the aerospace industry because they:
a) Are cost-effective and easily available
b) Provide high strength-to-weight ratio
c) Have low thermal resistance
d) Are magnetic in nature

4) Nanomaterials are commonly used in which of the following fields?
a) Drug delivery systems
b) Large-scale structural applications
c) Agricultural machinery
d) Waste disposal

5) Which of the following is not a primary classification of engineering materials?
a) Metals b) Ceramics
c) Gases d) Polymers

6) Which property is most associated with metals?
a) High electrical conductivity b) High brittleness
c) Low melting point d) Low density

7) The Gibbs phase rule is given by:
a) $P + F = C - 1$ b) $P + F = C + 1$
c) $F = C - P + 2$ d) $F = C + P - 2$

8) Non-ferrous metals are primarily used for their:
a) High strength
b) High corrosion resistance and low density
c) Magnetic properties
d) Low melting point

9) In the eutectic transformation, liquid transforms into:
a) One solid phase b) Two solid phases
c) One liquid and one solid phase d) Three solid phases

10) Which of the following is a characteristic of brass alloy?
a) Primarily composed of copper and tin
b) Primarily composed of copper and zinc
c) Primarily composed, of copper and aluminum
d) Primarily composed of copper ana nickel

11) Bronze alloys are primarily composed of copper and:
a) Zinc b) Aluminum
c) Nickel d) Tin

12) Which of the following is an example of a thermoplastic polymer?
a) Bakelite b) Epoxy resin
c) Polystyrene d) Rubber

13) The ability of a polymer to return to its original shape after deformation is known as:
a) Ductility b) Elasticity
c) Malleability d) Toughness

14) Which of the following properties is enhanced by vulcanization of rubber?
a) High flexibility
b) Increased strength and resistance to wear
c) Decreased thermal stability
d) Decreased electrical resistance

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two full questions from each section.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

SECTION – I

Q.2	**a)**	What are engineering materials, and how are they classified?	**07**
	b)	What is a phase diagram? Explain the different types of phase diagrams.	**07**
Q.3	**a)**	Discuss the phases present in the Fe-Fe_3C diagram at different compositions of carbon.	**07**
	b)	Discuss the composition and properties of plain carbon steels.	**07**
Q.4	**a)**	Discuss the composition and properties of brass and bronze.	**07**
	b)	Explain the properties and applications of Al-Cu alloys.	**07**

SECTION – II

Q.5	**a)**	Discuss the differences between thermoplastic and thermosetting polymers.	**07**
	b)	Explain how vulcanization is used to modify the physical properties of natural rubber.	**07**
Q.6	**a)**	What are ceramics, and what makes them different from metals and polymers?	**07**
	b)	Discuss the role of ceramics in the aerospace industry.	**07**
Q.7	**a)**	Explain the classification of composite materials.	**07**
	b)	Explain the role of nanomaterials in electronics and semiconductors.	**07**

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is a characteristic of brass alloy?
a) Primarily composed of copper and tin
b) Primarily composed of copper and zinc
c) Primarily composed, of copper and aluminum
d) Primarily composed of copper ana nickel

2) Bronze alloys are primarily composed of copper and:
a) Zinc b) Aluminum
c) Nickel d) Tin

3) Which of the following is an example of a thermoplastic polymer?
a) Bakelite b) Epoxy resin
c) Polystyrene d) Rubber

4) The ability of a polymer to return to its original shape after deformation is known as:
a) Ductility b) Elasticity
c) Malleability d) Toughness

5) Which of the following properties is enhanced by vulcanization of rubber?
a) High flexibility
b) Increased strength and resistance to wear
c) Decreased thermal stability
d) Decreased electrical resistance

6) Which of the following is NOT a characteristic of ceramic materials?
a) High melting points b) High electrical conductivity
c) Brittle nature d) Good wear resistance

7) Advanced ceramics are typically characterized by:
a) High ductility
b) Low strength
c) High thermal and electrical conductivity
d) High performance at high temperatures

8) Composite materials are widely used in the aerospace industry because they:
a) Are cost-effective and easily available
b) Provide high strength-to-weight ratio
c) Have low thermal resistance
d) Are magnetic in nature

9) Nanomaterials are commonly used in which of the following fields?
a) Drug delivery systems
b) Large-scale structural applications
c) Agricultural machinery
d) Waste disposal

10) Which of the following is not a primary classification of engineering materials?
a) Metals
b) Ceramics
c) Gases
d) Polymers

11) Which property is most associated with metals?
a) High electrical conductivity
b) High brittleness
c) Low melting point
d) Low density

12) The Gibbs phase rule is given by:
a) $\mathrm{P} + \mathrm{F} = \mathrm{C} - 1$
b) $\mathrm{P} + \mathrm{F} = \mathrm{C} + 1$
c) $\mathrm{F} = \mathrm{C} - \mathrm{P} + 2$
d) $\mathrm{F} = \mathrm{C} + \mathrm{P} - 2$

13) Non-ferrous metals are primarily used for their:
a) High strength
b) High corrosion resistance and low density
c) Magnetic properties
d) Low melting point

14) In the eutectic transformation, liquid transforms into:
a) One solid phase
b) Two solid phases
c) One liquid and one solid phase
d) Three solid phases

SLR-BD-140

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two full questions from each section.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

SECTION – I

Q.2	**a)**	What are engineering materials, and how are they classified?	**07**
	b)	What is a phase diagram? Explain the different types of phase diagrams.	**07**
Q.3	**a)**	Discuss the phases present in the Fe-Fe_3C diagram at different compositions of carbon.	**07**
	b)	Discuss the composition and properties of plain carbon steels.	**07**
Q.4	**a)**	Discuss the composition and properties of brass and bronze.	**07**
	b)	Explain the properties and applications of Al-Cu alloys.	**07**

SECTION – II

Q.5	**a)**	Discuss the differences between thermoplastic and thermosetting polymers.	**07**
	b)	Explain how vulcanization is used to modify the physical properties of natural rubber.	**07**
Q.6	**a)**	What are ceramics, and what makes them different from metals and polymers?	**07**
	b)	Discuss the role of ceramics in the aerospace industry.	**07**
Q.7	**a)**	Explain the classification of composite materials.	**07**
	b)	Explain the role of nanomaterials in electronics and semiconductors.	**07**

SLR-BD-141

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the primary purpose of management?
a) To maximize profits
b) To achieve organizational goals efficiently
c) To manage resources effectively
d) To implement policies

2) Which approach emphasizes the interdependence of various organizational functions?
a) Classical Approach b) Systems Approach
c) Behavioral Approach d) Contingency Approach

3) What is NOT a function of managers?
a) Planning b) Organizing
c) Playing d) Controlling

4) Which of the following is a responsibility of managers regarding social responsibility?
a) Maximizing shareholder wealth
b) Ensuring employee satisfaction
c) Contributing to community welfare
d) Minimizing costs

5) What is the first step in the planning process?
a) Developing alternatives b) Setting objectives
c) Implementing plans d) Evaluating results

6) Which type of plan is designed to cover a short period?
a) Strategic Plan b) Tactical Plan
c) Operational Plan d) Contingency Plan

7) Which of the following is a part of the staffing function?
a) Budgeting b) Training
c) Planning d) Controlling

8) Which theory focuses on the hierarchy of needs to motivate employees?
a) Herzberg's Two-Factor Theory
b) McGregor's Theory X and Y
c) Maslow's Hierarchy of Needs
d) Adams' Equity Theory

9) What is the main purpose of controlling in management?
a) To set goals
b) To ensure that organizational activities are aligned with plans
c) To improve employee morale
d) To increase production

10) What type of costs includes costs associated with preventing defects?
a) Internal failure costs b) External failure costs
c) Appraisal costs d) Prevention costs

11) Which quality guru is known for his work in the field of quality improvement through statistical methods?
a) Philip Crosby b) W. Edwards Deming
c) Joseph Juran d) Kaoru Ishikawa

12) Which chart is used to monitor the mean of a process over time?
a) R-chart b) P-chart
c) C-chart d) X-bar chart

13) Acceptance sampling is primarily concerned with:
a) Evaluating the entire production process
b) Inspecting all items produced
c) Testing a sample to infer about the quality of the entire lot
d) Conducting customer satisfaction surveys

14) What is the primary goal of employee involvement in TQM?
a) To increase profits
b) To enhance product quality through teamwork and engagement
c) To reduce the number of employees
d) To focus solely on production output

SLR-BD-141

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section – I, Q. No. 3 is compulsory and attempt any two questions from the remaining questions.
1) In Section – II, Q. No. 6 is compulsory and attempt any two questions from the remaining questions.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.
4) Draw neat-labelled diagrams wherever necessary.
5) Use of log table and calculators is allowed.

Section – I

Q.2	**a)**	What are managerial skills and managerial roles?	**05**
	b)	Explain the Social responsibilities and ethics in management.	**04**
Q.3	**a)**	What is planning? Explain advantages and disadvantages of planning?	**05**
	b)	What are the types of organizations? Explain Problems with organizational level.	**05**
Q.4	**a)**	Define Leadership. Explain four extreme styles.	**05**
	b)	Discuss types of communication by taking suitable example.	**04**
Q.5	**Write short note on any three.**		**09**
	a)	Channel of distribution	
	b)	Functions of Managers	
	c)	Methods of Departmentation	
	d)	Explain Maslow's theory	
	e)	Decision making	

Section – II

Q.6	**a)**	Define productivity. How does material management impact the productivity of a manufacturing unit?	**05**
	b)	Explain how the production process is planned and controlled in batch production systems.	**05**

Q.7	**a)**	Describe the importance of supplier partnerships in Total Quality Management. What are the key aspects that define a successful supplier partnership?	**05**
	b)	Explain the concept of employee involvement in TQM. How does fostering employee participation contribute to improved quality and productivity?	**04**
Q.8	**a)**	Explain the importance of Training and Development in enhancing employee performance. How can training programs be aligned with organizational goals?	**05**
	b)	What are the objectives of Human Resource Management (HRM)? Discuss how HRM helps in managing employee relations and improving organizational efficiency.	**04**

Q.9 Write short note on any three. **09**

- **a)** Material Requirement Planning (MRP)
- **b)** Batch Production
- **c)** Factors to improve productivity
- **d)** Functions of Production Planning and Control (PPC)
- **e)** Mass Production - Advantages and Disadvantages

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Which theory focuses on the hierarchy of needs to motivate employees?
a) Herzberg's Two-Factor Theory
b) McGregor's Theory X and Y
c) Maslow's Hierarchy of Needs
d) Adams' Equity Theory

2) What is the main purpose of controlling in management?
a) To set goals
b) To ensure that organizational activities are aligned with plans
c) To improve employee morale
d) To increase production

3) What type of costs includes costs associated with preventing defects?
a) Internal failure costs b) External failure costs
c) Appraisal costs d) Prevention costs

4) Which quality guru is known for his work in the field of quality improvement through statistical methods?
a) Philip Crosby b) W. Edwards Deming
c) Joseph Juran d) Kaoru Ishikawa

5) Which chart is used to monitor the mean of a process over time?
a) R-chart b) P-chart
c) C-chart d) X-bar chart

6) Acceptance sampling is primarily concerned with:
a) Evaluating the entire production process
b) Inspecting all items produced
c) Testing a sample to infer about the quality of the entire lot
d) Conducting customer satisfaction surveys

7) What is the primary goal of employee involvement in TQM?
a) To increase profits
b) To enhance product quality through teamwork and engagement
c) To reduce the number of employees
d) To focus solely on production output

8) What is the primary purpose of management?
a) To maximize profits
b) To achieve organizational goals efficiently
c) To manage resources effectively
d) To implement policies

9) Which approach emphasizes the interdependence of various organizational functions?
a) Classical Approach b) Systems Approach
c) Behavioral Approach d) Contingency Approach

10) What is NOT a function of managers?
a) Planning b) Organizing
c) Playing d) Controlling

11) Which of the following is a responsibility of managers regarding social responsibility?
a) Maximizing shareholder wealth
b) Ensuring employee satisfaction
c) Contributing to community welfare
d) Minimizing costs

12) What is the first step in the planning process?
a) Developing alternatives b) Setting objectives
c) Implementing plans d) Evaluating results

13) Which type of plan is designed to cover a short period?
a) Strategic Plan b) Tactical Plan
c) Operational Plan d) Contingency Plan

14) Which of the following is a part of the staffing function?
a) Budgeting b) Training
c) Planning d) Controlling

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section – I, Q. No. 3 is compulsory and attempt any two questions from the remaining questions.
1) In Section – II, Q. No. 6 is compulsory and attempt any two questions from the remaining questions.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.
4) Draw neat-labelled diagrams wherever necessary.
5) Use of log table and calculators is allowed.

Section – I

Q.2 **a)** What are managerial skills and managerial roles? **05**
b) Explain the Social responsibilities and ethics in management. **04**

Q.3 **a)** What is planning? Explain advantages and disadvantages of planning? **05**
b) What are the types of organizations? Explain Problems with organizational level. **05**

Q.4 **a)** Define Leadership. Explain four extreme styles. **05**
b) Discuss types of communication by taking suitable example. **04**

Q.5 **Write short note on any three.** **09**
a) Channel of distribution
b) Functions of Managers
c) Methods of Departmentation
d) Explain Maslow's theory
e) Decision making

Section – II

Q.6 **a)** Define productivity. How does material management impact the productivity of a manufacturing unit? **05**
b) Explain how the production process is planned and controlled in batch production systems. **05**

Q.7	**a)**	Describe the importance of supplier partnerships in Total Quality Management. What are the key aspects that define a successful supplier partnership?	**05**
	b)	Explain the concept of employee involvement in TQM. How does fostering employee participation contribute to improved quality and productivity?	**04**
Q.8	**a)**	Explain the importance of Training and Development in enhancing employee performance. How can training programs be aligned with organizational goals?	**05**
	b)	What are the objectives of Human Resource Management (HRM)? Discuss how HRM helps in managing employee relations and improving organizational efficiency.	**04**

Q.9 Write short note on any three. **09**

- **a)** Material Requirement Planning (MRP)
- **b)** Batch Production
- **c)** Factors to improve productivity
- **d)** Functions of Production Planning and Control (PPC)
- **e)** Mass Production - Advantages and Disadvantages

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which quality guru is known for his work in the field of quality improvement through statistical methods?
a) Philip Crosby b) W. Edwards Deming
c) Joseph Juran d) Kaoru Ishikawa

2) Which chart is used to monitor the mean of a process over time?
a) R-chart b) P-chart
c) C-chart d) X-bar chart

3) Acceptance sampling is primarily concerned with:
a) Evaluating the entire production process
b) Inspecting all items produced
c) Testing a sample to infer about the quality of the entire lot
d) Conducting customer satisfaction surveys

4) What is the primary goal of employee involvement in TQM?
a) To increase profits
b) To enhance product quality through teamwork and engagement
c) To reduce the number of employees
d) To focus solely on production output

5) What is the primary purpose of management?
a) To maximize profits
b) To achieve organizational goals efficiently
c) To manage resources effectively
d) To implement policies

6) Which approach emphasizes the interdependence of various organizational functions?

a) Classical Approach b) Systems Approach
c) Behavioral Approach d) Contingency Approach

7) What is NOT a function of managers?

a) Planning b) Organizing
c) Playing d) Controlling

8) Which of the following is a responsibility of managers regarding social responsibility?

a) Maximizing shareholder wealth
b) Ensuring employee satisfaction
c) Contributing to community welfare
d) Minimizing costs

9) What is the first step in the planning process?

a) Developing alternatives b) Setting objectives
c) Implementing plans d) Evaluating results

10) Which type of plan is designed to cover a short period?

a) Strategic Plan b) Tactical Plan
c) Operational Plan d) Contingency Plan

11) Which of the following is a part of the staffing function?

a) Budgeting b) Training
c) Planning d) Controlling

12) Which theory focuses on the hierarchy of needs to motivate employees?

a) Herzberg's Two-Factor Theory
b) McGregor's Theory X and Y
c) Maslow's Hierarchy of Needs
d) Adams' Equity Theory

13) What is the main purpose of controlling in management?

a) To set goals
b) To ensure that organizational activities are aligned with plans
c) To improve employee morale
d) To increase production

14) What type of costs includes costs associated with preventing defects?

a) Internal failure costs b) External failure costs
c) Appraisal costs d) Prevention costs

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section – I, Q. No. 3 is compulsory and attempt any two questions from the remaining questions.
1) In Section – II, Q. No. 6 is compulsory and attempt any two questions from the remaining questions.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.
4) Draw neat-labelled diagrams wherever necessary.
5) Use of log table and calculators is allowed.

Section – I

Q.2 **a)** What are managerial skills and managerial roles? **05**
b) Explain the Social responsibilities and ethics in management. **04**

Q.3 **a)** What is planning? Explain advantages and disadvantages of planning? **05**
b) What are the types of organizations? Explain Problems with organizational level. **05**

Q.4 **a)** Define Leadership. Explain four extreme styles. **05**
b) Discuss types of communication by taking suitable example. **04**

Q.5 **Write short note on any three.** **09**
a) Channel of distribution
b) Functions of Managers
c) Methods of Departmentation
d) Explain Maslow's theory
e) Decision making

Section – II

Q.6 **a)** Define productivity. How does material management impact the productivity of a manufacturing unit? **05**
b) Explain how the production process is planned and controlled in batch production systems. **05**

Q.7	**a)**	Describe the importance of supplier partnerships in Total Quality Management. What are the key aspects that define a successful supplier partnership?	**05**
	b)	Explain the concept of employee involvement in TQM. How does fostering employee participation contribute to improved quality and productivity?	**04**
Q.8	**a)**	Explain the importance of Training and Development in enhancing employee performance. How can training programs be aligned with organizational goals?	**05**
	b)	What are the objectives of Human Resource Management (HRM)? Discuss how HRM helps in managing employee relations and improving organizational efficiency.	**04**

Q.9 Write short note on any three. **09**

- **a)** Material Requirement Planning (MRP)
- **b)** Batch Production
- **c)** Factors to improve productivity
- **d)** Functions of Production Planning and Control (PPC)
- **e)** Mass Production - Advantages and Disadvantages

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which type of plan is designed to cover a short period?
a) Strategic Plan b) Tactical Plan
c) Operational Plan d) Contingency Plan

2) Which of the following is a part of the staffing function?
a) Budgeting b) Training
c) Planning d) Controlling

3) Which theory focuses on the hierarchy of needs to motivate employees?
a) Herzberg's Two-Factor Theory
b) McGregor's Theory X and Y
c) Maslow's Hierarchy of Needs
d) Adams' Equity Theory

4) What is the main purpose of controlling in management?
a) To set goals
b) To ensure that organizational activities are aligned with plans
c) To improve employee morale
d) To increase production

5) What type of costs includes costs associated with preventing defects?
a) Internal failure costs b) External failure costs
c) Appraisal costs d) Prevention costs

6) Which quality guru is known for his work in the field of quality improvement through statistical methods?
a) Philip Crosby b) W. Edwards Deming
c) Joseph Juran d) Kaoru Ishikawa

7) Which chart is used to monitor the mean of a process over time?
a) R-chart b) P-chart
c) C-chart d) X-bar chart

8) Acceptance sampling is primarily concerned with:
a) Evaluating the entire production process
b) Inspecting all items produced
c) Testing a sample to infer about the quality of the entire lot
d) Conducting customer satisfaction surveys

9) What is the primary goal of employee involvement in TQM?
a) To increase profits
b) To enhance product quality through teamwork and engagement
c) To reduce the number of employees
d) To focus solely on production output

10) What is the primary purpose of management?
a) To maximize profits
b) To achieve organizational goals efficiently
c) To manage resources effectively
d) To implement policies

11) Which approach emphasizes the interdependence of various organizational functions?
a) Classical Approach b) Systems Approach
c) Behavioral Approach d) Contingency Approach

12) What is NOT a function of managers?
a) Planning b) Organizing
c) Playing d) Controlling

13) Which of the following is a responsibility of managers regarding social responsibility?
a) Maximizing shareholder wealth
b) Ensuring employee satisfaction
c) Contributing to community welfare
d) Minimizing costs

14) What is the first step in the planning process?
a) Developing alternatives b) Setting objectives
c) Implementing plans d) Evaluating results

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section – I, Q. No. 3 is compulsory and attempt any two questions from the remaining questions.
1) In Section – II, Q. No. 6 is compulsory and attempt any two questions from the remaining questions.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.
4) Draw neat-labelled diagrams wherever necessary.
5) Use of log table and calculators is allowed.

Section – I

Q.2 **a)** What are managerial skills and managerial roles? **05**
b) Explain the Social responsibilities and ethics in management. **04**

Q.3 **a)** What is planning? Explain advantages and disadvantages of planning? **05**
b) What are the types of organizations? Explain Problems with organizational level. **05**

Q.4 **a)** Define Leadership. Explain four extreme styles. **05**
b) Discuss types of communication by taking suitable example. **04**

Q.5 **Write short note on any three.** **09**
a) Channel of distribution
b) Functions of Managers
c) Methods of Departmentation
d) Explain Maslow's theory
e) Decision making

Section – II

Q.6 **a)** Define productivity. How does material management impact the productivity of a manufacturing unit? **05**
b) Explain how the production process is planned and controlled in batch production systems. **05**

Q.7	**a)**	Describe the importance of supplier partnerships in Total Quality Management. What are the key aspects that define a successful supplier partnership?	**05**
	b)	Explain the concept of employee involvement in TQM. How does fostering employee participation contribute to improved quality and productivity?	**04**
Q.8	**a)**	Explain the importance of Training and Development in enhancing employee performance. How can training programs be aligned with organizational goals?	**05**
	b)	What are the objectives of Human Resource Management (HRM)? Discuss how HRM helps in managing employee relations and improving organizational efficiency.	**04**

Q.9 Write short note on any three. **09**

- **a)** Material Requirement Planning (MRP)
- **b)** Batch Production
- **c)** Factors to improve productivity
- **d)** Functions of Production Planning and Control (PPC)
- **e)** Mass Production - Advantages and Disadvantages

SLR-BD-142

Seat No.		Set	P

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The terms in SOP are called _____.
a) max terms b) min terms
c) mid terms d) sum terms

2) The number of cells in a K-map with n- variables.
a) 2n b) n^2
c) 2^n d) n

3) The logical sum of two or more logical product terms is called _____.
a) SOP b) POS
c) OR operation d) NAND operation

4) A Karnaugh map (K-map) is an abstract form of _____ diagram organized as a matrix of squares.
a) Venn Diagram b) Cycle Diagram
c) Block diagram d) Triangular Diagram

5) If A and B are the inputs of a half adder, the sum is given by _____.
a) A AND B b) A OR B
c) A XOR B d) A EX-NOR B

6) Let A and B is the input of a Subtractor, then the output will be _____.
a) A XOR B b) A AND B
c) A OR B d) A EX-NOR B

7) What is a multiplexer?

a) It is a type of decoder which decodes several inputs and gives one output
b) A multiplexer is a device which converts many signals into one
c) It takes one input and results into many output
d) It is a type of encoder which decodes several inputs and gives one output

8) A basic S-R flip-flop can be constructed by cross-coupling of which basic logic gates?

a) AND or OR gates
b) XOR or XNOR gates
c) NOR or NAND gates
d) AND or NOR gates

9) In S-R flip-flop, if Q = 0 the output is said to be _____.

a) Set
b) Reset
c) Previous state
d) Current state

10) A D-Flip flop is said to be transparent, when _____.

a) the output is Low
b) the output is High
c) the output follows clock
d) the output follows input

11) How many stable state/states present in flip-flop?

a) 1
b) 0
c) 2
d) 4

12) How many natural states will there be in a 4-bit ripple counter?

a) 4
b) 8
c) 16
d) 32

13) How many flip-flops are required to construct a decade counter?

a) 4
b) 8
c) 5
d) 10

14) A 4-bit counter has a maximum modulus of _____.

a) 3
b) 6
c) 8
d) 16

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) Explain Standard representation of logic function.
b) Express Boolean function $F = xy + x'z$ as a product of Max-terms.
c) Explain Half Adder with logic diagram.
d) Explain 1:4 De-Multiplexer with truth Table and logic diagram.
e) Explain stepwise procedure for K-map solution.

Q.3 Attempt any two. **12**

a) Explain Binary to Gray conversion in details.
b) Explain Full Adder with suitable diagram
c) Solve using K Map -

$$F\ (A, B, C, D)\ = \sum (0, 2, 5, 7, 8, 10, 13, 15)$$

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic SR Flip-flop using logic gates.
b) Explain D-Flip-Flop with suitable diagram.
c) Differentiate between Synchronous and Asynchronous sequential circuit.
d) Explain PISO shift register.
e) Explain Race-Round condition. How this condition will overcome?

Q.5 Attempt any two. **12**

a) Design MOD-10 Counter.
b) Explain JK Flip flop with suitable diagram, and truth table.
c) Explain 4-bit UP/DOWN counter with suitable diagram.

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) A basic S-R flip-flop can be constructed by cross-coupling of which basic logic gates?
a) AND or OR gates b) XOR or XNOR gates
c) NOR or NAND gates d) AND or NOR gates

2) In S-R flip-flop, if Q = 0 the output is said to be _____.
a) Set b) Reset
c) Previous state d) Current state

3) A D-Flip flop is said to be transparent, when _____.
a) the output is Low b) the output is High
c) the output follows clock d) the output follows input

4) How many stable state/states present in flip-flop?
a) 1 b) 0
c) 2 d) 4

5) How many natural states will there be in a 4-bit ripple counter?
a) 4 b) 8
c) 16 d) 32

6) How many flip-flops are required to construct a decade counter?
a) 4 b) 8
c) 5 d) 10

7) A 4-bit counter has a maximum modulus of _____.
a) 3 b) 6
c) 8 d) 16

8) The terms in SOP are called _____.
a) max terms b) min terms
c) mid terms d) sum terms

9) The number of cells in a K-map with n- variables.
a) 2n b) n^2
c) 2^n d) n

10) The logical sum of two or more logical product terms is called _____.
a) SOP b) POS
c) OR operation d) NAND operation

11) A Karnaugh map (K-map) is an abstract form of _____ diagram organized as a matrix of squares.
a) Venn Diagram b) Cycle Diagram
c) Block diagram d) Triangular Diagram

12) If A and B are the inputs of a half adder, the sum is given by _____.
a) A AND B b) A OR B
c) A XOR B d) A EX-NOR B

13) Let A and B is the input of a Subtractor, then the output will be _____.
a) A XOR B b) A AND B
c) A OR B d) A EX-NOR B

14) What is a multiplexer?
a) It is a type of decoder which decodes several inputs and gives one output
b) A multiplexer is a device which converts many signals into one
c) It takes one input and results into many output
d) It is a type of encoder which decodes several inputs and gives one output

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) Explain Standard representation of logic function.
b) Express Boolean function $F = xy + x'z$ as a product of Max-terms.
c) Explain Half Adder with logic diagram.
d) Explain 1:4 De-Multiplexer with truth Table and logic diagram.
e) Explain stepwise procedure for K-map solution.

Q.3 Attempt any two. **12**

a) Explain Binary to Gray conversion in details.
b) Explain Full Adder with suitable diagram
c) Solve using K Map -

$$F\ (A, B, C, D)\ = \sum (0, 2, 5, 7, 8, 10, 13, 15)$$

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic SR Flip-flop using logic gates.
b) Explain D-Flip-Flop with suitable diagram.
c) Differentiate between Synchronous and Asynchronous sequential circuit.
d) Explain PISO shift register.
e) Explain Race-Round condition. How this condition will overcome?

Q.5 Attempt any two. **12**

a) Design MOD-10 Counter.
b) Explain JK Flip flop with suitable diagram, and truth table.
c) Explain 4-bit UP/DOWN counter with suitable diagram.

Seat No.	

Set R

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) How many stable state/states present in flip-flop?
a) 1 b) 0
c) 2 d) 4

2) How many natural states will there be in a 4-bit ripple counter?
a) 4 b) 8
c) 16 d) 32

3) How many flip-flops are required to construct a decade counter?
a) 4 b) 8
c) 5 d) 10

4) A 4-bit counter has a maximum modulus of _____.
a) 3 b) 6
c) 8 d) 16

5) The terms in SOP are called _____.
a) max terms b) min terms
c) mid terms d) sum terms

6) The number of cells in a K-map with n- variables.
a) 2n b) n^2
c) 2^n d) n

7) The logical sum of two or more logical product terms is called _____.
a) SOP b) POS
c) OR operation d) NAND operation

8) A Karnaugh map (K-map) is an abstract form of _____ diagram organized as a matrix of squares.

a) Venn Diagram b) Cycle Diagram
c) Block diagram d) Triangular Diagram

9) If A and B are the inputs of a half adder, the sum is given by _____.

a) A AND B b) A OR B
c) A XOR B d) A EX-NOR B

10) Let A and B is the input of a Subtractor, then the output will be _____.

a) A XOR B b) A AND B
c) A OR B d) A EX-NOR B

11) What is a multiplexer?

a) It is a type of decoder which decodes several inputs and gives one output
b) A multiplexer is a device which converts many signals into one
c) It takes one input and results into many output
d) It is a type of encoder which decodes several inputs and gives one output

12) A basic S-R flip-flop can be constructed by cross-coupling of which basic logic gates?

a) AND or OR gates b) XOR or XNOR gates
c) NOR or NAND gates d) AND or NOR gates

13) In S-R flip-flop, if Q = 0 the output is said to be _____.

a) Set b) Reset
c) Previous state d) Current state

14) A D-Flip flop is said to be transparent, when _____.

a) the output is Low b) the output is High
c) the output follows clock d) the output follows input

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) Explain Standard representation of logic function.
b) Express Boolean function $F = xy + x'z$ as a product of Max-terms.
c) Explain Half Adder with logic diagram.
d) Explain 1:4 De-Multiplexer with truth Table and logic diagram.
e) Explain stepwise procedure for K-map solution.

Q.3 Attempt any two. **12**

a) Explain Binary to Gray conversion in details.
b) Explain Full Adder with suitable diagram
c) Solve using K Map -

$$F\ (A, B, C, D)\ = \sum (0, 2, 5, 7, 8, 10, 13, 15)$$

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic SR Flip-flop using logic gates.
b) Explain D-Flip-Flop with suitable diagram.
c) Differentiate between Synchronous and Asynchronous sequential circuit.
d) Explain PISO shift register.
e) Explain Race-Round condition. How this condition will overcome?

Q.5 Attempt any two. **12**

a) Design MOD-10 Counter.
b) Explain JK Flip flop with suitable diagram, and truth table.
c) Explain 4-bit UP/DOWN counter with suitable diagram.

Seat No.		Set	S

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Let A and B is the input of a Subtractor, then the output will be _____.
a) A XOR B b) A AND B
c) A OR B d) A EX-NOR B

2) What is a multiplexer?
a) It is a type of decoder which decodes several inputs and gives one output
b) A multiplexer is a device which converts many signals into one
c) It takes one input and results into many output
d) It is a type of encoder which decodes several inputs and gives one output

3) A basic S-R flip-flop can be constructed by cross-coupling of which basic logic gates?
a) AND or OR gates b) XOR or XNOR gates
c) NOR or NAND gates d) AND or NOR gates

4) In S-R flip-flop, if Q = 0 the output is said to be _____.
a) Set b) Reset
c) Previous state d) Current state

5) A D-Flip flop is said to be transparent, when _____.
a) the output is Low b) the output is High
c) the output follows clock d) the output follows input

6) How many stable state/states present in flip-flop?
a) 1 b) 0
c) 2 d) 4

7) How many natural states will there be in a 4-bit ripple counter?
a) 4 b) 8
c) 16 d) 32

8) How many flip-flops are required to construct a decade counter?
a) 4 b) 8
c) 5 d) 10

9) A 4-bit counter has a maximum modulus of _____.
a) 3 b) 6
c) 8 d) 16

10) The terms in SOP are called _____.
a) max terms b) min terms
c) mid terms d) sum terms

11) The number of cells in a K-map with n- variables.
a) 2n b) n^2
c) 2^n d) n

12) The logical sum of two or more logical product terms is called _____.
a) SOP b) POS
c) OR operation d) NAND operation

13) A Karnaugh map (K-map) is an abstract form of _____ diagram organized as a matrix of squares.
a) Venn Diagram b) Cycle Diagram
c) Block diagram d) Triangular Diagram

14) If A and B are the inputs of a half adder, the sum is given by _____.
a) A AND B b) A OR B
c) A XOR B d) A EX-NOR B

SLR-BD-142

Seat No.	

Set S

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) Explain Standard representation of logic function.
b) Express Boolean function $F = xy + x'z$ as a product of Max-terms.
c) Explain Half Adder with logic diagram.
d) Explain 1:4 De-Multiplexer with truth Table and logic diagram.
e) Explain stepwise procedure for K-map solution.

Q.3 Attempt any two. **12**

a) Explain Binary to Gray conversion in details.
b) Explain Full Adder with suitable diagram
c) Solve using K Map -

$$F\ (A, B, C, D)\ = \sum (0, 2, 5, 7, 8, 10, 13, 15)$$

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic SR Flip-flop using logic gates.
b) Explain D-Flip-Flop with suitable diagram.
c) Differentiate between Synchronous and Asynchronous sequential circuit.
d) Explain PISO shift register.
e) Explain Race-Round condition. How this condition will overcome?

Q.5 Attempt any two. **12**

a) Design MOD-10 Counter.
b) Explain JK Flip flop with suitable diagram, and truth table.
c) Explain 4-bit UP/DOWN counter with suitable diagram.

SLR-BD-143

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Thermocouple generate output voltage according to _____.
a) Circuit parameters b) Humidity
c) Temperature d) Voltage

2) Sensor is a type of transducer.
a) True b) False

3) Which factor affects the least while selection of sensor?
a) Size b) Accuracy
c) Colour d) Durability

4) Which sensor should one prefer for accurate measurement of distance upto 1 meter?
a) Ultrasonic sensor b) Infrared sensor
c) PIR sensor d) Photoresistor sensor

5) IR sensors can't work in dark environment.
a) True b) False

6) Which sensor should be used for calculating humidity?
a) DHT11 b) LM335Z/NOPB
c) HC-SR04 d) MPX10DP

7) What is the primary purpose of a strain gauge?
a) Measure temperature
b) Measure pressure
c) Measure deformation or strain
d) Measure voltage

8) What is a Wheatstone bridge used for in the context of strain gauges?
a) To amplify the signal
b) To convert mechanical strain to a voltage output
c) To filter noise from the signal
d) To measure temperature

9) Signal conditioning is carried out in _____.
a) Transducer housing b) Processor
c) Network interface d) None of the mentioned

10) What principle does a thermocouple operate on?
a) Seebeck effect b) Peltier effect
c) Joule heating d) Hall effect

11) Which material is most commonly used in RTDs for temperature sensing?
a) Copper b) Aluminum
c) Platinum d) Nickel

12) What is the typical temperature range for standard RTDs?
a) -200 to 500 °C b) -50 to 200 °C
c) 0 to 100 °C d) -100 to 1000 °C

13) What type of electrode is commonly used in a pHsensor?
a) Reference electrode b) Glass electrode
c) Metal electrode d) Carbon electrode

14) What is the output of atypical pHsensor?
a) Voltage b) Resistance
c) Current d) Frequency

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any Four. **16**

a) Define Motion Transducer. Explain different types of motion sensor with example.
b) Write a short note on sensor selection.
c) Define Sensor & Transducer. How do they differ from each other?
d) What is Calibration? With the help of block diagram explain procedure of calibration.
e) Explain concept of strain gauge & light intensity.
f) Describe concept of motion transducer in detail.

Q.3 Attempt any two. **12**

a) Discuss the classification of sensor based on Measurand. Provide the example of each type and their application.
b) State the working principle of LDR. Explain the construction & working of it. Also state advantages, disadvantages & application of it.
c) Write a note on:-
1) Temperature sensing
2) Light Intensity
3) Strain gauge
4) Magnetic field Sensor

Section – II

Q.4 Attempt any Four. **16**

a) With the help of neat sketch explain concept of LVDT.
b) Illustrate concept of ultrasonic sensor & Chemical sensor in detail
c) With the help of explain RTD.
d) With the help of neat sketch explain concept of RVDT.
e) Describe the concept of motion transducer.

Q.5 Attempt any two. **12**

a) With the help of neat sketch explain concept of AC Tachometer & DC Tachometer.

b) Define following concepts:

1) Humidity Sensor
2) Vibration Sensor
3) Gas Sensor

c) With the help of neat sketch explain Thermocouple & Thermistor.

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) What is a Wheatstone bridge used for in the context of strain gauges?
a) To amplify the signal
b) To convert mechanical strain to a voltage output
c) To filter noise from the signal
d) To measure temperature

2) Signal conditioning is carried out in _____.
a) Transducer housing b) Processor
c) Network interface d) None of the mentioned

3) What principle does a thermocouple operate on?
a) Seebeck effect b) Peltier effect
c) Joule heating d) Hall effect

4) Which material is most commonly used in RTDs for temperature sensing?
a) Copper b) Aluminum
c) Platinum d) Nickel

5) What is the typical temperature range for standard RTDs?
a) -200 to 500 °C b) -50 to 200 °C
c) 0 to 100 °C d) -100 to 1000 °C

6) What type of electrode is commonly used in a pHsensor?
a) Reference electrode b) Glass electrode
c) Metal electrode d) Carbon electrode

7) What is the output of atypical pHsensor?
a) Voltage b) Resistance
c) Current d) Frequency

8) Thermocouple generate output voltage according to _____.
a) Circuit parameters b) Humidity
c) Temperature d) Voltage

9) Sensor is a type of transducer.
a) True b) False

10) Which factor affects the least while selection of sensor?
a) Size b) Accuracy
c) Colour d) Durability

11) Which sensor should one prefer for accurate measurement of distance upto 1 meter?
a) Ultrasonic sensor b) Infrared sensor
c) PIR sensor d) Photoresistor sensor

12) IR sensors can't work in dark environment.
a) True b) False

13) Which sensor should be used for calculating humidity?
a) DHT11 b) LM335Z/NOPB
c) HC-SR04 d) MPX10DP

14) What is the primary purpose of a strain gauge?
a) Measure temperature
b) Measure pressure
c) Measure deformation or strain
d) Measure voltage

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any Four. **16**

a) Define Motion Transducer. Explain different types of motion sensor with example.
b) Write a short note on sensor selection.
c) Define Sensor & Transducer. How do they differ from each other?
d) What is Calibration? With the help of block diagram explain procedure of calibration.
e) Explain concept of strain gauge & light intensity.
f) Describe concept of motion transducer in detail.

Q.3 Attempt any two. **12**

a) Discuss the classification of sensor based on Measurand. Provide the example of each type and their application.
b) State the working principle of LDR. Explain the construction & working of it. Also state advantages, disadvantages & application of it.
c) Write a note on:-
1) Temperature sensing
2) Light Intensity
3) Strain gauge
4) Magnetic field Sensor

Section – II

Q.4 Attempt any Four. **16**

a) With the help of neat sketch explain concept of LVDT.
b) Illustrate concept of ultrasonic sensor & Chemical sensor in detail
c) With the help of explain RTD.
d) With the help of neat sketch explain concept of RVDT.
e) Describe the concept of motion transducer.

Q.5 Attempt any two. **12**

a) With the help of neat sketch explain concept of AC Tachometer & DC Tachometer.

b) Define following concepts:

1) Humidity Sensor
2) Vibration Sensor
3) Gas Sensor

c) With the help of neat sketch explain Thermocouple & Thermistor.

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which material is most commonly used in RTDs for temperature sensing?
a) Copper b) Aluminum
c) Platinum d) Nickel

2) What is the typical temperature range for standard RTDs?
a) -200 to 500 °C b) -50 to 200 °C
c) 0 to 100 °C d) -100 to 1000 °C

3) What type of electrode is commonly used in a pHsensor?
a) Reference electrode b) Glass electrode
c) Metal electrode d) Carbon electrode

4) What is the output of atypical pHsensor?
a) Voltage b) Resistance
c) Current d) Frequency

5) Thermocouple generate output voltage according to _____.
a) Circuit parameters b) Humidity
c) Temperature d) Voltage

6) Sensor is a type of transducer.
a) True b) False

7) Which factor affects the least while selection of sensor?
a) Size b) Accuracy
c) Colour d) Durability

8) Which sensor should one prefer for accurate measurement of distance upto 1 meter?

a) Ultrasonic sensor
b) Infrared sensor
c) PIR sensor
d) Photoresistor sensor

9) IR sensors can't work in dark environment.

a) True
b) False

10) Which sensor should be used for calculating humidity?

a) DHT11
b) LM335Z/NOPB
c) HC-SR04
d) MPX10DP

11) What is the primary purpose of a strain gauge?

a) Measure temperature
b) Measure pressure
c) Measure deformation or strain
d) Measure voltage

12) What is a Wheatstone bridge used for in the context of strain gauges?

a) To amplify the signal
b) To convert mechanical strain to a voltage output
c) To filter noise from the signal
d) To measure temperature

13) Signal conditioning is carried out in _____.

a) Transducer housing
b) Processor
c) Network interface
d) None of the mentioned

14) What principle does a thermocouple operate on?

a) Seebeck effect
b) Peltier effect
c) Joule heating
d) Hall effect

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any Four. **16**

a) Define Motion Transducer. Explain different types of motion sensor with example.
b) Write a short note on sensor selection.
c) Define Sensor & Transducer. How do they differ from each other?
d) What is Calibration? With the help of block diagram explain procedure of calibration.
e) Explain concept of strain gauge & light intensity.
f) Describe concept of motion transducer in detail.

Q.3 Attempt any two. **12**

a) Discuss the classification of sensor based on Measurand. Provide the example of each type and their application.
b) State the working principle of LDR. Explain the construction & working of it. Also state advantages, disadvantages & application of it.
c) Write a note on:-
1) Temperature sensing
2) Light Intensity
3) Strain gauge
4) Magnetic field Sensor

Section – II

Q.4 Attempt any Four. **16**

a) With the help of neat sketch explain concept of LVDT.
b) Illustrate concept of ultrasonic sensor & Chemical sensor in detail
c) With the help of explain RTD.
d) With the help of neat sketch explain concept of RVDT.
e) Describe the concept of motion transducer.

Q.5 Attempt any two. **12**

a) With the help of neat sketch explain concept of AC Tachometer & DC Tachometer.

b) Define following concepts:

1) Humidity Sensor
2) Vibration Sensor
3) Gas Sensor

c) With the help of neat sketch explain Thermocouple & Thermistor.

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which sensor should be used for calculating humidity?
a) DHT11 b) LM335Z/NOPB
c) HC-SR04 d) MPX10DP

2) What is the primary purpose of a strain gauge?
a) Measure temperature
b) Measure pressure
c) Measure deformation or strain
d) Measure voltage

3) What is a Wheatstone bridge used for in the context of strain gauges?
a) To amplify the signal
b) To convert mechanical strain to a voltage output
c) To filter noise from the signal
d) To measure temperature

4) Signal conditioning is carried out in _____.
a) Transducer housing b) Processor
c) Network interface d) None of the mentioned

5) What principle does a thermocouple operate on?
a) Seebeck effect b) Peltier effect
c) Joule heating d) Hall effect

6) Which material is most commonly used in RTDs for temperature sensing?
a) Copper b) Aluminum
c) Platinum d) Nickel

7) What is the typical temperature range for standard RTDs?
a) -200 to 500 °C b) -50 to 200 °C
c) 0 to 100 °C d) -100 to 1000 °C

8) What type of electrode is commonly used in a pHsensor?
a) Reference electrode b) Glass electrode
c) Metal electrode d) Carbon electrode

9) What is the output of atypical pHsensor?
a) Voltage b) Resistance
c) Current d) Frequency

10) Thermocouple generate output voltage according to _____.
a) Circuit parameters b) Humidity
c) Temperature d) Voltage

11) Sensor is a type of transducer.
a) True b) False

12) Which factor affects the least while selection of sensor?
a) Size b) Accuracy
c) Colour d) Durability

13) Which sensor should one prefer for accurate measurement of distance upto 1 meter?
a) Ultrasonic sensor b) Infrared sensor
c) PIR sensor d) Photoresistor sensor

14) IR sensors can't work in dark environment.
a) True b) False

SLR-BD-143

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any Four. **16**

a) Define Motion Transducer. Explain different types of motion sensor with example.
b) Write a short note on sensor selection.
c) Define Sensor & Transducer. How do they differ from each other?
d) What is Calibration? With the help of block diagram explain procedure of calibration.
e) Explain concept of strain gauge & light intensity.
f) Describe concept of motion transducer in detail.

Q.3 Attempt any two. **12**

a) Discuss the classification of sensor based on Measurand. Provide the example of each type and their application.
b) State the working principle of LDR. Explain the construction & working of it. Also state advantages, disadvantages & application of it.
c) Write a note on:-
1) Temperature sensing
2) Light Intensity
3) Strain gauge
4) Magnetic field Sensor

Section – II

Q.4 Attempt any Four. **16**

a) With the help of neat sketch explain concept of LVDT.
b) Illustrate concept of ultrasonic sensor & Chemical sensor in detail
c) With the help of explain RTD.
d) With the help of neat sketch explain concept of RVDT.
e) Describe the concept of motion transducer.

Q.5 Attempt any two. **12**

a) With the help of neat sketch explain concept of AC Tachometer & DC Tachometer.

b) Define following concepts:

1) Humidity Sensor
2) Vibration Sensor
3) Gas Sensor

c) With the help of neat sketch explain Thermocouple & Thermistor.

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is an advantage of electronic energy meters over induction-type meters?
a) Higher accuracy b) More moving parts
c) More expensive d) Require more maintenance

2) Moving iron instruments have _____.
a) Uniform scale b) Squared scale
c) Log scale d) Linear scale

3) Digital voltmeters convert _____.
a) Analog to digital signal b) Digital to analog signal
c) Current to voltage d) Resistance to voltage

4) In a separately excited DC motor, the field windings are _____.
a) Connected in series with the armature
b) Supplied from an independent source
c) Connected to the same supply as the armature
d) None of above

5) A single-phase induction motor is inherently _____.
a) Self-starting
b) Not self-starting
c) More efficient than a three-phase motor
d) Can operate on both AC and DC supplies

6) The synchronous speed of a synchronous generator is dependent on __.
a) Rotor size
b) Number of poles and frequency
c) Magnetic field strength
d) Load current

7) The synchronous generator operates at _____.
a) A variable speed
b) A constant speed
c) A speed proportional to the load
d) A speed inversely proportional to the load

8) What is the main advantage of a permanent magnet DC motor over a conventional DC motor?
a) No need for a field winding b) Higher efficiency at low speeds
c) Reduced cost of construction d) All of the above

9) Which of the following is an application of PMSMs?
a) Fans b) Electric vehicles
c) HVAC systems d) All of the above

10) What is the purpose of laminated cores in AC machines?
a) Reduce mechanical stress
b) Minimize eddy current losses
c) Increase the resistance of the windings
d) Improve heat dissipation

11) In energy-efficient AC motors, the stator windings are often made of _____.
a) Aluminum b) Copper
c) Steel d) Brass

12) Which of the following does not change in a transformer?
a) Current b) Voltage
c) Frequency d) All of the above

13) When a transformer is loaded, the primary current?
a) Increases b) Decreases
c) Remains constant d) Becomes zero

14) Open circuit test on transformers is conducted to determine _____.
a) hysteresis losses b) copper losses
c) core losses d) eddy current losses

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) With neat sketch explain PMMC type instrument.
b) A 3-phase 500V motor load has a power factor of 0.4 two wattmeter connected to measure input. They show input to be 30 KW. Find the reading of each instrument.
c) With neat sketch explain the construction of DC machine.
d) What is the purpose of the auxiliary winding in a single-phase induction motor?
e) Explain the working principle of a synchronous generator.

Q.3 Attempt any two. **12**

a) Explain 1 - ø induction energy meter with neat diagram.
b) Explain the speed control techniques of separately excited dc motor.
c) Explain the principle of operation of 3ø induction motor. With the help of phasor diagram explain how rotating magnetic field is produced?

Section – II

Q.4 Attempt any Four. **16**

a) Explain with neat sketch construction of permanent magnet brushless DC motor.
b) Explain the principle of operation of a linear induction motor.
c) Discuss the techniques used to reduce iron losses in energy-efficient AC machines.
d) A 230/2300V transformer takes a no-load current of 6.5 A and absorbs 187W if the resistance of the primary is 0.6 Ω. Find.
1) the core loss
2) no load power factor
3) active component of current
4) magnetizing current
e) Derive the expression for saving of copper in autotransformer.

Q.5 Attempt any two. **12**

a) What are the applications of Synchronous Reluctance Motor? Explain with phasor diagram torque speed characteristics of Synchronous Reluctance Motor.

b) An energy-efficient AC motor has the following loss components:
Copper losses: 2 kW
Iron losses: 1.5 kW
Friction and windage losses: 0.5 kW
The input power is 25 kW. Calculate the efficiency of the motor.

c) With neat sketch explain open circuit and short circuit test of transformer. How equivalent circuit parameters and efficiency of a transformer are computed?

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the main advantage of a permanent magnet DC motor over a conventional DC motor?
a) No need for a field winding b) Higher efficiency at low speeds
c) Reduced cost of construction d) All of the above

2) Which of the following is an application of PMSMs?
a) Fans b) Electric vehicles
c) HVAC systems d) All of the above

3) What is the purpose of laminated cores in AC machines?
a) Reduce mechanical stress
b) Minimize eddy current losses
c) Increase the resistance of the windings
d) Improve heat dissipation

4) In energy-efficient AC motors, the stator windings are often made of _____.
a) Aluminum b) Copper
c) Steel d) Brass

5) Which of the following does not change in a transformer?
a) Current b) Voltage
c) Frequency d) All of the above

6) When a transformer is loaded, the primary current?
a) Increases b) Decreases
c) Remains constant d) Becomes zero

7) Open circuit test on transformers is conducted to determine _____.
a) hysteresis losses b) copper losses
c) core losses d) eddy current losses

8) Which of the following is an advantage of electronic energy meters over induction-type meters?
a) Higher accuracy b) More moving parts
c) More expensive d) Require more maintenance

9) Moving iron instruments have _____.
a) Uniform scale b) Squared scale
c) Log scale d) Linear scale

10) Digital voltmeters convert _____.
a) Analog to digital signal b) Digital to analog signal
c) Current to voltage d) Resistance to voltage

11) In a separately excited DC motor, the field windings are _____.
a) Connected in series with the armature
b) Supplied from an independent source
c) Connected to the same supply as the armature
d) None of above

12) A single-phase induction motor is inherently _____.
a) Self-starting
b) Not self-starting
c) More efficient than a three-phase motor
d) Can operate on both AC and DC supplies

13) The synchronous speed of a synchronous generator is dependent on __.
a) Rotor size
b) Number of poles and frequency
c) Magnetic field strength
d) Load current

14) The synchronous generator operates at _____.
a) A variable speed
b) A constant speed
c) A speed proportional to the load
d) A speed inversely proportional to the load

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) With neat sketch explain PMMC type instrument.
b) A 3-phase 500V motor load has a power factor of 0.4 two wattmeter connected to measure input. They show input to be 30 KW. Find the reading of each instrument.
c) With neat sketch explain the construction of DC machine.
d) What is the purpose of the auxiliary winding in a single-phase induction motor?
e) Explain the working principle of a synchronous generator.

Q.3 Attempt any two. **12**

a) Explain 1 - ø induction energy meter with neat diagram.
b) Explain the speed control techniques of separately excited dc motor.
c) Explain the principle of operation of 3ø induction motor. With the help of phasor diagram explain how rotating magnetic field is produced?

Section – II

Q.4 Attempt any Four. **16**

a) Explain with neat sketch construction of permanent magnet brushless DC motor.
b) Explain the principle of operation of a linear induction motor.
c) Discuss the techniques used to reduce iron losses in energy-efficient AC machines.
d) A 230/2300V transformer takes a no-load current of 6.5 A and absorbs 187W if the resistance of the primary is 0.6 Ω. Find.
1) the core loss
2) no load power factor
3) active component of current
4) magnetizing current
e) Derive the expression for saving of copper in autotransformer.

Q.5 Attempt any two. **12**

a) What are the applications of Synchronous Reluctance Motor? Explain with phasor diagram torque speed characteristics of Synchronous Reluctance Motor.

b) An energy-efficient AC motor has the following loss components:
Copper losses: 2 kW
Iron losses: 1.5 kW
Friction and windage losses: 0.5 kW
The input power is 25 kW. Calculate the efficiency of the motor.

c) With neat sketch explain open circuit and short circuit test of transformer. How equivalent circuit parameters and efficiency of a transformer are computed?

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) In energy-efficient AC motors, the stator windings are often made of _____.
a) Aluminum b) Copper
c) Steel d) Brass

2) Which of the following does not change in a transformer?
a) Current b) Voltage
c) Frequency d) All of the above

3) When a transformer is loaded, the primary current?
a) Increases b) Decreases
c) Remains constant d) Becomes zero

4) Open circuit test on transformers is conducted to determine _____.
a) hysteresis losses b) copper losses
c) core losses d) eddy current losses

5) Which of the following is an advantage of electronic energy meters over induction-type meters?
a) Higher accuracy b) More moving parts
c) More expensive d) Require more maintenance

6) Moving iron instruments have _____.
a) Uniform scale b) Squared scale
c) Log scale d) Linear scale

7) Digital voltmeters convert _____.
a) Analog to digital signal b) Digital to analog signal
c) Current to voltage d) Resistance to voltage

8) In a separately excited DC motor, the field windings are _____.
a) Connected in series with the armature
b) Supplied from an independent source
c) Connected to the same supply as the armature
d) None of above

9) A single-phase induction motor is inherently _____.
a) Self-starting
b) Not self-starting
c) More efficient than a three-phase motor
d) Can operate on both AC and DC supplies

10) The synchronous speed of a synchronous generator is dependent on __.
a) Rotor size
b) Number of poles and frequency
c) Magnetic field strength
d) Load current

11) The synchronous generator operates at _____.
a) A variable speed
b) A constant speed
c) A speed proportional to the load
d) A speed inversely proportional to the load

12) What is the main advantage of a permanent magnet DC motor over a conventional DC motor?
a) No need for a field winding b) Higher efficiency at low speeds
c) Reduced cost of construction d) All of the above

13) Which of the following is an application of PMSMs?
a) Fans b) Electric vehicles
c) HVAC systems d) All of the above

14) What is the purpose of laminated cores in AC machines?
a) Reduce mechanical stress
b) Minimize eddy current losses
c) Increase the resistance of the windings
d) Improve heat dissipation

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) With neat sketch explain PMMC type instrument.
b) A 3-phase 500V motor load has a power factor of 0.4 two wattmeter connected to measure input. They show input to be 30 KW. Find the reading of each instrument.
c) With neat sketch explain the construction of DC machine.
d) What is the purpose of the auxiliary winding in a single-phase induction motor?
e) Explain the working principle of a synchronous generator.

Q.3 Attempt any two. **12**

a) Explain 1 - ø induction energy meter with neat diagram.
b) Explain the speed control techniques of separately excited dc motor.
c) Explain the principle of operation of 3ø induction motor. With the help of phasor diagram explain how rotating magnetic field is produced?

Section – II

Q.4 Attempt any Four. **16**

a) Explain with neat sketch construction of permanent magnet brushless DC motor.
b) Explain the principle of operation of a linear induction motor.
c) Discuss the techniques used to reduce iron losses in energy-efficient AC machines.
d) A 230/2300V transformer takes a no-load current of 6.5 A and absorbs 187W if the resistance of the primary is 0.6 Ω. Find.
1) the core loss
2) no load power factor
3) active component of current
4) magnetizing current
e) Derive the expression for saving of copper in autotransformer.

Q.5 Attempt any two. **12**

a) What are the applications of Synchronous Reluctance Motor? Explain with phasor diagram torque speed characteristics of Synchronous Reluctance Motor.

b) An energy-efficient AC motor has the following loss components:
Copper losses: 2 kW
Iron losses: 1.5 kW
Friction and windage losses: 0.5 kW
The input power is 25 kW. Calculate the efficiency of the motor.

c) With neat sketch explain open circuit and short circuit test of transformer. How equivalent circuit parameters and efficiency of a transformer are computed?

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) The synchronous speed of a synchronous generator is dependent on __.
a) Rotor size
b) Number of poles and frequency
c) Magnetic field strength
d) Load current

2) The synchronous generator operates at _____.
a) A variable speed
b) A constant speed
c) A speed proportional to the load
d) A speed inversely proportional to the load

3) What is the main advantage of a permanent magnet DC motor over a conventional DC motor?
a) No need for a field winding b) Higher efficiency at low speeds
c) Reduced cost of construction d) All of the above

4) Which of the following is an application of PMSMs?
a) Fans b) Electric vehicles
c) HVAC systems d) All of the above

5) What is the purpose of laminated cores in AC machines?
a) Reduce mechanical stress
b) Minimize eddy current losses
c) Increase the resistance of the windings
d) Improve heat dissipation

6) In energy-efficient AC motors, the stator windings are often made of _____.
a) Aluminum b) Copper
c) Steel d) Brass

7) Which of the following does not change in a transformer?
a) Current b) Voltage
c) Frequency d) All of the above

8) When a transformer is loaded, the primary current?
a) Increases b) Decreases
c) Remains constant d) Becomes zero

9) Open circuit test on transformers is conducted to determine _____.
a) hysteresis losses b) copper losses
c) core losses d) eddy current losses

10) Which of the following is an advantage of electronic energy meters over induction-type meters?
a) Higher accuracy b) More moving parts
c) More expensive d) Require more maintenance

11) Moving iron instruments have _____.
a) Uniform scale b) Squared scale
c) Log scale d) Linear scale

12) Digital voltmeters convert _____.
a) Analog to digital signal b) Digital to analog signal
c) Current to voltage d) Resistance to voltage

13) In a separately excited DC motor, the field windings are _____.
a) Connected in series with the armature
b) Supplied from an independent source
c) Connected to the same supply as the armature
d) None of above

14) A single-phase induction motor is inherently _____.
a) Self-starting
b) Not self-starting
c) More efficient than a three-phase motor
d) Can operate on both AC and DC supplies

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) With neat sketch explain PMMC type instrument.
b) A 3-phase 500V motor load has a power factor of 0.4 two wattmeter connected to measure input. They show input to be 30 KW. Find the reading of each instrument.
c) With neat sketch explain the construction of DC machine.
d) What is the purpose of the auxiliary winding in a single-phase induction motor?
e) Explain the working principle of a synchronous generator.

Q.3 Attempt any two. **12**

a) Explain 1 - ø induction energy meter with neat diagram.
b) Explain the speed control techniques of separately excited dc motor.
c) Explain the principle of operation of 3ø induction motor. With the help of phasor diagram explain how rotating magnetic field is produced?

Section – II

Q.4 Attempt any Four. **16**

a) Explain with neat sketch construction of permanent magnet brushless DC motor.
b) Explain the principle of operation of a linear induction motor.
c) Discuss the techniques used to reduce iron losses in energy-efficient AC machines.
d) A 230/2300V transformer takes a no-load current of 6.5 A and absorbs 187W if the resistance of the primary is 0.6 Ω. Find.
1) the core loss
2) no load power factor
3) active component of current
4) magnetizing current
e) Derive the expression for saving of copper in autotransformer.

Q.5 Attempt any two. **12**

a) What are the applications of Synchronous Reluctance Motor? Explain with phasor diagram torque speed characteristics of Synchronous Reluctance Motor.

b) An energy-efficient AC motor has the following loss components:
Copper losses: 2 kW
Iron losses: 1.5 kW
Friction and windage losses: 0.5 kW
The input power is 25 kW. Calculate the efficiency of the motor.

c) With neat sketch explain open circuit and short circuit test of transformer. How equivalent circuit parameters and efficiency of a transformer are computed?

SLR-BD-145

Seat No.		Set	P

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is an electric vehicle?
a) Vehicle powered by gasoline
b) Vehicle powered by Electricity
c) Vehicle powered by Diesel
d) Vehicle powered by solar energy

2) What is the function of electric motor in an EV?
a) To charge the battery b) To power the wheels
c) To generate electricity d) To cool the vehicle

3) What is the purpose of battery management system (BMS) in an EV?
a) To monitor and control the battery's state of charge
b) To power the electric motor
c) To generate electricity
d) To cool the vehicle

4) What is the primary advantage of hybrid electric vehicle?
a) Increase driving range
b) Decreased operating cost
c) Reduced Greenhouse gas emissions
d) All of above

5) What type of battery is commonly used in Battery Electric Vehicles?
a) Lead -acid battery b) Nickel- metal hybrid battery
c) Lithium- ion battery d) All of above

6) Which is the types of electric vehicle charging?
a) Level one charging b) Level two charging
c) DC fast charging d) All of the above

7) Which of the following affects battery lifespan?
a) Depth of discharge (DOD) b) Temperature
c) Charging Frequency d) All of above

8) What type of fuel do Fuel Cell Electric Vehicles use?
a) Gasoline b) Diesel
c) Hydrogen d) Natural gas

9) What is the primary cause of battery degradation?
a) Overcharge b) Undercharge
c) Depth of discharge d) High temperature

10) How does battery storage system help in grid stability?
a) By supplying reactive power
b) By absorbing excess energy
c) By providing frequency regulation
d) All of above

11) Which of the following is the benefit of Electric Vehicles?
a) Zero emission b) Lower operating cost
c) Improved performance d) All of above

12) What is the purpose of power electronic controller in electric vehicle?
a) To regulate the flow of electrical energy
b) To monitor the vehicles speed
c) To control the onboard charger
d) To regulate the battery's state of charge

13) What is the purpose of equalization in battery Storage?
a) To balance cell voltage b) To increase battery capacity
c) To reduce charging time d) To improve discharge rate

14) What is the primary function of the on board charger in electric vehicle?
a) To charge the battery from an external power source
b) To convert AC power to DC power
c) To regulate battery's state of charge
d) To monitor the vehicles speed

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four **16**

a) State and explain challenges faced by Hybrid electric vehicle.
b) State and explain Economics and Environmental impacts of using electrical vehicles.
c) State and explain need of Electrical Vehicle.
d) State and Explain common part between ICE and EV drivetrain.
e) State and explain battery pack and battery management system.

Q.3 Attempt any two. **12**

a) State and explain major requirements of electrical vehicles.
b) State and explain types of electric vehicles in brief.
c) State and explain electric vehicle configuration in brief.

Section – II

Q.4 Attempt any Four. **16**

a) State and explain battery based energy storage system.
b) State and Explain components of HEVs drive train system.
c) State and explain alternative novel energy source solar photovoltaic cells, fuel cells, super capacitors and flywheels.
d) State and explain HEVs basic architecture.
e) Compare between Hybrid electric vehicle and Fuel cell electric vehicle.

Q.5 Attempt any two. **12**

a) State and explain overview of batteries and battery parameters, battery charging, regenerative braking.
b) State and Explain classification of HEVs: Conventional HEVs, Grid able HEVs.
c) State and explain fuel efficiency in HEV.

Seat No.	

Set Q

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What type of fuel do Fuel Cell Electric Vehicles use?
a) Gasoline b) Diesel
c) Hydrogen d) Natural gas

2) What is the primary cause of battery degradation?
a) Overcharge b) Undercharge
c) Depth of discharge d) High temperature

3) How does battery storage system help in grid stability?
a) By supplying reactive power
b) By absorbing excess energy
c) By providing frequency regulation
d) All of above

4) Which of the following is the benefit of Electric Vehicles?
a) Zero emission b) Lower operating cost
c) Improved performance d) All of above

5) What is the purpose of power electronic controller in electric vehicle?
a) To regulate the flow of electrical energy
b) To monitor the vehicles speed
c) To control the onboard charger
d) To regulate the battery's state of charge

6) What is the purpose of equalization in battery Storage?
a) To balance cell voltage b) To increase battery capacity
c) To reduce charging time d) To improve discharge rate

7) What is the primary function of the on board charger in electric vehicle?
a) To charge the battery from an external power source
b) To convert AC power to DC power
c) To regulate battery's state of charge
d) To monitor the vehicles speed

8) What is an electric vehicle?
a) Vehicle powered by gasoline
b) Vehicle powered by Electricity
c) Vehicle powered by Diesel
d) Vehicle powered by solar energy

9) What is the function of electric motor in an EV?
a) To charge the battery b) To power the wheels
c) To generate electricity d) To cool the vehicle

10) What is the purpose of battery management system (BMS) in an EV?
a) To monitor and control the battery's state of charge
b) To power the electric motor
c) To generate electricity
d) To cool the vehicle

11) What is the primary advantage of hybrid electric vehicle?
a) Increase driving range
b) Decreased operating cost
c) Reduced Greenhouse gas emissions
d) All of above

12) What type of battery is commonly used in Battery Electric Vehicles?
a) Lead -acid battery b) Nickel- metal hybrid battery
c) Lithium- ion battery d) All of above

13) Which is the types of electric vehicle charging?
a) Level one charging b) Level two charging
c) DC fast charging d) All of the above

14) Which of the following affects battery lifespan?
a) Depth of discharge (DOD) b) Temperature
c) Charging Frequency d) All of above

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four **16**

a) State and explain challenges faced by Hybrid electric vehicle.
b) State and explain Economics and Environmental impacts of using electrical vehicles.
c) State and explain need of Electrical Vehicle.
d) State and Explain common part between ICE and EV drivetrain.
e) State and explain battery pack and battery management system.

Q.3 Attempt any two. **12**

a) State and explain major requirements of electrical vehicles.
b) State and explain types of electric vehicles in brief.
c) State and explain electric vehicle configuration in brief.

Section – II

Q.4 Attempt any Four. **16**

a) State and explain battery based energy storage system.
b) State and Explain components of HEVs drive train system.
c) State and explain alternative novel energy source solar photovoltaic cells, fuel cells, super capacitors and flywheels.
d) State and explain HEVs basic architecture.
e) Compare between Hybrid electric vehicle and Fuel cell electric vehicle.

Q.5 Attempt any two. **12**

a) State and explain overview of batteries and battery parameters, battery charging, regenerative braking.
b) State and Explain classification of HEVs: Conventional HEVs, Grid able HEVs.
c) State and explain fuel efficiency in HEV.

Seat No.	

Set R

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is the benefit of Electric Vehicles?
a) Zero emission b) Lower operating cost
c) Improved performance d) All of above

2) What is the purpose of power electronic controller in electric vehicle?
a) To regulate the flow of electrical energy
b) To monitor the vehicles speed
c) To control the onboard charger
d) To regulate the battery's state of charge

3) What is the purpose of equalization in battery Storage?
a) To balance cell voltage b) To increase battery capacity
c) To reduce charging time d) To improve discharge rate

4) What is the primary function of the on board charger in electric vehicle?
a) To charge the battery from an external power source
b) To convert AC power to DC power
c) To regulate battery's state of charge
d) To monitor the vehicles speed

5) What is an electric vehicle?
a) Vehicle powered by gasoline
b) Vehicle powered by Electricity
c) Vehicle powered by Diesel
d) Vehicle powered by solar energy

6) What is the function of electric motor in an EV?
a) To charge the battery b) To power the wheels
c) To generate electricity d) To cool the vehicle

7) What is the purpose of battery management system (BMS) in an EV?
a) To monitor and control the battery's state of charge
b) To power the electric motor
c) To generate electricity
d) To cool the vehicle

8) What is the primary advantage of hybrid electric vehicle?
a) Increase driving range
b) Decreased operating cost
c) Reduced Greenhouse gas emissions
d) All of above

9) What type of battery is commonly used in Battery Electric Vehicles?
a) Lead -acid battery b) Nickel- metal hybrid battery
c) Lithium- ion battery d) All of above

10) Which is the types of electric vehicle charging?
a) Level one charging b) Level two charging
c) DC fast charging d) All of the above

11) Which of the following affects battery lifespan?
a) Depth of discharge (DOD) b) Temperature
c) Charging Frequency d) All of above

12) What type of fuel do Fuel Cell Electric Vehicles use?
a) Gasoline b) Diesel
c) Hydrogen d) Natural gas

13) What is the primary cause of battery degradation?
a) Overcharge b) Undercharge
c) Depth of discharge d) High temperature

14) How does battery storage system help in grid stability?
a) By supplying reactive power
b) By absorbing excess energy
c) By providing frequency regulation
d) All of above

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four **16**

a) State and explain challenges faced by Hybrid electric vehicle.
b) State and explain Economics and Environmental impacts of using electrical vehicles.
c) State and explain need of Electrical Vehicle.
d) State and Explain common part between ICE and EV drivetrain.
e) State and explain battery pack and battery management system.

Q.3 Attempt any two. **12**

a) State and explain major requirements of electrical vehicles.
b) State and explain types of electric vehicles in brief.
c) State and explain electric vehicle configuration in brief.

Section – II

Q.4 Attempt any Four. **16**

a) State and explain battery based energy storage system.
b) State and Explain components of HEVs drive train system.
c) State and explain alternative novel energy source solar photovoltaic cells, fuel cells, super capacitors and flywheels.
d) State and explain HEVs basic architecture.
e) Compare between Hybrid electric vehicle and Fuel cell electric vehicle.

Q.5 Attempt any two. **12**

a) State and explain overview of batteries and battery parameters, battery charging, regenerative braking.
b) State and Explain classification of HEVs: Conventional HEVs, Grid able HEVs.
c) State and explain fuel efficiency in HEV.

Seat No.		Set	S

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which is the types of electric vehicle charging?
a) Level one charging b) Level two charging
c) DC fast charging d) All of the above

2) Which of the following affects battery lifespan?
a) Depth of discharge (DOD) b) Temperature
c) Charging Frequency d) All of above

3) What type of fuel do Fuel Cell Electric Vehicles use?
a) Gasoline b) Diesel
c) Hydrogen d) Natural gas

4) What is the primary cause of battery degradation?
a) Overcharge b) Undercharge
c) Depth of discharge d) High temperature

5) How does battery storage system help in grid stability?
a) By supplying reactive power
b) By absorbing excess energy
c) By providing frequency regulation
d) All of above

6) Which of the following is the benefit of Electric Vehicles?
a) Zero emission b) Lower operating cost
c) Improved performance d) All of above

7) What is the purpose of power electronic controller in electric vehicle?
a) To regulate the flow of electrical energy
b) To monitor the vehicles speed
c) To control the onboard charger
d) To regulate the battery's state of charge

8) What is the purpose of equalization in battery Storage?
a) To balance cell voltage
b) To increase battery capacity
c) To reduce charging time
d) To improve discharge rate

9) What is the primary function of the on board charger in electric vehicle?
a) To charge the battery from an external power source
b) To convert AC power to DC power
c) To regulate battery's state of charge
d) To monitor the vehicles speed

10) What is an electric vehicle?
a) Vehicle powered by gasoline
b) Vehicle powered by Electricity
c) Vehicle powered by Diesel
d) Vehicle powered by solar energy

11) What is the function of electric motor in an EV?
a) To charge the battery
b) To power the wheels
c) To generate electricity
d) To cool the vehicle

12) What is the purpose of battery management system (BMS) in an EV?
a) To monitor and control the battery's state of charge
b) To power the electric motor
c) To generate electricity
d) To cool the vehicle

13) What is the primary advantage of hybrid electric vehicle?
a) Increase driving range
b) Decreased operating cost
c) Reduced Greenhouse gas emissions
d) All of above

14) What type of battery is commonly used in Battery Electric Vehicles?
a) Lead -acid battery
b) Nickel- metal hybrid battery
c) Lithium- ion battery
d) All of above

Seat No.	

Set **S**

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four **16**

a) State and explain challenges faced by Hybrid electric vehicle.
b) State and explain Economics and Environmental impacts of using electrical vehicles.
c) State and explain need of Electrical Vehicle.
d) State and Explain common part between ICE and EV drivetrain.
e) State and explain battery pack and battery management system.

Q.3 Attempt any two. **12**

a) State and explain major requirements of electrical vehicles.
b) State and explain types of electric vehicles in brief.
c) State and explain electric vehicle configuration in brief.

Section – II

Q.4 Attempt any Four. **16**

a) State and explain battery based energy storage system.
b) State and Explain components of HEVs drive train system.
c) State and explain alternative novel energy source solar photovoltaic cells, fuel cells, super capacitors and flywheels.
d) State and explain HEVs basic architecture.
e) Compare between Hybrid electric vehicle and Fuel cell electric vehicle.

Q.5 Attempt any two. **12**

a) State and explain overview of batteries and battery parameters, battery charging, regenerative braking.
b) State and Explain classification of HEVs: Conventional HEVs, Grid able HEVs.
c) State and explain fuel efficiency in HEV.

SLR-BD-146

Seat No.		Set	P

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Machine Learning (CSEHON-01A)

Day & Date: Friday 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which are not the approaches of machine learning?
a) Reinforcement Learning b) Unsupervised Learning
c) Semi-supervised Learning d) Natural language processing

2) Do you need maths for machine learning.
a) Yes b) No

3) Identify the successful applications of ML.
a) Learning to classify new astronomical structures
b) Learning to recognize spoken words
c) Learning to drive an autonomous vehicle
d) All of the above

4) Machine learning model which is built on sample data is known as _.
a) Transfer data b) Training data
c) Clean data d) None of the above

5) Analysis of ML algorithm needs _____.
a) Statistical learning theory b) Computational learning theory
c) Both a and b d) None of the above

6) Gradient Descent is an optimization algorithm used for, _____.
a) Certain Changes in algorithm
b) Minimizing the cost function in various machine learning algorithms
c) Maximizing the cost function in various machine learning algorithms
d) Remaining same the cost function in various machine learning algorithms

7) _____, the algorithm follows a straight path towards the minimum.
a) Batch Gradient Descent b) Stochastic Gradient Descent
c) Mini Batch gradient descent d) None of the above

8) Automatic speech recognition find a wide variety of applications in the _____ domains.
a) Medical Assistance b) Industrial Robotics
c) Defence and Aviation d) All of the above

9) What is linear regression used for _____.
a) It is used to predict the value of a variable based on the value of another variable
b) To calculate the sum of 2 numbers
c) To predict the value
d) None of this

10) Which of the following is not supervised learning?
a) Naive Bayesian b) Linear Regression
c) PCA d) Decision Tree

11) What is the application of a machine learning method to a large dataset called?
a) Database b) Data Mining
c) Supervised Learning d) None of the above

12) _____ is the machine learning algorithms that can be used with unlabeled data.
a) Regression Algorithms b) Clustering Algorithms
c) Association Algorithms d) All of the above

13) What kind of learning algorithm for “Facial identities or facial expressions”?
a) Prediction b) Recognition Patterns
c) Generating Patterns d) Recognizing Anomalies

14) _____ of hypothesis h with respect to target concept c and distribution D, is the probability that h will misclassify an instance drawn at random according to D.
a) True Error b) Type 1 Error
c) Type 2 Error d) None of these

SLR-BD-146

Seat No.	

Set P

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Machine Learning (CSEHON-01A)

Day & Date: Friday 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any four: **12**
- **a)** Explain Cost Function in detail.
- **b)** Write a note on Data Mining and Statistics in machine learning.
- **c)** Explain the Leveraging the Power of Machine Learning.
- **d)** Write a difference between descriptive and inferential statistics.

Q.3 Answer any one: **16**
- **a)** Explain Applications of machine learning in detail.
- **b)** Explain Types of Machine Learning.
- **c)** Explain Machine Learning Life Cycle.

Section – II

Q.4 Answer any four: **12**
- **a)** Explain K-Fold Cross validation in detail.
- **b)** What are different Out_of_Sample Errors in validation.
- **c)** Explain Greedy Classification Trees with the help of examples.
- **d)** Write a note on Averaging model and Stacking Model.

Q.5 Answer any one: **16**
- **a)** Explain Feature Engineering.
- **b)** Explain the Classification of images application step by step with an example.
- **c)** Explain different validation techniques.

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Machine Learning (CSEHON-01A)

Day & Date: Friday 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Automatic speech recognition find a wide variety of applications in the _____ domains.
a) Medical Assistance b) Industrial Robotics
c) Defence and Aviation d) All of the above

2) What is linear regression used for _____.
a) It is used to predict the value of a variable based on the value of another variable
b) To calculate the sum of 2 numbers
c) To predict the value
d) None of this

3) Which of the following is not supervised learning?
a) Naive Bayesian b) Linear Regression
c) PCA d) Decision Tree

4) What is the application of a machine learning method to a large dataset called?
a) Database b) Data Mining
c) Supervised Learning d) None of the above

5) _____ is the machine learning algorithms that can be used with unlabeled data.
a) Regression Algorithms b) Clustering Algorithms
c) Association Algorithms d) All of the above

6) What kind of learning algorithm for "Facial identities or facial expressions"?
a) Prediction b) Recognition Patterns
c) Generating Patterns d) Recognizing Anomalies

7) _____ of hypothesis h with respect to target concept c and distribution D, is the probability that h will misclassify an instance drawn at random according to D.

a) True Error b) Type 1 Error
c) Type 2 Error d) None of these

8) Which are not the approaches of machine learning?

a) Reinforcement Learning b) Unsupervised Learning
c) Semi-supervised Learning d) Natural language processing

9) Do you need maths for machine learning.

a) Yes b) No

10) Identify the successful applications of ML.

a) Learning to classify new astronomical structures
b) Learning to recognize spoken words
c) Learning to drive an autonomous vehicle
d) All of the above

11) Machine learning model which is built on sample data is known as _.

a) Transfer data b) Training data
c) Clean data d) None of the above

12) Analysis of ML algorithm needs _____.

a) Statistical learning theory b) Computational learning theory
c) Both a and b d) None of the above

13) Gradient Descent is an optimization algorithm used for, _____.

a) Certain Changes in algorithm
b) Minimizing the cost function in various machine learning algorithms
c) Maximizing the cost function in various machine learning algorithms
d) Remaining same the cost function in various machine learning algorithms

14) _____, the algorithm follows a straight path towards the minimum.

a) Batch Gradient Descent b) Stochastic Gradient Descent
c) Mini Batch gradient descent d) None of the above

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Machine Learning (CSEHON-01A)

Day & Date: Friday 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any four: **12**
- **a)** Explain Cost Function in detail.
- **b)** Write a note on Data Mining and Statistics in machine learning.
- **c)** Explain the Leveraging the Power of Machine Learning.
- **d)** Write a difference between descriptive and inferential statistics.

Q.3 Answer any one: **16**
- **a)** Explain Applications of machine learning in detail.
- **b)** Explain Types of Machine Learning.
- **c)** Explain Machine Learning Life Cycle.

Section – II

Q.4 Answer any four: **12**
- **a)** Explain K-Fold Cross validation in detail.
- **b)** What are different Out_of_Sample Errors in validation.
- **c)** Explain Greedy Classification Trees with the help of examples.
- **d)** Write a note on Averaging model and Stacking Model.

Q.5 Answer any one: **16**
- **a)** Explain Feature Engineering.
- **b)** Explain the Classification of images application step by step with an example.
- **c)** Explain different validation techniques.

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Machine Learning (CSEHON-01A)

Day & Date: Friday 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the application of a machine learning method to a large dataset called?
a) Database b) Data Mining
c) Supervised Learning d) None of the above

2) _____ is the machine learning algorithms that can be used with unlabeled data.
a) Regression Algorithms b) Clustering Algorithms
c) Association Algorithms d) All of the above

3) What kind of learning algorithm for "Facial identities or facial expressions"?
a) Prediction b) Recognition Patterns
c) Generating Patterns d) Recognizing Anomalies

4) _____ of hypothesis h with respect to target concept c and distribution D, is the probability that h will misclassify an instance drawn at random according to D.
a) True Error b) Type 1 Error
c) Type 2 Error d) None of these

5) Which are not the approaches of machine learning?
a) Reinforcement Learning b) Unsupervised Learning
c) Semi-supervised Learning d) Natural language processing

6) Do you need maths for machine learning.
a) Yes b) No

7) Identify the successful applications of ML.
a) Learning to classify new astronomical structures
b) Learning to recognize spoken words
c) Learning to drive an autonomous vehicle
d) All of the above

8) Machine learning model which is built on sample data is known as _.
a) Transfer data b) Training data
c) Clean data d) None of the above

9) Analysis of ML algorithm needs _____.
a) Statistical learning theory b) Computational learning theory
c) Both a and b d) None of the above

10) Gradient Descent is an optimization algorithm used for, _____.
a) Certain Changes in algorithm
b) Minimizing the cost function in various machine learning algorithms
c) Maximizing the cost function in various machine learning algorithms
d) Remaining same the cost function in various machine learning algorithms

11) _____, the algorithm follows a straight path towards the minimum.
a) Batch Gradient Descent b) Stochastic Gradient Descent
c) Mini Batch gradient descent d) None of the above

12) Automatic speech recognition find a wide variety of applications in the _____ domains.
a) Medical Assistance b) Industrial Robotics
c) Defence and Aviation d) All of the above

13) What is linear regression used for _____.
a) It is used to predict the value of a variable based on the value of another variable
b) To calculate the sum of 2 numbers
c) To predict the value
d) None of this

14) Which of the following is not supervised learning?
a) Naive Bayesian b) Linear Regression
c) PCA d) Decision Tree

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Machine Learning (CSEHON-01A)

Day & Date: Friday 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any four: **12**
- **a)** Explain Cost Function in detail.
- **b)** Write a note on Data Mining and Statistics in machine learning.
- **c)** Explain the Leveraging the Power of Machine Learning.
- **d)** Write a difference between descriptive and inferential statistics.

Q.3 Answer any one: **16**
- **a)** Explain Applications of machine learning in detail.
- **b)** Explain Types of Machine Learning.
- **c)** Explain Machine Learning Life Cycle.

Section – II

Q.4 Answer any four: **12**
- **a)** Explain K-Fold Cross validation in detail.
- **b)** What are different Out_of_Sample Errors in validation.
- **c)** Explain Greedy Classification Trees with the help of examples.
- **d)** Write a note on Averaging model and Stacking Model.

Q.5 Answer any one: **16**
- **a)** Explain Feature Engineering.
- **b)** Explain the Classification of images application step by step with an example.
- **c)** Explain different validation techniques.

Seat No.		Set	S

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Machine Learning (CSEHON-01A)

Day & Date: Friday 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Gradient Descent is an optimization algorithm used for, _____.
a) Certain Changes in algorithm
b) Minimizing the cost function in various machine learning algorithms
c) Maximizing the cost function in various machine learning algorithms
d) Remaining same the cost function in various machine learning algorithms

2) _____, the algorithm follows a straight path towards the minimum.
a) Batch Gradient Descent b) Stochastic Gradient Descent
c) Mini Batch gradient descent d) None of the above

3) Automatic speech recognition find a wide variety of applications in the _____ domains.
a) Medical Assistance b) Industrial Robotics
c) Defence and Aviation d) All of the above

4) What is linear regression used for _____.
a) It is used to predict the value of a variable based on the value of another variable
b) To calculate the sum of 2 numbers
c) To predict the value
d) None of this

5) Which of the following is not supervised learning?
a) Naive Bayesian b) Linear Regression
c) PCA d) Decision Tree

6) What is the application of a machine learning method to a large dataset called?

a) Database b) Data Mining
c) Supervised Learning d) None of the above

7) _____ is the machine learning algorithms that can be used with unlabeled data.

a) Regression Algorithms b) Clustering Algorithms
c) Association Algorithms d) All of the above

8) What kind of learning algorithm for “Facial identities or facial expressions”?

a) Prediction b) Recognition Patterns
c) Generating Patterns d) Recognizing Anomalies

9) _____ of hypothesis h with respect to target concept c and distribution D, is the probability that h will misclassify an instance drawn at random according to D.

a) True Error b) Type 1 Error
c) Type 2 Error d) None of these

10) Which are not the approaches of machine learning?

a) Reinforcement Learning b) Unsupervised Learning
c) Semi-supervised Learning d) Natural language processing

11) Do you need maths for machine learning.

a) Yes b) No

12) Identify the successful applications of ML.

a) Learning to classify new astronomical structures
b) Learning to recognize spoken words
c) Learning to drive an autonomous vehicle
d) All of the above

13) Machine learning model which is built on sample data is known as _.

a) Transfer data b) Training data
c) Clean data d) None of the above

14) Analysis of ML algorithm needs _____.

a) Statistical learning theory b) Computational learning theory
c) Both a and b d) None of the above

SLR-BD-146

Seat No.	

Set S

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Machine Learning (CSEHON-01A)

Day & Date: Friday 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any four: **12**
- **a)** Explain Cost Function in detail.
- **b)** Write a note on Data Mining and Statistics in machine learning.
- **c)** Explain the Leveraging the Power of Machine Learning.
- **d)** Write a difference between descriptive and inferential statistics.

Q.3 Answer any one: **16**
- **a)** Explain Applications of machine learning in detail.
- **b)** Explain Types of Machine Learning.
- **c)** Explain Machine Learning Life Cycle.

Section – II

Q.4 Answer any four: **12**
- **a)** Explain K-Fold Cross validation in detail.
- **b)** What are different Out_of_Sample Errors in validation.
- **c)** Explain Greedy Classification Trees with the help of examples.
- **d)** Write a note on Averaging model and Stacking Model.

Q.5 Answer any one: **16**
- **a)** Explain Feature Engineering.
- **b)** Explain the Classification of images application step by step with an example.
- **c)** Explain different validation techniques.

SLR-BD-147

Seat No.		Set	P

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Cryptography (CSEHON-01B)

Day & Date: Friday, 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) A substitution technique in which every new message requires a new key of the same length as the new message is known as ___.
a) Hill Cipher b) Playfair Cipher
c) One-time Pad d) Caesar Cipher

2) Use Caesar's Cipher to decipher the following text "HQFUBSWHG WHAW"
a) ABANDONED LOCK b) ENCRYPTED TEXT
c) BANDONED TEXT d) ENCRYPTED LOCK

3) ITU-T Recommendation X-800 defines _____.
a) Security attacks b) Security services
c) Security mechanisms d) All the above

4) With Rail Fence Technique having height/level/rows 3 what will be ciphertext of following plaintext = solapuruniversitysolapur.
a) spnryaoauuiestslprlrviou b) slprnvriyoauoauuiestslpr
c) srroouuesslrlpnviyauaitp d) srnrayoauuiestslprlrviou

5) NIST stands for _____.
a) National Information Security Technology
b) National Information Standard Technology
c) National Institute of Standard and Technology
c) National Institute of Security Technology

6) How many round does AES-192 perform?
a) 10 b) 12
c) 14 d) 16

7) In AES Algorithm following operation need not be performed in last round.

a) Add round key b) Mix column
c) Shift row d) Byte Substitution

8) Amitabh digitally signs a message and sends it to Jaya. Verification of the signature by jaya requires.

a) Amitabh's public key b) Amitabh's private key
c) Jaya's public key d) Jaya's private key

9) If end to end connection is done at a network or IP level, and if there are N hosts, then what is the number of keys required?

a) N(N-1)/2 b) N
c) N(N+1)/2 d) N/2

10) The _____ property protects against a sophisticated class of attack known as the birthday attack.

a) collision resistant b) one-way
c) preimage resistant d) second preimage resistant

11) A hash function guarantees the integrity of a message. It guarantees that the message has not be _____.

a) Replaced b) Over view
c) Changed d) Violated

12) Hashed message is signed by a sender using _____.

a) his public key b) his private key
c) receiver’s public key d) receiver’s private key

13) Which of the following is the least secure method of authentication?

a) Key card b) Fingerprint
c) Retina pattern d) Password

14) What are the common security threats?

a) File Shredding b) File sharing and permission
c) File corrupting d) File integrity

SLR-BD-147

Seat No.	

Set P

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Cryptography (CSEHON-01B)

Day & Date: Friday, 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any three: **12**

a) Differentiate between substitution and transposition technique.
b) What is the ciphertext of the word "MAHARASHTRA" if we use a key of 4 in the Caesar Cipher?
c) Write short note on Steganography.
d) Explain in details AddRoundkey() function of AES.

Q.3 Answer any two: **16**

a) Explain the fundamental difference between an active attack and a passive attack in network security, providing examples of each.
b) Construct the playfair matrix with the key "SECURITY" and use it to encrypt the message "ENCRYPTION IS FUN".
c) Explain the working of DES with neat diagram.

Section – II

Q.4 Answer any three: **12**

a) Explain principles of public key cryptosystem.
b) Perform the encryption and decryption of RSA Algorithm for p=5, q=7, e=7 and M=12.
c) List and explain five properties of digital signature.
d) Explain identity management architecture.

Q.5 Answer any two: **16**

a) Explain Diffe-Helman key exchange protocol. For Users A and B, the Diffie-Hellman key exchange technique with a common prime q=83 and primitive root $\alpha = 5$. If A has a private key XA= 6, Calculate A's public key YA?
b) Describe with diagram three basic uses of Message Authentication Code.
c) Explain working of Kerberos version 4 and summarise Message exchange.

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Cryptography (CSEHON-01B)

Day & Date: Friday, 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Amitabh digitally signs a message and sends it to Jaya. Verification of the signature by jaya requires.
a) Amitabh's public key b) Amitabh's private key
c) Jaya's public key d) Jaya's private key

2) If end to end connection is done at a network or IP level, and if there are N hosts, then what is the number of keys required?
a) N(N-1)/2 b) N
c) N(N+1)/2 d) N/2

3) The _____ property protects against a sophisticated class of attack known as the birthday attack.
a) collision resistant b) one-way
c) preimage resistant d) second preimage resistant

4) A hash function guarantees the integrity of a message. It guarantees that the message has not be _____.
a) Replaced b) Over view
c) Changed d) Violated

5) Hashed message is signed by a sender using _____.
a) his public key b) his private key
c) receiver's public key d) receiver's private key

6) Which of the following is the least secure method of authentication?
a) Key card b) Fingerprint
c) Retina pattern d) Password

7) What are the common security threats?
a) File Shredding b) File sharing and permission
c) File corrupting d) File integrity

8) A substitution technique in which every new message requires a new key of the same length as the new message is known as ___.

a) Hill Cipher b) Playfair Cipher
c) One-time Pad d) Caesar Cipher

9) Use Caesar's Cipher to decipher the following text "HQFUBSWHG WHAW"

a) ABANDONED LOCK b) ENCRYPTED TEXT
c) BANDONED TEXT d) ENCRYPTED LOCK

10) ITU-T Recommendation X-800 defines _____.

a) Security attacks b) Security services
c) Security mechanisms d) All the above

11) With Rail Fence Technique having height/level/rows 3 what will be ciphertext of following plaintext = solapuruniversitysolapur.

a) spnryaoauuiestslprlrviou b) slprnvriyoauoauuiestslpr
c) srroouuesslrlpnviyauaitp d) srnrayoauuiestslprlrviou

12) NIST stands for _____.

a) National Information Security Technology
b) National Information Standard Technology
c) National Institute of Standard and Technology
c) National Institute of Security Technology

13) How many round does AES-192 perform?

a) 10 b) 12
c) 14 d) 16

14) In AES Algorithm following operation need not be performed in last round.

a) Add round key b) Mix column
c) Shift row d) Byte Substitution

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Cryptography (CSEHON-01B)

Day & Date: Friday, 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any three: **12**

a) Differentiate between substitution and transposition technique.
b) What is the ciphertext of the word "MAHARASHTRA" if we use a key of 4 in the Caesar Cipher?
c) Write short note on Steganography.
d) Explain in details AddRoundkey() function of AES.

Q.3 Answer any two: **16**

a) Explain the fundamental difference between an active attack and a passive attack in network security, providing examples of each.
b) Construct the playfair matrix with the key "SECURITY" and use it to encrypt the message "ENCRYPTION IS FUN".
c) Explain the working of DES with neat diagram.

Section – II

Q.4 Answer any three: **12**

a) Explain principles of public key cryptosystem.
b) Perform the encryption and decryption of RSA Algorithm for p=5, q=7, e=7 and M=12.
c) List and explain five properties of digital signature.
d) Explain identity management architecture.

Q.5 Answer any two: **16**

a) Explain Diffe-Helman key exchange protocol. For Users A and B, the Diffie-Hellman key exchange technique with a common prime q=83 and primitive root $\alpha = 5$. If A has a private key XA= 6, Calculate A's public key YA?
b) Describe with diagram three basic uses of Message Authentication Code.
c) Explain working of Kerberos version 4 and summarise Message exchange.

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Cryptography (CSEHON-01B)

Day & Date: Friday, 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) A hash function guarantees the integrity of a message. It guarantees that the message has not be _____.
a) Replaced b) Over view
c) Changed d) Violated

2) Hashed message is signed by a sender using _____.
a) his public key b) his private key
c) receiver's public key d) receiver's private key

3) Which of the following is the least secure method of authentication?
a) Key card b) Fingerprint
c) Retina pattern d) Password

4) What are the common security threats?
a) File Shredding b) File sharing and permission
c) File corrupting d) File integrity

5) A substitution technique in which every new message requires a new key of the same length as the new message is known as ___.
a) Hill Cipher b) Playfair Cipher
c) One-time Pad d) Caesar Cipher

6) Use Caesar's Cipher to decipher the following text "HQFUBSWHG WHAW"
a) ABANDONED LOCK b) ENCRYPTED TEXT
c) BANDONED TEXT d) ENCRYPTED LOCK

7) ITU-T Recommendation X-800 defines _____.
a) Security attacks b) Security services
c) Security mechanisms d) All the above

8) With Rail Fence Technique having height/level/rows 3 what will be ciphertext of following plaintext = solapuruniversitysolapur.

a) spnryaoauuiestslprlrviou b) slprnvriyoauoauuiestslpr
c) srroouuesslrlpnviyauaitp d) srnrayoauuiestslprlrviou

10) NIST stands for _____.

a) National Information Security Technology
b) National Information Standard Technology
c) National Institute of Standard and Technology
c) National Institute of Security Technology

10) How many round does AES-192 perform?

a) 10 b) 12
c) 14 d) 16

11) In AES Algorithm following operation need not be performed in last round.

a) Add round key b) Mix column
c) Shift row d) Byte Substitution

12) Amitabh digitally signs a message and sends it to Jaya. Verification of the signature by jaya requires.

a) Amitabh's public key b) Amitabh's private key
c) Jaya's public key d) Jaya's private key

13) If end to end connection is done at a network or IP level, and if there are N hosts, then what is the number of keys required?

a) N(N-1)/2 b) N
c) N(N+1)/2 d) N/2

14) The _____ property protects against a sophisticated class of attack known as the birthday attack.

a) collision resistant b) one-way
c) preimage resistant d) second preimage resistant

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Cryptography (CSEHON-01B)

Day & Date: Friday, 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any three: **12**

a) Differentiate between substitution and transposition technique.
b) What is the ciphertext of the word "MAHARASHTRA" if we use a key of 4 in the Caesar Cipher?
c) Write short note on Steganography.
d) Explain in details AddRoundkey() function of AES.

Q.3 Answer any two: **16**

a) Explain the fundamental difference between an active attack and a passive attack in network security, providing examples of each.
b) Construct the playfair matrix with the key "SECURITY" and use it to encrypt the message "ENCRYPTION IS FUN".
c) Explain the working of DES with neat diagram.

Section – II

Q.4 Answer any three: **12**

a) Explain principles of public key cryptosystem.
b) Perform the encryption and decryption of RSA Algorithm for p=5, q=7, e=7 and M=12.
c) List and explain five properties of digital signature.
d) Explain identity management architecture.

Q.5 Answer any two: **16**

a) Explain Diffe-Helman key exchange protocol. For Users A and B, the Diffie-Hellman key exchange technique with a common prime q=83 and primitive root $\alpha = 5$. If A has a private key XA= 6, Calculate A's public key YA?
b) Describe with diagram three basic uses of Message Authentication Code.
c) Explain working of Kerberos version 4 and summarise Message exchange.

Seat No.	

Set **S**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Cryptography (CSEHON-01B)

Day & Date: Friday, 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) How many round does AES-192 perform?
a) 10 b) 12
c) 14 d) 16

2) In AES Algorithm following operation need not be performed in last round.
a) Add round key b) Mix column
c) Shift row d) Byte Substitution

3) Amitabh digitally signs a message and sends it to Jaya. Verification of the signature by jaya requires.
a) Amitabh's public key b) Amitabh's private key
c) Jaya's public key d) Jaya's private key

4) If end to end connection is done at a network or IP level, and if there are N hosts, then what is the number of keys required?
a) N(N-1)/2 b) N
c) N(N+1)/2 d) N/2

5) The _____ property protects against a sophisticated class of attack known as the birthday attack.
a) collision resistant b) one-way
c) preimage resistant d) second preimage resistant

6) A hash function guarantees the integrity of a message. It guarantees that the message has not be _____.
a) Replaced b) Over view
c) Changed d) Violated

7) Hashed message is signed by a sender using _____.
a) his public key b) his private key
c) receiver's public key d) receiver's private key

8) Which of the following is the least secure method of authentication?
a) Key card b) Fingerprint
c) Retina pattern d) Password

9) What are the common security threats?
a) File Shredding b) File sharing and permission
c) File corrupting d) File integrity

10) A substitution technique in which every new message requires a new key of the same length as the new message is known as ___.
a) Hill Cipher b) Playfair Cipher
c) One-time Pad d) Caesar Cipher

11) Use Caesar's Cipher to decipher the following text "HQFUBSWHG WHAW"
a) ABANDONED LOCK b) ENCRYPTED TEXT
c) BANDONED TEXT d) ENCRYPTED LOCK

12) ITU-T Recommendation X-800 defines _____.
a) Security attacks b) Security services
c) Security mechanisms d) All the above

13) With Rail Fence Technique having height/level/rows 3 what will be ciphertext of following plaintext = solapuruniversitysolapur.
a) spnryaoauuiestslprlrviou b) slprnvriyoauoauuiestslpr
c) srroouuesslrlpnviyauaitp d) srnrayoauuiestslprlrviou

14) NIST stands for _____.
a) National Information Security Technology
b) National Information Standard Technology
c) National Institute of Standard and Technology
c) National Institute of Security Technology

SLR-BD-147

Seat No.	

Set S

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Cryptography (CSEHON-01B)

Day & Date: Friday, 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any three: **12**

a) Differentiate between substitution and transposition technique.
b) What is the ciphertext of the word "MAHARASHTRA" if we use a key of 4 in the Caesar Cipher?
c) Write short note on Steganography.
d) Explain in details AddRoundkey() function of AES.

Q.3 Answer any two: **16**

a) Explain the fundamental difference between an active attack and a passive attack in network security, providing examples of each.
b) Construct the playfair matrix with the key "SECURITY" and use it to encrypt the message "ENCRYPTION IS FUN".
c) Explain the working of DES with neat diagram.

Section – II

Q.4 Answer any three: **12**

a) Explain principles of public key cryptosystem.
b) Perform the encryption and decryption of RSA Algorithm for p=5, q=7, e=7 and M=12.
c) List and explain five properties of digital signature.
d) Explain identity management architecture.

Q.5 Answer any two: **16**

a) Explain Diffe-Helman key exchange protocol. For Users A and B, the Diffie-Hellman key exchange technique with a common prime q=83 and primitive root $\alpha = 5$. If A has a private key XA= 6, Calculate A's public key YA?
b) Describe with diagram three basic uses of Message Authentication Code.
c) Explain working of Kerberos version 4 and summarise Message exchange.

SLR-BD-149

Seat No.		Set	P

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Universal Human Values (VEC-01)

Day & Date: Saturday, 24-05-2025 Max. Marks: 50
Time: 03:00 PM To 4:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) Basic unit of human interaction is _____.
a) Family b) Society
c) Group d) None of the above

2) The Self(I) is the seer, _____.
a) Doer b) Enjoyer
c) Doer & Enjoyer d) None

3) PROSPERITY deals with _____.
a) Right understanding in the self
b) Fulfilment in relationship
c) Ensuring more than required physical facility
d) None

4) When we expect feelings from others for our happiness, it is a state of _____.
a) Swatantrata b) Partantrata
c) Prosperity d) None

5) For continuity of happiness, what is essential?
a) Right understanding in the Self
b) Right feeling and right thought in the Self
c) Recognition of needs, ensure more than required, make right utilisation of it
d) All the above

6) Right Understanding and Right Feeling is matter of _____.
a) Self b) Body
c) Both d) None

7) Acceptance of excellence in others is called _____.

a) Gratitude b) Reverence
c) Glory d) None of above

8) Self and _____ are different in nature, materiality, needs and activities.

a) Prosperity b) Right Understanding
c) Body d) None of above

9) _____ is assuming without knowing.

a) Knowing b) Assuming
c) Preconditioning d) Relationship

10) Imagination is combination of _____.

a) Desire & thought
b) Desire, thought & expectation
c) Expectation & thought
d) None of above

11) Following are the basic guidelines for value education except _____.

a) Universal b) Personal
c) Rational d) Natural

12) Natural acceptance and _____ are the two processes of knowing.

a) Self-Actualization b) Self-exploration
c) Self Evaluation d) Self control

13) Human Life is lived at four levels: Individual, Family, and Society and _____.

a) Nature b) Nurture
c) World d) Universe

14) Value education should not be based on dogmas or blind beliefs _____.

a) True b) False

15) Value of an entity is _____.

a) Physical Facility
b) Prosperity
c) Its participation in the larger order of which it is part
d) both a and b

16) _____ are as Basic Human Aspirations.

a) Money
b) Relationship without money
c) Physical Facility
d) Continuous Happiness and Prosperity

17) Please give the correct priority for Physical Facilities, Right Understanding and Relationship _____.

a) Physical Facilities, Right Understanding and Relationship
b) Relationship, Right Understanding and Physical Facilities
c) Right Understanding, Relationship and Physical Facilities
d) None of the above

18) Right Understanding in relationship lead to _____.

a) Mutual Happiness b) Mutual Prosperity
c) Both a and b d) All are wrong

19) SSDD stands for _____.

a) Sadhan Viheen Dukhi Daridra
b) Sadhan Sampan Dukhi Daridra
c) Sadhan Sampan Sukhi Samridha
d) None of the above

20) Natural acceptance does not change with _____.

a) Time b) Place
c) Beliefs d) All of above

21) Human being is co-existence of the _____ and the _____.

a) self, self b) body, body
c) self, body d) None

22) _____ is the feeling of responsibility for nurturing, protecting and right utilizing the body.

a) Swasthya b) Sanyam
c) Prosperity d) None

23) The _____ is an instrument of _____.

a) I, Body b) Body, I
c) Both a and b d) None

24) _____ is the information we get from the Body through the five sense organs.

a) Precondition b) Sensation
c) Natural acceptance d) None

25) Which of the following is NOT a response of the Self?

a) Knowing b) Assuming
c) Recognising d) Preconditioning

26) Needs of Body are quantitative whereas needs of Self are qualitative _____.

a) True b) False

27) Sah-astitva means _____.

a) Co-existence b) Co-operation
c) Cooption d) Corporate identity

28) Ensuring justice in the relationship, on the basis of values leads to _____ in society.

a) Fearlessness b) Confusion
c) Confidence d) Fear

29) _____ is the complete value in relationship.

a) Respect b) Love
c) Trust d) Glory

30) The feeling to nurture and protect the body of our relative is called _____.

a) Care b) Affection
c) Gratitude d) Respect

31) _____ is the feeling of acceptance for those who have made efforts for my excellence.

a) Reverence b) Glory
c) Gratitude d) Guidance

32) We all are similar at the level of our _____ but differ in our _____.

a) Competence, Intension b) Intension, Competence
c) Competence, Competence d) None

33) Abhay means _____.

a) Right understanding b) Trust and fearlessness
c) Prosperity d) Co-existance

34) All the units of nature can be classified into _____ orders.

a) Two b) Three
c) Four d) Six

35) Which of the following does not form an order in nature?

a) Bio b) Animal
c) Consciousness d) Human

36) According to quantity, which of the following is true for the orders in nature?

a) Bio order >> Physical order >> Animal order >> Human order
b) Animal order >> Bio order >> Physical order >> Human order
c) Physical order >> Bio order >> Animal order >> Human order
d) Physical order >> Animal order >> Bio order >> Human order

37) What is NOT acceptable naturally in the nature?

a) Enrichment of nature b) Pollution in nature
c) Protection of nature d) Right Utilization of nature

38) Which of the following is NOT a unit of physical order?

a) Soil b) Air
c) Tree d) Water

39) There is justice in relationship when there is _____.
a) Self-regulation b) Freedom
c) Mutual fulfillment d) None

40) Justice from family to world family leads to _____.
a) Powerful nation
b) Strong political ties between nations
c) Undivided society
d) Disruption of the family structure

41) _____ is and it exists between one self (I1) and other self (I2).
a) Body b) Relationship
c) Health d) All

42) Which of the following results from over-evaluation _____.
a) Ego b) Depression
c) Self-confidence d) Trust

43) Which of the following statement is true?
a) Intention of a human being is always doubtful
b) One's intension is always to make the other happy
c) Intension of a human keeps varying from time to time
d) Intension of a human being can never be understood

44) Feeling of relationship exist between _____.
a) Self and self b) Body and Body
c) Self and body d) None of the above

45) Which of the following is NOT one of the goals at the level of society?
a) Right Understanding b) Fearlessness
c) Madness for profit d) Prosperity

46) Intension of a human being is the same as _____.
a) Natural acceptance b) Competence
c) Thought d) Pre-conditioning

47) Harmony should be maintained in _____.
a) Between body and life b) Between self and body
c) Between self and society d) All of the above

48) If something is _____ to us without any force or compulsion, then it is often correct and does not change with time and people.
a) Not acceptable b) Completely acceptable
c) Naturally acceptable d) Less acceptable

49) Nurturing on the Body depends upon _____.
a) Ingestion b) Digestion
c) Excretion d) All of the above

50) Sensation is related to _____.

a) Body
b) Self 'I'
c) Both a and b
d) None of the above

SLR-BD-149

Seat No.		Set	Q

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Universal Human Values (VEC-01)

Day & Date: Saturday, 24-05-2025 Max. Marks: 50
Time: 03:00 PM To 4:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) _____ is the feeling of acceptance for those who have made efforts for my excellence.
a) Reverence b) Glory
c) Gratitude d) Guidance

2) We all are similar at the level of our _____ but differ in our _____.
a) Competence, Intension b) Intension, Competence
c) Competence, Competence d) None

3) Abhay means _____.
a) Right understanding b) Trust and fearlessness
c) Prosperity d) Co-existance

4) All the units of nature can be classified into _____ orders.
a) Two b) Three
c) Four d) Six

5) Which of the following does not form an order in nature?
a) Bio b) Animal
c) Consciousness d) Human

6) According to quantity, which of the following is true for the orders in nature?
a) Bio order >> Physical order >> Animal order >> Human order
b) Animal order >> Bio order >> Physical order >> Human order
c) Physical order >> Bio order >> Animal order >> Human order
d) Physical order >> Animal order >> Bio order >> Human order

7) What is NOT acceptable naturally in the nature?
a) Enrichment of nature b) Pollution in nature
c) Protection of nature d) Right Utilization of nature

8) Which of the following is NOT a unit of physical order?
a) Soil b) Air
c) Tree d) Water

9) There is justice in relationship when there is _____.
a) Self-regulation b) Freedom
c) Mutual fulfillment d) None

10) Justice from family to world family leads to _____.
a) Powerful nation
b) Strong political ties between nations
c) Undivided society
d) Disruption of the family structure

11) _____ is and it exists between one self (I1) and other self (I2).
a) Body b) Relationship
c) Health d) All

12) Which of the following results from over-evaluation _____.
a) Ego b) Depression
c) Self-confidence d) Trust

13) Which of the following statement is true?
a) Intention of a human being is always doubtful
b) One's intension is always to make the other happy
c) Intension of a human keeps varying from time to time
d) Intension of a human being can never be understood

14) Feeling of relationship exist between _____.
a) Self and self b) Body and Body
c) Self and body d) None of the above

15) Which of the following is NOT one of the goals at the level of society?
a) Right Understanding b) Fearlessness
c) Madness for profit d) Prosperity

16) Intension of a human being is the same as _____.
a) Natural acceptance b) Competence
c) Thought d) Pre-conditioning

17) Harmony should be maintained in _____.
a) Between body and life b) Between self and body
c) Between self and society d) All of the above

18) If something is _____ to us without any force or compulsion, then it is often correct and does not change with time and people.
a) Not acceptable b) Completely acceptable
c) Naturally acceptable d) Less acceptable

19) Nurturing on the Body depends upon _____.
a) Ingestion b) Digestion
c) Excretion d) All of the above

20) Sensation is related to _____.
a) Body b) Self 'I'
c) Both a and b d) None of the above

21) Basic unit of human interaction is _____.
a) Family b) Society
c) Group d) None of the above

22) The Self(I) is the seer, _____.
a) Doer b) Enjoyer
c) Doer & Enjoyer d) None

23) PROSPERITY deals with _____.
a) Right understanding in the self
b) Fulfilment in relationship
c) Ensuring more than required physical facility
d) None

24) When we expect feelings from others for our happiness, it is a state of _____.
a) Swatantrata b) Partantrata
c) Prosperity d) None

25) For continuity of happiness, what is essential?
a) Right understanding in the Self
b) Right feeling and right thought in the Self
c) Recognition of needs, ensure more than required, make right utilisation of it
d) All the above

26) Right Understanding and Right Feeling is matter of _____.
a) Self b) Body
c) Both d) None

27) Acceptance of excellence in others is called _____.
a) Gratitude b) Reverence
c) Glory d) None of above

28) Self and _____ are different in nature, materiality, needs and activities.
a) Prosperity b) Right Understanding
c) Body d) None of above

29) _____ is assuming without knowing.

a) Knowing b) Assuming
c) Preconditioning d) Relationship

30) Imagination is combination of _____.

a) Desire & thought
b) Desire, thought & expectation
c) Expectation & thought
d) None of above

31) Following are the basic guidelines for value education except _____.

a) Universal b) Personal
c) Rational d) Natural

32) Natural acceptance and _____ are the two processes of knowing.

a) Self-Actualization b) Self-exploration
c) Self Evaluation d) Self control

33) Human Life is lived at four levels: Individual, Family, and Society and _____.

a) Nature b) Nurture
c) World d) Universe

34) Value education should not be based on dogmas or blind beliefs _____.

a) True b) False

35) Value of an entity is _____.

a) Physical Facility
b) Prosperity
c) Its participation in the larger order of which it is part
d) both a and b

36) _____ are as Basic Human Aspirations.

a) Money
b) Relationship without money
c) Physical Facility
d) Continuous Happiness and Prosperity

37) Please give the correct priority for Physical Facilities, Right Understanding and Relationship _____.

a) Physical Facilities, Right Understanding and Relationship
b) Relationship, Right Understanding and Physical Facilities
c) Right Understanding, Relationship and Physical Facilities
d) None of the above

38) Right Understanding in relationship lead to _____.

a) Mutual Happiness b) Mutual Prosperity

c) Both a and b d) All are wrong

39) SSDD stands for _____.

a) Sadhan Viheen Dukhi Daridra

b) Sadhan Sampan Dukhi Daridra

c) Sadhan Sampan Sukhi Samridha

d) None of the above

40) Natural acceptance does not change with _____.

a) Time b) Place

c) Beliefs d) All of above

41) Human being is co-existence of the _____ and the _____.

a) self, self b) body, body

c) self, body d) None

42) _____ is the feeling of responsibility for nurturing, protecting and right utilizing the body.

a) Swasthya b) Sanyam

c) Prosperity d) None

43) The _____ is an instrument of _____.

a) I, Body b) Body, I

c) Both a and b d) None

44) _____ is the information we get from the Body through the five sense organs.

a) Precondition b) Sensation

c) Natural acceptance d) None

45) Which of the following is NOT a response of the Self?

a) Knowing b) Assuming

c) Recognising d) Preconditioning

46) Needs of Body are quantitative whereas needs of Self are qualitative _____.

a) True b) False

47) Sah-astitva means _____.

a) Co-existence b) Co-operation

c) Cooption d) Corporate identity

48) Ensuring justice in the relationship, on the basis of values leads to _____ in society.

a) Fearlessness b) Confusion

c) Confidence d) Fear

49) _____ is the complete value in relationship.

a) Respect b) Love

c) Trust d) Glory

50) The feeling to nurture and protect the body of our relative is called _____.

a) Care b) Affection

c) Gratitude d) Respect

SLR-BD-149

Seat No.		Set	R

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Universal Human Values (VEC-01)

Day & Date: Saturday, 24-05-2025 Max. Marks: 50
Time: 03:00 PM To 4:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) Following are the basic guidelines for value education except _____.
a) Universal b) Personal
c) Rational d) Natural

2) Natural acceptance and _____ are the two processes of knowing.
a) Self-Actualization b) Self-exploration
c) Self Evaluation d) Self control

3) Human Life is lived at four levels: Individual, Family, and Society and _____.
a) Nature b) Nurture
c) World d) Universe

4) Value education should not be based on dogmas or blind beliefs _____.
a) True b) False

5) Value of an entity is _____.
a) Physical Facility
b) Prosperity
c) Its participation in the larger order of which it is part
d) both a and b

6) _____ are as Basic Human Aspirations.
a) Money
b) Relationship without money
c) Physical Facility
d) Continuous Happiness and Prosperity

7) Please give the correct priority for Physical Facilities, Right Understanding and Relationship _____.

a) Physical Facilities, Right Understanding and Relationship
b) Relationship, Right Understanding and Physical Facilities
c) Right Understanding, Relationship and Physical Facilities
d) None of the above

8) Right Understanding in relationship lead to _____.

a) Mutual Happiness b) Mutual Prosperity
c) Both a and b d) All are wrong

9) SSDD stands for _____.

a) Sadhan Viheen Dukhi Daridra
b) Sadhan Sampan Dukhi Daridra
c) Sadhan Sampan Sukhi Samridha
d) None of the above

10) Natural acceptance does not change with _____.

a) Time b) Place
c) Beliefs d) All of above

11) Human being is co-existence of the _____ and the _____.

a) self, self b) body, body
c) self, body d) None

12) _____ is the feeling of responsibility for nurturing, protecting and right utilizing the body.

a) Swasthya b) Sanyam
c) Prosperity d) None

13) The _____ is an instrument of _____.

a) I, Body b) Body, I
c) Both a and b d) None

14) _____ is the information we get from the Body through the five sense organs.

a) Precondition b) Sensation
c) Natural acceptance d) None

15) Which of the following is NOT a response of the Self?

a) Knowing b) Assuming
c) Recognising d) Preconditioning

16) Needs of Body are quantitative whereas needs of Self are qualitative _____.

a) True b) False

17) Sah-astitva means _____.

a) Co-existence b) Co-operation
c) Cooption d) Corporate identity

18) Ensuring justice in the relationship, on the basis of values leads to _____ in society.

a) Fearlessness b) Confusion
c) Confidence d) Fear

19) _____ is the complete value in relationship.

a) Respect b) Love
c) Trust d) Glory

20) The feeling to nurture and protect the body of our relative is called _____.

a) Care b) Affection
c) Gratitude d) Respect

21) _____ is the feeling of acceptance for those who have made efforts for my excellence.

a) Reverence b) Glory
c) Gratitude d) Guidance

22) We all are similar at the level of our _____ but differ in our _____.

a) Competence, Intension b) Intension, Competence
c) Competence, Competence d) None

23) Abhay means _____.

a) Right understanding b) Trust and fearlessness
c) Prosperity d) Co-existance

24) All the units of nature can be classified into _____ orders.

a) Two b) Three
c) Four d) Six

25) Which of the following does not form an order in nature?

a) Bio b) Animal
c) Consciousness d) Human

26) According to quantity, which of the following is true for the orders in nature?

a) Bio order >> Physical order >> Animal order >> Human order
b) Animal order >> Bio order >> Physical order >> Human order
c) Physical order >> Bio order >> Animal order >> Human order
d) Physical order >> Animal order >> Bio order >> Human order

27) What is NOT acceptable naturally in the nature?

a) Enrichment of nature b) Pollution in nature
c) Protection of nature d) Right Utilization of nature

28) Which of the following is NOT a unit of physical order?

a) Soil b) Air
c) Tree d) Water

29) There is justice in relationship when there is _____.
a) Self-regulation b) Freedom
c) Mutual fulfillment d) None

30) Justice from family to world family leads to _____.
a) Powerful nation
b) Strong political ties between nations
c) Undivided society
d) Disruption of the family structure

31) _____ is and it exists between one self (I1) and other self (I2).
a) Body b) Relationship
c) Health d) All

32) Which of the following results from over-evaluation _____.
a) Ego b) Depression
c) Self-confidence d) Trust

33) Which of the following statement is true?
a) Intention of a human being is always doubtful
b) One's intension is always to make the other happy
c) Intension of a human keeps varying from time to time
d) Intension of a human being can never be understood

34) Feeling of relationship exist between _____.
a) Self and self b) Body and Body
c) Self and body d) None of the above

35) Which of the following is NOT one of the goals at the level of society?
a) Right Understanding b) Fearlessness
c) Madness for profit d) Prosperity

36) Intension of a human being is the same as _____.
a) Natural acceptance b) Competence
c) Thought d) Pre-conditioning

37) Harmony should be maintained in _____.
a) Between body and life b) Between self and body
c) Between self and society d) All of the above

38) If something is _____ to us without any force or compulsion, then it is often correct and does not change with time and people.
a) Not acceptable b) Completely acceptable
c) Naturally acceptable d) Less acceptable

39) Nurturing on the Body depends upon _____.
a) Ingestion b) Digestion
c) Excretion d) All of the above

40) Sensation is related to _____.

a) Body b) Self 'I'
c) Both a and b d) None of the above

41) Basic unit of human interaction is _____.

a) Family b) Society
c) Group d) None of the above

42) The Self(I) is the seer, _____.

a) Doer b) Enjoyer
c) Doer & Enjoyer d) None

43) PROSPERITY deals with _____.

a) Right understanding in the self
b) Fulfilment in relationship
c) Ensuring more than required physical facility
d) None

44) When we expect feelings from others for our happiness, it is a state of _____.

a) Swatantrata b) Partantrata
c) Prosperity d) None

45) For continuity of happiness, what is essential?

a) Right understanding in the Self
b) Right feeling and right thought in the Self
c) Recognition of needs, ensure more than required, make right utilisation of it
d) All the above

46) Right Understanding and Right Feeling is matter of _____.

a) Self b) Body
c) Both d) None

47) Acceptance of excellence in others is called _____.

a) Gratitude b) Reverence
c) Glory d) None of above

48) Self and _____ are different in nature, materiality, needs and activities.

a) Prosperity b) Right Understanding
c) Body d) None of above

49) _____ is assuming without knowing.

a) Knowing b) Assuming
c) Preconditioning d) Relationship

50) Imagination is combination of _____.

a) Desire & thought
b) Desire, thought & expectation
c) Expectation & thought
d) None of above

SLR-BD-149

Seat No.		Set	S

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - I) (New) (NEP CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Universal Human Values (VEC-01)

Day & Date: Saturday, 24-05-2025 Max. Marks: 50
Time: 03:00 PM To 4:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) _____ is and it exists between one self (I1) and other self (I2).
a) Body b) Relationship
c) Health d) All

2) Which of the following results from over-evaluation _____.
a) Ego b) Depression
c) Self-confidence d) Trust

3) Which of the following statement is true?
a) Intention of a human being is always doubtful
b) One's intension is always to make the other happy
c) Intension of a human keeps varying from time to time
d) Intension of a human being can never be understood

4) Feeling of relationship exist between _____.
a) Self and self b) Body and Body
c) Self and body d) None of the above

5) Which of the following is NOT one of the goals at the level of society?
a) Right Understanding b) Fearlessness
c) Madness for profit d) Prosperity

6) Intension of a human being is the same as _____.
a) Natural acceptance b) Competence
c) Thought d) Pre-conditioning

7) Harmony should be maintained in _____.
a) Between body and life b) Between self and body
c) Between self and society d) All of the above

8) If something is _____ to us without any force or compulsion, then it is often correct and does not change with time and people.

a) Not acceptable
b) Completely acceptable
c) Naturally acceptable
d) Less acceptable

9) Nurturing on the Body depends upon _____.

a) Ingestion
b) Digestion
c) Excretion
d) All of the above

10) Sensation is related to _____.

a) Body
b) Self 'I'
c) Both a and b
d) None of the above

11) Basic unit of human interaction is _____.

a) Family
b) Society
c) Group
d) None of the above

12) The Self(I) is the seer, _____.

a) Doer
b) Enjoyer
c) Doer & Enjoyer
d) None

13) PROSPERITY deals with _____.

a) Right understanding in the self
b) Fulfilment in relationship
c) Ensuring more than required physical facility
d) None

14) When we expect feelings from others for our happiness, it is a state of _____.

a) Swatantrata
b) Partantrata
c) Prosperity
d) None

15) For continuity of happiness, what is essential?

a) Right understanding in the Self
b) Right feeling and right thought in the Self
c) Recognition of needs, ensure more than required, make right utilisation of it
d) All the above

16) Right Understanding and Right Feeling is matter of _____.

a) Self
b) Body
c) Both
d) None

17) Acceptance of excellence in others is called _____.

a) Gratitude
b) Reverence
c) Glory
d) None of above

18) Self and _____ are different in nature, materiality, needs and activities.

a) Prosperity
b) Right Understanding
c) Body
d) None of above

19) _____ is assuming without knowing.

a) Knowing
b) Assuming
c) Preconditioning
d) Relationship

20) Imagination is combination of _____.

a) Desire & thought
b) Desire, thought & expectation
c) Expectation & thought
d) None of above

21) Following are the basic guidelines for value education except _____.

a) Universal
b) Personal
c) Rational
d) Natural

22) Natural acceptance and _____ are the two processes of knowing.

a) Self-Actualization
b) Self-exploration
c) Self Evaluation
d) Self control

23) Human Life is lived at four levels: Individual, Family, and Society and _____.

a) Nature
b) Nurture
c) World
d) Universe

24) Value education should not be based on dogmas or blind beliefs _____.

a) True
b) False

25) Value of an entity is _____.

a) Physical Facility
b) Prosperity
c) Its participation in the larger order of which it is part
d) both a and b

26) _____ are as Basic Human Aspirations.

a) Money
b) Relationship without money
c) Physical Facility
d) Continuous Happiness and Prosperity

27) Please give the correct priority for Physical Facilities, Right Understanding and Relationship _____.

a) Physical Facilities, Right Understanding and Relationship
b) Relationship, Right Understanding and Physical Facilities
c) Right Understanding, Relationship and Physical Facilities
d) None of the above

28) Right Understanding in relationship lead to _____.

a) Mutual Happiness
b) Mutual Prosperity
c) Both a and b
d) All are wrong

29) SSDD stands for _____.

a) Sadhan Viheen Dukhi Daridra
b) Sadhan Sampan Dukhi Daridra
c) Sadhan Sampan Sukhi Samridha
d) None of the above

30) Natural acceptance does not change with _____.

a) Time
b) Place
c) Beliefs
d) All of above

31) Human being is co-existence of the _____ and the _____.

a) self, self
b) body, body
c) self, body
d) None

32) _____ is the feeling of responsibility for nurturing, protecting and right utilizing the body.

a) Swasthya
b) Sanyam
c) Prosperity
d) None

33) The _____ is an instrument of _____.

a) I, Body
b) Body, I
c) Both a and b
d) None

34) _____ is the information we get from the Body through the five sense organs.

a) Precondition
b) Sensation
c) Natural acceptance
d) None

35) Which of the following is NOT a response of the Self?

a) Knowing
b) Assuming
c) Recognising
d) Preconditioning

36) Needs of Body are quantitative whereas needs of Self are qualitative _____.

a) True
b) False

37) Sah-astitva means _____.

a) Co-existence
b) Co-operation
c) Cooption
d) Corporate identity

38) Ensuring justice in the relationship, on the basis of values leads to _____ in society.

a) Fearlessness b) Confusion
c) Confidence d) Fear

39) _____ is the complete value in relationship.

a) Respect b) Love
c) Trust d) Glory

40) The feeling to nurture and protect the body of our relative is called _____.

a) Care b) Affection
c) Gratitude d) Respect

41) _____ is the feeling of acceptance for those who have made efforts for my excellence.

a) Reverence b) Glory
c) Gratitude d) Guidance

42) We all are similar at the level of our _____ but differ in our _____.

a) Competence, Intension b) Intension, Competence
c) Competence, Competence d) None

43) Abhay means _____.

a) Right understanding b) Trust and fearlessness
c) Prosperity d) Co-existance

44) All the units of nature can be classified into _____ orders.

a) Two b) Three
c) Four d) Six

45) Which of the following does not form an order in nature?

a) Bio b) Animal
c) Consciousness d) Human

46) According to quantity, which of the following is true for the orders in nature?

a) Bio order >> Physical order >> Animal order >> Human order
b) Animal order >> Bio order >> Physical order >> Human order
c) Physical order >> Bio order >> Animal order >> Human order
d) Physical order >> Animal order >> Bio order >> Human order

47) What is NOT acceptable naturally in the nature?

a) Enrichment of nature b) Pollution in nature
c) Protection of nature d) Right Utilization of nature

48) Which of the following is NOT a unit of physical order?

a) Soil b) Air
c) Tree d) Water

49) There is justice in relationship when there is _____.

a) Self-regulation b) Freedom

c) Mutual fulfillment d) None

50) Justice from family to world family leads to _____.

a) Powerful nation

b) Strong political ties between nations

c) Undivided society

d) Disruption of the family structure

Seat No.	

Set P

S.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2025
Applied Mathematics – I (BTN03301)

Day & Date: Saturday 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) The solution of $\frac{d^3y}{dx^3} - 4\frac{dy}{dx} = 0$ is _____.

a) $c_1 + c_2e^{2x} + c_3e^{-2x}$ b) $c_1 + (c_2 + c_3x)e^{2x}$

c) $c_1e^x + c_2e^{2x} + c_3e^{-2x}$ d) $(c_1 + c_2x + c_3x^2)e^{2x}$

2) $\frac{1}{D^2+a^2}\sin ax =$ _____.

a) $-\frac{x}{2a}\sin ax$ b) $\frac{x}{a}\sin ax$

c) $-\frac{x}{2a}\cos ax$ d) $\frac{x}{2a^2}\cos ax$

3) $\frac{1}{D-3}x =$ _____.

a) $\frac{x}{3} - \frac{1}{9}$ b) $\frac{-x}{3} - \frac{1}{9}$

c) $\frac{x}{3} + \frac{1}{9}$ d) $-\frac{x}{3} + \frac{1}{9}$

4) The value of the integral $\int_0^\infty e^{-3t}\cos t dt$ is_____.

a) $\frac{3}{10}$ b) $-\frac{3}{10}$

c) 3 d) 10

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

a) $\frac{t^2}{2!}$ b) $\frac{t}{2}$

c) t^2 d) t

6) Since $Z\{1\} = \frac{z}{z-1}, |z| > 1, Z\{k\} =$ _____.

a) $\frac{1}{z-1}$ b) $\frac{1}{(z-1)^2}$

c) $\frac{z}{(z-1)^2}$ d) $\frac{-z}{(z-1)^2}$

7) If $\delta(k) = \begin{cases} 1, & k = 0 \\ 0, & otherwise \end{cases}$ then $Z\{\delta(k)\} =$ _____.

a) 0 b) 1

c) z d) $1/z$

8) The Fourier series expansion of an even function $f(x)$ in $(-l, l)$ has _____.

a) Both sine and cosine terms b) Only sine terms

c) Only cosine terms d) None of these

9) If $f(x) = x^2$ is expanded as a cosine series in $(0, \pi)$ then the constant term is _____.

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

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

10) The value of Karl Pearson's coefficient of correlation r lies between _____.

a) -2 and -1 b) -1 and 1

c) 1 and 2 d) 2 and 3

11) A discrete probability distribution is given by, _____.

$p(x) = \frac{x^2+1}{18}, x = 0,1,2,3$, then $p(x = 1 \; or \; x = 3) =$ _____.

a) $1/3$ b) $2/18$

c) $2/3$ d) $2/9$

12) Between 2 and 4 pm average number of phone calls coming to a switch board of a company is 2.5. then the probability that during a minute there will be exactly 3 calls is _____.

a) 0.2138 b) 0.3120

c) 0.2183 d) 0.3821

13) Idle time of queuing system is _____.

a) $1 - \frac{\lambda}{\mu}$ b) $\frac{\lambda}{\mu}$

c) $\frac{\mu}{\lambda}$ d) $1 - \frac{\mu}{\lambda}$

14) In a $M/M/S/\infty$ system with $\lambda = 4$ and $\mu = 4, S = 2, P_0$ is _____.

a) 1 b) $1/2$

c) $1/3$ d) $1/4$

Seat No.	

Set P

S.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2025
Applied Mathematics – I (BTN03301)

Day & Date: Saturday 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any Three of the following. **09**

a) Solve $(D^3+1)y = 3 + e^{-x} + 5e^{2x}$

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

c) Calculate $L\{te^{3t}\sin^2 3t\}$

d) Find $L^{-1}\left\{\frac{1}{(s^2+1)(s^2+9}\right\}$ by using convolution theorem.

e) Calculate $Z\{f(k)\}$ and the region of convergence, where $f(k) = k2^k + k3^k, k \geq 0$

Q.3 Solve any Three of the following. **09**

a) Solve $(D^3 - 7D - 6)y = e^{2x}(x+1)$

b) Calculate Z-Transform of $f(k) = 3^k \sin h\alpha k, k \geq 0.$

c) Calculate $L\left\{\int_0^t \frac{e^{-3u}\sin 2u}{u}\,du\right\}$

d) Calculate $Z\{2^{|k|}\}$

e) Calculate inverse Laplace transform of $\tan^{-1}\left(\frac{2}{s}\right)$

Q.4 Solve any Two of the following. **10**

a) Solve $(D^2 - 4D + 4)y = 8.x^2e^{2x}\sin 2x.$

b) Solve by using Laplace transform $\frac{d^2x}{dt^2} + 4\frac{dx}{dt} = -8t, x(0) = 0 = x'(0)$

c) Calculate inverse Z-Transform of $F(z) = \frac{z}{(z-2)(z-3)}$, if ROC is $2 < |z| < 3.$

Section – II

Q.5 Solve any Three of the following. **09**

a) Obtain half range sine series of $f(x) = x^2$ in $(0,1)$.

b) Calculate the correlation co-efficient between x *and* y, if nine students obtained the following percentage of marks in the college examination (x) and in the University examination (y).

x	51	53	73	46	50	60	47	36	60
y	49	72	74	44	58	66	50	30	55

c) Calculate

i) k

ii) $p(x > 5)$

iii) $p(0 \leq x \leq 5)$,

if a random variable x has the following probability distribution

x	1	2	3	4	5	6	7
$p(x)$	k	$2k$	$3k$	k^2	$k^2 + k$	$2k^2$	$4k^2$

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

e) Find the probability that a customer has to wait more than 20 minutes to be out of the service station with $\lambda = 8$ per hour and $\mu = 11$ per hour, if the system is $M/M/1/\infty$.

Q.6 Solve any Three of the following. **09**

a) Obtain Fourier Series for the function, $f(x) = \sin 2x$ in $(-l, l)$.

b) Determine what is the probability that out of 10 men, now 60, at least 8 would live up to 70? The probability that a man aged 60 will live up to 70 is 0.65.

c) Calculate what is the number of persons of this group who have income

i) exceeding Rs. 6680

ii) exceeding Rs. 8320? If the income distribution of a group of 10,000 persons was found to be normal with mean Rs. 7500 and standard deviation Rs. 500.
(Given: Area under the standard normal curve between ordinates $\pm$ 1.64 is 0.8990.)

d) A super market has two girls serving at the two counters. The customers arrive in Poisson fashion at the rate of 12 per hour. The service time for each customer is exponential with mean 6 minutes. Find

i) the probability that an arriving customer has to wait.

ii) the average number of customers in the system.

e) The following mistakes per page were observed in a book.

No. of mistakes	0	1	2	3	4	Total
No. of pages	211	90	19	5	0	325

Q.7 Solve any Two of the following. **10**

a) Calculate Karl Pearson's co-efficient of correlation and the equations of the lines of regression from the following data.

Age of husband	18	19	20	21	22	23	24	25	26	27
Age of wife	17	17	18	18	18	19	19	20	21	22

Estimate age of wife when that of husband is 30 and age of husband when that of wife is 25.

b) Obtain the Fourier series of, $f(x) = x^2$, in $(0,2\pi)$ and hence deduce that $\frac{\pi^2}{12} = \frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + \cdots$

c) A man earns Rs. 5 per hour on a typewriter. The time to type a job varies according to an exponential distribution with mean of 6 minutes. Jobs arrive according to a Poisson distribution at the average rate of 5 per hour. The typiest works 8 hour a day. Find

i) the percentage of time for which the typiest is idle.
ii) average earning of the typiest per day.
iii) average time a job is in the system.

Seat No.	

Set Q

S.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2025
Applied Mathematics – I (BTN03301)

Day & Date: Saturday 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) The Fourier series expansion of an even function $f(x)$ in $(-l, l)$ has _____.

a) Both sine and cosine terms b) Only sine terms
c) Only cosine terms d) None of these

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

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

3) The value of Karl Pearson's coefficient of correlation r lies between _____.

a) -2 and -1 b) -1 and 1
c) 1 and 2 d) 2 and 3

4) A discrete probability distribution is given by, _____.
$p(x) = \frac{x^2+1}{18}, x = 0,1,2,3$, then $p(x = 1 \; or \; x = 3) =$ _____.

a) $1/3$ b) $2/18$
c) $2/3$ d) $2/9$

5) Between 2 and 4 pm average number of phone calls coming to a switch board of a company is 2.5. then the probability that during a minute there will be exactly 3 calls is _____.

a) 0.2138 b) 0.3120
c) 0.2183 d) 0.3821

6) Idle time of queuing system is _____.

a) $1-\frac{\lambda}{\mu}$ b) $\frac{\lambda}{\mu}$

c) $\frac{\mu}{\lambda}$ d) $1-\frac{\mu}{\lambda}$

7) In a $M/M/S/\infty$ system with $\lambda = 4$ and $\mu = 4, S = 2, P_0$ is _____.

a) 1 b) $1/2$

c) $1/3$ d) $1/4$

8) The solution of $\frac{d^3y}{dx^3} - 4\frac{dy}{dx} = 0$ is _____.

a) $c_1 + c_2e^{2x} + c_3e^{-2x}$ b) $c_1 + (c_2 + c_3x)e^{2x}$

c) $c_1e^x + c_2e^{2x} + c_3e^{-2x}$ d) $(c_1 + c_2x + c_3x^2)e^{2x}$

9) $\frac{1}{D^2+a^2}\sin ax =$ _____.

a) $-\frac{x}{2a}\sin ax$ b) $\frac{x}{a}\sin ax$

c) $-\frac{x}{2a}\cos ax$ d) $\frac{x}{2a^2}\cos ax$

10) $\frac{1}{D-3}x =$ _____.

a) $\frac{x}{3} - \frac{1}{9}$ b) $\frac{-x}{3} - \frac{1}{9}$

c) $\frac{x}{3} + \frac{1}{9}$ d) $-\frac{x}{3} + \frac{1}{9}$

11) The value of the integral $\int_0^\infty e^{-3t}\cos t dt$ is_____.

a) $\frac{3}{10}$ b) $-\frac{3}{10}$

c) 3 d) 10

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

a) $\frac{t^2}{2!}$ b) $\frac{t}{2}$

c) t^2 d) t

13) Since $Z\{1\} = \frac{z}{z-1}, |z| > 1, Z\{k\} =$ _____.

a) $\frac{1}{z-1}$ b) $\frac{1}{(z-1)^2}$

c) $\frac{z}{(z-1)^2}$ d) $\frac{-z}{(z-1)^2}$

14) If $\delta(k) = \begin{cases} 1, & k = 0 \\ 0, & otherwise \end{cases}$ then $Z\{\delta(k)\} =$ _____.

a) 0 b) 1

c) z d) $1/z$

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2025
Applied Mathematics – I (BTN03301)

Day & Date: Saturday 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any Three of the following. **09**

a) Solve $(D^3+1)y = 3 + e^{-x} + 5e^{2x}$

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

c) Calculate $L\{te^{3t}\sin^2 3t\}$

d) Find $L^{-1}\left\{\frac{1}{(s^2+1)(s^2+9}\right\}$ by using convolution theorem.

e) Calculate $Z\{f(k)\}$ and the region of convergence, where $f(k) = k2^k + k3^k, k \geq 0$

Q.3 Solve any Three of the following. **09**

a) Solve $(D^3 - 7D - 6)y = e^{2x}(x+1)$

b) Calculate Z-Transform of $f(k) = 3^k \sin h\alpha k, k \geq 0.$

c) Calculate $L\left\{\int_0^t \frac{e^{-3u}\sin 2u}{u}\,du\right\}$

d) Calculate $Z\{2^{|k|}\}$

e) Calculate inverse Laplace transform of $\tan^{-1}\left(\frac{2}{s}\right)$

Q.4 Solve any Two of the following. **10**

a) Solve $(D^2 - 4D + 4)y = 8.x^2e^{2x}\sin 2x.$

b) Solve by using Laplace transform $\frac{d^2x}{dt^2} + 4\frac{dx}{dt} = -8t, x(0) = 0 = x'(0)$

c) Calculate inverse Z-Transform of $F(z) = \frac{z}{(z-2)(z-3)}$, if ROC is $2 < |z| < 3.$

Section – II

Q.5 Solve any Three of the following. **09**

a) Obtain half range sine series of $f(x) = x^2$ in $(0,1)$.

b) Calculate the correlation co-efficient between x *and* y, if nine students obtained the following percentage of marks in the college examination (x) and in the University examination (y).

x	51	53	73	46	50	60	47	36	60
y	49	72	74	44	58	66	50	30	55

c) Calculate

i) k

ii) $p(x > 5)$

iii) $p(0 \leq x \leq 5)$,

if a random variable x has the following probability distribution

x	1	2	3	4	5	6	7
$p(x)$	k	$2k$	$3k$	k^2	$k^2 + k$	$2k^2$	$4k^2$

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

e) Find the probability that a customer has to wait more than 20 minutes to be out of the service station with $\lambda = 8$ per hour and $\mu = 11$ per hour, if the system is $M/M/1/\infty$.

Q.6 Solve any Three of the following. **09**

a) Obtain Fourier Series for the function, $f(x) = \sin 2x$ in $(-l, l)$.

b) Determine what is the probability that out of 10 men, now 60, at least 8 would live up to 70? The probability that a man aged 60 will live up to 70 is 0.65.

c) Calculate what is the number of persons of this group who have income

i) exceeding Rs. 6680

ii) exceeding Rs. 8320? If the income distribution of a group of 10,000 persons was found to be normal with mean Rs. 7500 and standard deviation Rs. 500.
(Given: Area under the standard normal curve between ordinates $\pm$ 1.64 is 0.8990.)

d) A super market has two girls serving at the two counters. The customers arrive in Poisson fashion at the rate of 12 per hour. The service time for each customer is exponential with mean 6 minutes. Find

i) the probability that an arriving customer has to wait.

ii) the average number of customers in the system.

e) The following mistakes per page were observed in a book.

No. of mistakes	0	1	2	3	4	Total
No. of pages	211	90	19	5	0	325

Q.7 Solve any Two of the following. **10**

a) Calculate Karl Pearson's co-efficient of correlation and the equations of the lines of regression from the following data.

Age of husband	18	19	20	21	22	23	24	25	26	27
Age of wife	17	17	18	18	18	19	19	20	21	22

Estimate age of wife when that of husband is 30 and age of husband when that of wife is 25.

b) Obtain the Fourier series of, $f(x) = x^2$, in $(0,2\pi)$ and hence deduce that $\frac{\pi^2}{12} = \frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + \cdots$

c) A man earns Rs. 5 per hour on a typewriter. The time to type a job varies according to an exponential distribution with mean of 6 minutes. Jobs arrive according to a Poisson distribution at the average rate of 5 per hour. The typiest works 8 hour a day. Find

i) the percentage of time for which the typiest is idle.
ii) average earning of the typiest per day.
iii) average time a job is in the system.

Seat No.	

Set R

S.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2025
Applied Mathematics – I (BTN03301)

Day & Date: Saturday 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) A discrete probability distribution is given by, _____.
$p(x) = \frac{x^2+1}{18}, x = 0,1,2,3$, then $p(x = 1 \; or \; x = 3) =$ _____.

a) $1/3$ b) $2/18$
c) $2/3$ d) $2/9$

2) Between 2 and 4 pm average number of phone calls coming to a switch board of a company is 2.5. then the probability that during a minute there will be exactly 3 calls is _____.

a) 0.2138 b) 0.3120
c) 0.2183 d) 0.3821

3) Idle time of queuing system is _____.

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

4) In a $M/M/S/\infty$ system with $\lambda = 4$ and $\mu = 4, S = 2, P_0$ is _____.

a) 1 b) $1/2$
c) $1/3$ d) $1/4$

5) The solution of $\frac{d^3y}{dx^3} - 4\frac{dy}{dx} = 0$ is _____.

a) $c_1 + c_2e^{2x} + c_3e^{-2x}$ b) $c_1 + (c_2 + c_3x)e^{2x}$
c) $c_1e^x + c_2e^{2x} + c_3e^{-2x}$ d) $(c_1 + c_2x + c_3x^2)e^{2x}$

6) $\frac{1}{D^2+a^2}\sin ax =$ _____.

a) $-\frac{x}{2a}\sin ax$ b) $\frac{x}{a}\sin ax$

c) $-\frac{x}{2a}\cos ax$ d) $\frac{x}{2a^2}\cos ax$

7) $\frac{1}{D-3}x =$ _____.

a) $\frac{x}{3}-\frac{1}{9}$ b) $\frac{-x}{3}-\frac{1}{9}$

c) $\frac{x}{3}+\frac{1}{9}$ d) $-\frac{x}{3}+\frac{1}{9}$

8) The value of the integral $\int_0^\infty e^{-3t}\cos tdt$ is_____.

a) $\frac{3}{10}$ b) $-\frac{3}{10}$

c) 3 d) 10

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

a) $\frac{t^2}{2!}$ b) $\frac{t}{2}$

c) t^2 d) t

10) Since $Z\{1\} = \frac{z}{z-1}, |z| > 1, Z\{k\} =$ _____.

a) $\frac{1}{z-1}$ b) $\frac{1}{(z-1)^2}$

c) $\frac{z}{(z-1)^2}$ d) $\frac{-z}{(z-1)^2}$

11) If $\delta(k) = \begin{cases}1, & k=0\\ 0, & otherwise\end{cases}$ then $Z\{\delta(k)\} =$ _____.

a) 0 b) 1

c) z d) $1/z$

12) The Fourier series expansion of an even function $f(x)$ in $(-l, l)$ has _____.

a) Both sine and cosine terms b) Only sine terms

c) Only cosine terms d) None of these

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

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

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

14) The value of Karl Pearson's coefficient of correlation r lies between _____.

a) -2 and -1 b) -1 and 1

c) 1 and 2 d) 2 and 3

Seat No.	

Set **R**

S.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2025
Applied Mathematics – I (BTN03301)

Day & Date: Saturday 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any Three of the following. **09**

a) Solve $(D^3+1)y = 3 + e^{-x} + 5e^{2x}$

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

c) Calculate $L\{te^{3t}\sin^2 3t\}$

d) Find $L^{-1}\left\{\frac{1}{(s^2+1)(s^2+9}\right\}$ by using convolution theorem.

e) Calculate $Z\{f(k)\}$ and the region of convergence, where $f(k) = k2^k + k3^k, k \geq 0$

Q.3 Solve any Three of the following. **09**

a) Solve $(D^3 - 7D - 6)y = e^{2x}(x+1)$

b) Calculate Z-Transform of $f(k) = 3^k \sin h\alpha k, k \geq 0.$

c) Calculate $L\left\{\int_0^t \frac{e^{-3u}\sin 2u}{u}\,du\right\}$

d) Calculate $Z\{2^{|k|}\}$

e) Calculate inverse Laplace transform of $\tan^{-1}\left(\frac{2}{s}\right)$

Q.4 Solve any Two of the following. **10**

a) Solve $(D^2 - 4D + 4)y = 8.x^2e^{2x}\sin 2x.$

b) Solve by using Laplace transform $\frac{d^2x}{dt^2} + 4\frac{dx}{dt} = -8t, x(0) = 0 = x'(0)$

c) Calculate inverse Z-Transform of $F(z) = \frac{z}{(z-2)(z-3)}$, if ROC is $2 < |z| < 3.$

Section – II

Q.5 Solve any Three of the following. **09**

a) Obtain half range sine series of $f(x) = x^2$ in $(0,1)$.

b) Calculate the correlation co-efficient between x *and* y, if nine students obtained the following percentage of marks in the college examination (x) and in the University examination (y).

x	51	53	73	46	50	60	47	36	60
y	49	72	74	44	58	66	50	30	55

c) Calculate

i) k

ii) $p(x > 5)$

iii) $p(0 \leq x \leq 5)$,

if a random variable x has the following probability distribution

x	1	2	3	4	5	6	7
$p(x)$	k	$2k$	$3k$	k^2	$k^2 + k$	$2k^2$	$4k^2$

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

e) Find the probability that a customer has to wait more than 20 minutes to be out of the service station with $\lambda = 8$ per hour and $\mu = 11$ per hour, if the system is $M/M/1/\infty$.

Q.6 Solve any Three of the following. **09**

a) Obtain Fourier Series for the function, $f(x) = \sin 2x$ in $(-l, l)$.

b) Determine what is the probability that out of 10 men, now 60, at least 8 would live up to 70? The probability that a man aged 60 will live up to 70 is 0.65.

c) Calculate what is the number of persons of this group who have income

i) exceeding Rs. 6680

ii) exceeding Rs. 8320? If the income distribution of a group of 10,000 persons was found to be normal with mean Rs. 7500 and standard deviation Rs. 500.
(Given: Area under the standard normal curve between ordinates $\pm$ 1.64 is 0.8990.)

d) A super market has two girls serving at the two counters. The customers arrive in Poisson fashion at the rate of 12 per hour. The service time for each customer is exponential with mean 6 minutes. Find

i) the probability that an arriving customer has to wait.

ii) the average number of customers in the system.

e) The following mistakes per page were observed in a book.

No. of mistakes	0	1	2	3	4	Total
No. of pages	211	90	19	5	0	325

Q.7 Solve any Two of the following. **10**

a) Calculate Karl Pearson's co-efficient of correlation and the equations of the lines of regression from the following data.

Age of husband	18	19	20	21	22	23	24	25	26	27
Age of wife	17	17	18	18	18	19	19	20	21	22

Estimate age of wife when that of husband is 30 and age of husband when that of wife is 25.

b) Obtain the Fourier series of, $f(x) = x^2$, in $(0,2\pi)$ and hence deduce that $\frac{\pi^2}{12} = \frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + \cdots$

c) A man earns Rs. 5 per hour on a typewriter. The time to type a job varies according to an exponential distribution with mean of 6 minutes. Jobs arrive according to a Poisson distribution at the average rate of 5 per hour. The typiest works 8 hour a day. Find

i) the percentage of time for which the typiest is idle.
ii) average earning of the typiest per day.
iii) average time a job is in the system.

Seat No.	

Set S

S.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2025
Applied Mathematics – I (BTN03301)

Day & Date: Saturday 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Since $Z\{1\} = \frac{z}{z-1}, |z| > 1, Z\{k\} =$ _____.

a) $\frac{1}{z-1}$ b) $\frac{1}{(z-1)^2}$

c) $\frac{z}{(z-1)^2}$ d) $\frac{-z}{(z-1)^2}$

2) If $\delta(k) = \begin{cases} 1, & k = 0 \\ 0, & otherwise \end{cases}$ then $Z\{\delta(k)\} =$ _____.

a) 0 b) 1

c) z d) $1/z$

3) The Fourier series expansion of an even function $f(x)$ in $(-l, l)$ has _____.

a) Both sine and cosine terms b) Only sine terms

c) Only cosine terms d) None of these

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

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

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

5) The value of Karl Pearson's coefficient of correlation r lies between _____.

a) -2 and -1 b) -1 and 1

c) 1 and 2 d) 2 and 3

6) A discrete probability distribution is given by, _____.
$p(x) = \frac{x^2+1}{18}, x = 0,1,2,3$, then $p(x = 1 \; or \; x = 3) =$ _____.

a) $1/3$ b) $2/18$

c) $2/3$ d) $2/9$

7) Between 2 and 4 pm average number of phone calls coming to a switch board of a company is 2.5. then the probability that during a minute there will be exactly 3 calls is _____.

a) 0.2138 b) 0.3120

c) 0.2183 d) 0.3821

8) Idle time of queuing system is _____.

a) $1 - \frac{\lambda}{\mu}$ b) $\frac{\lambda}{\mu}$

c) $\frac{\mu}{\lambda}$ d) $1 - \frac{\mu}{\lambda}$

9) In a $M/M/S/\infty$ system with $\lambda = 4$ and $\mu = 4, S = 2, P_0$ is _____.

a) 1 b) $1/2$

c) $1/3$ d) $1/4$

10) The solution of $\frac{d^3y}{dx^3} - 4\frac{dy}{dx} = 0$ is _____.

a) $c_1 + c_2e^{2x} + c_3e^{-2x}$ b) $c_1 + (c_2 + c_3x)e^{2x}$

c) $c_1e^x + c_2e^{2x} + c_3e^{-2x}$ d) $(c_1 + c_2x + c_3x^2)e^{2x}$

11) $\frac{1}{D^2+a^2}\sin ax =$ _____.

a) $-\frac{x}{2a}\sin ax$ b) $\frac{x}{a}\sin ax$

c) $-\frac{x}{2a}\cos ax$ d) $\frac{x}{2a^2}\cos ax$

12) $\frac{1}{D-3}x =$ _____.

a) $\frac{x}{3} - \frac{1}{9}$ b) $\frac{-x}{3} - \frac{1}{9}$

c) $\frac{x}{3} + \frac{1}{9}$ d) $-\frac{x}{3} + \frac{1}{9}$

13) The value of the integral $\int_0^\infty e^{-3t}\cos t dt$ is_____.

a) $\frac{3}{10}$ b) $-\frac{3}{10}$

c) 3 d) 10

14) $L^{-1}\left\{\frac{1}{s^2}\right\} = \cdots$

a) $\frac{t^2}{2!}$

b) $\frac{t}{2}$

c) t^2

d) t

Seat No.	

Set **S**

S.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2025
Applied Mathematics – I (BTN03301)

Day & Date: Saturday 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any Three of the following. **09**

a) Solve $(D^3+1)y = 3 + e^{-x} + 5e^{2x}$

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

c) Calculate $L\{te^{3t}\sin^2 3t\}$

d) Find $L^{-1}\left\{\frac{1}{(s^2+1)(s^2+9}\right\}$ by using convolution theorem.

e) Calculate $Z\{f(k)\}$ and the region of convergence, where $f(k) = k2^k + k3^k, k \geq 0$

Q.3 Solve any Three of the following. **09**

a) Solve $(D^3 - 7D - 6)y = e^{2x}(x+1)$

b) Calculate Z-Transform of $f(k) = 3^k \sin h\alpha k, k \geq 0.$

c) Calculate $L\left\{\int_0^t \frac{e^{-3u}\sin 2u}{u}\,du\right\}$

d) Calculate $Z\{2^{|k|}\}$

e) Calculate inverse Laplace transform of $\tan^{-1}\left(\frac{2}{s}\right)$

Q.4 Solve any Two of the following. **10**

a) Solve $(D^2 - 4D + 4)y = 8.x^2e^{2x}\sin 2x.$

b) Solve by using Laplace transform $\frac{d^2x}{dt^2} + 4\frac{dx}{dt} = -8t, x(0) = 0 = x'(0)$

c) Calculate inverse Z-Transform of $F(z) = \frac{z}{(z-2)(z-3)}$, if ROC is $2 < |z| < 3.$

Section – II

Q.5 Solve any Three of the following. **09**

a) Obtain half range sine series of $f(x) = x^2$ in $(0,1)$.

b) Calculate the correlation co-efficient between x *and* y, if nine students obtained the following percentage of marks in the college examination (x) and in the University examination (y).

x	51	53	73	46	50	60	47	36	60
y	49	72	74	44	58	66	50	30	55

c) Calculate

i) k

ii) $p(x > 5)$

iii) $p(0 \leq x \leq 5)$,

if a random variable x has the following probability distribution

x	1	2	3	4	5	6	7
$p(x)$	k	$2k$	$3k$	k^2	$k^2 + k$	$2k^2$	$4k^2$

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

e) Find the probability that a customer has to wait more than 20 minutes to be out of the service station with $\lambda = 8$ per hour and $\mu = 11$ per hour, if the system is $M/M/1/\infty$.

Q.6 Solve any Three of the following. **09**

a) Obtain Fourier Series for the function, $f(x) = \sin 2x$ in $(-l, l)$.

b) Determine what is the probability that out of 10 men, now 60, at least 8 would live up to 70? The probability that a man aged 60 will live up to 70 is 0.65.

c) Calculate what is the number of persons of this group who have income

i) exceeding Rs. 6680

ii) exceeding Rs. 8320? If the income distribution of a group of 10,000 persons was found to be normal with mean Rs. 7500 and standard deviation Rs. 500.
(Given: Area under the standard normal curve between ordinates $\pm$ 1.64 is 0.8990.)

d) A super market has two girls serving at the two counters. The customers arrive in Poisson fashion at the rate of 12 per hour. The service time for each customer is exponential with mean 6 minutes. Find

i) the probability that an arriving customer has to wait.

ii) the average number of customers in the system.

e) The following mistakes per page were observed in a book.

No. of mistakes	0	1	2	3	4	Total
No. of pages	211	90	19	5	0	325

Q.7 Solve any Two of the following. **10**

a) Calculate Karl Pearson's co-efficient of correlation and the equations of the lines of regression from the following data.

Age of husband	18	19	20	21	22	23	24	25	26	27
Age of wife	17	17	18	18	18	19	19	20	21	22

Estimate age of wife when that of husband is 30 and age of husband when that of wife is 25.

b) Obtain the Fourier series of, $f(x) = x^2$, in $(0,2\pi)$ and hence deduce that $\frac{\pi^2}{12} = \frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + \cdots$

c) A man earns Rs. 5 per hour on a typewriter. The time to type a job varies according to an exponential distribution with mean of 6 minutes. Jobs arrive according to a Poisson distribution at the average rate of 5 per hour. The typiest works 8 hour a day. Find

i) the percentage of time for which the typiest is idle.
ii) average earning of the typiest per day.
iii) average time a job is in the system.

SLR-BD-151

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
COMPUTAR SCIENCE & ENGINEERING
Discrete Mathematical Structures (BTN03302)

Day & Date: Monday, 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct option. 14

1) Which of the following formula/s is/ are not well-formed formula/s?
a) $((\neg Q \wedge P) \wedge Q)$
b) $((P \rightarrow (Q \rightarrow R)) \rightarrow ((P \rightarrow Q) \rightarrow (P \rightarrow R)))$
c) $((\neg P \rightarrow Q) \rightarrow (Q \rightarrow P)))$
d) $((P \wedge Q) \leftrightarrow P)$

2) Which of the following statement formula is contradiction?
a) $\neg(\neg(P \wedge Q) \leftrightarrow (\neg P) \vee (\neg Q))$
b) $\neg(P \wedge Q) \leftrightarrow (\neg P) \vee (\neg Q)$
c) $R \rightarrow \neg R$
d) None

3) Which of the following formula/s is/are PCNF?
a) $(P \vee \neg Q) \wedge (Q \vee R) \wedge (\neg P \vee Q \vee \neg R)$
b) $(P \vee \neg R) \wedge (P \vee \neg Q \vee R) \wedge (\neg P \vee \neg Q \wedge \neg R)$
c) $(P \vee \neg P \vee \neg R) \wedge (P \vee \neg Q \vee R) \wedge (\neg P \vee \neg Q \vee \neg R)$
d) $(P \vee \neg Q \vee \neg R) \wedge (P \vee \neg Q \vee R) \wedge (\neg P \vee \neg Q \vee \neg R)$

4) If the principal disjunctive normal form of a given formula A containing n variables is known, then the principal disjunctive normal form of $\neg A$ will consist of _____.
a) The disjunction of the remaining maxterms which do not appear in the principal disjunctive normal form of A.
b) The disjunction of the remaining minterms which do not appear in the principal disjunctive normal form of A.
c) The conjunction of the remaining minterms which do not appear in the principal disjunctive normal form of A.
d) The conjunction of the remaining maxterms which do not appear in the principal disjunctive normal form of A.

5) Let $P = \{x | 4 \leq x \leq 10$ and x is even$\}$ Then P is equivalent to _____.

a) $\{4, 5, 6, 7, 8, 9, 10\}$ b) $\{6, 8\}$

c) $\{6, 8, 10\}$ d) $\{4, 6, 8, 10\}$

6) Given $A = \{2,5,6\}$ $B = \{3,4,2\}$, then $A + B$ is given by _____.

a) $\{2\}$ b) $\{3, 4\}$

c) $\{5, 6\}$ d) $\{5, 6, 3, 4\}$

7) Consider a set $A = \{1,2,3\}$. The binary relation $R = \{< 1,1 >, < 1,2 >, < 1,3 >, < 3,1 >, < 3,2 >\}$ on A is _____.

a) R is both symmetric and antisymmetric

b) R is not symmetric but antisymmetric

c) R is neither symmetric and nor antisymmetric

d) R is symmetric but not antisymmetric

8) $S = \{a. b, c\}$ and consider the following collections of subsets of S. $A = \{\{a, b\}, \{b, c\}\}, B = \{\{a\}, \{a, c\}\}, C = \{\{a\}, \{b, c\}\}, D = \{\{a, b, c\}\}$, $E = \{\{a\}, \{b\}, \{c\}\}$, and $F = \{\{a\}, \{a, b\}, \{a, c\}\}$. Which of the following set is not covering?

a) $A = \{\{a, b\}, \{b, c\}\}$ b) $B = \{\{a\}, \{a, c\}\}$

c) $C = \{\{a\}, \{b, c\}\}$ d) $D = \{\{a, b, c\}\}$

9) Which of the following is are true?

a) The inverse of a function f exists if f is injective only

b) The inverse of a function f exists if f is surjective only

c) The inverse of a function f is defined if f is both injective and surjective

d) A function that is neither injective e or surjective is sometimes invertible

10) Which of the following algebraic structures form a group?

a) The set of integers under subtraction.

b) The set of integers under addition.

c) The set of rational numbers under multiplication.

d) The set of complex numbers under multiplication.

11) Let g be a homomorphism from $< X, \circ >$ to $< Y, * >$. If g : $X \rightarrow Y$ is one-to-one onto then g is called _____.

a) Automorphism b) Endomorphism

c) Monomorphism d) Isomorphism

12) What is the rank of the equation $abc+$?

a) 1 b) 2

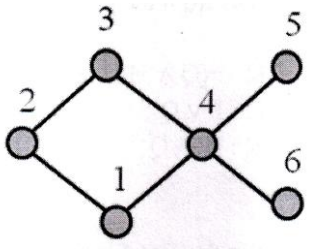
c) 3 d) 4

13) For the following $< Z_5, +5 >$ what is the inverse of element $[3]$.

$+_6$	0	1	2	3	4	5
0	0	1	2	3	4	5
1	1	2	3	4	5	0
2	2	3	4	5	0	1
3	3	4	5	0	1	2
4	4	5	0	1	2	3
5	5	0	1	2	3	4

a) $[1]$ b) $[2]$
c) $[3]$ d) $[4]$

14) What is least element for following diagram?



a) 1 b) 6
c) Both 1 and 6 d) none

Seat No.		Set	P

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
COMPUTAR SCIENCE & ENGINEERING
Discrete Mathematical Structures (BTN03302)

Day & Date: Monday, 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve Any Three. **12**

a) Show the following implications
i) $(P \to Q) \to Q \Rightarrow P \vee Q$
ii) $(P \wedge Q) \Rightarrow (P \to Q)$

b) Convert the following prefix and suffix formulas into completely parenthesized form. Also write then in an infix form using the above order of precedence to minimize the number of parentheses.
i) $\to \neg P \vee Q \leftrightarrow R \neg S$
ii) $\to\to PQ \to\to QR \to PR$

c) Given $S = \{a1, a2, a3, a4, a5, a6, a7, a8\}$, what subsets are represented by $B_{15},\ B_{30}$? Also how will you designate the subsets $\{a2, a6, a7\}$ and $\{a1, a8\}$.

d) Given $S = \{1, 2, 3, 4\}$ and a relation R on S defined by $R = \{< 1,2 >, < 4,3 >, < 2,2 >, < 2,1 >, < 3,1 >\}$. Show that R is not transitive. Find a relation $R1 \supseteq R$ such that $R1$ is transitive. Can you find another relation $R2 \supseteq R$ which is also transitive?

Q.3 a) Obtain PDNF for the following and comment whether they are tautology or not **08**
a) $(\urcorner P \vee \urcorner Q) \to (P \leftrightarrow \urcorner Q)$
b) $(Q \to P) \wedge (\urcorner P \wedge Q)$
c) $P \to (P \wedge (Q \to P))$
d) $Q \wedge (P \vee \urcorner Q)$

OR

b) State the different properties of relation with example and solve the following problem. Let $R = \{< 2,3 >, < 4,5 >, < 3,3 >\}$ and $S = \{< 5,3 >, < 4,2 >, < 2,4 >\}$. Find $R \circ S, R \circ R$ and $S \circ S$. **08**

Q.4 Show that the conclusion C follows from the premises $\mathrm{H1}, \mathrm{H2}, \cdots$ in the following cases **08**

a) $\mathrm{H1}: \mathrm{P} \to \mathrm{Q}$ $\mathrm{C}: \mathrm{P} \to (\mathrm{P} \wedge \mathrm{Q})$

b) $\mathrm{H1}: \neg\mathrm{P} \vee \mathrm{Q}$ $\mathrm{H2}: \neg(\mathrm{Q} \wedge \neg\mathrm{P})$ $\mathrm{H3}: \neg\mathrm{R}$ $\mathrm{C}: \mathrm{Q}$

c) $\mathrm{H1}: \neg\mathrm{P}$ $\mathrm{H2}: \mathrm{P} \vee \mathrm{Q}$ $\mathrm{C}: \mathrm{Q}$

d) $\mathrm{H1}: \neg\mathrm{Q}$ $\mathrm{H2}: \mathrm{P} \to \mathrm{Q}$ $\mathrm{C}: \neg\mathrm{P}$

Section – II

Q.5 Solve any three. **12**

a) Let $f: R \to R$ and $g: R \to R$ where R is the set of real numbers. Find $f \circ g$ and $g \circ f$ where $f(x) = x^2 - 2$ and $g(x) = x + 4$.

b) Prove that the set $G = \{0, 1, 2, 3, 4, 5, 6\}$ is a monoid with respect to addition modulo 7.

c) Convert the infix expression $\mathrm{a} + \mathrm{b} * \mathrm{c} - \mathrm{d}/\mathrm{e}$ to reverse polish expression

d) Explain the term lattice with example.

Q.6 **a)** Let A be a given finite set and $\rho(A)$ its power set. Let $\subseteq$ be the inclusion relation on the elements of $\rho(A)$. Draw Hasse diagram of $< \rho(A), \subseteq >$ for **08**

a) $A = \{a\}$

b) $A = \{a, b\}$

c) $A = \{a, b, c\}$

d) $A = \{a, b, c, d\}$

OR

b) Define algebraic system. State and explain its properties with example.

Q.7 Let $X = \{1, 2, 3\}$ and f, g, h and s be the functions from X to X given by **08**

$f = \{< 1, 2 >, < 2, 3 >, < 3, 1 >\}$

$g = \{< 1,2 >, < 2, 1 >, < 3, 3 >\}$

$h = \{< 1, 1 >, < 2, 2 >, < 3, 1 >\}$

$s = \{< 1,1 >, < 2, 2 >, < 3, 3 >\}$

Find

1) $f \circ f$
2) $g \circ g$
3) $f \circ h \circ g$
4) $s \circ g$
5) $g \circ s$
6) $s \circ s$ and
7) $f \circ s$

SLR-BD-151

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
COMPUTAR SCIENCE & ENGINEERING
Discrete Mathematical Structures (BTN03302)

Day & Date: Monday, 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct option. **14**

1) $S = \{a.b,c\}$ and consider the following collections of subsets of S. $A = \{\{a,b\},\{b,c\}\}, B = \{\{a\},\{a,c\}\}, C = \{\{a\},\{b,c\}\}, D = \{\{a,b,c\}\}$, $E = \{\{a\},\{b\},\{c\}\}$, and $F = \{\{a\},\{a,b\},\{a,c\}\}$. Which of the following set is not covering?

a) $A = \{\{a,b\},\{b,c\}\}$ b) $B = \{\{a\},\{a,c\}\}$
c) $C = \{\{a\},\{b,c\}\}$ d) $D = \{\{a,b,c\}\}$

2) Which of the following is are true?

a) The inverse of a function f exists if f is injective only
b) The inverse of a function f exists if f is surjective only
c) The inverse of a function f is defined if f is both injective and surjective
d) A function that is neither injective e or surjective is sometimes invertible

3) Which of the following algebraic structures form a group?

a) The set of integers under subtraction.
b) The set of integers under addition.
c) The set of rational numbers under multiplication.
d) The set of complex numbers under multiplication.

4) Let g be a homomorphism from $< X, \circ >$ to $< Y, * >$. If g : $X \to Y$ is one-to-one onto then g is called _____.

a) Automorphism b) Endomorphism
c) Monomorphism d) Isomorphism

5) What is the rank of the equation $abc+$?

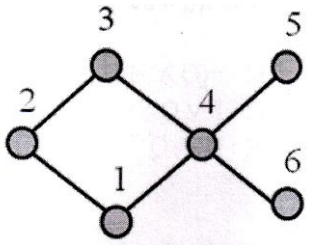
a) 1 b) 2
c) 3 d) 4

6) For the following $< Z_5, +5 >$ what is the inverse of element $[3]$.

$+_6$	0	1	2	3	4	5
0	0	1	2	3	4	5
1	1	2	3	4	5	0
2	2	3	4	5	0	1
3	3	4	5	0	1	2
4	4	5	0	1	2	3
5	5	0	1	2	3	4

a) $[1]$ b) $[2]$
c) $[3]$ d) $[4]$

7) What is least element for following diagram?



a) 1 b) 6
c) Both 1 and 6 d) none

8) Which of the following formula/s is/ are not well-formed formula/s?

a) $((\neg Q \wedge P) \wedge Q)$
b) $((P \rightarrow (Q \rightarrow R)) \rightarrow ((P \rightarrow Q) \rightarrow (P \rightarrow R)))$
c) $((\neg P \rightarrow Q) \rightarrow (Q \rightarrow P)))$
d) $((P \wedge Q) \leftrightarrow P)$

9) Which of the following statement formula is contradiction?

a) $\neg(\neg(P \wedge Q) \leftrightarrow (\neg P) \vee (\neg Q))$
b) $\neg(P \wedge Q) \leftrightarrow (\neg P) \vee (\neg Q)$
c) $R \rightarrow \neg R$
d) None

10) Which of the following formula/s is/are PCNF?

a) $(P \vee \neg Q) \wedge (Q \vee R) \wedge (\neg P \vee Q \vee \neg R)$
b) $(P \vee \neg R) \wedge (P \vee \neg Q \vee R) \wedge (\neg P \vee \neg Q \wedge \neg R)$
c) $(P \vee \neg P \vee \neg R) \wedge (P \vee \neg Q \vee R) \wedge (\neg P \vee \neg Q \vee \neg R)$
d) $(P \vee \neg Q \vee \neg R) \wedge (P \vee \neg Q \vee R) \wedge (\neg P \vee \neg Q \vee \neg R)$

11) If the principal disjunctive normal form of a given formula A containing n variables is known, then the principal disjunctive normal form of $\neg A$ will consist of _____.

a) The disjunction of the remaining maxterms which do not appear in the principal disjunctive normal form of A.
b) The disjunction of the remaining minterms which do not appear in the principal disjunctive normal form of A.
c) The conjunction of the remaining minterms which do not appear in the principal disjunctive normal form of A.
d) The conjunction of the remaining maxterms which do not appear in the principal disjunctive normal form of A.

12) Let $P = \{x | 4 \leq x \leq 10$ and x is even$\}$ Then P is equivalent to _____.

a) $\{4, 5, 6, 7, 8, 9, 10\}$
b) $\{6, 8\}$
c) $\{6, 8, 10\}$
d) $\{4, 6, 8, 10\}$

13) Given $A = \{2,5,6\}$ $B = \{3,4,2\}$, then $A + B$ is given by _____.

a) $\{2\}$
b) $\{3, 4\}$
c) $\{5, 6\}$
d) $\{5, 6, 3, 4\}$

14) Consider a set $A = \{1,2,3\}$. The binary relation $R = \{< 1,1 >, < 1,2 >, < 1,3 >, < 3,1 >, < 3,2 >\}$ on A is _____.

a) R is both symmetric and antisymmetric
b) R is not symmetric but antisymmetric
c) R is neither symmetric and nor antisymmetric
d) R is symmetric but not antisymmetric

Seat No.		Set	Q

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
COMPUTAR SCIENCE & ENGINEERING
Discrete Mathematical Structures (BTN03302)

Day & Date: Monday, 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve Any Three. **12**

a) Show the following implications
i) $(P \to Q) \to Q \Rightarrow P \vee Q$
ii) $(P \wedge Q) \Rightarrow (P \to Q)$

b) Convert the following prefix and suffix formulas into completely parenthesized form. Also write then in an infix form using the above order of precedence to minimize the number of parentheses.
i) $\to \neg P \vee Q \leftrightarrow R \neg S$
ii) $\to\to PQ \to\to QR \to PR$

c) Given $S = \{a1, a2, a3, a4, a5, a6, a7, a8\}$, what subsets are represented by $B_{15},\ B_{30}$? Also how will you designate the subsets $\{a2, a6, a7\}$ and $\{a1, a8\}$.

d) Given $S = \{1, 2, 3, 4\}$ and a relation R on S defined by $R = \{< 1,2 >, < 4,3 >, < 2,2 >, < 2,1 >, < 3,1 >\}$. Show that R is not transitive. Find a relation $R1 \supseteq R$ such that $R1$ is transitive. Can you find another relation $R2 \supseteq R$ which is also transitive?

Q.3 a) Obtain PDNF for the following and comment whether they are tautology or not **08**
a) $(\urcorner P \vee \urcorner Q) \to (P \leftrightarrow \urcorner Q)$
b) $(Q \to P) \wedge (\urcorner P \wedge Q)$
c) $P \to (P \wedge (Q \to P))$
d) $Q \wedge (P \vee \urcorner Q)$

OR

b) State the different properties of relation with example and solve the following problem. Let $R = \{< 2,3 >, < 4,5 >, < 3,3 >\}$ and $S = \{< 5,3 >, < 4,2 >, < 2,4 >\}$. Find $R \circ S, R \circ R$ and $S \circ S$. **08**

Q.4 Show that the conclusion C follows from the premises $\mathrm{H1}, \mathrm{H2}, \cdots$ in the following cases **08**

a) $\mathrm{H1}: \mathrm{P} \rightarrow \mathrm{Q}$ $\mathrm{C}: \mathrm{P} \rightarrow (\mathrm{P} \wedge \mathrm{Q})$

b) $\mathrm{H1}: \neg\mathrm{P} \vee \mathrm{Q}$ $\mathrm{H2}: \neg(\mathrm{Q} \wedge \neg\mathrm{P})$ $\mathrm{H3}: \neg\mathrm{R}$ $\mathrm{C}: \mathrm{Q}$

c) $\mathrm{H1}: \neg\mathrm{P}$ $\mathrm{H2}: \mathrm{P} \vee \mathrm{Q}$ $\mathrm{C}: \mathrm{Q}$

d) $\mathrm{H1}: \neg\mathrm{Q}$ $\mathrm{H2}: \mathrm{P} \rightarrow \mathrm{Q}$ $\mathrm{C}: \neg\mathrm{P}$

Section – II

Q.5 Solve any three. **12**

a) Let $f: R \rightarrow R$ and $g: R \rightarrow R$ where R is the set of real numbers. Find $f \circ g$ and $g \circ f$ where $f(x) = x^2 - 2$ and $g(x) = x + 4$.

b) Prove that the set $G = \{0, 1, 2, 3, 4, 5, 6\}$ is a monoid with respect to addition modulo 7.

c) Convert the infix expression $\mathrm{a} + \mathrm{b} * \mathrm{c} - \mathrm{d}/\mathrm{e}$ to reverse polish expression

d) Explain the term lattice with example.

Q.6 **a)** Let A be a given finite set and $\rho(A)$ its power set. Let $\subseteq$ be the inclusion relation on the elements of $\rho(A)$. Draw Hasse diagram of $< \rho(A), \subseteq >$ for **08**

a) $A = \{a\}$

b) $A = \{a, b\}$

c) $A = \{a, b, c\}$

d) $A = \{a, b, c, d\}$

OR

b) Define algebraic system. State and explain its properties with example.

Q.7 Let $X = \{1, 2, 3\}$ and f, g, h and s be the functions from X to X given by **08**

$f = \{< 1, 2 >, < 2, 3 >, < 3, 1 >\}$

$g = \{< 1,2 >, < 2, 1 >, < 3, 3 >\}$

$h = \{< 1, 1 >, < 2, 2 >, < 3, 1 >\}$

$s = \{< 1,1 >, < 2, 2 >, < 3, 3 >\}$

Find

1) $f \circ f$
2) $g \circ g$
3) $f \circ h \circ g$
4) $s \circ g$
5) $g \circ s$
6) $s \circ s$ and
7) $f \circ s$

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
COMPUTAR SCIENCE & ENGINEERING
Discrete Mathematical Structures (BTN03302)

Day & Date: Monday, 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct option. **14**

1) Let g be a homomorphism from $< X, \circ >$ to $< Y, * >$. If $g : X \to Y$ is one-to-one onto then g is called _____.
a) Automorphism b) Endomorphism
c) Monomorphism d) Isomorphism

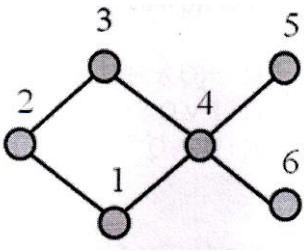
2) What is the rank of the equation $abc+$?
a) 1 b) 2
c) 3 d) 4

3) For the following $< Z_5, +5 >$ what is the inverse of element $[3]$.

$+_6$	0	1	2	3	4	5
0	0	1	2	3	4	5
1	1	2	3	4	5	0
2	2	3	4	5	0	1
3	3	4	5	0	1	2
4	4	5	0	1	2	3
5	5	0	1	2	3	4

a) $[1]$ b) $[2]$
c) $[3]$ d) $[4]$

4) What is least element for following diagram?



a) 1 b) 6
c) Both 1 and 6 d) none

5) Which of the following formula/s is/ are not well-formed formula/s?
a) $((\neg Q \wedge P) \wedge Q)$
b) $((P \rightarrow (Q \rightarrow R)) \rightarrow ((P \rightarrow Q) \rightarrow (P \rightarrow R)))$
c) $((\neg P \rightarrow Q) \rightarrow (Q \rightarrow P)))$
d) $((P \wedge Q) \leftrightarrow P)$

6) Which of the following statement formula is contradiction?
a) $\neg(\neg(P \wedge Q) \leftrightarrow (\neg P) \vee (\neg Q))$
b) $\neg(P \wedge Q) \leftrightarrow (\neg P) \vee (\neg Q)$
c) $R \rightarrow \neg R$
d) None

7) Which of the following formula/s is/are PCNF?
a) $(P \vee \neg Q) \wedge (Q \vee R) \wedge (\neg P \vee Q \vee \neg R)$
b) $(P \vee \neg R) \wedge (P \vee \neg Q \vee R) \wedge (\neg P \vee \neg Q \wedge \neg R)$
c) $(P \vee \neg P \vee \neg R) \wedge (P \vee \neg Q \vee R) \wedge (\neg P \vee \neg Q \vee \neg R)$
d) $(P \vee \neg Q \vee \neg R) \wedge (P \vee \neg Q \vee R) \wedge (\neg P \vee \neg Q \vee \neg R)$

8) If the principal disjunctive normal form of a given formula A containing n variables is known, then the principal disjunctive normal form of $\neg A$ will consist of _____.
a) The disjunction of the remaining maxterms which do not appear in the principal disjunctive normal form of A.
b) The disjunction of the remaining minterms which do not appear in the principal disjunctive normal form of A.
c) The conjunction of the remaining minterms which do not appear in the principal disjunctive normal form of A.
d) The conjunction of the remaining maxterms which do not appear in the principal disjunctive normal form of A.

___

9) Let $P = \{x | 4 \leq x \leq 10$ and x is even$\}$ Then P is equivalent to _____.
a) $\{4, 5, 6, 7, 8, 9, 10\}$ b) $\{6, 8\}$
c) $\{6, 8, 10\}$ d) $\{4, 6, 8, 10\}$

10) Given $A = \{2,5,6\}$ $B = \{3,4,2\}$, then $A + B$ is given by _____.
a) $\{2\}$ b) $\{3, 4\}$
c) $\{5, 6\}$ d) $\{5, 6, 3, 4\}$

11) Consider a set $A = \{1,2,3\}$. The binary relation $R = \{< 1,1 >, < 1,2 >, < 1,3 >, < 3,1 >, < 3,2 >\}$ on A is _____.

a) R is both symmetric and antisymmetric
b) R is not symmetric but antisymmetric
c) R is neither symmetric and nor antisymmetric
d) R is symmetric but not antisymmetric

12) $S = \{a.b, c\}$ and consider the following collections of subsets of S. $A = \{\{a, b\}, \{b, c\}\}, B = \{\{a\}, \{a, c\}\}, C = \{\{a\}, \{b, c\}\}, D = \{\{a, b, c\}\}$, $E = \{\{a\}, \{b\}, \{c\}\}$, and $F = \{\{a\}, \{a, b\}, \{a, c\}\}$. Which of the following set is not covering?

a) $A = \{\{a, b\}, \{b, c\}\}$
b) $B = \{\{a\}, \{a, c\}\}$
c) $C = \{\{a\}, \{b, c\}\}$
d) $D = \{\{a, b, c\}\}$

13) Which of the following is are true?

a) The inverse of a function f exists if f is injective only
b) The inverse of a function f exists if f is surjective only
c) The inverse of a function f is defined if f is both injective and surjective
d) A function that is neither injective e or surjective is sometimes invertible

14) Which of the following algebraic structures form a group?

a) The set of integers under subtraction.
b) The set of integers under addition.
c) The set of rational numbers under multiplication.
d) The set of complex numbers under multiplication.

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
COMPUTAR SCIENCE & ENGINEERING
Discrete Mathematical Structures (BTN03302)

Day & Date: Monday, 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve Any Three. **12**

a) Show the following implications
i) $(P \to Q) \to Q \Rightarrow P \vee Q$
ii) $(P \wedge Q) \Rightarrow (P \to Q)$

b) Convert the following prefix and suffix formulas into completely parenthesized form. Also write then in an infix form using the above order of precedence to minimize the number of parentheses.
i) $\to \neg P \vee Q \leftrightarrow R \neg S$
ii) $\to\to PQ \to\to QR \to PR$

c) Given $S = \{a1, a2, a3, a4, a5, a6, a7, a8\}$, what subsets are represented by $B_{15},\ B_{30}$? Also how will you designate the subsets $\{a2, a6, a7\}$ and $\{a1, a8\}$.

d) Given $S = \{1, 2, 3, 4\}$ and a relation R on S defined by $R = \{< 1,2 >, < 4,3 >, < 2,2 >, < 2,1 >, < 3,1 >\}$. Show that R is not transitive. Find a relation $R1 \supseteq R$ such that $R1$ is transitive. Can you find another relation $R2 \supseteq R$ which is also transitive?

Q.3 a) Obtain PDNF for the following and comment whether they are tautology or not **08**
a) $(\urcorner P \vee \urcorner Q) \to (P \leftrightarrow \urcorner Q)$
b) $(Q \to P) \wedge (\urcorner P \wedge Q)$
c) $P \to (P \wedge (Q \to P))$
d) $Q \wedge (P \vee \urcorner Q)$

OR

b) State the different properties of relation with example and solve the following problem. Let $R = \{< 2,3 >, < 4,5 >, < 3,3 >\}$ and $S = \{< 5,3 >, < 4,2 >, < 2,4 >\}$. Find $R \circ S, R \circ R$ and $S \circ S$. **08**

Q.4 Show that the conclusion C follows from the premises $\mathrm{H1}, \mathrm{H2}, \cdots$ in the following cases **08**

a) $\mathrm{H1}: \mathrm{P} \to \mathrm{Q}$ $\quad$ $\mathrm{C}: \mathrm{P} \to (\mathrm{P} \wedge \mathrm{Q})$

b) $\mathrm{H1}: \neg\mathrm{P} \vee \mathrm{Q}$ $\quad$ $\mathrm{H2}: \neg(\mathrm{Q} \wedge \neg\mathrm{P})$ $\mathrm{H3}: \neg\mathrm{R}$ $\quad$ $\mathrm{C}: \mathrm{Q}$

c) $\mathrm{H1}: \neg\mathrm{P}$ $\quad$ $\mathrm{H2}: \mathrm{P} \vee \mathrm{Q}$ $\quad$ $\mathrm{C}: \mathrm{Q}$

d) $\mathrm{H1}: \neg\mathrm{Q}$ $\quad$ $\mathrm{H2}: \mathrm{P} \to \mathrm{Q}$ $\quad$ $\mathrm{C}: \neg\mathrm{P}$

Section – II

Q.5 Solve any three. **12**

a) Let $f: R \to R$ and $g: R \to R$ where R is the set of real numbers. Find $f \circ g$ and $g \circ f$ where $f(x) = x^2 - 2$ and $g(x) = x + 4$.

b) Prove that the set $G = \{0, 1, 2, 3, 4, 5, 6\}$ is a monoid with respect to addition modulo 7.

c) Convert the infix expression $\mathrm{a} + \mathrm{b} * \mathrm{c} - \mathrm{d}/\mathrm{e}$ to reverse polish expression

d) Explain the term lattice with example.

Q.6 **a)** Let A be a given finite set and $\rho(A)$ its power set. Let $\subseteq$ be the inclusion relation on the elements of $\rho(A)$. Draw Hasse diagram of $< \rho(A), \subseteq >$ for **08**

a) $A = \{a\}$

b) $A = \{a, b\}$

c) $A = \{a, b, c\}$

d) $A = \{a, b, c, d\}$

OR

b) Define algebraic system. State and explain its properties with example.

Q.7 Let $X = \{1, 2, 3\}$ and f, g, h and s be the functions from X to X given by **08**

$f = \{< 1, 2 >, < 2, 3 >, < 3, 1 >\}$

$g = \{< 1,2 >, < 2, 1 >, < 3, 3 >\}$

$h = \{< 1, 1 >, < 2, 2 >, < 3, 1 >\}$

$s = \{< 1,1 >, < 2, 2 >, < 3, 3 >\}$

Find

1) $f \circ f$
2) $g \circ g$
3) $f \circ h \circ g$
4) $s \circ g$
5) $g \circ s$
6) $s \circ s$ and
7) $f \circ s$

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
COMPUTAR SCIENCE & ENGINEERING
Discrete Mathematical Structures (BTN03302)

Day & Date: Monday, 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose correct option. **14**

1) Given $A = \{2,5,6\}$ $B = \{3,4,2\}$, then $A + B$ is given by _____.
a) $\{2\}$ b) $\{3,4\}$
c) $\{5,6\}$ d) $\{5,6,3,4\}$

2) Consider a set $A = \{1,2,3\}$. The binary relation $R = \{< 1,1 >, < 1,2 >, < 1,3 >, < 3,1 >, < 3,2 >\}$ on A is _____.
a) R is both symmetric and antisymmetric
b) R is not symmetric but antisymmetric
c) R is neither symmetric and nor antisymmetric
d) R is symmetric but not antisymmetric

3) $S = \{a.b,c\}$ and consider the following collections of subsets of S. $A = \{\{a,b\},\{b,c\}\}, B = \{\{a\},\{a,c\}\}, C = \{\{a\},\{b,c\}\}, D = \{\{a,b,c\}\}$, $E = \{\{a\},\{b\},\{c\}\}$, and $F = \{\{a\},\{a,b\},\{a,c\}\}$. Which of the following set is not covering?
a) $A = \{\{a,b\},\{b,c\}\}$ b) $B = \{\{a\},\{a,c\}\}$
c) $C = \{\{a\},\{b,c\}\}$ d) $D = \{\{a,b,c\}\}$

4) Which of the following is are true?
a) The inverse of a function f exists if f is injective only
b) The inverse of a function f exists if f is surjective only
c) The inverse of a function f is defined if f is both injective and surjective
d) A function that is neither injective e or surjective is sometimes invertible

5) Which of the following algebraic structures form a group?

a) The set of integers under subtraction.
b) The set of integers under addition.
c) The set of rational numbers under multiplication.
d) The set of complex numbers under multiplication.

6) Let g be a homomorphism from $< X, \circ >$ to $< Y, * >$. If $g : X \to Y$ is one-to-one onto then g is called _____.

a) Automorphism
b) Endomorphism
c) Monomorphism
d) Isomorphism

7) What is the rank of the equation $abc+?$

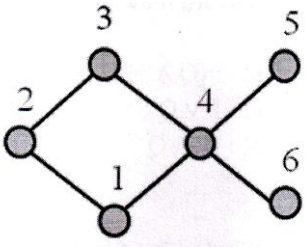
a) 1
b) 2
c) 3
d) 4

8) For the following $< Z_5, +5 >$ what is the inverse of element $[3]$.

$+_6$	0	1	2	3	4	5
0	0	1	2	3	4	5
1	1	2	3	4	5	0
2	2	3	4	5	0	1
3	3	4	5	0	1	2
4	4	5	0	1	2	3
5	5	0	1	2	3	4

a) $[1]$
b) $[2]$
c) $[3]$
d) $[4]$

9) What is least element for following diagram?



a) 1
b) 6
c) Both 1 and 6
d) none

10) Which of the following formula/s is/ are not well-formed formula/s?

a) $((\neg Q \wedge P) \wedge Q)$
b) $((P \to (Q \to R)) \to ((P \to Q) \to (P \to R)))$
c) $((\neg P \to Q) \to (Q \to P)))$
d) $((P \wedge Q) \leftrightarrow P)$

11) Which of the following statement formula is contradiction?

a) $\neg(\neg(P \wedge Q) \leftrightarrow (\neg P) \vee (\neg Q))$
b) $\neg(P \wedge Q) \leftrightarrow (\neg P) \vee (\neg Q)$
c) $R \to \neg R$
d) None

12) Which of the following formula/s is/are PCNF?

a) $(P \vee \neg Q) \wedge (Q \vee R) \wedge (\neg P \vee Q \vee \neg R)$

b) $(P \vee \neg R) \wedge (P \vee \neg Q \vee R) \wedge (\neg P \vee \neg Q \wedge \neg R)$

c) $(P \vee \neg P \vee \neg R) \wedge (P \vee \neg Q \vee R) \wedge (\neg P \vee \neg Q \vee \neg R)$

d) $(P \vee \neg Q \vee \neg R) \wedge (P \vee \neg Q \vee R) \wedge (\neg P \vee \neg Q \vee \neg R)$

13) If the principal disjunctive normal form of a given formula A containing n variables is known, then the principal disjunctive normal form of $\neg A$ will consist of _____.

a) The disjunction of the remaining maxterms which do not appear in the principal disjunctive normal form of A.

b) The disjunction of the remaining minterms which do not appear in the principal disjunctive normal form of A.

c) The conjunction of the remaining minterms which do not appear in the principal disjunctive normal form of A.

d) The conjunction of the remaining maxterms which do not appear in the principal disjunctive normal form of A.

14) Let $P = \{x | 4 \leq x \leq 10$ and x is even$\}$ Then P is equivalent to _____.

a) $\{4, 5, 6, 7, 8, 9, 10\}$ b) $\{6, 8\}$

c) $\{6, 8, 10\}$ d) $\{4, 6, 8, 10\}$

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
COMPUTAR SCIENCE & ENGINEERING
Discrete Mathematical Structures (BTN03302)

Day & Date: Monday, 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve Any Three. **12**

a) Show the following implications
i) $(P \to Q) \to Q \Rightarrow P \vee Q$
ii) $(P \wedge Q) \Rightarrow (P \to Q)$

b) Convert the following prefix and suffix formulas into completely parenthesized form. Also write then in an infix form using the above order of precedence to minimize the number of parentheses.
i) $\to \neg P \vee Q \leftrightarrow R \neg S$
ii) $\to\to PQ \to\to QR \to PR$

c) Given $S = \{a1, a2, a3, a4, a5, a6, a7, a8\}$, what subsets are represented by $B_{15},\ B_{30}$? Also how will you designate the subsets $\{a2, a6, a7\}$ and $\{a1, a8\}$.

d) Given $S = \{1, 2, 3, 4\}$ and a relation R on S defined by $R = \{< 1,2 >, < 4,3 >, < 2,2 >, < 2,1 >, < 3,1 >\}$. Show that R is not transitive. Find a relation $R1 \supseteq R$ such that $R1$ is transitive. Can you find another relation $R2 \supseteq R$ which is also transitive?

Q.3 a) Obtain PDNF for the following and comment whether they are tautology or not **08**
a) $(\urcorner P \vee \urcorner Q) \to (P \leftrightarrow \urcorner Q)$
b) $(Q \to P) \wedge (\urcorner P \wedge Q)$
c) $P \to (P \wedge (Q \to P))$
d) $Q \wedge (P \vee \urcorner Q)$

OR

b) State the different properties of relation with example and solve the following problem. Let $R = \{< 2,3 >, < 4,5 >, < 3,3 >\}$ and $S = \{< 5,3 >, < 4,2 >, < 2,4 >\}$. Find $R \circ S, R \circ R$ and $S \circ S$. **08**

Q.4 Show that the conclusion C follows from the premises $\mathrm{H1}, \mathrm{H2}, \cdots$ in the following cases **08**

a) $\mathrm{H1}: \mathrm{P} \to \mathrm{Q}$ $\mathrm{C}: \mathrm{P} \to (\mathrm{P} \wedge \mathrm{Q})$

b) $\mathrm{H1}: \neg\mathrm{P} \vee \mathrm{Q}$ $\mathrm{H2}: \neg(\mathrm{Q} \wedge \neg\mathrm{P})$ $\mathrm{H3}: \neg\mathrm{R}$ $\mathrm{C}: \mathrm{Q}$

c) $\mathrm{H1}: \neg\mathrm{P}$ $\mathrm{H2}: \mathrm{P} \vee \mathrm{Q}$ $\mathrm{C}: \mathrm{Q}$

d) $\mathrm{H1}: \neg\mathrm{Q}$ $\mathrm{H2}: \mathrm{P} \to \mathrm{Q}$ $\mathrm{C}: \neg\mathrm{P}$

Section – II

Q.5 Solve any three. **12**

a) Let $f: R \to R$ and $g: R \to R$ where R is the set of real numbers. Find $f \circ g$ and $g \circ f$ where $f(x) = x^2 - 2$ and $g(x) = x + 4$.

b) Prove that the set $G = \{0, 1, 2, 3, 4, 5, 6\}$ is a monoid with respect to addition modulo 7.

c) Convert the infix expression $\mathrm{a} + \mathrm{b} * \mathrm{c} - \mathrm{d}/\mathrm{e}$ to reverse polish expression

d) Explain the term lattice with example.

Q.6 **a)** Let A be a given finite set and $\rho(A)$ its power set. Let $\subseteq$ be the inclusion relation on the elements of $\rho(A)$. Draw Hasse diagram of $< \rho(A), \subseteq >$ for **08**

a) $A = \{a\}$

b) $A = \{a, b\}$

c) $A = \{a, b, c\}$

d) $A = \{a, b, c, d\}$

OR

b) Define algebraic system. State and explain its properties with example.

Q.7 Let $X = \{1, 2, 3\}$ and f, g, h and s be the functions from X to X given by **08**

$f = \{< 1, 2 >, < 2, 3 >, < 3, 1 >\}$

$g = \{< 1,2 >, < 2, 1 >, < 3, 3 >\}$

$h = \{< 1, 1 >, < 2, 2 >, < 3, 1 >\}$

$s = \{< 1,1 >, < 2, 2 >, < 3, 3 >\}$

Find

1) $f \circ f$
2) $g \circ g$
3) $f \circ h \circ g$
4) $s \circ g$
5) $g \circ s$
6) $s \circ s$ and
7) $f \circ s$

Seat No.	

Set **P**

S.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old)
(CBCS) Examination: March/April - 2025
Data Structures (BTN03303)

Day & Date: Tuesday, 20-May-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions: **14**

1) Two main measures for the efficiency of an algorithm are ____
a) Processor and memory b) Complexity and capacity
c) Time and space d) Data and space

2) Which data structure allows deleting data elements from front and inserting at rear?
a) Stack b) Queue
c) Dequeue d) None of these

3) Hashing collision resolution techniques are ____.
a) Huffman coding, linear hashing
b) Buket addressing, Huffman coding
c) Chaining, Huffman coding
d) close chaining, open addressing

4) The number of edges in a complete graph of n vertices is ____.
a) n(n+1)/2 b) n(n-1)/2
c) n2/2 d) n

5) The situation when in a linked list START=NULL is ____.
a) Underflow b) Overflow
c) Houseful d) Saturated

6) The keys 12, 18, 13, 2, 3, 23, 5 and 15 are inserted into an initially empty hash table of length 10 using open addressing with hash function h(k) = k mod 10 and linear probing. What is the resultant hash table?

a)

0	
1	
2	2
3	23
4	
5	15
6	
7	
8	18
9	

b)

0	
1	
2	12
3	13
4	
5	5
6	
7	
8	18
9	

c)

0	
1	
2	12
3	13
4	2
5	3
6	23
7	5
8	18
9	15

d)

0	
1	
2	12, 2
3	13, 3, 23
4	
5	5, 15
6	
7	
8	18
9	

7) Suppose the numbers 7, 5, 1, 8, 3, 6, 0, 9, 4, 2 are inserted in that order into an initially empty binary search tree. The binary search tree uses the usual ordering on natural numbers. What is the in-order traversal sequence of the resultant tree?

a) 7 5 1 0 3 2 4 6 8 9
b) 0 2 4 3 1 6 5 9 8 7
c) 0 1 2 3 4 5 6 7 8 9
d) 9 8 6 4 2 3 0 1 5 7

8) Find Postorder of the binary tree with node labels a, b, c, d, e, f and g for which the in order and preorder traversals result in the following sequences:

Inorder a f b c d g e Preorder b f a d c e g

a) b f a d e c
b) a b d f c e g
c) a f c g e d b
d) g e c d a f b

9) Consider the following linked list and linked list representation, what will be the value of following statement?

start→next→next→next→data 10→12→15→25→30→36

a) 12
b) 30
c) 15
d) 25

10) Which indicates pre-order traversal?

a) Left sub-tree, Right sub-tree, and root
b) Right sub-tree, Left sub-tree and root
c) Root, Left sub-tree, Right sub-tree
d) Right sub-tree, root, Left sub-tree

11) If there exist one pain at least, between every pair of vertices in a graph, the Graph is known as ____.

a) complete graph b) Disconnected graph
c) connected graph d) Euler graph

12) The postfix form of A* B+C/D is ____.

a) AB*CD/+ b) A*BCD/+
c) ABCD*/+ d) None

13) In Breadth First Search of Graph, which of the following data structure is used?

a) Stack b) Queue
c) Linked List d) None of the above

14) The operation of visiting each element in the list is known as ____

a) Sorting b) Merging
c) Inserting d) Traversal

Seat No.	

Set | P

S.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old)
(CBCS) Examination: March/April - 2025
Data Structures (BTN03303)

Day & Date: Tuesday, 20-May-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.
4) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2 Answer the following: (Any Three) **12**

a) Perform Bubble sort (ascending) of following numbers. Show every iteration.
A = {27, 13, 32, 6, 15, 19, 11}

b) Elaborate Data Structures and its types.

c) Write a short note on the collision resolution technique of Linear Probing using suitable example?

d) Evaluate the following postfix expression 7 4 2 * + 9 - using Stack.

Q.3 Answer the following: (Any Two) **16**

a) Explain doubly linked list with insertion and deletion operation.

b) How an infix expression is converted to postfix using stack? Convert following expression into postfix by providing proper explanation and showing content of stack?
(P + Q) * R/S + T ^ U/V

c) Write a program/pseudocode to implement linear queue and perform the operations.
i) Insert
ii) Delete
iii) Display

Section – II

Q.4 Answer the following: (Any Three) **12**

a) Compare between B tree with B+ Tree.

b) Write a note on DFS (Depth First Search) traversal in graph with a suitable example.

c) What is Graph? With an example explain Adjacency Matrix Graph Representation for directed and undirected graph.

d) Define following terminologies in Graph
i) Cycle
ii) degree of a node
iii) regular graph
iv) Path

Q.5 Answer the following: (Any Two) **16**

a) Explain the finding the shortest path in a given graph using Dijkstra algorithm (State and assume suitable data)

b) Explain with example rotations in AVL tree.
Also Give an AVL tree for following elements.
12, 45, 66, 21, 88, 45, 32, 89,14, 76, 46, 91, 33, 28

c) Construct a Binary Search Tree for following elements: 8, 40, 25, 70, 22, 35, 60, 80, 90,10, 30. Traverse the tree using Inorder, Preorder and Postorder traversals.

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old)
(CBCS) Examination: March/April - 2025
Data Structures (BTN03303)

Day & Date: Tuesday, 20-May-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions: **14**

1) Find Postorder of the binary tree with node labels a, b, c, d, e, f and g for which the in order and preorder traversals result in the following sequences:
Inorder a f b c d g e Preorder b f a d c e g

a) b f a d e c
b) a b d f c e g
c) a f c g e d b
d) g e c d a f b

2) Consider the following linked list and linked list representation, what will be the value of following statement?
start→next→next→next→data 10→12→15→25→30→36

a) 12
b) 30
c) 15
d) 25

3) Which indicates pre-order traversal?

a) Left sub-tree, Right sub-tree, and root
b) Right sub-tree, Left sub-tree and root
c) Root, Left sub-tree, Right sub-tree
d) Right sub-tree, root, Left sub-tree

4) If there exist one pain at least, between every pair of vertices in a graph, the Graph is known as ____.

a) complete graph
b) Disconnected graph
c) connected graph
d) Euler graph

5) The postfix form of A* B+C/D is ____.

a) AB*CD/+
b) A*BCD/+
c) ABCD*/+
d) None

6) In Breadth First Search of Graph, which of the following data structure is used?

a) Stack
b) Queue
c) Linked List
d) None of the above

7) The operation of visiting each element in the list is known as ____

a) Sorting
b) Merging
c) Inserting
d) Traversal

8) Two main measures for the efficiency of an algorithm are ____

a) Processor and memory
b) Complexity and capacity
c) Time and space
d) Data and space

9) Which data structure allows deleting data elements from front and inserting at rear?

a) Stack
b) Queue
c) Dequeue
d) None of these

10) Hashing collision resolution techniques are ____.

a) Huffman coding, linear hashing
b) Buket addressing, Huffman coding
c) Chaining, Huffman coding
d) close chaining, open addressing

11) The number of edges in a complete graph of n vertices is ____.

a) n(n+1)/2
b) n(n-1)/2
c) n2/2
d) n

12) The situation when in a linked list START=NULL is ____.

a) Underflow
b) Overflow
c) Houseful
d) Saturated

13) The keys 12, 18, 13, 2, 3, 23, 5 and 15 are inserted into an initially empty hash table of length 10 using open addressing with hash function h(k) = k mod 10 and linear probing. What is the resultant hash table?

a)

0	
1	
2	2
3	23
4	
5	15
6	
7	
8	18
9	

b)

0	
1	
2	12
3	13
4	
5	5
6	
7	
8	18
9	

c)

0	
1	
2	12
3	13
4	2
5	3
6	23
7	5
8	18
9	15

d)

0	
1	
2	12, 2
3	13, 3, 23
4	
5	5, 15
6	
7	
8	18
9	

14) Suppose the numbers 7, 5, 1, 8, 3, 6, 0, 9, 4, 2 are inserted in that order into an initially empty binary search tree. The binary search tree uses the usual ordering on natural numbers. What is the in-order traversal sequence of the resultant tree?

a) 7 5 1 0 3 2 4 6 8 9

b) 0 2 4 3 1 6 5 9 8 7

c) 0 1 2 3 4 5 6 7 8 9

d) 9 8 6 4 2 3 0 1 5 7

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2025
Data Structures (BTN03303)

Day & Date: Tuesday, 20-May-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.
4) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2 Answer the following: (Any Three) **12**

a) Perform Bubble sort (ascending) of following numbers. Show every iteration.
A = {27, 13, 32, 6, 15, 19, 11}

b) Elaborate Data Structures and its types.

c) Write a short note on the collision resolution technique of Linear Probing using suitable example?

d) Evaluate the following postfix expression 7 4 2 * + 9 - using Stack.

Q.3 Answer the following: (Any Two) **16**

a) Explain doubly linked list with insertion and deletion operation.

b) How an infix expression is converted to postfix using stack? Convert following expression into postfix by providing proper explanation and showing content of stack?
(P + Q) * R/S + T ^ U/V

c) Write a program/pseudocode to implement linear queue and perform the operations.
i) Insert
ii) Delete
iii) Display

Section – II

Q.4 Answer the following: (Any Three) **12**

a) Compare between B tree with B+ Tree.

b) Write a note on DFS (Depth First Search) traversal in graph with a suitable example.

c) What is Graph? With an example explain Adjacency Matrix Graph Representation for directed and undirected graph.

d) Define following terminologies in Graph
i) Cycle
ii) degree of a node
iii) regular graph
iv) Path

Q.5 Answer the following: (Any Two) **16**

a) Explain the finding the shortest path in a given graph using Dijkstra algorithm (State and assume suitable data)

b) Explain with example rotations in AVL tree.
Also Give an AVL tree for following elements.
12, 45, 66, 21, 88, 45, 32, 89,14, 76, 46, 91, 33, 28

c) Construct a Binary Search Tree for following elements: 8, 40, 25, 70, 22, 35, 60, 80, 90,10, 30. Traverse the tree using Inorder, Preorder and Postorder traversals.

Seat No.	

Set **R**

S.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old)
(CBCS) Examination: March/April - 2025
Data Structures (BTN03303)

Day & Date: Tuesday, 20-May-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions: **14**

1) If there exist one pain at least, between every pair of vertices in a graph, the Graph is known as ____.
a) complete graph b) Disconnected graph
c) connected graph d) Euler graph

2) The postfix form of A* B+C/D is ____.
a) AB*CD/+ b) A*BCD/+
c) ABCD*/+ d) None

3) In Breadth First Search of Graph, which of the following data structure is used?
a) Stack b) Queue
c) Linked List d) None of the above

4) The operation of visiting each element in the list is known as ____
a) Sorting b) Merging
c) Inserting d) Traversal

5) Two main measures for the efficiency of an algorithm are ____
a) Processor and memory b) Complexity and capacity
c) Time and space d) Data and space

6) Which data structure allows deleting data elements from front and inserting at rear?
a) Stack b) Queue
c) Dequeue d) None of these

7) Hashing collision resolution techniques are ____.
a) Huffman coding, linear hashing
b) Buket addressing, Huffman coding
c) Chaining, Huffman coding
d) close chaining, open addressing

8) The number of edges in a complete graph of n vertices is ____.
a) n(n+1)/2 b) n(n-1)/2
c) n2/2 d) n

9) The situation when in a linked list START=NULL is ____.
a) Underflow b) Overflow
c) Houseful d) Saturated

10) The keys 12, 18, 13, 2, 3, 23, 5 and 15 are inserted into an initially empty hash table of length 10 using open addressing with hash function h(k) = k mod 10 and linear probing. What is the resultant hash table?

a)

0	
1	
2	2
3	23
4	
5	15
6	
7	
8	18
9	

b)

0	
1	
2	12
3	13
4	
5	5
6	
7	
8	18
9	

c)

0	
1	
2	12
3	13
4	2
5	3
6	23
7	5
8	18
9	15

d)

0	
1	
2	12, 2
3	13, 3, 23
4	
5	5, 15
6	
7	
8	18
9	

11) Suppose the numbers 7, 5, 1, 8, 3, 6, 0, 9, 4, 2 are inserted in that order into an initially empty binary search tree. The binary search tree uses the usual ordering on natural numbers. What is the in-order traversal sequence of the resultant tree?
a) 7 5 1 0 3 2 4 6 8 9 b) 0 2 4 3 1 6 5 9 8 7
c) 0 1 2 3 4 5 6 7 8 9 d) 9 8 6 4 2 3 0 1 5 7

12) Find Postorder of the binary tree with node labels a, b, c, d, e, f and g for which the in order and preorder traversals result in the following sequences:

Inorder a f b c d g e Preorder b f a d c e g

a) b f a d e c
b) a b d f c e g
c) a f c g e d b
d) g e c d a f b

13) Consider the following linked list and linked list representation, what will be the value of following statement?

start→next→next→next→data 10→12→15→25→30→36

a) 12
b) 30
c) 15
d) 25

14) Which indicates pre-order traversal?

a) Left sub-tree, Right sub-tree, and root
b) Right sub-tree, Left sub-tree and root
c) Root, Left sub-tree, Right sub-tree
d) Right sub-tree, root, Left sub-tree

Seat No.	

Set | R

S.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old)
(CBCS) Examination: March/April - 2025
Data Structures (BTN03303)

Day & Date: Tuesday, 20-May-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.
4) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2 Answer the following: (Any Three) **12**

a) Perform Bubble sort (ascending) of following numbers. Show every iteration.
A = {27, 13, 32, 6, 15, 19, 11}

b) Elaborate Data Structures and its types.

c) Write a short note on the collision resolution technique of Linear Probing using suitable example?

d) Evaluate the following postfix expression 7 4 2 * + 9 - using Stack.

Q.3 Answer the following: (Any Two) **16**

a) Explain doubly linked list with insertion and deletion operation.

b) How an infix expression is converted to postfix using stack? Convert following expression into postfix by providing proper explanation and showing content of stack?
(P + Q) * R/S + T ^ U/V

c) Write a program/pseudocode to implement linear queue and perform the operations.
i) Insert
ii) Delete
iii) Display

Section – II

Q.4 Answer the following: (Any Three) **12**

a) Compare between B tree with B+ Tree.

b) Write a note on DFS (Depth First Search) traversal in graph with a suitable example.

c) What is Graph? With an example explain Adjacency Matrix Graph Representation for directed and undirected graph.

d) Define following terminologies in Graph
i) Cycle
ii) degree of a node
iii) regular graph
iv) Path

Q.5 Answer the following: (Any Two) **16**

a) Explain the finding the shortest path in a given graph using Dijkstra algorithm (State and assume suitable data)

b) Explain with example rotations in AVL tree.
Also Give an AVL tree for following elements.
12, 45, 66, 21, 88, 45, 32, 89,14, 76, 46, 91, 33, 28

c) Construct a Binary Search Tree for following elements: 8, 40, 25, 70, 22, 35, 60, 80, 90,10, 30. Traverse the tree using Inorder, Preorder and Postorder traversals.

Seat No.	

Set **S**

S.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old)
(CBCS) Examination: March/April - 2025
Data Structures (BTN03303)

Day & Date: Tuesday, 20-May-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions: **14**

1) The keys 12, 18, 13, 2, 3, 23, 5 and 15 are inserted into an initially empty hash table of length 10 using open addressing with hash function h(k) = k mod 10 and linear probing. What is the resultant hash table?

a)

0	
1	
2	2
3	23
4	
5	15
6	
7	
8	18
9	

b)

0	
1	
2	12
3	13
4	
5	5
6	
7	
8	18
9	

c)

0	
1	
2	12
3	13
4	2
5	3
6	23
7	5
8	18
9	15

d)

0	
1	
2	12, 2
3	13, 3, 23
4	
5	5, 15
6	
7	
8	18
9	

2) Suppose the numbers 7, 5, 1, 8, 3, 6, 0, 9, 4, 2 are inserted in that order into an initially empty binary search tree. The binary search tree uses the usual ordering on natural numbers. What is the in-order traversal sequence of the resultant tree?

a) 7 5 1 0 3 2 4 6 8 9 b) 0 2 4 3 1 6 5 9 8 7
c) 0 1 2 3 4 5 6 7 8 9 d) 9 8 6 4 2 3 0 1 5 7

3) Find Postorder of the binary tree with node labels a, b, c, d, e, f and g for which the in order and preorder traversals result in the following sequences:

Inorder a f b c d g e Preorder b f a d c e g

a) b f a d e c b) a b d f c e g
c) a f c g e d b d) g e c d a f b

4) Consider the following linked list and linked list representation, what will be the value of following statement?

start→next→next→next→data 10→12→15→25→30→36

a) 12 b) 30
c) 15 d) 25

5) Which indicates pre-order traversal?

a) Left sub-tree, Right sub-tree, and root
b) Right sub-tree, Left sub-tree and root
c) Root, Left sub-tree, Right sub-tree
d) Right sub-tree, root, Left sub-tree

6) If there exist one pain at least, between every pair of vertices in a graph, the Graph is known as ____.

a) complete graph b) Disconnected graph
c) connected graph d) Euler graph

7) The postfix form of A* B+C/D is ____.

a) AB*CD/+ b) A*BCD/+
c) ABCD*/+ d) None

8) In Breadth First Search of Graph, which of the following data structure is used?

a) Stack b) Queue
c) Linked List d) None of the above

9) The operation of visiting each element in the list is known as ____

a) Sorting b) Merging
c) Inserting d) Traversal

10) Two main measures for the efficiency of an algorithm are ____

a) Processor and memory b) Complexity and capacity
c) Time and space d) Data and space

11) Which data structure allows deleting data elements from front and inserting at rear?

a) Stack
b) Queue
c) Dequeue
d) None of these

12) Hashing collision resolution techniques are ____.

a) Huffman coding, linear hashing
b) Buket addressing, Huffman coding
c) Chaining, Huffman coding
d) close chaining, open addressing

13) The number of edges in a complete graph of n vertices is ____.

a) n(n+1)/2
b) n(n-1)/2
c) n2/2
d) n

14) The situation when in a linked list START=NULL is ____.

a) Underflow
b) Overflow
c) Houseful
d) Saturated

Seat No.	

Set | S

S.Y. (B.Tech.) (Computer Science & Engineering) (Semester - I) (Old)
(CBCS) Examination: March/April - 2025
Data Structures (BTN03303)

Day & Date: Tuesday, 20-May-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculators is allowed.
4) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2 Answer the following: (Any Three) **12**

a) Perform Bubble sort (ascending) of following numbers. Show every iteration.
A = {27, 13, 32, 6, 15, 19, 11}

b) Elaborate Data Structures and its types.

c) Write a short note on the collision resolution technique of Linear Probing using suitable example?

d) Evaluate the following postfix expression 7 4 2 * + 9 - using Stack.

Q.3 Answer the following: (Any Two) **16**

a) Explain doubly linked list with insertion and deletion operation.

b) How an infix expression is converted to postfix using stack? Convert following expression into postfix by providing proper explanation and showing content of stack?
(P + Q) * R/S + T ^ U/V

c) Write a program/pseudocode to implement linear queue and perform the operations.
i) Insert
ii) Delete
iii) Display

Section – II

Q.4 Answer the following: (Any Three) **12**

a) Compare between B tree with B+ Tree.

b) Write a note on DFS (Depth First Search) traversal in graph with a suitable example.

c) What is Graph? With an example explain Adjacency Matrix Graph Representation for directed and undirected graph.

d) Define following terminologies in Graph
i) Cycle
ii) degree of a node
iii) regular graph
iv) Path

Q.5 Answer the following: (Any Two) **16**

a) Explain the finding the shortest path in a given graph using Dijkstra algorithm (State and assume suitable data)

b) Explain with example rotations in AVL tree.
Also Give an AVL tree for following elements.
12, 45, 66, 21, 88, 45, 32, 89,14, 76, 46, 91, 33, 28

c) Construct a Binary Search Tree for following elements: 8, 40, 25, 70, 22, 35, 60, 80, 90,10, 30. Traverse the tree using Inorder, Preorder and Postorder traversals.

SLR-BD-153

Seat No.	

Set P

S.Y. (B.Tech.) (Semester - I) (Old) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE & ENGINEERING
Computer Graphics (BTN03304)

Day & Date: Wednesday, 21-May-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) At end of each scan line the electron beam return to the left side on the screen to begin next _____.
a) Vertical refresh b) Horizontal refresh
c) Scanning d) Both a & b

2) The transformation that changes the coordinate positions of an object along a circular path is called ____.
a) Translation b) Scaling
c) Rotation d) Reflection

3) The process of determining the suitable or appropriate pixels for representing image or graphic object is called ____.
a) Animation b) Rasterization
c) Scan-Conversion d) Quantization

4) Which of the following techniques is used in Midpoint Subdivision algorithm?
a) Binary search b) Bubble sort
c) Linear search d) Sequential search

5) The basic geometric transformations are ____.
a) Translation b) Rotation
c) Scaling d) All of the mentioned

6) Back face removal is an example of ____.
a) object space method b) image space method
c) combination of both d) None

7) Clipping algorithm which follows "Divide and conquer" strategy is____.
a) Sutherland - Cohen algorithm b) Cyrus - Beck algorithm
c) Midpoint subdivision d) None of the above

8) The centre region of the screen and the window can be represented as ____.

a) 0000 b) 1111
c) 0110 d) 1001

9) In the Cohen-sutherland line clipping algorithm, if the codes of the two points P and Q are 0101 and 0001 then the line segment joining the points P and Q will be ____ the clipping window.

a) Totally outside b) Partially outside
c) Totally inside d) None

10) Aliasing effect means ____.

a) Staircase effect b) Shading effect
c) Rendering effect d) Cueing effect

11) In Warnock algorithm, the polygon is called as surrounding, if it completely ____ the window.

a) Outside b) Contains
c) Intersects d) None of above

12) ____ are the types of curve representation.

a) Parametric b) Non-parametric
c) Both d) None

13) ____ control points are the points which decides the local shape of a curve.

a) Local b) Global
c) Interpolation d) None

14) In interpolation, curve always passes through ____ control points.

a) Last and second b) First and second
c) First and Last d) All

Seat No.	

Set P

S.Y. (B.Tech.) (Semester - I) (Old) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE & ENGINEERING
Computer Graphics (BTN03304)

Day & Date: Wednesday, 21-May-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2 Answer the following: (Any Four) **16**

a) Write a note on: Aspect ratio and Frame buffer.
b) Explain 2D Reflection.
c) Define polygon. Explain seed fill polygon filling.
d) Scale the polygon with coordinates A(2,5) B(7,10) C(10,2) by 2 units in both x and 3 units in y direction.
e) Explain Rotation about an arbitrary point.

Q.3 Answer the following: (Any One) **06**

a) Consider a line from (1,1) to (7,8). Use DDA algorithm to rasterize this line.
b) Write a 'C' program for Bresenham's Circle generation algorithm.

Q.4 Answer the following: **06**

Explain the following:
a) Interactive Devices
b) Shadow Mask Technique

Section-II

Q.5 Answer the following: (Any Four) **16**

a) Explain Back Face removal algorithm.
b) Explain Display file compilation?
c) Explain properties of Bezier curve.
d) Explain Z-Buffer algorithm.
e) Explain Painter's algorithm.

Q.6 Answer the following: (Any One) **06**

a) Explain Warnock algorithm.
b) Explain parametric and non-parametric curves.

Q.7 Answer the following: **06**

Explain Cohen-Sutherland Line Clipping algorithm.

Seat No.		Set	Q

S.Y. (B.Tech.) (Semester - I) (Old) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE & ENGINEERING
Computer Graphics (BTN03304)

Day & Date: Wednesday, 21-May-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The centre region of the screen and the window can be represented as ____.
a) 0000 b) 1111
c) 0110 d) 1001

2) In the Cohen-sutherland line clipping algorithm, if the codes of the two points P and Q are 0101 and 0001 then the line segment joining the points P and Q will be ____ the clipping window.
a) Totally outside b) Partially outside
c) Totally inside d) None

3) Aliasing effect means ____.
a) Staircase effect b) Shading effect
c) Rendering effect d) Cueing effect

4) In Warnock algorithm, the polygon is called as surrounding, if it completely ____ the window.
a) Outside b) Contains
c) Intersects d) None of above

5) ____ are the types of curve representation.
a) Parametric b) Non-parametric
c) Both d) None

6) ____ control points are the points which decides the local shape of a curve.
a) Local b) Global
c) Interpolation d) None

7) In interpolation, curve always passes through ____ control points.
a) Last and second b) First and second
c) First and Last d) All

8) At end of each scan line the electron beam return to the left side on the screen to begin next _____.
a) Vertical refresh b) Horizontal refresh
c) Scanning d) Both a & b

9) The transformation that changes the coordinate positions of an object along a circular path is called ____.
a) Translation b) Scaling
c) Rotation d) Reflection

10) The process of determining the suitable or appropriate pixels for representing image or graphic object is called ____.
a) Animation b) Rasterization
c) Scan-Conversion d) Quantization

11) Which of the following techniques is used in Midpoint Subdivision algorithm?
a) Binary search b) Bubble sort
c) Linear search d) Sequential search

12) The basic geometric transformations are ____.
a) Translation b) Rotation
c) Scaling d) All of the mentioned

13) Back face removal is an example of ____.
a) object space method b) image space method
c) combination of both d) None

14) Clipping algorithm which follows "Divide and conquer" strategy is____.
a) Sutherland - Cohen algorithm b) Cyrus - Beck algorithm
c) Midpoint subdivision d) None of the above

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Semester - I) (Old) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE & ENGINEERING
Computer Graphics (BTN03304)

Day & Date: Wednesday, 21-May-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2 Answer the following: (Any Four) **16**

a) Write a note on: Aspect ratio and Frame buffer.
b) Explain 2D Reflection.
c) Define polygon. Explain seed fill polygon filling.
d) Scale the polygon with coordinates A(2,5) B(7,10) C(10,2) by 2 units in both x and 3 units in y direction.
e) Explain Rotation about an arbitrary point.

Q.3 Answer the following: (Any One) **06**

a) Consider a line from (1,1) to (7,8). Use DDA algorithm to rasterize this line.
b) Write a 'C' program for Bresenham's Circle generation algorithm.

Q.4 Answer the following: **06**

Explain the following:
a) Interactive Devices
b) Shadow Mask Technique

Section-II

Q.5 Answer the following: (Any Four) **16**

a) Explain Back Face removal algorithm.
b) Explain Display file compilation?
c) Explain properties of Bezier curve.
d) Explain Z-Buffer algorithm.
e) Explain Painter's algorithm.

Q.6 Answer the following: (Any One) **06**

a) Explain Warnock algorithm.
b) Explain parametric and non-parametric curves.

Q.7 Answer the following: **06**

Explain Cohen-Sutherland Line Clipping algorithm.

Seat No.	

Set **R**

S.Y. (B.Tech.) (Semester - I) (Old) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE & ENGINEERING
Computer Graphics (BTN03304)

Day & Date: Wednesday, 21-May-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) In Warnock algorithm, the polygon is called as surrounding, if it completely ____ the window.
a) Outside b) Contains
c) Intersects d) None of above

2) ____ are the types of curve representation.
a) Parametric b) Non-parametric
c) Both d) None

3) ____ control points are the points which decides the local shape of a curve.
a) Local b) Global
c) Interpolation d) None

4) In interpolation, curve always passes through ____ control points.
a) Last and second b) First and second
c) First and Last d) All

5) At end of each scan line the electron beam return to the left side on the screen to begin next _____.
a) Vertical refresh b) Horizontal refresh
c) Scanning d) Both a & b

6) The transformation that changes the coordinate positions of an object along a circular path is called ____.
a) Translation b) Scaling
c) Rotation d) Reflection

7) The process of determining the suitable or appropriate pixels for representing image or graphic object is called ____.

a) Animation b) Rasterization
c) Scan-Conversion d) Quantization

8) Which of the following techniques is used in Midpoint Subdivision algorithm?

a) Binary search b) Bubble sort
c) Linear search d) Sequential search

9) The basic geometric transformations are ____.

a) Translation b) Rotation
c) Scaling d) All of the mentioned

10) Back face removal is an example of ____.

a) object space method b) image space method
c) combination of both d) None

11) Clipping algorithm which follows "Divide and conquer" strategy is____.

a) Sutherland - Cohen algorithm b) Cyrus - Beck algorithm
c) Midpoint subdivision d) None of the above

12) The centre region of the screen and the window can be represented as ____.

a) 0000 b) 1111
c) 0110 d) 1001

13) In the Cohen-sutherland line clipping algorithm, if the codes of the two points P and Q are 0101 and 0001 then the line segment joining the points P and Q will be ____ the clipping window.

a) Totally outside b) Partially outside
c) Totally inside d) None

14) Aliasing effect means ____.

a) Staircase effect b) Shading effect
c) Rendering effect d) Cueing effect

Seat No.	

Set R

S.Y. (B.Tech.) (Semester - I) (Old) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE & ENGINEERING
Computer Graphics (BTN03304)

Day & Date: Wednesday, 21-May-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2 Answer the following: (Any Four) **16**

a) Write a note on: Aspect ratio and Frame buffer.
b) Explain 2D Reflection.
c) Define polygon. Explain seed fill polygon filling.
d) Scale the polygon with coordinates A(2,5) B(7,10) C(10,2) by 2 units in both x and 3 units in y direction.
e) Explain Rotation about an arbitrary point.

Q.3 Answer the following: (Any One) **06**

a) Consider a line from (1,1) to (7,8). Use DDA algorithm to rasterize this line.
b) Write a 'C' program for Bresenham's Circle generation algorithm.

Q.4 Answer the following: **06**

Explain the following:
a) Interactive Devices
b) Shadow Mask Technique

Section-II

Q.5 Answer the following: (Any Four) **16**

a) Explain Back Face removal algorithm.
b) Explain Display file compilation?
c) Explain properties of Bezier curve.
d) Explain Z-Buffer algorithm.
e) Explain Painter's algorithm.

Q.6 Answer the following: (Any One) **06**

a) Explain Warnock algorithm.
b) Explain parametric and non-parametric curves.

Q.7 Answer the following: **06**

Explain Cohen-Sutherland Line Clipping algorithm.

Seat No.		Set	S

S.Y. (B.Tech.) (Semester - I) (Old) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE & ENGINEERING
Computer Graphics (BTN03304)

Day & Date: Wednesday, 21-May-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Back face removal is an example of ____.
a) object space method b) image space method
c) combination of both d) None

2) Clipping algorithm which follows "Divide and conquer" strategy is____.
a) Sutherland - Cohen algorithm b) Cyrus - Beck algorithm
c) Midpoint subdivision d) None of the above

3) The centre region of the screen and the window can be represented as ____.
a) 0000 b) 1111
c) 0110 d) 1001

4) In the Cohen-sutherland line clipping algorithm, if the codes of the two points P and Q are 0101 and 0001 then the line segment joining the points P and Q will be ____ the clipping window.
a) Totally outside b) Partially outside
c) Totally inside d) None

5) Aliasing effect means ____.
a) Staircase effect b) Shading effect
c) Rendering effect d) Cueing effect

6) In Warnock algorithm, the polygon is called as surrounding, if it completely ____ the window.
a) Outside b) Contains
c) Intersects d) None of above

7) ____ are the types of curve representation.
a) Parametric b) Non-parametric
c) Both d) None

8) ____ control points are the points which decides the local shape of a curve.

a) Local b) Global
c) Interpolation d) None

9) In interpolation, curve always passes through ____ control points.

a) Last and second b) First and second
c) First and Last d) All

10) At end of each scan line the electron beam return to the left side on the screen to begin next _____.

a) Vertical refresh b) Horizontal refresh
c) Scanning d) Both a & b

11) The transformation that changes the coordinate positions of an object along a circular path is called ____.

a) Translation b) Scaling
c) Rotation d) Reflection

12) The process of determining the suitable or appropriate pixels for representing image or graphic object is called ____.

a) Animation b) Rasterization
c) Scan-Conversion d) Quantization

13) Which of the following techniques is used in Midpoint Subdivision algorithm?

a) Binary search b) Bubble sort
c) Linear search d) Sequential search

14) The basic geometric transformations are ____.

a) Translation b) Rotation
c) Scaling d) All of the mentioned

SLR-BD-153

Seat No.	

Set S

S.Y. (B.Tech.) (Semester - I) (Old) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE & ENGINEERING
Computer Graphics (BTN03304)

Day & Date: Wednesday, 21-May-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2 Answer the following: (Any Four) **16**
- **a)** Write a note on: Aspect ratio and Frame buffer.
- **b)** Explain 2D Reflection.
- **c)** Define polygon. Explain seed fill polygon filling.
- **d)** Scale the polygon with coordinates A(2,5) B(7,10) C(10,2) by 2 units in both x and 3 units in y direction.
- **e)** Explain Rotation about an arbitrary point.

Q.3 Answer the following: (Any One) **06**
- **a)** Consider a line from (1,1) to (7,8). Use DDA algorithm to rasterize this line.
- **b)** Write a 'C' program for Bresenham's Circle generation algorithm.

Q.4 Answer the following: **06**
Explain the following:
- **a)** Interactive Devices
- **b)** Shadow Mask Technique

Section-II

Q.5 Answer the following: (Any Four) **16**
- **a)** Explain Back Face removal algorithm.
- **b)** Explain Display file compilation?
- **c)** Explain properties of Bezier curve.
- **d)** Explain Z-Buffer algorithm.
- **e)** Explain Painter's algorithm.

Q.6 Answer the following: (Any One) **06**
- **a)** Explain Warnock algorithm.
- **b)** Explain parametric and non-parametric curves.

Q.7 Answer the following: **06**
Explain Cohen-Sutherland Line Clipping algorithm.

SLR-BD-154

Seat No.	

Set P

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
COMPUTAR SCIENCE & ENGINEERING
Microprocessors (BTN03305)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which section of the 8085 microprocessor pin diagram typically handles input/output operations?
a) Data bus b) Address bus
c) Control bus d) I/O Ports

2) Which addressing mode is commonly used in the 8086 microprocessor for accessing data located at a fixed memory address?
a) Direct addressing mode b) Indirect addressing mode
c) Register addressing mode d) Immediate addressing mode

3) Which component of the 8086 microprocessor is responsible for executing machine language instructions?
a) CU (Control Unit) b) ALU (Arithmetic Logic Unit)
c) Registers d) Cache Memory

4) Which directive in assembly language is used to define a constant value?
a) MOV b) DB
c) JMP d) CALL

5) Which register is commonly used for storing the result of arithmetic operations in the 8086-instruction set?
a) AX b) BX
c) CX d) DX

6) What does the "MOV" instruction do in the 8086 instruction set?
a) Adds two operands
b) Moves data from one location to another
c) Subtracts two operands
d) Compares two operands

7) Which instruction is used for unconditional branching in the 8086 instruction set?

a) JZ
b) CALL
c) JMP
d) ADC

8) In the minimum mode configuration of 8086, which component is responsible for generating control signals and coordinating operations?

a) CPU
b) Clock Generator
c) Bus Controller
d) Memory Controller

9) What does the HOLD signal indicate in the system timing diagram of the 8086 microprocessor?

a) That the processor has completed an instruction
b) That a DMA (Direct Memory Access) request is pending
c) That the processor requires additional wait states
d) That the processor is resetting

10) In the system timing diagram of the 8086 microprocessor, what does the T1 state represent?

a) Memory read
b) Memory write
c) Opcode fetch
d) Execution of instruction

11) What is the primary function of the Programmable Interrupt Controller (PIC) 8259 in computer systems?

a) To handle memory management
b) To generate interrupts
c) To control input/output operations
d) To manage processor cache

12) What is the primary function of the Numeric Data Processor (NDP) 8087 in conjunction with the 8086 microprocessors?

a) To perform floating-point arithmetic operations
b) To handle interrupt requests
c) To manage memory access
d) To execute control transfer instructions

13) What is the primary function of the Programmable Peripheral Interface (PPI) 8255 in computer systems?

a) To handle memory management
b) To generate interrupts
c) To control input/output operations
d) To manage processor cache

14) Which mode of operation allows bidirectional data transfer on all three ports of the 8255?

a) Mode 3
b) Mode 2
c) Mode 1
d) Mode 0

SLR-BD-154

Seat No.	

Set P

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
COMPUTAR SCIENCE & ENGINEERING
Microprocessors (BTN03305)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four **16**

a) Draw the pin diagram of 8085 and explain the function of following pins.
1) HLDA 2) SID and SOD

b) Explain the Following instruction with example.
1) ADC 2) XOR
3) MOVSB 4) SHL

c) Draw the Falg register of 8086 and explain the conditional and Control Flags.

d) Draw the net diagram of minimum mode of operation of 8086.

e) Write an assembly language Program for the factorial of a number 5.

Q.3 Attempt any two. **12**

a) Draw and explain the system bus timing diagram for READ AND WRITE operation in minimum mode of 8086.

b) Explain the architecture of 8086 in detail.

c) Define the machine cycle instruction? Draw the machine cycle instruction format? Explain the same with example.

Section – II

Q.4 Attempt any Four. **16**

a) Draw and explain the architecture of 8259A.

b) list the features of 8257?

c) Explain the operating modes of 8255 PPI.

d) Explain the real addressing mode of 80286 Microprocessor.

e) Compare the Maskable and Nonmaskable interrupt.

Q.5 Attempt any two. **12**

a) Draw and explain the Architecture of 80386.

b) Explain the architecture of 8257 in detail.

c) Explain any three data types of 8087 NDP Processor.

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
COMPUTAR SCIENCE & ENGINEERING
Microprocessors (BTN03305)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) In the minimum mode configuration of 8086, which component is responsible for generating control signals and coordinating operations?
a) CPU b) Clock Generator
c) Bus Controller d) Memory Controller

2) What does the HOLD signal indicate in the system timing diagram of the 8086 microprocessor?
a) That the processor has completed an instruction
b) That a DMA (Direct Memory Access) request is pending
c) That the processor requires additional wait states
d) That the processor is resetting

3) In the system timing diagram of the 8086 microprocessor, what does the T1 state represent?
a) Memory read b) Memory write
c) Opcode fetch d) Execution of instruction

4) What is the primary function of the Programmable Interrupt Controller (PIC) 8259 in computer systems?
a) To handle memory management
b) To generate interrupts
c) To control input/output operations
d) To manage processor cache

5) What is the primary function of the Numeric Data Processor (NDP) 8087 in conjunction with the 8086 microprocessors?
a) To perform floating-point arithmetic operations
b) To handle interrupt requests
c) To manage memory access
d) To execute control transfer instructions

6) What is the primary function of the Programmable Peripheral Interface (PPI) 8255 in computer systems?
a) To handle memory management
b) To generate interrupts
c) To control input/output operations
d) To manage processor cache

7) Which mode of operation allows bidirectional data transfer on all three ports of the 8255?
a) Mode 3 b) Mode 2
c) Mode 1 d) Mode 0

8) Which section of the 8085 microprocessor pin diagram typically handles input/output operations?
a) Data bus b) Address bus
c) Control bus d) I/O Ports

9) Which addressing mode is commonly used in the 8086 microprocessor for accessing data located at a fixed memory address?
a) Direct addressing mode b) Indirect addressing mode
c) Register addressing mode d) Immediate addressing mode

10) Which component of the 8086 microprocessor is responsible for executing machine language instructions?
a) CU (Control Unit) b) ALU (Arithmetic Logic Unit)
c) Registers d) Cache Memory

11) Which directive in assembly language is used to define a constant value?
a) MOV b) DB
c) JMP d) CALL

12) Which register is commonly used for storing the result of arithmetic operations in the 8086-instruction set?
a) AX b) BX
c) CX d) DX

13) What does the "MOV" instruction do in the 8086 instruction set?
a) Adds two operands
b) Moves data from one location to another
c) Subtracts two operands
d) Compares two operands

14) Which instruction is used for unconditional branching in the 8086 instruction set?

a) JZ
b) CALL
c) JMP
d) ADC

SLR-BD-154

Seat No.	

Set Q

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
COMPUTAR SCIENCE & ENGINEERING
Microprocessors (BTN03305)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four **16**

a) Draw the pin diagram of 8085 and explain the function of following pins.
1) HLDA 2) SID and SOD

b) Explain the Following instruction with example.
1) ADC 2) XOR
3) MOVSB 4) SHL

c) Draw the Falg register of 8086 and explain the conditional and Control Flags.

d) Draw the net diagram of minimum mode of operation of 8086.

e) Write an assembly language Program for the factorial of a number 5.

Q.3 Attempt any two. **12**

a) Draw and explain the system bus timing diagram for READ AND WRITE operation in minimum mode of 8086.

b) Explain the architecture of 8086 in detail.

c) Define the machine cycle instruction? Draw the machine cycle instruction format? Explain the same with example.

Section – II

Q.4 Attempt any Four. **16**

a) Draw and explain the architecture of 8259A.

b) list the features of 8257?

c) Explain the operating modes of 8255 PPI.

d) Explain the real addressing mode of 80286 Microprocessor.

e) Compare the Maskable and Nonmaskable interrupt.

Q.5 Attempt any two. **12**

a) Draw and explain the Architecture of 80386.

b) Explain the architecture of 8257 in detail.

c) Explain any three data types of 8087 NDP Processor.

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
COMPUTAR SCIENCE & ENGINEERING
Microprocessors (BTN03305)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the primary function of the Programmable Interrupt Controller (PIC) 8259 in computer systems?
a) To handle memory management
b) To generate interrupts
c) To control input/output operations
d) To manage processor cache

2) What is the primary function of the Numeric Data Processor (NDP) 8087 in conjunction with the 8086 microprocessors?
a) To perform floating-point arithmetic operations
b) To handle interrupt requests
c) To manage memory access
d) To execute control transfer instructions

3) What is the primary function of the Programmable Peripheral Interface (PPI) 8255 in computer systems?
a) To handle memory management
b) To generate interrupts
c) To control input/output operations
d) To manage processor cache

4) Which mode of operation allows bidirectional data transfer on all three ports of the 8255?
a) Mode 3 b) Mode 2
c) Mode 1 d) Mode 0

5) Which section of the 8085 microprocessor pin diagram typically handles input/output operations?
a) Data bus b) Address bus
c) Control bus d) I/O Ports

6) Which addressing mode is commonly used in the 8086 microprocessor for accessing data located at a fixed memory address?

a) Direct addressing mode b) Indirect addressing mode
c) Register addressing mode d) Immediate addressing mode

7) Which component of the 8086 microprocessor is responsible for executing machine language instructions?

a) CU (Control Unit) b) ALU (Arithmetic Logic Unit)
c) Registers d) Cache Memory

8) Which directive in assembly language is used to define a constant value?

a) MOV b) DB
c) JMP d) CALL

9) Which register is commonly used for storing the result of arithmetic operations in the 8086-instruction set?

a) AX b) BX
c) CX d) DX

10) What does the "MOV" instruction do in the 8086 instruction set?

a) Adds two operands
b) Moves data from one location to another
c) Subtracts two operands
d) Compares two operands

11) Which instruction is used for unconditional branching in the 8086 instruction set?

a) JZ b) CALL
c) JMP d) ADC

12) In the minimum mode configuration of 8086, which component is responsible for generating control signals and coordinating operations?

a) CPU b) Clock Generator
c) Bus Controller d) Memory Controller

13) What does the HOLD signal indicate in the system timing diagram of the 8086 microprocessor?

a) That the processor has completed an instruction
b) That a DMA (Direct Memory Access) request is pending
c) That the processor requires additional wait states
d) That the processor is resetting

14) In the system timing diagram of the 8086 microprocessor, what does the T1 state represent?

a) Memory read b) Memory write
c) Opcode fetch d) Execution of instruction

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
COMPUTAR SCIENCE & ENGINEERING
Microprocessors (BTN03305)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four **16**

a) Draw the pin diagram of 8085 and explain the function of following pins.
1) HLDA 2) SID and SOD

b) Explain the Following instruction with example.
1) ADC 2) XOR
3) MOVSB 4) SHL

c) Draw the Falg register of 8086 and explain the conditional and Control Flags.

d) Draw the net diagram of minimum mode of operation of 8086.

e) Write an assembly language Program for the factorial of a number 5.

Q.3 Attempt any two. **12**

a) Draw and explain the system bus timing diagram for READ AND WRITE operation in minimum mode of 8086.

b) Explain the architecture of 8086 in detail.

c) Define the machine cycle instruction? Draw the machine cycle instruction format? Explain the same with example.

Section – II

Q.4 Attempt any Four. **16**

a) Draw and explain the architecture of 8259A.

b) list the features of 8257?

c) Explain the operating modes of 8255 PPI.

d) Explain the real addressing mode of 80286 Microprocessor.

e) Compare the Maskable and Nonmaskable interrupt.

Q.5 Attempt any two. **12**

a) Draw and explain the Architecture of 80386.

b) Explain the architecture of 8257 in detail.

c) Explain any three data types of 8087 NDP Processor.

Seat No.	

Set **S**

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
COMPUTAR SCIENCE & ENGINEERING
Microprocessors (BTN03305)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What does the "MOV" instruction do in the 8086 instruction set?
a) Adds two operands
b) Moves data from one location to another
c) Subtracts two operands
d) Compares two operands

2) Which instruction is used for unconditional branching in the 8086 instruction set?
a) JZ b) CALL
c) JMP d) ADC

3) In the minimum mode configuration of 8086, which component is responsible for generating control signals and coordinating operations?
a) CPU b) Clock Generator
c) Bus Controller d) Memory Controller

4) What does the HOLD signal indicate in the system timing diagram of the 8086 microprocessor?
a) That the processor has completed an instruction
b) That a DMA (Direct Memory Access) request is pending
c) That the processor requires additional wait states
d) That the processor is resetting

5) In the system timing diagram of the 8086 microprocessor, what does the T1 state represent?
a) Memory read b) Memory write
c) Opcode fetch d) Execution of instruction

6) What is the primary function of the Programmable Interrupt Controller (PIC) 8259 in computer systems?
a) To handle memory management
b) To generate interrupts
c) To control input/output operations
d) To manage processor cache

7) What is the primary function of the Numeric Data Processor (NDP) 8087 in conjunction with the 8086 microprocessors?
a) To perform floating-point arithmetic operations
b) To handle interrupt requests
c) To manage memory access
d) To execute control transfer instructions

8) What is the primary function of the Programmable Peripheral Interface (PPI) 8255 in computer systems?
a) To handle memory management
b) To generate interrupts
c) To control input/output operations
d) To manage processor cache

9) Which mode of operation allows bidirectional data transfer on all three ports of the 8255?
a) Mode 3 b) Mode 2
c) Mode 1 d) Mode 0

10) Which section of the 8085 microprocessor pin diagram typically handles input/output operations?
a) Data bus b) Address bus
c) Control bus d) I/O Ports

11) Which addressing mode is commonly used in the 8086 microprocessor for accessing data located at a fixed memory address?
a) Direct addressing mode b) Indirect addressing mode
c) Register addressing mode d) Immediate addressing mode

12) Which component of the 8086 microprocessor is responsible for executing machine language instructions?
a) CU (Control Unit) b) ALU (Arithmetic Logic Unit)
c) Registers d) Cache Memory

13) Which directive in assembly language is used to define a constant value?
a) MOV b) DB
c) JMP d) CALL

14) Which register is commonly used for storing the result of arithmetic operations in the 8086-instruction set?
a) AX b) BX
c) CX d) DX

SLR-BD-154

Seat No.		Set	S

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
COMPUTAR SCIENCE & ENGINEERING
Microprocessors (BTN03305)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four **16**

a) Draw the pin diagram of 8085 and explain the function of following pins.
1) HLDA 2) SID and SOD

b) Explain the Following instruction with example.
1) ADC 2) XOR
3) MOVSB 4) SHL

c) Draw the Falg register of 8086 and explain the conditional and Control Flags.

d) Draw the net diagram of minimum mode of operation of 8086.

e) Write an assembly language Program for the factorial of a number 5.

Q.3 Attempt any two. **12**

a) Draw and explain the system bus timing diagram for READ AND WRITE operation in minimum mode of 8086.

b) Explain the architecture of 8086 in detail.

c) Define the machine cycle instruction? Draw the machine cycle instruction format? Explain the same with example.

Section – II

Q.4 Attempt any Four. **16**

a) Draw and explain the architecture of 8259A.

b) list the features of 8257?

c) Explain the operating modes of 8255 PPI.

d) Explain the real addressing mode of 80286 Microprocessor.

e) Compare the Maskable and Nonmaskable interrupt.

Q.5 Attempt any two. **12**

a) Draw and explain the Architecture of 80386.

b) Explain the architecture of 8257 in detail.

c) Explain any three data types of 8087 NDP Processor.

SLR-BD-155

Seat No.	

Set P

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Organization and Architecture (CSEPCC-04)

Day & Date: Monday, 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) Which of the following was used in the first generation of computers?
a) Transistors b) Integrated Circuits
c) Vacuum Tubes d) Microprocessors

2) Which was the first stored program computer developed?
a) ENIAC b) EDVAC
c) Sys. 360 d) Pentium 4

3) In a RISC (Reduced Instruction Set Computer) architecture: ____
a) Instructions are highly complex
b) Execution time is slower
c) Instructions are simple and execute in one clock cycle
d) There is a large number of addressing modes

4) The addressing mode used in instructions like MOV A, B is usually: ____
a) Direct addressing b) Register addressing
c) Immediate addressing d) Indexed addressing

5) The part of a memory address used to identify whether the required block is in the cache is called: ____
a) Offset b) Index
c) Tag d) Block number

6) A multi-core CPU where each core executes its own thread independently is typically classified as: ____
a) SISD b) SIMD
c) MISD d) MIMD

7) Which technique helps reduce the impact of control hazards in pipelining?

a) Cache memory
b) Instruction scheduling
c) Branch prediction
d) Register renaming

8) Which of the following requires minimum CPU intervention during data transfer?

a) Programmed I/O
b) Interrupt-driven I/O
c) DMA
d) Memory-mapped I/O

9) The main goal of memory hierarchy is to: ____

a) Reduce power consumption
b) Increase instruction throughput
c) Minimize cost while maximizing performance
d) Use only cache memory

10) ____ converts data from electrical to other forms of energy during output and from other forms to electrical during input.

a) Compiler
b) Transducer
c) Control logic
d) Interpreter

11) In a pipeline, a control hazard occurs due to: ____

a) Data dependencies between instructions
b) Branch instructions that alter the flow of control
c) Memory access conflicts
d) Cache misses

12) A logical programming model such as Prolog uses: ____

a) A series of instructions that define how to manipulate data
b) A set of mathematical equations to perform computations
c) Facts and rules to infer conclusions
d) Functions that process inputs and outputs

13) In a 5-stage pipeline, the stages are generally: ____

a) Fetch, decode, execute, memory access, and write-back
b) Fetch, write, decode, execute, and return
c) Instruction load, fetch, decode, write-back, and branch
d) Fetch, execute, memory, output, and input

14) Locality of reference is the basis for the effectiveness of: ____

a) Virtual memory
b) Registers
c) Caching
d) Interrupts

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Organization and Architecture (CSEPCC-04)

Day & Date: Monday, 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four **16**

a) Write a short note on the history of computing.
b) Write notes on computer generations.
c) Explain in detail message passing model.
d) Explain in detail Functional and Logic Models.
e) Describe a RISC computer in detail.

Q.3 Attempt any Two **12**

a) Enlist and explain the different addressing modes and explain in detail.
b) Explain Optimizing Compilers for Parallelism
c) Explain memory Hierarchy with different levels of memory.

Section – II

Q.4 Attempt any Four **16**

a) Differentiate between Memory Mapped I/O and I/O Mapped I/O
b) Short note on ILP Dynamic scheduling issues.
c) With neat diagram, explain any one shared memory multiprocessor model.
d) Short note on - Directory based coherence
e) Define I/O module. Explain its function in detail.

Q.5 Attempt any Two **12**

a) With a neat diagram, explain Linear and Non-linear pipeline.
b) Explain basic compiler techniques for exposing ILP.
c) Write a note on
i) External Devices
ii) I/O channels and processors

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Organization and Architecture (CSEPCC-04)

Day & Date: Monday, 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) Which of the following requires minimum CPU intervention during data transfer?
a) Programmed I/O b) Interrupt-driven I/O
c) DMA d) Memory-mapped I/O

2) The main goal of memory hierarchy is to: ____
a) Reduce power consumption
b) Increase instruction throughput
c) Minimize cost while maximizing performance
d) Use only cache memory

3) ____ converts data from electrical to other forms of energy during output and from other forms to electrical during input.
a) Compiler b) Transducer
c) Control logic d) Interpreter

4) In a pipeline, a control hazard occurs due to: ____
a) Data dependencies between instructions
b) Branch instructions that alter the flow of control
c) Memory access conflicts
d) Cache misses

5) A logical programming model such as Prolog uses: ____
a) A series of instructions that define how to manipulate data
b) A set of mathematical equations to perform computations
c) Facts and rules to infer conclusions
d) Functions that process inputs and outputs

6) In a 5-stage pipeline, the stages are generally: ____
a) Fetch, decode, execute, memory access, and write-back
b) Fetch, write, decode, execute, and return
c) Instruction load, fetch, decode, write-back, and branch
d) Fetch, execute, memory, output, and input

7) Locality of reference is the basis for the effectiveness of: ____
a) Virtual memory
b) Registers
c) Caching
d) Interrupts

8) Which of the following was used in the first generation of computers?
a) Transistors
b) Integrated Circuits
c) Vacuum Tubes
d) Microprocessors

9) Which was the first stored program computer developed?
a) ENIAC
b) EDVAC
c) Sys. 360
d) Pentium 4

10) In a RISC (Reduced Instruction Set Computer) architecture: ____
a) Instructions are highly complex
b) Execution time is slower
c) Instructions are simple and execute in one clock cycle
d) There is a large number of addressing modes

11) The addressing mode used in instructions like MOV A, B is usually: ____
a) Direct addressing
b) Register addressing
c) Immediate addressing
d) Indexed addressing

12) The part of a memory address used to identify whether the required block is in the cache is called: ____
a) Offset
b) Index
c) Tag
d) Block number

13) A multi-core CPU where each core executes its own thread independently is typically classified as: ____
a) SISD
b) SIMD
c) MISD
d) MIMD

14) Which technique helps reduce the impact of control hazards in pipelining?
a) Cache memory
b) Instruction scheduling
c) Branch prediction
d) Register renaming

SLR-BD-155

Seat No.	

Set Q

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Organization and Architecture (CSEPCC-04)

Day & Date: Monday, 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four **16**

a) Write a short note on the history of computing.
b) Write notes on computer generations.
c) Explain in detail message passing model.
d) Explain in detail Functional and Logic Models.
e) Describe a RISC computer in detail.

Q.3 Attempt any Two **12**

a) Enlist and explain the different addressing modes and explain in detail.
b) Explain Optimizing Compilers for Parallelism
c) Explain memory Hierarchy with different levels of memory.

Section – II

Q.4 Attempt any Four **16**

a) Differentiate between Memory Mapped I/O and I/O Mapped I/O
b) Short note on ILP Dynamic scheduling issues.
c) With neat diagram, explain any one shared memory multiprocessor model.
d) Short note on - Directory based coherence
e) Define I/O module. Explain its function in detail.

Q.5 Attempt any Two **12**

a) With a neat diagram, explain Linear and Non-linear pipeline.
b) Explain basic compiler techniques for exposing ILP.
c) Write a note on
i) External Devices
ii) I/O channels and processors

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Organization and Architecture (CSEPCC-04)

Day & Date: Monday, 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) In a pipeline, a control hazard occurs due to: ____
a) Data dependencies between instructions
b) Branch instructions that alter the flow of control
c) Memory access conflicts
d) Cache misses

2) A logical programming model such as Prolog uses: ____
a) A series of instructions that define how to manipulate data
b) A set of mathematical equations to perform computations
c) Facts and rules to infer conclusions
d) Functions that process inputs and outputs

3) In a 5-stage pipeline, the stages are generally: ____
a) Fetch, decode, execute, memory access, and write-back
b) Fetch, write, decode, execute, and return
c) Instruction load, fetch, decode, write-back, and branch
d) Fetch, execute, memory, output, and input

4) Locality of reference is the basis for the effectiveness of: ____
a) Virtual memory b) Registers
c) Caching d) Interrupts

5) Which of the following was used in the first generation of computers?
a) Transistors b) Integrated Circuits
c) Vacuum Tubes d) Microprocessors

6) Which was the first stored program computer developed?
a) ENIAC b) EDVAC
c) Sys. 360 d) Pentium 4

7) In a RISC (Reduced Instruction Set Computer) architecture: ____
a) Instructions are highly complex
b) Execution time is slower
c) Instructions are simple and execute in one clock cycle
d) There is a large number of addressing modes

8) The addressing mode used in instructions like MOV A, B is usually: ____
a) Direct addressing b) Register addressing
c) Immediate addressing d) Indexed addressing

9) The part of a memory address used to identify whether the required block is in the cache is called: ____
a) Offset b) Index
c) Tag d) Block number

10) A multi-core CPU where each core executes its own thread independently is typically classified as: ____
a) SISD b) SIMD
c) MISD d) MIMD

11) Which technique helps reduce the impact of control hazards in pipelining?
a) Cache memory b) Instruction scheduling
c) Branch prediction d) Register renaming

12) Which of the following requires minimum CPU intervention during data transfer?
a) Programmed I/O b) Interrupt-driven I/O
c) DMA d) Memory-mapped I/O

13) The main goal of memory hierarchy is to: ____
a) Reduce power consumption
b) Increase instruction throughput
c) Minimize cost while maximizing performance
d) Use only cache memory

14) ____ converts data from electrical to other forms of energy during output and from other forms to electrical during input.
a) Compiler b) Transducer
c) Control logic d) Interpreter

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Organization and Architecture (CSEPCC-04)

Day & Date: Monday, 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four **16**

a) Write a short note on the history of computing.
b) Write notes on computer generations.
c) Explain in detail message passing model.
d) Explain in detail Functional and Logic Models.
e) Describe a RISC computer in detail.

Q.3 Attempt any Two **12**

a) Enlist and explain the different addressing modes and explain in detail.
b) Explain Optimizing Compilers for Parallelism
c) Explain memory Hierarchy with different levels of memory.

Section – II

Q.4 Attempt any Four **16**

a) Differentiate between Memory Mapped I/O and I/O Mapped I/O
b) Short note on ILP Dynamic scheduling issues.
c) With neat diagram, explain any one shared memory multiprocessor model.
d) Short note on - Directory based coherence
e) Define I/O module. Explain its function in detail.

Q.5 Attempt any Two **12**

a) With a neat diagram, explain Linear and Non-linear pipeline.
b) Explain basic compiler techniques for exposing ILP.
c) Write a note on
i) External Devices
ii) I/O channels and processors

SLR-BD-155

Seat No.	

Set S

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Organization and Architecture (CSEPCC-04)

Day & Date: Monday, 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options and rewrite the sentence. **14**

1) A multi-core CPU where each core executes its own thread independently is typically classified as: ____
a) SISD b) SIMD
c) MISD d) MIMD

2) Which technique helps reduce the impact of control hazards in pipelining?
a) Cache memory b) Instruction scheduling
c) Branch prediction d) Register renaming

3) Which of the following requires minimum CPU intervention during data transfer?
a) Programmed I/O b) Interrupt-driven I/O
c) DMA d) Memory-mapped I/O

4) The main goal of memory hierarchy is to: ____
a) Reduce power consumption
b) Increase instruction throughput
c) Minimize cost while maximizing performance
d) Use only cache memory

5) ____ converts data from electrical to other forms of energy during output and from other forms to electrical during input.
a) Compiler b) Transducer
c) Control logic d) Interpreter

6) In a pipeline, a control hazard occurs due to: ____
a) Data dependencies between instructions
b) Branch instructions that alter the flow of control
c) Memory access conflicts
d) Cache misses

7) A logical programming model such as Prolog uses: ____
a) A series of instructions that define how to manipulate data
b) A set of mathematical equations to perform computations
c) Facts and rules to infer conclusions
d) Functions that process inputs and outputs

8) In a 5-stage pipeline, the stages are generally: ____
a) Fetch, decode, execute, memory access, and write-back
b) Fetch, write, decode, execute, and return
c) Instruction load, fetch, decode, write-back, and branch
d) Fetch, execute, memory, output, and input

9) Locality of reference is the basis for the effectiveness of: ____
a) Virtual memory b) Registers
c) Caching d) Interrupts

10) Which of the following was used in the first generation of computers?
a) Transistors b) Integrated Circuits
c) Vacuum Tubes d) Microprocessors

11) Which was the first stored program computer developed?
a) ENIAC b) EDVAC
c) Sys. 360 d) Pentium 4

12) In a RISC (Reduced Instruction Set Computer) architecture: ____
a) Instructions are highly complex
b) Execution time is slower
c) Instructions are simple and execute in one clock cycle
d) There is a large number of addressing modes

13) The addressing mode used in instructions like MOV A, B is usually: ____
a) Direct addressing b) Register addressing
c) Immediate addressing d) Indexed addressing

14) The part of a memory address used to identify whether the required block is in the cache is called: ____
a) Offset b) Index
c) Tag d) Block number

SLR-BD-155

Seat No.	

Set S

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Organization and Architecture (CSEPCC-04)

Day & Date: Monday, 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four **16**

a) Write a short note on the history of computing.
b) Write notes on computer generations.
c) Explain in detail message passing model.
d) Explain in detail Functional and Logic Models.
e) Describe a RISC computer in detail.

Q.3 Attempt any Two **12**

a) Enlist and explain the different addressing modes and explain in detail.
b) Explain Optimizing Compilers for Parallelism
c) Explain memory Hierarchy with different levels of memory.

Section – II

Q.4 Attempt any Four **16**

a) Differentiate between Memory Mapped I/O and I/O Mapped I/O
b) Short note on ILP Dynamic scheduling issues.
c) With neat diagram, explain any one shared memory multiprocessor model.
d) Short note on - Directory based coherence
e) Define I/O module. Explain its function in detail.

Q.5 Attempt any Two **12**

a) With a neat diagram, explain Linear and Non-linear pipeline.
b) Explain basic compiler techniques for exposing ILP.
c) Write a note on
i) External Devices
ii) I/O channels and processors

SLR-BD-156

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Theory of Computation (CSEPCC-05)

Day & Date: Wednesday 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct Answer. **14**

1) Which of the following statement is/are false _____.
a) The regular expression $00(1+10)^*$ denotes all strings of 0's and 1's with at least two consecutive 0's
b) The regular expression $(0+\wedge)(1+10)^*$ denotes all strings of 0's and 1's that do not have two consecutive 0's
c) The regular expression $(0+1)^*011$ denotes all strings of 0's and 1's ending with 011
d) The regular expression $(1+10)^*$ denotes all strings of 0's and 1's beginning with '1' and not having two consecutives 0's

2) The length of the shortest string NOT in the language (over $\sum = \{a, b\}$) of the following regular expression is _____.
$a^*b^*(ba)^*a^*$ Select one:
a) 5 b) 2
c) 3 d) 4

3) Given the language $\mathrm{P} = \{\mathrm{ab}, \mathrm{aa}, \mathrm{baa}\}$, which of the following strings are in P^*?
a) abaabaaabaa b) aaaabaaaa
c) baaaaabaa d) All of these

4) Describe in simple English, the language defined by $\mathrm{RE} = (01^*0)^*1$.
a) The strings starting with 1
b) The strings ending with 1 and containing even no. of 0's
c) The strings ending with 1
d) The strings starting with 1 and containing odd no. of 0's

5) The R.E. in which any number of $0'$s followed by any number of $1'$s followed by any num-ber of 2 is _____.

a) $0^*1^*2^*$ b) $(0+1)^*2^*$

c) 0^*+1+2 d) $(0+1+2)^*$

6) Which of the following statement is true?

a) Converting from Mealy into Moore machine and vice versa is possible

b) Mealy machine has no terminating state

c) A Moore machine has no terminating state

d) All of these

7) The given CFG indicates the strings _____.

$S \rightarrow aS \mid bX \mid a \mid b$

$X \rightarrow aSa \mid a$

a) with aa or bb but not both

b) that do not contain aaa

c) do not contain bbb

d) That has no consecutive b's but a's

8) Consider the following grammar.

$S \rightarrow AB$

$A \rightarrow a$

$A \rightarrow BaB$

$B \rightarrow bbA$

Which of the following statement is FALSE?

a) No string produced by this grammar has three consecutive a's

b) The length of every string produced by this grammar is even

c) No string produced by this grammar has four consecutive b's

d) The length of substring produced by B is always odd

9) Following CFG

$S \rightarrow AB \mid AS$

$A \rightarrow a \mid aA$

$B \rightarrow b$

generates the language _____

a) aa^*b b) $a(ab)^*b$

c) aa^*b+ d) $(ab)^*$

10) Which type of symbol contains in the stack of PDA?

a) Variables b) Terminals

c) Both a and b d) None of the mentioned

11) While applying Pumping lemma for CFL, we consider a string w that belong to L and fragment it into _____ parts.

a) 2 b) 5

c) 3 d) 6

12) According to Chomsky hierarchy, which of the following is recognized by Recursively Enumerable language?

a) Type 3 b) Type 2
c) Type 1 d) Type 0

13) A Turing machine that is able to simulate other Turing machines _____

a) Nested Turing machines b) Multi tap Turing machine
c) Universal Turing machines d) None of these

14) Halting state of Turing Machine are _____.

a) Start and Stop b) Accept and Reject
c) Start and Reject d) Reject and allow

Seat No.	

Set **P**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Theory of Computation (CSEPCC-05)

Day & Date: Wednesday 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are Compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer any four of the following. **16**

a) Give the regular expression for following regular language over $\sum = \{0,1\}$
i) The language of all strings of 0's and 1's that have odd length
ii) The set of all strings of 0's and 1's whose second symbol from right is 0.

b) Design the DFA for following regular expression
i) $(11 + 110)^*0$
ii) $(0 + 1)^*1000$

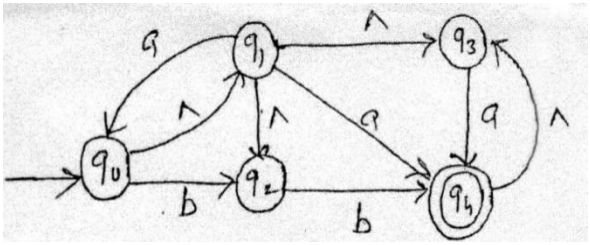
c) Differentiate between Moore machine and Mealy Machine.

d) Give recursive definition of regular language and corresponding regular expression. List and explain at least two applications of regular expression.

e) Define the CFG and give the CFG for the following CFL
$L = \{a^i b^j c^k | i = j \text{ or } j = k\}$

Q.3 Answer any two of the following. **12**

a) Convert following NFA-∧ into NFA and DFA.



b) With the help of union, concatenation and Kleene closure property design the NFA-∧ for following regular expression.
i) $(0 + 1)(01)^*(011)^*$
ii) $(0 + 1)^*(011 + 01010)$

c) Convert following CFG to CNF Notation
S → ASB
A → aAS | a | ∧
B → SbS | A |bb

SECTION – II

Q.4 Answer any four of the following. **16**

a) Prove that following language is not CFL
$L = \{a^i b^j c^k | i, j, k \geq 0\}$

b) State and explain pumping lemma for regular language.

c) Define the PDA and demonstrate the working of it.

d) Design the PDA for following language.
$L = \{a^n b^m c^{n+m} | i, j, k \geq 1\}$

e) Design the TM for $f(n, m) = n - m$, assume $n > m$.

Q.5 Answer any two of the following. **12**

a) Design the Turing Machine for Language of Palindrome over $\sum = \{a, b\}$ and demonstrate the working of string "$abba$"

b) Define the PDA acceptance by Final State and Empty Stack. Design the PDA for $L = \{a^n b^{n+m} c^m | i, j, k \geq 1\}$

c) Explain the following Turing Machines

i) Multitape Turing Machine

ii) Linear Bounded Automata

iii) Off-line Turing Machine

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Theory of Computation (CSEPCC-05)

Day & Date: Wednesday 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct Answer. **14**

1) Consider the following grammar.
$S \rightarrow AB$
$A \rightarrow a$
$A \rightarrow BaB$
$B \rightarrow bbA$
Which of the following statement is FALSE?
a) No string produced by this grammar has three consecutive a's
b) The length of every string produced by this grammar is even
c) No string produced by this grammar has four consecutive b's
d) The length of substring produced by B is always odd

2) Following CFG
$S \rightarrow AB \mid AS$
$A \rightarrow a \mid aA$
$B \rightarrow b$
generates the language _____
a) aa^*b b) $a(ab)^*b$
c) aa^*b+ d) $(ab)^*$

3) Which type of symbol contains in the stack of PDA?
a) Variables b) Terminals
c) Both a and b d) None of the mentioned

4) While applying Pumping lemma for CFL, we consider a string w that belong to L and fragment it into _____ parts.
a) 2 b) 5
c) 3 d) 6

5) According to Chomsky hierarchy, which of the following is recognized by Recursively Enumerable language?

a) Type 3 b) Type 2
c) Type 1 d) Type 0

6) A Turing machine that is able to simulate other Turing machines _____

a) Nested Turing machines b) Multi tap Turing machine
c) Universal Turing machines d) None of these

7) Halting state of Turing Machine are _____.

a) Start and Stop b) Accept and Reject
c) Start and Reject d) Reject and allow

8) Which of the following statement is/are false _____.

a) The regular expression $00(1+10)^*$ denotes all strings of 0's and 1's with at least two consecutive 0's
b) The regular expression $(0+\wedge)(1+10)^*$ denotes all strings of 0's and 1's that do not have two consecutive 0's
c) The regular expression $(0+1)^*011$ denotes all strings of 0's and 1's ending with 011
d) The regular expression $(1+10)^*$ denotes all strings of 0's and 1's beginning with '1' and not having two consecutives 0's

9) The length of the shortest string NOT in the language (over $\sum = \{a, b\}$) of the following regular expression is _____.
$a^*b^*(ba)^*a^*$ Select one:

a) 5 b) 2
c) 3 d) 4

10) Given the language $\mathrm{P} = \{\mathrm{ab}, \mathrm{aa}, \mathrm{baa}\}$, which of the following strings are in P^*?

a) abaabaaabaa b) aaaabaaaa
c) baaaaabaa d) All of these

11) Describe in simple English, the language defined by $\mathrm{RE} = (01^*0)^*1$.

a) The strings starting with 1
b) The strings ending with 1 and containing even no. of 0's
c) The strings ending with 1
d) The strings starting with 1 and containing odd no. of 0's

12) The R.E. in which any number of $0's$ followed by any number of $1's$ followed by any num-ber of 2 is _____.

a) $0^*1^*2^*$ b) $(0+1)^*2^*$
c) 0^*+1+2 d) $(0+1+2)^*$

13) Which of the following statement is true?

a) Converting from Mealy into Moore machine and vice versa is possible
b) Mealy machine has no terminating state
c) A Moore machine has no terminating state
d) All of these

14) The given CFG indicates the strings _____.

$S \rightarrow aS \mid bX \mid a \mid b$

$X \rightarrow aSa \mid a$

a) with aa or bb but not both
b) that do not contain aaa
c) do not contain bbb
d) That has no consecutive b's but a's

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Theory of Computation (CSEPCC-05)

Day & Date: Wednesday 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are Compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer any four of the following. **16**

a) Give the regular expression for following regular language over $\sum = \{0,1\}$
i) The language of all strings of 0's and 1's that have odd length
ii) The set of all strings of 0's and 1's whose second symbol from right is 0.

b) Design the DFA for following regular expression
i) $(11 + 110)^*0$
ii) $(0 + 1)^*1000$

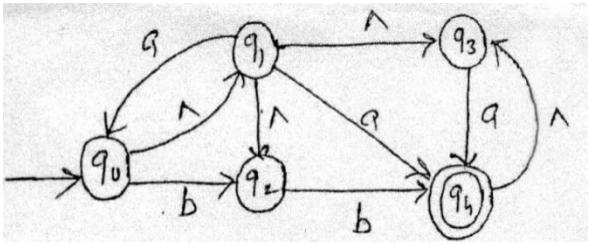
c) Differentiate between Moore machine and Mealy Machine.

d) Give recursive definition of regular language and corresponding regular expression. List and explain at least two applications of regular expression.

e) Define the CFG and give the CFG for the following CFL
$L = \{a^i b^j c^k | i = j \text{ or } j = k\}$

Q.3 Answer any two of the following. **12**

a) Convert following NFA-∧ into NFA and DFA.



b) With the help of union, concatenation and Kleene closure property design the NFA-∧ for following regular expression.
i) $(0 + 1)(01)^*(011)^*$
ii) $(0 + 1)^*(011 + 01010)$

c) Convert following CFG to CNF Notation
S → ASB
A → aAS | a | ∧
B → SbS | A |bb

SECTION – II

Q.4 Answer any four of the following. **16**

a) Prove that following language is not CFL
$L = \{a^i b^j c^k | i, j, k \geq 0\}$

b) State and explain pumping lemma for regular language.

c) Define the PDA and demonstrate the working of it.

d) Design the PDA for following language.
$L = \{a^n b^m c^{n+m} | i, j, k \geq 1\}$

e) Design the TM for $f(n, m) = n - m$, assume $n > m$.

Q.5 Answer any two of the following. **12**

a) Design the Turing Machine for Language of Palindrome over $\sum = \{a, b\}$ and demonstrate the working of string "$abba$"

b) Define the PDA acceptance by Final State and Empty Stack. Design the PDA for $L = \{a^n b^{n+m} c^m | i, j, k \geq 1\}$

c) Explain the following Turing Machines

i) Multitape Turing Machine

ii) Linear Bounded Automata

iii) Off-line Turing Machine

Seat No.	

Set R

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Theory of Computation (CSEPCC-05)

Day & Date: Wednesday 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct Answer. **14**

1) While applying Pumping lemma for CFL, we consider a string w that belong to L and fragment it into _____ parts.
a) 2 b) 5
c) 3 d) 6

2) According to Chomsky hierarchy, which of the following is recognized by Recursively Enumerable language?
a) Type 3 b) Type 2
c) Type 1 d) Type 0

3) A Turing machine that is able to simulate other Turing machines _____
a) Nested Turing machines b) Multi tap Turing machine
c) Universal Turing machines d) None of these

4) Halting state of Turing Machine are _____.
a) Start and Stop b) Accept and Reject
c) Start and Reject d) Reject and allow

5) Which of the following statement is/are false _____.
a) The regular expression $00(1+10)^*$ denotes all strings of 0's and 1's with at least two consecutive 0's
b) The regular expression $(0+\wedge)(1+10)^*$ denotes all strings of 0's and 1's that do not have two consecutive 0's
c) The regular expression $(0+1)^*011$ denotes all strings of 0's and 1's ending with 011
d) The regular expression $(1+10)^*$ denotes all strings of 0's and 1's beginning with '1' and not having two consecutives 0's

6) The length of the shortest string NOT in the language (over $\sum = \{a, b\}$) of the following regular expression is _____.
$a^*b^*(ba)^*a^*$ Select one:

a) 5 b) 2
c) 3 d) 4

7) Given the language $\mathrm{P} = \{\mathrm{ab}, \mathrm{aa}, \mathrm{baa}\}$, which of the following strings are in P^*?

a) abaabaaabaa b) aaaabaaaa
c) baaaaabaa d) All of these

8) Describe in simple English, the language defined by $\mathrm{RE} = (01^*0)^*1$.

a) The strings starting with 1
b) The strings ending with 1 and containing even no. of 0's
c) The strings ending with 1
d) The strings starting with 1 and containing odd no. of 0's

9) The R.E. in which any number of $0's$ followed by any number of $1's$ followed by any num-ber of 2 is _____.

a) $0^*1^*2^*$ b) $(0+1)^*2^*$
c) $0^* + 1 + 2$ d) $(0+1+2)^*$

10) Which of the following statement is true?

a) Converting from Mealy into Moore machine and vice versa is possible
b) Mealy machine has no terminating state
c) A Moore machine has no terminating state
d) All of these

11) The given CFG indicates the strings _____.
$\mathrm{S} \rightarrow \mathrm{aS} \mid \mathrm{bX} \mid \mathrm{a} \mid \mathrm{b}$
$\mathrm{X} \rightarrow \mathrm{aSa} \mid \mathrm{a}$

a) with aa or bb but not both
b) that do not contain aaa
c) do not contain bbb
d) That has no consecutive b's but a's

12) Consider the following grammar.
$\mathrm{S} \rightarrow \mathrm{AB}$
$\mathrm{A} \rightarrow \mathrm{a}$
$\mathrm{A} \rightarrow \mathrm{BaB}$
$\mathrm{B} \rightarrow \mathrm{bbA}$
Which of the following statement is FALSE?

a) No string produced by this grammar has three consecutive a's
b) The length of every string produced by this grammar is even
c) No string produced by this grammar has four consecutive b's
d) The length of substring produced by B is always odd

13) Following CFG

$S \rightarrow AB \mid AS$

$A \rightarrow a \mid aA$

$B \rightarrow b$

generates the language _____

a) aa^*b b) $a(ab)^*b$

c) $aa^*b +$ d) $(ab)^*$

14) Which type of symbol contains in the stack of PDA?

a) Variables b) Terminals

c) Both a and b d) None of the mentioned

SLR-BD-156

Seat No.	

Set R

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Theory of Computation (CSEPCC-05)

Day & Date: Wednesday 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are Compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer any four of the following. **16**

a) Give the regular expression for following regular language over $\sum = \{0,1\}$
i) The language of all strings of 0's and 1's that have odd length
ii) The set of all strings of 0's and 1's whose second symbol from right is 0.

b) Design the DFA for following regular expression
i) $(11 + 110)^*0$
ii) $(0 + 1)^*1000$

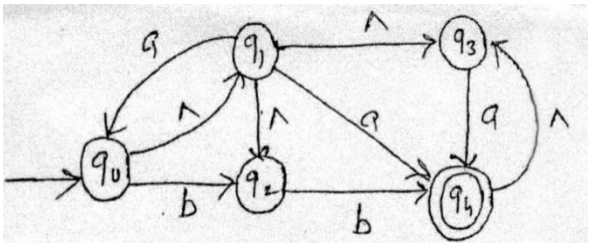
c) Differentiate between Moore machine and Mealy Machine.

d) Give recursive definition of regular language and corresponding regular expression. List and explain at least two applications of regular expression.

e) Define the CFG and give the CFG for the following CFL
$L = \{a^i b^j c^k | i = j \text{ or } j = k\}$

Q.3 Answer any two of the following. **12**

a) Convert following NFA-∧ into NFA and DFA.



b) With the help of union, concatenation and Kleene closure property design the NFA-∧ for following regular expression.
i) $(0 + 1)(01)^*(011)^*$
ii) $(0 + 1)^*(011 + 01010)$

c) Convert following CFG to CNF Notation
$S \rightarrow ASB$
$A \rightarrow aAS \mid a \mid \wedge$
$B \rightarrow SbS \mid A \mid bb$

SECTION – II

Q.4 Answer any four of the following. **16**

a) Prove that following language is not CFL
$L = \{a^i b^j c^k | i, j, k \geq 0\}$

b) State and explain pumping lemma for regular language.

c) Define the PDA and demonstrate the working of it.

d) Design the PDA for following language.
$L = \{a^n b^m c^{n+m} | i, j, k \geq 1\}$

e) Design the TM for $f(n, m) = n - m$, assume $n > m$.

Q.5 Answer any two of the following. **12**

a) Design the Turing Machine for Language of Palindrome over $\sum = \{a, b\}$ and demonstrate the working of string "$abba$"

b) Define the PDA acceptance by Final State and Empty Stack. Design the PDA for $L = \{a^n b^{n+m} c^m | i, j, k \geq 1\}$

c) Explain the following Turing Machines

i) Multitape Turing Machine
ii) Linear Bounded Automata
iii) Off-line Turing Machine

SLR-BD-156

Seat No.		Set	S

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Theory of Computation (CSEPCC-05)

Day & Date: Wednesday 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct Answer. 14

1) Which of the following statement is true?
a) Converting from Mealy into Moore machine and vice versa is possible
b) Mealy machine has no terminating state
c) A Moore machine has no terminating state
d) All of these

2) The given CFG indicates the strings _____.
$S \rightarrow aS \mid bX \mid a \mid b$
$X \rightarrow aSa \mid a$
a) with aa or bb but not both
b) that do not contain aaa
c) do not contain bbb
d) That has no consecutive b's but a's

3) Consider the following grammar.
$S \rightarrow AB$
$A \rightarrow a$
$A \rightarrow BaB$
$B \rightarrow bbA$
Which of the following statement is FALSE?
a) No string produced by this grammar has three consecutive a's
b) The length of every string produced by this grammar is even
c) No string produced by this grammar has four consecutive b's
d) The length of substring produced by B is always odd

4) Following CFG
$S \rightarrow AB \mid AS$
$A \rightarrow a \mid aA$
$B \rightarrow b$
generates the language _____
a) aa^*b b) $a(ab)^*b$
c) aa^*b+ d) $(ab)^*$

5) Which type of symbol contains in the stack of PDA?
a) Variables b) Terminals
c) Both a and b d) None of the mentioned

6) While applying Pumping lemma for CFL, we consider a string w that belong to L and fragment it into _____ parts.
a) 2 b) 5
c) 3 d) 6

7) According to Chomsky hierarchy, which of the following is recognized by Recursively Enumerable language?
a) Type 3 b) Type 2
c) Type 1 d) Type 0

8) A Turing machine that is able to simulate other Turing machines _____
a) Nested Turing machines b) Multi tap Turing machine
c) Universal Turing machines d) None of these

9) Halting state of Turing Machine are _____.
a) Start and Stop b) Accept and Reject
c) Start and Reject d) Reject and allow

10) Which of the following statement is/are false _____.
a) The regular expression $00(1+10)^*$ denotes all strings of 0's and 1's with at least two consecutive 0's
b) The regular expression $(0+\wedge)(1+10)^*$ denotes all strings of 0's and 1's that do not have two consecutive 0's
c) The regular expression $(0+1)^*011$ denotes all strings of 0's and 1's ending with 011
d) The regular expression $(1+10)^*$ denotes all strings of 0's and 1's beginning with '1' and not having two consecutives 0's

11) The length of the shortest string NOT in the language (over $\sum = \{a, b\}$) of the following regular expression is _____.
$a^*b^*(ba)^*a^*$ Select one:
a) 5 b) 2
c) 3 d) 4

12) Given the language $P = \{ab, aa, baa\}$, which of the following strings are in P^*?

a) abaabaaabaa
b) aaaabaaaa
c) baaaaabaa
d) All of these

13) Describe in simple English, the language defined by $RE = (01^*0)^*1$.

a) The strings starting with 1
b) The strings ending with 1 and containing even no. of 0's
c) The strings ending with 1
d) The strings starting with 1 and containing odd no. of 0's

14) The R.E. in which any number of $0's$ followed by any number of $1's$ followed by any num-ber of 2 is _____.

a) $0^*1^*2^*$
b) $(0+1)^*2^*$
c) $0^* + 1 + 2$
d) $(0+1+2)^*$

Seat No.	

Set **S**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Theory of Computation (CSEPCC-05)

Day & Date: Wednesday 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are Compulsory.
2) Figures to the right indicate full marks.

SECTION – I

Q.2 Answer any four of the following. **16**

a) Give the regular expression for following regular language over $\sum = \{0,1\}$
i) The language of all strings of 0's and 1's that have odd length
ii) The set of all strings of 0's and 1's whose second symbol from right is 0.

b) Design the DFA for following regular expression
i) $(11 + 110)^*0$
ii) $(0 + 1)^*1000$

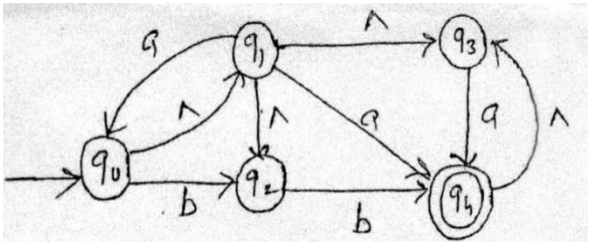
c) Differentiate between Moore machine and Mealy Machine.

d) Give recursive definition of regular language and corresponding regular expression. List and explain at least two applications of regular expression.

e) Define the CFG and give the CFG for the following CFL
$L = \{a^i b^j c^k | i = j \text{ or } j = k\}$

Q.3 Answer any two of the following. **12**

a) Convert following NFA-∧ into NFA and DFA.



b) With the help of union, concatenation and Kleene closure property design the NFA-∧ for following regular expression.
i) $(0 + 1)(01)^*(011)^*$
ii) $(0 + 1)^*(011 + 01010)$

c) Convert following CFG to CNF Notation
$S \rightarrow ASB$
$A \rightarrow aAS \mid a \mid \wedge$
$B \rightarrow SbS \mid A \mid bb$

SECTION – II

Q.4 Answer any four of the following. **16**

a) Prove that following language is not CFL
$L = \{a^i b^j c^k | i, j, k \geq 0\}$

b) State and explain pumping lemma for regular language.

c) Define the PDA and demonstrate the working of it.

d) Design the PDA for following language.
$L = \{a^n b^m c^{n+m} | i, j, k \geq 1\}$

e) Design the TM for $f(n, m) = n - m$, assume $n > m$.

Q.5 Answer any two of the following. **12**

a) Design the Turing Machine for Language of Palindrome over $\sum = \{a, b\}$ and demonstrate the working of string "$abba$"

b) Define the PDA acceptance by Final State and Empty Stack. Design the PDA for $L = \{a^n b^{n+m} c^m | i, j, k \geq 1\}$

c) Explain the following Turing Machines

i) Multitape Turing Machine

ii) Linear Bounded Automata

iii) Off-line Turing Machine

SLR-BD-157

Seat No.	

Set P

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Networks (CSEPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) UDP and TCP are both _____ layer protocols.
a) data link b) network
c) transport d) none of the above

2) _____ is a dynamic mapping protocol in which a physical address is found for a given logical address.
a) ARP b) RARP
c) both a and b d) none of the above

3) Identify the class of the following IPv4 address: 193.168.1.2
a) A b) B
c) C d) D

4) The combination of an IP address and a port number is called a _____.
a) transport address b) network address
c) socket address d) none of the above

5) There is no need for a header length field in SCTP because _____.
a) there are no options in the general header
b) the size of the header is fixed
c) both a and b
d) none of the above

6) _____ server can process multiple requests at a time.
a) An iterative b) A concurrent
c) A concurrent or an iterative d) None of the choices

7) A full domain name is a sequence of labels separated by _____.
a) semicolons b) dots
c) colons d) none of the above

8) DNS can use the services of _____ using the well-known port 53.
a) UDP b) TCP
c) either (a) or (b) d) none of the above

9) When the secondary downloads information from the primary, it is called _____ transfer.
a) domain b) zone
c) label d) none of the above

10) When the sender is connected to the mail server via a LAN or a WAN, we need _____.
a) two MTA
b) two UAs and two pairs of MTAs
c) two UAs and a pair of MTAs
d) none of the above

11) NVT uses two sets of characters, one for _____ and one for _____.
a) sending; receiving b) request; reply
c) data; control d) none of the above

12) In the _____ mode, each character typed is sent by the client to the server.
a) default b) character
c) line d) none of the above

13) TELNET uses only one TCP connection. The server uses _____ port and the client uses _____ port.
a) a well-known; another well-known
b) an ephemeral; another ephemeral
c) a well-known; an ephemeral
d) none of the above

14) _____ is more powerful and complex than _____.
a) POP3; IMAP4 b) IMAP4; POP3
c) SMTP; POP3 d) none of the above

Seat No.	

Set **P**

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Networks (CSEPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

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

a) Compare OSI and TCP/IP Model. Write its advantages & disadvantages.
b) Suppose a computer send a packet at network Layer to the another computer in the internet the logical destinations address in the packet is corrupted, what happens to the packet? how can the sender computer informed about the situation?
c) Explain three-way handshaking in TCP.
d) Explain UDP Header format.
e) Shortly describe with diagram the concept of multihoming service offered by SCTP.

Q.3 Attempt any One. **06**

a) Explain the following system calls with their syntax:
1) socket ( )
2) bind ( )
3) connect ( )
b) Explain the steps to implement connection-oriented concurrent client-server.

Q.4 Attempt the following. **06**

An organization is granted the subnet mask 255.255.255.128(/25) Assume that the network IP Address is **192.168.1.0/25** the administrator want to find.
a) network address
b) number of hosts per subnet
c) First valid IP and Last valid IP of subnet 1
d) Broadcast address of subnet

Section – II

Q.5 Attempt any four: **16**

a) Explain DNS Message format.

b) What is DHCP? Describe the DHCP operation when client and server are on the same network.

c) Write a short note on FTP.

d) Explain the concept of NVT. Also explain NVT Character set.

e) Explain DHCP packet format.

Q.6 Attempt any one. **06**

a) Explain the terms used in DNS: Flat Name Space, Hierarchical Name Space, Zone, FQDN and PQDN

b) Draw the diagram of SSH packet format and briefly describe it's fields.

Q.7 Explain the different scenario of SMTP. **06**

Seat No.	

Set **Q**

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Networks (CSEPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) DNS can use the services of _____ using the well-known port 53.
a) UDP b) TCP
c) either (a) or (b) d) none of the above

2) When the secondary downloads information from the primary, it is called _____ transfer.
a) domain b) zone
c) label d) none of the above

3) When the sender is connected to the mail server via a LAN or a WAN, we need _____.
a) two MTA
b) two UAs and two pairs of MTAs
c) two UAs and a pair of MTAs
d) none of the above

4) NVT uses two sets of characters, one for _____ and one for _____.
a) sending; receiving b) request; reply
c) data; control d) none of the above

5) In the _____ mode, each character typed is sent by the client to the server.
a) default b) character
c) line d) none of the above

6) TELNET uses only one TCP connection. The server uses _____ port and the client uses _____ port.
a) a well-known; another well-known
b) an ephemeral; another ephemeral
c) a well-known; an ephemeral
d) none of the above

7) _____ is more powerful and complex than _____.
a) POP3; IMAP4 b) IMAP4; POP3
c) SMTP; POP3 d) none of the above

8) UDP and TCP are both _____ layer protocols.
a) data link b) network
c) transport d) none of the above

9) _____ is a dynamic mapping protocol in which a physical address is found for a given logical address.
a) ARP b) RARP
c) both a and b d) none of the above

10) Identify the class of the following IPv4 address: 193.168.1.2
a) A b) B
c) C d) D

11) The combination of an IP address and a port number is called a _____.
a) transport address b) network address
c) socket address d) none of the above

12) There is no need for a header length field in SCTP because _____.
a) there are no options in the general header
b) the size of the header is fixed
c) both a and b
d) none of the above

13) _____ server can process multiple requests at a time.
a) An iterative b) A concurrent
c) A concurrent or an iterative d) None of the choices

14) A full domain name is a sequence of labels separated by _____.
a) semicolons b) dots
c) colons d) none of the above

Seat No.	

Set **Q**

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Networks (CSEPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

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

a) Compare OSI and TCP/IP Model. Write its advantages & disadvantages.
b) Suppose a computer send a packet at network Layer to the another computer in the internet the logical destinations address in the packet is corrupted, what happens to the packet? how can the sender computer informed about the situation?
c) Explain three-way handshaking in TCP.
d) Explain UDP Header format.
e) Shortly describe with diagram the concept of multihoming service offered by SCTP.

Q.3 Attempt any One. **06**

a) Explain the following system calls with their syntax:
1) socket ( )
2) bind ( )
3) connect ( )
b) Explain the steps to implement connection-oriented concurrent client-server.

Q.4 Attempt the following. **06**

An organization is granted the subnet mask 255.255.255.128(/25) Assume that the network IP Address is **192.168.1.0/25** the administrator want to find.
a) network address
b) number of hosts per subnet
c) First valid IP and Last valid IP of subnet 1
d) Broadcast address of subnet

Section – II

Q.5 **Attempt any four:** **16**

a) Explain DNS Message format.

b) What is DHCP? Describe the DHCP operation when client and server are on the same network.

c) Write a short note on FTP.

d) Explain the concept of NVT. Also explain NVT Character set.

e) Explain DHCP packet format.

Q.6 **Attempt any one.** **06**

a) Explain the terms used in DNS: Flat Name Space, Hierarchical Name Space, Zone, FQDN and PQDN

b) Draw the diagram of SSH packet format and briefly describe it's fields.

Q.7 Explain the different scenario of SMTP. **06**

Seat No.	

Set **R**

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Networks (CSEPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) NVT uses two sets of characters, one for _____ and one for _____.
a) sending; receiving b) request; reply
c) data; control d) none of the above

2) In the _____ mode, each character typed is sent by the client to the server.
a) default b) character
c) line d) none of the above

3) TELNET uses only one TCP connection. The server uses _____ port and the client uses _____ port.
a) a well-known; another well-known
b) an ephemeral; another ephemeral
c) a well-known; an ephemeral
d) none of the above

4) _____ is more powerful and complex than _____.
a) POP3; IMAP4 b) IMAP4; POP3
c) SMTP; POP3 d) none of the above

5) UDP and TCP are both _____ layer protocols.
a) data link b) network
c) transport d) none of the above

6) _____ is a dynamic mapping protocol in which a physical address is found for a given logical address.
a) ARP b) RARP
c) both a and b d) none of the above

7) Identify the class of the following IPv4 address: 193.168.1.2

a) A b) B
c) C d) D

8) The combination of an IP address and a port number is called a _____.

a) transport address b) network address
c) socket address d) none of the above

9) There is no need for a header length field in SCTP because _____.

a) there are no options in the general header
b) the size of the header is fixed
c) both a and b
d) none of the above

10) _____ server can process multiple requests at a time.

a) An iterative b) A concurrent
c) A concurrent or an iterative d) None of the choices

11) A full domain name is a sequence of labels separated by _____.

a) semicolons b) dots
c) colons d) none of the above

12) DNS can use the services of _____ using the well-known port 53.

a) UDP b) TCP
c) either (a) or (b) d) none of the above

13) When the secondary downloads information from the primary, it is called _____ transfer.

a) domain b) zone
c) label d) none of the above

14) When the sender is connected to the mail server via a LAN or a WAN, we need _____.

a) two MTA
b) two UAs and two pairs of MTAs
c) two UAs and a pair of MTAs
d) none of the above

Seat No.	

Set **R**

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Networks (CSEPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

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

a) Compare OSI and TCP/IP Model. Write its advantages & disadvantages.
b) Suppose a computer send a packet at network Layer to the another computer in the internet the logical destinations address in the packet is corrupted, what happens to the packet? how can the sender computer informed about the situation?
c) Explain three-way handshaking in TCP.
d) Explain UDP Header format.
e) Shortly describe with diagram the concept of multihoming service offered by SCTP.

Q.3 Attempt any One. **06**

a) Explain the following system calls with their syntax:
1) socket ( )
2) bind ( )
3) connect ( )
b) Explain the steps to implement connection-oriented concurrent client-server.

Q.4 Attempt the following. **06**

An organization is granted the subnet mask 255.255.255.128(/25) Assume that the network IP Address is **192.168.1.0/25** the administrator want to find.
a) network address
b) number of hosts per subnet
c) First valid IP and Last valid IP of subnet 1
d) Broadcast address of subnet

Section – II

Q.5 Attempt any four: **16**

a) Explain DNS Message format.

b) What is DHCP? Describe the DHCP operation when client and server are on the same network.

c) Write a short note on FTP.

d) Explain the concept of NVT. Also explain NVT Character set.

e) Explain DHCP packet format.

Q.6 Attempt any one. **06**

a) Explain the terms used in DNS: Flat Name Space, Hierarchical Name Space, Zone, FQDN and PQDN

b) Draw the diagram of SSH packet format and briefly describe it's fields.

Q.7 Explain the different scenario of SMTP. **06**

SLR-BD-157

Seat No.		Set	S

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Networks (CSEPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ server can process multiple requests at a time.
a) An iterative b) A concurrent
c) A concurrent or an iterative d) None of the choices

2) A full domain name is a sequence of labels separated by _____.
a) semicolons b) dots
c) colons d) none of the above

3) DNS can use the services of _____ using the well-known port 53.
a) UDP b) TCP
c) either (a) or (b) d) none of the above

4) When the secondary downloads information from the primary, it is called _____ transfer.
a) domain b) zone
c) label d) none of the above

5) When the sender is connected to the mail server via a LAN or a WAN, we need _____.
a) two MTA
b) two UAs and two pairs of MTAs
c) two UAs and a pair of MTAs
d) none of the above

6) NVT uses two sets of characters, one for _____ and one for _____.
a) sending; receiving b) request; reply
c) data; control d) none of the above

7) In the _____ mode, each character typed is sent by the client to the server.
a) default b) character
c) line d) none of the above

8) TELNET uses only one TCP connection. The server uses _____ port and the client uses _____ port.
a) a well-known; another well-known
b) an ephemeral; another ephemeral
c) a well-known; an ephemeral
d) none of the above

9) _____ is more powerful and complex than _____.
a) POP3; IMAP4 b) IMAP4; POP3
c) SMTP; POP3 d) none of the above

10) UDP and TCP are both _____ layer protocols.
a) data link b) network
c) transport d) none of the above

11) _____ is a dynamic mapping protocol in which a physical address is found for a given logical address.
a) ARP b) RARP
c) both a and b d) none of the above

12) Identify the class of the following IPv4 address: 193.168.1.2
a) A b) B
c) C d) D

13) The combination of an IP address and a port number is called a _____.
a) transport address b) network address
c) socket address d) none of the above

14) There is no need for a header length field in SCTP because _____.
a) there are no options in the general header
b) the size of the header is fixed
c) both a and b
d) none of the above

SLR-BD-157

Seat No.	

Set S

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Networks (CSEPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

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

a) Compare OSI and TCP/IP Model. Write its advantages & disadvantages.
b) Suppose a computer send a packet at network Layer to the another computer in the internet the logical destinations address in the packet is corrupted, what happens to the packet? how can the sender computer informed about the situation?
c) Explain three-way handshaking in TCP.
d) Explain UDP Header format.
e) Shortly describe with diagram the concept of multihoming service offered by SCTP.

Q.3 Attempt any One. **06**

a) Explain the following system calls with their syntax:
1) socket ( )
2) bind ( )
3) connect ( )
b) Explain the steps to implement connection-oriented concurrent client-server.

Q.4 Attempt the following. **06**

An organization is granted the subnet mask 255.255.255.128(/25) Assume that the network IP Address is **192.168.1.0/25** the administrator want to find.
a) network address
b) number of hosts per subnet
c) First valid IP and Last valid IP of subnet 1
d) Broadcast address of subnet

Section – II

Q.5 Attempt any four: **16**

a) Explain DNS Message format.

b) What is DHCP? Describe the DHCP operation when client and server are on the same network.

c) Write a short note on FTP.

d) Explain the concept of NVT. Also explain NVT Character set.

e) Explain DHCP packet format.

Q.6 Attempt any one. **06**

a) Explain the terms used in DNS: Flat Name Space, Hierarchical Name Space, Zone, FQDN and PQDN

b) Draw the diagram of SSH packet format and briefly describe it's fields.

Q.7 Explain the different scenario of SMTP. **06**

SLR-BD-158

Seat No.	

Set P

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Innovation can be best described as: _____
a) A new idea only
b) The process of creating value through ideas
c) Invention
d) None of the above

2) Entrepreneurship is primarily related to: _____
a) Administration b) Risk-taking
c) Planning d) None of these

3) Which of the following is not an entrepreneurial competency?
a) Innovation b) Leadership
c) Laziness d) Decision making

4) An entrepreneur operates: _____
a) Outside the organization b) Within an existing company
c) As a freelancer d) None

5) "Push" type innovation comes from: _____
a) Market needs b) Customer demands
c) Internal ideas d) Suppliers

6) Agile management promotes: _____
a) Linear process b) Flexibility and iteration
c) Bureaucracy d) None

7) Blue Ocean strategy refers to: _____
a) Competing in existing markets
b) Creating new market space
c) Losing market share
d) None

8) Which of these is not a barrier to innovation?
a) Risk-taking culture b) Resistance to change
c) Lack of resources d) Poor leadership

9) The shifting composition of the economy refers to: _____
a) Stable industries b) Changing business models
c) Static job roles d) None

10) Lean start-up encourages: _____
a) High upfront investment b) Rapid prototyping
c) Formal structure d) None

11) Legal considerations for entrepreneurs include: _____
a) Taxation b) IP protection
c) Contracts d) All of these

12) One of the seven sources of innovation is: _____
a) Competitor's failure b) Demographics
c) Inflation d) GDP

13) Entrepreneurial opportunity recognition is: _____
a) Unimportant b) Intuition-based only
c) Structured process d) Not taught

14) Six Thinking Hats is a method for: _____
a) Innovation testing b) Decision-making
c) Funding d) Legal advice

SLR-BD-158

Seat No.	

Set P

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 All questions are compulsory.

a) Define innovation. Explain its relationship with entrepreneurship. **06**
b) Distinguish between Entrepreneur, Manager, and Intrapreneur. **04**

Q.3 Solve any three questions.

a) Explain classification of innovation. **06**
b) Describe the economic theories of entrepreneurship. **06**
c) Discuss need and importance of Entrepreneurship Development. **06**
d) Describe sources of innovation with examples. **06**
e) Explain Agile management and NUF test in innovation. **06**

Section – II

Q.4 All questions are compulsory.

a) Explain the purpose and process of innovation. **06**
b) What are the needs for continuous learning in innovation? **04**

Q.5 Solve any three questions.

a) Explain different types of innovative strategies. **06**
b) Describe Red Ocean vs Blue Ocean strategies. **06**
c) List barriers to innovation and explain with examples. **06**
d) Explain the entrepreneurial process and opportunity recognition. **06**
e) Write short note on Lean start-up methodology. **06**

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of these is not a barrier to innovation?
a) Risk-taking culture b) Resistance to change
c) Lack of resources d) Poor leadership

2) The shifting composition of the economy refers to: _____
a) Stable industries b) Changing business models
c) Static job roles d) None

3) Lean start-up encourages: _____
a) High upfront investment b) Rapid prototyping
c) Formal structure d) None

4) Legal considerations for entrepreneurs include: _____
a) Taxation b) IP protection
c) Contracts d) All of these

5) One of the seven sources of innovation is: _____
a) Competitor's failure b) Demographics
c) Inflation d) GDP

6) Entrepreneurial opportunity recognition is: _____
a) Unimportant b) Intuition-based only
c) Structured process d) Not taught

7) Six Thinking Hats is a method for: _____
a) Innovation testing b) Decision-making
c) Funding d) Legal advice

8) Innovation can be best described as: _____
a) A new idea only
b) The process of creating value through ideas
c) Invention
d) None of the above

9) Entrepreneurship is primarily related to: _____
a) Administration
b) Risk-taking
c) Planning
d) None of these

10) Which of the following is not an entrepreneurial competency?
a) Innovation
b) Leadership
c) Laziness
d) Decision making

11) An entrepreneur operates: _____
a) Outside the organization
b) Within an existing company
c) As a freelancer
d) None

12) "Push" type innovation comes from: _____
a) Market needs
b) Customer demands
c) Internal ideas
d) Suppliers

13) Agile management promotes: _____
a) Linear process
b) Flexibility and iteration
c) Bureaucracy
d) None

14) Blue Ocean strategy refers to: _____
a) Competing in existing markets
b) Creating new market space
c) Losing market share
d) None

SLR-BD-158

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 All questions are compulsory.

a) Define innovation. Explain its relationship with entrepreneurship. **06**
b) Distinguish between Entrepreneur, Manager, and Intrapreneur. **04**

Q.3 Solve any three questions.

a) Explain classification of innovation. **06**
b) Describe the economic theories of entrepreneurship. **06**
c) Discuss need and importance of Entrepreneurship Development. **06**
d) Describe sources of innovation with examples. **06**
e) Explain Agile management and NUF test in innovation. **06**

Section – II

Q.4 All questions are compulsory.

a) Explain the purpose and process of innovation. **06**
b) What are the needs for continuous learning in innovation? **04**

Q.5 Solve any three questions.

a) Explain different types of innovative strategies. **06**
b) Describe Red Ocean vs Blue Ocean strategies. **06**
c) List barriers to innovation and explain with examples. **06**
d) Explain the entrepreneurial process and opportunity recognition. **06**
e) Write short note on Lean start-up methodology. **06**

Seat No.	

Set R

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Legal considerations for entrepreneurs include: _____
a) Taxation b) IP protection
c) Contracts d) All of these

2) One of the seven sources of innovation is: _____
a) Competitor's failure b) Demographics
c) Inflation d) GDP

3) Entrepreneurial opportunity recognition is: _____
a) Unimportant b) Intuition-based only
c) Structured process d) Not taught

4) Six Thinking Hats is a method for: _____
a) Innovation testing b) Decision-making
c) Funding d) Legal advice

5) Innovation can be best described as: _____
a) A new idea only
b) The process of creating value through ideas
c) Invention
d) None of the above

6) Entrepreneurship is primarily related to: _____
a) Administration b) Risk-taking
c) Planning d) None of these

7) Which of the following is not an entrepreneurial competency?
a) Innovation b) Leadership
c) Laziness d) Decision making

8) An entrepreneur operates: _____
a) Outside the organization
b) Within an existing company
c) As a freelancer
d) None

9) "Push" type innovation comes from: _____
a) Market needs
b) Customer demands
c) Internal ideas
d) Suppliers

10) Agile management promotes: _____
a) Linear process
b) Flexibility and iteration
c) Bureaucracy
d) None

11) Blue Ocean strategy refers to: _____
a) Competing in existing markets
b) Creating new market space
c) Losing market share
d) None

12) Which of these is not a barrier to innovation?
a) Risk-taking culture
b) Resistance to change
c) Lack of resources
d) Poor leadership

13) The shifting composition of the economy refers to: _____
a) Stable industries
b) Changing business models
c) Static job roles
d) None

14) Lean start-up encourages: _____
a) High upfront investment
b) Rapid prototyping
c) Formal structure
d) None

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 All questions are compulsory.

a) Define innovation. Explain its relationship with entrepreneurship. **06**
b) Distinguish between Entrepreneur, Manager, and Intrapreneur. **04**

Q.3 Solve any three questions.

a) Explain classification of innovation. **06**
b) Describe the economic theories of entrepreneurship. **06**
c) Discuss need and importance of Entrepreneurship Development. **06**
d) Describe sources of innovation with examples. **06**
e) Explain Agile management and NUF test in innovation. **06**

Section – II

Q.4 All questions are compulsory.

a) Explain the purpose and process of innovation. **06**
b) What are the needs for continuous learning in innovation? **04**

Q.5 Solve any three questions.

a) Explain different types of innovative strategies. **06**
b) Describe Red Ocean vs Blue Ocean strategies. **06**
c) List barriers to innovation and explain with examples. **06**
d) Explain the entrepreneurial process and opportunity recognition. **06**
e) Write short note on Lean start-up methodology. **06**

Seat No.		Set	S

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Agile management promotes: _____
a) Linear process b) Flexibility and iteration
c) Bureaucracy d) None

2) Blue Ocean strategy refers to: _____
a) Competing in existing markets
b) Creating new market space
c) Losing market share
d) None

3) Which of these is not a barrier to innovation?
a) Risk-taking culture b) Resistance to change
c) Lack of resources d) Poor leadership

4) The shifting composition of the economy refers to: _____
a) Stable industries b) Changing business models
c) Static job roles d) None

5) Lean start-up encourages: _____
a) High upfront investment b) Rapid prototyping
c) Formal structure d) None

6) Legal considerations for entrepreneurs include: _____
a) Taxation b) IP protection
c) Contracts d) All of these

7) One of the seven sources of innovation is: _____
a) Competitor's failure b) Demographics
c) Inflation d) GDP

8) Entrepreneurial opportunity recognition is: _____
a) Unimportant
b) Intuition-based only
c) Structured process
d) Not taught

9) Six Thinking Hats is a method for: _____
a) Innovation testing
b) Decision-making
c) Funding
d) Legal advice

10) Innovation can be best described as: _____
a) A new idea only
b) The process of creating value through ideas
c) Invention
d) None of the above

11) Entrepreneurship is primarily related to: _____
a) Administration
b) Risk-taking
c) Planning
d) None of these

12) Which of the following is not an entrepreneurial competency?
a) Innovation
b) Leadership
c) Laziness
d) Decision making

13) An entrepreneur operates: _____
a) Outside the organization
b) Within an existing company
c) As a freelancer
d) None

14) "Push" type innovation comes from: _____
a) Market needs
b) Customer demands
c) Internal ideas
d) Suppliers

SLR-BD-158

Seat No.	

Set S

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 All questions are compulsory.

a) Define innovation. Explain its relationship with entrepreneurship. **06**
b) Distinguish between Entrepreneur, Manager, and Intrapreneur. **04**

Q.3 Solve any three questions.

a) Explain classification of innovation. **06**
b) Describe the economic theories of entrepreneurship. **06**
c) Discuss need and importance of Entrepreneurship Development. **06**
d) Describe sources of innovation with examples. **06**
e) Explain Agile management and NUF test in innovation. **06**

Section – II

Q.4 All questions are compulsory.

a) Explain the purpose and process of innovation. **06**
b) What are the needs for continuous learning in innovation? **04**

Q.5 Solve any three questions.

a) Explain different types of innovative strategies. **06**
b) Describe Red Ocean vs Blue Ocean strategies. **06**
c) List barriers to innovation and explain with examples. **06**
d) Explain the entrepreneurial process and opportunity recognition. **06**
e) Write short note on Lean start-up methodology. **06**

SLR-BD-159

Seat No.		Set	P

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) The Occupational Health and Safety Management System (OHSMS) primarily aims to: _____
a) Increase industrial profits
b) Reduce energy consumption
c) Ensure worker safety and reduce health risks in workplaces
d) Promote environmental tourism

2) In-situ conservation refers to: _____
a) Conservation of species in zoos
b) Conservation using biotechnology
c) Conservation in gene banks
d) Conservation of species in their natural habitats

3) Carbon footprint is a measure of: _____
a) Land occupied by forests
b) Energy consumption in a home
c) Greenhouse gas emissions by an activity or person
d) Amount of carbon in plants

4) The main goal of sustainability is to: _____
a) Meet present needs without compromising future needs
b) Increase profit only
c) Eliminate economic development
d) Promote urbanization

5) Which of the following is an example of hazardous waste?
a) Expired medicines b) Plastic bottles
c) Food scraps d) Paper waste

6) Biodiversity hotspots in India include: _____
a) Eastern Ghats and Indo-Gangetic Plain
b) Western Ghats and the Himalayas
c) Thar Desert and Sundarbans only
d) Deccan Plateau and Indo-Gangetic Basin

7) The 3R concept stands for: _____
a) Reuse, Reduce, Rebuild
b) Reduce, Reuse, Recycle
c) Replace, Reuse, Restore
d) Recycle, Recover, Rebuild

8) The ISO 14000 Series deals with: _____
a) Energy-efficient building design
b) Environmental Management Systems
c) Industrial Safety Standards
d) Economic Performance Indicators

9) Which of the following is a non-conventional source of energy?
a) Coal
b) Natural Gas
c) Wind
d) Diesel

10) The main goal of a circular economy is to: _____
a) Increase fossil fuel usage
b) Promote single-use products
c) Minimize waste and resource use
d) Maximize profit only

11) The first step in preparing an Environmental Impact Assessment (EIA) report is: _____
a) Cost-benefit analysis
b) Monitoring
c) Screening
d) Public hearing

12) Which of the following is not a principle of Environmental Management?
a) Polluter pays
b) Sustainability
c) Preventive action
d) Maximum profit generation

13) Cost-Benefit Analysis (CBA) in environmental policies is used to: _____
a) Maximize pollution
b) Evaluate environmental legislation
c) Compare environmental costs with economic benefits
d) Promote industrialization

14) An ecosystem consists of: _____
a) Living organisms only
b) Non-living components only
c) Living organisms and their physical environment
d) Plants and animals only

SLR-BD-159

Seat No.		Set	P

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following **12**

a) Define the term "environment". Discuss the scope and importance of environmental studies. Why is there a need for public awareness?
b) Describe the causes and effects of air and water pollution. Suggest two preventive measures for each.
c) Define sustainability. Discuss any two major challenges in achieving sustainable development.

Q.3 Attempt Any Two **10**

a) What are hazardous wastes and e-wastes? How should they be managed?
b) What are carbon credits and carbon footprints? Explain with examples.
c) List any two Millennium Development Goals (MDGs). Mention one environmental protocol.

Q.4 Write short notes on any two of the following: **06**

a) Genetic diversity
b) India as a mega-diversity nation
c) In-situ and Ex-situ conservation

Section – II

Q.5 Write short notes on any two of the following: **10**

a) ISO 14000 Series
b) Sustainable Habitat - Green Buildings
c) Non-conventional energy sources

Q.6 Attempt the following **10**

a) Define Environmental Management. Discuss its nature, scope, and components.
b) Define the 3R concept and explain how it supports the zero waste approach.

Q.7 Attempt any two **08**

a) Define Environmental Management. Discuss its nature, scope, and components.

b) What is Environmental Policy Analysis? Distinguish between macro-level and micro-level analysis.

c) Outline the steps involved in the Environmental Impact Assessment (EIA) process.

Seat No.		Set	Q

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) The ISO 14000 Series deals with: _____
a) Energy-efficient building design
b) Environmental Management Systems
c) Industrial Safety Standards
d) Economic Performance Indicators

2) Which of the following is a non-conventional source of energy?
a) Coal b) Natural Gas
c) Wind d) Diesel

3) The main goal of a circular economy is to: _____
a) Increase fossil fuel usage
b) Promote single-use products
c) Minimize waste and resource use
d) Maximize profit only

4) The first step in preparing an Environmental Impact Assessment (EIA) report is: _____
a) Cost-benefit analysis b) Monitoring
c) Screening d) Public hearing

5) Which of the following is not a principle of Environmental Management?
a) Polluter pays b) Sustainability
c) Preventive action d) Maximum profit generation

6) Cost-Benefit Analysis (CBA) in environmental policies is used to: _____
a) Maximize pollution
b) Evaluate environmental legislation
c) Compare environmental costs with economic benefits
d) Promote industrialization

7) An ecosystem consists of: _____
   a) Living organisms only
   b) Non-living components only
   c) Living organisms and their physical environment
   d) Plants and animals only

8) The Occupational Health and Safety Management System (OHSMS) primarily aims to: _____
   a) Increase industrial profits
   b) Reduce energy consumption
   c) Ensure worker safety and reduce health risks in workplaces
   d) Promote environmental tourism

9) In-situ conservation refers to: _____
   a) Conservation of species in zoos
   b) Conservation using biotechnology
   c) Conservation in gene banks
   d) Conservation of species in their natural habitats

10) Carbon footprint is a measure of: _____
   a) Land occupied by forests
   b) Energy consumption in a home
   c) Greenhouse gas emissions by an activity or person
   d) Amount of carbon in plants

11) The main goal of sustainability is to: _____
   a) Meet present needs without compromising future needs
   b) Increase profit only
   c) Eliminate economic development
   d) Promote urbanization

12) Which of the following is an example of hazardous waste?
   a) Expired medicines b) Plastic bottles
   c) Food scraps d) Paper waste

13) Biodiversity hotspots in India include: _____
   a) Eastern Ghats and Indo-Gangetic Plain
   b) Western Ghats and the Himalayas
   c) Thar Desert and Sundarbans only
   d) Deccan Plateau and Indo-Gangetic Basin

14) The 3R concept stands for: _____
   a) Reuse, Reduce, Rebuild b) Reduce, Reuse, Recycle
   c) Replace, Reuse, Restore d) Recycle, Recover, Rebuild

Seat No.		Set	Q

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following **12**

a) Define the term "environment". Discuss the scope and importance of environmental studies. Why is there a need for public awareness?
b) Describe the causes and effects of air and water pollution. Suggest two preventive measures for each.
c) Define sustainability. Discuss any two major challenges in achieving sustainable development.

Q.3 Attempt Any Two **10**

a) What are hazardous wastes and e-wastes? How should they be managed?
b) What are carbon credits and carbon footprints? Explain with examples.
c) List any two Millennium Development Goals (MDGs). Mention one environmental protocol.

Q.4 Write short notes on any two of the following: **06**

a) Genetic diversity
b) India as a mega-diversity nation
c) In-situ and Ex-situ conservation

Section – II

Q.5 Write short notes on any two of the following: **10**

a) ISO 14000 Series
b) Sustainable Habitat - Green Buildings
c) Non-conventional energy sources

Q.6 Attempt the following **10**

a) Define Environmental Management. Discuss its nature, scope, and components.
b) Define the 3R concept and explain how it supports the zero waste approach.

Q.7 Attempt any two **08**

a) Define Environmental Management. Discuss its nature, scope, and components.

b) What is Environmental Policy Analysis? Distinguish between macro-level and micro-level analysis.

c) Outline the steps involved in the Environmental Impact Assessment (EIA) process.

Seat No.		Set	R

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) The first step in preparing an Environmental Impact Assessment (EIA) report is: _____
a) Cost-benefit analysis b) Monitoring
c) Screening d) Public hearing

2) Which of the following is not a principle of Environmental Management?
a) Polluter pays b) Sustainability
c) Preventive action d) Maximum profit generation

3) Cost-Benefit Analysis (CBA) in environmental policies is used to: _____
a) Maximize pollution
b) Evaluate environmental legislation
c) Compare environmental costs with economic benefits
d) Promote industrialization

4) An ecosystem consists of: _____
a) Living organisms only
b) Non-living components only
c) Living organisms and their physical environment
d) Plants and animals only

5) The Occupational Health and Safety Management System (OHSMS) primarily aims to: _____
a) Increase industrial profits
b) Reduce energy consumption
c) Ensure worker safety and reduce health risks in workplaces
d) Promote environmental tourism

6) In-situ conservation refers to: _____
a) Conservation of species in zoos
b) Conservation using biotechnology
c) Conservation in gene banks
d) Conservation of species in their natural habitats

7) Carbon footprint is a measure of: _____
a) Land occupied by forests
b) Energy consumption in a home
c) Greenhouse gas emissions by an activity or person
d) Amount of carbon in plants

8) The main goal of sustainability is to: _____
a) Meet present needs without compromising future needs
b) Increase profit only
c) Eliminate economic development
d) Promote urbanization

9) Which of the following is an example of hazardous waste?
a) Expired medicines b) Plastic bottles
c) Food scraps d) Paper waste

10) Biodiversity hotspots in India include: _____
a) Eastern Ghats and Indo-Gangetic Plain
b) Western Ghats and the Himalayas
c) Thar Desert and Sundarbans only
d) Deccan Plateau and Indo-Gangetic Basin

11) The 3R concept stands for: _____
a) Reuse, Reduce, Rebuild b) Reduce, Reuse, Recycle
c) Replace, Reuse, Restore d) Recycle, Recover, Rebuild

12) The ISO 14000 Series deals with: _____
a) Energy-efficient building design
b) Environmental Management Systems
c) Industrial Safety Standards
d) Economic Performance Indicators

13) Which of the following is a non-conventional source of energy?
a) Coal b) Natural Gas
c) Wind d) Diesel

14) The main goal of a circular economy is to: _____
a) Increase fossil fuel usage
b) Promote single-use products
c) Minimize waste and resource use
d) Maximize profit only

SLR-BD-159

Seat No.		Set	R

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following **12**

a) Define the term "environment". Discuss the scope and importance of environmental studies. Why is there a need for public awareness?
b) Describe the causes and effects of air and water pollution. Suggest two preventive measures for each.
c) Define sustainability. Discuss any two major challenges in achieving sustainable development.

Q.3 Attempt Any Two **10**

a) What are hazardous wastes and e-wastes? How should they be managed?
b) What are carbon credits and carbon footprints? Explain with examples.
c) List any two Millennium Development Goals (MDGs). Mention one environmental protocol.

Q.4 Write short notes on any two of the following: **06**

a) Genetic diversity
b) India as a mega-diversity nation
c) In-situ and Ex-situ conservation

Section – II

Q.5 Write short notes on any two of the following: **10**

a) ISO 14000 Series
b) Sustainable Habitat - Green Buildings
c) Non-conventional energy sources

Q.6 Attempt the following **10**

a) Define Environmental Management. Discuss its nature, scope, and components.
b) Define the 3R concept and explain how it supports the zero waste approach.

Q.7 Attempt any two **08**

a) Define Environmental Management. Discuss its nature, scope, and components.

b) What is Environmental Policy Analysis? Distinguish between macro-level and micro-level analysis.

c) Outline the steps involved in the Environmental Impact Assessment (EIA) process.

Seat No.		Set	S

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) Biodiversity hotspots in India include: _____
a) Eastern Ghats and Indo-Gangetic Plain
b) Western Ghats and the Himalayas
c) Thar Desert and Sundarbans only
d) Deccan Plateau and Indo-Gangetic Basin

2) The 3R concept stands for: _____
a) Reuse, Reduce, Rebuild b) Reduce, Reuse, Recycle
c) Replace, Reuse, Restore d) Recycle, Recover, Rebuild

3) The ISO 14000 Series deals with: _____
a) Energy-efficient building design
b) Environmental Management Systems
c) Industrial Safety Standards
d) Economic Performance Indicators

4) Which of the following is a non-conventional source of energy?
a) Coal b) Natural Gas
c) Wind d) Diesel

5) The main goal of a circular economy is to: _____
a) Increase fossil fuel usage
b) Promote single-use products
c) Minimize waste and resource use
d) Maximize profit only

6) The first step in preparing an Environmental Impact Assessment (EIA) report is: _____
a) Cost-benefit analysis b) Monitoring
c) Screening d) Public hearing

7) Which of the following is not a principle of Environmental Management?
a) Polluter pays
b) Sustainability
c) Preventive action
d) Maximum profit generation

8) Cost-Benefit Analysis (CBA) in environmental policies is used to: _____
a) Maximize pollution
b) Evaluate environmental legislation
c) Compare environmental costs with economic benefits
d) Promote industrialization

9) An ecosystem consists of: _____
a) Living organisms only
b) Non-living components only
c) Living organisms and their physical environment
d) Plants and animals only

10) The Occupational Health and Safety Management System (OHSMS) primarily aims to: _____
a) Increase industrial profits
b) Reduce energy consumption
c) Ensure worker safety and reduce health risks in workplaces
d) Promote environmental tourism

11) In-situ conservation refers to: _____
a) Conservation of species in zoos
b) Conservation using biotechnology
c) Conservation in gene banks
d) Conservation of species in their natural habitats

12) Carbon footprint is a measure of: _____
a) Land occupied by forests
b) Energy consumption in a home
c) Greenhouse gas emissions by an activity or person
d) Amount of carbon in plants

13) The main goal of sustainability is to: _____
a) Meet present needs without compromising future needs
b) Increase profit only
c) Eliminate economic development
d) Promote urbanization

14) Which of the following is an example of hazardous waste?
a) Expired medicines
b) Plastic bottles
c) Food scraps
d) Paper waste

SLR-BD-159

Seat No.		Set	S

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following **12**

a) Define the term "environment". Discuss the scope and importance of environmental studies. Why is there a need for public awareness?
b) Describe the causes and effects of air and water pollution. Suggest two preventive measures for each.
c) Define sustainability. Discuss any two major challenges in achieving sustainable development.

Q.3 Attempt Any Two **10**

a) What are hazardous wastes and e-wastes? How should they be managed?
b) What are carbon credits and carbon footprints? Explain with examples.
c) List any two Millennium Development Goals (MDGs). Mention one environmental protocol.

Q.4 Write short notes on any two of the following: **06**

a) Genetic diversity
b) India as a mega-diversity nation
c) In-situ and Ex-situ conservation

Section – II

Q.5 Write short notes on any two of the following: **10**

a) ISO 14000 Series
b) Sustainable Habitat - Green Buildings
c) Non-conventional energy sources

Q.6 Attempt the following **10**

a) Define Environmental Management. Discuss its nature, scope, and components.
b) Define the 3R concept and explain how it supports the zero waste approach.

Q.7 Attempt any two **08**

a) Define Environmental Management. Discuss its nature, scope, and components.

b) What is Environmental Policy Analysis? Distinguish between macro-level and micro-level analysis.

c) Outline the steps involved in the Environmental Impact Assessment (EIA) process.

SLR-BD-160

Seat No.		Set	P

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which is the primary advantage of using solar energy power generation?
a) Low initial coast
b) Reduce environmental impact
c) Do not require large area
d) Simple storage method

2) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

3) Which of the following common application of solar energy?
a) Generating electricity
b) Heating water
c) Providing power for electronic device
d) All of the above

4) Passive solar energy refers to trapping the Suns energy _____.
a) Using mechanical devices
b) without using mechanical devices
c) Using chemical
d) Incineration

5) The process or digestion taking place in the presence of air is called as _____.
a) Aerobic digestion b) Anaerobic digestion
c) Hydrolysis d) None of these

6) Which type of renewable energy resources generate low power energy?

a) Biomass b) Solar
c) Wind d) All of the above

7) In wind turbine gear box is used to _____.

a) Step up the speed b) Reduce the speed
c) shut down d) None of these

8) Geothermal energy present _____ of the earth.

a) Rotation b) Exterior
c) North side d) Interior

9) Biogas is the gaseous fuel which is obtained from biomass by means of _____ fermentation.

a) Aerobic b) Anaerobic
c) Constant d) None of the above

10) _____ is produced by blending of vegetable oil.

a) CNG b) Methane gas
c) Biofuel d) Biodisel

11) Availability of Solar energy on the earth surface is _____MW.

a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

12) Energy is _____ of substance or a body to do work.

a) Obesity b) Power
c) Capacity d) None of the above

13) Wind energy used from _____ years ago.

a) 3000 b) 2000
c) 6000 d) 5000

14) The major source of the Geothermal energy is _____.

a) Water b) Hot water reservoir
c) Oil d) Gas

SLR-BD-160

Seat No.	

Set P

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Attempt any Four **16**

a) Explain advantages of biomass energy.
b) Explain in detail scope of renewable energy.
c) What is biomass energy and explain resources of biomass energy.
d) Write a note on applications of solar energy.
e) Explain function of biogas digester.
f) Write a note on aerobic and anaerobic digestion.

Q.3 Attempt any two. **12**

a) Explain Solar photovoltaic technology.
b) Explain Basic components of wind energy conversion system.
c) Explain in detail advantages and disadvantages of renewable energy.
d) Explain in detail advantage and disadvantage of Solar energy.

Section – II

Q.4 Attempt any Four. **16**

a) Write a note on wave energy.
b) Merits and demerits of hydropower energy.
c) Explain specifications of energy storage devices.
d) Main parts of hydropower station.
e) Importance of tidal energy.
f) Importance of energy storage devices

Q.5 Attempt any two. **12**

a) Write a note on potential of wave energy in India.
b) Explain different methods of energy storage.
c) Explain with neat diagram hydropower plant.
d) Explain in detail ocean thermal energy conversion (OTEC) .

SLR-BD-160

Seat No.	

Set Q

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Geothermal energy present _____ of the earth.
a) Rotation b) Exterior
c) North side d) Interior

2) Biogas is the gaseous fuel which is obtained from biomass by means of _____ fermentation.
a) Aerobic b) Anaerobic
c) Constant d) None of the above

3) _____ is produced by blending of vegetable oil.
a) CNG b) Methane gas
c) Biofuel d) Biodisel

4) Availability of Solar energy on the earth surface is _____MW.
a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

5) Energy is _____ of substance or a body to do work.
a) Obesity b) Power
c) Capacity d) None of the above

6) Wind energy used from _____ years ago.
a) 3000 b) 2000
c) 6000 d) 5000

7) The major source of the Geothermal energy is _____.
a) Water b) Hot water reservoir
c) Oil d) Gas

8) Which is the primary advantage of using solar energy power generation?
a) Low initial coast
b) Reduce environmental impact
c) Do not require large area
d) Simple storage method

9) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

10) Which of the following common application of solar energy?
a) Generating electricity
b) Heating water
c) Providing power for electronic device
d) All of the above

11) Passive solar energy refers to trapping the Suns energy _____.
a) Using mechanical devices
b) without using mechanical devices
c) Using chemical
d) Incineration

12) The process or digestion taking place in the presence of air is called as _____.
a) Aerobic digestion b) Anaerobic digestion
c) Hydrolysis d) None of these

13) Which type of renewable energy resources generate low power energy?
a) Biomass b) Solar
c) Wind d) All of the above

14) In wind turbine gear box is used to _____.
a) Step up the speed b) Reduce the speed
c) shut down d) None of these

SLR-BD-160

Seat No.	

Set Q

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Attempt any Four **16**

a) Explain advantages of biomass energy.
b) Explain in detail scope of renewable energy.
c) What is biomass energy and explain resources of biomass energy.
d) Write a note on applications of solar energy.
e) Explain function of biogas digester.
f) Write a note on aerobic and anaerobic digestion.

Q.3 Attempt any two. **12**

a) Explain Solar photovoltaic technology.
b) Explain Basic components of wind energy conversion system.
c) Explain in detail advantages and disadvantages of renewable energy.
d) Explain in detail advantage and disadvantage of Solar energy.

Section – II

Q.4 Attempt any Four. **16**

a) Write a note on wave energy.
b) Merits and demerits of hydropower energy.
c) Explain specifications of energy storage devices.
d) Main parts of hydropower station.
e) Importance of tidal energy.
f) Importance of energy storage devices

Q.5 Attempt any two. **12**

a) Write a note on potential of wave energy in India.
b) Explain different methods of energy storage.
c) Explain with neat diagram hydropower plant.
d) Explain in detail ocean thermal energy conversion (OTEC) .

Seat No.	

Set **R**

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Availability of Solar energy on the earth surface is _____MW.
a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

2) Energy is _____ of substance or a body to do work.
a) Obesity b) Power
c) Capacity d) None of the above

3) Wind energy used from _____ years ago.
a) 3000 b) 2000
c) 6000 d) 5000

4) The major source of the Geothermal energy is _____.
a) Water b) Hot water reservoir
c) Oil d) Gas

5) Which is the primary advantage of using solar energy power generation?
a) Low initial coast
b) Reduce environmental impact
c) Do not require large area
d) Simple storage method

6) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

7) Which of the following common application of solar energy?
a) Generating electricity
b) Heating water
c) Providing power for electronic device
d) All of the above

8) Passive solar energy refers to trapping the Suns energy _____.
a) Using mechanical devices
b) without using mechanical devices
c) Using chemical
d) Incineration

9) The process or digestion taking place in the presence of air is called as _____.
a) Aerobic digestion
b) Anaerobic digestion
c) Hydrolysis
d) None of these

10) Which type of renewable energy resources generate low power energy?
a) Biomass
b) Solar
c) Wind
d) All of the above

11) In wind turbine gear box is used to _____.
a) Step up the speed
b) Reduce the speed
c) shut down
d) None of these

12) Geothermal energy present _____ of the earth.
a) Rotation
b) Exterior
c) North side
d) Interior

13) Biogas is the gaseous fuel which is obtained from biomass by means of _____ fermentation.
a) Aerobic
b) Anaerobic
c) Constant
d) None of the above

14) _____ is produced by blending of vegetable oil.
a) CNG
b) Methane gas
c) Biofuel
d) Biodisel

SLR-BD-160

Seat No.	

Set R

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Attempt any Four **16**

a) Explain advantages of biomass energy.
b) Explain in detail scope of renewable energy.
c) What is biomass energy and explain resources of biomass energy.
d) Write a note on applications of solar energy.
e) Explain function of biogas digester.
f) Write a note on aerobic and anaerobic digestion.

Q.3 Attempt any two. **12**

a) Explain Solar photovoltaic technology.
b) Explain Basic components of wind energy conversion system.
c) Explain in detail advantages and disadvantages of renewable energy.
d) Explain in detail advantage and disadvantage of Solar energy.

Section – II

Q.4 Attempt any Four. **16**

a) Write a note on wave energy.
b) Merits and demerits of hydropower energy.
c) Explain specifications of energy storage devices.
d) Main parts of hydropower station.
e) Importance of tidal energy.
f) Importance of energy storage devices

Q.5 Attempt any two. **12**

a) Write a note on potential of wave energy in India.
b) Explain different methods of energy storage.
c) Explain with neat diagram hydropower plant.
d) Explain in detail ocean thermal energy conversion (OTEC).

Seat No.	

Set **S**

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which type of renewable energy resources generate low power energy?
a) Biomass b) Solar
c) Wind d) All of the above

2) In wind turbine gear box is used to _____.
a) Step up the speed b) Reduce the speed
c) shut down d) None of these

3) Geothermal energy present _____ of the earth.
a) Rotation b) Exterior
c) North side d) Interior

4) Biogas is the gaseous fuel which is obtained from biomass by means of _____ fermentation.
a) Aerobic b) Anaerobic
c) Constant d) None of the above

5) _____ is produced by blending of vegetable oil.
a) CNG b) Methane gas
c) Biofuel d) Biodisel

6) Availability of Solar energy on the earth surface is _____MW.
a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

7) Energy is _____ of substance or a body to do work.
a) Obesity b) Power
c) Capacity d) None of the above

8) Wind energy used from _____ years ago.
a) 3000 b) 2000
c) 6000 d) 5000

9) The major source of the Geothermal energy is _____.
a) Water b) Hot water reservoir
c) Oil d) Gas

10) Which is the primary advantage of using solar energy power generation?
a) Low initial coast
b) Reduce environmental impact
c) Do not require large area
d) Simple storage method

11) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

12) Which of the following common application of solar energy?
a) Generating electricity
b) Heating water
c) Providing power for electronic device
d) All of the above

13) Passive solar energy refers to trapping the Suns energy _____.
a) Using mechanical devices
b) without using mechanical devices
c) Using chemical
d) Incineration

14) The process or digestion taking place in the presence of air is called as _____.
a) Aerobic digestion b) Anaerobic digestion
c) Hydrolysis d) None of these

SLR-BD-160

Seat No.	

Set S

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Attempt any Four **16**

a) Explain advantages of biomass energy.
b) Explain in detail scope of renewable energy.
c) What is biomass energy and explain resources of biomass energy.
d) Write a note on applications of solar energy.
e) Explain function of biogas digester.
f) Write a note on aerobic and anaerobic digestion.

Q.3 Attempt any two. **12**

a) Explain Solar photovoltaic technology.
b) Explain Basic components of wind energy conversion system.
c) Explain in detail advantages and disadvantages of renewable energy.
d) Explain in detail advantage and disadvantage of Solar energy.

Section – II

Q.4 Attempt any Four. **16**

a) Write a note on wave energy.
b) Merits and demerits of hydropower energy.
c) Explain specifications of energy storage devices.
d) Main parts of hydropower station.
e) Importance of tidal energy.
f) Importance of energy storage devices

Q.5 Attempt any two. **12**

a) Write a note on potential of wave energy in India.
b) Explain different methods of energy storage.
c) Explain with neat diagram hydropower plant.
d) Explain in detail ocean thermal energy conversion (OTEC).

SLR-BD-161

Seat No.	

Set P

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Draw neat diagrams whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) An instrument transformer is used to extend the range of _____.
a) induction instrument b) electrostatic instrument
c) moving coil instrument d) any of the above

2) The internal resistance of an ammeter should be _____.
a) Very small b) Medium
c) High d) Infinity

3) The smallest change which a sensor can detect is termed: _____
a) Accuracy b) Precision
c) Resolution d) Scale

4) Sensor effectiveness depends on _____ parameter.
a) Sensitivity b) Radiation
c) Restively d) All the above

5) The desirable static characteristics of a measuring system are _____
a) accuracy and drift
b) accuracy, sensitivity and reproducibility
c) drift and dead zone
d) static error

6) A _____ device prevents the oscillation of the moving system and enables the latter to reach its final position quickly.
a) Deflecting b) Controlling
c) Damping d) any of the above

7) _____ is an instrument which measures the insulation resistance of an electric circuit relative to earth and one another.
a) Tangent galvanometer
b) Megger
c) Current transformer
d) None of the above

8) Which of the following is a key characteristic of a sensor?
a) It can only measure temperature
b) It is an active component
c) It converts physical parameters into an electrical signal
d) Il requires no external power

9) Which of the following is a type of magnetic sensor?
a) Thermistor
b) Strain gauge
c) Hall effect sensor
d) LVDT

10) Typical conversion speed of ADC is _____
a) Less than 1 μs
b) Less than 100 μs
c) Less than 500 μs
d) Greater than 1000 μs

11) What is signal conditioning?
a) To analyze any signal
b) Conversion or modification is referred to as conditioning
c) Conversion from analog to digital is signal conditioning
d) Conversion from digital to analog is signal conditioning

12) Touch screen devices use which sensor?
a) Touch sensor
b) Temperature sensor
c) Humidity sensor
d) Pressure sensor

13) ENOB in ADC stand for _____
a) Effective number of bytes
b) Effective number of bits
c) Effective nibble baud
d) None of the mentioned

14) A simple bridge circuit consists of a network of _____
a) 3 resistance arms
b) 2 resistance arms
c) 4 resistance arms
d) 6 resistance arms

SLR-BD-161

Seat No.	

Set P

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt any four of the following: 16

a) Define standard & explain types of standards.
b) Define the following characteristics
1) Linearity 2) Accuracy 3) Repeatability 4) Sensitivity
c) Derive the expression for unknown capacitance with phasor diagram by using Schering Bridge.
d) Write difference between Current Transformer and Potential Transformer.
e) Explain working of digital storage oscilloscope with suitable block diagram.

Q.3 Attempt any two of the following: 12

a) Illustrate and derive the torque equation for a Moving iron instrument with neat diagram.
b) Draw the equivalent circuit and phasor diagram of a CT. Derive the expressions for ratio and phase angle errors.
c) Explain digital ramp type and dual slope integrating type digital voltmeter.

Section – II

Q.4 Attempt any four of the following: 16

a) Explain the principle of working of Hall effect sensor.
b) Explain different types of temperature sensor with details.
c) Discuss Classification of sensor and explain active and passive sensor.
d) State and explain the methods of data transmission.
e) State and Explain the Modes of Heat transfer.

Q.5 Attempt any two of the following: 12

a) Stale the sensors used for Velocity and Acceleration application and explain any one of them.
b) Slate and explain the sensors used for occupancy and motion detector application.
c) Define the temperature and explain the thermal properties of material.

Seat No.	

Set **Q**

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Draw neat diagrams whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which of the following is a key characteristic of a sensor?
a) It can only measure temperature
b) It is an active component
c) It converts physical parameters into an electrical signal
d) Il requires no external power

2) Which of the following is a type of magnetic sensor?
a) Thermistor b) Strain gauge
c) Hall effect sensor d) LVDT

3) Typical conversion speed of ADC is _____
a) Less than 1 μs b) Less than 100 μs
c) Less than 500 μs d) Greater than 1000 μs

4) What is signal conditioning?
a) To analyze any signal
b) Conversion or modification is referred to as conditioning
c) Conversion from analog to digital is signal conditioning
d) Conversion from digital to analog is signal conditioning

5) Touch screen devices use which sensor?
a) Touch sensor b) Temperature sensor
c) Humidity sensor d) Pressure sensor

6) ENOB in ADC stand for _____
a) Effective number of bytes b) Effective number of bits
c) Effective nibble baud d) None of the mentioned

7) A simple bridge circuit consists of a network of _____
a) 3 resistance arms b) 2 resistance arms
c) 4 resistance arms d) 6 resistance arms

8) An instrument transformer is used to extend the range of _____.
a) induction instrument b) electrostatic instrument
c) moving coil instrument d) any of the above

9) The internal resistance of an ammeter should be _____.
a) Very small b) Medium
c) High d) Infinity

10) The smallest change which a sensor can detect is termed: _____
a) Accuracy b) Precision
c) Resolution d) Scale

11) Sensor effectiveness depends on _____ parameter.
a) Sensitivity b) Radiation
c) Restively d) All the above

12) The desirable static characteristics of a measuring system are _____
a) accuracy and drift
b) accuracy, sensitivity and reproducibility
c) drift and dead zone
d) static error

13) A _____ device prevents the oscillation of the moving system and enables the latter to reach its final position quickly.
a) Deflecting b) Controlling
c) Damping d) any of the above

14) _____ is an instrument which measures the insulation resistance of an electric circuit relative to earth and one another.
a) Tangent galvanometer
b) Megger
c) Current transformer
d) None of the above

SLR-BD-161

Seat No.	

Set Q

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt any four of the following: 16

a) Define standard & explain types of standards.
b) Define the following characteristics
1) Linearity 2) Accuracy 3) Repeatability 4) Sensitivity
c) Derive the expression for unknown capacitance with phasor diagram by using Schering Bridge.
d) Write difference between Current Transformer and Potential Transformer.
e) Explain working of digital storage oscilloscope with suitable block diagram.

Q.3 Attempt any two of the following: 12

a) Illustrate and derive the torque equation for a Moving iron instrument with neat diagram.
b) Draw the equivalent circuit and phasor diagram of a CT. Derive the expressions for ratio and phase angle errors.
c) Explain digital ramp type and dual slope integrating type digital voltmeter.

Section – II

Q.4 Attempt any four of the following: 16

a) Explain the principle of working of Hall effect sensor.
b) Explain different types of temperature sensor with details.
c) Discuss Classification of sensor and explain active and passive sensor.
d) State and explain the methods of data transmission.
e) State and Explain the Modes of Heat transfer.

Q.5 Attempt any two of the following: 12

a) Stale the sensors used for Velocity and Acceleration application and explain any one of them.
b) Slate and explain the sensors used for occupancy and motion detector application.
c) Define the temperature and explain the thermal properties of material.

SLR-BD-161

Seat No.	

Set R

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Draw neat diagrams whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) What is signal conditioning?
a) To analyze any signal
b) Conversion or modification is referred to as conditioning
c) Conversion from analog to digital is signal conditioning
d) Conversion from digital to analog is signal conditioning

2) Touch screen devices use which sensor?
a) Touch sensor b) Temperature sensor
c) Humidity sensor d) Pressure sensor

3) ENOB in ADC stand for _____
a) Effective number of bytes b) Effective number of bits
c) Effective nibble baud d) None of the mentioned

4) A simple bridge circuit consists of a network of _____
a) 3 resistance arms b) 2 resistance arms
c) 4 resistance arms d) 6 resistance arms

5) An instrument transformer is used to extend the range of _____.
a) induction instrument b) electrostatic instrument
c) moving coil instrument d) any of the above

6) The internal resistance of an ammeter should be _____.
a) Very small b) Medium
c) High d) Infinity

7) The smallest change which a sensor can detect is termed: _____
a) Accuracy b) Precision
c) Resolution d) Scale

8) Sensor effectiveness depends on _____ parameter.
a) Sensitivity b) Radiation
c) Restively d) All the above

9) The desirable static characteristics of a measuring system are _____
a) accuracy and drift
b) accuracy, sensitivity and reproducibility
c) drift and dead zone
d) static error

10) A _____ device prevents the oscillation of the moving system and enables the latter to reach its final position quickly.
a) Deflecting b) Controlling
c) Damping d) any of the above

11) _____ is an instrument which measures the insulation resistance of an electric circuit relative to earth and one another.
a) Tangent galvanometer
b) Megger
c) Current transformer
d) None of the above

12) Which of the following is a key characteristic of a sensor?
a) It can only measure temperature
b) It is an active component
c) It converts physical parameters into an electrical signal
d) Il requires no external power

13) Which of the following is a type of magnetic sensor?
a) Thermistor b) Strain gauge
c) Hall effect sensor d) LVDT

14) Typical conversion speed of ADC is _____
a) Less than 1 μs b) Less than 100 μs
c) Less than 500 μs d) Greater than 1000 μs

Seat No.	

Set **R**

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt any four of the following: **16**

a) Define standard & explain types of standards.
b) Define the following characteristics
1) Linearity 2) Accuracy 3) Repeatability 4) Sensitivity
c) Derive the expression for unknown capacitance with phasor diagram by using Schering Bridge.
d) Write difference between Current Transformer and Potential Transformer.
e) Explain working of digital storage oscilloscope with suitable block diagram.

Q.3 Attempt any two of the following: **12**

a) Illustrate and derive the torque equation for a Moving iron instrument with neat diagram.
b) Draw the equivalent circuit and phasor diagram of a CT. Derive the expressions for ratio and phase angle errors.
c) Explain digital ramp type and dual slope integrating type digital voltmeter.

Section – II

Q.4 Attempt any four of the following: **16**

a) Explain the principle of working of Hall effect sensor.
b) Explain different types of temperature sensor with details.
c) Discuss Classification of sensor and explain active and passive sensor.
d) State and explain the methods of data transmission.
e) State and Explain the Modes of Heat transfer.

Q.5 Attempt any two of the following: **12**

a) Stale the sensors used for Velocity and Acceleration application and explain any one of them.
b) Slate and explain the sensors used for occupancy and motion detector application.
c) Define the temperature and explain the thermal properties of material.

SLR-BD-161

Seat No.	

Set S

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Draw neat diagrams whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) A _____ device prevents the oscillation of the moving system and enables the latter to reach its final position quickly.
a) Deflecting b) Controlling
c) Damping d) any of the above

2) _____ is an instrument which measures the insulation resistance of an electric circuit relative to earth and one another.
a) Tangent galvanometer
b) Megger
c) Current transformer
d) None of the above

3) Which of the following is a key characteristic of a sensor?
a) It can only measure temperature
b) It is an active component
c) It converts physical parameters into an electrical signal
d) Il requires no external power

4) Which of the following is a type of magnetic sensor?
a) Thermistor b) Strain gauge
c) Hall effect sensor d) LVDT

5) Typical conversion speed of ADC is _____
a) Less than 1 μs b) Less than 100 μs
c) Less than 500 μs d) Greater than 1000 μs

6) What is signal conditioning?
a) To analyze any signal
b) Conversion or modification is referred to as conditioning
c) Conversion from analog to digital is signal conditioning
d) Conversion from digital to analog is signal conditioning

7) Touch screen devices use which sensor?
a) Touch sensor b) Temperature sensor
c) Humidity sensor d) Pressure sensor

8) ENOB in ADC stand for _____
a) Effective number of bytes b) Effective number of bits
c) Effective nibble baud d) None of the mentioned

9) A simple bridge circuit consists of a network of _____
a) 3 resistance arms b) 2 resistance arms
c) 4 resistance arms d) 6 resistance arms

10) An instrument transformer is used to extend the range of _____.
a) induction instrument b) electrostatic instrument
c) moving coil instrument d) any of the above

11) The internal resistance of an ammeter should be _____.
a) Very small b) Medium
c) High d) Infinity

12) The smallest change which a sensor can detect is termed: _____
a) Accuracy b) Precision
c) Resolution d) Scale

13) Sensor effectiveness depends on _____ parameter.
a) Sensitivity b) Radiation
c) Restively d) All the above

14) The desirable static characteristics of a measuring system are _____
a) accuracy and drift
b) accuracy, sensitivity and reproducibility
c) drift and dead zone
d) static error

SLR-BD-161

Seat No.		Set	S

S. Y. (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt any four of the following: 16

a) Define standard & explain types of standards.
b) Define the following characteristics
1) Linearity 2) Accuracy 3) Repeatability 4) Sensitivity
c) Derive the expression for unknown capacitance with phasor diagram by using Schering Bridge.
d) Write difference between Current Transformer and Potential Transformer.
e) Explain working of digital storage oscilloscope with suitable block diagram.

Q.3 Attempt any two of the following: 12

a) Illustrate and derive the torque equation for a Moving iron instrument with neat diagram.
b) Draw the equivalent circuit and phasor diagram of a CT. Derive the expressions for ratio and phase angle errors.
c) Explain digital ramp type and dual slope integrating type digital voltmeter.

Section – II

Q.4 Attempt any four of the following: 16

a) Explain the principle of working of Hall effect sensor.
b) Explain different types of temperature sensor with details.
c) Discuss Classification of sensor and explain active and passive sensor.
d) State and explain the methods of data transmission.
e) State and Explain the Modes of Heat transfer.

Q.5 Attempt any two of the following: 12

a) Stale the sensors used for Velocity and Acceleration application and explain any one of them.
b) Slate and explain the sensors used for occupancy and motion detector application.
c) Define the temperature and explain the thermal properties of material.

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Linear programming deals with the optimization of a function of variables is, known as _____
a) Subjective function b) Objective function
c) Combined Equation d) None of these

2) What is the condition of Balance Assignment Problem?
a) Σ Demand$=\Sigma$ Supply
b) No. of rows $>$ No. of column
c) No. of rows $<$ No. of column
d) No. of rows $=$ No. of columns

3) EOQ means: _____
a) Economic Offering Quantity b) Empty Order Quantity
c) Economic Order Quantity d) Economic Order Quality

4) In ABC analysis, high monitoring and control are required for: _____
a) A class items b) B class items
c) C class items d) All of these

5) Graphical method, simplex method, and transportation method are concerned with _____.
a) Break-even analysis b) Value analysis
c) Linear programming d) Queueing theory

6) The cost of keeping items in inventory is called _____
a) Set up cost b) Holding cost
c) Shortage cost d) None of these

7) Dual of the Dual is _____
a) Dual b) Primal
c) Zero d) Infinity

8) At the Break-Even Point _____
a) Profit > Loss
b) Profit < Loss
c) Profit = Loss
d) None of these

9) The PERT in project management means Program Evaluation and _____ Technique.
a) Resource
b) Reconciliation
c) Reconsideration
d) Review

10) _____ Stock is the lower limit of stock below which the stock should not be allowed to fall.
a) Maximum
b) Average
c) Safety
d) Standard

11) Optimization Means _____.
a) Maximization
b) Minimization
c) Minimization or Maximization
d) Mean of Minimization & Maximization

12) A feasible solution to LPP _____.
a) Must satisfy all the constraints simultaneously
b) Need not satisfy all the constraints
c) Must be a corner point of feasible region
d) Must optimize the objective function

13) In a project network, the critical path _____.
a) May be the shortest path
b) Is the longest path
c) May be the longest path
d) Is the shortest path

14) The inventory carrying costs are also called as _____.
a) Procurement costs
b) Set-up costs
c) Storage costs
d) None of the above

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt Any Three. **24**

a) Using Graphical method, Solve

Maximize $Z = 10X_1 + 8X_2$
Subject to, $2X_1 + X_2 \leq 40;$
$2X_1 + 3X_2 \leq 80;$
$0 \leq X_1; 0 \leq X_2$

b) Solve the following assignment model for minimum processing time.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Find the initial basic feasible solution by Least Cost Method.

	W1	W2	W3	W4	Supply
F1	48	60	56	58	140
F2	45	55	53	60	260
F3	50	65	60	62	360
F4	52	64	55	61	220
Demand	200	320	250	210	

d) What are the different Limitations & Applications of 'Operation Research'?

e) How do you solve unbalanced transportation problem? What are different methods to solve Transportation Model? Explain in details.

Q.3 Answer any one. **04**

a) What is LPP? What are different components of LPP?

b) How assignment model is useful in practical life?

Section – II

Q.4 Attempt Any Three. **24**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/- Find economic order quantity and number of orders to be placed per month?

b) Write a note various types inventory cost.

c) Draw network, find out CP & PD. Calculate All floats of each non-critical Activity.

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Immediate Predecessor	-	-	-	B	A	A	B	C,D	C,D	E	F,G,H	F,G,H	I	J,K
Time in Months	2	6	4	3	6	8	3	7	2	5	4	3	13	7

d) A small project consists of seven activities. The time estimates in weeks of different activities are given below. Find out probability of completing the project in 18 weeks.

Activity	Estimated Time		
	to	tm	tp
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

Probability Factor	Probability
0	50%
1	84.13%
2	97.72%
3	99.87%

e) Explain Sequencing Problem Technique. What are its Different Elements, also elaborate its assumptions.

Q.3 Attempt Any One. **04**

a) What is EOQ? What is its important?

b) Distinguish between CPM & PERT (At least 4 points)

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) At the Break-Even Point _____
a) Profit > Loss b) Profit < Loss
c) Profit = Loss d) None of these

2) The PERT in project management means Program Evaluation and _____ Technique.
a) Resource b) Reconciliation
c) Reconsideration d) Review

3) _____ Stock is the lower limit of stock below which the stock should not be allowed to fall.
a) Maximum b) Average
c) Safety d) Standard

4) Optimization Means _____.
a) Maximization
b) Minimization
c) Minimization or Maximization
d) Mean of Minimization & Maximization

5) A feasible solution to LPP _____.
a) Must satisfy all the constraints simultaneously
b) Need not satisfy all the constraints
c) Must be a corner point of feasible region
d) Must optimize the objective function

6) In a project network, the critical path _____.
a) May be the shortest path b) Is the longest path
c) May be the longest path d) Is the shortest path

7) The inventory carrying costs are also called as _____.
a) Procurement costs b) Set-up costs
c) Storage costs d) None of the above

8) Linear programming deals with the optimization of a function of variables is, known as _____
a) Subjective function b) Objective function
c) Combined Equation d) None of these

9) What is the condition of Balance Assignment Problem?
a) Σ Demand= Σ Supply
b) No. of rows > No. of column
c) No. of rows < No. of column
d) No. of rows = No. of columns

10) EOQ means: _____
a) Economic Offering Quantity b) Empty Order Quantity
c) Economic Order Quantity d) Economic Order Quality

11) In ABC analysis, high monitoring and control are required for: _____
a) A class items b) B class items
c) C class items d) All of these

12) Graphical method, simplex method, and transportation method are concerned with _____.
a) Break-even analysis b) Value analysis
c) Linear programming d) Queueing theory

13) The cost of keeping items in inventory is called _____
a) Set up cost b) Holding cost
c) Shortage cost d) None of these

14) Dual of the Dual is _____
a) Dual b) Primal
c) Zero d) Infinity

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt Any Three. **24**

a) Using Graphical method, Solve

Maximize $Z = 10X_1 + 8X_2$
Subject to, $2X_1 + X_2 \leq 40;$
$2X_1 + 3X_2 \leq 80;$
$0 \leq X_1; 0 \leq X_2$

b) Solve the following assignment model for minimum processing time.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Find the initial basic feasible solution by Least Cost Method.

	W1	W2	W3	W4	Supply
F1	48	60	56	58	140
F2	45	55	53	60	260
F3	50	65	60	62	360
F4	52	64	55	61	220
Demand	200	320	250	210	

d) What are the different Limitations & Applications of 'Operation Research'?
e) How do you solve unbalanced transportation problem? What are different methods to solve Transportation Model? Explain in details.

Q.3 Answer any one. **04**

a) What is LPP? What are different components of LPP?
b) How assignment model is useful in practical life?

Section – II

Q.4 Attempt Any Three. **24**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/- Find economic order quantity and number of orders to be placed per month?

b) Write a note various types inventory cost.

c) Draw network, find out CP & PD. Calculate All floats of each non-critical Activity.

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Immediate Predecessor	-	-	-	B	A	A	B	C,D	C,D	E	F,G,H	F,G,H	I	J,K
Time in Months	2	6	4	3	6	8	3	7	2	5	4	3	13	7

d) A small project consists of seven activities. The time estimates in weeks of different activities are given below. Find out probability of completing the project in 18 weeks.

Activity	Estimated Time		
	to	tm	tp
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

Probability Factor	Probability
0	50%
1	84.13%
2	97.72%
3	99.87%

e) Explain Sequencing Problem Technique. What are its Different Elements, also elaborate its assumptions.

Q.3 Attempt Any One. **04**

a) What is EOQ? What is its important?

b) Distinguish between CPM & PERT (At least 4 points)

Seat No.	

Set R

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Optimization Means _____.
a) Maximization
b) Minimization
c) Minimization or Maximization
d) Mean of Minimization & Maximization

2) A feasible solution to LPP _____.
a) Must satisfy all the constraints simultaneously
b) Need not satisfy all the constraints
c) Must be a corner point of feasible region
d) Must optimize the objective function

3) In a project network, the critical path _____.
a) May be the shortest path b) Is the longest path
c) May be the longest path d) Is the shortest path

4) The inventory carrying costs are also called as _____.
a) Procurement costs b) Set-up costs
c) Storage costs d) None of the above

5) Linear programming deals with the optimization of a function of variables is, known as _____
a) Subjective function b) Objective function
c) Combined Equation d) None of these

6) What is the condition of Balance Assignment Problem?
a) Σ Demand= Σ Supply
b) No. of rows > No. of column
c) No. of rows < No. of column
d) No. of rows = No. of columns

7) EOQ means: _____

a) Economic Offering Quantity b) Empty Order Quantity
c) Economic Order Quantity d) Economic Order Quality

8) In ABC analysis, high monitoring and control are required for: _____

a) A class items b) B class items
c) C class items d) All of these

9) Graphical method, simplex method, and transportation method are concerned with _____.

a) Break-even analysis b) Value analysis
c) Linear programming d) Queueing theory

10) The cost of keeping items in inventory is called _____

a) Set up cost b) Holding cost
c) Shortage cost d) None of these

11) Dual of the Dual is _____

a) Dual b) Primal
c) Zero d) Infinity

12) At the Break-Even Point _____

a) Profit > Loss b) Profit < Loss
c) Profit = Loss d) None of these

13) The PERT in project management means Program Evaluation and _____ Technique.

a) Resource b) Reconciliation
c) Reconsideration d) Review

14) _____ Stock is the lower limit of stock below which the stock should not be allowed to fall.

a) Maximum b) Average
c) Safety d) Standard

Seat No.	

Set R

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt Any Three. **24**

a) Using Graphical method, Solve

Maximize $Z = 10X_1 + 8X_2$
Subject to, $2X_1 + X_2 \leq 40;$
$2X_1 + 3X_2 \leq 80;$
$0 \leq X_1; 0 \leq X_2$

b) Solve the following assignment model for minimum processing time.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Find the initial basic feasible solution by Least Cost Method.

	W1	W2	W3	W4	Supply
F1	48	60	56	58	140
F2	45	55	53	60	260
F3	50	65	60	62	360
F4	52	64	55	61	220
Demand	200	320	250	210	

d) What are the different Limitations & Applications of 'Operation Research'?

e) How do you solve unbalanced transportation problem? What are different methods to solve Transportation Model? Explain in details.

Q.3 Answer any one. **04**

a) What is LPP? What are different components of LPP?

b) How assignment model is useful in practical life?

Section – II

Q.4 Attempt Any Three. **24**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/- Find economic order quantity and number of orders to be placed per month?

b) Write a note various types inventory cost.

c) Draw network, find out CP & PD. Calculate All floats of each non-critical Activity.

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Immediate Predecessor	-	-	-	B	A	A	B	C,D	C,D	E	F,G,H	F,G,H	I	J,K
Time in Months	2	6	4	3	6	8	3	7	2	5	4	3	13	7

d) A small project consists of seven activities. The time estimates in weeks of different activities are given below. Find out probability of completing the project in 18 weeks.

Activity	Estimated Time		
	to	tm	tp
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

Probability Factor	Probability
0	50%
1	84.13%
2	97.72%
3	99.87%

e) Explain Sequencing Problem Technique. What are its Different Elements, also elaborate its assumptions.

Q.3 Attempt Any One. **04**

a) What is EOQ? What is its important?

b) Distinguish between CPM & PERT (At least 4 points)

Seat No.	

Set **S**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) The cost of keeping items in inventory is called _____
a) Set up cost b) Holding cost
c) Shortage cost d) None of these

2) Dual of the Dual is _____
a) Dual b) Primal
c) Zero d) Infinity

3) At the Break-Even Point _____
a) Profit > Loss b) Profit < Loss
c) Profit = Loss d) None of these

4) The PERT in project management means Program Evaluation and _____ Technique.
a) Resource b) Reconciliation
c) Reconsideration d) Review

5) _____ Stock is the lower limit of stock below which the stock should not be allowed to fall.
a) Maximum b) Average
c) Safety d) Standard

6) Optimization Means _____.
a) Maximization
b) Minimization
c) Minimization or Maximization
d) Mean of Minimization & Maximization

7) A feasible solution to LPP _____.
a) Must satisfy all the constraints simultaneously
b) Need not satisfy all the constraints
c) Must be a corner point of feasible region
d) Must optimize the objective function

8) In a project network, the critical path _____.
a) May be the shortest path b) Is the longest path
c) May be the longest path d) Is the shortest path

9) The inventory carrying costs are also called as _____.
a) Procurement costs b) Set-up costs
c) Storage costs d) None of the above

10) Linear programming deals with the optimization of a function of variables is, known as _____
a) Subjective function b) Objective function
c) Combined Equation d) None of these

11) What is the condition of Balance Assignment Problem?
a) Σ Demand$=\Sigma$ Supply
b) No. of rows $>$ No. of column
c) No. of rows $<$ No. of column
d) No. of rows $=$ No. of columns

12) EOQ means: _____
a) Economic Offering Quantity b) Empty Order Quantity
c) Economic Order Quantity d) Economic Order Quality

13) In ABC analysis, high monitoring and control are required for: _____
a) A class items b) B class items
c) C class items d) All of these

14) Graphical method, simplex method, and transportation method are concerned with _____.
a) Break-even analysis b) Value analysis
c) Linear programming d) Queueing theory

Seat No.	

Set **S**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt Any Three. **24**

a) Using Graphical method, Solve

Maximize $Z = 10X_1 + 8X_2$
Subject to, $2X_1 + X_2 \leq 40;$
$2X_1 + 3X_2 \leq 80;$
$0 \leq X_1; 0 \leq X_2$

b) Solve the following assignment model for minimum processing time.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Find the initial basic feasible solution by Least Cost Method.

	W1	W2	W3	W4	Supply
F1	48	60	56	58	140
F2	45	55	53	60	260
F3	50	65	60	62	360
F4	52	64	55	61	220
Demand	200	320	250	210	

d) What are the different Limitations & Applications of 'Operation Research'?
e) How do you solve unbalanced transportation problem? What are different methods to solve Transportation Model? Explain in details.

Q.3 Answer any one. **04**

a) What is LPP? What are different components of LPP?
b) How assignment model is useful in practical life?

Section – II

Q.4 Attempt Any Three. **24**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/- Find economic order quantity and number of orders to be placed per month?

b) Write a note various types inventory cost.

c) Draw network, find out CP & PD. Calculate All floats of each non-critical Activity.

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Immediate Predecessor	-	-	-	B	A	A	B	C,D	C,D	E	F,G,H	F,G,H	I	J,K
Time in Months	2	6	4	3	6	8	3	7	2	5	4	3	13	7

d) A small project consists of seven activities. The time estimates in weeks of different activities are given below. Find out probability of completing the project in 18 weeks.

Activity	Estimated Time		
	to	tm	tp
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

Probability Factor	Probability
0	50%
1	84.13%
2	97.72%
3	99.87%

e) Explain Sequencing Problem Technique. What are its Different Elements, also elaborate its assumptions.

Q.3 Attempt Any One. **04**

a) What is EOQ? What is its important?

b) Distinguish between CPM & PERT (At least 4 points)

SLR-BD-163

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) A transcendental equation is an equation that involves _____.
a) Only algebraic terms
b) Only transcendental functions
c) Both algebraic and transcendental functions
d) Linear terms only

2) The interval in which a real root of the equation $x^3 - 2x - 5 = 0$ lies is _____.
a) $(1,2)$ b) $(0,1)$
c) $(2,3)$ d) $(3,4)$

3) The Gauss-Seidel method is used for solving _____.
a) Nonlinear equations
b) Systems of linear equations
c) Ordinary differential equations
d) Partial differential equations

4) Which of the following is a disadvantage of the Gauss-Jacobi method?
a) It converges faster than most direct methods
b) It requires a large number of iterations for a good approximation
c) It cannot be used for systems with more than two equations
d) It works only for symmetric systems

5) The use of Romberg's method is _____.
a) To solve simultaneous linear equation
b) To find root of linear equation
c) To evaluate definite integration
d) To find the Eigen values

6) The order of convergence of Newton-Raphson method is _____.

a) 1 b) 2

c) $\sqrt{2}$ d) 1.6

7) Power Method is used to find _____.

a) Negative Eigen Value b) Largest Eigen value

c) Positive Eigen Value d) None of these

8) To find the Numerically largest Eigen value using iterative Method we use the equation _____.

a) $A = \lambda X$ b) $AX = X$

c) $X = \lambda X$ d) $AX = \lambda X$

9) If $\frac{dy}{dx} = x - y$ and $y(0) = 1$ then by Picard's method the value of $y_1(1)$ is _____.

a) 0.905 b) 1.905

c) 2.905 d) none

10) Runge-Kutta method is self-starting method _____.

a) true d) false

c) we can't say d) none

11) If the data is equally spaced and interpolation is near the beginning of the data then _____ Interpolation formula is used.

a) Newton's backward difference

b) Newton's divided difference

c) Newton's forward difference

d) Lagrange's

12) The process of finding the value inside the interval (x_0, x_n) is called ___.

a) Interpolation b) Extrapolation

c) Iterative d) polynomial equation

13) Using Newton-Raphson method the first approximation to the root of the equation $x^4 - x - 10 = 0$ near to $x_0 = 2$ is _____.

a) 1.671 b) 2.271

c) 2.071 d) 1.871

14) To apply Simpson's one-third rule the number of sub-intervals must be _____.

a) Even b) Odd

c) Multiple of 3 d) Multiple of 6

SLR-BD-163

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any three. **09**

a) Find the double root of the equation $x^3 - 5.4x^2 + 9.24x - 5.096 = 0$ given that it is nearer to 1.5.

b) Solve the system of equations by Jacobi's iterative method (perform 3 iterations) $27x + 6y - z = 85,\ 6x + 15y + 2z = 72,\ x + y + 54z = 110$

c) Find positive real root of the equation $x \sin x + \cos x = 0$ using Newton Raphson method correct to 3 decimal places.

d) Solve the system of equation by using Gauss-Elimination method. $x + 4y - z = -5, x + y - 6z = -12, -3x - y - z = 4$

e) Solve $\frac{dy}{dx} = -xy$ with $x_0 = 0\ ,\ y_0 = 1$ using Picard's method upto 3rd approximation.

Q.3 Answer any three. **09**

a) Solve $\frac{dy}{dx} = x + y$ with $x_0 = 0\ , y_0 = 1$ using Range kutta forth order method and find approximate value of y when $x = 0.2$

b) Solve $\frac{dy}{dx} = 1 + xy$ with $y(0) = 1$ using Picard's method take first approximation and find y for $x = 0.1$

c) Solve by Gauss Seidel Method, the equations $20x + y - 2z = 17, 3x + 20y - z = -18, 2x - 3y + 20z = 25$ Perform 3 iteration.

d) Find the value of $\sqrt{5}$ using newton's iterative formula. Perform 3 iteration.

e) Find the positive root of $f(x) = 2x^3 - 3x - 6$ by Newton's Raphson method perform 3 iteration.

Q.4 Answer any two. **10**

a) Perform 2-iteration by Newton's Raphson Method to Solve the non-linear equation $x = x^2 + y^2,\ y = x^2 - y^2$ Take initial approximation $x_0 = 0.8, y_0 = 0.4$

b) Solve the system of equation by LU decomposition Method $3x + 2y + 7z = 4,\quad 2x + 3y + z = 5,\quad 3x + 4y + z = 7$

c) Solve differential equation $\frac{dy}{dx} = 1 + xz,\ \frac{dz}{dx} = -xy$ for $x = 0.3$ using 4th order Runge-Kutta Method Initial Values are $x = 0,\ y = 0,\ z = 1$

Section – II

Q.5 Answer any Three. **09**

a) Evaluate the integral $\int_0^1 \frac{x^2}{1+x^3}\,dx$ using Simpson's $\frac{1}{3}$rd rule, Take $h = 0.25$

b) Determine the largest Eigen value and corresponding Eigen vector of the matrix $\begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$ by using power method perform three iteration.

c) Use Trapezoidal Rule to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as 0.5

d) Using Newton's divided difference formula, find the value of $f(2)$. Given the following table.

x	4	5	7	10	11	13
$f(x)$	48	100	294	900	1210	2028

e) Construct Newton's Forward interpolation polynomial for the following data:

x	4	6	8	10
y	1	3	8	16

Hence find the value of y for $x = 5$

Q.6 Answer any Three. **09**

a) Solve the integral $\int_0^{1/2} \frac{1}{\sqrt{1-x^2}}\,dx$ using Weddle's rule Taking $n = 6$

b) Solve $\int_3^5 \frac{4}{(2x^2)}\,dx$ Using Gauss Formula for $n = 2$ and $n = 3$.

c) Find all Eigen values and Eigen vectors of the following matrix by using Gauss Jacobi's Method. $\begin{bmatrix} 2 & 3 \\ 3 & 2 \end{bmatrix}$

d) Solve $\int_0^6 \frac{dx}{1+x^2}$ by using Simpsons 3/8th rule take $h = 1$

e) Using Newton's Backward formula, find the value of $f(2)$ if

x	1	1.4	1.8	2.2
$f(x)$	3.49	4.82	5.96	6.5

Q.7 Answer any two. **10**

a) Find the largest eigen value and the corresponding eigen vector of the matrix:

$\begin{bmatrix} 25 & 1 & 2 \\ 1 & 3 & 0 \\ 2 & 0 & -4 \end{bmatrix}$ by using power method

Take $[1 \quad 0 \quad 0]^r$ as initial eigen vector (perform 5 iterations)

b) Use Romberg's method to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as $0.5, 0.25, 0.125$

c) Given the Values

x	5	7	11	13	17
$f(x)$	150	392	1452	2366	5202

Evaluate $f(9)$,using Lagrange's Formula.

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) To find the Numerically largest Eigen value using iterative Method we use the equation _____.
a) $A = \lambda X$ b) $AX = X$
c) $X = \lambda X$ d) $AX = \lambda X$

2) If $\frac{dy}{dx} = x - y$ and $y(0) = 1$ then by Picard's method the value of $y_1(1)$ is _____.
a) 0.905 b) 1.905
c) 2.905 d) none

3) Runge-Kutta method is self-starting method _____.
a) true d) false
c) we can't say d) none

4) If the data is equally spaced and interpolation is near the beginning of the data then _____ Interpolation formula is used.
a) Newton's backward difference
b) Newton's divided difference
c) Newton's forward difference
d) Lagrange's

5) The process of finding the value inside the interval (x_0, x_n) is called ___.
a) Interpolation b) Extrapolation
c) Iterative d) polynomial equation

6) Using Newton-Raphson method the first approximation to the root of the equation $x^4 - x - 10 = 0$ near to $x_0 = 2$ is _____.
a) 1.671 b) 2.271
c) 2.071 d) 1.871

7) To apply Simpson's one-third rule the number of sub-intervals must be _____.

a) Even b) Odd
c) Multiple of 3 d) Multiple of 6

8) A transcendental equation is an equation that involves _____.

a) Only algebraic terms
b) Only transcendental functions
c) Both algebraic and transcendental functions
d) Linear terms only

9) The interval in which a real root of the equation $x^3 - 2x - 5 = 0$ lies is _____.

a) $(1,2)$ b) $(0,1)$
c) $(2,3)$ d) $(3,4)$

10) The Gauss-Seidel method is used for solving _____.

a) Nonlinear equations
b) Systems of linear equations
c) Ordinary differential equations
d) Partial differential equations

11) Which of the following is a disadvantage of the Gauss-Jacobi method?

a) It converges faster than most direct methods
b) It requires a large number of iterations for a good approximation
c) It cannot be used for systems with more than two equations
d) It works only for symmetric systems

12) The use of Romberg's method is _____.

a) To solve simultaneous linear equation
b) To find root of linear equation
c) To evaluate definite integration
d) To find the Eigen values

13) The order of convergence of Newton-Raphson method is _____.

a) 1 b) 2
c) $\sqrt{2}$ d) 1.6

14) Power Method is used to find _____.

a) Negative Eigen Value b) Largest Eigen value
c) Positive Eigen Value d) None of these

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any three. **09**

a) Find the double root of the equation $x^3 - 5.4x^2 + 9.24x - 5.096 = 0$ given that it is nearer to 1.5.

b) Solve the system of equations by Jacobi's iterative method (perform 3 iterations) $27x + 6y - z = 85,\ 6x + 15y + 2z = 72,\ x + y + 54z = 110$

c) Find positive real root of the equation $x \sin x + \cos x = 0$ using Newton Raphson method correct to 3 decimal places.

d) Solve the system of equation by using Gauss-Elimination method. $x + 4y - z = -5, x + y - 6z = -12, -3x - y - z = 4$

e) Solve $\frac{dy}{dx} = -xy$ with $x_0 = 0\ ,\ y_0 = 1$ using Picard's method upto 3rd approximation.

Q.3 Answer any three. **09**

a) Solve $\frac{dy}{dx} = x + y$ with $x_0 = 0\ , y_0 = 1$ using Range kutta forth order method and find approximate value of y when $x = 0.2$

b) Solve $\frac{dy}{dx} = 1 + xy$ with $y(0) = 1$ using Picard's method take first approximation and find y for $x = 0.1$

c) Solve by Gauss Seidel Method, the equations $20x + y - 2z = 17, 3x + 20y - z = -18, 2x - 3y + 20z = 25$ Perform 3 iteration.

d) Find the value of $\sqrt{5}$ using newton's iterative formula. Perform 3 iteration.

e) Find the positive root of $f(x) = 2x^3 - 3x - 6$ by Newton's Raphson method perform 3 iteration.

Q.4 Answer any two. **10**

a) Perform 2-iteration by Newton's Raphson Method to Solve the non-linear equation $x = x^2 + y^2,\ y = x^2 - y^2$ Take initial approximation $x_0 = 0.8, y_0 = 0.4$

b) Solve the system of equation by LU decomposition Method $3x + 2y + 7z = 4,\quad 2x + 3y + z = 5,\quad 3x + 4y + z = 7$

c) Solve differential equation $\frac{dy}{dx} = 1 + xz,\ \frac{dz}{dx} = -xy$ for $x = 0.3$ using 4th order Runge-Kutta Method Initial Values are $x = 0,\ y = 0,\ z = 1$

Section – II

Q.5 Answer any Three. **09**

a) Evaluate the integral $\int_0^1 \frac{x^2}{1+x^3}\,dx$ using Simpson's $\frac{1}{3}$rd rule, Take $h = 0.25$

b) Determine the largest Eigen value and corresponding Eigen vector of the matrix $\begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$ by using power method perform three iteration.

c) Use Trapezoidal Rule to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as 0.5

d) Using Newton's divided difference formula, find the value of $f(2)$. Given the following table.

x	4	5	7	10	11	13
$f(x)$	48	100	294	900	1210	2028

e) Construct Newton's Forward interpolation polynomial for the following data:

x	4	6	8	10
y	1	3	8	16

Hence find the value of y for $x = 5$

Q.6 Answer any Three. **09**

a) Solve the integral $\int_0^{1/2} \frac{1}{\sqrt{1-x^2}}\,dx$ using Weddle's rule Taking $n = 6$

b) Solve $\int_3^5 \frac{4}{(2x^2)}\,dx$ Using Gauss Formula for $n = 2$ and $n = 3$.

c) Find all Eigen values and Eigen vectors of the following matrix by using Gauss Jacobi's Method. $\begin{bmatrix} 2 & 3 \\ 3 & 2 \end{bmatrix}$

d) Solve $\int_0^6 \frac{dx}{1+x^2}$ by using Simpsons 3/8th rule take $h = 1$

e) Using Newton's Backward formula, find the value of $f(2)$ if

x	1	1.4	1.8	2.2
$f(x)$	3.49	4.82	5.96	6.5

Q.7 Answer any two. **10**

a) Find the largest eigen value and the corresponding eigen vector of the matrix:

$\begin{bmatrix} 25 & 1 & 2 \\ 1 & 3 & 0 \\ 2 & 0 & -4 \end{bmatrix}$ by using power method

Take $[1 \quad 0 \quad 0]^r$ as initial eigen vector (perform 5 iterations)

b) Use Romberg's method to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as $0.5, 0.25, 0.125$

c) Given the Values

x	5	7	11	13	17
$f(x)$	150	392	1452	2366	5202

Evaluate $f(9)$,using Lagrange's Formula.

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) If the data is equally spaced and interpolation is near the beginning of the data then _____ Interpolation formula is used.
a) Newton's backward difference
b) Newton's divided difference
c) Newton's forward difference
d) Lagrange's

2) The process of finding the value inside the interval (x_0, x_n) is called ___.
a) Interpolation b) Extrapolation
c) Iterative d) polynomial equation

3) Using Newton-Raphson method the first approximation to the root of the equation $x^4 - x - 10 = 0$ near to $x_0 = 2$ is _____.
a) 1.671 b) 2.271
c) 2.071 d) 1.871

4) To apply Simpson's one-third rule the number of sub-intervals must be _____.
a) Even b) Odd
c) Multiple of 3 d) Multiple of 6

5) A transcendental equation is an equation that involves _____.
a) Only algebraic terms
b) Only transcendental functions
c) Both algebraic and transcendental functions
d) Linear terms only

6) The interval in which a real root of the equation $x^3 - 2x - 5 = 0$ lies is _____.

a) $(1,2)$ b) $(0,1)$
c) $(2,3)$ d) $(3,4)$

7) The Gauss-Seidel method is used for solving _____.

a) Nonlinear equations
b) Systems of linear equations
c) Ordinary differential equations
d) Partial differential equations

8) Which of the following is a disadvantage of the Gauss-Jacobi method?

a) It converges faster than most direct methods
b) It requires a large number of iterations for a good approximation
c) It cannot be used for systems with more than two equations
d) It works only for symmetric systems

9) The use of Romberg's method is _____.

a) To solve simultaneous linear equation
b) To find root of linear equation
c) To evaluate definite integration
d) To find the Eigen values

10) The order of convergence of Newton-Raphson method is _____.

a) 1 b) 2
c) $\sqrt{2}$ d) 1.6

11) Power Method is used to find _____.

a) Negative Eigen Value b) Largest Eigen value
c) Positive Eigen Value d) None of these

12) To find the Numerically largest Eigen value using iterative Method we use the equation _____.

a) $A = \lambda X$ b) $AX = X$
c) $X = \lambda X$ d) $AX = \lambda X$

13) If $\frac{dy}{dx} = x - y$ and $y(0) = 1$ then by Picard's method the value of $y_1(1)$ is _____.

a) 0.905 b) 1.905
c) 2.905 d) none

14) Runge-Kutta method is self-starting method _____.

a) true d) false
c) we can't say d) none

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any three. **09**

a) Find the double root of the equation $x^3 - 5.4x^2 + 9.24x - 5.096 = 0$ given that it is nearer to 1.5.

b) Solve the system of equations by Jacobi's iterative method (perform 3 iterations) $27x + 6y - z = 85,\ 6x + 15y + 2z = 72,\ x + y + 54z = 110$

c) Find positive real root of the equation $x \sin x + \cos x = 0$ using Newton Raphson method correct to 3 decimal places.

d) Solve the system of equation by using Gauss-Elimination method. $x + 4y - z = -5, x + y - 6z = -12, -3x - y - z = 4$

e) Solve $\frac{dy}{dx} = -xy$ with $x_0 = 0\ ,\ y_0 = 1$ using Picard's method upto 3rd approximation.

Q.3 Answer any three. **09**

a) Solve $\frac{dy}{dx} = x + y$ with $x_0 = 0\ , y_0 = 1$ using Range kutta forth order method and find approximate value of y when $x = 0.2$

b) Solve $\frac{dy}{dx} = 1 + xy$ with $y(0) = 1$ using Picard's method take first approximation and find y for $x = 0.1$

c) Solve by Gauss Seidel Method, the equations $20x + y - 2z = 17, 3x + 20y - z = -18, 2x - 3y + 20z = 25$ Perform 3 iteration.

d) Find the value of $\sqrt{5}$ using newton's iterative formula. Perform 3 iteration.

e) Find the positive root of $f(x) = 2x^3 - 3x - 6$ by Newton's Raphson method perform 3 iteration.

Q.4 Answer any two. **10**

a) Perform 2-iteration by Newton's Raphson Method to Solve the non-linear equation $x = x^2 + y^2,\ y = x^2 - y^2$ Take initial approximation $x_0 = 0.8, y_0 = 0.4$

b) Solve the system of equation by LU decomposition Method $3x + 2y + 7z = 4,\quad 2x + 3y + z = 5,\quad 3x + 4y + z = 7$

c) Solve differential equation $\frac{dy}{dx} = 1 + xz,\ \frac{dz}{dx} = -xy$ for $x = 0.3$ using 4th order Runge-Kutta Method Initial Values are $x = 0,\ y = 0,\ z = 1$

Section – II

Q.5 Answer any Three. **09**

a) Evaluate the integral $\int_0^1 \frac{x^2}{1+x^3}\,dx$ using Simpson's $\frac{1}{3}$rd rule, Take $h = 0.25$

b) Determine the largest Eigen value and corresponding Eigen vector of the matrix $\begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$ by using power method perform three iteration.

c) Use Trapezoidal Rule to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as 0.5

d) Using Newton's divided difference formula, find the value of $f(2)$. Given the following table.

x	4	5	7	10	11	13
$f(x)$	48	100	294	900	1210	2028

e) Construct Newton's Forward interpolation polynomial for the following data:

x	4	6	8	10
y	1	3	8	16

Hence find the value of y for $x = 5$

Q.6 Answer any Three. **09**

a) Solve the integral $\int_0^{1/2} \frac{1}{\sqrt{1-x^2}}\,dx$ using Weddle's rule Taking $n = 6$

b) Solve $\int_3^5 \frac{4}{(2x^2)}\,dx$ Using Gauss Formula for $n = 2$ and $n = 3$.

c) Find all Eigen values and Eigen vectors of the following matrix by using Gauss Jacobi's Method. $\begin{bmatrix} 2 & 3 \\ 3 & 2 \end{bmatrix}$

d) Solve $\int_0^6 \frac{dx}{1+x^2}$ by using Simpsons 3/8th rule take $h = 1$

e) Using Newton's Backward formula, find the value of $f(2)$ if

x	1	1.4	1.8	2.2
$f(x)$	3.49	4.82	5.96	6.5

Q.7 Answer any two. **10**

a) Find the largest eigen value and the corresponding eigen vector of the matrix:

$\begin{bmatrix} 25 & 1 & 2 \\ 1 & 3 & 0 \\ 2 & 0 & -4 \end{bmatrix}$ by using power method

Take $[1 \quad 0 \quad 0]^r$ as initial eigen vector (perform 5 iterations)

b) Use Romberg's method to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as $0.5, 0.25, 0.125$

c) Given the Values

x	5	7	11	13	17
$f(x)$	150	392	1452	2366	5202

Evaluate $f(9)$,using Lagrange's Formula.

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The order of convergence of Newton-Raphson method is _____.
a) 1 b) 2
c) $\sqrt{2}$ d) 1.6

2) Power Method is used to find _____.
a) Negative Eigen Value b) Largest Eigen value
c) Positive Eigen Value d) None of these

3) To find the Numerically largest Eigen value using iterative Method we use the equation _____.
a) $A = \lambda X$ b) $AX = X$
c) $X = \lambda X$ d) $AX = \lambda X$

4) If $\frac{dy}{dx} = x - y$ and $y(0) = 1$ then by Picard's method the value of $y_1(1)$ is _____.
a) 0.905 b) 1.905
c) 2.905 d) none

5) Runge-Kutta method is self-starting method _____.
a) true d) false
c) we can't say d) none

6) If the data is equally spaced and interpolation is near the beginning of the data then _____ Interpolation formula is used.
a) Newton's backward difference
b) Newton's divided difference
c) Newton's forward difference
d) Lagrange's

7) The process of finding the value inside the interval (x_0, x_n) is called ___.
a) Interpolation b) Extrapolation
c) Iterative d) polynomial equation

8) Using Newton-Raphson method the first approximation to the root of the equation $x^4 - x - 10 = 0$ near to $x_0 = 2$ is _____.
a) 1.671 b) 2.271
c) 2.071 d) 1.871

9) To apply Simpson's one-third rule the number of sub-intervals must be _____.
a) Even b) Odd
c) Multiple of 3 d) Multiple of 6

10) A transcendental equation is an equation that involves _____.
a) Only algebraic terms
b) Only transcendental functions
c) Both algebraic and transcendental functions
d) Linear terms only

11) The interval in which a real root of the equation $x^3 - 2x - 5 = 0$ lies is _____.
a) $(1,2)$ b) $(0,1)$
c) $(2,3)$ d) $(3,4)$

12) The Gauss-Seidel method is used for solving _____.
a) Nonlinear equations
b) Systems of linear equations
c) Ordinary differential equations
d) Partial differential equations

13) Which of the following is a disadvantage of the Gauss-Jacobi method?
a) It converges faster than most direct methods
b) It requires a large number of iterations for a good approximation
c) It cannot be used for systems with more than two equations
d) It works only for symmetric systems

14) The use of Romberg's method is _____.
a) To solve simultaneous linear equation
b) To find root of linear equation
c) To evaluate definite integration
d) To find the Eigen values

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any three. **09**

a) Find the double root of the equation $x^3 - 5.4x^2 + 9.24x - 5.096 = 0$ given that it is nearer to 1.5.

b) Solve the system of equations by Jacobi's iterative method (perform 3 iterations) $27x + 6y - z = 85,\ 6x + 15y + 2z = 72,\ x + y + 54z = 110$

c) Find positive real root of the equation $x \sin x + \cos x = 0$ using Newton Raphson method correct to 3 decimal places.

d) Solve the system of equation by using Gauss-Elimination method. $x + 4y - z = -5, x + y - 6z = -12, -3x - y - z = 4$

e) Solve $\frac{dy}{dx} = -xy$ with $x_0 = 0\ ,\ y_0 = 1$ using Picard's method upto 3rd approximation.

Q.3 Answer any three. **09**

a) Solve $\frac{dy}{dx} = x + y$ with $x_0 = 0\ , y_0 = 1$ using Range kutta forth order method and find approximate value of y when $x = 0.2$

b) Solve $\frac{dy}{dx} = 1 + xy$ with $y(0) = 1$ using Picard's method take first approximation and find y for $x = 0.1$

c) Solve by Gauss Seidel Method, the equations $20x + y - 2z = 17, 3x + 20y - z = -18, 2x - 3y + 20z = 25$ Perform 3 iteration.

d) Find the value of $\sqrt{5}$ using newton's iterative formula. Perform 3 iteration.

e) Find the positive root of $f(x) = 2x^3 - 3x - 6$ by Newton's Raphson method perform 3 iteration.

Q.4 Answer any two. **10**

a) Perform 2-iteration by Newton's Raphson Method to Solve the non-linear equation $x = x^2 + y^2,\ y = x^2 - y^2$ Take initial approximation $x_0 = 0.8, y_0 = 0.4$

b) Solve the system of equation by LU decomposition Method $3x + 2y + 7z = 4,\quad 2x + 3y + z = 5,\quad 3x + 4y + z = 7$

c) Solve differential equation $\frac{dy}{dx} = 1 + xz,\ \frac{dz}{dx} = -xy$ for $x = 0.3$ using 4th order Runge-Kutta Method Initial Values are $x = 0,\ y = 0,\ z = 1$

Section – II

Q.5 Answer any Three. **09**

a) Evaluate the integral $\int_0^1 \frac{x^2}{1+x^3}\,dx$ using Simpson's $\frac{1}{3}$rd rule, Take $h = 0.25$

b) Determine the largest Eigen value and corresponding Eigen vector of the matrix $\begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$ by using power method perform three iteration.

c) Use Trapezoidal Rule to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as 0.5

d) Using Newton's divided difference formula, find the value of $f(2)$. Given the following table.

x	4	5	7	10	11	13
$f(x)$	48	100	294	900	1210	2028

e) Construct Newton's Forward interpolation polynomial for the following data:

x	4	6	8	10
y	1	3	8	16

Hence find the value of y for $x = 5$

Q.6 Answer any Three. **09**

a) Solve the integral $\int_0^{1/2} \frac{1}{\sqrt{1-x^2}}\,dx$ using Weddle's rule Taking $n = 6$

b) Solve $\int_3^5 \frac{4}{(2x^2)}\,dx$ Using Gauss Formula for $n = 2$ and $n = 3$.

c) Find all Eigen values and Eigen vectors of the following matrix by using Gauss Jacobi's Method. $\begin{bmatrix} 2 & 3 \\ 3 & 2 \end{bmatrix}$

d) Solve $\int_0^6 \frac{dx}{1+x^2}$ by using Simpsons 3/8th rule take $h = 1$

e) Using Newton's Backward formula, find the value of $f(2)$ if

x	1	1.4	1.8	2.2
$f(x)$	3.49	4.82	5.96	6.5

Q.7 Answer any two. **10**

a) Find the largest eigen value and the corresponding eigen vector of the matrix:

$\begin{bmatrix} 25 & 1 & 2 \\ 1 & 3 & 0 \\ 2 & 0 & -4 \end{bmatrix}$ by using power method

Take $[1 \quad 0 \quad 0]^r$ as initial eigen vector (perform 5 iterations)

b) Use Romberg's method to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as $0.5, 0.25, 0.125$

c) Given the Values

x	5	7	11	13	17
$f(x)$	150	392	1452	2366	5202

Evaluate $f(9)$,using Lagrange's Formula.

SLR-BD-164

Seat No.	

Set P

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) In communication, _____ is the person who receives and decodes the message.
a) Sender b) Receiver
c) Driver d) Cleaner

2) Which among the following is not a manmade channel of communication?
a) Telephone b) Cell phone
c) Fax d) Air

3) Communication is the part of _____ skills.
a) Rough b) Soft
c) Hard d) Short

4) Which among the following are the barriers to communication?
a) Physical b) Mechanical
c) Psychological d) All of above

5) To overcome language barrier, which of the ways should not be followed?
a) Easy and understandable words should be used.
b) Jokes should be told to the audience.
c) The language of audience should be used.
d) Non-verbal ways should be used to the extent possible.

6) Which of the following is not among 7Cs?
a) Conciseness b) Completeness
c) Clarity d) Charity

7) Posters fall under _____ communication.
a) oral b) visual
c) written d) spoken

8) On the _____ it is possible to get immediate feedback.
a) letter b) e-mail
c) fax d) telephone

9) The response to a sender's message is called as _____.
a) Reply b) Feedback
c) Answer d) None of the above

10) _____ is the soul of communication.
a) Sender b) Receiver
c) Message d) Feedback

11) Which of these is not an element of non-verbal communication?
a) Personal appearance b) Posture
c) Eye contact d) Name of the speaker

12) Telephonic conversation is a form of: _____
a) verbal communication b) non-verbal communication
c) visual communication d) Written

13) To give a good presentation, full rehearsal is: _____
a) Optional b) Necessary
c) Useless d) Audience based

14) Which of the following is not an advantage of oral presentation?
a) Flexibility b) Scope for body language
c) Expensive d) Time-saving

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Three. **12**

a) Explain how communication is necessary for business.
b) What is feedback? Explain its necessity in communication.
c) Write short note on: Different channels of communication.
d) Explain language barriers to communication with the ways to overcome them.
e) Explain language as a tool of communication.

Q.3 Attempt Any Four. **16**

a) Explain seven C's of effective communication.
b) Explain various types of barriers to communication and the ways to overcome them.
c) What is oral communication? Explain its advantages.
d) Explain various steps in the process of communication.
e) What is written communication? Explain its benefits.

Section – II

Q.4 Attempt Any Three. **12**

a) Explain the difference between formal and informal communication.
b) Explain vertical communication with its types.
c) Explain farewell speech by the departing person, with an example
d) Explain the speech for vote of thanks, with an example.
e) Write short note on: Non- verbal aspects of presentation.

Q.5 Attempt Any Four. **16**

a) Explain the structure of a business letter with its various components.
b) Explain the steps in the process of presentation.
c) You had purchased some furniture items from a vendor. Afterwards you found that the furniture items are in a damaged condition. Write a letter of complaint and ask for replacement.
d) Explain four P's of effective presentations.
e) You are in need of some computer hardware parts. Prepare a letter placing order to the supplier. Specify the terms and conditions of purchase.

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) On the _____ it is possible to get immediate feedback.
a) letter b) e-mail
c) fax d) telephone

2) The response to a sender's message is called as _____.
a) Reply b) Feedback
c) Answer d) None of the above

3) _____ is the soul of communication.
a) Sender b) Receiver
c) Message d) Feedback

4) Which of these is not an element of non-verbal communication?
a) Personal appearance b) Posture
c) Eye contact d) Name of the speaker

5) Telephonic conversation is a form of: _____
a) verbal communication b) non-verbal communication
c) visual communication d) Written

6) To give a good presentation, full rehearsal is: _____
a) Optional b) Necessary
c) Useless d) Audience based

7) Which of the following is not an advantage of oral presentation?
a) Flexibility b) Scope for body language
c) Expensive d) Time-saving

8) In communication, _____ is the person who receives and decodes the message.
a) Sender b) Receiver
c) Driver d) Cleaner

9) Which among the following is not a manmade channel of communication?
a) Telephone b) Cell phone
c) Fax d) Air

10) Communication is the part of _____ skills.
a) Rough b) Soft
c) Hard d) Short

11) Which among the following are the barriers to communication?
a) Physical b) Mechanical
c) Psychological d) All of above

12) To overcome language barrier, which of the ways should not be followed?
a) Easy and understandable words should be used.
b) Jokes should be told to the audience.
c) The language of audience should be used.
d) Non-verbal ways should be used to the extent possible.

13) Which of the following is not among 7Cs?
a) Conciseness b) Completeness
c) Clarity d) Charity

14) Posters fall under _____ communication.
a) oral b) visual
c) written d) spoken

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Three. **12**

a) Explain how communication is necessary for business.
b) What is feedback? Explain its necessity in communication.
c) Write short note on: Different channels of communication.
d) Explain language barriers to communication with the ways to overcome them.
e) Explain language as a tool of communication.

Q.3 Attempt Any Four. **16**

a) Explain seven C's of effective communication.
b) Explain various types of barriers to communication and the ways to overcome them.
c) What is oral communication? Explain its advantages.
d) Explain various steps in the process of communication.
e) What is written communication? Explain its benefits.

Section – II

Q.4 Attempt Any Three. **12**

a) Explain the difference between formal and informal communication.
b) Explain vertical communication with its types.
c) Explain farewell speech by the departing person, with an example
d) Explain the speech for vote of thanks, with an example.
e) Write short note on: Non- verbal aspects of presentation.

Q.5 Attempt Any Four. **16**

a) Explain the structure of a business letter with its various components.
b) Explain the steps in the process of presentation.
c) You had purchased some furniture items from a vendor. Afterwards you found that the furniture items are in a damaged condition. Write a letter of complaint and ask for replacement.
d) Explain four P's of effective presentations.
e) You are in need of some computer hardware parts. Prepare a letter placing order to the supplier. Specify the terms and conditions of purchase.

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Which of these is not an element of non-verbal communication?
a) Personal appearance b) Posture
c) Eye contact d) Name of the speaker

2) Telephonic conversation is a form of: _____
a) verbal communication b) non-verbal communication
c) visual communication d) Written

3) To give a good presentation, full rehearsal is: _____
a) Optional b) Necessary
c) Useless d) Audience based

4) Which of the following is not an advantage of oral presentation?
a) Flexibility b) Scope for body language
c) Expensive d) Time-saving

5) In communication, _____ is the person who receives and decodes the message.
a) Sender b) Receiver
c) Driver d) Cleaner

6) Which among the following is not a manmade channel of communication?
a) Telephone b) Cell phone
c) Fax d) Air

7) Communication is the part of _____ skills.
a) Rough b) Soft
c) Hard d) Short

8) Which among the following are the barriers to communication?
a) Physical b) Mechanical
c) Psychological d) All of above

9) To overcome language barrier, which of the ways should not be followed?
a) Easy and understandable words should be used.
b) Jokes should be told to the audience.
c) The language of audience should be used.
d) Non-verbal ways should be used to the extent possible.

10) Which of the following is not among 7Cs?
a) Conciseness b) Completeness
c) Clarity d) Charity

11) Posters fall under _____ communication.
a) oral b) visual
c) written d) spoken

12) On the _____ it is possible to get immediate feedback.
a) letter b) e-mail
c) fax d) telephone

13) The response to a sender's message is called as _____.
a) Reply b) Feedback
c) Answer d) None of the above

14) _____ is the soul of communication.
a) Sender b) Receiver
c) Message d) Feedback

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Three. **12**

a) Explain how communication is necessary for business.
b) What is feedback? Explain its necessity in communication.
c) Write short note on: Different channels of communication.
d) Explain language barriers to communication with the ways to overcome them.
e) Explain language as a tool of communication.

Q.3 Attempt Any Four. **16**

a) Explain seven C's of effective communication.
b) Explain various types of barriers to communication and the ways to overcome them.
c) What is oral communication? Explain its advantages.
d) Explain various steps in the process of communication.
e) What is written communication? Explain its benefits.

Section – II

Q.4 Attempt Any Three. **12**

a) Explain the difference between formal and informal communication.
b) Explain vertical communication with its types.
c) Explain farewell speech by the departing person, with an example
d) Explain the speech for vote of thanks, with an example.
e) Write short note on: Non- verbal aspects of presentation.

Q.5 Attempt Any Four. **16**

a) Explain the structure of a business letter with its various components.
b) Explain the steps in the process of presentation.
c) You had purchased some furniture items from a vendor. Afterwards you found that the furniture items are in a damaged condition. Write a letter of complaint and ask for replacement.
d) Explain four P's of effective presentations.
e) You are in need of some computer hardware parts. Prepare a letter placing order to the supplier. Specify the terms and conditions of purchase.

Seat No.		Set	S

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) Which of the following is not among 7Cs?
a) Conciseness b) Completeness
c) Clarity d) Charity

2) Posters fall under _____ communication.
a) oral b) visual
c) written d) spoken

3) On the _____ it is possible to get immediate feedback.
a) letter b) e-mail
c) fax d) telephone

4) The response to a sender's message is called as _____.
a) Reply b) Feedback
c) Answer d) None of the above

5) _____ is the soul of communication.
a) Sender b) Receiver
c) Message d) Feedback

6) Which of these is not an element of non-verbal communication?
a) Personal appearance b) Posture
c) Eye contact d) Name of the speaker

7) Telephonic conversation is a form of: _____
a) verbal communication b) non-verbal communication
c) visual communication d) Written

8) To give a good presentation, full rehearsal is: _____
a) Optional b) Necessary
c) Useless d) Audience based

9) Which of the following is not an advantage of oral presentation?
a) Flexibility b) Scope for body language
c) Expensive d) Time-saving

10) In communication, _____ is the person who receives and decodes the message.
a) Sender b) Receiver
c) Driver d) Cleaner

11) Which among the following is not a manmade channel of communication?
a) Telephone b) Cell phone
c) Fax d) Air

12) Communication is the part of _____ skills.
a) Rough b) Soft
c) Hard d) Short

13) Which among the following are the barriers to communication?
a) Physical b) Mechanical
c) Psychological d) All of above

14) To overcome language barrier, which of the ways should not be followed?
a) Easy and understandable words should be used.
b) Jokes should be told to the audience.
c) The language of audience should be used.
d) Non-verbal ways should be used to the extent possible.

SLR-BD-164

Seat No.	

Set S

S.Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Three. **12**

a) Explain how communication is necessary for business.
b) What is feedback? Explain its necessity in communication.
c) Write short note on: Different channels of communication.
d) Explain language barriers to communication with the ways to overcome them.
e) Explain language as a tool of communication.

Q.3 Attempt Any Four. **16**

a) Explain seven C's of effective communication.
b) Explain various types of barriers to communication and the ways to overcome them.
c) What is oral communication? Explain its advantages.
d) Explain various steps in the process of communication.
e) What is written communication? Explain its benefits.

Section – II

Q.4 Attempt Any Three. **12**

a) Explain the difference between formal and informal communication.
b) Explain vertical communication with its types.
c) Explain farewell speech by the departing person, with an example
d) Explain the speech for vote of thanks, with an example.
e) Write short note on: Non- verbal aspects of presentation.

Q.5 Attempt Any Four. **16**

a) Explain the structure of a business letter with its various components.
b) Explain the steps in the process of presentation.
c) You had purchased some furniture items from a vendor. Afterwards you found that the furniture items are in a damaged condition. Write a letter of complaint and ask for replacement.
d) Explain four P's of effective presentations.
e) You are in need of some computer hardware parts. Prepare a letter placing order to the supplier. Specify the terms and conditions of purchase.

SLR-BD-165

Seat No.	

Set P

S.Y (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. 14

1) Find out the quartile value (Q3) for a given series of data
3, 4, 7, 2, 3, 7, 4 ,2, 4, 7, 4.
a) 4 b) 6
c) 7 d) 2

2) Which of the following is used to find the indices of the maximum and minimum elements in a NumPy array?
a) argmax() and argmin() b) max() and min()
c) amax() and amin() d) None of these

3) Which of the following is an example of a nominal variable?
a) Blood pressure
b) Eye color
c) Height of individuals
d) Time taken to complete a task

4) Which of the following is NOT a step in preparing data tables for analysis?
a) Data cleaning
b) Data visualization
c) Removing irrelevant observations
d) Converting data into a suitable format for analysis

5)
```
import numpy as np
a = np.array([[1, 2], [3, 4]])
print(a.ndim)
```
a) 0 b) 1
c) 2 d) 3

6) What are the benefits of Data Visualizations?
a) Better Analysis
b) Identifying patterns
c) Exploring Business Insights
d) All of the above

7) Which method can be used to convert text data to numerical values?
a) One-hot encoding
b) Normalization
c) Binning
d) Grouping

8) How to handle the missing values in the dataset?
a) dropping the missing rows & columns
b) Replace with some values
c) Compute with mean/mode/median value
d) All of above

9) What is the output of data frame, head() method?
a) return only the first row
b) return only headers or column name of the Data Frame
c) return the first five rows of the Data Frame
d) throw an exception as it expects parameter(number) in parenthesis

10) After installing Pandas, which command is used to import it in a Python script?
a) import pandas as pd
b) import pandas
c) from pandas import*
d) import pandas as pd as np

11) Which Pandas method is used to remove rows with missing data from a Data Frame?
a) df.dropna()
b) df.fillna()
c) df.isna()
d) df.replace()

12) Which function is used to create a histogram in Seaborn?
a) sns.lineplot()
b) sns.histplot()
c) sns.scatterplot()
d) sns.barplot()

13) Which of the following correctly plots a histogram using Matplotlib?
a) plt.hist(data, bins=10)
b) plt.histogram(data, bins=10)
c) sns.histplot(data=data, bins=10)
d) plt.hist(data, 10)

14) Which is the correct command to install Matplotlib?
a) pip install matplotlib
b) pip install matplotlib.pz
c) pip install matplotlib.*
d) All of these

SLR-BD-165

Seat No.	

Set P

S.Y (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Assume suitable data if required.
3) Figures to the right indicates full marks

Section – I

Q.2 Attempt any Three. **12**

a) Describe the process for making sense of data.
b) What are the different types of Variable?
c) Explain broadcasting. Summarize the rules with example.
d) Explain Data preprocessing steps and write Uses of Data Preprocessing.

Q.3 Attempt any One. **08**

a) The following are test scores on a biology exam:
64, 82, 87, 76, 93, 68, 71, 68, 75, 91, 84, 89.
Calculate: mean, median, mode, range, variance, standard deviation.
b) Why there is a need to generate consistent scale across variables? Describe with example.

Q.4 Compulsory Question. **08**

Normalize the following Original Percentage feature in a given table using.
i) Min-Max scaling method
ii) Z-score Method

Student	Original Percentage
Ajay	50
Vijay	60
Spandan	75
Sakshi	80

Section – II

Q.5 Attempt any Three. **12**

a) What is Data Visualization, identify the design principles of data visualization.

b) Write a program to perform concat and merging operation of two datasets using Pandas library.

c) Explain univariate data visualization & Multivariate Data Visualization with suitable example.

d) How to handle missing values in Pandas, explain with example.

Q.6 Attempt any One. **08**

a) List types of tables. Explain it with Example. How Cross classification table is better than summary table?

b) Write the Python code to visualize the Histogram, Bar Chart & scatter plot Consider suitable dataset.

Q.7 Compulsory Question. **08**

Write a program to create Data Frame from dictionary of Series, and write down the output also.

SLR-BD-165

Seat No.	

Set Q

S.Y (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) How to handle the missing values in the dataset?
a) dropping the missing rows & columns
b) Replace with some values
c) Compute with mean/mode/median value
d) All of above

2) What is the output of data frame, head() method?
a) return only the first row
b) return only headers or column name of the Data Frame
c) return the first five rows of the Data Frame
d) throw an exception as it expects parameter(number) in parenthesis

3) After installing Pandas, which command is used to import it in a Python script?
a) import pandas as pd
b) import pandas
c) from pandas import*
d) import pandas as pd as np

4) Which Pandas method is used to remove rows with missing data from a Data Frame?
a) df.dropna()
b) df.fillna()
c) df.isna()
d) df.replace()

5) Which function is used to create a histogram in Seaborn?
a) sns.lineplot()
b) sns.histplot()
c) sns.scatterplot()
d) sns.barplot()

6) Which of the following correctly plots a histogram using Matplotlib?
a) plt.hist(data, bins=10)
b) plt.histogram(data, bins=10)
c) sns.histplot(data=data, bins=10)
d) plt.hist(data, 10)

7) Which is the correct command to install Matplotlib?
a) pip install matplotlib
b) pip install matplotlib.pz
c) pip install matplotlib.*
d) All of these

8) Find out the quartile value (Q3) for a given series of data
3, 4, 7, 2, 3, 7, 4 ,2, 4, 7, 4.
a) 4
b) 6
c) 7
d) 2

9) Which of the following is used to find the indices of the maximum and minimum elements in a NumPy array?
a) argmax() and argmin()
b) max() and min()
c) amax() and amin()
d) None of these

10) Which of the following is an example of a nominal variable?
a) Blood pressure
b) Eye color
c) Height of individuals
d) Time taken to complete a task

11) Which of the following is NOT a step in preparing data tables for analysis?
a) Data cleaning
b) Data visualization
c) Removing irrelevant observations
d) Converting data into a suitable format for analysis

12)
```
import numpy as np
a = np.array([[1, 2], [3, 4]])
print(a.ndim)
```
a) 0
b) 1
c) 2
d) 3

13) What are the benefits of Data Visualizations?
a) Better Analysis
b) Identifying patterns
c) Exploring Business Insights
d) All of the above

14) Which method can be used to convert text data to numerical values?
a) One-hot encoding
b) Normalization
c) Binning
d) Grouping

SLR-BD-165

Seat No.	

Set Q

S.Y (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Assume suitable data if required.
3) Figures to the right indicates full marks

Section – I

Q.2 Attempt any Three. **12**

a) Describe the process for making sense of data.
b) What are the different types of Variable?
c) Explain broadcasting. Summarize the rules with example.
d) Explain Data preprocessing steps and write Uses of Data Preprocessing.

Q.3 Attempt any One. **08**

a) The following are test scores on a biology exam:
64, 82, 87, 76, 93, 68, 71, 68, 75, 91, 84, 89.
Calculate: mean, median, mode, range, variance, standard deviation.
b) Why there is a need to generate consistent scale across variables? Describe with example.

Q.4 Compulsory Question. **08**

Normalize the following Original Percentage feature in a given table using.
i) Min-Max scaling method
ii) Z-score Method

Student	Original Percentage
Ajay	50
Vijay	60
Spandan	75
Sakshi	80

Section – II

Q.5 Attempt any Three. **12**

a) What is Data Visualization, identify the design principles of data visualization.

b) Write a program to perform concat and merging operation of two datasets using Pandas library.

c) Explain univariate data visualization & Multivariate Data Visualization with suitable example.

d) How to handle missing values in Pandas, explain with example.

Q.6 Attempt any One. **08**

a) List types of tables. Explain it with Example. How Cross classification table is better than summary table?

b) Write the Python code to visualize the Histogram, Bar Chart & scatter plot Consider suitable dataset.

Q.7 Compulsory Question. **08**

Write a program to create Data Frame from dictionary of Series, and write down the output also.

Seat No.	

Set **R**

S.Y (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Which Pandas method is used to remove rows with missing data from a Data Frame?
a) df.dropna() b) df.fillna()
c) df.isna() d) df.replace()

2) Which function is used to create a histogram in Seaborn?
a) sns.lineplot() b) sns.histplot()
c) sns.scatterplot() d) sns.barplot()

3) Which of the following correctly plots a histogram using Matplotlib?
a) plt.hist(data, bins=10)
b) plt.histogram(data, bins=10)
c) sns.histplot(data=data, bins=10)
d) plt.hist(data, 10)

4) Which is the correct command to install Matplotlib?
a) pip install matplotlib b) pip install matplotlib.pz
c) pip install matplotlib.* d) All of these

5) Find out the quartile value (Q3) for a given series of data 3, 4, 7, 2, 3, 7, 4 ,2, 4, 7, 4.
a) 4 b) 6
c) 7 d) 2

6) Which of the following is used to find the indices of the maximum and minimum elements in a NumPy array?
a) argmax() and argmin() b) max() and min()
c) amax() and amin() d) None of these

7) Which of the following is an example of a nominal variable?
a) Blood pressure
b) Eye color
c) Height of individuals
d) Time taken to complete a task

8) Which of the following is NOT a step in preparing data tables for analysis?
a) Data cleaning
b) Data visualization
c) Removing irrelevant observations
d) Converting data into a suitable format for analysis

9)
```
import numpy as np
a = np.array([[1, 2], [3, 4]])
print(a.ndim)
```
a) 0 b) 1
c) 2 d) 3

10) What are the benefits of Data Visualizations?
a) Better Analysis
b) Identifying patterns
c) Exploring Business Insights
d) All of the above

11) Which method can be used to convert text data to numerical values?
a) One-hot encoding b) Normalization
c) Binning d) Grouping

12) How to handle the missing values in the dataset?
a) dropping the missing rows & columns
b) Replace with some values
c) Compute with mean/mode/median value
d) All of above

13) What is the output of data frame, head() method?
a) return only the first row
b) return only headers or column name of the Data Frame
c) return the first five rows of the Data Frame
d) throw an exception as it expects parameter(number) in parenthesis

14) After installing Pandas, which command is used to import it in a Python script?
a) import pandas as pd b) import pandas
c) from pandas import* d) import pandas as pd as np

Seat No.	

Set **R**

S.Y (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Assume suitable data if required.
3) Figures to the right indicates full marks

Section – I

Q.2 Attempt any Three. **12**

a) Describe the process for making sense of data.
b) What are the different types of Variable?
c) Explain broadcasting. Summarize the rules with example.
d) Explain Data preprocessing steps and write Uses of Data Preprocessing.

Q.3 Attempt any One. **08**

a) The following are test scores on a biology exam:
64, 82, 87, 76, 93, 68, 71, 68, 75, 91, 84, 89.
Calculate: mean, median, mode, range, variance, standard deviation.
b) Why there is a need to generate consistent scale across variables? Describe with example.

Q.4 Compulsory Question. **08**

Normalize the following Original Percentage feature in a given table using.
i) Min-Max scaling method
ii) Z-score Method

Student	Original Percentage
Ajay	50
Vijay	60
Spandan	75
Sakshi	80

Section – II

Q.5 Attempt any Three. **12**

a) What is Data Visualization, identify the design principles of data visualization.

b) Write a program to perform concat and merging operation of two datasets using Pandas library.

c) Explain univariate data visualization & Multivariate Data Visualization with suitable example.

d) How to handle missing values in Pandas, explain with example.

Q.6 Attempt any One. **08**

a) List types of tables. Explain it with Example. How Cross classification table is better than summary table?

b) Write the Python code to visualize the Histogram, Bar Chart & scatter plot Consider suitable dataset.

Q.7 Compulsory Question. **08**

Write a program to create Data Frame from dictionary of Series, and write down the output also.

SLR-BD-165

Seat No.	

Set S

S.Y (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. 14

1) What are the benefits of Data Visualizations?
a) Better Analysis
b) Identifying patterns
c) Exploring Business Insights
d) All of the above

2) Which method can be used to convert text data to numerical values?
a) One-hot encoding b) Normalization
c) Binning d) Grouping

3) How to handle the missing values in the dataset?
a) dropping the missing rows & columns
b) Replace with some values
c) Compute with mean/mode/median value
d) All of above

4) What is the output of data frame, head() method?
a) return only the first row
b) return only headers or column name of the Data Frame
c) return the first five rows of the Data Frame
d) throw an exception as it expects parameter(number) in parenthesis

5) After installing Pandas, which command is used to import it in a Python script?
a) import pandas as pd b) import pandas
c) from pandas import* d) import pandas as pd as np

6) Which Pandas method is used to remove rows with missing data from a Data Frame?

a) df.dropna() b) df.fillna()
c) df.isna() d) df.replace()

7) Which function is used to create a histogram in Seaborn?

a) sns.lineplot() b) sns.histplot()
c) sns.scatterplot() d) sns.barplot()

8) Which of the following correctly plots a histogram using Matplotlib?

a) plt.hist(data, bins=10)
b) plt.histogram(data, bins=10)
c) sns.histplot(data=data, bins=10)
d) plt.hist(data, 10)

9) Which is the correct command to install Matplotlib?

a) pip install matplotlib b) pip install matplotlib.pz
c) pip install matplotlib.* d) All of these

10) Find out the quartile value (Q3) for a given series of data
3, 4, 7, 2, 3, 7, 4 ,2, 4, 7, 4.

a) 4 b) 6
c) 7 d) 2

11) Which of the following is used to find the indices of the maximum and minimum elements in a NumPy array?

a) argmax() and argmin() b) max() and min()
c) amax() and amin() d) None of these

12) Which of the following is an example of a nominal variable?

a) Blood pressure
b) Eye color
c) Height of individuals
d) Time taken to complete a task

13) Which of the following is NOT a step in preparing data tables for analysis?

a) Data cleaning
b) Data visualization
c) Removing irrelevant observations
d) Converting data into a suitable format for analysis

14)
```
import numpy as np
a = np.array([[1, 2], [3, 4]])
print(a.ndim)
```

a) 0 b) 1
c) 2 d) 3

Seat No.	

Set | S

S.Y (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Assume suitable data if required.
3) Figures to the right indicates full marks

Section – I

Q.2 Attempt any Three. **12**

a) Describe the process for making sense of data.
b) What are the different types of Variable?
c) Explain broadcasting. Summarize the rules with example.
d) Explain Data preprocessing steps and write Uses of Data Preprocessing.

Q.3 Attempt any One. **08**

a) The following are test scores on a biology exam:
64, 82, 87, 76, 93, 68, 71, 68, 75, 91, 84, 89.
Calculate: mean, median, mode, range, variance, standard deviation.
b) Why there is a need to generate consistent scale across variables? Describe with example.

Q.4 Compulsory Question. **08**

Normalize the following Original Percentage feature in a given table using.
i) Min-Max scaling method
ii) Z-score Method

Student	Original Percentage
Ajay	50
Vijay	60
Spandan	75
Sakshi	80

Section – II

Q.5 Attempt any Three. **12**

a) What is Data Visualization, identify the design principles of data visualization.

b) Write a program to perform concat and merging operation of two datasets using Pandas library.

c) Explain univariate data visualization & Multivariate Data Visualization with suitable example.

d) How to handle missing values in Pandas, explain with example.

Q.6 Attempt any One. **08**

a) List types of tables. Explain it with Example. How Cross classification table is better than summary table?

b) Write the Python code to visualize the Histogram, Bar Chart & scatter plot Consider suitable dataset.

Q.7 Compulsory Question. **08**

Write a program to create Data Frame from dictionary of Series, and write down the output also.

SLR-BD-165

Seat No.	

Set P

S.Y (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. 14

1) Find out the quartile value (Q3) for a given series of data
3, 4, 7, 2, 3, 7, 4 ,2, 4, 7, 4.
a) 4 b) 6
c) 7 d) 2

2) Which of the following is used to find the indices of the maximum and minimum elements in a NumPy array?
a) argmax() and argmin() b) max() and min()
c) amax() and amin() d) None of these

3) Which of the following is an example of a nominal variable?
a) Blood pressure
b) Eye color
c) Height of individuals
d) Time taken to complete a task

4) Which of the following is NOT a step in preparing data tables for analysis?
a) Data cleaning
b) Data visualization
c) Removing irrelevant observations
d) Converting data into a suitable format for analysis

5)
```
import numpy as np
a = np.array([[1, 2], [3, 4]])
print(a.ndim)
```
a) 0 b) 1
c) 2 d) 3

6) What are the benefits of Data Visualizations?
a) Better Analysis
b) Identifying patterns
c) Exploring Business Insights
d) All of the above

7) Which method can be used to convert text data to numerical values?
a) One-hot encoding
b) Normalization
c) Binning
d) Grouping

8) How to handle the missing values in the dataset?
a) dropping the missing rows & columns
b) Replace with some values
c) Compute with mean/mode/median value
d) All of above

9) What is the output of data frame, head() method?
a) return only the first row
b) return only headers or column name of the Data Frame
c) return the first five rows of the Data Frame
d) throw an exception as it expects parameter(number) in parenthesis

10) After installing Pandas, which command is used to import it in a Python script?
a) import pandas as pd
b) import pandas
c) from pandas import*
d) import pandas as pd as np

11) Which Pandas method is used to remove rows with missing data from a Data Frame?
a) df.dropna()
b) df.fillna()
c) df.isna()
d) df.replace()

12) Which function is used to create a histogram in Seaborn?
a) sns.lineplot()
b) sns.histplot()
c) sns.scatterplot()
d) sns.barplot()

13) Which of the following correctly plots a histogram using Matplotlib?
a) plt.hist(data, bins=10)
b) plt.histogram(data, bins=10)
c) sns.histplot(data=data, bins=10)
d) plt.hist(data, 10)

14) Which is the correct command to install Matplotlib?
a) pip install matplotlib
b) pip install matplotlib.pz
c) pip install matplotlib.*
d) All of these

Seat No.	

Set | P

S.Y (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Assume suitable data if required.
3) Figures to the right indicates full marks

Section – I

Q.2 Attempt any Three. **12**

a) Describe the process for making sense of data.
b) What are the different types of Variable?
c) Explain broadcasting. Summarize the rules with example.
d) Explain Data preprocessing steps and write Uses of Data Preprocessing.

Q.3 Attempt any One. **08**

a) The following are test scores on a biology exam:
64, 82, 87, 76, 93, 68, 71, 68, 75, 91, 84, 89.
Calculate: mean, median, mode, range, variance, standard deviation.
b) Why there is a need to generate consistent scale across variables? Describe with example.

Q.4 Compulsory Question. **08**

Normalize the following Original Percentage feature in a given table using.
i) Min-Max scaling method
ii) Z-score Method

Student	Original Percentage
Ajay	50
Vijay	60
Spandan	75
Sakshi	80

Section – II

Q.5 Attempt any Three. **12**

a) What is Data Visualization, identify the design principles of data visualization.

b) Write a program to perform concat and merging operation of two datasets using Pandas library.

c) Explain univariate data visualization & Multivariate Data Visualization with suitable example.

d) How to handle missing values in Pandas, explain with example.

Q.6 Attempt any One. **08**

a) List types of tables. Explain it with Example. How Cross classification table is better than summary table?

b) Write the Python code to visualize the Histogram, Bar Chart & scatter plot Consider suitable dataset.

Q.7 Compulsory Question. **08**

Write a program to create Data Frame from dictionary of Series, and write down the output also.

SLR-BD-165

Seat No.	

Set Q

S.Y (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) How to handle the missing values in the dataset?
a) dropping the missing rows & columns
b) Replace with some values
c) Compute with mean/mode/median value
d) All of above

2) What is the output of data frame, head() method?
a) return only the first row
b) return only headers or column name of the Data Frame
c) return the first five rows of the Data Frame
d) throw an exception as it expects parameter(number) in parenthesis

3) After installing Pandas, which command is used to import it in a Python script?
a) import pandas as pd
b) import pandas
c) from pandas import*
d) import pandas as pd as np

4) Which Pandas method is used to remove rows with missing data from a Data Frame?
a) df.dropna()
b) df.fillna()
c) df.isna()
d) df.replace()

5) Which function is used to create a histogram in Seaborn?
a) sns.lineplot()
b) sns.histplot()
c) sns.scatterplot()
d) sns.barplot()

6) Which of the following correctly plots a histogram using Matplotlib?
a) plt.hist(data, bins=10)
b) plt.histogram(data, bins=10)
c) sns.histplot(data=data, bins=10)
d) plt.hist(data, 10)

7) Which is the correct command to install Matplotlib?
a) pip install matplotlib
b) pip install matplotlib.pz
c) pip install matplotlib.*
d) All of these

8) Find out the quartile value (Q3) for a given series of data
3, 4, 7, 2, 3, 7, 4 ,2, 4, 7, 4.
a) 4
b) 6
c) 7
d) 2

9) Which of the following is used to find the indices of the maximum and minimum elements in a NumPy array?
a) argmax() and argmin()
b) max() and min()
c) amax() and amin()
d) None of these

10) Which of the following is an example of a nominal variable?
a) Blood pressure
b) Eye color
c) Height of individuals
d) Time taken to complete a task

11) Which of the following is NOT a step in preparing data tables for analysis?
a) Data cleaning
b) Data visualization
c) Removing irrelevant observations
d) Converting data into a suitable format for analysis

12)
```
import numpy as np
a = np.array([[1, 2], [3, 4]])
print(a.ndim)
```
a) 0
b) 1
c) 2
d) 3

13) What are the benefits of Data Visualizations?
a) Better Analysis
b) Identifying patterns
c) Exploring Business Insights
d) All of the above

14) Which method can be used to convert text data to numerical values?
a) One-hot encoding
b) Normalization
c) Binning
d) Grouping

Seat No.	

Set **Q**

S.Y (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Assume suitable data if required.
3) Figures to the right indicates full marks

Section – I

Q.2 Attempt any Three. **12**

a) Describe the process for making sense of data.
b) What are the different types of Variable?
c) Explain broadcasting. Summarize the rules with example.
d) Explain Data preprocessing steps and write Uses of Data Preprocessing.

Q.3 Attempt any One. **08**

a) The following are test scores on a biology exam:
64, 82, 87, 76, 93, 68, 71, 68, 75, 91, 84, 89.
Calculate: mean, median, mode, range, variance, standard deviation.
b) Why there is a need to generate consistent scale across variables? Describe with example.

Q.4 Compulsory Question. **08**

Normalize the following Original Percentage feature in a given table using.
i) Min-Max scaling method
ii) Z-score Method

Student	Original Percentage
Ajay	50
Vijay	60
Spandan	75
Sakshi	80

Section – II

Q.5 Attempt any Three. **12**

a) What is Data Visualization, identify the design principles of data visualization.

b) Write a program to perform concat and merging operation of two datasets using Pandas library.

c) Explain univariate data visualization & Multivariate Data Visualization with suitable example.

d) How to handle missing values in Pandas, explain with example.

Q.6 Attempt any One. **08**

a) List types of tables. Explain it with Example. How Cross classification table is better than summary table?

b) Write the Python code to visualize the Histogram, Bar Chart & scatter plot Consider suitable dataset.

Q.7 Compulsory Question. **08**

Write a program to create Data Frame from dictionary of Series, and write down the output also.

Seat No.	

Set **R**

S.Y (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Which Pandas method is used to remove rows with missing data from a Data Frame?
a) df.dropna() b) df.fillna()
c) df.isna() d) df.replace()

2) Which function is used to create a histogram in Seaborn?
a) sns.lineplot() b) sns.histplot()
c) sns.scatterplot() d) sns.barplot()

3) Which of the following correctly plots a histogram using Matplotlib?
a) plt.hist(data, bins=10)
b) plt.histogram(data, bins=10)
c) sns.histplot(data=data, bins=10)
d) plt.hist(data, 10)

4) Which is the correct command to install Matplotlib?
a) pip install matplotlib b) pip install matplotlib.pz
c) pip install matplotlib.* d) All of these

5) Find out the quartile value (Q3) for a given series of data 3, 4, 7, 2, 3, 7, 4 ,2, 4, 7, 4.
a) 4 b) 6
c) 7 d) 2

6) Which of the following is used to find the indices of the maximum and minimum elements in a NumPy array?
a) argmax() and argmin() b) max() and min()
c) amax() and amin() d) None of these

7) Which of the following is an example of a nominal variable?
a) Blood pressure
b) Eye color
c) Height of individuals
d) Time taken to complete a task

8) Which of the following is NOT a step in preparing data tables for analysis?
a) Data cleaning
b) Data visualization
c) Removing irrelevant observations
d) Converting data into a suitable format for analysis

9)
```
import numpy as np
a = np.array([[1, 2], [3, 4]])
print(a.ndim)
```
a) 0 b) 1
c) 2 d) 3

10) What are the benefits of Data Visualizations?
a) Better Analysis
b) Identifying patterns
c) Exploring Business Insights
d) All of the above

11) Which method can be used to convert text data to numerical values?
a) One-hot encoding b) Normalization
c) Binning d) Grouping

12) How to handle the missing values in the dataset?
a) dropping the missing rows & columns
b) Replace with some values
c) Compute with mean/mode/median value
d) All of above

13) What is the output of data frame, head() method?
a) return only the first row
b) return only headers or column name of the Data Frame
c) return the first five rows of the Data Frame
d) throw an exception as it expects parameter(number) in parenthesis

14) After installing Pandas, which command is used to import it in a Python script?
a) import pandas as pd b) import pandas
c) from pandas import* d) import pandas as pd as np

Seat No.	

Set **R**

S.Y (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Assume suitable data if required.
3) Figures to the right indicates full marks

Section – I

Q.2 Attempt any Three. **12**

a) Describe the process for making sense of data.
b) What are the different types of Variable?
c) Explain broadcasting. Summarize the rules with example.
d) Explain Data preprocessing steps and write Uses of Data Preprocessing.

Q.3 Attempt any One. **08**

a) The following are test scores on a biology exam:
64, 82, 87, 76, 93, 68, 71, 68, 75, 91, 84, 89.
Calculate: mean, median, mode, range, variance, standard deviation.
b) Why there is a need to generate consistent scale across variables? Describe with example.

Q.4 Compulsory Question. **08**

Normalize the following Original Percentage feature in a given table using.
i) Min-Max scaling method
ii) Z-score Method

Student	Original Percentage
Ajay	50
Vijay	60
Spandan	75
Sakshi	80

Section – II

Q.5 Attempt any Three. **12**

a) What is Data Visualization, identify the design principles of data visualization.

b) Write a program to perform concat and merging operation of two datasets using Pandas library.

c) Explain univariate data visualization & Multivariate Data Visualization with suitable example.

d) How to handle missing values in Pandas, explain with example.

Q.6 Attempt any One. **08**

a) List types of tables. Explain it with Example. How Cross classification table is better than summary table?

b) Write the Python code to visualize the Histogram, Bar Chart & scatter plot Consider suitable dataset.

Q.7 Compulsory Question. **08**

Write a program to create Data Frame from dictionary of Series, and write down the output also.

SLR-BD-165

Seat No.	

Set S

S.Y (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) What are the benefits of Data Visualizations?
a) Better Analysis
b) Identifying patterns
c) Exploring Business Insights
d) All of the above

2) Which method can be used to convert text data to numerical values?
a) One-hot encoding b) Normalization
c) Binning d) Grouping

3) How to handle the missing values in the dataset?
a) dropping the missing rows & columns
b) Replace with some values
c) Compute with mean/mode/median value
d) All of above

4) What is the output of data frame, head() method?
a) return only the first row
b) return only headers or column name of the Data Frame
c) return the first five rows of the Data Frame
d) throw an exception as it expects parameter(number) in parenthesis

5) After installing Pandas, which command is used to import it in a Python script?
a) import pandas as pd b) import pandas
c) from pandas import* d) import pandas as pd as np

6) Which Pandas method is used to remove rows with missing data from a Data Frame?

a) df.dropna() b) df.fillna()
c) df.isna() d) df.replace()

7) Which function is used to create a histogram in Seaborn?

a) sns.lineplot() b) sns.histplot()
c) sns.scatterplot() d) sns.barplot()

8) Which of the following correctly plots a histogram using Matplotlib?

a) plt.hist(data, bins=10)
b) plt.histogram(data, bins=10)
c) sns.histplot(data=data, bins=10)
d) plt.hist(data, 10)

9) Which is the correct command to install Matplotlib?

a) pip install matplotlib b) pip install matplotlib.pz
c) pip install matplotlib.* d) All of these

10) Find out the quartile value (Q3) for a given series of data
3, 4, 7, 2, 3, 7, 4 ,2, 4, 7, 4.

a) 4 b) 6
c) 7 d) 2

11) Which of the following is used to find the indices of the maximum and minimum elements in a NumPy array?

a) argmax() and argmin() b) max() and min()
c) amax() and amin() d) None of these

12) Which of the following is an example of a nominal variable?

a) Blood pressure
b) Eye color
c) Height of individuals
d) Time taken to complete a task

13) Which of the following is NOT a step in preparing data tables for analysis?

a) Data cleaning
b) Data visualization
c) Removing irrelevant observations
d) Converting data into a suitable format for analysis

14)
```
import numpy as np
a = np.array([[1, 2], [3, 4]])
print(a.ndim)
```

a) 0 b) 1
c) 2 d) 3

Seat No.	

Set **S**

S.Y (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Assume suitable data if required.
3) Figures to the right indicates full marks

Section – I

Q.2 Attempt any Three. **12**

a) Describe the process for making sense of data.
b) What are the different types of Variable?
c) Explain broadcasting. Summarize the rules with example.
d) Explain Data preprocessing steps and write Uses of Data Preprocessing.

Q.3 Attempt any One. **08**

a) The following are test scores on a biology exam:
64, 82, 87, 76, 93, 68, 71, 68, 75, 91, 84, 89.
Calculate: mean, median, mode, range, variance, standard deviation.
b) Why there is a need to generate consistent scale across variables? Describe with example.

Q.4 Compulsory Question. **08**

Normalize the following Original Percentage feature in a given table using.
i) Min-Max scaling method
ii) Z-score Method

Student	Original Percentage
Ajay	50
Vijay	60
Spandan	75
Sakshi	80

Section – II

Q.5 Attempt any Three. **12**

a) What is Data Visualization, identify the design principles of data visualization.

b) Write a program to perform concat and merging operation of two datasets using Pandas library.

c) Explain univariate data visualization & Multivariate Data Visualization with suitable example.

d) How to handle missing values in Pandas, explain with example.

Q.6 Attempt any One. **08**

a) List types of tables. Explain it with Example. How Cross classification table is better than summary table?

b) Write the Python code to visualize the Histogram, Bar Chart & scatter plot Consider suitable dataset.

Q.7 Compulsory Question. **08**

Write a program to create Data Frame from dictionary of Series, and write down the output also.

SLR-BD-165

Seat No.	

Set P

S.Y (B. Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. 14

1) Find out the quartile value (Q3) for a given series of data
3, 4, 7, 2, 3, 7, 4 ,2, 4, 7, 4.
a) 4 b) 6
c) 7 d) 2

2) Which of the following is used to find the indices of the maximum and minimum elements in a NumPy array?
a) argmax() and argmin() b) max() and min()
c) amax() and amin() d) None of these

3) Which of the following is an example of a nominal variable?
a) Blood pressure
b) Eye color
c) Height of individuals
d) Time taken to complete a task

4) Which of the following is NOT a step in preparing data tables for analysis?
a) Data cleaning
b) Data visualization
c) Removing irrelevant observations
d) Converting data into a suitable format for analysis

5)
```
import numpy as np
a = np.array([[1, 2], [3, 4]])
print(a.ndim)
```
a) 0 b) 1
c) 2 d) 3

6) What are the benefits of Data Visualizations?
a) Better Analysis
b) Identifying patterns
c) Exploring Business Insights
d) All of the above

7) Which method can be used to convert text data to numerical values?
a) One-hot encoding
b) Normalization
c) Binning
d) Grouping

8) How to handle the missing values in the dataset?
a) dropping the missing rows & columns
b) Replace with some values
c) Compute with mean/mode/median value
d) All of above

9) What is the output of data frame, head() method?
a) return only the first row
b) return only headers or column name of the Data Frame
c) return the first five rows of the Data Frame
d) throw an exception as it expects parameter(number) in parenthesis

10) After installing Pandas, which command is used to import it in a Python script?
a) import pandas as pd
b) import pandas
c) from pandas import*
d) import pandas as pd as np

11) Which Pandas method is used to remove rows with missing data from a Data Frame?
a) df.dropna()
b) df.fillna()
c) df.isna()
d) df.replace()

12) Which function is used to create a histogram in Seaborn?
a) sns.lineplot()
b) sns.histplot()
c) sns.scatterplot()
d) sns.barplot()

13) Which of the following correctly plots a histogram using Matplotlib?
a) plt.hist(data, bins=10)
b) plt.histogram(data, bins=10)
c) sns.histplot(data=data, bins=10)
d) plt.hist(data, 10)

14) Which is the correct command to install Matplotlib?
a) pip install matplotlib
b) pip install matplotlib.pz
c) pip install matplotlib.*
d) All of these

SLR-BD-165

Seat No.	

Set P

S.Y (B. Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Assume suitable data if required.
3) Figures to the right indicates full marks

Section – I

Q.2 Attempt any Three. **12**

a) Describe the process for making sense of data.
b) What are the different types of Variable?
c) Explain broadcasting. Summarize the rules with example.
d) Explain Data preprocessing steps and write Uses of Data Preprocessing.

Q.3 Attempt any One. **08**

a) The following are test scores on a biology exam:
64, 82, 87, 76, 93, 68, 71, 68, 75, 91, 84, 89.
Calculate: mean, median, mode, range, variance, standard deviation.
b) Why there is a need to generate consistent scale across variables? Describe with example.

Q.4 Compulsory Question. **08**

Normalize the following Original Percentage feature in a given table using.
i) Min-Max scaling method
ii) Z-score Method

Student	Original Percentage
Ajay	50
Vijay	60
Spandan	75
Sakshi	80

Section – II

Q.5 Attempt any Three. **12**

a) What is Data Visualization, identify the design principles of data visualization.

b) Write a program to perform concat and merging operation of two datasets using Pandas library.

c) Explain univariate data visualization & Multivariate Data Visualization with suitable example.

d) How to handle missing values in Pandas, explain with example.

Q.6 Attempt any One. **08**

a) List types of tables. Explain it with Example. How Cross classification table is better than summary table?

b) Write the Python code to visualize the Histogram, Bar Chart & scatter plot Consider suitable dataset.

Q.7 Compulsory Question. **08**

Write a program to create Data Frame from dictionary of Series, and write down the output also.

Seat No.	

Set **Q**

S.Y (B. Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) How to handle the missing values in the dataset?
a) dropping the missing rows & columns
b) Replace with some values
c) Compute with mean/mode/median value
d) All of above

2) What is the output of data frame, head() method?
a) return only the first row
b) return only headers or column name of the Data Frame
c) return the first five rows of the Data Frame
d) throw an exception as it expects parameter(number) in parenthesis

3) After installing Pandas, which command is used to import it in a Python script?
a) import pandas as pd
b) import pandas
c) from pandas import*
d) import pandas as pd as np

4) Which Pandas method is used to remove rows with missing data from a Data Frame?
a) df.dropna()
b) df.fillna()
c) df.isna()
d) df.replace()

5) Which function is used to create a histogram in Seaborn?
a) sns.lineplot()
b) sns.histplot()
c) sns.scatterplot()
d) sns.barplot()

6) Which of the following correctly plots a histogram using Matplotlib?
a) plt.hist(data, bins=10)
b) plt.histogram(data, bins=10)
c) sns.histplot(data=data, bins=10)
d) plt.hist(data, 10)

7) Which is the correct command to install Matplotlib?
a) pip install matplotlib
b) pip install matplotlib.pz
c) pip install matplotlib.*
d) All of these

8) Find out the quartile value (Q3) for a given series of data
3, 4, 7, 2, 3, 7, 4 ,2, 4, 7, 4.
a) 4
b) 6
c) 7
d) 2

9) Which of the following is used to find the indices of the maximum and minimum elements in a NumPy array?
a) argmax() and argmin()
b) max() and min()
c) amax() and amin()
d) None of these

10) Which of the following is an example of a nominal variable?
a) Blood pressure
b) Eye color
c) Height of individuals
d) Time taken to complete a task

11) Which of the following is NOT a step in preparing data tables for analysis?
a) Data cleaning
b) Data visualization
c) Removing irrelevant observations
d) Converting data into a suitable format for analysis

12)
```
import numpy as np
a = np.array([[1, 2], [3, 4]])
print(a.ndim)
```
a) 0
b) 1
c) 2
d) 3

13) What are the benefits of Data Visualizations?
a) Better Analysis
b) Identifying patterns
c) Exploring Business Insights
d) All of the above

14) Which method can be used to convert text data to numerical values?
a) One-hot encoding
b) Normalization
c) Binning
d) Grouping

SLR-BD-165

Seat No.	

Set Q

S.Y (B. Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Assume suitable data if required.
3) Figures to the right indicates full marks

Section – I

Q.2 Attempt any Three. **12**

a) Describe the process for making sense of data.
b) What are the different types of Variable?
c) Explain broadcasting. Summarize the rules with example.
d) Explain Data preprocessing steps and write Uses of Data Preprocessing.

Q.3 Attempt any One. **08**

a) The following are test scores on a biology exam:
64, 82, 87, 76, 93, 68, 71, 68, 75, 91, 84, 89.
Calculate: mean, median, mode, range, variance, standard deviation.
b) Why there is a need to generate consistent scale across variables? Describe with example.

Q.4 Compulsory Question. **08**

Normalize the following Original Percentage feature in a given table using.
i) Min-Max scaling method
ii) Z-score Method

Student	Original Percentage
Ajay	50
Vijay	60
Spandan	75
Sakshi	80

Section – II

Q.5 Attempt any Three. **12**

a) What is Data Visualization, identify the design principles of data visualization.

b) Write a program to perform concat and merging operation of two datasets using Pandas library.

c) Explain univariate data visualization & Multivariate Data Visualization with suitable example.

d) How to handle missing values in Pandas, explain with example.

Q.6 Attempt any One. **08**

a) List types of tables. Explain it with Example. How Cross classification table is better than summary table?

b) Write the Python code to visualize the Histogram, Bar Chart & scatter plot Consider suitable dataset.

Q.7 Compulsory Question. **08**

Write a program to create Data Frame from dictionary of Series, and write down the output also.

Seat No.	

Set **R**

S.Y (B. Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Which Pandas method is used to remove rows with missing data from a Data Frame?
a) df.dropna() b) df.fillna()
c) df.isna() d) df.replace()

2) Which function is used to create a histogram in Seaborn?
a) sns.lineplot() b) sns.histplot()
c) sns.scatterplot() d) sns.barplot()

3) Which of the following correctly plots a histogram using Matplotlib?
a) plt.hist(data, bins=10)
b) plt.histogram(data, bins=10)
c) sns.histplot(data=data, bins=10)
d) plt.hist(data, 10)

4) Which is the correct command to install Matplotlib?
a) pip install matplotlib b) pip install matplotlib.pz
c) pip install matplotlib.* d) All of these

5) Find out the quartile value (Q3) for a given series of data 3, 4, 7, 2, 3, 7, 4 ,2, 4, 7, 4.
a) 4 b) 6
c) 7 d) 2

6) Which of the following is used to find the indices of the maximum and minimum elements in a NumPy array?
a) argmax() and argmin() b) max() and min()
c) amax() and amin() d) None of these

7) Which of the following is an example of a nominal variable?
a) Blood pressure
b) Eye color
c) Height of individuals
d) Time taken to complete a task

8) Which of the following is NOT a step in preparing data tables for analysis?
a) Data cleaning
b) Data visualization
c) Removing irrelevant observations
d) Converting data into a suitable format for analysis

9)
```
import numpy as np
a = np.array([[1, 2], [3, 4]])
print(a.ndim)
```
a) 0 b) 1
c) 2 d) 3

10) What are the benefits of Data Visualizations?
a) Better Analysis
b) Identifying patterns
c) Exploring Business Insights
d) All of the above

11) Which method can be used to convert text data to numerical values?
a) One-hot encoding b) Normalization
c) Binning d) Grouping

12) How to handle the missing values in the dataset?
a) dropping the missing rows & columns
b) Replace with some values
c) Compute with mean/mode/median value
d) All of above

13) What is the output of data frame, head() method?
a) return only the first row
b) return only headers or column name of the Data Frame
c) return the first five rows of the Data Frame
d) throw an exception as it expects parameter(number) in parenthesis

14) After installing Pandas, which command is used to import it in a Python script?
a) import pandas as pd b) import pandas
c) from pandas import* d) import pandas as pd as np

SLR-BD-165

Seat No.	

Set R

S.Y (B. Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Assume suitable data if required.
3) Figures to the right indicates full marks

Section – I

Q.2 Attempt any Three. **12**

a) Describe the process for making sense of data.
b) What are the different types of Variable?
c) Explain broadcasting. Summarize the rules with example.
d) Explain Data preprocessing steps and write Uses of Data Preprocessing.

Q.3 Attempt any One. **08**

a) The following are test scores on a biology exam:
64, 82, 87, 76, 93, 68, 71, 68, 75, 91, 84, 89.
Calculate: mean, median, mode, range, variance, standard deviation.
b) Why there is a need to generate consistent scale across variables? Describe with example.

Q.4 Compulsory Question. **08**

Normalize the following Original Percentage feature in a given table using.
i) Min-Max scaling method
ii) Z-score Method

Student	Original Percentage
Ajay	50
Vijay	60
Spandan	75
Sakshi	80

Section – II

Q.5 Attempt any Three. **12**

a) What is Data Visualization, identify the design principles of data visualization.

b) Write a program to perform concat and merging operation of two datasets using Pandas library.

c) Explain univariate data visualization & Multivariate Data Visualization with suitable example.

d) How to handle missing values in Pandas, explain with example.

Q.6 Attempt any One. **08**

a) List types of tables. Explain it with Example. How Cross classification table is better than summary table?

b) Write the Python code to visualize the Histogram, Bar Chart & scatter plot Consider suitable dataset.

Q.7 Compulsory Question. **08**

Write a program to create Data Frame from dictionary of Series, and write down the output also.

SLR-BD-165

Seat No.	

Set S

S.Y (B. Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) What are the benefits of Data Visualizations?
a) Better Analysis
b) Identifying patterns
c) Exploring Business Insights
d) All of the above

2) Which method can be used to convert text data to numerical values?
a) One-hot encoding b) Normalization
c) Binning d) Grouping

3) How to handle the missing values in the dataset?
a) dropping the missing rows & columns
b) Replace with some values
c) Compute with mean/mode/median value
d) All of above

4) What is the output of data frame, head() method?
a) return only the first row
b) return only headers or column name of the Data Frame
c) return the first five rows of the Data Frame
d) throw an exception as it expects parameter(number) in parenthesis

5) After installing Pandas, which command is used to import it in a Python script?
a) import pandas as pd b) import pandas
c) from pandas import* d) import pandas as pd as np

6) Which Pandas method is used to remove rows with missing data from a Data Frame?

a) df.dropna() b) df.fillna()
c) df.isna() d) df.replace()

7) Which function is used to create a histogram in Seaborn?

a) sns.lineplot() b) sns.histplot()
c) sns.scatterplot() d) sns.barplot()

8) Which of the following correctly plots a histogram using Matplotlib?

a) plt.hist(data, bins=10)
b) plt.histogram(data, bins=10)
c) sns.histplot(data=data, bins=10)
d) plt.hist(data, 10)

9) Which is the correct command to install Matplotlib?

a) pip install matplotlib b) pip install matplotlib.pz
c) pip install matplotlib.* d) All of these

10) Find out the quartile value (Q3) for a given series of data 3, 4, 7, 2, 3, 7, 4 ,2, 4, 7, 4.

a) 4 b) 6
c) 7 d) 2

11) Which of the following is used to find the indices of the maximum and minimum elements in a NumPy array?

a) argmax() and argmin() b) max() and min()
c) amax() and amin() d) None of these

12) Which of the following is an example of a nominal variable?

a) Blood pressure
b) Eye color
c) Height of individuals
d) Time taken to complete a task

13) Which of the following is NOT a step in preparing data tables for analysis?

a) Data cleaning
b) Data visualization
c) Removing irrelevant observations
d) Converting data into a suitable format for analysis

14)
```
import numpy as np
a = np.array([[1, 2], [3, 4]])
print(a.ndim)
```

a) 0 b) 1
c) 2 d) 3

SLR-BD-165

Seat No.	

Set S

S.Y (B. Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Assume suitable data if required.
3) Figures to the right indicates full marks

Section – I

Q.2 Attempt any Three. **12**

a) Describe the process for making sense of data.
b) What are the different types of Variable?
c) Explain broadcasting. Summarize the rules with example.
d) Explain Data preprocessing steps and write Uses of Data Preprocessing.

Q.3 Attempt any One. **08**

a) The following are test scores on a biology exam:
64, 82, 87, 76, 93, 68, 71, 68, 75, 91, 84, 89.
Calculate: mean, median, mode, range, variance, standard deviation.
b) Why there is a need to generate consistent scale across variables? Describe with example.

Q.4 Compulsory Question. **08**

Normalize the following Original Percentage feature in a given table using.
i) Min-Max scaling method
ii) Z-score Method

Student	Original Percentage
Ajay	50
Vijay	60
Spandan	75
Sakshi	80

Section – II

Q.5 Attempt any Three. **12**

a) What is Data Visualization, identify the design principles of data visualization.

b) Write a program to perform concat and merging operation of two datasets using Pandas library.

c) Explain univariate data visualization & Multivariate Data Visualization with suitable example.

d) How to handle missing values in Pandas, explain with example.

Q.6 Attempt any One. **08**

a) List types of tables. Explain it with Example. How Cross classification table is better than summary table?

b) Write the Python code to visualize the Histogram, Bar Chart & scatter plot Consider suitable dataset.

Q.7 Compulsory Question. **08**

Write a program to create Data Frame from dictionary of Series, and write down the output also.

SLR-BD-165

Seat No.	

Set P

S.Y (B. Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. 14

1) Find out the quartile value (Q3) for a given series of data
3, 4, 7, 2, 3, 7, 4 ,2, 4, 7, 4.
a) 4 b) 6
c) 7 d) 2

2) Which of the following is used to find the indices of the maximum and minimum elements in a NumPy array?
a) argmax() and argmin() b) max() and min()
c) amax() and amin() d) None of these

3) Which of the following is an example of a nominal variable?
a) Blood pressure
b) Eye color
c) Height of individuals
d) Time taken to complete a task

4) Which of the following is NOT a step in preparing data tables for analysis?
a) Data cleaning
b) Data visualization
c) Removing irrelevant observations
d) Converting data into a suitable format for analysis

5)
```
import numpy as np
a = np.array([[1, 2], [3, 4]])
print(a.ndim)
```
a) 0 b) 1
c) 2 d) 3

6) What are the benefits of Data Visualizations?
a) Better Analysis
b) Identifying patterns
c) Exploring Business Insights
d) All of the above

7) Which method can be used to convert text data to numerical values?
a) One-hot encoding
b) Normalization
c) Binning
d) Grouping

8) How to handle the missing values in the dataset?
a) dropping the missing rows & columns
b) Replace with some values
c) Compute with mean/mode/median value
d) All of above

9) What is the output of data frame, head() method?
a) return only the first row
b) return only headers or column name of the Data Frame
c) return the first five rows of the Data Frame
d) throw an exception as it expects parameter(number) in parenthesis

10) After installing Pandas, which command is used to import it in a Python script?
a) import pandas as pd
b) import pandas
c) from pandas import*
d) import pandas as pd as np

11) Which Pandas method is used to remove rows with missing data from a Data Frame?
a) df.dropna()
b) df.fillna()
c) df.isna()
d) df.replace()

12) Which function is used to create a histogram in Seaborn?
a) sns.lineplot()
b) sns.histplot()
c) sns.scatterplot()
d) sns.barplot()

13) Which of the following correctly plots a histogram using Matplotlib?
a) plt.hist(data, bins=10)
b) plt.histogram(data, bins=10)
c) sns.histplot(data=data, bins=10)
d) plt.hist(data, 10)

14) Which is the correct command to install Matplotlib?
a) pip install matplotlib
b) pip install matplotlib.pz
c) pip install matplotlib.*
d) All of these

Seat No.	

Set **P**

S.Y (B. Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Assume suitable data if required.
3) Figures to the right indicates full marks

Section – I

Q.2 Attempt any Three. **12**

a) Describe the process for making sense of data.
b) What are the different types of Variable?
c) Explain broadcasting. Summarize the rules with example.
d) Explain Data preprocessing steps and write Uses of Data Preprocessing.

Q.3 Attempt any One. **08**

a) The following are test scores on a biology exam:
64, 82, 87, 76, 93, 68, 71, 68, 75, 91, 84, 89.
Calculate: mean, median, mode, range, variance, standard deviation.
b) Why there is a need to generate consistent scale across variables? Describe with example.

Q.4 Compulsory Question. **08**

Normalize the following Original Percentage feature in a given table using.
i) Min-Max scaling method
ii) Z-score Method

Student	Original Percentage
Ajay	50
Vijay	60
Spandan	75
Sakshi	80

Section – II

Q.5 Attempt any Three. **12**

a) What is Data Visualization, identify the design principles of data visualization.

b) Write a program to perform concat and merging operation of two datasets using Pandas library.

c) Explain univariate data visualization & Multivariate Data Visualization with suitable example.

d) How to handle missing values in Pandas, explain with example.

Q.6 Attempt any One. **08**

a) List types of tables. Explain it with Example. How Cross classification table is better than summary table?

b) Write the Python code to visualize the Histogram, Bar Chart & scatter plot Consider suitable dataset.

Q.7 Compulsory Question. **08**

Write a program to create Data Frame from dictionary of Series, and write down the output also.

Seat No.	

Set **Q**

S.Y (B. Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) How to handle the missing values in the dataset?
a) dropping the missing rows & columns
b) Replace with some values
c) Compute with mean/mode/median value
d) All of above

2) What is the output of data frame, head() method?
a) return only the first row
b) return only headers or column name of the Data Frame
c) return the first five rows of the Data Frame
d) throw an exception as it expects parameter(number) in parenthesis

3) After installing Pandas, which command is used to import it in a Python script?
a) import pandas as pd
b) import pandas
c) from pandas import*
d) import pandas as pd as np

4) Which Pandas method is used to remove rows with missing data from a Data Frame?
a) df.dropna()
b) df.fillna()
c) df.isna()
d) df.replace()

5) Which function is used to create a histogram in Seaborn?
a) sns.lineplot()
b) sns.histplot()
c) sns.scatterplot()
d) sns.barplot()

6) Which of the following correctly plots a histogram using Matplotlib?
a) plt.hist(data, bins=10)
b) plt.histogram(data, bins=10)
c) sns.histplot(data=data, bins=10)
d) plt.hist(data, 10)

7) Which is the correct command to install Matplotlib?
a) pip install matplotlib
b) pip install matplotlib.pz
c) pip install matplotlib.*
d) All of these

8) Find out the quartile value (Q3) for a given series of data
3, 4, 7, 2, 3, 7, 4 ,2, 4, 7, 4.
a) 4
b) 6
c) 7
d) 2

9) Which of the following is used to find the indices of the maximum and minimum elements in a NumPy array?
a) argmax() and argmin()
b) max() and min()
c) amax() and amin()
d) None of these

10) Which of the following is an example of a nominal variable?
a) Blood pressure
b) Eye color
c) Height of individuals
d) Time taken to complete a task

11) Which of the following is NOT a step in preparing data tables for analysis?
a) Data cleaning
b) Data visualization
c) Removing irrelevant observations
d) Converting data into a suitable format for analysis

12)
```
import numpy as np
a = np.array([[1, 2], [3, 4]])
print(a.ndim)
```
a) 0
b) 1
c) 2
d) 3

13) What are the benefits of Data Visualizations?
a) Better Analysis
b) Identifying patterns
c) Exploring Business Insights
d) All of the above

14) Which method can be used to convert text data to numerical values?
a) One-hot encoding
b) Normalization
c) Binning
d) Grouping

Seat No.	

Set **Q**

S.Y (B. Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Assume suitable data if required.
3) Figures to the right indicates full marks

Section – I

Q.2 Attempt any Three. **12**

a) Describe the process for making sense of data.
b) What are the different types of Variable?
c) Explain broadcasting. Summarize the rules with example.
d) Explain Data preprocessing steps and write Uses of Data Preprocessing.

Q.3 Attempt any One. **08**

a) The following are test scores on a biology exam:
64, 82, 87, 76, 93, 68, 71, 68, 75, 91, 84, 89.
Calculate: mean, median, mode, range, variance, standard deviation.
b) Why there is a need to generate consistent scale across variables? Describe with example.

Q.4 Compulsory Question. **08**

Normalize the following Original Percentage feature in a given table using.
i) Min-Max scaling method
ii) Z-score Method

Student	Original Percentage
Ajay	50
Vijay	60
Spandan	75
Sakshi	80

Section – II

Q.5 Attempt any Three. **12**

a) What is Data Visualization, identify the design principles of data visualization.

b) Write a program to perform concat and merging operation of two datasets using Pandas library.

c) Explain univariate data visualization & Multivariate Data Visualization with suitable example.

d) How to handle missing values in Pandas, explain with example.

Q.6 Attempt any One. **08**

a) List types of tables. Explain it with Example. How Cross classification table is better than summary table?

b) Write the Python code to visualize the Histogram, Bar Chart & scatter plot Consider suitable dataset.

Q.7 Compulsory Question. **08**

Write a program to create Data Frame from dictionary of Series, and write down the output also.

Seat No.	

Set **R**

S.Y (B. Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Which Pandas method is used to remove rows with missing data from a Data Frame?
a) df.dropna() b) df.fillna()
c) df.isna() d) df.replace()

2) Which function is used to create a histogram in Seaborn?
a) sns.lineplot() b) sns.histplot()
c) sns.scatterplot() d) sns.barplot()

3) Which of the following correctly plots a histogram using Matplotlib?
a) plt.hist(data, bins=10)
b) plt.histogram(data, bins=10)
c) sns.histplot(data=data, bins=10)
d) plt.hist(data, 10)

4) Which is the correct command to install Matplotlib?
a) pip install matplotlib b) pip install matplotlib.pz
c) pip install matplotlib.* d) All of these

5) Find out the quartile value (Q3) for a given series of data 3, 4, 7, 2, 3, 7, 4 ,2, 4, 7, 4.
a) 4 b) 6
c) 7 d) 2

6) Which of the following is used to find the indices of the maximum and minimum elements in a NumPy array?
a) argmax() and argmin() b) max() and min()
c) amax() and amin() d) None of these

7) Which of the following is an example of a nominal variable?
a) Blood pressure
b) Eye color
c) Height of individuals
d) Time taken to complete a task

8) Which of the following is NOT a step in preparing data tables for analysis?
a) Data cleaning
b) Data visualization
c) Removing irrelevant observations
d) Converting data into a suitable format for analysis

9)
```
import numpy as np
a = np.array([[1, 2], [3, 4]])
print(a.ndim)
```
a) 0 b) 1
c) 2 d) 3

10) What are the benefits of Data Visualizations?
a) Better Analysis
b) Identifying patterns
c) Exploring Business Insights
d) All of the above

11) Which method can be used to convert text data to numerical values?
a) One-hot encoding b) Normalization
c) Binning d) Grouping

12) How to handle the missing values in the dataset?
a) dropping the missing rows & columns
b) Replace with some values
c) Compute with mean/mode/median value
d) All of above

13) What is the output of data frame, head() method?
a) return only the first row
b) return only headers or column name of the Data Frame
c) return the first five rows of the Data Frame
d) throw an exception as it expects parameter(number) in parenthesis

14) After installing Pandas, which command is used to import it in a Python script?
a) import pandas as pd b) import pandas
c) from pandas import* d) import pandas as pd as np

SLR-BD-165

Seat No.	

Set R

S.Y (B. Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Assume suitable data if required.
3) Figures to the right indicates full marks

Section – I

Q.2 Attempt any Three. **12**

a) Describe the process for making sense of data.
b) What are the different types of Variable?
c) Explain broadcasting. Summarize the rules with example.
d) Explain Data preprocessing steps and write Uses of Data Preprocessing.

Q.3 Attempt any One. **08**

a) The following are test scores on a biology exam:
64, 82, 87, 76, 93, 68, 71, 68, 75, 91, 84, 89.
Calculate: mean, median, mode, range, variance, standard deviation.
b) Why there is a need to generate consistent scale across variables? Describe with example.

Q.4 Compulsory Question. **08**

Normalize the following Original Percentage feature in a given table using.
i) Min-Max scaling method
ii) Z-score Method

Student	Original Percentage
Ajay	50
Vijay	60
Spandan	75
Sakshi	80

Section – II

Q.5 Attempt any Three. **12**

a) What is Data Visualization, identify the design principles of data visualization.

b) Write a program to perform concat and merging operation of two datasets using Pandas library.

c) Explain univariate data visualization & Multivariate Data Visualization with suitable example.

d) How to handle missing values in Pandas, explain with example.

Q.6 Attempt any One. **08**

a) List types of tables. Explain it with Example. How Cross classification table is better than summary table?

b) Write the Python code to visualize the Histogram, Bar Chart & scatter plot Consider suitable dataset.

Q.7 Compulsory Question. **08**

Write a program to create Data Frame from dictionary of Series, and write down the output also.

Seat No.	

Set **S**

S.Y (B. Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) What are the benefits of Data Visualizations?
a) Better Analysis
b) Identifying patterns
c) Exploring Business Insights
d) All of the above

2) Which method can be used to convert text data to numerical values?
a) One-hot encoding b) Normalization
c) Binning d) Grouping

3) How to handle the missing values in the dataset?
a) dropping the missing rows & columns
b) Replace with some values
c) Compute with mean/mode/median value
d) All of above

4) What is the output of data frame, head() method?
a) return only the first row
b) return only headers or column name of the Data Frame
c) return the first five rows of the Data Frame
d) throw an exception as it expects parameter(number) in parenthesis

5) After installing Pandas, which command is used to import it in a Python script?
a) import pandas as pd b) import pandas
c) from pandas import* d) import pandas as pd as np

6) Which Pandas method is used to remove rows with missing data from a Data Frame?

a) df.dropna() b) df.fillna()
c) df.isna() d) df.replace()

7) Which function is used to create a histogram in Seaborn?

a) sns.lineplot() b) sns.histplot()
c) sns.scatterplot() d) sns.barplot()

8) Which of the following correctly plots a histogram using Matplotlib?

a) plt.hist(data, bins=10)
b) plt.histogram(data, bins=10)
c) sns.histplot(data=data, bins=10)
d) plt.hist(data, 10)

9) Which is the correct command to install Matplotlib?

a) pip install matplotlib b) pip install matplotlib.pz
c) pip install matplotlib.* d) All of these

10) Find out the quartile value (Q3) for a given series of data
3, 4, 7, 2, 3, 7, 4 ,2, 4, 7, 4.

a) 4 b) 6
c) 7 d) 2

11) Which of the following is used to find the indices of the maximum and minimum elements in a NumPy array?

a) argmax() and argmin() b) max() and min()
c) amax() and amin() d) None of these

12) Which of the following is an example of a nominal variable?

a) Blood pressure
b) Eye color
c) Height of individuals
d) Time taken to complete a task

13) Which of the following is NOT a step in preparing data tables for analysis?

a) Data cleaning
b) Data visualization
c) Removing irrelevant observations
d) Converting data into a suitable format for analysis

14)
```
import numpy as np
a = np.array([[1, 2], [3, 4]])
print(a.ndim)
```

a) 0 b) 1
c) 2 d) 3

Seat No.	

Set **S**

S.Y (B. Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Assume suitable data if required.
3) Figures to the right indicates full marks

Section – I

Q.2 Attempt any Three. **12**

a) Describe the process for making sense of data.
b) What are the different types of Variable?
c) Explain broadcasting. Summarize the rules with example.
d) Explain Data preprocessing steps and write Uses of Data Preprocessing.

Q.3 Attempt any One. **08**

a) The following are test scores on a biology exam:
64, 82, 87, 76, 93, 68, 71, 68, 75, 91, 84, 89.
Calculate: mean, median, mode, range, variance, standard deviation.
b) Why there is a need to generate consistent scale across variables? Describe with example.

Q.4 Compulsory Question. **08**

Normalize the following Original Percentage feature in a given table using.
i) Min-Max scaling method
ii) Z-score Method

Student	Original Percentage
Ajay	50
Vijay	60
Spandan	75
Sakshi	80

Section – II

Q.5 Attempt any Three. **12**

a) What is Data Visualization, identify the design principles of data visualization.

b) Write a program to perform concat and merging operation of two datasets using Pandas library.

c) Explain univariate data visualization & Multivariate Data Visualization with suitable example.

d) How to handle missing values in Pandas, explain with example.

Q.6 Attempt any One. **08**

a) List types of tables. Explain it with Example. How Cross classification table is better than summary table?

b) Write the Python code to visualize the Histogram, Bar Chart & scatter plot Consider suitable dataset.

Q.7 Compulsory Question. **08**

Write a program to create Data Frame from dictionary of Series, and write down the output also.

SLR-BD-165

Seat No.	

Set P

S.Y (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. 14

1) Find out the quartile value (Q3) for a given series of data
3, 4, 7, 2, 3, 7, 4 ,2, 4, 7, 4.
a) 4 b) 6
c) 7 d) 2

2) Which of the following is used to find the indices of the maximum and minimum elements in a NumPy array?
a) argmax() and argmin() b) max() and min()
c) amax() and amin() d) None of these

3) Which of the following is an example of a nominal variable?
a) Blood pressure
b) Eye color
c) Height of individuals
d) Time taken to complete a task

4) Which of the following is NOT a step in preparing data tables for analysis?
a) Data cleaning
b) Data visualization
c) Removing irrelevant observations
d) Converting data into a suitable format for analysis

5)
```
import numpy as np
a = np.array([[1, 2], [3, 4]])
print(a.ndim)
```
a) 0 b) 1
c) 2 d) 3

6) What are the benefits of Data Visualizations?
a) Better Analysis
b) Identifying patterns
c) Exploring Business Insights
d) All of the above

7) Which method can be used to convert text data to numerical values?
a) One-hot encoding
b) Normalization
c) Binning
d) Grouping

8) How to handle the missing values in the dataset?
a) dropping the missing rows & columns
b) Replace with some values
c) Compute with mean/mode/median value
d) All of above

9) What is the output of data frame, head() method?
a) return only the first row
b) return only headers or column name of the Data Frame
c) return the first five rows of the Data Frame
d) throw an exception as it expects parameter(number) in parenthesis

10) After installing Pandas, which command is used to import it in a Python script?
a) import pandas as pd
b) import pandas
c) from pandas import*
d) import pandas as pd as np

11) Which Pandas method is used to remove rows with missing data from a Data Frame?
a) df.dropna()
b) df.fillna()
c) df.isna()
d) df.replace()

12) Which function is used to create a histogram in Seaborn?
a) sns.lineplot()
b) sns.histplot()
c) sns.scatterplot()
d) sns.barplot()

13) Which of the following correctly plots a histogram using Matplotlib?
a) plt.hist(data, bins=10)
b) plt.histogram(data, bins=10)
c) sns.histplot(data=data, bins=10)
d) plt.hist(data, 10)

14) Which is the correct command to install Matplotlib?
a) pip install matplotlib
b) pip install matplotlib.pz
c) pip install matplotlib.*
d) All of these

SLR-BD-165

Seat No.	

Set P

S.Y (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Assume suitable data if required.
3) Figures to the right indicates full marks

Section – I

Q.2 Attempt any Three. **12**

a) Describe the process for making sense of data.
b) What are the different types of Variable?
c) Explain broadcasting. Summarize the rules with example.
d) Explain Data preprocessing steps and write Uses of Data Preprocessing.

Q.3 Attempt any One. **08**

a) The following are test scores on a biology exam:
64, 82, 87, 76, 93, 68, 71, 68, 75, 91, 84, 89.
Calculate: mean, median, mode, range, variance, standard deviation.
b) Why there is a need to generate consistent scale across variables? Describe with example.

Q.4 Compulsory Question. **08**

Normalize the following Original Percentage feature in a given table using.
i) Min-Max scaling method
ii) Z-score Method

Student	Original Percentage
Ajay	50
Vijay	60
Spandan	75
Sakshi	80

Section – II

Q.5 Attempt any Three. **12**

a) What is Data Visualization, identify the design principles of data visualization.

b) Write a program to perform concat and merging operation of two datasets using Pandas library.

c) Explain univariate data visualization & Multivariate Data Visualization with suitable example.

d) How to handle missing values in Pandas, explain with example.

Q.6 Attempt any One. **08**

a) List types of tables. Explain it with Example. How Cross classification table is better than summary table?

b) Write the Python code to visualize the Histogram, Bar Chart & scatter plot Consider suitable dataset.

Q.7 Compulsory Question. **08**

Write a program to create Data Frame from dictionary of Series, and write down the output also.

Seat No.	

Set **Q**

S.Y (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) How to handle the missing values in the dataset?
a) dropping the missing rows & columns
b) Replace with some values
c) Compute with mean/mode/median value
d) All of above

2) What is the output of data frame, head() method?
a) return only the first row
b) return only headers or column name of the Data Frame
c) return the first five rows of the Data Frame
d) throw an exception as it expects parameter(number) in parenthesis

3) After installing Pandas, which command is used to import it in a Python script?
a) import pandas as pd
b) import pandas
c) from pandas import*
d) import pandas as pd as np

4) Which Pandas method is used to remove rows with missing data from a Data Frame?
a) df.dropna()
b) df.fillna()
c) df.isna()
d) df.replace()

5) Which function is used to create a histogram in Seaborn?
a) sns.lineplot()
b) sns.histplot()
c) sns.scatterplot()
d) sns.barplot()

6) Which of the following correctly plots a histogram using Matplotlib?
a) plt.hist(data, bins=10)
b) plt.histogram(data, bins=10)
c) sns.histplot(data=data, bins=10)
d) plt.hist(data, 10)

7) Which is the correct command to install Matplotlib?
a) pip install matplotlib
b) pip install matplotlib.pz
c) pip install matplotlib.*
d) All of these

8) Find out the quartile value (Q3) for a given series of data
3, 4, 7, 2, 3, 7, 4 ,2, 4, 7, 4.
a) 4
b) 6
c) 7
d) 2

9) Which of the following is used to find the indices of the maximum and minimum elements in a NumPy array?
a) argmax() and argmin()
b) max() and min()
c) amax() and amin()
d) None of these

10) Which of the following is an example of a nominal variable?
a) Blood pressure
b) Eye color
c) Height of individuals
d) Time taken to complete a task

11) Which of the following is NOT a step in preparing data tables for analysis?
a) Data cleaning
b) Data visualization
c) Removing irrelevant observations
d) Converting data into a suitable format for analysis

12)
```
import numpy as np
a = np.array([[1, 2], [3, 4]])
print(a.ndim)
```
a) 0
b) 1
c) 2
d) 3

13) What are the benefits of Data Visualizations?
a) Better Analysis
b) Identifying patterns
c) Exploring Business Insights
d) All of the above

14) Which method can be used to convert text data to numerical values?
a) One-hot encoding
b) Normalization
c) Binning
d) Grouping

SLR-BD-165

Seat No.	

Set Q

S.Y (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Assume suitable data if required.
3) Figures to the right indicates full marks

Section – I

Q.2 Attempt any Three. **12**

a) Describe the process for making sense of data.
b) What are the different types of Variable?
c) Explain broadcasting. Summarize the rules with example.
d) Explain Data preprocessing steps and write Uses of Data Preprocessing.

Q.3 Attempt any One. **08**

a) The following are test scores on a biology exam:
64, 82, 87, 76, 93, 68, 71, 68, 75, 91, 84, 89.
Calculate: mean, median, mode, range, variance, standard deviation.
b) Why there is a need to generate consistent scale across variables? Describe with example.

Q.4 Compulsory Question. **08**

Normalize the following Original Percentage feature in a given table using.
i) Min-Max scaling method
ii) Z-score Method

Student	Original Percentage
Ajay	50
Vijay	60
Spandan	75
Sakshi	80

Section – II

Q.5 Attempt any Three. **12**

a) What is Data Visualization, identify the design principles of data visualization.

b) Write a program to perform concat and merging operation of two datasets using Pandas library.

c) Explain univariate data visualization & Multivariate Data Visualization with suitable example.

d) How to handle missing values in Pandas, explain with example.

Q.6 Attempt any One. **08**

a) List types of tables. Explain it with Example. How Cross classification table is better than summary table?

b) Write the Python code to visualize the Histogram, Bar Chart & scatter plot Consider suitable dataset.

Q.7 Compulsory Question. **08**

Write a program to create Data Frame from dictionary of Series, and write down the output also.

Seat No.	

Set **R**

S.Y (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) Which Pandas method is used to remove rows with missing data from a Data Frame?
a) df.dropna() b) df.fillna()
c) df.isna() d) df.replace()

2) Which function is used to create a histogram in Seaborn?
a) sns.lineplot() b) sns.histplot()
c) sns.scatterplot() d) sns.barplot()

3) Which of the following correctly plots a histogram using Matplotlib?
a) plt.hist(data, bins=10)
b) plt.histogram(data, bins=10)
c) sns.histplot(data=data, bins=10)
d) plt.hist(data, 10)

4) Which is the correct command to install Matplotlib?
a) pip install matplotlib b) pip install matplotlib.pz
c) pip install matplotlib.* d) All of these

5) Find out the quartile value (Q3) for a given series of data 3, 4, 7, 2, 3, 7, 4 ,2, 4, 7, 4.
a) 4 b) 6
c) 7 d) 2

6) Which of the following is used to find the indices of the maximum and minimum elements in a NumPy array?
a) argmax() and argmin() b) max() and min()
c) amax() and amin() d) None of these

7) Which of the following is an example of a nominal variable?
a) Blood pressure
b) Eye color
c) Height of individuals
d) Time taken to complete a task

8) Which of the following is NOT a step in preparing data tables for analysis?
a) Data cleaning
b) Data visualization
c) Removing irrelevant observations
d) Converting data into a suitable format for analysis

9)
```
import numpy as np
a = np.array([[1, 2], [3, 4]])
print(a.ndim)
```
a) 0 b) 1
c) 2 d) 3

10) What are the benefits of Data Visualizations?
a) Better Analysis
b) Identifying patterns
c) Exploring Business Insights
d) All of the above

11) Which method can be used to convert text data to numerical values?
a) One-hot encoding b) Normalization
c) Binning d) Grouping

12) How to handle the missing values in the dataset?
a) dropping the missing rows & columns
b) Replace with some values
c) Compute with mean/mode/median value
d) All of above

13) What is the output of data frame, head() method?
a) return only the first row
b) return only headers or column name of the Data Frame
c) return the first five rows of the Data Frame
d) throw an exception as it expects parameter(number) in parenthesis

14) After installing Pandas, which command is used to import it in a Python script?
a) import pandas as pd b) import pandas
c) from pandas import* d) import pandas as pd as np

Seat No.	

Set **R**

S.Y (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Assume suitable data if required.
3) Figures to the right indicates full marks

Section – I

Q.2 Attempt any Three. **12**

a) Describe the process for making sense of data.
b) What are the different types of Variable?
c) Explain broadcasting. Summarize the rules with example.
d) Explain Data preprocessing steps and write Uses of Data Preprocessing.

Q.3 Attempt any One. **08**

a) The following are test scores on a biology exam:
64, 82, 87, 76, 93, 68, 71, 68, 75, 91, 84, 89.
Calculate: mean, median, mode, range, variance, standard deviation.
b) Why there is a need to generate consistent scale across variables? Describe with example.

Q.4 Compulsory Question. **08**

Normalize the following Original Percentage feature in a given table using.
i) Min-Max scaling method
ii) Z-score Method

Student	Original Percentage
Ajay	50
Vijay	60
Spandan	75
Sakshi	80

Section – II

Q.5 Attempt any Three. **12**

a) What is Data Visualization, identify the design principles of data visualization.

b) Write a program to perform concat and merging operation of two datasets using Pandas library.

c) Explain univariate data visualization & Multivariate Data Visualization with suitable example.

d) How to handle missing values in Pandas, explain with example.

Q.6 Attempt any One. **08**

a) List types of tables. Explain it with Example. How Cross classification table is better than summary table?

b) Write the Python code to visualize the Histogram, Bar Chart & scatter plot Consider suitable dataset.

Q.7 Compulsory Question. **08**

Write a program to create Data Frame from dictionary of Series, and write down the output also.

SLR-BD-165

Seat No.	

Set S

S.Y (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following. **14**

1) What are the benefits of Data Visualizations?
a) Better Analysis
b) Identifying patterns
c) Exploring Business Insights
d) All of the above

2) Which method can be used to convert text data to numerical values?
a) One-hot encoding b) Normalization
c) Binning d) Grouping

3) How to handle the missing values in the dataset?
a) dropping the missing rows & columns
b) Replace with some values
c) Compute with mean/mode/median value
d) All of above

4) What is the output of data frame, head() method?
a) return only the first row
b) return only headers or column name of the Data Frame
c) return the first five rows of the Data Frame
d) throw an exception as it expects parameter(number) in parenthesis

5) After installing Pandas, which command is used to import it in a Python script?
a) import pandas as pd b) import pandas
c) from pandas import* d) import pandas as pd as np

6) Which Pandas method is used to remove rows with missing data from a Data Frame?

a) df.dropna() b) df.fillna()
c) df.isna() d) df.replace()

7) Which function is used to create a histogram in Seaborn?

a) sns.lineplot() b) sns.histplot()
c) sns.scatterplot() d) sns.barplot()

8) Which of the following correctly plots a histogram using Matplotlib?

a) plt.hist(data, bins=10)
b) plt.histogram(data, bins=10)
c) sns.histplot(data=data, bins=10)
d) plt.hist(data, 10)

9) Which is the correct command to install Matplotlib?

a) pip install matplotlib b) pip install matplotlib.pz
c) pip install matplotlib.* d) All of these

10) Find out the quartile value (Q3) for a given series of data
3, 4, 7, 2, 3, 7, 4 ,2, 4, 7, 4.

a) 4 b) 6
c) 7 d) 2

11) Which of the following is used to find the indices of the maximum and minimum elements in a NumPy array?

a) argmax() and argmin() b) max() and min()
c) amax() and amin() d) None of these

12) Which of the following is an example of a nominal variable?

a) Blood pressure
b) Eye color
c) Height of individuals
d) Time taken to complete a task

13) Which of the following is NOT a step in preparing data tables for analysis?

a) Data cleaning
b) Data visualization
c) Removing irrelevant observations
d) Converting data into a suitable format for analysis

14)
```
import numpy as np
a = np.array([[1, 2], [3, 4]])
print(a.ndim)
```

a) 0 b) 1
c) 2 d) 3

Seat No.	

Set **S**

S.Y (B. Tech.) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Data Pre-processing & Visualization (CSEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Assume suitable data if required.
3) Figures to the right indicates full marks

Section – I

Q.2 Attempt any Three. **12**

a) Describe the process for making sense of data.
b) What are the different types of Variable?
c) Explain broadcasting. Summarize the rules with example.
d) Explain Data preprocessing steps and write Uses of Data Preprocessing.

Q.3 Attempt any One. **08**

a) The following are test scores on a biology exam:
64, 82, 87, 76, 93, 68, 71, 68, 75, 91, 84, 89.
Calculate: mean, median, mode, range, variance, standard deviation.
b) Why there is a need to generate consistent scale across variables? Describe with example.

Q.4 Compulsory Question. **08**

Normalize the following Original Percentage feature in a given table using.
i) Min-Max scaling method
ii) Z-score Method

Student	Original Percentage
Ajay	50
Vijay	60
Spandan	75
Sakshi	80

Section – II

Q.5 Attempt any Three. **12**

a) What is Data Visualization, identify the design principles of data visualization.

b) Write a program to perform concat and merging operation of two datasets using Pandas library.

c) Explain univariate data visualization & Multivariate Data Visualization with suitable example.

d) How to handle missing values in Pandas, explain with example.

Q.6 Attempt any One. **08**

a) List types of tables. Explain it with Example. How Cross classification table is better than summary table?

b) Write the Python code to visualize the Histogram, Bar Chart & scatter plot Consider suitable dataset.

Q.7 Compulsory Question. **08**

Write a program to create Data Frame from dictionary of Series, and write down the output also.

SLR-BD-166

Seat No.	

Set P

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) This money is considered as an investment by the organization in doing quality work.
a) Blue Money b) White Money
c) Green Money d) Red Money

2) The objective of _____ is to find problems and fix them to improve the quality of a project.
a) Software bug b) Software complexity
c) Software testing d) Software development

3) Defects found in testing are blamed on developers.
a) True b) False

4) Black box testing is also called as ____.
a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

5) Which of the following is NOT a black box testing technique?
a) Equivalence partitioning b) Boundary value analysis
c) White box testing d) Decision table testing

6) It is an activity where we check the work products with reference to standards, guidelines and procedures.
a) Validation b) Quality Assurance
c) Verification d) None

7) Which of the following is considered a primary factor in determining software quality?
   a) Number of developers
   b) User requirements
   c) Project deadline
   d) Programming language used

8) _____ is intended to determine whether the changed components have introduced any error in unchanged components of the system.
   a) Regression Testing b) Stress Testing
   c) Usability Testing d) Installation Testing

9) At which level of testing is the entire system tested to ensure that it meets the specified requirements?
   a) Unit Testing b) Integration Testing
   c) System Testing d) Acceptance Testing

10) White Box Testing is also called as _____
   a) Functional testing b) Structural testing
   c) Stress testing d) Interface testing

11) _____ is the process of methodically reducing the huge set of possible test cases into a much smaller, but still equally effective set.
   a) Test Planning b) Test Strategy
   c) Test Design d) Equivalence Partitioning

12) _____ is a first level of testing.
   a) Unit testing b) Integration Testing
   c) System Testing d) None of above

13) CMM means _____
   a) Common Maturity Model b) Cost Maturity Model
   c) Capability Maturity Model d) All

14) When testing principles are useful?
   a) During testing b) During execution
   c) During review d) Throughout life-cycle

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer all the questions from Section-I & Section-II.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

Section – I

Q.2 Attempt any four **16**

a) What are the misconceptions about testing?
b) Features of good Testing.
c) Compare White and Black box testing.
d) Explain Compatibility testing in detail.
e) Explain State Testing in brief.

Q.3 Attempt any two **12**

a) Write Short note on Equivalence Partitioning with example.
b) Draw and explain Verification and Validation model.
c) Explain Acceptance testing in detail.

Section – II

Q.4 Attempt any four **16**

a) Explain goals of Test Case Planning.
b) Explain five views of quality.
c) Explain CMM with diagram.
d) Explain Random testing in automation.
e) Explain Software Test Automation.

Q.5 Attempt any two **12**

a) What are the contents in test planning? Explain in detail.
b) Write few benefits of using automation and tools.
c) Explain SQA Processes and Product Characteristics.

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ is intended to determine whether the changed components have introduced any error in unchanged components of the system.
a) Regression Testing b) Stress Testing
c) Usability Testing d) Installation Testing

2) At which level of testing is the entire system tested to ensure that it meets the specified requirements?
a) Unit Testing b) Integration Testing
c) System Testing d) Acceptance Testing

3) White Box Testing is also called as _____
a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

4) _____ is the process of methodically reducing the huge set of possible test cases into a much smaller, but still equally effective set.
a) Test Planning b) Test Strategy
c) Test Design d) Equivalence Partitioning

5) _____ is a first level of testing.
a) Unit testing b) Integration Testing
c) System Testing d) None of above

6) CMM means _____
a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

7) When testing principles are useful?
a) During testing b) During execution
c) During review d) Throughout life-cycle

8) This money is considered as an investment by the organization in doing quality work.
a) Blue Money
b) White Money
c) Green Money
d) Red Money

9) The objective of _____ is to find problems and fix them to improve the quality of a project.
a) Software bug
b) Software complexity
c) Software testing
d) Software development

10) Defects found in testing are blamed on developers.
a) True
b) False

11) Black box testing is also called as ____.
a) Structural testing
b) Interface testing
c) Stress testing
d) Functional testing

12) Which of the following is NOT a black box testing technique?
a) Equivalence partitioning
b) Boundary value analysis
c) White box testing
d) Decision table testing

13) It is an activity where we check the work products with reference to standards, guidelines and procedures.
a) Validation
b) Quality Assurance
c) Verification
d) None

14) Which of the following is considered a primary factor in determining software quality?
a) Number of developers
b) User requirements
c) Project deadline
d) Programming language used

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer all the questions from Section-I & Section-II.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

Section – I

Q.2 Attempt any four **16**

a) What are the misconceptions about testing?
b) Features of good Testing.
c) Compare White and Black box testing.
d) Explain Compatibility testing in detail.
e) Explain State Testing in brief.

Q.3 Attempt any two **12**

a) Write Short note on Equivalence Partitioning with example.
b) Draw and explain Verification and Validation model.
c) Explain Acceptance testing in detail.

Section – II

Q.4 Attempt any four **16**

a) Explain goals of Test Case Planning.
b) Explain five views of quality.
c) Explain CMM with diagram.
d) Explain Random testing in automation.
e) Explain Software Test Automation.

Q.5 Attempt any two **12**

a) What are the contents in test planning? Explain in detail.
b) Write few benefits of using automation and tools.
c) Explain SQA Processes and Product Characteristics.

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ is the process of methodically reducing the huge set of possible test cases into a much smaller, but still equally effective set.
a) Test Planning b) Test Strategy
c) Test Design d) Equivalence Partitioning

2) _____ is a first level of testing.
a) Unit testing b) Integration Testing
c) System Testing d) None of above

3) CMM means _____
a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

4) When testing principles are useful?
a) During testing b) During execution
c) During review d) Throughout life-cycle

5) This money is considered as an investment by the organization in doing quality work.
a) Blue Money b) White Money
c) Green Money d) Red Money

6) The objective of _____ is to find problems and fix them to improve the quality of a project.
a) Software bug b) Software complexity
c) Software testing d) Software development

7) Defects found in testing are blamed on developers.
a) True b) False

8) Black box testing is also called as ____.
a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

9) Which of the following is NOT a black box testing technique?
a) Equivalence partitioning b) Boundary value analysis
c) White box testing d) Decision table testing

10) It is an activity where we check the work products with reference to standards, guidelines and procedures.
a) Validation b) Quality Assurance
c) Verification d) None

11) Which of the following is considered a primary factor in determining software quality?
a) Number of developers
b) User requirements
c) Project deadline
d) Programming language used

12) _____ is intended to determine whether the changed components have introduced any error in unchanged components of the system.
a) Regression Testing b) Stress Testing
c) Usability Testing d) Installation Testing

13) At which level of testing is the entire system tested to ensure that it meets the specified requirements?
a) Unit Testing b) Integration Testing
c) System Testing d) Acceptance Testing

14) White Box Testing is also called as _____
a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer all the questions from Section-I & Section-II.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

Section – I

Q.2 Attempt any four **16**

a) What are the misconceptions about testing?
b) Features of good Testing.
c) Compare White and Black box testing.
d) Explain Compatibility testing in detail.
e) Explain State Testing in brief.

Q.3 Attempt any two **12**

a) Write Short note on Equivalence Partitioning with example.
b) Draw and explain Verification and Validation model.
c) Explain Acceptance testing in detail.

Section – II

Q.4 Attempt any four **16**

a) Explain goals of Test Case Planning.
b) Explain five views of quality.
c) Explain CMM with diagram.
d) Explain Random testing in automation.
e) Explain Software Test Automation.

Q.5 Attempt any two **12**

a) What are the contents in test planning? Explain in detail.
b) Write few benefits of using automation and tools.
c) Explain SQA Processes and Product Characteristics.

Seat No.		Set	S

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) It is an activity where we check the work products with reference to standards, guidelines and procedures.
a) Validation b) Quality Assurance
c) Verification d) None

2) Which of the following is considered a primary factor in determining software quality?
a) Number of developers
b) User requirements
c) Project deadline
d) Programming language used

3) _____ is intended to determine whether the changed components have introduced any error in unchanged components of the system.
a) Regression Testing b) Stress Testing
c) Usability Testing d) Installation Testing

4) At which level of testing is the entire system tested to ensure that it meets the specified requirements?
a) Unit Testing b) Integration Testing
c) System Testing d) Acceptance Testing

5) White Box Testing is also called as _____
a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

6) _____ is the process of methodically reducing the huge set of possible test cases into a much smaller, but still equally effective set.
a) Test Planning b) Test Strategy
c) Test Design d) Equivalence Partitioning

7) _____ is a first level of testing.
a) Unit testing b) Integration Testing
c) System Testing d) None of above

8) CMM means _____
a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

9) When testing principles are useful?
a) During testing b) During execution
c) During review d) Throughout life-cycle

10) This money is considered as an investment by the organization in doing quality work.
a) Blue Money b) White Money
c) Green Money d) Red Money

11) The objective of _____ is to find problems and fix them to improve the quality of a project.
a) Software bug b) Software complexity
c) Software testing d) Software development

12) Defects found in testing are blamed on developers.
a) True b) False

13) Black box testing is also called as ____.
a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

14) Which of the following is NOT a black box testing technique?
a) Equivalence partitioning b) Boundary value analysis
c) White box testing d) Decision table testing

SLR-BD-166

Seat No.	

Set S

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer all the questions from Section-I & Section-II.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

Section – I

Q.2 Attempt any four **16**

a) What are the misconceptions about testing?
b) Features of good Testing.
c) Compare White and Black box testing.
d) Explain Compatibility testing in detail.
e) Explain State Testing in brief.

Q.3 Attempt any two **12**

a) Write Short note on Equivalence Partitioning with example.
b) Draw and explain Verification and Validation model.
c) Explain Acceptance testing in detail.

Section – II

Q.4 Attempt any four **16**

a) Explain goals of Test Case Planning.
b) Explain five views of quality.
c) Explain CMM with diagram.
d) Explain Random testing in automation.
e) Explain Software Test Automation.

Q.5 Attempt any two **12**

a) What are the contents in test planning? Explain in detail.
b) Write few benefits of using automation and tools.
c) Explain SQA Processes and Product Characteristics.

Seat No.	

Set P

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) This money is considered as an investment by the organization in doing quality work.
a) Blue Money b) White Money
c) Green Money d) Red Money

2) The objective of _____ is to find problems and fix them to improve the quality of a project.
a) Software bug b) Software complexity
c) Software testing d) Software development

3) Defects found in testing are blamed on developers.
a) True b) False

4) Black box testing is also called as ____.
a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

5) Which of the following is NOT a black box testing technique?
a) Equivalence partitioning b) Boundary value analysis
c) White box testing d) Decision table testing

6) It is an activity where we check the work products with reference to standards, guidelines and procedures.
a) Validation b) Quality Assurance
c) Verification d) None

7) Which of the following is considered a primary factor in determining software quality?
   a) Number of developers
   b) User requirements
   c) Project deadline
   d) Programming language used

8) _____ is intended to determine whether the changed components have introduced any error in unchanged components of the system.
   a) Regression Testing b) Stress Testing
   c) Usability Testing d) Installation Testing

9) At which level of testing is the entire system tested to ensure that it meets the specified requirements?
   a) Unit Testing b) Integration Testing
   c) System Testing d) Acceptance Testing

10) White Box Testing is also called as _____
   a) Functional testing b) Structural testing
   c) Stress testing d) Interface testing

11) _____ is the process of methodically reducing the huge set of possible test cases into a much smaller, but still equally effective set.
   a) Test Planning b) Test Strategy
   c) Test Design d) Equivalence Partitioning

12) _____ is a first level of testing.
   a) Unit testing b) Integration Testing
   c) System Testing d) None of above

13) CMM means _____
   a) Common Maturity Model b) Cost Maturity Model
   c) Capability Maturity Model d) All

14) When testing principles are useful?
   a) During testing b) During execution
   c) During review d) Throughout life-cycle

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer all the questions from Section-I & Section-II.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

Section – I

Q.2 Attempt any four **16**

a) What are the misconceptions about testing?
b) Features of good Testing.
c) Compare White and Black box testing.
d) Explain Compatibility testing in detail.
e) Explain State Testing in brief.

Q.3 Attempt any two **12**

a) Write Short note on Equivalence Partitioning with example.
b) Draw and explain Verification and Validation model.
c) Explain Acceptance testing in detail.

Section – II

Q.4 Attempt any four **16**

a) Explain goals of Test Case Planning.
b) Explain five views of quality.
c) Explain CMM with diagram.
d) Explain Random testing in automation.
e) Explain Software Test Automation.

Q.5 Attempt any two **12**

a) What are the contents in test planning? Explain in detail.
b) Write few benefits of using automation and tools.
c) Explain SQA Processes and Product Characteristics.

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ is intended to determine whether the changed components have introduced any error in unchanged components of the system.
a) Regression Testing b) Stress Testing
c) Usability Testing d) Installation Testing

2) At which level of testing is the entire system tested to ensure that it meets the specified requirements?
a) Unit Testing b) Integration Testing
c) System Testing d) Acceptance Testing

3) White Box Testing is also called as _____
a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

4) _____ is the process of methodically reducing the huge set of possible test cases into a much smaller, but still equally effective set.
a) Test Planning b) Test Strategy
c) Test Design d) Equivalence Partitioning

5) _____ is a first level of testing.
a) Unit testing b) Integration Testing
c) System Testing d) None of above

6) CMM means _____
a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

7) When testing principles are useful?
a) During testing b) During execution
c) During review d) Throughout life-cycle

8) This money is considered as an investment by the organization in doing quality work.
a) Blue Money
b) White Money
c) Green Money
d) Red Money

9) The objective of _____ is to find problems and fix them to improve the quality of a project.
a) Software bug
b) Software complexity
c) Software testing
d) Software development

10) Defects found in testing are blamed on developers.
a) True
b) False

11) Black box testing is also called as ____.
a) Structural testing
b) Interface testing
c) Stress testing
d) Functional testing

12) Which of the following is NOT a black box testing technique?
a) Equivalence partitioning
b) Boundary value analysis
c) White box testing
d) Decision table testing

13) It is an activity where we check the work products with reference to standards, guidelines and procedures.
a) Validation
b) Quality Assurance
c) Verification
d) None

14) Which of the following is considered a primary factor in determining software quality?
a) Number of developers
b) User requirements
c) Project deadline
d) Programming language used

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer all the questions from Section-I & Section-II.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

Section – I

Q.2 Attempt any four **16**

a) What are the misconceptions about testing?
b) Features of good Testing.
c) Compare White and Black box testing.
d) Explain Compatibility testing in detail.
e) Explain State Testing in brief.

Q.3 Attempt any two **12**

a) Write Short note on Equivalence Partitioning with example.
b) Draw and explain Verification and Validation model.
c) Explain Acceptance testing in detail.

Section – II

Q.4 Attempt any four **16**

a) Explain goals of Test Case Planning.
b) Explain five views of quality.
c) Explain CMM with diagram.
d) Explain Random testing in automation.
e) Explain Software Test Automation.

Q.5 Attempt any two **12**

a) What are the contents in test planning? Explain in detail.
b) Write few benefits of using automation and tools.
c) Explain SQA Processes and Product Characteristics.

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ is the process of methodically reducing the huge set of possible test cases into a much smaller, but still equally effective set.
a) Test Planning b) Test Strategy
c) Test Design d) Equivalence Partitioning

2) _____ is a first level of testing.
a) Unit testing b) Integration Testing
c) System Testing d) None of above

3) CMM means _____
a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

4) When testing principles are useful?
a) During testing b) During execution
c) During review d) Throughout life-cycle

5) This money is considered as an investment by the organization in doing quality work.
a) Blue Money b) White Money
c) Green Money d) Red Money

6) The objective of _____ is to find problems and fix them to improve the quality of a project.
a) Software bug b) Software complexity
c) Software testing d) Software development

7) Defects found in testing are blamed on developers.
a) True b) False

8) Black box testing is also called as ____.
a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

9) Which of the following is NOT a black box testing technique?
a) Equivalence partitioning b) Boundary value analysis
c) White box testing d) Decision table testing

10) It is an activity where we check the work products with reference to standards, guidelines and procedures.
a) Validation b) Quality Assurance
c) Verification d) None

11) Which of the following is considered a primary factor in determining software quality?
a) Number of developers
b) User requirements
c) Project deadline
d) Programming language used

12) _____ is intended to determine whether the changed components have introduced any error in unchanged components of the system.
a) Regression Testing b) Stress Testing
c) Usability Testing d) Installation Testing

13) At which level of testing is the entire system tested to ensure that it meets the specified requirements?
a) Unit Testing b) Integration Testing
c) System Testing d) Acceptance Testing

14) White Box Testing is also called as _____
a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer all the questions from Section-I & Section-II.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

Section – I

Q.2 Attempt any four **16**

a) What are the misconceptions about testing?
b) Features of good Testing.
c) Compare White and Black box testing.
d) Explain Compatibility testing in detail.
e) Explain State Testing in brief.

Q.3 Attempt any two **12**

a) Write Short note on Equivalence Partitioning with example.
b) Draw and explain Verification and Validation model.
c) Explain Acceptance testing in detail.

Section – II

Q.4 Attempt any four **16**

a) Explain goals of Test Case Planning.
b) Explain five views of quality.
c) Explain CMM with diagram.
d) Explain Random testing in automation.
e) Explain Software Test Automation.

Q.5 Attempt any two **12**

a) What are the contents in test planning? Explain in detail.
b) Write few benefits of using automation and tools.
c) Explain SQA Processes and Product Characteristics.

Seat No.		Set	S

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) It is an activity where we check the work products with reference to standards, guidelines and procedures.
a) Validation b) Quality Assurance
c) Verification d) None

2) Which of the following is considered a primary factor in determining software quality?
a) Number of developers
b) User requirements
c) Project deadline
d) Programming language used

3) _____ is intended to determine whether the changed components have introduced any error in unchanged components of the system.
a) Regression Testing b) Stress Testing
c) Usability Testing d) Installation Testing

4) At which level of testing is the entire system tested to ensure that it meets the specified requirements?
a) Unit Testing b) Integration Testing
c) System Testing d) Acceptance Testing

5) White Box Testing is also called as _____
a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

6) _____ is the process of methodically reducing the huge set of possible test cases into a much smaller, but still equally effective set.
a) Test Planning b) Test Strategy
c) Test Design d) Equivalence Partitioning

7) _____ is a first level of testing.
a) Unit testing b) Integration Testing
c) System Testing d) None of above

8) CMM means _____
a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

9) When testing principles are useful?
a) During testing b) During execution
c) During review d) Throughout life-cycle

10) This money is considered as an investment by the organization in doing quality work.
a) Blue Money b) White Money
c) Green Money d) Red Money

11) The objective of _____ is to find problems and fix them to improve the quality of a project.
a) Software bug b) Software complexity
c) Software testing d) Software development

12) Defects found in testing are blamed on developers.
a) True b) False

13) Black box testing is also called as ____.
a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

14) Which of the following is NOT a black box testing technique?
a) Equivalence partitioning b) Boundary value analysis
c) White box testing d) Decision table testing

Seat No.	

Set **S**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer all the questions from Section-I & Section-II.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

Section – I

Q.2 Attempt any four **16**

a) What are the misconceptions about testing?
b) Features of good Testing.
c) Compare White and Black box testing.
d) Explain Compatibility testing in detail.
e) Explain State Testing in brief.

Q.3 Attempt any two **12**

a) Write Short note on Equivalence Partitioning with example.
b) Draw and explain Verification and Validation model.
c) Explain Acceptance testing in detail.

Section – II

Q.4 Attempt any four **16**

a) Explain goals of Test Case Planning.
b) Explain five views of quality.
c) Explain CMM with diagram.
d) Explain Random testing in automation.
e) Explain Software Test Automation.

Q.5 Attempt any two **12**

a) What are the contents in test planning? Explain in detail.
b) Write few benefits of using automation and tools.
c) Explain SQA Processes and Product Characteristics.

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) This money is considered as an investment by the organization in doing quality work.
a) Blue Money b) White Money
c) Green Money d) Red Money

2) The objective of _____ is to find problems and fix them to improve the quality of a project.
a) Software bug b) Software complexity
c) Software testing d) Software development

3) Defects found in testing are blamed on developers.
a) True b) False

4) Black box testing is also called as ____.
a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

5) Which of the following is NOT a black box testing technique?
a) Equivalence partitioning b) Boundary value analysis
c) White box testing d) Decision table testing

6) It is an activity where we check the work products with reference to standards, guidelines and procedures.
a) Validation b) Quality Assurance
c) Verification d) None

7) Which of the following is considered a primary factor in determining software quality?
   a) Number of developers
   b) User requirements
   c) Project deadline
   d) Programming language used

8) _____ is intended to determine whether the changed components have introduced any error in unchanged components of the system.
   a) Regression Testing b) Stress Testing
   c) Usability Testing d) Installation Testing

9) At which level of testing is the entire system tested to ensure that it meets the specified requirements?
   a) Unit Testing b) Integration Testing
   c) System Testing d) Acceptance Testing

10) White Box Testing is also called as _____
   a) Functional testing b) Structural testing
   c) Stress testing d) Interface testing

11) _____ is the process of methodically reducing the huge set of possible test cases into a much smaller, but still equally effective set.
   a) Test Planning b) Test Strategy
   c) Test Design d) Equivalence Partitioning

12) _____ is a first level of testing.
   a) Unit testing b) Integration Testing
   c) System Testing d) None of above

13) CMM means _____
   a) Common Maturity Model b) Cost Maturity Model
   c) Capability Maturity Model d) All

14) When testing principles are useful?
   a) During testing b) During execution
   c) During review d) Throughout life-cycle

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer all the questions from Section-I & Section-II.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

Section – I

Q.2 Attempt any four **16**

a) What are the misconceptions about testing?
b) Features of good Testing.
c) Compare White and Black box testing.
d) Explain Compatibility testing in detail.
e) Explain State Testing in brief.

Q.3 Attempt any two **12**

a) Write Short note on Equivalence Partitioning with example.
b) Draw and explain Verification and Validation model.
c) Explain Acceptance testing in detail.

Section – II

Q.4 Attempt any four **16**

a) Explain goals of Test Case Planning.
b) Explain five views of quality.
c) Explain CMM with diagram.
d) Explain Random testing in automation.
e) Explain Software Test Automation.

Q.5 Attempt any two **12**

a) What are the contents in test planning? Explain in detail.
b) Write few benefits of using automation and tools.
c) Explain SQA Processes and Product Characteristics.

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ is intended to determine whether the changed components have introduced any error in unchanged components of the system.
a) Regression Testing b) Stress Testing
c) Usability Testing d) Installation Testing

2) At which level of testing is the entire system tested to ensure that it meets the specified requirements?
a) Unit Testing b) Integration Testing
c) System Testing d) Acceptance Testing

3) White Box Testing is also called as _____
a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

4) _____ is the process of methodically reducing the huge set of possible test cases into a much smaller, but still equally effective set.
a) Test Planning b) Test Strategy
c) Test Design d) Equivalence Partitioning

5) _____ is a first level of testing.
a) Unit testing b) Integration Testing
c) System Testing d) None of above

6) CMM means _____
a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

7) When testing principles are useful?
a) During testing b) During execution
c) During review d) Throughout life-cycle

8) This money is considered as an investment by the organization in doing quality work.
a) Blue Money
b) White Money
c) Green Money
d) Red Money

9) The objective of _____ is to find problems and fix them to improve the quality of a project.
a) Software bug
b) Software complexity
c) Software testing
d) Software development

10) Defects found in testing are blamed on developers.
a) True
b) False

11) Black box testing is also called as ____.
a) Structural testing
b) Interface testing
c) Stress testing
d) Functional testing

12) Which of the following is NOT a black box testing technique?
a) Equivalence partitioning
b) Boundary value analysis
c) White box testing
d) Decision table testing

13) It is an activity where we check the work products with reference to standards, guidelines and procedures.
a) Validation
b) Quality Assurance
c) Verification
d) None

14) Which of the following is considered a primary factor in determining software quality?
a) Number of developers
b) User requirements
c) Project deadline
d) Programming language used

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer all the questions from Section-I & Section-II.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

Section – I

Q.2 Attempt any four **16**

a) What are the misconceptions about testing?
b) Features of good Testing.
c) Compare White and Black box testing.
d) Explain Compatibility testing in detail.
e) Explain State Testing in brief.

Q.3 Attempt any two **12**

a) Write Short note on Equivalence Partitioning with example.
b) Draw and explain Verification and Validation model.
c) Explain Acceptance testing in detail.

Section – II

Q.4 Attempt any four **16**

a) Explain goals of Test Case Planning.
b) Explain five views of quality.
c) Explain CMM with diagram.
d) Explain Random testing in automation.
e) Explain Software Test Automation.

Q.5 Attempt any two **12**

a) What are the contents in test planning? Explain in detail.
b) Write few benefits of using automation and tools.
c) Explain SQA Processes and Product Characteristics.

Seat No.		Set	R

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ is the process of methodically reducing the huge set of possible test cases into a much smaller, but still equally effective set.
a) Test Planning b) Test Strategy
c) Test Design d) Equivalence Partitioning

2) _____ is a first level of testing.
a) Unit testing b) Integration Testing
c) System Testing d) None of above

3) CMM means _____
a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

4) When testing principles are useful?
a) During testing b) During execution
c) During review d) Throughout life-cycle

5) This money is considered as an investment by the organization in doing quality work.
a) Blue Money b) White Money
c) Green Money d) Red Money

6) The objective of _____ is to find problems and fix them to improve the quality of a project.
a) Software bug b) Software complexity
c) Software testing d) Software development

7) Defects found in testing are blamed on developers.
a) True b) False

8) Black box testing is also called as ____.
a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

9) Which of the following is NOT a black box testing technique?
a) Equivalence partitioning b) Boundary value analysis
c) White box testing d) Decision table testing

10) It is an activity where we check the work products with reference to standards, guidelines and procedures.
a) Validation b) Quality Assurance
c) Verification d) None

11) Which of the following is considered a primary factor in determining software quality?
a) Number of developers
b) User requirements
c) Project deadline
d) Programming language used

12) _____ is intended to determine whether the changed components have introduced any error in unchanged components of the system.
a) Regression Testing b) Stress Testing
c) Usability Testing d) Installation Testing

13) At which level of testing is the entire system tested to ensure that it meets the specified requirements?
a) Unit Testing b) Integration Testing
c) System Testing d) Acceptance Testing

14) White Box Testing is also called as _____
a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer all the questions from Section-I & Section-II.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

Section – I

Q.2 Attempt any four **16**

a) What are the misconceptions about testing?
b) Features of good Testing.
c) Compare White and Black box testing.
d) Explain Compatibility testing in detail.
e) Explain State Testing in brief.

Q.3 Attempt any two **12**

a) Write Short note on Equivalence Partitioning with example.
b) Draw and explain Verification and Validation model.
c) Explain Acceptance testing in detail.

Section – II

Q.4 Attempt any four **16**

a) Explain goals of Test Case Planning.
b) Explain five views of quality.
c) Explain CMM with diagram.
d) Explain Random testing in automation.
e) Explain Software Test Automation.

Q.5 Attempt any two **12**

a) What are the contents in test planning? Explain in detail.
b) Write few benefits of using automation and tools.
c) Explain SQA Processes and Product Characteristics.

Seat No.		Set	S

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) It is an activity where we check the work products with reference to standards, guidelines and procedures.
a) Validation b) Quality Assurance
c) Verification d) None

2) Which of the following is considered a primary factor in determining software quality?
a) Number of developers
b) User requirements
c) Project deadline
d) Programming language used

3) _____ is intended to determine whether the changed components have introduced any error in unchanged components of the system.
a) Regression Testing b) Stress Testing
c) Usability Testing d) Installation Testing

4) At which level of testing is the entire system tested to ensure that it meets the specified requirements?
a) Unit Testing b) Integration Testing
c) System Testing d) Acceptance Testing

5) White Box Testing is also called as _____
a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

6) _____ is the process of methodically reducing the huge set of possible test cases into a much smaller, but still equally effective set.
a) Test Planning b) Test Strategy
c) Test Design d) Equivalence Partitioning

7) _____ is a first level of testing.
a) Unit testing b) Integration Testing
c) System Testing d) None of above

8) CMM means _____
a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

9) When testing principles are useful?
a) During testing b) During execution
c) During review d) Throughout life-cycle

10) This money is considered as an investment by the organization in doing quality work.
a) Blue Money b) White Money
c) Green Money d) Red Money

11) The objective of _____ is to find problems and fix them to improve the quality of a project.
a) Software bug b) Software complexity
c) Software testing d) Software development

12) Defects found in testing are blamed on developers.
a) True b) False

13) Black box testing is also called as ____.
a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

14) Which of the following is NOT a black box testing technique?
a) Equivalence partitioning b) Boundary value analysis
c) White box testing d) Decision table testing

SLR-BD-166

Seat No.		Set	S

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer all the questions from Section-I & Section-II.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

Section – I

Q.2 Attempt any four **16**

a) What are the misconceptions about testing?
b) Features of good Testing.
c) Compare White and Black box testing.
d) Explain Compatibility testing in detail.
e) Explain State Testing in brief.

Q.3 Attempt any two **12**

a) Write Short note on Equivalence Partitioning with example.
b) Draw and explain Verification and Validation model.
c) Explain Acceptance testing in detail.

Section – II

Q.4 Attempt any four **16**

a) Explain goals of Test Case Planning.
b) Explain five views of quality.
c) Explain CMM with diagram.
d) Explain Random testing in automation.
e) Explain Software Test Automation.

Q.5 Attempt any two **12**

a) What are the contents in test planning? Explain in detail.
b) Write few benefits of using automation and tools.
c) Explain SQA Processes and Product Characteristics.

SLR-BD-166

Seat No.	

Set P

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) This money is considered as an investment by the organization in doing quality work.
a) Blue Money b) White Money
c) Green Money d) Red Money

2) The objective of _____ is to find problems and fix them to improve the quality of a project.
a) Software bug b) Software complexity
c) Software testing d) Software development

3) Defects found in testing are blamed on developers.
a) True b) False

4) Black box testing is also called as ____.
a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

5) Which of the following is NOT a black box testing technique?
a) Equivalence partitioning b) Boundary value analysis
c) White box testing d) Decision table testing

6) It is an activity where we check the work products with reference to standards, guidelines and procedures.
a) Validation b) Quality Assurance
c) Verification d) None

7) Which of the following is considered a primary factor in determining software quality?
   a) Number of developers
   b) User requirements
   c) Project deadline
   d) Programming language used

8) _____ is intended to determine whether the changed components have introduced any error in unchanged components of the system.
   a) Regression Testing b) Stress Testing
   c) Usability Testing d) Installation Testing

9) At which level of testing is the entire system tested to ensure that it meets the specified requirements?
   a) Unit Testing b) Integration Testing
   c) System Testing d) Acceptance Testing

10) White Box Testing is also called as _____
   a) Functional testing b) Structural testing
   c) Stress testing d) Interface testing

11) _____ is the process of methodically reducing the huge set of possible test cases into a much smaller, but still equally effective set.
   a) Test Planning b) Test Strategy
   c) Test Design d) Equivalence Partitioning

12) _____ is a first level of testing.
   a) Unit testing b) Integration Testing
   c) System Testing d) None of above

13) CMM means _____
   a) Common Maturity Model b) Cost Maturity Model
   c) Capability Maturity Model d) All

14) When testing principles are useful?
   a) During testing b) During execution
   c) During review d) Throughout life-cycle

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer all the questions from Section-I & Section-II.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

Section – I

Q.2 Attempt any four **16**

a) What are the misconceptions about testing?
b) Features of good Testing.
c) Compare White and Black box testing.
d) Explain Compatibility testing in detail.
e) Explain State Testing in brief.

Q.3 Attempt any two **12**

a) Write Short note on Equivalence Partitioning with example.
b) Draw and explain Verification and Validation model.
c) Explain Acceptance testing in detail.

Section – II

Q.4 Attempt any four **16**

a) Explain goals of Test Case Planning.
b) Explain five views of quality.
c) Explain CMM with diagram.
d) Explain Random testing in automation.
e) Explain Software Test Automation.

Q.5 Attempt any two **12**

a) What are the contents in test planning? Explain in detail.
b) Write few benefits of using automation and tools.
c) Explain SQA Processes and Product Characteristics.

Seat No.		Set	Q

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ is intended to determine whether the changed components have introduced any error in unchanged components of the system.
a) Regression Testing b) Stress Testing
c) Usability Testing d) Installation Testing

2) At which level of testing is the entire system tested to ensure that it meets the specified requirements?
a) Unit Testing b) Integration Testing
c) System Testing d) Acceptance Testing

3) White Box Testing is also called as _____
a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

4) _____ is the process of methodically reducing the huge set of possible test cases into a much smaller, but still equally effective set.
a) Test Planning b) Test Strategy
c) Test Design d) Equivalence Partitioning

5) _____ is a first level of testing.
a) Unit testing b) Integration Testing
c) System Testing d) None of above

6) CMM means _____
a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

7) When testing principles are useful?
a) During testing b) During execution
c) During review d) Throughout life-cycle

8) This money is considered as an investment by the organization in doing quality work.
a) Blue Money
b) White Money
c) Green Money
d) Red Money

9) The objective of _____ is to find problems and fix them to improve the quality of a project.
a) Software bug
b) Software complexity
c) Software testing
d) Software development

10) Defects found in testing are blamed on developers.
a) True
b) False

11) Black box testing is also called as ____.
a) Structural testing
b) Interface testing
c) Stress testing
d) Functional testing

12) Which of the following is NOT a black box testing technique?
a) Equivalence partitioning
b) Boundary value analysis
c) White box testing
d) Decision table testing

13) It is an activity where we check the work products with reference to standards, guidelines and procedures.
a) Validation
b) Quality Assurance
c) Verification
d) None

14) Which of the following is considered a primary factor in determining software quality?
a) Number of developers
b) User requirements
c) Project deadline
d) Programming language used

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer all the questions from Section-I & Section-II.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

Section – I

Q.2 Attempt any four **16**

a) What are the misconceptions about testing?
b) Features of good Testing.
c) Compare White and Black box testing.
d) Explain Compatibility testing in detail.
e) Explain State Testing in brief.

Q.3 Attempt any two **12**

a) Write Short note on Equivalence Partitioning with example.
b) Draw and explain Verification and Validation model.
c) Explain Acceptance testing in detail.

Section – II

Q.4 Attempt any four **16**

a) Explain goals of Test Case Planning.
b) Explain five views of quality.
c) Explain CMM with diagram.
d) Explain Random testing in automation.
e) Explain Software Test Automation.

Q.5 Attempt any two **12**

a) What are the contents in test planning? Explain in detail.
b) Write few benefits of using automation and tools.
c) Explain SQA Processes and Product Characteristics.

Seat No.		Set	R

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ is the process of methodically reducing the huge set of possible test cases into a much smaller, but still equally effective set.
a) Test Planning b) Test Strategy
c) Test Design d) Equivalence Partitioning

2) _____ is a first level of testing.
a) Unit testing b) Integration Testing
c) System Testing d) None of above

3) CMM means _____
a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

4) When testing principles are useful?
a) During testing b) During execution
c) During review d) Throughout life-cycle

5) This money is considered as an investment by the organization in doing quality work.
a) Blue Money b) White Money
c) Green Money d) Red Money

6) The objective of _____ is to find problems and fix them to improve the quality of a project.
a) Software bug b) Software complexity
c) Software testing d) Software development

7) Defects found in testing are blamed on developers.
a) True b) False

8) Black box testing is also called as ____.
a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

9) Which of the following is NOT a black box testing technique?
a) Equivalence partitioning b) Boundary value analysis
c) White box testing d) Decision table testing

10) It is an activity where we check the work products with reference to standards, guidelines and procedures.
a) Validation b) Quality Assurance
c) Verification d) None

11) Which of the following is considered a primary factor in determining software quality?
a) Number of developers
b) User requirements
c) Project deadline
d) Programming language used

12) _____ is intended to determine whether the changed components have introduced any error in unchanged components of the system.
a) Regression Testing b) Stress Testing
c) Usability Testing d) Installation Testing

13) At which level of testing is the entire system tested to ensure that it meets the specified requirements?
a) Unit Testing b) Integration Testing
c) System Testing d) Acceptance Testing

14) White Box Testing is also called as _____
a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer all the questions from Section-I & Section-II.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

Section – I

Q.2 Attempt any four **16**

a) What are the misconceptions about testing?
b) Features of good Testing.
c) Compare White and Black box testing.
d) Explain Compatibility testing in detail.
e) Explain State Testing in brief.

Q.3 Attempt any two **12**

a) Write Short note on Equivalence Partitioning with example.
b) Draw and explain Verification and Validation model.
c) Explain Acceptance testing in detail.

Section – II

Q.4 Attempt any four **16**

a) Explain goals of Test Case Planning.
b) Explain five views of quality.
c) Explain CMM with diagram.
d) Explain Random testing in automation.
e) Explain Software Test Automation.

Q.5 Attempt any two **12**

a) What are the contents in test planning? Explain in detail.
b) Write few benefits of using automation and tools.
c) Explain SQA Processes and Product Characteristics.

Seat No.	

Set **S**

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) It is an activity where we check the work products with reference to standards, guidelines and procedures.
a) Validation b) Quality Assurance
c) Verification d) None

2) Which of the following is considered a primary factor in determining software quality?
a) Number of developers
b) User requirements
c) Project deadline
d) Programming language used

3) _____ is intended to determine whether the changed components have introduced any error in unchanged components of the system.
a) Regression Testing b) Stress Testing
c) Usability Testing d) Installation Testing

4) At which level of testing is the entire system tested to ensure that it meets the specified requirements?
a) Unit Testing b) Integration Testing
c) System Testing d) Acceptance Testing

5) White Box Testing is also called as _____
a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

6) _____ is the process of methodically reducing the huge set of possible test cases into a much smaller, but still equally effective set.
a) Test Planning b) Test Strategy
c) Test Design d) Equivalence Partitioning

7) _____ is a first level of testing.
a) Unit testing b) Integration Testing
c) System Testing d) None of above

8) CMM means _____
a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

9) When testing principles are useful?
a) During testing b) During execution
c) During review d) Throughout life-cycle

10) This money is considered as an investment by the organization in doing quality work.
a) Blue Money b) White Money
c) Green Money d) Red Money

11) The objective of _____ is to find problems and fix them to improve the quality of a project.
a) Software bug b) Software complexity
c) Software testing d) Software development

12) Defects found in testing are blamed on developers.
a) True b) False

13) Black box testing is also called as ____.
a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

14) Which of the following is NOT a black box testing technique?
a) Equivalence partitioning b) Boundary value analysis
c) White box testing d) Decision table testing

SLR-BD-166

Seat No.		Set	S

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer all the questions from Section-I & Section-II.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

Section – I

Q.2 Attempt any four **16**

a) What are the misconceptions about testing?
b) Features of good Testing.
c) Compare White and Black box testing.
d) Explain Compatibility testing in detail.
e) Explain State Testing in brief.

Q.3 Attempt any two **12**

a) Write Short note on Equivalence Partitioning with example.
b) Draw and explain Verification and Validation model.
c) Explain Acceptance testing in detail.

Section – II

Q.4 Attempt any four **16**

a) Explain goals of Test Case Planning.
b) Explain five views of quality.
c) Explain CMM with diagram.
d) Explain Random testing in automation.
e) Explain Software Test Automation.

Q.5 Attempt any two **12**

a) What are the contents in test planning? Explain in detail.
b) Write few benefits of using automation and tools.
c) Explain SQA Processes and Product Characteristics.

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) This money is considered as an investment by the organization in doing quality work.
a) Blue Money b) White Money
c) Green Money d) Red Money

2) The objective of _____ is to find problems and fix them to improve the quality of a project.
a) Software bug b) Software complexity
c) Software testing d) Software development

3) Defects found in testing are blamed on developers.
a) True b) False

4) Black box testing is also called as ____.
a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

5) Which of the following is NOT a black box testing technique?
a) Equivalence partitioning b) Boundary value analysis
c) White box testing d) Decision table testing

6) It is an activity where we check the work products with reference to standards, guidelines and procedures.
a) Validation b) Quality Assurance
c) Verification d) None

7) Which of the following is considered a primary factor in determining software quality?
   a) Number of developers
   b) User requirements
   c) Project deadline
   d) Programming language used

8) _____ is intended to determine whether the changed components have introduced any error in unchanged components of the system.
   a) Regression Testing b) Stress Testing
   c) Usability Testing d) Installation Testing

9) At which level of testing is the entire system tested to ensure that it meets the specified requirements?
   a) Unit Testing b) Integration Testing
   c) System Testing d) Acceptance Testing

10) White Box Testing is also called as _____
   a) Functional testing b) Structural testing
   c) Stress testing d) Interface testing

11) _____ is the process of methodically reducing the huge set of possible test cases into a much smaller, but still equally effective set.
   a) Test Planning b) Test Strategy
   c) Test Design d) Equivalence Partitioning

12) _____ is a first level of testing.
   a) Unit testing b) Integration Testing
   c) System Testing d) None of above

13) CMM means _____
   a) Common Maturity Model b) Cost Maturity Model
   c) Capability Maturity Model d) All

14) When testing principles are useful?
   a) During testing b) During execution
   c) During review d) Throughout life-cycle

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer all the questions from Section-I & Section-II.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

Section – I

Q.2 Attempt any four **16**

a) What are the misconceptions about testing?
b) Features of good Testing.
c) Compare White and Black box testing.
d) Explain Compatibility testing in detail.
e) Explain State Testing in brief.

Q.3 Attempt any two **12**

a) Write Short note on Equivalence Partitioning with example.
b) Draw and explain Verification and Validation model.
c) Explain Acceptance testing in detail.

Section – II

Q.4 Attempt any four **16**

a) Explain goals of Test Case Planning.
b) Explain five views of quality.
c) Explain CMM with diagram.
d) Explain Random testing in automation.
e) Explain Software Test Automation.

Q.5 Attempt any two **12**

a) What are the contents in test planning? Explain in detail.
b) Write few benefits of using automation and tools.
c) Explain SQA Processes and Product Characteristics.

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ is intended to determine whether the changed components have introduced any error in unchanged components of the system.
a) Regression Testing b) Stress Testing
c) Usability Testing d) Installation Testing

2) At which level of testing is the entire system tested to ensure that it meets the specified requirements?
a) Unit Testing b) Integration Testing
c) System Testing d) Acceptance Testing

3) White Box Testing is also called as _____
a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

4) _____ is the process of methodically reducing the huge set of possible test cases into a much smaller, but still equally effective set.
a) Test Planning b) Test Strategy
c) Test Design d) Equivalence Partitioning

5) _____ is a first level of testing.
a) Unit testing b) Integration Testing
c) System Testing d) None of above

6) CMM means _____
a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

7) When testing principles are useful?
a) During testing b) During execution
c) During review d) Throughout life-cycle

8) This money is considered as an investment by the organization in doing quality work.
a) Blue Money
b) White Money
c) Green Money
d) Red Money

9) The objective of _____ is to find problems and fix them to improve the quality of a project.
a) Software bug
b) Software complexity
c) Software testing
d) Software development

10) Defects found in testing are blamed on developers.
a) True
b) False

11) Black box testing is also called as ____.
a) Structural testing
b) Interface testing
c) Stress testing
d) Functional testing

12) Which of the following is NOT a black box testing technique?
a) Equivalence partitioning
b) Boundary value analysis
c) White box testing
d) Decision table testing

13) It is an activity where we check the work products with reference to standards, guidelines and procedures.
a) Validation
b) Quality Assurance
c) Verification
d) None

14) Which of the following is considered a primary factor in determining software quality?
a) Number of developers
b) User requirements
c) Project deadline
d) Programming language used

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer all the questions from Section-I & Section-II.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

Section – I

Q.2 Attempt any four **16**

a) What are the misconceptions about testing?
b) Features of good Testing.
c) Compare White and Black box testing.
d) Explain Compatibility testing in detail.
e) Explain State Testing in brief.

Q.3 Attempt any two **12**

a) Write Short note on Equivalence Partitioning with example.
b) Draw and explain Verification and Validation model.
c) Explain Acceptance testing in detail.

Section – II

Q.4 Attempt any four **16**

a) Explain goals of Test Case Planning.
b) Explain five views of quality.
c) Explain CMM with diagram.
d) Explain Random testing in automation.
e) Explain Software Test Automation.

Q.5 Attempt any two **12**

a) What are the contents in test planning? Explain in detail.
b) Write few benefits of using automation and tools.
c) Explain SQA Processes and Product Characteristics.

Seat No.		Set	R

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ is the process of methodically reducing the huge set of possible test cases into a much smaller, but still equally effective set.
a) Test Planning b) Test Strategy
c) Test Design d) Equivalence Partitioning

2) _____ is a first level of testing.
a) Unit testing b) Integration Testing
c) System Testing d) None of above

3) CMM means _____
a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

4) When testing principles are useful?
a) During testing b) During execution
c) During review d) Throughout life-cycle

5) This money is considered as an investment by the organization in doing quality work.
a) Blue Money b) White Money
c) Green Money d) Red Money

6) The objective of _____ is to find problems and fix them to improve the quality of a project.
a) Software bug b) Software complexity
c) Software testing d) Software development

7) Defects found in testing are blamed on developers.
a) True b) False

8) Black box testing is also called as ____.
a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

9) Which of the following is NOT a black box testing technique?
a) Equivalence partitioning b) Boundary value analysis
c) White box testing d) Decision table testing

10) It is an activity where we check the work products with reference to standards, guidelines and procedures.
a) Validation b) Quality Assurance
c) Verification d) None

11) Which of the following is considered a primary factor in determining software quality?
a) Number of developers
b) User requirements
c) Project deadline
d) Programming language used

12) _____ is intended to determine whether the changed components have introduced any error in unchanged components of the system.
a) Regression Testing b) Stress Testing
c) Usability Testing d) Installation Testing

13) At which level of testing is the entire system tested to ensure that it meets the specified requirements?
a) Unit Testing b) Integration Testing
c) System Testing d) Acceptance Testing

14) White Box Testing is also called as _____
a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer all the questions from Section-I & Section-II.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

Section – I

Q.2 Attempt any four **16**

a) What are the misconceptions about testing?
b) Features of good Testing.
c) Compare White and Black box testing.
d) Explain Compatibility testing in detail.
e) Explain State Testing in brief.

Q.3 Attempt any two **12**

a) Write Short note on Equivalence Partitioning with example.
b) Draw and explain Verification and Validation model.
c) Explain Acceptance testing in detail.

Section – II

Q.4 Attempt any four **16**

a) Explain goals of Test Case Planning.
b) Explain five views of quality.
c) Explain CMM with diagram.
d) Explain Random testing in automation.
e) Explain Software Test Automation.

Q.5 Attempt any two **12**

a) What are the contents in test planning? Explain in detail.
b) Write few benefits of using automation and tools.
c) Explain SQA Processes and Product Characteristics.

Seat No.		Set	S

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) It is an activity where we check the work products with reference to standards, guidelines and procedures.
a) Validation b) Quality Assurance
c) Verification d) None

2) Which of the following is considered a primary factor in determining software quality?
a) Number of developers
b) User requirements
c) Project deadline
d) Programming language used

3) _____ is intended to determine whether the changed components have introduced any error in unchanged components of the system.
a) Regression Testing b) Stress Testing
c) Usability Testing d) Installation Testing

4) At which level of testing is the entire system tested to ensure that it meets the specified requirements?
a) Unit Testing b) Integration Testing
c) System Testing d) Acceptance Testing

5) White Box Testing is also called as _____
a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

6) _____ is the process of methodically reducing the huge set of possible test cases into a much smaller, but still equally effective set.
a) Test Planning b) Test Strategy
c) Test Design d) Equivalence Partitioning

7) _____ is a first level of testing.
a) Unit testing b) Integration Testing
c) System Testing d) None of above

8) CMM means _____
a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

9) When testing principles are useful?
a) During testing b) During execution
c) During review d) Throughout life-cycle

10) This money is considered as an investment by the organization in doing quality work.
a) Blue Money b) White Money
c) Green Money d) Red Money

11) The objective of _____ is to find problems and fix them to improve the quality of a project.
a) Software bug b) Software complexity
c) Software testing d) Software development

12) Defects found in testing are blamed on developers.
a) True b) False

13) Black box testing is also called as ____.
a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

14) Which of the following is NOT a black box testing technique?
a) Equivalence partitioning b) Boundary value analysis
c) White box testing d) Decision table testing

Seat No.	

Set **S**

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Software Testing & Quality Assurance (CSEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) Answer all the questions from Section-I & Section-II.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.

Section – I

Q.2 Attempt any four **16**

a) What are the misconceptions about testing?
b) Features of good Testing.
c) Compare White and Black box testing.
d) Explain Compatibility testing in detail.
e) Explain State Testing in brief.

Q.3 Attempt any two **12**

a) Write Short note on Equivalence Partitioning with example.
b) Draw and explain Verification and Validation model.
c) Explain Acceptance testing in detail.

Section – II

Q.4 Attempt any four **16**

a) Explain goals of Test Case Planning.
b) Explain five views of quality.
c) Explain CMM with diagram.
d) Explain Random testing in automation.
e) Explain Software Test Automation.

Q.5 Attempt any two **12**

a) What are the contents in test planning? Explain in detail.
b) Write few benefits of using automation and tools.
c) Explain SQA Processes and Product Characteristics.

SLR-BD-167

Seat No.		Set	P

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Reinforcement Learning (CSEHON-02A)

Day & Date: Monday 09-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) In reinforcement learning, the agent learns by:
a) Labelled data b) Interacting with environment
c) Clustering data d) Using hidden layers

2) The component of RL that defines the goal is:
a) Policy b) Reward signal
c) Environment d) Value function

3) Which of the following is an element of RL?
a) Agent b) Environment
c) Reward d) All of the above

4) Which game was mastered using RL in DeepMind's AlphaGo?
a) Chess b) Go
c) Poker d) Checkers

5) Which algorithm is an example of temporal-difference learning?
a) SARSA b) Q-learning
c) Both a & b d) None

6) A policy in RL is:
a) A function that maps state to action
b) A reward
c) A value estimator
d) An input feature

7) The agent-environment interface includes:
a) Observations b) Rewards
c) Actions d) All of the above

8) The history of reinforcement learning is closely linked to:
a) Statistics b) Control theory
c) Psychology d) All of the above

9) What is the full form of RL?
a) Reasoning Logic b) Reinforcement Learning
c) Recursive Logic d) Random Learning

10) A key difference between supervised and reinforcement learning is:
a) RL uses labelled data b) RL learns from interaction
c) RL uses clustering d) None of these

11) Which method is used for solving the multi-armed bandit problem?
a) Policy Iteration b) Value Iteration
c) Action-value methods d) TD-Learning

12) The Bellman Equation is used in:
a) Data Mining b) Deep Learning
c) Value Function updates d) Supervised Learning

13) Incremental implementation in RL means:
a) Batch updates b) Update after full episode
c) Online updates per step d) None

14) The methods which uses models are called
a) Model based methods b) Model free methods
c) Value oriented methods d) Computational methods

Seat No.	

Set **P**

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Reinforcement Learning (CSEHON-02A)

Day & Date: Monday 09-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any three questions. **12**

a) Define Reinforcement Learning. How does it differ from supervised learning?
b) Explain Unified notation for Episodic and Continuing tasks with diagrams.
c) Describe the interaction between an agent and an environment using a standard RL model. Illustrate with an example.
d) Write a short note on the history and development of Reinforcement Learning.

Q.3 Attempt any one question. **08**

a) Explain with a diagram the key elements of Reinforcement Learning.
b) Explain 10-Armed testbed in detail with diagram.

Q.4 Compulsory Question. **08**

The following table shows the rewards received by an agent over 10 steps. Calculate.

Step	Reward
1	2
2	3
3	5
4	1
5	4
6	3
7	0
8	2
9	1
10	5

a) Total reward
b) Average reward
c) Discounted return with $\gamma = 0.9$ (first 3 steps only)

Section – II

Q.5 Attempt any three questions. **12**

a) Explain the policy evaluation and improvement process in dynamic programming.

b) Describe the concept and working of SARSA algorithm with a diagram.

c) Differentiate between On-policy and Off-policy methods with examples.

d) Write a short note on Monte Carlo Methods in Reinforcement Learning.

Q.6 Attempt any one question. **08**

a) Discuss the Temporal-Difference (TD) learning method and its advantages over Monte Carlo and DP.

b) Describe the Dyna architecture. How does it integrate planning, acting, and learning?

Q.7 Compulsory Question. **08**

Write a case study of **TD-Gammon** or **AlphaGo** highlighting how Reinforcement Learning techniques were applied, what challenges were faced, and what were the outcomes. (Explain any 1 Case study)

Seat No.		Set	Q

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Reinforcement Learning (CSEHON-02A)

Day & Date: Monday 09-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) The history of reinforcement learning is closely linked to:
a) Statistics b) Control theory
c) Psychology d) All of the above

2) What is the full form of RL?
a) Reasoning Logic b) Reinforcement Learning
c) Recursive Logic d) Random Learning

3) A key difference between supervised and reinforcement learning is:
a) RL uses labelled data b) RL learns from interaction
c) RL uses clustering d) None of these

4) Which method is used for solving the multi-armed bandit problem?
a) Policy Iteration b) Value Iteration
c) Action-value methods d) TD-Learning

5) The Bellman Equation is used in:
a) Data Mining b) Deep Learning
c) Value Function updates d) Supervised Learning

6) Incremental implementation in RL means:
a) Batch updates b) Update after full episode
c) Online updates per step d) None

7) The methods which uses models are called
a) Model based methods b) Model free methods
c) Value oriented methods d) Computational methods

8) In reinforcement learning, the agent learns by:
a) Labelled data b) Interacting with environment
c) Clustering data d) Using hidden layers

9) The component of RL that defines the goal is:
a) Policy b) Reward signal
c) Environment d) Value function

10) Which of the following is an element of RL?
a) Agent b) Environment
c) Reward d) All of the above

11) Which game was mastered using RL in DeepMind's AlphaGo?
a) Chess b) Go
c) Poker d) Checkers

12) Which algorithm is an example of temporal-difference learning?
a) SARSA b) Q-learning
c) Both a & b d) None

13) A policy in RL is:
a) A function that maps state to action
b) A reward
c) A value estimator
d) An input feature

14) The agent-environment interface includes:
a) Observations b) Rewards
c) Actions d) All of the above

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Reinforcement Learning (CSEHON-02A)

Day & Date: Monday 09-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any three questions. **12**

a) Define Reinforcement Learning. How does it differ from supervised learning?
b) Explain Unified notation for Episodic and Continuing tasks with diagrams.
c) Describe the interaction between an agent and an environment using a standard RL model. Illustrate with an example.
d) Write a short note on the history and development of Reinforcement Learning.

Q.3 Attempt any one question. **08**

a) Explain with a diagram the key elements of Reinforcement Learning.
b) Explain 10-Armed testbed in detail with diagram.

Q.4 Compulsory Question. **08**

The following table shows the rewards received by an agent over 10 steps. Calculate.

Step	Reward
1	2
2	3
3	5
4	1
5	4
6	3
7	0
8	2
9	1
10	5

a) Total reward
b) Average reward
c) Discounted return with $\gamma = 0.9$ (first 3 steps only)

Section – II

Q.5 Attempt any three questions. **12**

a) Explain the policy evaluation and improvement process in dynamic programming.

b) Describe the concept and working of SARSA algorithm with a diagram.

c) Differentiate between On-policy and Off-policy methods with examples.

d) Write a short note on Monte Carlo Methods in Reinforcement Learning.

Q.6 Attempt any one question. **08**

a) Discuss the Temporal-Difference (TD) learning method and its advantages over Monte Carlo and DP.

b) Describe the Dyna architecture. How does it integrate planning, acting, and learning?

Q.7 Compulsory Question. **08**

Write a case study of **TD-Gammon** or **AlphaGo** highlighting how Reinforcement Learning techniques were applied, what challenges were faced, and what were the outcomes. (Explain any 1 Case study)

Seat No.		Set	R

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Reinforcement Learning (CSEHON-02A)

Day & Date: Monday 09-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Which method is used for solving the multi-armed bandit problem?
a) Policy Iteration b) Value Iteration
c) Action-value methods d) TD-Learning

2) The Bellman Equation is used in:
a) Data Mining b) Deep Learning
c) Value Function updates d) Supervised Learning

3) Incremental implementation in RL means:
a) Batch updates b) Update after full episode
c) Online updates per step d) None

4) The methods which uses models are called
a) Model based methods b) Model free methods
c) Value oriented methods d) Computational methods

5) In reinforcement learning, the agent learns by:
a) Labelled data b) Interacting with environment
c) Clustering data d) Using hidden layers

6) The component of RL that defines the goal is:
a) Policy b) Reward signal
c) Environment d) Value function

7) Which of the following is an element of RL?
a) Agent b) Environment
c) Reward d) All of the above

8) Which game was mastered using RL in DeepMind's AlphaGo?
a) Chess b) Go
c) Poker d) Checkers

9) Which algorithm is an example of temporal-difference learning?
a) SARSA b) Q-learning
c) Both a & b d) None

10) A policy in RL is:
a) A function that maps state to action
b) A reward
c) A value estimator
d) An input feature

11) The agent-environment interface includes:
a) Observations b) Rewards
c) Actions d) All of the above

12) The history of reinforcement learning is closely linked to:
a) Statistics b) Control theory
c) Psychology d) All of the above

13) What is the full form of RL?
a) Reasoning Logic b) Reinforcement Learning
c) Recursive Logic d) Random Learning

14) A key difference between supervised and reinforcement learning is:
a) RL uses labelled data b) RL learns from interaction
c) RL uses clustering d) None of these

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Reinforcement Learning (CSEHON-02A)

Day & Date: Monday 09-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any three questions. **12**

a) Define Reinforcement Learning. How does it differ from supervised learning?
b) Explain Unified notation for Episodic and Continuing tasks with diagrams.
c) Describe the interaction between an agent and an environment using a standard RL model. Illustrate with an example.
d) Write a short note on the history and development of Reinforcement Learning.

Q.3 Attempt any one question. **08**

a) Explain with a diagram the key elements of Reinforcement Learning.
b) Explain 10-Armed testbed in detail with diagram.

Q.4 Compulsory Question. **08**

The following table shows the rewards received by an agent over 10 steps. Calculate.

Step	Reward
1	2
2	3
3	5
4	1
5	4
6	3
7	0
8	2
9	1
10	5

a) Total reward
b) Average reward
c) Discounted return with $\gamma = 0.9$ (first 3 steps only)

Section – II

Q.5 Attempt any three questions. **12**

a) Explain the policy evaluation and improvement process in dynamic programming.

b) Describe the concept and working of SARSA algorithm with a diagram.

c) Differentiate between On-policy and Off-policy methods with examples.

d) Write a short note on Monte Carlo Methods in Reinforcement Learning.

Q.6 Attempt any one question. **08**

a) Discuss the Temporal-Difference (TD) learning method and its advantages over Monte Carlo and DP.

b) Describe the Dyna architecture. How does it integrate planning, acting, and learning?

Q.7 Compulsory Question. **08**

Write a case study of **TD-Gammon** or **AlphaGo** highlighting how Reinforcement Learning techniques were applied, what challenges were faced, and what were the outcomes. (Explain any 1 Case study)

Seat No.		Set	S

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Reinforcement Learning (CSEHON-02A)

Day & Date: Monday 09-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) A policy in RL is:
a) A function that maps state to action
b) A reward
c) A value estimator
d) An input feature

2) The agent-environment interface includes:
a) Observations b) Rewards
c) Actions d) All of the above

3) The history of reinforcement learning is closely linked to:
a) Statistics b) Control theory
c) Psychology d) All of the above

4) What is the full form of RL?
a) Reasoning Logic b) Reinforcement Learning
c) Recursive Logic d) Random Learning

5) A key difference between supervised and reinforcement learning is:
a) RL uses labelled data b) RL learns from interaction
c) RL uses clustering d) None of these

6) Which method is used for solving the multi-armed bandit problem?
a) Policy Iteration b) Value Iteration
c) Action-value methods d) TD-Learning

7) The Bellman Equation is used in:
a) Data Mining b) Deep Learning
c) Value Function updates d) Supervised Learning

8) Incremental implementation in RL means:
a) Batch updates b) Update after full episode
c) Online updates per step d) None

9) The methods which uses models are called
a) Model based methods b) Model free methods
c) Value oriented methods d) Computational methods

10) In reinforcement learning, the agent learns by:
a) Labelled data b) Interacting with environment
c) Clustering data d) Using hidden layers

11) The component of RL that defines the goal is:
a) Policy b) Reward signal
c) Environment d) Value function

12) Which of the following is an element of RL?
a) Agent b) Environment
c) Reward d) All of the above

13) Which game was mastered using RL in DeepMind's AlphaGo?
a) Chess b) Go
c) Poker d) Checkers

14) Which algorithm is an example of temporal-difference learning?
a) SARSA b) Q-learning
c) Both a & b d) None

SLR-BD-167

Seat No.	

Set S

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Reinforcement Learning (CSEHON-02A)

Day & Date: Monday 09-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All Questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any three questions. **12**

a) Define Reinforcement Learning. How does it differ from supervised learning?
b) Explain Unified notation for Episodic and Continuing tasks with diagrams.
c) Describe the interaction between an agent and an environment using a standard RL model. Illustrate with an example.
d) Write a short note on the history and development of Reinforcement Learning.

Q.3 Attempt any one question. **08**

a) Explain with a diagram the key elements of Reinforcement Learning.
b) Explain 10-Armed testbed in detail with diagram.

Q.4 Compulsory Question. **08**

The following table shows the rewards received by an agent over 10 steps. Calculate.

Step	Reward
1	2
2	3
3	5
4	1
5	4
6	3
7	0
8	2
9	1
10	5

a) Total reward
b) Average reward
c) Discounted return with $\gamma = 0.9$ (first 3 steps only)

Section – II

Q.5 Attempt any three questions. **12**

a) Explain the policy evaluation and improvement process in dynamic programming.

b) Describe the concept and working of SARSA algorithm with a diagram.

c) Differentiate between On-policy and Off-policy methods with examples.

d) Write a short note on Monte Carlo Methods in Reinforcement Learning.

Q.6 Attempt any one question. **08**

a) Discuss the Temporal-Difference (TD) learning method and its advantages over Monte Carlo and DP.

b) Describe the Dyna architecture. How does it integrate planning, acting, and learning?

Q.7 Compulsory Question. **08**

Write a case study of **TD-Gammon** or **AlphaGo** highlighting how Reinforcement Learning techniques were applied, what challenges were faced, and what were the outcomes. (Explain any 1 Case study)

SLR-BD-168

Seat No.		Set	P

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Network Security and Secure Coding (CSEHON-02B)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is a key weakness of SNMPv1?
a) Lack of encryption
b) No support for network monitoring
c) Incompatibility with IPv4
d) High resource consumption

2) Which of the following tools is commonly used for symbolic execution?
a) Valgrind b) KLEE
c) Metasploit d) Nessus

3) What is a common defense against use-after-free vulnerabilities?
a) Address sanitization b) Data encryption
c) Secure key storage d) Taint analysis

4) Which of the following is an example of an attack that involves altering the data in transmission?
a) Session hijacking b) Buffer overflow
c) ARP spoofing d) Man-in-the-middle

5) Which of the following protocols does TCP use for session management and authentication?
a) IPsec b) ARP
c) TCP handshaking d) TLS/SSL

6) What is the goal of integrity in network security?
a) Ensuring data is only accessible to authorized users
b) Ensuring data has not been tampered with
c) Verifying the identity of the sender
d) Preventing denial of service attacks

7) Which of the following protocols is used for key exchange in IPsec?
a) Diffie-Hellman b) RSA
c) Kerberos d) AES

8) Which of the following is a default community string in SNMPv1?
a) private b) public
c) secret d) admin

9) Which type of threat involves a program that replicates itself to spread to other systems?
a) Worm b) Spyware
c) Trojan d) Virus

10) Which of tire following is a conventional encryption algorithm?
a) RSA b) DES
c) Diffie-Hellman d) ECC

11) Which encryption device location ensures secure end-to-end communication?
a) Link encryption
b) End-to-end encryption
c) Device-to-device encryption
d) Hop-by-hop encryption

12) Which of the following is an example of a public key cryptography algorithm?
a) AES b) DES
c) RSA d) HMAC

13) What does IPsec primarily aim to secure?
a) Email communications
b) Network-layer communication
c) Application-layer communication
d) Physical-layer communication

14) Who is responsible for issuing digital certificates?
a) Certificate Authority b) Kerberos
c) Key Distribution Center d) Public Key Infrastructure

SLR-BD-168

Seat No.		Set	P

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Network Security and Secure Coding (CSEHON-02B)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any three of the following. **12**

a) Explain how RSA encryption works in public key cryptography with the following example P=11 and Q=13 and identify the public and private key.
b) Explain the man-in-the-middle attack with a neat diagram.
c) Explain ARP Attacks with an example.
d) Explain the Substitution Encryption Techniques with examples.

Q.3 Solve any two of the followings. **16**

a) Write a difference between TCP and UDP session hijacking.
b) Describe MAC with reference to HMAC.
c) Explain Digital signature and Digital Certificate with real life examples.

Section – II

Q.4 Solve any three of the following. **12**

a) Define secure coding and explain the memory safety and vulnerabilities.
b) Explain the following terms with an example.
i) AH ii) ESP
c) Explain How S/MIME protocol works.
d) Explain the working of IDs with workflow.

Q.5 Solve any two of the followings. **16**

a) Write a Differentiate between SNMPV1 and SNMPV3.
b) Define Firewall. Explain the primary types of firewalls and Design principle of firewall.
c) Describe following terms with example.
i) Intruders
ii) Virus
iii) Threats
iv) IDS

Seat No.		Set	Q

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Network Security and Secure Coding (CSEHON-02B)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is a default community string in SNMPv1?
a) private b) public
c) secret d) admin

2) Which type of threat involves a program that replicates itself to spread to other systems?
a) Worm b) Spyware
c) Trojan d) Virus

3) Which of tire following is a conventional encryption algorithm?
a) RSA b) DES
c) Diffie-Hellman d) ECC

4) Which encryption device location ensures secure end-to-end communication?
a) Link encryption
b) End-to-end encryption
c) Device-to-device encryption
d) Hop-by-hop encryption

5) Which of the following is an example of a public key cryptography algorithm?
a) AES b) DES
c) RSA d) HMAC

6) What does IPsec primarily aim to secure?
a) Email communications
b) Network-layer communication
c) Application-layer communication
d) Physical-layer communication

7) Who is responsible for issuing digital certificates?
a) Certificate Authority b) Kerberos
c) Key Distribution Center d) Public Key Infrastructure

8) Which of the following is a key weakness of SNMPv1?
a) Lack of encryption
b) No support for network monitoring
c) Incompatibility with IPv4
d) High resource consumption

9) Which of the following tools is commonly used for symbolic execution?
a) Valgrind b) KLEE
c) Metasploit d) Nessus

10) What is a common defense against use-after-free vulnerabilities?
a) Address sanitization b) Data encryption
c) Secure key storage d) Taint analysis

11) Which of the following is an example of an attack that involves altering the data in transmission?
a) Session hijacking b) Buffer overflow
c) ARP spoofing d) Man-in-the-middle

12) Which of the following protocols does TCP use for session management and authentication?
a) IPsec b) ARP
c) TCP handshaking d) TLS/SSL

13) What is the goal of integrity in network security?
a) Ensuring data is only accessible to authorized users
b) Ensuring data has not been tampered with
c) Verifying the identity of the sender
d) Preventing denial of service attacks

14) Which of the following protocols is used for key exchange in IPsec?
a) Diffie-Hellman b) RSA
c) Kerberos d) AES

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Network Security and Secure Coding (CSEHON-02B)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any three of the following. **12**

a) Explain how RSA encryption works in public key cryptography with the following example P=11 and Q=13 and identify the public and private key.
b) Explain the man-in-the-middle attack with a neat diagram.
c) Explain ARP Attacks with an example.
d) Explain the Substitution Encryption Techniques with examples.

Q.3 Solve any two of the followings. **16**

a) Write a difference between TCP and UDP session hijacking.
b) Describe MAC with reference to HMAC.
c) Explain Digital signature and Digital Certificate with real life examples.

Section – II

Q.4 Solve any three of the following. **12**

a) Define secure coding and explain the memory safety and vulnerabilities.
b) Explain the following terms with an example.
i) AH ii) ESP
c) Explain How S/MIME protocol works.
d) Explain the working of IDs with workflow.

Q.5 Solve any two of the followings. **16**

a) Write a Differentiate between SNMPV1 and SNMPV3.
b) Define Firewall. Explain the primary types of firewalls and Design principle of firewall.
c) Describe following terms with example.
i) Intruders
ii) Virus
iii) Threats
iv) IDS

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Network Security and Secure Coding (CSEHON-02B)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which encryption device location ensures secure end-to-end communication?
a) Link encryption
b) End-to-end encryption
c) Device-to-device encryption
d) Hop-by-hop encryption

2) Which of the following is an example of a public key cryptography algorithm?
a) AES b) DES
c) RSA d) HMAC

3) What does IPsec primarily aim to secure?
a) Email communications
b) Network-layer communication
c) Application-layer communication
d) Physical-layer communication

4) Who is responsible for issuing digital certificates?
a) Certificate Authority b) Kerberos
c) Key Distribution Center d) Public Key Infrastructure

5) Which of the following is a key weakness of SNMPv1?
a) Lack of encryption
b) No support for network monitoring
c) Incompatibility with IPv4
d) High resource consumption

6) Which of the following tools is commonly used for symbolic execution?
a) Valgrind b) KLEE
c) Metasploit d) Nessus

7) What is a common defense against use-after-free vulnerabilities?
a) Address sanitization b) Data encryption
c) Secure key storage d) Taint analysis

8) Which of the following is an example of an attack that involves altering the data in transmission?
a) Session hijacking b) Buffer overflow
c) ARP spoofing d) Man-in-the-middle

9) Which of the following protocols does TCP use for session management and authentication?
a) IPsec b) ARP
c) TCP handshaking d) TLS/SSL

10) What is the goal of integrity in network security?
a) Ensuring data is only accessible to authorized users
b) Ensuring data has not been tampered with
c) Verifying the identity of the sender
d) Preventing denial of service attacks

11) Which of the following protocols is used for key exchange in IPsec?
a) Diffie-Hellman b) RSA
c) Kerberos d) AES

12) Which of the following is a default community string in SNMPv1?
a) private b) public
c) secret d) admin

13) Which type of threat involves a program that replicates itself to spread to other systems?
a) Worm b) Spyware
c) Trojan d) Virus

14) Which of tire following is a conventional encryption algorithm?
a) RSA b) DES
c) Diffie-Hellman d) ECC

SLR-BD-168

Seat No.	

Set R

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Network Security and Secure Coding (CSEHON-02B)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any three of the following. **12**

a) Explain how RSA encryption works in public key cryptography with the following example P=11 and Q=13 and identify the public and private key.
b) Explain the man-in-the-middle attack with a neat diagram.
c) Explain ARP Attacks with an example.
d) Explain the Substitution Encryption Techniques with examples.

Q.3 Solve any two of the followings. **16**

a) Write a difference between TCP and UDP session hijacking.
b) Describe MAC with reference to HMAC.
c) Explain Digital signature and Digital Certificate with real life examples.

Section – II

Q.4 Solve any three of the following. **12**

a) Define secure coding and explain the memory safety and vulnerabilities.
b) Explain the following terms with an example.
i) AH ii) ESP
c) Explain How S/MIME protocol works.
d) Explain the working of IDs with workflow.

Q.5 Solve any two of the followings. **16**

a) Write a Differentiate between SNMPV1 and SNMPV3.
b) Define Firewall. Explain the primary types of firewalls and Design principle of firewall.
c) Describe following terms with example.
i) Intruders
ii) Virus
iii) Threats
iv) IDS

SLR-BD-168

Seat No.		Set	S

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Network Security and Secure Coding (CSEHON-02B)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the goal of integrity in network security?
a) Ensuring data is only accessible to authorized users
b) Ensuring data has not been tampered with
c) Verifying the identity of the sender
d) Preventing denial of service attacks

2) Which of the following protocols is used for key exchange in IPsec?
a) Diffie-Hellman b) RSA
c) Kerberos d) AES

3) Which of the following is a default community string in SNMPv1?
a) private b) public
c) secret d) admin

4) Which type of threat involves a program that replicates itself to spread to other systems?
a) Worm b) Spyware
c) Trojan d) Virus

5) Which of tire following is a conventional encryption algorithm?
a) RSA b) DES
c) Diffie-Hellman d) ECC

6) Which encryption device location ensures secure end-to-end communication?
a) Link encryption
b) End-to-end encryption
c) Device-to-device encryption
d) Hop-by-hop encryption

7) Which of the following is an example of a public key cryptography algorithm?

a) AES b) DES
c) RSA d) HMAC

8) What does IPsec primarily aim to secure?

a) Email communications
b) Network-layer communication
c) Application-layer communication
d) Physical-layer communication

9) Who is responsible for issuing digital certificates?

a) Certificate Authority b) Kerberos
c) Key Distribution Center d) Public Key Infrastructure

10) Which of the following is a key weakness of SNMPv1?

a) Lack of encryption
b) No support for network monitoring
c) Incompatibility with IPv4
d) High resource consumption

11) Which of the following tools is commonly used for symbolic execution?

a) Valgrind b) KLEE
c) Metasploit d) Nessus

12) What is a common defense against use-after-free vulnerabilities?

a) Address sanitization b) Data encryption
c) Secure key storage d) Taint analysis

13) Which of the following is an example of an attack that involves altering the data in transmission?

a) Session hijacking b) Buffer overflow
c) ARP spoofing d) Man-in-the-middle

14) Which of the following protocols does TCP use for session management and authentication?

a) IPsec b) ARP
c) TCP handshaking d) TLS/SSL

SLR-BD-168

Seat No.		Set	S

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Network Security and Secure Coding (CSEHON-02B)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any three of the following. **12**

a) Explain how RSA encryption works in public key cryptography with the following example P=11 and Q=13 and identify the public and private key.
b) Explain the man-in-the-middle attack with a neat diagram.
c) Explain ARP Attacks with an example.
d) Explain the Substitution Encryption Techniques with examples.

Q.3 Solve any two of the followings. **16**

a) Write a difference between TCP and UDP session hijacking.
b) Describe MAC with reference to HMAC.
c) Explain Digital signature and Digital Certificate with real life examples.

Section – II

Q.4 Solve any three of the following. **12**

a) Define secure coding and explain the memory safety and vulnerabilities.
b) Explain the following terms with an example.
i) AH ii) ESP
c) Explain How S/MIME protocol works.
d) Explain the working of IDs with workflow.

Q.5 Solve any two of the followings. **16**

a) Write a Differentiate between SNMPV1 and SNMPV3.
b) Define Firewall. Explain the primary types of firewalls and Design principle of firewall.
c) Describe following terms with example.
i) Intruders
ii) Virus
iii) Threats
iv) IDS

SLR-BD-170

Seat No.		Set	P

S.Y. (B.Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Theory of Computation (BTN03402)

Day & Date: Monday, 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is not a regular expression?
a) $[(a+b)^* - (aa+bb)]^*$
b) $[(0+1) - (0\mathrm{b} + \mathrm{a}1)^*(\mathrm{a}+\mathrm{b})]^*$
c) $(01+11+10)^*$
d) $(1+2+0)^*(1+2)^*$

2) Regular expressions are closed under _____.
a) Union b) Intersection
c) Kleen star d) All of the mentioned

3) Transition function maps.
a) $\sum^* \mathrm{Q} \to \sum$ b) $\mathrm{Q}^* \mathrm{Q} \to \sum$
c) $\sum^* \sum \to \mathrm{Q}$ d) $\mathrm{Q}^* \sum \to \mathrm{Q}$

4) Number of states required to accept a string end with 10.
a) 3 b) 2
c) 1 d) can't be represented

5) Which of the following is not a part of 5-tuple finite automata?
a) Input alphabet b) Transition function
c) Initial State d) Output Alphabet

6) Which is not a part of the diagram a Turing machine?
a) Input tape b) Read - Write head
c) Finite control d) Stack

7) In a mealy machine, the O/P depends upon?
a) State b) Previous State
c) State and Input d) Only Input

8) The set of all strings over the alphabet S={a,b} (including null) is denoted by _____.

a) (a+b)* b) (a+b)+
c) a+b+ d) a*b*

9) A grammar that produces more than one parse tree for some sentence is called _____

a) Ambiguous b) Unambiguous
c) Regular d) None of these

10) The intersection of CFL and regular language _____

a) Is always regular b) Is always context free
c) Both (a) and (b) d) Need not be regular

11) A→ aA| a| b The number of steps to form aab: _____

a) 2 b) 3
c) 4 d) 5

12) The language recognized by Turing machine is: _____

a) Context free language
b) Context sensitive language
c) Recursively enumerable language
d) Regular language

13) Are Multitape and Multitrack Turing machines the same?

a) Yes b) No
c) Somewhat yes d) Cannot tell

14) A regular language over an alphabet Σ is one that cannot be obtained from the basic languages using the operation

a) Union b) Concatenation
c) Kleene* d) All of the mentioned

Seat No.	

Set P

S.Y. (B.Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Theory of Computation (BTN03402)

Day & Date: Monday, 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are Compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any four **16**

a) Define Moore Machine with an example.

b) For the two regular expressions given below,
i) find a string corresponding to r_2 but not to r_1 and
ii) find a string corresponding to both r_1 and r_2.
$r_1 = a^* + b^* \quad r_2 = ab^* + ba^* + b^*a + (a^*b)^*$

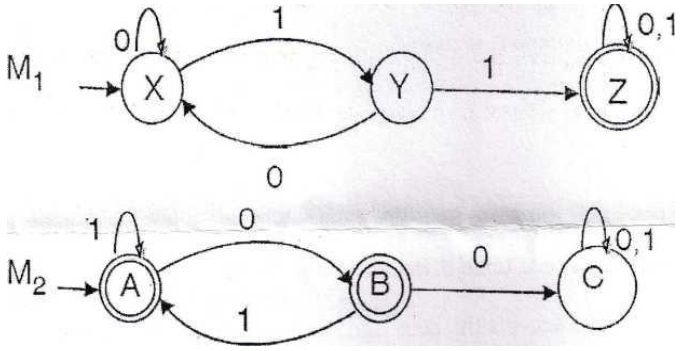
c) Draw DFA for regular expression
1) $ab(a+b)^*ab$
2) $(0+1)^*(00+11)$

d) Find context free grammar generating following language
$\{a^i b^j c^k | i = j \text{ or } i = k\}$

e) Construct deterministic finite automata to recognize odd number of 1's and even number of 0's?

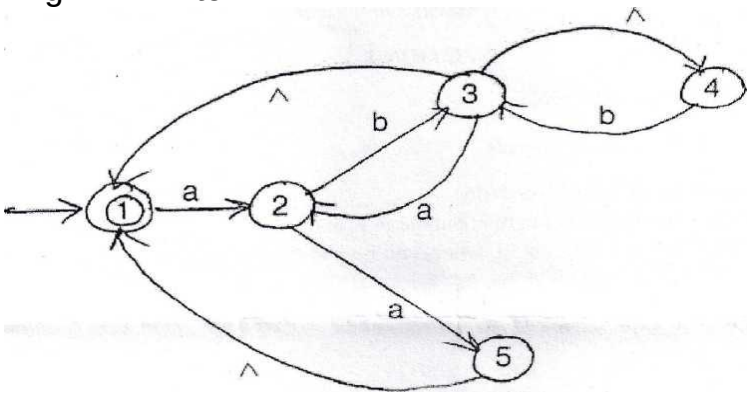
Q.3 Solve any one **06**

a) Following FAs recognize the languages $L1$ and $L2$. Draw FAs recognizing languages $L1 \cup L2,\ L1 \cap L2,\ L1 - L2$



b) State and explain different types of grammar.

Q.4 Convert following NFA- Λ to DFA **06**



Section – II

Q.5 **Attempt any four of the following.** **16**

a) What is PDA? Explain with an example

b) Convert the following CFG to a PDA.
$S \rightarrow aAA$,
$A \rightarrow aS|bS|a$

c) State and explain pumping lemma for Regular language

d) Construct an NPDA for the language $L = \{wcw^R : w \in \{a, b\}^*\}$

e) Explain Multiple Turing machine.

Q.6 **Attempt any one of the following.** **06**

a) Explain in detail universal Turing machine

b) Give transition table for PDA to recognize balanced strings of 2 types "( )" and "[ ]"

Q.7 Construct a Turing Machine that accepts the language **06**
$L = \{a^n b^m a^{n+m} | n > 0, m \geq 1\}$

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Theory of Computation (BTN03402)

Day & Date: Monday, 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) The set of all strings over the alphabet S={a,b} (including null) is denoted by _____.
a) (a+b)* b) (a+b)+
c) a+b+ d) a*b*

2) A grammar that produces more than one parse tree for some sentence is called _____
a) Ambiguous b) Unambiguous
c) Regular d) None of these

3) The intersection of CFL and regular language _____
a) Is always regular b) Is always context free
c) Both (a) and (b) d) Need not be regular

4) A→ aA| a| b The number of steps to form aab: _____
a) 2 b) 3
c) 4 d) 5

5) The language recognized by Turing machine is: _____
a) Context free language
b) Context sensitive language
c) Recursively enumerable language
d) Regular language

6) Are Multitape and Multitrack Turing machines the same?
a) Yes b) No
c) Somewhat yes d) Cannot tell

7) A regular language over an alphabet Σ is one that cannot be obtained from the basic languages using the operation

a) Union b) Concatenation
c) Kleene* d) All of the mentioned

8) Which of the following is not a regular expression?

a) $[(a+b)^* - (aa+bb)]^*$
b) $[(0+1) - (0\mathrm{b} + \mathrm{a}1)^*(\mathrm{a}+\mathrm{b})]^*$
c) $(01+11+10)^*$
d) $(1+2+0)^*(1+2)^*$

9) Regular expressions are closed under _____.

a) Union b) Intersection
c) Kleen star d) All of the mentioned

10) Transition function maps.

a) $\sum^* \mathrm{Q} \to \sum$ b) $\mathrm{Q}^* \mathrm{Q} \to \sum$
c) $\sum^* \sum \to \mathrm{Q}$ d) $\mathrm{Q}^* \sum \to \mathrm{Q}$

11) Number of states required to accept a string end with 10.

a) 3 b) 2
c) 1 d) can't be represented

12) Which of the following is not a part of 5-tuple finite automata?

a) Input alphabet b) Transition function
c) Initial State d) Output Alphabet

13) Which is not a part of the diagram a Turing machine?

a) Input tape b) Read - Write head
c) Finite control d) Stack

14) In a mealy machine, the O/P depends upon?

a) State b) Previous State
c) State and Input d) Only Input

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Theory of Computation (BTN03402)

Day & Date: Monday, 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are Compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any four **16**

a) Define Moore Machine with an example.

b) For the two regular expressions given below,
i) find a string corresponding to r_2 but not to r_1 and
ii) find a string corresponding to both r_1 and r_2.
$r_1 = a^* + b^* \quad r_2 = ab^* + ba^* + b^*a + (a^*b)^*$

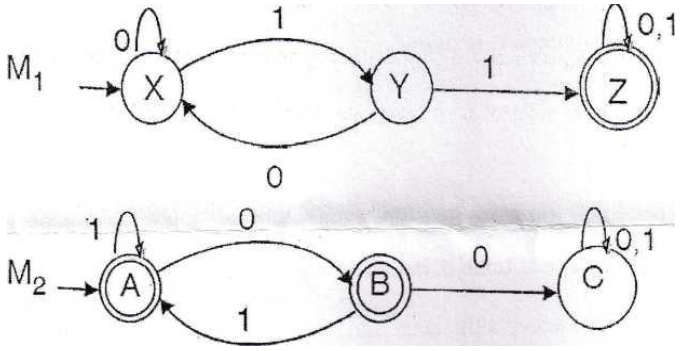
c) Draw DFA for regular expression
1) $ab(a+b)^*ab$
2) $(0+1)^*(00+11)$

d) Find context free grammar generating following language
$\{a^i b^j c^k | i = j \text{ or } i = k\}$

e) Construct deterministic finite automata to recognize odd number of 1's and even number of 0's?

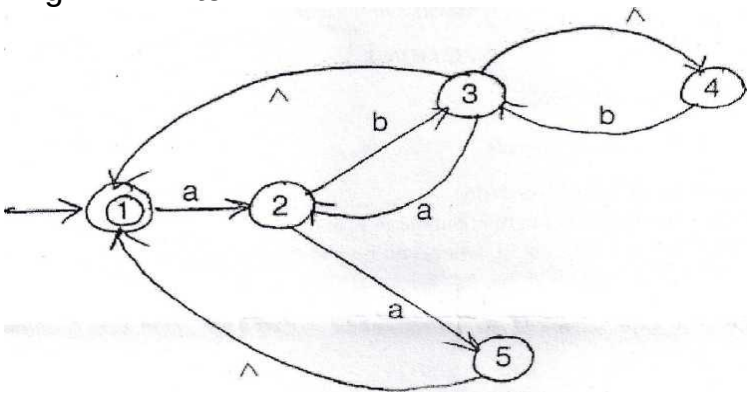
Q.3 Solve any one **06**

a) Following FAs recognize the languages $L1$ and $L2$. Draw FAs recognizing languages $L1 \cup L2,\ L1 \cap L2,\ L1 - L2$



b) State and explain different types of grammar.

Q.4 Convert following NFA- Λ to DFA **06**



Section – II

Q.5 **Attempt any four of the following.** **16**

a) What is PDA? Explain with an example

b) Convert the following CFG to a PDA.
$S \rightarrow aAA$,
$A \rightarrow aS|bS|a$

c) State and explain pumping lemma for Regular language

d) Construct an NPDA for the language $L = \{wcw^R : w \in \{a, b\}^*\}$

e) Explain Multiple Turing machine.

Q.6 **Attempt any one of the following.** **06**

a) Explain in detail universal Turing machine

b) Give transition table for PDA to recognize balanced strings of 2 types "( )" and "[ ]"

Q.7 Construct a Turing Machine that accepts the language **06**
$L = \{a^n b^m a^{n+m} | n > 0, m \geq 1\}$

Seat No.		Set	R

S.Y. (B.Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Theory of Computation (BTN03402)

Day & Date: Monday, 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) A→ aA| a| b The number of steps to form aab: _____
a) 2 b) 3
c) 4 d) 5

2) The language recognized by Turing machine is: _____
a) Context free language
b) Context sensitive language
c) Recursively enumerable language
d) Regular language

3) Are Multitape and Multitrack Turing machines the same?
a) Yes b) No
c) Somewhat yes d) Cannot tell

4) A regular language over an alphabet Σ is one that cannot be obtained from the basic languages using the operation
a) Union b) Concatenation
c) Kleene* d) All of the mentioned

5) Which of the following is not a regular expression?
a) $[(a+b)^* - (aa+bb)]^*$
b) $[(0+1) - (0\mathrm{b}+\mathrm{a}1)^*(\mathrm{a}+\mathrm{b})]^*$
c) $(01+11+10)^*$
d) $(1+2+0)^*(1+2)^*$

6) Regular expressions are closed under _____.
a) Union b) Intersection
c) Kleen star d) All of the mentioned

7) Transition function maps.

a) $\sum^* Q \to \sum$ b) $Q^* Q \to \sum$

c) $\sum^* \sum \to Q$ d) $Q^* \sum \to Q$

8) Number of states required to accept a string end with 10.

a) 3 b) 2

c) 1 d) can't be represented

9) Which of the following is not a part of 5-tuple finite automata?

a) Input alphabet b) Transition function

c) Initial State d) Output Alphabet

10) Which is not a part of the diagram a Turing machine?

a) Input tape b) Read - Write head

c) Finite control d) Stack

11) In a mealy machine, the O/P depends upon?

a) State b) Previous State

c) State and Input d) Only Input

12) The set of all strings over the alphabet S={a,b} (including null) is denoted by _____.

a) (a+b)* b) (a+b)+

c) a+b+ d) a*b*

13) A grammar that produces more than one parse tree for some sentence is called _____

a) Ambiguous b) Unambiguous

c) Regular d) None of these

14) The intersection of CFL and regular language _____

a) Is always regular b) Is always context free

c) Both (a) and (b) d) Need not be regular

Seat No.	

Set R

S.Y. (B.Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Theory of Computation (BTN03402)

Day & Date: Monday, 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are Compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any four **16**

a) Define Moore Machine with an example.

b) For the two regular expressions given below,
i) find a string corresponding to r_2 but not to r_1 and
ii) find a string corresponding to both r_1 and r_2.
$r_1 = a^* + b^* \quad r_2 = ab^* + ba^* + b^*a + (a^*b)^*$

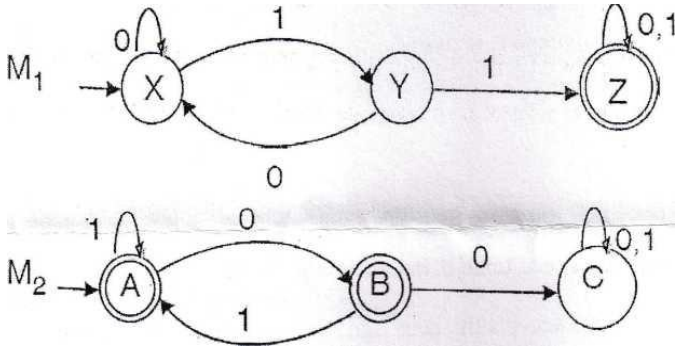
c) Draw DFA for regular expression
1) $ab(a+b)^*ab$
2) $(0+1)^*(00+11)$

d) Find context free grammar generating following language
$\{a^i b^j c^k | i = j \text{ or } i = k\}$

e) Construct deterministic finite automata to recognize odd number of 1's and even number of 0's?

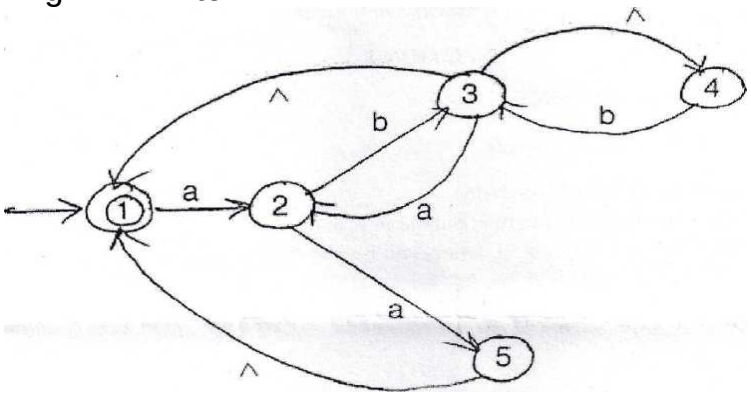
Q.3 Solve any one **06**

a) Following FAs recognize the languages $L1$ and $L2$. Draw FAs recognizing languages $L1 \cup L2,\ L1 \cap L2,\ L1 - L2$



b) State and explain different types of grammar.

Q.4 Convert following NFA- Λ to DFA **06**



Section – II

Q.5 **Attempt any four of the following.** **16**

a) What is PDA? Explain with an example

b) Convert the following CFG to a PDA.
$S \rightarrow aAA$,
$A \rightarrow aS|bS|a$

c) State and explain pumping lemma for Regular language

d) Construct an NPDA for the language $L = \{wcw^R : w \in \{a, b\}^*\}$

e) Explain Multiple Turing machine.

Q.6 **Attempt any one of the following.** **06**

a) Explain in detail universal Turing machine

b) Give transition table for PDA to recognize balanced strings of 2 types "( )" and "[ ]"

Q.7 Construct a Turing Machine that accepts the language **06**
$L = \{a^n b^m a^{n+m} | n > 0, m \geq 1\}$

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Theory of Computation (BTN03402)

Day & Date: Monday, 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which is not a part of the diagram a Turing machine?
a) Input tape b) Read - Write head
c) Finite control d) Stack

2) In a mealy machine, the O/P depends upon?
a) State b) Previous State
c) State and Input d) Only Input

3) The set of all strings over the alphabet S={a,b} (including null) is denoted by _____.
a) (a+b)* b) (a+b)+
c) a+b+ d) a*b*

4) A grammar that produces more than one parse tree for some sentence is called _____
a) Ambiguous b) Unambiguous
c) Regular d) None of these

5) The intersection of CFL and regular language _____
a) Is always regular b) Is always context free
c) Both (a) and (b) d) Need not be regular

6) A→ aA| a| b The number of steps to form aab: _____
a) 2 b) 3
c) 4 d) 5

7) The language recognized by Turing machine is: _____
a) Context free language
b) Context sensitive language
c) Recursively enumerable language
d) Regular language

8) Are Multitape and Multitrack Turing machines the same?

a) Yes
b) No
c) Somewhat yes
d) Cannot tell

9) A regular language over an alphabet Σ is one that cannot be obtained from the basic languages using the operation

a) Union
b) Concatenation
c) Kleene*
d) All of the mentioned

10) Which of the following is not a regular expression?

a) $[(a+b)^* - (aa+bb)]^*$
b) $[(0+1) - (0\mathrm{b} + \mathrm{a}1)^*(\mathrm{a}+\mathrm{b})]^*$
c) $(01+11+10)^*$
d) $(1+2+0)^*(1+2)^*$

11) Regular expressions are closed under _____.

a) Union
b) Intersection
c) Kleen star
d) All of the mentioned

12) Transition function maps.

a) $\sum^* \mathrm{Q} \to \sum$
b) $\mathrm{Q}^* \mathrm{Q} \to \sum$
c) $\sum^* \sum \to \mathrm{Q}$
d) $\mathrm{Q}^* \sum \to \mathrm{Q}$

13) Number of states required to accept a string end with 10.

a) 3
b) 2
c) 1
d) can't be represented

14) Which of the following is not a part of 5-tuple finite automata?

a) Input alphabet
b) Transition function
c) Initial State
d) Output Alphabet

Seat No.		Set	S

S.Y. (B.Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Theory of Computation (BTN03402)

Day & Date: Monday, 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are Compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any four **16**

a) Define Moore Machine with an example.

b) For the two regular expressions given below,
i) find a string corresponding to r_2 but not to r_1 and
ii) find a string corresponding to both r_1 and r_2.
$r_1 = a^* + b^* \quad r_2 = ab^* + ba^* + b^*a + (a^*b)^*$

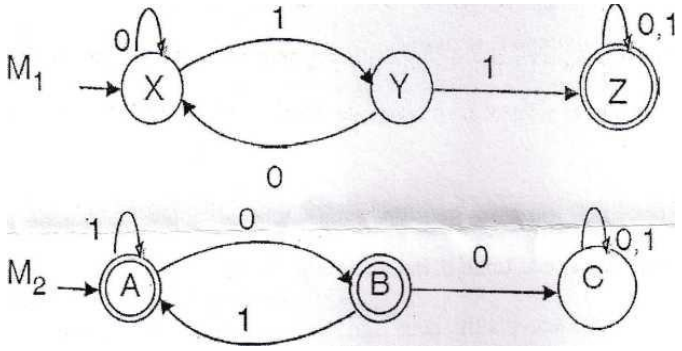
c) Draw DFA for regular expression
1) $ab(a+b)^*ab$
2) $(0+1)^*(00+11)$

d) Find context free grammar generating following language
$\{a^i b^j c^k | i = j \text{ or } i = k\}$

e) Construct deterministic finite automata to recognize odd number of 1's and even number of 0's?

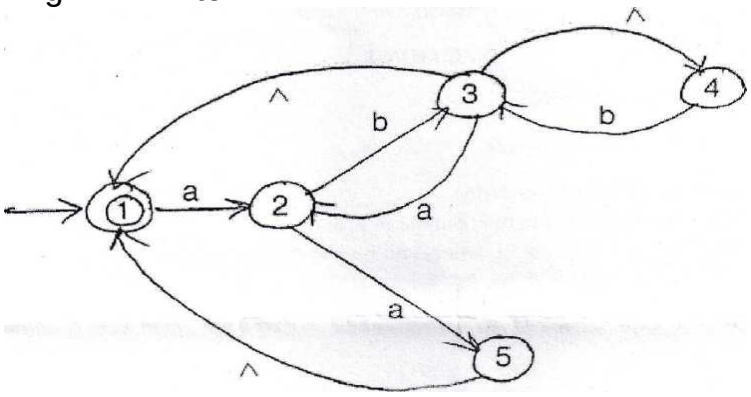
Q.3 Solve any one **06**

a) Following FAs recognize the languages $L1$ and $L2$. Draw FAs recognizing languages $L1 \cup L2,\ L1 \cap L2,\ L1 - L2$



b) State and explain different types of grammar.

Q.4 Convert following NFA- Λ to DFA **06**



Section – II

Q.5 **Attempt any four of the following.** **16**

a) What is PDA? Explain with an example

b) Convert the following CFG to a PDA.
$S \rightarrow aAA$,
$A \rightarrow aS|bS|a$

c) State and explain pumping lemma for Regular language

d) Construct an NPDA for the language $L = \{wcw^R : w \in \{a, b\}^*\}$

e) Explain Multiple Turing machine.

Q.6 **Attempt any one of the following.** **06**

a) Explain in detail universal Turing machine

b) Give transition table for PDA to recognize balanced strings of 2 types "( )" and "[ ]"

Q.7 Construct a Turing Machine that accepts the language **06**
$L = \{a^n b^m a^{n+m} | n > 0, m \geq 1\}$

SLR-BD-171

Seat No.		Set	P

S. Y. (B. Tech) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Organization and Architecture (BTN03403)

Day & Date: Wednesday 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each Question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the option and rewrite the sentence. **14**

1) Which architecture is followed by general purpose microprocessors?
a) Harvard architecture b) Von Neumann architecture
c) None of the mentioned d) All of the mentioned

2) Which architecture involves both the volatile and the nonvolatile memory?
a) Harvard architecture b) Von Neumann architecture
c) None of the mentioned d) All of the mentioned

3) Which of the following is a type of computer architecture?
a) Microarchitecture b) Harvard Architecture
c) Von-Neumann Architecture d) All of the mentioned

4) Which of the following is a type of architecture used in the computers nowadays?
a) Microarchitecture b) Harvard Architecture
c) Von-Neumann Architecture d) System Design

5) What is the high speed memory between the main memory and the CPU called?
a) Register Memory b) Cache Memory
c) Storage Memory d) Virtual Memory

6) Computer architecture is abstracted by its _____.
a) Instruction b) Instruction set
c) Organization d) None of the above

7) _____ Model is more suitable for special purpose computations.
a) SIMD b) MISD
c) MIMD d) Both a and b

8) Hazards in pipelines can make it necessary to _____ the pipeline.
a) Stall b) Stake
c) Storm d) None of the above

9) The processors in a multiprocessor system communicate with each other through _____.
a) Shared memory
b) The shared variable in a common memory
c) Both a & b
d) None of the above

10) _____ classification shows the architectural evolution from sequential scalar computers to vector processors and parallel computers.
a) Von-Neumann's b) Nyquist's
c) Flynn's d) None of the above

11) Which of the following is true about DMA?
a) DMA is an approach of performing data transfers in bulk between memory and the external device without the intervention of the processor.
b) The DMA controller acts as a processor for DMA transfers and overlooks the entire process.
c) The DMA controller has 3 registers.
d) All of the above

12) The fetch and execution cycles are interleaved with the help of _____.
a) modification in processor architecture
b) clock
c) special unit
d) control unit

13) To increase the speed of memory access in pipelining, we make use of _____.
a) special memory locations b) special purpose registers
c) Cache d) Buffers

14) The contention for the usage of a hardware device is called _____.
a) Structural hazard b) Stalk
c) Deadlock d) none of the mentioned

Seat No.	

Set **P**

S. Y. (B. Tech) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Organization and Architecture (BTN03403)

Day & Date: Wednesday 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Answer the following. (Any Three) **12**

a) Explain different levels of machines.
b) Explain in detail Von Neumann Architecture in detail.
c) Explain in detail Shared Variable Model.
d) Explain Cache memory hierarchy.

Q.3 Answer the following. (Any Two) **16**

a) Evaluate the equation using zero address, one address, two address instruction and three address.
$X = (A + B)^*(C + D)$
b) What is addressing mode? Explain the different types of addressing mode with example.
c) Explain in detail data parallel model & Object Oriented model.

Section – II

Q.4 Answer the following. (Any Three) **12**

a) Describe IO channels and its types.
b) Describe UMA and NUMA models of multiprocessor.
c) Define Parallelism. Explain in details types of parallelism.
d) Explain in detail Programmed I/O transfer technique.

Q.5 Answer the following. (Any Two) **16**

a) Describe look aside and look-through organization of cache.
b) Describe asynchronous and synchronous model of pipeline.
c) Describe Data Hazards along with its classification.

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Organization and Architecture (BTN03403)

Day & Date: Wednesday 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each Question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the option and rewrite the sentence. **14**

1) Hazards in pipelines can make it necessary to _____ the pipeline.
a) Stall b) Stake
c) Storm d) None of the above

2) The processors in a multiprocessor system communicate with each other through _____.
a) Shared memory
b) The shared variable in a common memory
c) Both a & b
d) None of the above

3) _____ classification shows the architectural evolution from sequential scalar computers to vector processors and parallel computers.
a) Von-Neumann's b) Nyquist's
c) Flynn's d) None of the above

4) Which of the following is true about DMA?
a) DMA is an approach of performing data transfers in bulk between memory and the external device without the intervention of the processor.
b) The DMA controller acts as a processor for DMA transfers and overlooks the entire process.
c) The DMA controller has 3 registers.
d) All of the above

5) The fetch and execution cycles are interleaved with the help of _____.
a) modification in processor architecture
b) clock
c) special unit
d) control unit

6) To increase the speed of memory access in pipelining, we make use of _____.
a) special memory locations b) special purpose registers
c) Cache d) Buffers

7) The contention for the usage of a hardware device is called _____.
a) Structural hazard b) Stalk
c) Deadlock d) none of the mentioned

8) Which architecture is followed by general purpose microprocessors?
a) Harvard architecture b) Von Neumann architecture
c) None of the mentioned d) All of the mentioned

9) Which architecture involves both the volatile and the nonvolatile memory?
a) Harvard architecture b) Von Neumann architecture
c) None of the mentioned d) All of the mentioned

10) Which of the following is a type of computer architecture?
a) Microarchitecture b) Harvard Architecture
c) Von-Neumann Architecture d) All of the mentioned

11) Which of the following is a type of architecture used in the computers nowadays?
a) Microarchitecture b) Harvard Architecture
c) Von-Neumann Architecture d) System Design

12) What is the high speed memory between the main memory and the CPU called?
a) Register Memory b) Cache Memory
c) Storage Memory d) Virtual Memory

13) Computer architecture is abstracted by its _____.
a) Instruction b) Instruction set
c) Organization d) None of the above

14) _____ Model is more suitable for special purpose computations.
a) SIMD b) MISD
c) MIMD d) Both a and b

SLR-BD-171

Seat No.	

Set Q

S. Y. (B. Tech) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Organization and Architecture (BTN03403)

Day & Date: Wednesday 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Answer the following. (Any Three) **12**

a) Explain different levels of machines.
b) Explain in detail Von Neumann Architecture in detail.
c) Explain in detail Shared Variable Model.
d) Explain Cache memory hierarchy.

Q.3 Answer the following. (Any Two) **16**

a) Evaluate the equation using zero address, one address, two address instruction and three address.
$X = (A + B)^*(C + D)$
b) What is addressing mode? Explain the different types of addressing mode with example.
c) Explain in detail data parallel model & Object Oriented model.

Section – II

Q.4 Answer the following. (Any Three) **12**

a) Describe IO channels and its types.
b) Describe UMA and NUMA models of multiprocessor.
c) Define Parallelism. Explain in details types of parallelism.
d) Explain in detail Programmed I/O transfer technique.

Q.5 Answer the following. (Any Two) **16**

a) Describe look aside and look-through organization of cache.
b) Describe asynchronous and synchronous model of pipeline.
c) Describe Data Hazards along with its classification.

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Organization and Architecture (BTN03403)

Day & Date: Wednesday 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each Question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the option and rewrite the sentence. **14**

1) Which of the following is true about DMA?
a) DMA is an approach of performing data transfers in bulk between memory and the external device without the intervention of the processor.
b) The DMA controller acts as a processor for DMA transfers and overlooks the entire process.
c) The DMA controller has 3 registers.
d) All of the above

2) The fetch and execution cycles are interleaved with the help of _____.
a) modification in processor architecture
b) clock
c) special unit
d) control unit

3) To increase the speed of memory access in pipelining, we make use of _____.
a) special memory locations b) special purpose registers
c) Cache d) Buffers

4) The contention for the usage of a hardware device is called _____.
a) Structural hazard b) Stalk
c) Deadlock d) none of the mentioned

5) Which architecture is followed by general purpose microprocessors?
a) Harvard architecture b) Von Neumann architecture
c) None of the mentioned d) All of the mentioned

6) Which architecture involves both the volatile and the nonvolatile memory?

a) Harvard architecture b) Von Neumann architecture
c) None of the mentioned d) All of the mentioned

7) Which of the following is a type of computer architecture?

a) Microarchitecture b) Harvard Architecture
c) Von-Neumann Architecture d) All of the mentioned

8) Which of the following is a type of architecture used in the computers nowadays?

a) Microarchitecture b) Harvard Architecture
c) Von-Neumann Architecture d) System Design

9) What is the high speed memory between the main memory and the CPU called?

a) Register Memory b) Cache Memory
c) Storage Memory d) Virtual Memory

10) Computer architecture is abstracted by its _____.

a) Instruction b) Instruction set
c) Organization d) None of the above

11) _____ Model is more suitable for special purpose computations.

a) SIMD b) MISD
c) MIMD d) Both a and b

12) Hazards in pipelines can make it necessary to _____ the pipeline.

a) Stall b) Stake
c) Storm d) None of the above

13) The processors in a multiprocessor system communicate with each other through _____.

a) Shared memory
b) The shared variable in a common memory
c) Both a & b
d) None of the above

14) _____ classification shows the architectural evolution from sequential scalar computers to vector processors and parallel computers.

a) Von-Neumann's b) Nyquist's
c) Flynn's d) None of the above

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Organization and Architecture (BTN03403)

Day & Date: Wednesday 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Answer the following. (Any Three) **12**

a) Explain different levels of machines.
b) Explain in detail Von Neumann Architecture in detail.
c) Explain in detail Shared Variable Model.
d) Explain Cache memory hierarchy.

Q.3 Answer the following. (Any Two) **16**

a) Evaluate the equation using zero address, one address, two address instruction and three address.
$X = (A + B)^*(C + D)$
b) What is addressing mode? Explain the different types of addressing mode with example.
c) Explain in detail data parallel model & Object Oriented model.

Section – II

Q.4 Answer the following. (Any Three) **12**

a) Describe IO channels and its types.
b) Describe UMA and NUMA models of multiprocessor.
c) Define Parallelism. Explain in details types of parallelism.
d) Explain in detail Programmed I/O transfer technique.

Q.5 Answer the following. (Any Two) **16**

a) Describe look aside and look-through organization of cache.
b) Describe asynchronous and synchronous model of pipeline.
c) Describe Data Hazards along with its classification.

Seat No.		Set	S

S. Y. (B. Tech) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Organization and Architecture (BTN03403)

Day & Date: Wednesday 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each Question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the option and rewrite the sentence. **14**

1) Computer architecture is abstracted by its _____.
a) Instruction b) Instruction set
c) Organization d) None of the above

2) _____ Model is more suitable for special purpose computations.
a) SIMD b) MISD
c) MIMD d) Both a and b

3) Hazards in pipelines can make it necessary to _____ the pipeline.
a) Stall b) Stake
c) Storm d) None of the above

4) The processors in a multiprocessor system communicate with each other through _____.
a) Shared memory
b) The shared variable in a common memory
c) Both a & b
d) None of the above

5) _____ classification shows the architectural evolution from sequential scalar computers to vector processors and parallel computers.
a) Von-Neumann's b) Nyquist's
c) Flynn's d) None of the above

6) Which of the following is true about DMA?
a) DMA is an approach of performing data transfers in bulk between memory and the external device without the intervention of the processor.
b) The DMA controller acts as a processor for DMA transfers and overlooks the entire process.
c) The DMA controller has 3 registers.
d) All of the above

7) The fetch and execution cycles are interleaved with the help of _____.
a) modification in processor architecture
b) clock
c) special unit
d) control unit

8) To increase the speed of memory access in pipelining, we make use of _____.
a) special memory locations
b) special purpose registers
c) Cache
d) Buffers

9) The contention for the usage of a hardware device is called _____.
a) Structural hazard
b) Stalk
c) Deadlock
d) none of the mentioned

10) Which architecture is followed by general purpose microprocessors?
a) Harvard architecture
b) Von Neumann architecture
c) None of the mentioned
d) All of the mentioned

11) Which architecture involves both the volatile and the nonvolatile memory?
a) Harvard architecture
b) Von Neumann architecture
c) None of the mentioned
d) All of the mentioned

12) Which of the following is a type of computer architecture?
a) Microarchitecture
b) Harvard Architecture
c) Von-Neumann Architecture
d) All of the mentioned

13) Which of the following is a type of architecture used in the computers nowadays?
a) Microarchitecture
b) Harvard Architecture
c) Von-Neumann Architecture
d) System Design

14) What is the high speed memory between the main memory and the CPU called?
a) Register Memory
b) Cache Memory
c) Storage Memory
d) Virtual Memory

SLR-BD-171

Seat No.	

Set S

S. Y. (B. Tech) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Organization and Architecture (BTN03403)

Day & Date: Wednesday 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Answer the following. (Any Three) **12**

a) Explain different levels of machines.
b) Explain in detail Von Neumann Architecture in detail.
c) Explain in detail Shared Variable Model.
d) Explain Cache memory hierarchy.

Q.3 Answer the following. (Any Two) **16**

a) Evaluate the equation using zero address, one address, two address instruction and three address.
$X = (A + B)^*(C + D)$
b) What is addressing mode? Explain the different types of addressing mode with example.
c) Explain in detail data parallel model & Object Oriented model.

Section – II

Q.4 Answer the following. (Any Three) **12**

a) Describe IO channels and its types.
b) Describe UMA and NUMA models of multiprocessor.
c) Define Parallelism. Explain in details types of parallelism.
d) Explain in detail Programmed I/O transfer technique.

Q.5 Answer the following. (Any Two) **16**

a) Describe look aside and look-through organization of cache.
b) Describe asynchronous and synchronous model of pipeline.
c) Describe Data Hazards along with its classification.

SLR-BD-172

Seat No.		Set	P

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Networks (BTN03404)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) A one-to-one communication between one source and one destination is classified as a _____ communication.
a) Unicast b) Multicast
c) Broadcast d) none of the above

2) One computer can communicate to another computer by using _____.
a) Port address b) Physical address
c) Logical address d) Specific Address

3) The actual mail transfer is done through _____.
a) UA b) MTA
c) SPOOL d) None of the above

4) Which of the following statement is correct?
a) UDP is suitable for request-response communication
b) UDP is suitable transport protocol for multicasting.
c) UDP is used for route updating protocol like RIP
d) All of the above

5) FIN control field of TCP segment is used to _____.
a) Establish the connection b) Terminate the connection
c) Abort the connection d) Reset the connection

6) In TCP, one end can stop sending data while still receiving data. This is called a _____.
a) Half-close b) Half-open
c) One-way termination d) None of the above

7) _____ socket type is designed to be used with a connectionless protocol such as UDP.

a) Stream b) Datagram
c) Raw d) none of the above

8) A computer that uses the _____ system stores the most significant bytes of data in the starting address of the data unit.

a) Little-Endian b) Big-Endian
c) Bothe a and b d) Short-Endian

9) In a DNS, if a label is terminated by null string, it is called _____.

a) FQDN b) PQDN
c) Both a & b d) None of the above

10) The _____ domain section uses two-character country abbreviations.

a) Generic b) Country
c) Inverse d) None of the above

11) In file transfer protocol, data transfer can be done in _____.

a) Stream mode b) Block mode
c) Compressed mode d) All of the mentioned

12) To make control character more effective in special situation, TELNET uses _____signaling.

a) Out of band b) In band
c) Out of out d) none of the above

13) What is the purpose of the DHCP server?

a) To provide storage for email
b) To translate URLs to IP addresses
c) To translate IPv4 addresses to MAC addresses
d) To provide an IP configuration information to hosts

14) When the sender and the receiver of an email are on the same system, we need only _____.

a) One UA b) Two UAs
c) One UA and one MTA d) none of the above

Seat No.	

Set **P**

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Networks (BTN03404)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

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

a) What is IP Datagram? Explain with a neat diagram.
b) What is fragmentation? Explain the fields related to fragmentation with an example.
c) What is concurrency in server? Describe connection-oriented Concurrent server.
d) Define socket. Draw socket address structure and describe each field.
e) Describe Three-Way Hand shaking mechanism in TCP connection.
f) List TCP services and Explain stream delivery service.

Q.3 Attempt any One. **06**

a) What is socket? List and explain the different fields and types of sockets.
b) Describe Network Address Translation (NAT) with neat diagram.

Q.4 What is Segment? And explain TCP segment format in detail. **06**

Section – II

Q.5 Attempt any four: **16**

a) What is name space? Explain the types of name space.
b) Explain Types of Records in DNS in detail.
c) Describe the Network Virtual Terminal (NVT).
d) Explain in detail about the TELNET Login.
e) Explain in detail about File Transfer Protocol (FTP).
f) Explain the different types of TFTP Messages.

Q.6 Attempt any one. **06**

a) With a neat diagram explain the Message Transfer Agent (MTA) in SMTP.
b) Describe the DNS in the internet.

Q.7 Explain the Architecture of E-mail with four different scenarios. **06**

SLR-BD-172

Seat No.	

Set Q

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Networks (BTN03404)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) A computer that uses the _____ system stores the most significant bytes of data in the starting address of the data unit.
a) Little-Endian b) Big-Endian
c) Bothe a and b d) Short-Endian

2) In a DNS, if a label is terminated by null string, it is called _____.
a) FQDN b) PQDN
c) Both a & b d) None of the above

3) The _____ domain section uses two-character country abbreviations.
a) Generic b) Country
c) Inverse d) None of the above

4) In file transfer protocol, data transfer can be done in _____.
a) Stream mode b) Block mode
c) Compressed mode d) All of the mentioned

5) To make control character more effective in special situation, TELNET uses _____signaling.
a) Out of band b) In band
c) Out of out d) none of the above

6) What is the purpose of the DHCP server?
a) To provide storage for email
b) To translate URLs to IP addresses
c) To translate IPv4 addresses to MAC addresses
d) To provide an IP configuration information to hosts

7) When the sender and the receiver of an email are on the same system, we need only _____.

a) One UA b) Two UAs
c) One UA and one MTA d) none of the above

8) A one-to-one communication between one source and one destination is classified as a _____ communication.

a) Unicast b) Multicast
c) Broadcast d) none of the above

9) One computer can communicate to another computer by using _____.

a) Port address b) Physical address
c) Logical address d) Specific Address

10) The actual mail transfer is done through _____.

a) UA b) MTA
c) SPOOL d) None of the above

11) Which of the following statement is correct?

a) UDP is suitable for request-response communication
b) UDP is suitable transport protocol for multicasting.
c) UDP is used for route updating protocol like RIP
d) All of the above

12) FIN control field of TCP segment is used to _____.

a) Establish the connection b) Terminate the connection
c) Abort the connection d) Reset the connection

13) In TCP, one end can stop sending data while still receiving data. This is called a _____.

a) Half-close b) Half-open
c) One-way termination d) None of the above

14) _____ socket type is designed to be used with a connectionless protocol such as UDP.

a) Stream b) Datagram
c) Raw d) none of the above

Seat No.	

Set **Q**

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Networks (BTN03404)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

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

a) What is IP Datagram? Explain with a neat diagram.
b) What is fragmentation? Explain the fields related to fragmentation with an example.
c) What is concurrency in server? Describe connection-oriented Concurrent server.
d) Define socket. Draw socket address structure and describe each field.
e) Describe Three-Way Hand shaking mechanism in TCP connection.
f) List TCP services and Explain stream delivery service.

Q.3 Attempt any One. **06**

a) What is socket? List and explain the different fields and types of sockets.
b) Describe Network Address Translation (NAT) with neat diagram.

Q.4 What is Segment? And explain TCP segment format in detail. **06**

Section – II

Q.5 Attempt any four: **16**

a) What is name space? Explain the types of name space.
b) Explain Types of Records in DNS in detail.
c) Describe the Network Virtual Terminal (NVT).
d) Explain in detail about the TELNET Login.
e) Explain in detail about File Transfer Protocol (FTP).
f) Explain the different types of TFTP Messages.

Q.6 Attempt any one. **06**

a) With a neat diagram explain the Message Transfer Agent (MTA) in SMTP.
b) Describe the DNS in the internet.

Q.7 Explain the Architecture of E-mail with four different scenarios. **06**

Seat No.	

Set **R**

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Networks (BTN03404)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) In file transfer protocol, data transfer can be done in _____.
a) Stream mode b) Block mode
c) Compressed mode d) All of the mentioned

2) To make control character more effective in special situation, TELNET uses _____signaling.
a) Out of band b) In band
c) Out of out d) none of the above

3) What is the purpose of the DHCP server?
a) To provide storage for email
b) To translate URLs to IP addresses
c) To translate IPv4 addresses to MAC addresses
d) To provide an IP configuration information to hosts

4) When the sender and the receiver of an email are on the same system, we need only _____.
a) One UA b) Two UAs
c) One UA and one MTA d) none of the above

5) A one-to-one communication between one source and one destination is classified as a _____ communication.
a) Unicast b) Multicast
c) Broadcast d) none of the above

6) One computer can communicate to another computer by using _____.
a) Port address b) Physical address
c) Logical address d) Specific Address

7) The actual mail transfer is done through _____.
a) UA b) MTA
c) SPOOL d) None of the above

8) Which of the following statement is correct?
a) UDP is suitable for request-response communication
b) UDP is suitable transport protocol for multicasting.
c) UDP is used for route updating protocol like RIP
d) All of the above

9) FIN control field of TCP segment is used to _____.
a) Establish the connection b) Terminate the connection
c) Abort the connection d) Reset the connection

10) In TCP, one end can stop sending data while still receiving data. This is called a _____.
a) Half-close b) Half-open
c) One-way termination d) None of the above

11) _____ socket type is designed to be used with a connectionless protocol such as UDP.
a) Stream b) Datagram
c) Raw d) none of the above

12) A computer that uses the _____ system stores the most significant bytes of data in the starting address of the data unit.
a) Little-Endian b) Big-Endian
c) Bothe a and b d) Short-Endian

13) In a DNS, if a label is terminated by null string, it is called _____.
a) FQDN b) PQDN
c) Both a & b d) None of the above

14) The _____ domain section uses two-character country abbreviations.
a) Generic b) Country
c) Inverse d) None of the above

Seat No.	

Set R

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Networks (BTN03404)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

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

a) What is IP Datagram? Explain with a neat diagram.
b) What is fragmentation? Explain the fields related to fragmentation with an example.
c) What is concurrency in server? Describe connection-oriented Concurrent server.
d) Define socket. Draw socket address structure and describe each field.
e) Describe Three-Way Hand shaking mechanism in TCP connection.
f) List TCP services and Explain stream delivery service.

Q.3 Attempt any One. **06**

a) What is socket? List and explain the different fields and types of sockets.
b) Describe Network Address Translation (NAT) with neat diagram.

Q.4 What is Segment? And explain TCP segment format in detail. **06**

Section – II

Q.5 Attempt any four: **16**

a) What is name space? Explain the types of name space.
b) Explain Types of Records in DNS in detail.
c) Describe the Network Virtual Terminal (NVT).
d) Explain in detail about the TELNET Login.
e) Explain in detail about File Transfer Protocol (FTP).
f) Explain the different types of TFTP Messages.

Q.6 Attempt any one. **06**

a) With a neat diagram explain the Message Transfer Agent (MTA) in SMTP.
b) Describe the DNS in the internet.

Q.7 Explain the Architecture of E-mail with four different scenarios. **06**

Seat No.		Set	S

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Networks (BTN03404)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) In TCP, one end can stop sending data while still receiving data. This is called a _____.
a) Half-close b) Half-open
c) One-way termination d) None of the above

2) _____ socket type is designed to be used with a connectionless protocol such as UDP.
a) Stream b) Datagram
c) Raw d) none of the above

3) A computer that uses the _____ system stores the most significant bytes of data in the starting address of the data unit.
a) Little-Endian b) Big-Endian
c) Bothe a and b d) Short-Endian

4) In a DNS, if a label is terminated by null string, it is called _____.
a) FQDN b) PQDN
c) Both a & b d) None of the above

5) The _____ domain section uses two-character country abbreviations.
a) Generic b) Country
c) Inverse d) None of the above

6) In file transfer protocol, data transfer can be done in _____.
a) Stream mode b) Block mode
c) Compressed mode d) All of the mentioned

7) To make control character more effective in special situation, TELNET uses _____signaling.

a) Out of band b) In band
c) Out of out d) none of the above

8) What is the purpose of the DHCP server?

a) To provide storage for email
b) To translate URLs to IP addresses
c) To translate IPv4 addresses to MAC addresses
d) To provide an IP configuration information to hosts

9) When the sender and the receiver of an email are on the same system, we need only _____.

a) One UA b) Two UAs
c) One UA and one MTA d) none of the above

10) A one-to-one communication between one source and one destination is classified as a _____ communication.

a) Unicast b) Multicast
c) Broadcast d) none of the above

11) One computer can communicate to another computer by using _____.

a) Port address b) Physical address
c) Logical address d) Specific Address

12) The actual mail transfer is done through _____.

a) UA b) MTA
c) SPOOL d) None of the above

13) Which of the following statement is correct?

a) UDP is suitable for request-response communication
b) UDP is suitable transport protocol for multicasting.
c) UDP is used for route updating protocol like RIP
d) All of the above

14) FIN control field of TCP segment is used to _____.

a) Establish the connection b) Terminate the connection
c) Abort the connection d) Reset the connection

SLR-BD-172

Seat No.	

Set S

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Computer Networks (BTN03404)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Attempt any four: **16**
- **a)** What is IP Datagram? Explain with a neat diagram.
- **b)** What is fragmentation? Explain the fields related to fragmentation with an example.
- **c)** What is concurrency in server? Describe connection-oriented Concurrent server.
- **d)** Define socket. Draw socket address structure and describe each field.
- **e)** Describe Three-Way Hand shaking mechanism in TCP connection.
- **f)** List TCP services and Explain stream delivery service.

Q.3 Attempt any One. **06**
- **a)** What is socket? List and explain the different fields and types of sockets.
- **b)** Describe Network Address Translation (NAT) with neat diagram.

Q.4 What is Segment? And explain TCP segment format in detail. **06**

Section – II

Q.5 Attempt any four: **16**
- **a)** What is name space? Explain the types of name space.
- **b)** Explain Types of Records in DNS in detail.
- **c)** Describe the Network Virtual Terminal (NVT).
- **d)** Explain in detail about the TELNET Login.
- **e)** Explain in detail about File Transfer Protocol (FTP).
- **f)** Explain the different types of TFTP Messages.

Q.6 Attempt any one. **06**
- **a)** With a neat diagram explain the Message Transfer Agent (MTA) in SMTP.
- **b)** Describe the DNS in the internet.

Q.7 Explain the Architecture of E-mail with four different scenarios. **06**

SLR-BD-173

Seat No.	

Set P

S.Y (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Applied Mathematics - II (BTN03401)

Day & Date: Tuesday, 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and state them clearly.
5) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) _____ method has quadratic convergence.
a) Newton Raphson method b) Regula falsi method
c) Bisection method d) None of these

2) A root of $x - \cos x = 0$ lies between _____.
a) 1 and 2 b) 2 and 3
c) 0 and 1 d) None of these

3) The number of strips required in Simpson's $1/3^{\text{rd}}$ rule is _____.
a) a multiple of 2 b) a multiple of 3
c) a multiple of 6 d) any

4) The use of Romberg's method is _____.
a) To solve simultaneous linear equations
b) To find root of linear equation
c) To evaluate definite integration
d) To find eigen values

5) _____ method is used to find largest eigen value.
a) Gauss Jordan b) Factorization
c) Gauss -Seidel d) Power

6) In Gauss Elimination method the system is reduced to _____ matrix.
a) lower triangular b) upper triangular
c) diagonal d) identity

7) For the data

x:	2	4	6	8
$f(x)$:	3	5	6	7

The value of $\int_2^8 f(x)dx$ by Trapezoidal rule is _____.

a) 18 b) 25
c) 16 d) 32

8) For the fuzzy sets

Elements :	x_1	x_2	x_3
$A(x)$:	0.2	0.5	0.6
$B(x)$:	0.1	0.4	0.5

Then set $A \cup B =$

a) $\frac{0.2}{x_1} + \frac{0.5}{x_2} + \frac{0.6}{x_3}$ b) $\frac{0.1}{x_1} + \frac{0.4}{x_2} + \frac{0.5}{x_3}$

c) $\frac{0.9}{x_1} + \frac{0.5}{x_2} + \frac{0.6}{x_3}$ d) $\frac{1}{x_1} + \frac{1}{x_2} + \frac{0.2}{x_3}$

9) The $\alpha -$ cuts of fuzzy numbers except $0 -$ cut are _____.

a) open intervals b) closed interval
c) bounded interval d) fuzzy sets

10) Which of the following is not true?

a) $S(A,B) = \frac{|A \cap B|}{|B|}$ d) $S(B,A) = \frac{|A \cap B|}{|B|}$

c) $|B| = \sum_{\propto} \frac{\alpha}{|\alpha_B|}$ d) $|A| = \sum_{\propto} \frac{\alpha}{|A|}$

11) A set of values of decision variables that satisfies the linear constraints and non-negativity conditions of an L.P.P. is called its:

a) Unbounded solution b) Optimum solution
c) Feasible solution d) None of these

12) The cost coefficient of slack variable is _____.

a) zero b) one
c) greater than one d) less than one

13) A fuzzy cardinality of fuzzy set is _____.

a) Fuzzy set b) A real number
c) Fuzzy number d) none of these

14) The dummy source or destination in assignment problem u added to _____.

a) satisfy rim conditions
b) prevent solution from becoming degenerate
c) ensure that total cost does not exceed a limit
d) none of these

Seat No.	

Set **P**

S.Y (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Applied Mathematics - II (BTN03401)

Day & Date: Tuesday, 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state them clearly.
4) Use of non-programmable calculators is allowed

Section – I

Q.2 Attempt any three from the following. **09**

a) Find an approximate positive real root of $e^{-x} = \sin x$ by False position method (Perform 2 iterations)

b) Solve by Newton Raphson method $x^4 - x - 13 = 0$ correct to three decimal places.

c) Solve the system of equations by Gauss Elimination method.
$2x + y + z = 10, 3x + 2y + 3z = 18, x + 4y + 9z = 16$

d) Find numerically largest eigen value and corresponding eigen vector by Power method.
$\begin{bmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix}$ Perform 3 iterations. Take $x_0 = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$ as initial approximation.

e) Evaluate $\int_4^{5.2} \log x \, dx \;\; n = 6$ using Weddel's rule.

Q.3 Attempt any three from the following. **09**

a) Evaluate $\sqrt{37}$ by Newton Raphson method correct to four decimal places by taking initial approximation as $x_0 = 6$.

b) Solve the system of equations by Jacobi's method (Perform 3 iterations)
$3x + y - z = 3, 2x - 8y + z = -5, x - 2y + 9z = 8$

c) Evaluate $\int_0^6 \frac{dx}{1+x^2}$ by using Simpson's 3/8th rule, $n = 6$

d) Evaluate $\int_0^1 \int_0^1 xe^y \, dxdy \qquad h = 0.5, k = 0.5$ by Trapezoidal rule.

e) Solve the simultaneous equations $x^2 + y^2 = 1$, and $xy = x + y$, the initial approximations $x_0 = 0.5$ and $y_0 = -1$ using Newton Raphson method. (Perform one iteration)

Q.4 Attempt the following.

a) Solve the system of equations by Gauss Seidel method. (Perform 4 iterations) **05**

$20x_1 + x_2 - 2x_3 = 17, 3x_1 + 20x_2 - x_3 = -18, 2x_1 - 3x_2 + 20x_3 = 25$

b) Evaluate $\int_0^2 \frac{1}{4+x^2} dx$ using Romberg's method with $n = 2$ **05**

Section – II

Q.5 Attempt any three of the following. **09**

a) Calculate $\propto -$ cut and strong $\propto -$ cut of

$$A(x) = \frac{x}{x+2}, \quad x \in [0,10]$$
$$= 0 \quad \text{otherwise} \qquad \propto = 0.2, 0.5, 1$$

b) For the fuzzy sets

Elements :	x_1	x_2	x_3	x_4	x_5	x_6
$A(x)$:	0.23	0.65	0.81	1	0.72	0.18
$B(x)$:	0.99	0.45	0.5	0.95	0.1	0

Then, find $(A \cup B)'$ and $A' \cap B$

c) Evaluate the following

i) $[-1,3] + [1,5]$
ii) $[-1,3] - [1,5]$
iii) $[-1,3].[1,5]$

d) If $C(x)\ \frac{x}{x+1}$ and $D(x) = 1 - \frac{x}{10}$ are membership functions of fuzzy sets C and D defiend on universal set $X = \{1,2,3,4,5\}$ find $S(C,D)$ and $S(D,C)$.

e) Find I.B.F.S by using Hungarian method.

	I	II	III	IV
A	10	12	19	11
B	5	10	7	8
C	12	14	13	11
D	8	15	11	9

Q.6 Attempt any three of the following. **09**

a) Determine whether the following fuzzy set is a fuzzy number

$A(x) = \min\{1, x\} \quad 0 \le x \le 10$
$= 0 \quad \text{otherwise}$

b) Solve the fuzzy equation $AX = B$
where $\alpha_A = [\alpha + 4, 6 - \alpha]$ and $\propto_B = [10 + 10\alpha, 35 - 15\alpha]$

c) Let A and B are fuzzy sets defined on universal set $X = Z$ (set of integers) as
$A(x) = \frac{0.5}{-1} + \frac{1}{0}$, $B(x) = \frac{0.5}{2} + \frac{1}{3}$ and $f(x_1, x_2) = x_1 x_2$ find $f(A,B)$

d) Maximize $Z = 3x_1 + 4x_2$, subject to
$x_1 - x_2 \le 1, -x_1 + x_2 \le 2, x_1, x_2 \ge 0$

e) Define:

i) Support of fuzzy set

ii) Normal fuzzy set

iii) Height of fuzzy set

Q.7 Attempt the following.

a) Find $A + B$ for the following membership function: **06**

i)
$$A(x) = \frac{x+1}{2} \quad -1 < x \leq 1$$
$$= \frac{3-x}{2} \quad 1 < x < 3$$
$$= 0 \quad \text{otherwise}$$

ii)
$$B(x) = \frac{x-1}{2} \quad 1 < x \leq 3$$
$$= \frac{5-x}{2} \quad 1 < x \leq 5$$
$$= 0 \quad \text{otherwise}$$

b) Solve the Assignment Problem. **04**

Men

Task	A	B	C	D
1	7	5	8	4
2	5	6	7	4
3	8	7	9	8

SLR-BD-173

Seat No.	

Set Q

S.Y (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Applied Mathematics - II (BTN03401)

Day & Date: Tuesday, 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and state them clearly.
5) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) For the fuzzy sets

Elements	:	x_1	x_2	x_3
$A(x)$	:	0.2	0.5	0.6
$B(x)$	:	0.1	0.4	0.5

Then set $A \cup B =$

a) $\frac{0.2}{x_1}+\frac{0.5}{x_2}+\frac{0.6}{x_3}$ b) $\frac{0.1}{x_1}+\frac{0.4}{x_2}+\frac{0.5}{x_3}$

c) $\frac{0.9}{x_1}+\frac{0.5}{x_2}+\frac{0.6}{x_3}$ d) $\frac{1}{x_1}+\frac{1}{x_2}+\frac{0.2}{x_3}$

2) The $\alpha-$ cuts of fuzzy numbers except $0-$ cut are _____.
a) open intervals b) closed interval
c) bounded interval d) fuzzy sets

3) Which of the following is not true?
a) $S(A,B)=\frac{|A\cap B|}{|B|}$ d) $S(B,A)=\frac{|A\cap B|}{|B|}$
c) $|B|=\sum_{\propto}\frac{\alpha}{|\alpha_B|}$ d) $|A|=\sum_{\propto}\frac{\alpha}{|A|}$

4) A set of values of decision variables that satisfies the linear constraints and non-negativity conditions of an L.P.P. is called its:
a) Unbounded solution b) Optimum solution
c) Feasible solution d) None of these

5) The cost coefficient of slack variable is _____.
a) zero b) one
c) greater than one d) less than one

6) A fuzzy cardinality of fuzzy set is _____.

a) Fuzzy set
b) A real number
c) Fuzzy number
d) none of these

7) The dummy source or destination in assignment problem u added to _____.

a) satisfy rim conditions
b) prevent solution from becoming degenerate
c) ensure that total cost does not exceed a limit
d) none of these

8) _____ method has quadratic convergence.

a) Newton Raphson method
b) Regula falsi method
c) Bisection method
d) None of these

9) A root of $x - \cos x = 0$ lies between _____.

a) 1 and 2
b) 2 and 3
c) 0 and 1
d) None of these

10) The number of strips required in Simpson's $1/3^{\text{rd}}$ rule is _____.

a) a multiple of 2
b) a multiple of 3
c) a multiple of 6
d) any

11) The use of Romberg's method is _____.

a) To solve simultaneous linear equations
b) To find root of linear equation
c) To evaluate definite integration
d) To find eigen values

12) _____ method is used to find largest eigen value.

a) Gauss Jordan
b) Factorization
c) Gauss -Seidel
d) Power

13) In Gauss Elimination method the system is reduced to _____ matrix.

a) lower triangular
b) upper triangular
c) diagonal
d) identity

14) For the data

x:	2	4	6	8
$f(x)$:	3	5	6	7

The value of $\int_2^8 f(x)dx$ by Trapezoidal rule is _____.

a) 18
b) 25
c) 16
d) 32

Seat No.	

Set **Q**

S.Y (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Applied Mathematics - II (BTN03401)

Day & Date: Tuesday, 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state them clearly.
4) Use of non-programmable calculators is allowed

Section – I

Q.2 Attempt any three from the following. **09**

a) Find an approximate positive real root of $e^{-x} = \sin x$ by False position method (Perform 2 iterations)

b) Solve by Newton Raphson method $x^4 - x - 13 = 0$ correct to three decimal places.

c) Solve the system of equations by Gauss Elimination method.
$2x + y + z = 10, 3x + 2y + 3z = 18, x + 4y + 9z = 16$

d) Find numerically largest eigen value and corresponding eigen vector by Power method.
$\begin{bmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix}$ Perform 3 iterations. Take $x_0 = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$ as initial approximation.

e) Evaluate $\int_4^{5.2} \log x \, dx \;\; n = 6$ using Weddel's rule.

Q.3 Attempt any three from the following. **09**

a) Evaluate $\sqrt{37}$ by Newton Raphson method correct to four decimal places by taking initial approximation as $x_0 = 6$.

b) Solve the system of equations by Jacobi's method (Perform 3 iterations)
$3x + y - z = 3, 2x - 8y + z = -5, x - 2y + 9z = 8$

c) Evaluate $\int_0^6 \frac{dx}{1+x^2}$ by using Simpson's 3/8th rule, $n = 6$

d) Evaluate $\int_0^1 \int_0^1 xe^y \, dxdy \qquad h = 0.5, k = 0.5$ by Trapezoidal rule.

e) Solve the simultaneous equations $x^2 + y^2 = 1$, and $xy = x + y$, the initial approximations $x_0 = 0.5$ and $y_0 = -1$ using Newton Raphson method. (Perform one iteration)

Q.4 Attempt the following.

a) Solve the system of equations by Gauss Seidel method. (Perform 4 iterations) **05**

$20x_1 + x_2 - 2x_3 = 17, 3x_1 + 20x_2 - x_3 = -18, 2x_1 - 3x_2 + 20x_3 = 25$

b) Evaluate $\int_0^2 \frac{1}{4+x^2} dx$ using Romberg's method with $n = 2$ **05**

Section – II

Q.5 Attempt any three of the following. **09**

a) Calculate $\propto -$ cut and strong $\propto -$ cut of

$$A(x) = \frac{x}{x+2}, \quad x \in [0,10]$$
$$= 0 \quad \text{otherwise} \qquad \propto = 0.2, 0.5, 1$$

b) For the fuzzy sets

Elements	:	x_1	x_2	x_3	x_4	x_5	x_6
$A(x)$	:	0.23	0.65	0.81	1	0.72	0.18
$B(x)$	:	0.99	0.45	0.5	0.95	0.1	0

Then, find $(A \cup B)'$ and $A' \cap B$

c) Evaluate the following

i) $[-1,3] + [1,5]$
ii) $[-1,3] - [1,5]$
iii) $[-1,3].[1,5]$

d) If $C(x)\ \frac{x}{x+1}$ and $D(x) = 1 - \frac{x}{10}$ are membership functions of fuzzy sets C and D defiend on universal set $X = \{1,2,3,4,5\}$ find $S(C,D)$ and $S(D,C)$.

e) Find I.B.F.S by using Hungarian method.

	I	II	III	IV
A	10	12	19	11
B	5	10	7	8
C	12	14	13	11
D	8	15	11	9

Q.6 Attempt any three of the following. **09**

a) Determine whether the following fuzzy set is a fuzzy number

$A(x) = \min\{1, x\} \quad 0 \le x \le 10$
$= 0 \quad \text{otherwise}$

b) Solve the fuzzy equation $AX = B$
where $\alpha_A = [\alpha + 4, 6 - \alpha]$ and $\propto_B = [10 + 10\alpha, 35 - 15\alpha]$

c) Let A and B are fuzzy sets defined on universal set $X = Z$ (set of integers) as
$A(x) = \frac{0.5}{-1} + \frac{1}{0}$, $B(x) = \frac{0.5}{2} + \frac{1}{3}$ and $f(x_1, x_2) = x_1 x_2$ find $f(A,B)$

d) Maximize $Z = 3x_1 + 4x_2$, subject to
$x_1 - x_2 \le 1, -x_1 + x_2 \le 2, x_1, x_2 \ge 0$

e) Define:

i) Support of fuzzy set

ii) Normal fuzzy set

iii) Height of fuzzy set

Q.7 Attempt the following.

a) Find $A + B$ for the following membership function: **06**

i)
$$A(x) = \frac{x+1}{2} \quad -1 < x \leq 1$$
$$= \frac{3-x}{2} \quad 1 < x < 3$$
$$= 0 \quad \text{otherwise}$$

ii)
$$B(x) = \frac{x-1}{2} \quad 1 < x \leq 3$$
$$= \frac{5-x}{2} \quad 1 < x \leq 5$$
$$= 0 \quad \text{otherwise}$$

b) Solve the Assignment Problem. **04**

Men

Task	A	B	C	D
1	7	5	8	4
2	5	6	7	4
3	8	7	9	8

SLR-BD-173

Seat No.	

Set R

S.Y (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Applied Mathematics - II (BTN03401)

Day & Date: Tuesday, 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and state them clearly.
5) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) A set of values of decision variables that satisfies the linear constraints and non-negativity conditions of an L.P.P. is called its:
a) Unbounded solution b) Optimum solution
c) Feasible solution d) None of these

2) The cost coefficient of slack variable is _____.
a) zero b) one
c) greater than one d) less than one

3) A fuzzy cardinality of fuzzy set is _____.
a) Fuzzy set b) A real number
c) Fuzzy number d) none of these

4) The dummy source or destination in assignment problem u added to _____.
a) satisfy rim conditions
b) prevent solution from becoming degenerate
c) ensure that total cost does not exceed a limit
d) none of these

5) _____ method has quadratic convergence.
a) Newton Raphson method b) Regula falsi method
c) Bisection method d) None of these

6) A root of $x - \cos x = 0$ lies between _____.
a) 1 and 2 b) 2 and 3
c) 0 and 1 d) None of these

7) The number of strips required in Simpson's $1/3^{\text{rd}}$ rule is _____.

a) a multiple of 2 b) a multiple of 3

c) a multiple of 6 d) any

8) The use of Romberg's method is _____.

a) To solve simultaneous linear equations

b) To find root of linear equation

c) To evaluate definite integration

d) To find eigen values

9) _____ method is used to find largest eigen value.

a) Gauss Jordan b) Factorization

c) Gauss -Seidel d) Power

10) In Gauss Elimination method the system is reduced to _____ matrix.

a) lower triangular b) upper triangular

c) diagonal d) identity

11) For the data

x:	2	4	6	8
$f(x)$:	3	5	6	7

The value of $\int_2^8 f(x)dx$ by Trapezoidal rule is _____.

a) 18 b) 25

c) 16 d) 32

12) For the fuzzy sets

Elements :	x_1	x_2	x_3
$A(x)$:	0.2	0.5	0.6
$B(x)$:	0.1	0.4	0.5

Then set $A \cup B =$

a) $\frac{0.2}{x_1} + \frac{0.5}{x_2} + \frac{0.6}{x_3}$ b) $\frac{0.1}{x_1} + \frac{0.4}{x_2} + \frac{0.5}{x_3}$

c) $\frac{0.9}{x_1} + \frac{0.5}{x_2} + \frac{0.6}{x_3}$ d) $\frac{1}{x_1} + \frac{1}{x_2} + \frac{0.2}{x_3}$

13) The $\alpha -$ cuts of fuzzy numbers except $0 -$ cut are _____.

a) open intervals b) closed interval

c) bounded interval d) fuzzy sets

14) Which of the following is not true?

a) $S(A,B) = \frac{|A \cap B|}{|B|}$ d) $S(B,A) = \frac{|A \cap B|}{|B|}$

c) $|B| = \sum_{\propto} \frac{\alpha}{|\alpha_B|}$ d) $|A| = \sum_{\propto} \frac{\alpha}{|A|}$

Seat No.	

Set **R**

S.Y (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Applied Mathematics - II (BTN03401)

Day & Date: Tuesday, 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state them clearly.
4) Use of non-programmable calculators is allowed

Section – I

Q.2 Attempt any three from the following. **09**

a) Find an approximate positive real root of $e^{-x} = \sin x$ by False position method (Perform 2 iterations)

b) Solve by Newton Raphson method $x^4 - x - 13 = 0$ correct to three decimal places.

c) Solve the system of equations by Gauss Elimination method.
$2x + y + z = 10, 3x + 2y + 3z = 18, x + 4y + 9z = 16$

d) Find numerically largest eigen value and corresponding eigen vector by Power method.
$\begin{bmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix}$ Perform 3 iterations. Take $x_0 = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$ as initial approximation.

e) Evaluate $\int_4^{5.2} \log x \, dx \;\; n = 6$ using Weddel's rule.

Q.3 Attempt any three from the following. **09**

a) Evaluate $\sqrt{37}$ by Newton Raphson method correct to four decimal places by taking initial approximation as $x_0 = 6$.

b) Solve the system of equations by Jacobi's method (Perform 3 iterations)
$3x + y - z = 3, 2x - 8y + z = -5, x - 2y + 9z = 8$

c) Evaluate $\int_0^6 \frac{dx}{1+x^2}$ by using Simpson's 3/8th rule, $n = 6$

d) Evaluate $\int_0^1 \int_0^1 xe^y \, dxdy \qquad h = 0.5, k = 0.5$ by Trapezoidal rule.

e) Solve the simultaneous equations $x^2 + y^2 = 1$, and $xy = x + y$, the initial approximations $x_0 = 0.5$ and $y_0 = -1$ using Newton Raphson method. (Perform one iteration)

Q.4 Attempt the following.

a) Solve the system of equations by Gauss Seidel method. (Perform 4 iterations) **05**

$20x_1 + x_2 - 2x_3 = 17, 3x_1 + 20x_2 - x_3 = -18, 2x_1 - 3x_2 + 20x_3 = 25$

b) Evaluate $\int_0^2 \frac{1}{4+x^2} dx$ using Romberg's method with $n = 2$ **05**

Section – II

Q.5 Attempt any three of the following. **09**

a) Calculate $\propto -$ cut and strong $\propto -$ cut of

$$A(x) = \frac{x}{x+2}, \quad x \in [0,10]$$
$$= 0 \quad \text{otherwise} \qquad \propto = 0.2, 0.5, 1$$

b) For the fuzzy sets

Elements :	x_1	x_2	x_3	x_4	x_5	x_6
$A(x)$:	0.23	0.65	0.81	1	0.72	0.18
$B(x)$:	0.99	0.45	0.5	0.95	0.1	0

Then, find $(A \cup B)'$ and $A' \cap B$

c) Evaluate the following

i) $[-1,3] + [1,5]$
ii) $[-1,3] - [1,5]$
iii) $[-1,3].[1,5]$

d) If $C(x)\ \frac{x}{x+1}$ and $D(x) = 1 - \frac{x}{10}$ are membership functions of fuzzy sets C and D defiend on universal set $X = \{1,2,3,4,5\}$ find $S(C,D)$ and $S(D,C)$.

e) Find I.B.F.S by using Hungarian method.

	I	II	III	IV
A	10	12	19	11
B	5	10	7	8
C	12	14	13	11
D	8	15	11	9

Q.6 Attempt any three of the following. **09**

a) Determine whether the following fuzzy set is a fuzzy number

$A(x) = \min\{1, x\} \quad 0 \le x \le 10$
$= 0 \quad \text{otherwise}$

b) Solve the fuzzy equation $AX = B$
where $\alpha_A = [\alpha + 4, 6 - \alpha]$ and $\propto_B = [10 + 10\alpha, 35 - 15\alpha]$

c) Let A and B are fuzzy sets defined on universal set $X = Z$ (set of integers) as
$A(x) = \frac{0.5}{-1} + \frac{1}{0}$, $B(x) = \frac{0.5}{2} + \frac{1}{3}$ and $f(x_1, x_2) = x_1 x_2$ find $f(A,B)$

d) Maximize $Z = 3x_1 + 4x_2$, subject to
$x_1 - x_2 \le 1, -x_1 + x_2 \le 2, x_1, x_2 \ge 0$

e) Define:

i) Support of fuzzy set

ii) Normal fuzzy set

iii) Height of fuzzy set

Q.7 Attempt the following.

a) Find $A + B$ for the following membership function: **06**

i)
$$A(x) = \frac{x+1}{2} \quad -1 < x \leq 1$$
$$= \frac{3-x}{2} \quad 1 < x < 3$$
$$= 0 \quad \text{otherwise}$$

ii)
$$B(x) = \frac{x-1}{2} \quad 1 < x \leq 3$$
$$= \frac{5-x}{2} \quad 1 < x \leq 5$$
$$= 0 \quad \text{otherwise}$$

b) Solve the Assignment Problem. **04**

Men

Task	A	B	C	D
1	7	5	8	4
2	5	6	7	4
3	8	7	9	8

Seat No.	

Set **S**

S.Y (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Applied Mathematics - II (BTN03401)

Day & Date: Tuesday, 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and state them clearly.
5) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) In Gauss Elimination method the system is reduced to _____ matrix.
a) lower triangular b) upper triangular
c) diagonal d) identity

2) For the data

x:	2	4	6	8
$f(x)$:	3	5	6	7

The value of $\int_2^8 f(x)dx$ by Trapezoidal rule is _____.
a) 18 b) 25
c) 16 d) 32

3) For the fuzzy sets

Elements :	x_1	x_2	x_3
$A(x)$:	0.2	0.5	0.6
$B(x)$:	0.1	0.4	0.5

Then set $A \cup B =$
a) $\frac{0.2}{x_1}+\frac{0.5}{x_2}+\frac{0.6}{x_3}$ b) $\frac{0.1}{x_1}+\frac{0.4}{x_2}+\frac{0.5}{x_3}$
c) $\frac{0.9}{x_1}+\frac{0.5}{x_2}+\frac{0.6}{x_3}$ d) $\frac{1}{x_1}+\frac{1}{x_2}+\frac{0.2}{x_3}$

4) The $\alpha-$ cuts of fuzzy numbers except $0-$ cut are _____.
a) open intervals b) closed interval
c) bounded interval d) fuzzy sets

5) Which of the following is not true?

a) $S(A,B) = \frac{|A \cap B|}{|B|}$ d) $S(B,A) = \frac{|A \cap B|}{|B|}$

c) $|B| = \sum_{\propto} \frac{\alpha}{|\alpha_B|}$ d) $|A| = \sum_{\propto} \frac{\alpha}{|A|}$

6) A set of values of decision variables that satisfies the linear constraints and non-negativity conditions of an L.P.P. is called its:

a) Unbounded solution b) Optimum solution
c) Feasible solution d) None of these

7) The cost coefficient of slack variable is _____.

a) zero b) one
c) greater than one d) less than one

8) A fuzzy cardinality of fuzzy set is _____.

a) Fuzzy set b) A real number
c) Fuzzy number d) none of these

9) The dummy source or destination in assignment problem u added to _____.

a) satisfy rim conditions
b) prevent solution from becoming degenerate
c) ensure that total cost does not exceed a limit
d) none of these

10) _____ method has quadratic convergence.

a) Newton Raphson method b) Regula falsi method
c) Bisection method d) None of these

11) A root of $x - \cos x = 0$ lies between _____.

a) 1 and 2 b) 2 and 3
c) 0 and 1 d) None of these

12) The number of strips required in Simpson's $1/3^{\text{rd}}$ rule is _____.

a) a multiple of 2 b) a multiple of 3
c) a multiple of 6 d) any

13) The use of Romberg's method is _____.

a) To solve simultaneous linear equations
b) To find root of linear equation
c) To evaluate definite integration
d) To find eigen values

14) _____ method is used to find largest eigen value.

a) Gauss Jordan b) Factorization
c) Gauss -Seidel d) Power

Seat No.	

Set **S**

S.Y (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Applied Mathematics - II (BTN03401)

Day & Date: Tuesday, 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state them clearly.
4) Use of non-programmable calculators is allowed

Section – I

Q.2 Attempt any three from the following. **09**

a) Find an approximate positive real root of $e^{-x} = \sin x$ by False position method (Perform 2 iterations)

b) Solve by Newton Raphson method $x^4 - x - 13 = 0$ correct to three decimal places.

c) Solve the system of equations by Gauss Elimination method.
$2x + y + z = 10, 3x + 2y + 3z = 18, x + 4y + 9z = 16$

d) Find numerically largest eigen value and corresponding eigen vector by Power method.
$\begin{bmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix}$ Perform 3 iterations. Take $x_0 = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$ as initial approximation.

e) Evaluate $\int_4^{5.2} \log x \, dx \;\; n = 6$ using Weddel's rule.

Q.3 Attempt any three from the following. **09**

a) Evaluate $\sqrt{37}$ by Newton Raphson method correct to four decimal places by taking initial approximation as $x_0 = 6$.

b) Solve the system of equations by Jacobi's method (Perform 3 iterations)
$3x + y - z = 3, 2x - 8y + z = -5, x - 2y + 9z = 8$

c) Evaluate $\int_0^6 \frac{dx}{1+x^2}$ by using Simpson's 3/8th rule, $n = 6$

d) Evaluate $\int_0^1 \int_0^1 xe^y \, dxdy \qquad h = 0.5, k = 0.5$ by Trapezoidal rule.

e) Solve the simultaneous equations $x^2 + y^2 = 1$, and $xy = x + y$, the initial approximations $x_0 = 0.5$ and $y_0 = -1$ using Newton Raphson method. (Perform one iteration)

Q.4 Attempt the following.

a) Solve the system of equations by Gauss Seidel method. (Perform 4 iterations) **05**

$20x_1 + x_2 - 2x_3 = 17, 3x_1 + 20x_2 - x_3 = -18, 2x_1 - 3x_2 + 20x_3 = 25$

b) Evaluate $\int_0^2 \frac{1}{4+x^2} dx$ using Romberg's method with $n = 2$ **05**

Section – II

Q.5 Attempt any three of the following. **09**

a) Calculate $\propto -$ cut and strong $\propto -$ cut of

$$A(x) = \frac{x}{x+2}, \quad x \in [0,10]$$
$$= 0 \quad \text{otherwise} \qquad \propto = 0.2, 0.5, 1$$

b) For the fuzzy sets

Elements :	x_1	x_2	x_3	x_4	x_5	x_6
$A(x)$:	0.23	0.65	0.81	1	0.72	0.18
$B(x)$:	0.99	0.45	0.5	0.95	0.1	0

Then, find $(A \cup B)'$ and $A' \cap B$

c) Evaluate the following

i) $[-1,3] + [1,5]$
ii) $[-1,3] - [1,5]$
iii) $[-1,3].[1,5]$

d) If $C(x)\ \frac{x}{x+1}$ and $D(x) = 1 - \frac{x}{10}$ are membership functions of fuzzy sets C and D defiend on universal set $X = \{1,2,3,4,5\}$ find $S(C,D)$ and $S(D,C)$.

e) Find I.B.F.S by using Hungarian method.

	I	II	III	IV
A	10	12	19	11
B	5	10	7	8
C	12	14	13	11
D	8	15	11	9

Q.6 Attempt any three of the following. **09**

a) Determine whether the following fuzzy set is a fuzzy number

$A(x) = \min\{1, x\} \quad 0 \le x \le 10$
$= 0 \quad \text{otherwise}$

b) Solve the fuzzy equation $AX = B$
where $\alpha_A = [\alpha + 4, 6 - \alpha]$ and $\propto_B = [10 + 10\alpha, 35 - 15\alpha]$

c) Let A and B are fuzzy sets defined on universal set $X = Z$ (set of integers) as
$A(x) = \frac{0.5}{-1} + \frac{1}{0}$, $B(x) = \frac{0.5}{2} + \frac{1}{3}$ and $f(x_1, x_2) = x_1 x_2$ find $f(A,B)$

d) Maximize $Z = 3x_1 + 4x_2$, subject to
$x_1 - x_2 \le 1, -x_1 + x_2 \le 2, x_1, x_2 \ge 0$

e) Define:

i) Support of fuzzy set

ii) Normal fuzzy set

iii) Height of fuzzy set

Q.7 Attempt the following.

a) Find $A + B$ for the following membership function: **06**

i)
$$A(x) = \frac{x+1}{2} \quad -1 < x \leq 1$$
$$= \frac{3-x}{2} \quad 1 < x < 3$$
$$= 0 \quad \text{otherwise}$$

ii)
$$B(x) = \frac{x-1}{2} \quad 1 < x \leq 3$$
$$= \frac{5-x}{2} \quad 1 < x \leq 5$$
$$= 0 \quad \text{otherwise}$$

b) Solve the Assignment Problem. **04**

Men

Task	A	B	C	D
1	7	5	8	4
2	5	6	7	4
3	8	7	9	8

SLR-BD-174

Seat No.	

Set P

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Machine Learning (BTN03406)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Which of the following is an example of a supervised learning problem?
a) Image classification b) Market segmentation
c) Fraud detection d) Social network analysis

2) Which of the following is an example of an unsupervised learning problem?
a) Predicting the stock market
b) Recommending products to users
c) Spam filtering
d) Sentiment analysis

3) What is the purpose of regularization in machine learning?
a) To prevent overfitting
b) To increase the accuracy of the model
c) To reduce the variance of the model
d) To reduce the bias of the model

4) Which of the following is an example of a semi-supervised learning problem?
a) Image classification b) Object detection
c) Text clustering d) Speech recognition

5) Which of the following is a common approach to handling missing data in machine learning?
a) Removing the missing data
b) Filling in the missing data with a constant value
c) Filling in the missing data with the mean or median value
d) Using a separate imputation model to predict the missing values

6) Which of the following is a common approach to reducing dimensionality in machine learning?

a) Feature selection
b) Feature extraction
c) Feature scaling
d) Feature engineering

7) How can you avoid overfitting?

a) by using a lot of data
b) by using inductive machine learning
c) by using validation only
d) none of above

8) What is Training set?

a) training set is used to test the accuracy of the hypotheses generated by the learner
b) a set of data is used to discover the potentially predictive relationship
c) both a & b
d) none of above

9) Commons unsupervised applications include ____.

a) object segmentation
b) similarity detection
c) automatic labelling
d) all above

10) Which of the following are supervised learning applications ____.

a) spam detection, pattern detection, natural language processing
b) image classification, real-time visual tracking
c) autonomous car driving, logistic optimization
d) bioinformatics, speech recognition

11) The parameter ____ allows specifying the percentage of elements to put into the test/training set.

a) test_size
b) training_size
c) all above
d) none of these

12) Which are two techniques of Machine Learning?

a) genetic programming and inductive learning
b) speech recognition and regression
c) both a & b
d) none of the mentioned

13) In reinforcement learning if feedback is negative one it is defined as ___.

a) Penalty
b) Overlearning
c) Reward
d) none of above

14) A supervised scenario is characterized by the concept of a ____.

a) Programmer
b) Teacher
c) Author
d) Farmer

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Machine Learning (BTN03406)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume additional data if required and mention it clearly.

Section – I

Q.2 Answer the following: (Any Three) **12**

a) Explain Data Preparation in Machine Learning.
b) How can we Focus on Business Problem in ML
c) Explain the World of Probabilities in Machine Learning.
d) How can we determine the Best Learning Model in ML?

Q.3 Answer the following: (Any One) **08**

a) How can we explore cost functions in Machine Learning?
b) Explain how can we Prepare Data when looking inside ML

Q.4 What is Machine Learning? Explain the types of Machine Learning. **08**

Section – II

Q.5 Answer the following: (Any Three) **12**

a) Explain Growing Greedy Classification Trees in detail.
b) Explain Searching for the Best Hyper-Parameters in Machine Learning.
c) Explore the Resorting to Cross-Validation in ML.
d) Explain selecting features of improve ML models and examples.

Q.6 Answer the following: (Any One) **08**

a) Explain Scoring Opinions and Sentiments in ML.
b) How can we Avoid Sample Bias and Leakage Traps with example in ML.

Q.7 Explain Classifying Images with Machine Learning in detail. **08**

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Machine Learning (BTN03406)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is Training set?
a) training set is used to test the accuracy of the hypotheses generated by the learner
b) a set of data is used to discover the potentially predictive relationship
c) both a & b
d) none of above

2) Commons unsupervised applications include ____.
a) object segmentation b) similarity detection
c) automatic labelling d) all above

3) Which of the following are supervised learning applications ____.
a) spam detection, pattern detection, natural language processing
b) image classification, real-time visual tracking
c) autonomous car driving, logistic optimization
d) bioinformatics, speech recognition

4) The parameter ____ allows specifying the percentage of elements to put into the test/training set.
a) test_size b) training_size
c) all above d) none of these

5) Which are two techniques of Machine Learning?
a) genetic programming and inductive learning
b) speech recognition and regression
c) both a & b
d) none of the mentioned

6) In reinforcement learning if feedback is negative one it is defined as ___.
a) Penalty b) Overlearning
c) Reward d) none of above

7) A supervised scenario is characterized by the concept of a ____.
a) Programmer b) Teacher
c) Author d) Farmer

8) Which of the following is an example of a supervised learning problem?
a) Image classification b) Market segmentation
c) Fraud detection d) Social network analysis

9) Which of the following is an example of an unsupervised learning problem?
a) Predicting the stock market
b) Recommending products to users
c) Spam filtering
d) Sentiment analysis

10) What is the purpose of regularization in machine learning?
a) To prevent overfitting
b) To increase the accuracy of the model
c) To reduce the variance of the model
d) To reduce the bias of the model

11) Which of the following is an example of a semi-supervised learning problem?
a) Image classification b) Object detection
c) Text clustering d) Speech recognition

12) Which of the following is a common approach to handling missing data in machine learning?
a) Removing the missing data
b) Filling in the missing data with a constant value
c) Filling in the missing data with the mean or median value
d) Using a separate imputation model to predict the missing values

13) Which of the following is a common approach to reducing dimensionality in machine learning?
a) Feature selection b) Feature extraction
c) Feature scaling d) Feature engineering

14) How can you avoid overfitting?
a) by using a lot of data
b) by using inductive machine learning
c) by using validation only
d) none of above

SLR-BD-174

Seat No.	

Set Q

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Machine Learning (BTN03406)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume additional data if required and mention it clearly.

Section – I

Q.2 Answer the following: (Any Three) **12**
- **a)** Explain Data Preparation in Machine Learning.
- **b)** How can we Focus on Business Problem in ML
- **c)** Explain the World of Probabilities in Machine Learning.
- **d)** How can we determine the Best Learning Model in ML?

Q.3 Answer the following: (Any One) **08**
- **a)** How can we explore cost functions in Machine Learning?
- **b)** Explain how can we Prepare Data when looking inside ML

Q.4 What is Machine Learning? Explain the types of Machine Learning. **08**

Section – II

Q.5 Answer the following: (Any Three) **12**
- **a)** Explain Growing Greedy Classification Trees in detail.
- **b)** Explain Searching for the Best Hyper-Parameters in Machine Learning.
- **c)** Explore the Resorting to Cross-Validation in ML.
- **d)** Explain selecting features of improve ML models and examples.

Q.6 Answer the following: (Any One) **08**
- **a)** Explain Scoring Opinions and Sentiments in ML.
- **b)** How can we Avoid Sample Bias and Leakage Traps with example in ML.

Q.7 Explain Classifying Images with Machine Learning in detail. **08**

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Machine Learning (BTN03406)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The parameter ____ allows specifying the percentage of elements to put into the test/training set.
a) test_size b) training_size
c) all above d) none of these

2) Which are two techniques of Machine Learning?
a) genetic programming and inductive learning
b) speech recognition and regression
c) both a & b
d) none of the mentioned

3) In reinforcement learning if feedback is negative one it is defined as ___.
a) Penalty b) Overlearning
c) Reward d) none of above

4) A supervised scenario is characterized by the concept of a ____.
a) Programmer b) Teacher
c) Author d) Farmer

5) Which of the following is an example of a supervised learning problem?
a) Image classification b) Market segmentation
c) Fraud detection d) Social network analysis

6) Which of the following is an example of an unsupervised learning problem?
a) Predicting the stock market
b) Recommending products to users
c) Spam filtering
d) Sentiment analysis

7) What is the purpose of regularization in machine learning?
a) To prevent overfitting
b) To increase the accuracy of the model
c) To reduce the variance of the model
d) To reduce the bias of the model

8) Which of the following is an example of a semi-supervised learning problem?
a) Image classification
b) Object detection
c) Text clustering
d) Speech recognition

9) Which of the following is a common approach to handling missing data in machine learning?
a) Removing the missing data
b) Filling in the missing data with a constant value
c) Filling in the missing data with the mean or median value
d) Using a separate imputation model to predict the missing values

10) Which of the following is a common approach to reducing dimensionality in machine learning?
a) Feature selection
b) Feature extraction
c) Feature scaling
d) Feature engineering

11) How can you avoid overfitting?
a) by using a lot of data
b) by using inductive machine learning
c) by using validation only
d) none of above

12) What is Training set?
a) training set is used to test the accuracy of the hypotheses generated by the learner
b) a set of data is used to discover the potentially predictive relationship
c) both a & b
d) none of above

13) Commons unsupervised applications include ____.
a) object segmentation
b) similarity detection
c) automatic labelling
d) all above

14) Which of the following are supervised learning applications ____.
a) spam detection, pattern detection, natural language processing
b) image classification, real-time visual tracking
c) autonomous car driving, logistic optimization
d) bioinformatics, speech recognition

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Machine Learning (BTN03406)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume additional data if required and mention it clearly.

Section – I

Q.2 Answer the following: (Any Three) **12**
- **a)** Explain Data Preparation in Machine Learning.
- **b)** How can we Focus on Business Problem in ML
- **c)** Explain the World of Probabilities in Machine Learning.
- **d)** How can we determine the Best Learning Model in ML?

Q.3 Answer the following: (Any One) **08**
- **a)** How can we explore cost functions in Machine Learning?
- **b)** Explain how can we Prepare Data when looking inside ML

Q.4 What is Machine Learning? Explain the types of Machine Learning. **08**

Section – II

Q.5 Answer the following: (Any Three) **12**
- **a)** Explain Growing Greedy Classification Trees in detail.
- **b)** Explain Searching for the Best Hyper-Parameters in Machine Learning.
- **c)** Explore the Resorting to Cross-Validation in ML.
- **d)** Explain selecting features of improve ML models and examples.

Q.6 Answer the following: (Any One) **08**
- **a)** Explain Scoring Opinions and Sentiments in ML.
- **b)** How can we Avoid Sample Bias and Leakage Traps with example in ML.

Q.7 Explain Classifying Images with Machine Learning in detail. **08**

Seat No.		Set	S

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Machine Learning (BTN03406)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is a common approach to reducing dimensionality in machine learning?
a) Feature selection b) Feature extraction
c) Feature scaling d) Feature engineering

2) How can you avoid overfitting?
a) by using a lot of data
b) by using inductive machine learning
c) by using validation only
d) none of above

3) What is Training set?
a) training set is used to test the accuracy of the hypotheses generated by the learner
b) a set of data is used to discover the potentially predictive relationship
c) both a & b
d) none of above

4) Commons unsupervised applications include ____.
a) object segmentation b) similarity detection
c) automatic labelling d) all above

5) Which of the following are supervised learning applications ____.
a) spam detection, pattern detection, natural language processing
b) image classification, real-time visual tracking
c) autonomous car driving, logistic optimization
d) bioinformatics, speech recognition

6) The parameter ____ allows specifying the percentage of elements to put into the test/training set.

a) test_size b) training_size
c) all above d) none of these

7) Which are two techniques of Machine Learning?

a) genetic programming and inductive learning
b) speech recognition and regression
c) both a & b
d) none of the mentioned

8) In reinforcement learning if feedback is negative one it is defined as ___.

a) Penalty b) Overlearning
c) Reward d) none of above

9) A supervised scenario is characterized by the concept of a ____.

a) Programmer b) Teacher
c) Author d) Farmer

10) Which of the following is an example of a supervised learning problem?

a) Image classification b) Market segmentation
c) Fraud detection d) Social network analysis

11) Which of the following is an example of an unsupervised learning problem?

a) Predicting the stock market
b) Recommending products to users
c) Spam filtering
d) Sentiment analysis

12) What is the purpose of regularization in machine learning?

a) To prevent overfitting
b) To increase the accuracy of the model
c) To reduce the variance of the model
d) To reduce the bias of the model

13) Which of the following is an example of a semi-supervised learning problem?

a) Image classification b) Object detection
c) Text clustering d) Speech recognition

14) Which of the following is a common approach to handling missing data in machine learning?

a) Removing the missing data
b) Filling in the missing data with a constant value
c) Filling in the missing data with the mean or median value
d) Using a separate imputation model to predict the missing values

SLR-BD-174

Seat No.		Set	S

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Machine Learning (BTN03406)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume additional data if required and mention it clearly.

Section – I

Q.2 Answer the following: (Any Three) **12**
- **a)** Explain Data Preparation in Machine Learning.
- **b)** How can we Focus on Business Problem in ML
- **c)** Explain the World of Probabilities in Machine Learning.
- **d)** How can we determine the Best Learning Model in ML?

Q.3 Answer the following: (Any One) **08**
- **a)** How can we explore cost functions in Machine Learning?
- **b)** Explain how can we Prepare Data when looking inside ML

Q.4 What is Machine Learning? Explain the types of Machine Learning. **08**

Section – II

Q.5 Answer the following: (Any Three) **12**
- **a)** Explain Growing Greedy Classification Trees in detail.
- **b)** Explain Searching for the Best Hyper-Parameters in Machine Learning.
- **c)** Explore the Resorting to Cross-Validation in ML.
- **d)** Explain selecting features of improve ML models and examples.

Q.6 Answer the following: (Any One) **08**
- **a)** Explain Scoring Opinions and Sentiments in ML.
- **b)** How can we Avoid Sample Bias and Leakage Traps with example in ML.

Q.7 Explain Classifying Images with Machine Learning in detail. **08**

SLR-BD-175

Seat No.		Set	P

S. Y. (B.Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Mathematics for Data Science (BTN03407)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the rank of a matrix?
a) Number of rows
b) Number of columns
c) Maximum number of linearly independent rows or columns
d) Number of non-zero elements

2) Which of the following is not a measure of central tendency?
a) Mean b) Median
c) Mode d) Variance

3) The determinant of a 2x2 matrix [abcd]\begin{bmatrix} a & b \\ c & d \end{bmartix}[acbd] is: ____
a) ad−bcad - bcad−bc
b) ab−cdab - cdab−cd
c) a+da + da+d
d) a−da - da−d

4) What is the shape of the normal distribution curve?
a) Bell-shaped b) Flat
c) Skewed d) Exponential

5) Which of the following measures distance between two points in space?
a) Dot product b) Cross product
c) Euclidean distance d) Projection

6) In Bayes' Theorem, the term P(A|B)P(A|B)P(A|B) refers to: ____
a) Probability of B given A
b) Probability of A given B
c) Joint probability of A and B
d) Probability of A and B are independent

7) The correlation coefficient lies between: ____

a) 0 and 1 b) -1 and 0

c) -1 and 1 d) -∞ and ∞

8) What is the KKT condition used for?

a) Solving linear equations

b) Testing statistical hypotheses

c) Solving constraint optimization problems

d) Performing gradient descent

9) Which method minimizes the sum of squared errors in fitting a model?

a) Gradient descent

b) Least squares optimization

c) Bayesian inference

d) Cross-validation

10) Simpson's Paradox highlights the issue in: ____

a) Correlation and causation

b) Dependence and independence

c) Conditional probability

d) Random sampling

11) The trace of a square matrix is ____

a) The sum of all elements

b) The sum of diagonal elements

c) The product of diagonal elements

d) None of the above

12) What does the Central Limit Theorem state?

a) The sample mean will approximate the population mean for large samples

b) All distributions are normal for small samples

c) Probability distributions are constant over time

d) The mean and variance are equal for all distributions

13) Which is an example of a continuous random variable?

a) Number of students in a class

b) Height of a person

c) Roll of a die

d) Flipping a coin

14) Gradient descent works by: ____

a) Moving in the direction of increasing gradient

b) Moving in the direction of decreasing gradient

c) Jumping directly to the minimum

d) Finding Eigen values

SLR-BD-175

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Mathematics for Data Science (BTN03407)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions (if necessary and state them clearly).

Section – I

Q.2 Attempt any Four. **16**

a) What are central tendencies? Explain with examples.
b) Explain conditional probability with an example.
c) Describe the significance of the Central Limit Theorem in statistics.
d) What is the difference between correlation and causation?
e) Explain topology of problem.

Q.3 Attempt any Two. **12**

a) Prove that the sum of probabilities in any probability distribution is always 1.
b) Explain Bayes' Theorem with a real-world application.
c) Explain the importance of linear algebra in data science.

Section – II

Q.4 Attempt any Four. **16**

a) What is hypothesis? Explain types of hypothesis.
b) Explain the steps of gradient descent and its significance in optimization.
c) Write short notes on KKT conditions with an example.
d) Explain types of probability with example.
e) Explain the concept of confidence intervals with an example.

Q.5 Attempt any Two. **12**

a) Explain Normal distribution.
b) Explain statistical hypothesis testing.
c) Explain dependence and Independence probability with example.

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Mathematics for Data Science (BTN03407)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the KKT condition used for?
a) Solving linear equations
b) Testing statistical hypotheses
c) Solving constraint optimization problems
d) Performing gradient descent

2) Which method minimizes the sum of squared errors in fitting a model?
a) Gradient descent
b) Least squares optimization
c) Bayesian inference
d) Cross-validation

3) Simpson's Paradox highlights the issue in: ____
a) Correlation and causation
b) Dependence and independence
c) Conditional probability
d) Random sampling

4) The trace of a square matrix is ____
a) The sum of all elements
b) The sum of diagonal elements
c) The product of diagonal elements
d) None of the above

5) What does the Central Limit Theorem state?
a) The sample mean will approximate the population mean for large samples
b) All distributions are normal for small samples
c) Probability distributions are constant over time
d) The mean and variance are equal for all distributions

6) Which is an example of a continuous random variable?
a) Number of students in a class
b) Height of a person
c) Roll of a die
d) Flipping a coin

7) Gradient descent works by: ____
a) Moving in the direction of increasing gradient
b) Moving in the direction of decreasing gradient
c) Jumping directly to the minimum
d) Finding Eigen values

8) What is the rank of a matrix?
a) Number of rows
b) Number of columns
c) Maximum number of linearly independent rows or columns
d) Number of non-zero elements

9) Which of the following is not a measure of central tendency?
a) Mean b) Median
c) Mode d) Variance

10) The determinant of a 2x2 matrix [abcd]\begin{bmatrix} a & b \\ c & d \end{bmartix}[acbd] is: ____
a) ad−bcad - bcad−bc
b) ab−cdab - cdab−cd
c) a+da + da+d
d) a−da - da−d

11) What is the shape of the normal distribution curve?
a) Bell-shaped b) Flat
c) Skewed d) Exponential

12) Which of the following measures distance between two points in space?
a) Dot product b) Cross product
c) Euclidean distance d) Projection

13) In Bayes' Theorem, the term P(A|B)P(A|B)P(A|B) refers to: ____
a) Probability of B given A
b) Probability of A given B
c) Joint probability of A and B
d) Probability of A and B are independent

14) The correlation coefficient lies between: ____
a) 0 and 1 b) -1 and 0
c) -1 and 1 d) -∞ and ∞

SLR-BD-175

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Mathematics for Data Science (BTN03407)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions (if necessary and state them clearly).

Section – I

Q.2 Attempt any Four. **16**

a) What are central tendencies? Explain with examples.
b) Explain conditional probability with an example.
c) Describe the significance of the Central Limit Theorem in statistics.
d) What is the difference between correlation and causation?
e) Explain topology of problem.

Q.3 Attempt any Two. **12**

a) Prove that the sum of probabilities in any probability distribution is always 1.
b) Explain Bayes' Theorem with a real-world application.
c) Explain the importance of linear algebra in data science.

Section – II

Q.4 Attempt any Four. **16**

a) What is hypothesis? Explain types of hypothesis.
b) Explain the steps of gradient descent and its significance in optimization.
c) Write short notes on KKT conditions with an example.
d) Explain types of probability with example.
e) Explain the concept of confidence intervals with an example.

Q.5 Attempt any Two. **12**

a) Explain Normal distribution.
b) Explain statistical hypothesis testing.
c) Explain dependence and Independence probability with example.

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Mathematics for Data Science (BTN03407)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The trace of a square matrix is ____
- a) The sum of all elements
- b) The sum of diagonal elements
- c) The product of diagonal elements
- d) None of the above

2) What does the Central Limit Theorem state?
- a) The sample mean will approximate the population mean for large samples
- b) All distributions are normal for small samples
- c) Probability distributions are constant over time
- d) The mean and variance are equal for all distributions

3) Which is an example of a continuous random variable?
- a) Number of students in a class
- b) Height of a person
- c) Roll of a die
- d) Flipping a coin

4) Gradient descent works by: ____
- a) Moving in the direction of increasing gradient
- b) Moving in the direction of decreasing gradient
- c) Jumping directly to the minimum
- d) Finding Eigen values

5) What is the rank of a matrix?
- a) Number of rows
- b) Number of columns
- c) Maximum number of linearly independent rows or columns
- d) Number of non-zero elements

6) Which of the following is not a measure of central tendency?
a) Mean b) Median
c) Mode d) Variance

7) The determinant of a 2x2 matrix [abcd]\begin{bmatrix} a & b \\ c & d \end{bmartix}[acbd] is: ____
a) ad−bcad - bcad−bc
b) ab−cdab - cdab−cd
c) a+da + da+d
d) a−da - da−d

8) What is the shape of the normal distribution curve?
a) Bell-shaped b) Flat
c) Skewed d) Exponential

9) Which of the following measures distance between two points in space?
a) Dot product b) Cross product
c) Euclidean distance d) Projection

10) In Bayes' Theorem, the term P(A|B)P(A|B)P(A|B) refers to: ____
a) Probability of B given A
b) Probability of A given B
c) Joint probability of A and B
d) Probability of A and B are independent

11) The correlation coefficient lies between: ____
a) 0 and 1 b) -1 and 0
c) -1 and 1 d) -∞ and ∞

12) What is the KKT condition used for?
a) Solving linear equations
b) Testing statistical hypotheses
c) Solving constraint optimization problems
d) Performing gradient descent

13) Which method minimizes the sum of squared errors in fitting a model?
a) Gradient descent
b) Least squares optimization
c) Bayesian inference
d) Cross-validation

14) Simpson's Paradox highlights the issue in: ____
a) Correlation and causation
b) Dependence and independence
c) Conditional probability
d) Random sampling

SLR-BD-175

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Mathematics for Data Science (BTN03407)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions (if necessary and state them clearly).

Section – I

Q.2 Attempt any Four. **16**

a) What are central tendencies? Explain with examples.
b) Explain conditional probability with an example.
c) Describe the significance of the Central Limit Theorem in statistics.
d) What is the difference between correlation and causation?
e) Explain topology of problem.

Q.3 Attempt any Two. **12**

a) Prove that the sum of probabilities in any probability distribution is always 1.
b) Explain Bayes' Theorem with a real-world application.
c) Explain the importance of linear algebra in data science.

Section – II

Q.4 Attempt any Four. **16**

a) What is hypothesis? Explain types of hypothesis.
b) Explain the steps of gradient descent and its significance in optimization.
c) Write short notes on KKT conditions with an example.
d) Explain types of probability with example.
e) Explain the concept of confidence intervals with an example.

Q.5 Attempt any Two. **12**

a) Explain Normal distribution.
b) Explain statistical hypothesis testing.
c) Explain dependence and Independence probability with example.

Seat No.	

Set **S**

S. Y. (B.Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Mathematics for Data Science (BTN03407)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) In Bayes' Theorem, the term P(A|B)P(A|B)P(A|B) refers to: ____
a) Probability of B given A
b) Probability of A given B
c) Joint probability of A and B
d) Probability of A and B are independent

2) The correlation coefficient lies between: ____
a) 0 and 1 b) -1 and 0
c) -1 and 1 d) -∞ and ∞

3) What is the KKT condition used for?
a) Solving linear equations
b) Testing statistical hypotheses
c) Solving constraint optimization problems
d) Performing gradient descent

4) Which method minimizes the sum of squared errors in fitting a model?
a) Gradient descent
b) Least squares optimization
c) Bayesian inference
d) Cross-validation

5) Simpson's Paradox highlights the issue in: ____
a) Correlation and causation
b) Dependence and independence
c) Conditional probability
d) Random sampling

6) The trace of a square matrix is ____
a) The sum of all elements
b) The sum of diagonal elements
c) The product of diagonal elements
d) None of the above

7) What does the Central Limit Theorem state?
a) The sample mean will approximate the population mean for large samples
b) All distributions are normal for small samples
c) Probability distributions are constant over time
d) The mean and variance are equal for all distributions

8) Which is an example of a continuous random variable?
a) Number of students in a class
b) Height of a person
c) Roll of a die
d) Flipping a coin

9) Gradient descent works by: ____
a) Moving in the direction of increasing gradient
b) Moving in the direction of decreasing gradient
c) Jumping directly to the minimum
d) Finding Eigen values

10) What is the rank of a matrix?
a) Number of rows
b) Number of columns
c) Maximum number of linearly independent rows or columns
d) Number of non-zero elements

11) Which of the following is not a measure of central tendency?
a) Mean b) Median
c) Mode d) Variance

12) The determinant of a 2x2 matrix [abcd]\begin{bmatrix} a & b \\ c & d \end{bmartix}[acbd] is: ____
a) ad−bcad - bcad−bc
b) ab−cdab - cdab−cd
c) a+da + da+d
d) a−da - da−d

13) What is the shape of the normal distribution curve?
a) Bell-shaped b) Flat
c) Skewed d) Exponential

14) Which of the following measures distance between two points in space?
a) Dot product b) Cross product
c) Euclidean distance d) Projection

SLR-BD-175

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Mathematics for Data Science (BTN03407)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions (if necessary and state them clearly).

Section – I

Q.2 Attempt any Four. **16**

a) What are central tendencies? Explain with examples.
b) Explain conditional probability with an example.
c) Describe the significance of the Central Limit Theorem in statistics.
d) What is the difference between correlation and causation?
e) Explain topology of problem.

Q.3 Attempt any Two. **12**

a) Prove that the sum of probabilities in any probability distribution is always 1.
b) Explain Bayes' Theorem with a real-world application.
c) Explain the importance of linear algebra in data science.

Section – II

Q.4 Attempt any Four. **16**

a) What is hypothesis? Explain types of hypothesis.
b) Explain the steps of gradient descent and its significance in optimization.
c) Write short notes on KKT conditions with an example.
d) Explain types of probability with example.
e) Explain the concept of confidence intervals with an example.

Q.5 Attempt any Two. **12**

a) Explain Normal distribution.
b) Explain statistical hypothesis testing.
c) Explain dependence and Independence probability with example.

SLR-BD-176

Seat No.	

Set P

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Cryptography (BTN04410)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which one of the following algorithms is not used in asymmetric-key cryptography?
a) RSA algorithm
b) Diffie-Hellman algorithm
c) electronic code book algorithm
d) DS Algorithm

2) Block type cipher operates on _____ length of groups.
a) Fixed b) Constant
c) Zero d) All the above

3) In cryptography, the order of the letters in a message is rearranged by ____
a) transpositional ciphers
b) substitution ciphers
c) both transpositional ciphers and substitution ciphers
d) quadratic ciphers

4) What is data encryption standard (DES)?
a) block cipher b) stream cipher
c) bit cipher d) byte cipher

5) Cryptanalysis is used ____
a) to find some insecurity in a cryptographic scheme
b) to increase the speed
c) to encrypt the data
d) to make new ciphers

6) Cryptographic hash function takes an arbitrary block of data and returns ____.
a) fixed size bit string
b) variable size bit string
c) both fixed size bit string and variable size bit string
d) variable sized byte string

7) The sender "sign" a message as ____.
a) Encrypted signature b) Artificial Signature
c) Digital Signature d) All of the above

8) AES stands for ____.
a) Advance encryption server
b) Advance encryption standard
c) Advance encryption system
d) None of the above

9) Decryption algorithm is used to ____.
a) Encrypt input data b) Decrypt input data
c) Decrypt encrypted data d) None of the above

10) Authentication is ____.
a) Verification of data b) Verification of user's identity
c) Both a and b d) None of above

11) Output of encryption algorithm is ____.
a) Plain text b) Cipher text
c) Both a and b d) None of the above

12) Secure hash algorithm is developed by ____.
a) National Institute of Standards and Technology (NIST)
b) IEEE
c) ANSI
d) None of the above

13) ____ is the process of communicating confidential information in an unreadable format between legitimate users.
a) Cryptography b) Symmentricity
c) Asymmenticity d) All the above

14) Which are the ends does cryptography process takes place?
a) Transmitter b) Receiver
c) Channel d) Both a and b

Seat No.	

Set **P**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Cryptography (BTN04410)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION - I

Q.2 Solve the following: (Any Four) **16**

a) What is difference between monoalphabetic cipher and polyalphabetic cipher?
b) Explain Block cipher and Stream cipher in detail.
c) Explain Caesar cipher in detail with example.
d) Explain OSI Security Architecture in detail.
e) Explain Transposition technique in detail.

Q.3 Solve the following: (Any Two) **12**

a) Find the cipher text of given plaintext by using polyalphabetic substitution technique.
Plaintext: We are discovered save yourself
Key: Deceptive
b) Explain security services in detail.
c) Explain the working of DES in detail with diagram.

SECTION - II

Q.4 Attempt the following: (Any Four) **16**

a) Explain Kerberos in detail.
b) Explain applications of public key cryptosystem.
c) Explain Secure Hash Algorithm (SHA) in detail.
d) Explain cryptographic Hash function in detail.
e) Explain four AES Transformation function.

Q.5 Attempt the following: (Any Two) **12**

a) What is MAC? Explain Requirement and security of MAC.
b) Explain techniques for remote user authentication using symmetric encryption.
c) Explain RSA Algorithm in detail.

SLR-BD-176

Seat No.	

Set Q

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Cryptography (BTN04410)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) AES stands for ____.
a) Advance encryption server
b) Advance encryption standard
c) Advance encryption system
d) None of the above

2) Decryption algorithm is used to ____.
a) Encrypt input data b) Decrypt input data
c) Decrypt encrypted data d) None of the above

3) Authentication is ____.
a) Verification of data b) Verification of user's identity
c) Both a and b d) None of above

4) Output of encryption algorithm is ____.
a) Plain text b) Cipher text
c) Both a and b d) None of the above

5) Secure hash algorithm is developed by ____.
a) National Institute of Standards and Technology (NIST)
b) IEEE
c) ANSI
d) None of the above

6) ____ is the process of communicating confidential information in an unreadable format between legitimate users.
a) Cryptography b) Symmentricity
c) Asymmenticity d) All the above

7) Which are the ends does cryptography process takes place?
a) Transmitter b) Receiver
c) Channel d) Both a and b

8) Which one of the following algorithms is not used in asymmetric-key cryptography?
a) RSA algorithm
b) Diffie-Hellman algorithm
c) electronic code book algorithm
d) DS Algorithm

9) Block type cipher operates on _____ length of groups.
a) Fixed b) Constant
c) Zero d) All the above

10) In cryptography, the order of the letters in a message is rearranged by ____
a) transpositional ciphers
b) substitution ciphers
c) both transpositional ciphers and substitution ciphers
d) quadratic ciphers

11) What is data encryption standard (DES)?
a) block cipher b) stream cipher
c) bit cipher d) byte cipher

12) Cryptanalysis is used ____
a) to find some insecurity in a cryptographic scheme
b) to increase the speed
c) to encrypt the data
d) to make new ciphers

13) Cryptographic hash function takes an arbitrary block of data and returns ____.
a) fixed size bit string
b) variable size bit string
c) both fixed size bit string and variable size bit string
d) variable sized byte string

14) The sender “sign” a message as ____.
a) Encrypted signature b) Artificial Signature
c) Digital Signature d) All of the above

Seat No.	

Set **Q**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Cryptography (BTN04410)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION - I

Q.2 Solve the following: (Any Four) **16**

a) What is difference between monoalphabetic cipher and polyalphabetic cipher?
b) Explain Block cipher and Stream cipher in detail.
c) Explain Caesar cipher in detail with example.
d) Explain OSI Security Architecture in detail.
e) Explain Transposition technique in detail.

Q.3 Solve the following: (Any Two) **12**

a) Find the cipher text of given plaintext by using polyalphabetic substitution technique.
Plaintext: We are discovered save yourself
Key: Deceptive
b) Explain security services in detail.
c) Explain the working of DES in detail with diagram.

SECTION - II

Q.4 Attempt the following: (Any Four) **16**

a) Explain Kerberos in detail.
b) Explain applications of public key cryptosystem.
c) Explain Secure Hash Algorithm (SHA) in detail.
d) Explain cryptographic Hash function in detail.
e) Explain four AES Transformation function.

Q.5 Attempt the following: (Any Two) **12**

a) What is MAC? Explain Requirement and security of MAC.
b) Explain techniques for remote user authentication using symmetric encryption.
c) Explain RSA Algorithm in detail.

SLR-BD-176

Seat No.		Set	R

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Cryptography (BTN04410)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Output of encryption algorithm is ____.
a) Plain text b) Cipher text
c) Both a and b d) None of the above

2) Secure hash algorithm is developed by ____.
a) National Institute of Standards and Technology (NIST)
b) IEEE
c) ANSI
d) None of the above

3) ____ is the process of communicating confidential information in an unreadable format between legitimate users.
a) Cryptography b) Symmentricity
c) Asymmenticity d) All the above

4) Which are the ends does cryptography process takes place?
a) Transmitter b) Receiver
c) Channel d) Both a and b

5) Which one of the following algorithms is not used in asymmetric-key cryptography?
a) RSA algorithm
b) Diffie-Hellman algorithm
c) electronic code book algorithm
d) DS Algorithm

6) Block type cipher operates on _____ length of groups.
a) Fixed b) Constant
c) Zero d) All the above

7) In cryptography, the order of the letters in a message is rearranged by ____
a) transpositional ciphers
b) substitution ciphers
c) both transpositional ciphers and substitution ciphers
d) quadratic ciphers

8) What is data encryption standard (DES)?
a) block cipher b) stream cipher
c) bit cipher d) byte cipher

9) Cryptanalysis is used ____
a) to find some insecurity in a cryptographic scheme
b) to increase the speed
c) to encrypt the data
d) to make new ciphers

10) Cryptographic hash function takes an arbitrary block of data and returns ____.
a) fixed size bit string
b) variable size bit string
c) both fixed size bit string and variable size bit string
d) variable sized byte string

11) The sender “sign” a message as ____.
a) Encrypted signature b) Artificial Signature
c) Digital Signature d) All of the above

12) AES stands for ____.
a) Advance encryption server
b) Advance encryption standard
c) Advance encryption system
d) None of the above

13) Decryption algorithm is used to ____.
a) Encrypt input data b) Decrypt input data
c) Decrypt encrypted data d) None of the above

14) Authentication is ____.
a) Verification of data b) Verification of user’s identity
c) Both a and b d) None of above

Seat No.	

Set **R**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Cryptography (BTN04410)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION - I

Q.2 Solve the following: (Any Four) **16**

a) What is difference between monoalphabetic cipher and polyalphabetic cipher?
b) Explain Block cipher and Stream cipher in detail.
c) Explain Caesar cipher in detail with example.
d) Explain OSI Security Architecture in detail.
e) Explain Transposition technique in detail.

Q.3 Solve the following: (Any Two) **12**

a) Find the cipher text of given plaintext by using polyalphabetic substitution technique.
Plaintext: We are discovered save yourself
Key: Deceptive
b) Explain security services in detail.
c) Explain the working of DES in detail with diagram.

SECTION - II

Q.4 Attempt the following: (Any Four) **16**

a) Explain Kerberos in detail.
b) Explain applications of public key cryptosystem.
c) Explain Secure Hash Algorithm (SHA) in detail.
d) Explain cryptographic Hash function in detail.
e) Explain four AES Transformation function.

Q.5 Attempt the following: (Any Two) **12**

a) What is MAC? Explain Requirement and security of MAC.
b) Explain techniques for remote user authentication using symmetric encryption.
c) Explain RSA Algorithm in detail.

SLR-BD-176

Seat No.		Set	S

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Cryptography (BTN04410)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Cryptographic hash function takes an arbitrary block of data and returns ____.
a) fixed size bit string
b) variable size bit string
c) both fixed size bit string and variable size bit string
d) variable sized byte string

2) The sender "sign" a message as ____.
a) Encrypted signature b) Artificial Signature
c) Digital Signature d) All of the above

3) AES stands for ____.
a) Advance encryption server
b) Advance encryption standard
c) Advance encryption system
d) None of the above

4) Decryption algorithm is used to ____.
a) Encrypt input data b) Decrypt input data
c) Decrypt encrypted data d) None of the above

5) Authentication is ____.
a) Verification of data b) Verification of user's identity
c) Both a and b d) None of above

6) Output of encryption algorithm is ____.
a) Plain text b) Cipher text
c) Both a and b d) None of the above

7) Secure hash algorithm is developed by ____.
a) National Institute of Standards and Technology (NIST)
b) IEEE
c) ANSI
d) None of the above

8) ____ is the process of communicating confidential information in an unreadable format between legitimate users.
a) Cryptography b) Symmentricity
c) Asymmenticity d) All the above

9) Which are the ends does cryptography process takes place?
a) Transmitter b) Receiver
c) Channel d) Both a and b

10) Which one of the following algorithms is not used in asymmetric-key cryptography?
a) RSA algorithm
b) Diffie-Hellman algorithm
c) electronic code book algorithm
d) DS Algorithm

11) Block type cipher operates on _____ length of groups.
a) Fixed b) Constant
c) Zero d) All the above

12) In cryptography, the order of the letters in a message is rearranged by ____
a) transpositional ciphers
b) substitution ciphers
c) both transpositional ciphers and substitution ciphers
d) quadratic ciphers

13) What is data encryption standard (DES)?
a) block cipher b) stream cipher
c) bit cipher d) byte cipher

14) Cryptanalysis is used ____
a) to find some insecurity in a cryptographic scheme
b) to increase the speed
c) to encrypt the data
d) to make new ciphers

Seat No.	

Set | S

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE & ENGINEERING
Cryptography (BTN04410)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

SECTION - I

Q.2 Solve the following: (Any Four) **16**

a) What is difference between monoalphabetic cipher and polyalphabetic cipher?
b) Explain Block cipher and Stream cipher in detail.
c) Explain Caesar cipher in detail with example.
d) Explain OSI Security Architecture in detail.
e) Explain Transposition technique in detail.

Q.3 Solve the following: (Any Two) **12**

a) Find the cipher text of given plaintext by using polyalphabetic substitution technique.
Plaintext: We are discovered save yourself
Key: Deceptive
b) Explain security services in detail.
c) Explain the working of DES in detail with diagram.

SECTION - II

Q.4 Attempt the following: (Any Four) **16**

a) Explain Kerberos in detail.
b) Explain applications of public key cryptosystem.
c) Explain Secure Hash Algorithm (SHA) in detail.
d) Explain cryptographic Hash function in detail.
e) Explain four AES Transformation function.

Q.5 Attempt the following: (Any Two) **12**

a) What is MAC? Explain Requirement and security of MAC.
b) Explain techniques for remote user authentication using symmetric encryption.
c) Explain RSA Algorithm in detail.

Seat No.	

Set P

S.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Sem - I) (New) (NEP CBCS) Examination: March/April - 2025
Network Theory Analysis (ENTPCC-01)

Day & Date: Saturday, 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book Page no 03 (Starring page of the Answer Book Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of Page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following: **14**

1) Under which conditions do the source transformation technique remain directly unapplicable?
a) Only in the absence of impedance in series with a voltage source
b) Only in the absence of impedance in parallel with a current source
c) Both a and b
d) None of the above

2) Superposition theorem is not applicable to network of ____.
a) Nonlinear elements b) Dependent voltage sources
c) dependent current sources d) All of the above

3) What should be done, if the dependent current and voltage sources are present in a circuit while applying 'Superposition Theorem'?
a) Replace them by open circuit
b) Replaced them by short circuit
c) Keep in their original form without replacing by either open or short circuits
d) None of the above

4) If an a.c. signal generator drives a series RLC circuit, then the circuit undergoes resonance only due to variation in ____
a) Supply voltage b) Series resistance
c) Supply frequency d) Phase angle

5) In a series RLC circuit operating below the resonant frequency the current ____.

a) I leads Vs
b) I lags behind Vs
c) I is in phase with Vs
d) none

6) How is the short circuit reverse transfer admittance (y_{12}) calculated in terms of current and voltage ratio?

a) V_2/ I_1 (keeping $I_2 = 0$)
b) I_2/ V_1 (keeping $V_2 = 0$)
c) I_1/ V_2 (keeping $V_1 = 0$)
d) V_1/ I_2 (keeping $I_1 = 0$)

7) Which among the following is regarded as short circuit forward transfer admittance?

a) y11
b) y12
c) y21
d) y22

8) In a steady state, inductors and capacitors are respectively replaced by ____ circuit and ____ circuit.

a) short, open
b) open, short
c) short, short
d) open, open

9) When a series RC circuit is connected to a constant voltage at t=0, the current passing through the circuit is at t=0+ is ____.

a) Infinite
b) Zero
c) V/R
d) $V/\omega C$

10) The function is said to be having simple poles and zeros and only if ____.

a) the poles are not repeated
b) the zeros are not repeated
c) both poles and zeros are not repeated
d) None

11) Which among the following belong/s to the category of critical frequency?

a) Poles
b) Zeros
c) Both a and b
d) None of the above

12) In the m-derived high pass filters the resonant frequency is to be chosen so that it is ____.

a) above the cut off frequency
b) below the cut off frequency
c) between the cut off frequency
d) None

13) An ideal filter should have ____.

a) zero attenuation in the pass band
b) infinite attenuation in the pass band
c) zero attenuation in the attenuation band
d) infinite attenuation in the attenuation band

14) Transients are present in the circuit when the circuit is having ____.

a) C
b) L
c) R
d) Either L or C

Seat No.		Set	P

S.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Sem - I) (New) (NEP CBCS) Examination: March/April - 2025
Network Theory Analysis (ENTPCC-01)

Day & Date: Saturday, 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) figure to right indicate full marks.

Section – I

Q.2 Attempt the following questions: (Any Four) **16**

a) Determine Thevenin's equivalent circuit with reference to terminal ab for circuit shown in figure-2(a)

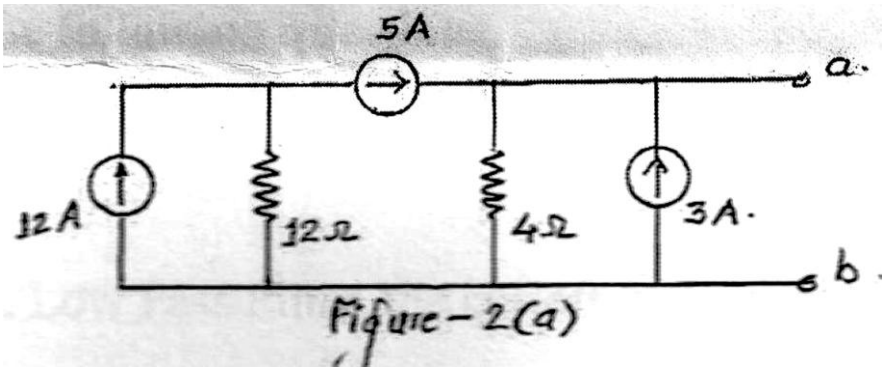


Figure – 2(a)

b) Determine load resistance to receive maximum power from source. Also find the maximum power delivered to the load in the circuit shown in figure 2(b)

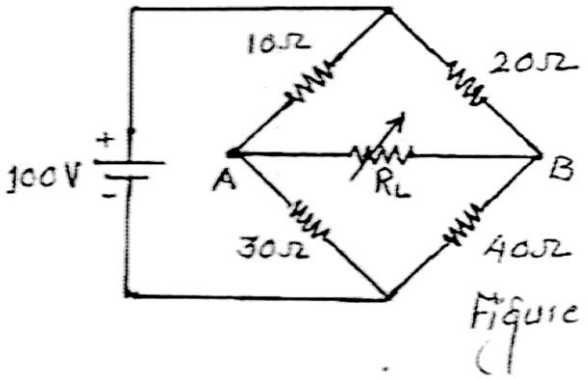


Figure – 2(b).

c) A series RLC circuit consists of R=4 Ω, L=0.5H & variable capacitance in series across a 100V, 50Hz.Calculate,
i) The capacitance to give resonance,
ii) The voltage across capacitor

d) Derive h-parameter equations for two-port network in terms of voltages & currents & give its electrical equivalent circuit.

e) Explain cascade connection of two-port networks.

Q.3 Answer the following: (Any Two) **12**

a) Replace given network shown in figure 3(a) by a single current source in parallel with a resistance.

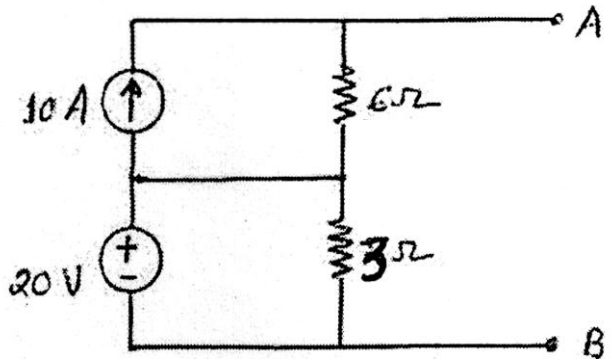


Figure – 3(a)

b) Prove that for an RLC series circuit the resonant frequency is geometric mean of upper & lower half power frequencies.

$\omega o = \sqrt{\omega_1\ \omega_2}$

c) Find the ABCD- parameters for the given π network shown in figure 3(c). Is this network bilateral or not?

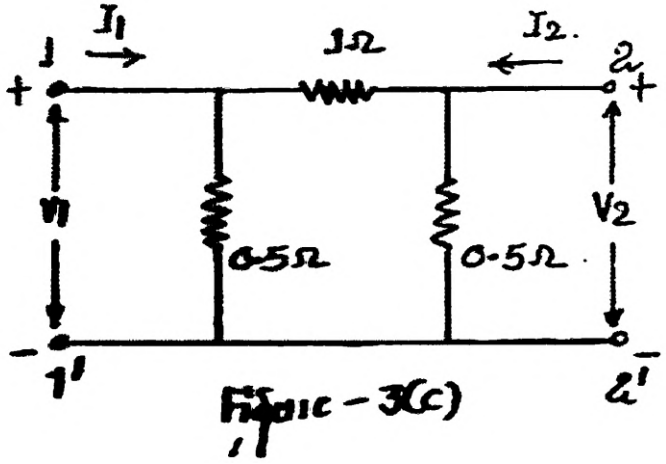


Figure – 3(c)

Section – II

Q.4 Answer the following: (Any Four) **16**

a) Design a T pad attenuator to give an attenuation of 60dB and to work in a line of impedance 500Ω.

b) Prove for Constant-K Low Pass Filter, the cut-off frequency is fc $= \frac{1}{\pi\sqrt{LC}}$

c) Draw T and π sections for m-derived LPF. State the design equations.

d) Draw pole zero plot for given function. Comment on stability of given system from pole zero plot.

$$H(s) = \frac{20(s+1)(s+5)}{s(s^2+2s+2)(s+7)}$$

e) Explain transient response of series RC circuit.

Q.5 Answer the following: (Any Two) **12**

a) Find current i(t) for t > 0 for the circuit shown in figure-5(a)

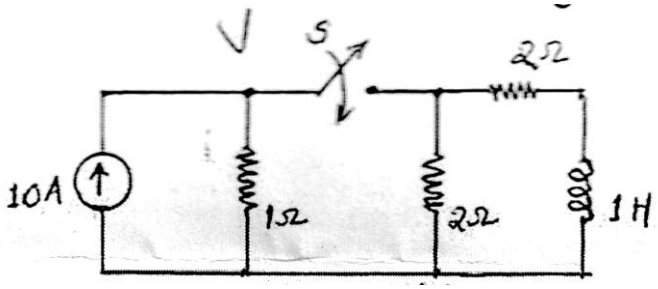


Figure – 5(a)

b) Define poles and zeros of network function. Explain the significance of poles and zeros with suitable examples.

c) Design m-derived LPF both T and π sections with cut-off frequency of 1 KHz, design impedance of 400 Ω and resonant frequency of 1100 Hz.

Seat No.	

Set Q

S.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Sem - I) (New) (NEP CBCS) Examination: March/April - 2025
Network Theory Analysis (ENTPCC-01)

Day & Date: Saturday, 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book Page no 03 (Starring page of the Answer Book Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of Page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following: **14**

1) In a steady state, inductors and capacitors are respectively replaced by ____ circuit and ____ circuit.
a) short, open b) open, short
c) short, short d) open, open

2) When a series RC circuit is connected to a constant voltage at t=0, the current passing through the circuit is at t=0+ is ____.
a) Infinite b) Zero
c) V/R d) $V/\omega C$

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

4) Which among the following belong/s to the category of critical frequency?
a) Poles b) Zeros
c) Both a and b d) None of the above

5) In the m-derived high pass filters the resonant frequency is to be chosen so that it is ____.
a) above the cut off frequency
b) below the cut off frequency
c) between the cut off frequency
d) None

6) An ideal filter should have ____.
a) zero attenuation in the pass band
b) infinite attenuation in the pass band
c) zero attenuation in the attenuation band
d) infinite attenuation in the attenuation band

7) Transients are present in the circuit when the circuit is having ____.
a) C b) L
c) R d) Either L or C

8) Under which conditions do the source transformation technique remain directly unapplicable?
a) Only in the absence of impedance in series with a voltage source
b) Only in the absence of impedance in parallel with a current source
c) Both a and b
d) None of the above

9) Superposition theorem is not applicable to network of ____.
a) Nonlinear elements b) Dependent voltage sources
c) dependent current sources d) All of the above

10) What should be done, if the dependent current and voltage sources are present in a circuit while applying 'Superposition Theorem'?
a) Replace them by open circuit
b) Replaced them by short circuit
c) Keep in their original form without replacing by either open or short circuits
d) None of the above

11) If an a.c. signal generator drives a series RLC circuit, then the circuit undergoes resonance only due to variation in ____
a) Supply voltage b) Series resistance
c) Supply frequency d) Phase angle

12) In a series RLC circuit operating below the resonant frequency the current ____.
a) I leads Vs b) I lags behind Vs
c) I is in phase with Vs d) none

13) How is the short circuit reverse transfer admittance (y_{12}) calculated in terms of current and voltage ratio?
a) V_2/ I_1 (keeping $I_2 = 0$) b) I_2/ V_1 (keeping $V_2 = 0$)
c) I_1/ V_2 (keeping $V_1 = 0$) d) V_1/ I_2 (keeping $I_1 = 0$)

14) Which among the following is regarded as short circuit forward transfer admittance?

a) y11 b) y12

c) y21 d) y22

Seat No.		Set	Q

S.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Sem - I) (New) (NEP CBCS) Examination: March/April - 2025
Network Theory Analysis (ENTPCC-01)

Day & Date: Saturday, 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) figure to right indicate full marks.

Section – I

Q.2 Attempt the following questions: (Any Four) **16**

a) Determine Thevenin's equivalent circuit with reference to terminal ab for circuit shown in figure-2(a)

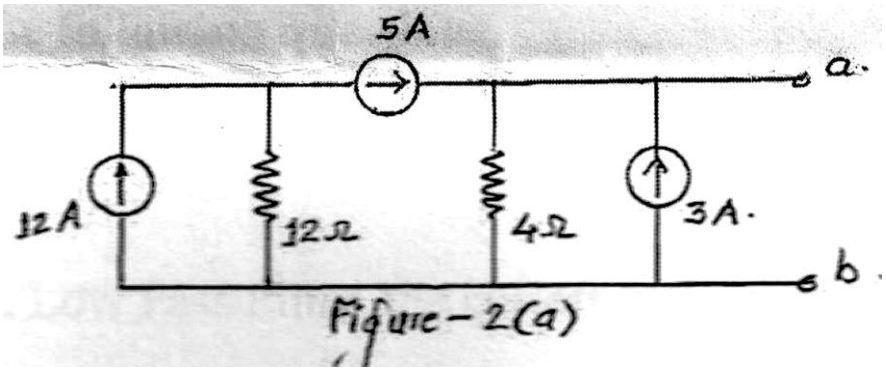


Figure – 2(a)

b) Determine load resistance to receive maximum power from source. Also find the maximum power delivered to the load in the circuit shown in figure 2(b)

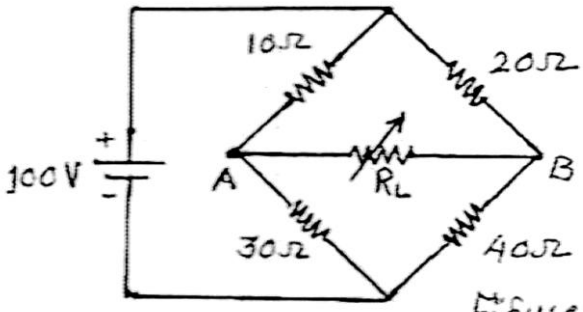


Figure – 2(b).

c) A series RLC circuit consists of R=4 Ω, L=0.5H & variable capacitance in series across a 100V, 50Hz.Calculate,
i) The capacitance to give resonance,
ii) The voltage across capacitor

d) Derive h-parameter equations for two-port network in terms of voltages & currents & give its electrical equivalent circuit.

e) Explain cascade connection of two-port networks.

Q.3 Answer the following: (Any Two) **12**

a) Replace given network shown in figure 3(a) by a single current source in parallel with a resistance.

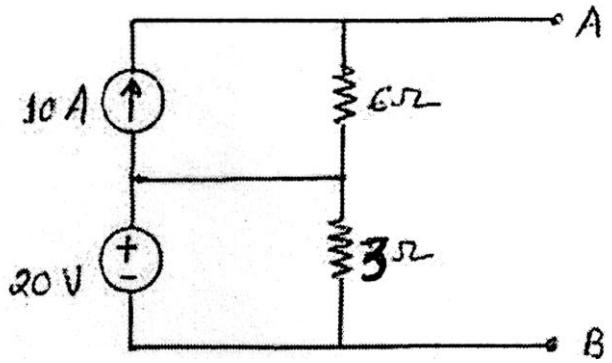


Figure – 3(a)

b) Prove that for an RLC series circuit the resonant frequency is geometric mean of upper & lower half power frequencies.

$\omega o = \sqrt{\omega_1\ \omega_2}$

c) Find the ABCD- parameters for the given π network shown in figure 3(c). Is this network bilateral or not?

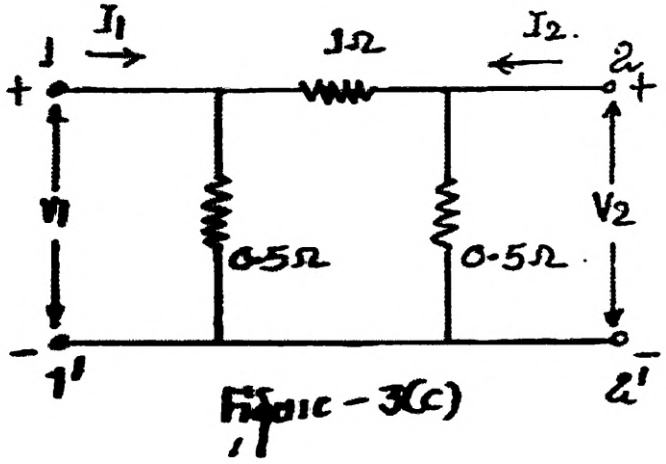


Figure – 3(c)

Section – II

Q.4 Answer the following: (Any Four) **16**

a) Design a T pad attenuator to give an attenuation of 60dB and to work in a line of impedance 500Ω.

b) Prove for Constant-K Low Pass Filter, the cut-off frequency is fc $= \frac{1}{\pi\sqrt{LC}}$

c) Draw T and π sections for m-derived LPF. State the design equations.

d) Draw pole zero plot for given function. Comment on stability of given system from pole zero plot.

$$H(s) = \frac{20(s+1)(s+5)}{s(s^2+2s+2)(s+7)}$$

e) Explain transient response of series RC circuit.

Q.5 Answer the following: (Any Two) **12**

a) Find current i(t) for t > 0 for the circuit shown in figure-5(a)

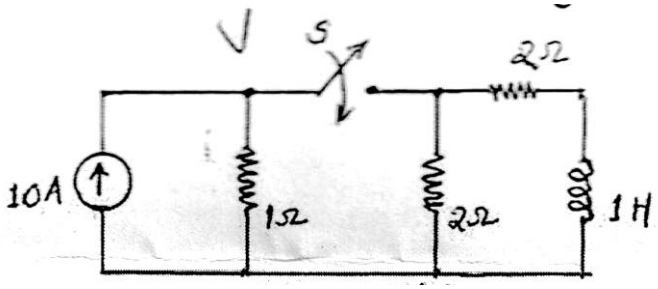


Figure – 5(a)

b) Define poles and zeros of network function. Explain the significance of poles and zeros with suitable examples.

c) Design m-derived LPF both T and π sections with cut-off frequency of 1 KHz, design impedance of 400 Ω and resonant frequency of 1100 Hz.

Seat No.	

Set R

S.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Sem - I) (New) (NEP CBCS) Examination: March/April - 2025
Network Theory Analysis (ENTPCC-01)

Day & Date: Saturday, 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book Page no 03 (Starring page of the Answer Book Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of Page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following: **14**

1) Which among the following belong/s to the category of critical frequency?
a) Poles b) Zeros
c) Both a and b d) None of the above

2) In the m-derived high pass filters the resonant frequency is to be chosen so that it is ____.
a) above the cut off frequency
b) below the cut off frequency
c) between the cut off frequency
d) None

3) An ideal filter should have ____.
a) zero attenuation in the pass band
b) infinite attenuation in the pass band
c) zero attenuation in the attenuation band
d) infinite attenuation in the attenuation band

4) Transients are present in the circuit when the circuit is having ____.
a) C b) L
c) R d) Either L or C

5) Under which conditions do the source transformation technique remain directly unapplicable?
a) Only in the absence of impedance in series with a voltage source
b) Only in the absence of impedance in parallel with a current source
c) Both a and b
d) None of the above

6) Superposition theorem is not applicable to network of ____.
a) Nonlinear elements b) Dependent voltage sources
c) dependent current sources d) All of the above

7) What should be done, if the dependent current and voltage sources are present in a circuit while applying 'Superposition Theorem'?
a) Replace them by open circuit
b) Replaced them by short circuit
c) Keep in their original form without replacing by either open or short circuits
d) None of the above

8) If an a.c. signal generator drives a series RLC circuit, then the circuit undergoes resonance only due to variation in ____
a) Supply voltage b) Series resistance
c) Supply frequency d) Phase angle

9) In a series RLC circuit operating below the resonant frequency the current ____.
a) I leads Vs b) I lags behind Vs
c) I is in phase with Vs d) none

10) How is the short circuit reverse transfer admittance (y_{12}) calculated in terms of current and voltage ratio?
a) V_2/ I_1 (keeping $I_2 = 0$) b) I_2/ V_1 (keeping $V_2 = 0$)
c) I_1/ V_2 (keeping $V_1 = 0$) d) V_1/ I_2 (keeping $I_1 = 0$)

11) Which among the following is regarded as short circuit forward transfer admittance?
a) y11 b) y12
c) y21 d) y22

12) In a steady state, inductors and capacitors are respectively replaced by ____ circuit and ____ circuit.
a) short, open b) open, short
c) short, short d) open, open

13) When a series RC circuit is connected to a constant voltage at t=0, the current passing through the circuit is at t=0+ is ____.

a) Infinite
b) Zero
c) V/R
d) $V/\omega C$

14) The function is said to be having simple poles and zeros and only if ____.

a) the poles are not repeated
b) the zeros are not repeated
c) both poles and zeros are not repeated
d) None

Seat No.	

Set R

S.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Sem - I) (New) (NEP CBCS) Examination: March/April - 2025
Network Theory Analysis (ENTPCC-01)

Day & Date: Saturday, 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) figure to right indicate full marks.

Section – I

Q.2 Attempt the following questions: (Any Four) **16**

a) Determine Thevenin's equivalent circuit with reference to terminal ab for circuit shown in figure-2(a)

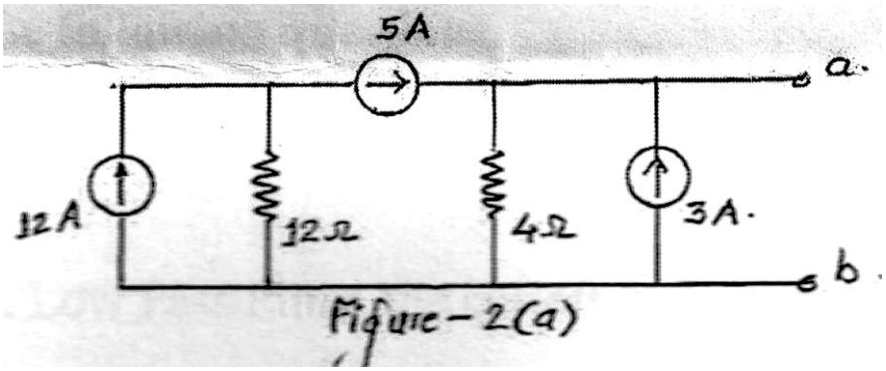


Figure – 2(a)

b) Determine load resistance to receive maximum power from source. Also find the maximum power delivered to the load in the circuit shown in figure 2(b)

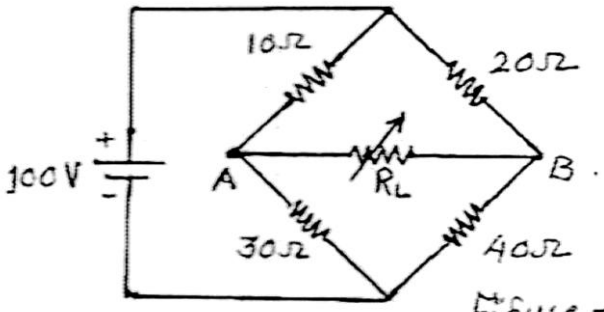


Figure – 2(b).

c) A series RLC circuit consists of R=4 Ω, L=0.5H & variable capacitance in series across a 100V, 50Hz.Calculate,
i) The capacitance to give resonance,
ii) The voltage across capacitor

d) Derive h-parameter equations for two-port network in terms of voltages & currents & give its electrical equivalent circuit.

e) Explain cascade connection of two-port networks.

Q.3 Answer the following: (Any Two) **12**

a) Replace given network shown in figure 3(a) by a single current source in parallel with a resistance.

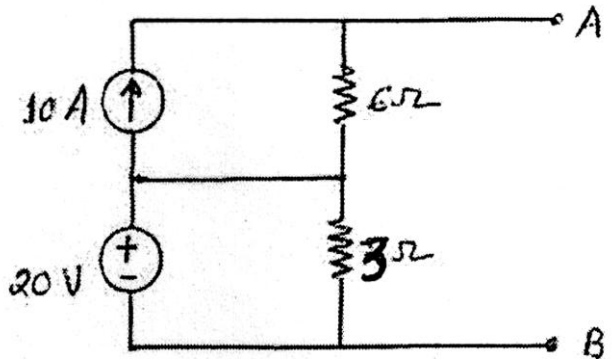


Figure – 3(a)

b) Prove that for an RLC series circuit the resonant frequency is geometric mean of upper & lower half power frequencies.

$\omega o = \sqrt{\omega_1\ \omega_2}$

c) Find the ABCD- parameters for the given π network shown in figure 3(c). Is this network bilateral or not?

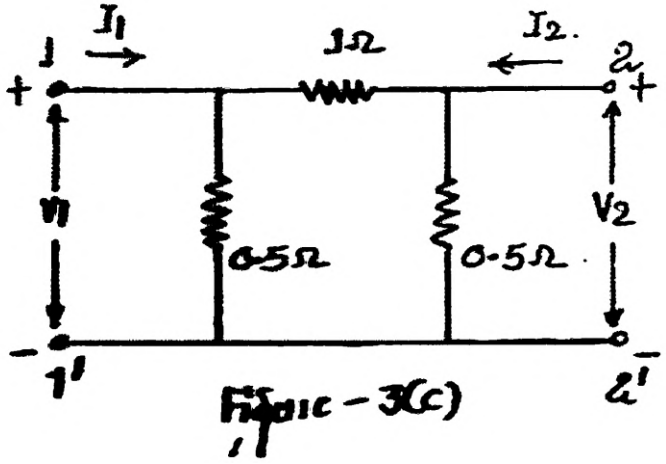


Figure – 3(c)

Section – II

Q.4 Answer the following: (Any Four) **16**

a) Design a T pad attenuator to give an attenuation of 60dB and to work in a line of impedance 500Ω.

b) Prove for Constant-K Low Pass Filter, the cut-off frequency is fc $= \frac{1}{\pi\sqrt{LC}}$

c) Draw T and π sections for m-derived LPF. State the design equations.

d) Draw pole zero plot for given function. Comment on stability of given system from pole zero plot.

$$H(s) = \frac{20(s+1)(s+5)}{s(s^2+2s+2)(s+7)}$$

e) Explain transient response of series RC circuit.

Q.5 Answer the following: (Any Two) **12**

a) Find current i(t) for t > 0 for the circuit shown in figure-5(a)

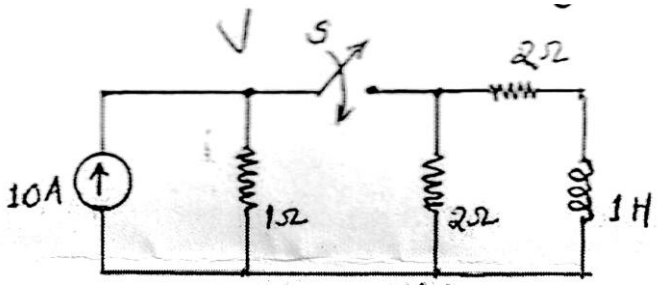


Figure – 5(a)

b) Define poles and zeros of network function. Explain the significance of poles and zeros with suitable examples.

c) Design m-derived LPF both T and π sections with cut-off frequency of 1 KHz, design impedance of 400 Ω and resonant frequency of 1100 Hz.

Seat No.	

Set **S**

S.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Sem - I) (New) (NEP CBCS) Examination: March/April - 2025
Network Theory Analysis (ENTPCC-01)

Day & Date: Saturday, 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book Page no 03 (Starring page of the Answer Book Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of Page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct option from the following: **14**

1) How is the short circuit reverse transfer admittance (y_{12}) calculated in terms of current and voltage ratio?
a) V_2/ I_1 (keeping $I_2 = 0$) b) I_2/ V_1 (keeping $V_2 = 0$)
c) I_1/ V_2 (keeping $V_1 = 0$) d) V_1/ I_2 (keeping $I_1 = 0$)

2) Which among the following is regarded as short circuit forward transfer admittance?
a) y11 b) y12
c) y21 d) y22

3) In a steady state, inductors and capacitors are respectively replaced by ____ circuit and ____ circuit.
a) short, open b) open, short
c) short, short d) open, open

4) When a series RC circuit is connected to a constant voltage at t=0, the current passing through the circuit is at t=0+ is ____.
a) Infinite b) Zero
c) V/R d) $V/\omega C$

5) The function is said to be having simple poles and zeros and only if ____.
a) the poles are not repeated
b) the zeros are not repeated
c) both poles and zeros are not repeated
d) None

6) Which among the following belong/s to the category of critical frequency?
a) Poles
b) Zeros
c) Both a and b
d) None of the above

7) In the m-derived high pass filters the resonant frequency is to be chosen so that it is ____.
a) above the cut off frequency
b) below the cut off frequency
c) between the cut off frequency
d) None

8) An ideal filter should have ____.
a) zero attenuation in the pass band
b) infinite attenuation in the pass band
c) zero attenuation in the attenuation band
d) infinite attenuation in the attenuation band

9) Transients are present in the circuit when the circuit is having ____.
a) C
b) L
c) R
d) Either L or C

10) Under which conditions do the source transformation technique remain directly unapplicable?
a) Only in the absence of impedance in series with a voltage source
b) Only in the absence of impedance in parallel with a current source
c) Both a and b
d) None of the above

11) Superposition theorem is not applicable to network of ____.
a) Nonlinear elements
b) Dependent voltage sources
c) dependent current sources
d) All of the above

12) What should be done, if the dependent current and voltage sources are present in a circuit while applying 'Superposition Theorem'?
a) Replace them by open circuit
b) Replaced them by short circuit
c) Keep in their original form without replacing by either open or short circuits
d) None of the above

13) If an a.c. signal generator drives a series RLC circuit, then the circuit undergoes resonance only due to variation in ____
a) Supply voltage
b) Series resistance
c) Supply frequency
d) Phase angle

14) In a series RLC circuit operating below the resonant frequency the current ____.

a) I leads Vs
b) I lags behind Vs
c) I is in phase with Vs
d) none

Seat No.		Set	S

S.Y. (B.Tech.) (Electronics & Telecommunication Engineering) (Sem - I) (New) (NEP CBCS) Examination: March/April - 2025
Network Theory Analysis (ENTPCC-01)

Day & Date: Saturday, 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) figure to right indicate full marks.

Section – I

Q.2 Attempt the following questions: (Any Four) **16**

a) Determine Thevenin's equivalent circuit with reference to terminal ab for circuit shown in figure-2(a)

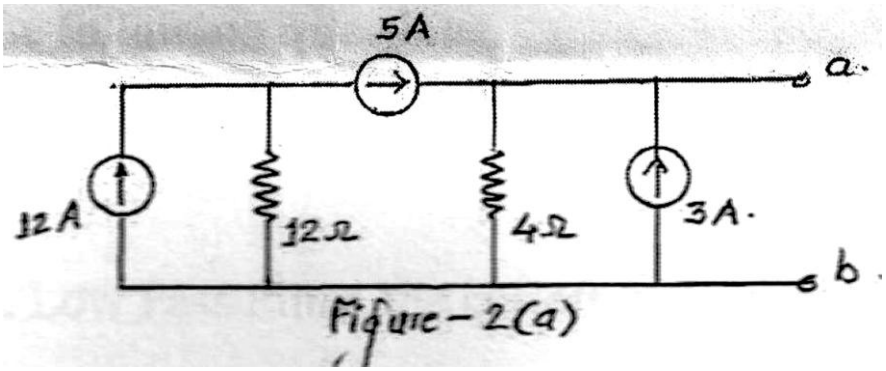


Figure – 2(a)

b) Determine load resistance to receive maximum power from source. Also find the maximum power delivered to the load in the circuit shown in figure 2(b)

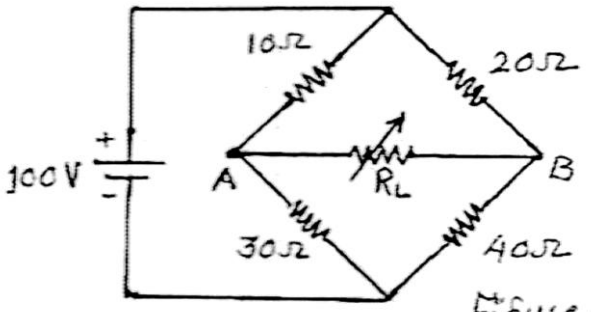


Figure – 2(b).

c) A series RLC circuit consists of R=4 Ω, L=0.5H & variable capacitance in series across a 100V, 50Hz.Calculate,
i) The capacitance to give resonance,
ii) The voltage across capacitor

d) Derive h-parameter equations for two-port network in terms of voltages & currents & give its electrical equivalent circuit.

e) Explain cascade connection of two-port networks.

Q.3 Answer the following: (Any Two) **12**

a) Replace given network shown in figure 3(a) by a single current source in parallel with a resistance.

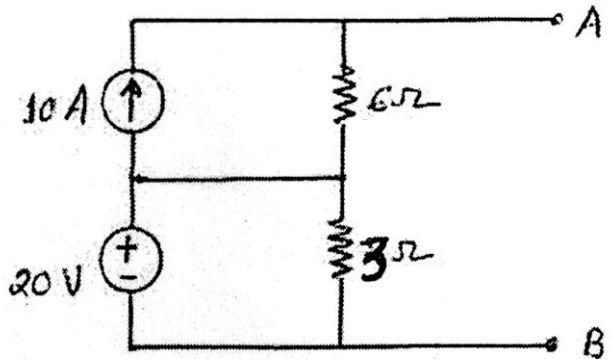


Figure – 3(a)

b) Prove that for an RLC series circuit the resonant frequency is geometric mean of upper & lower half power frequencies.

$\omega o = \sqrt{\omega_1\ \omega_2}$

c) Find the ABCD- parameters for the given π network shown in figure 3(c). Is this network bilateral or not?

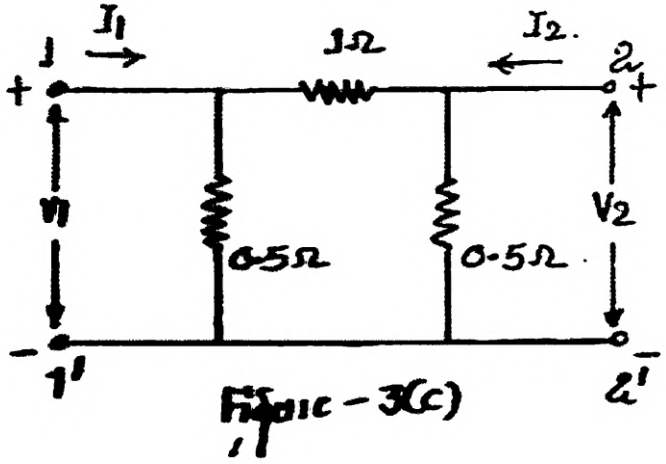


Figure – 3(c)

Section – II

Q.4 Answer the following: (Any Four) **16**

a) Design a T pad attenuator to give an attenuation of 60dB and to work in a line of impedance 500Ω.

b) Prove for Constant-K Low Pass Filter, the cut-off frequency is fc $= \frac{1}{\pi\sqrt{LC}}$

c) Draw T and π sections for m-derived LPF. State the design equations.

d) Draw pole zero plot for given function. Comment on stability of given system from pole zero plot.

$$H(s) = \frac{20(s+1)(s+5)}{s(s^2+2s+2)(s+7)}$$

e) Explain transient response of series RC circuit.

Q.5 Answer the following: (Any Two) **12**

a) Find current i(t) for t > 0 for the circuit shown in figure-5(a)

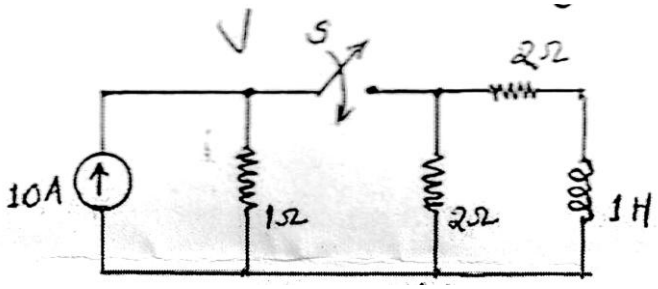


Figure – 5(a)

b) Define poles and zeros of network function. Explain the significance of poles and zeros with suitable examples.

c) Design m-derived LPF both T and π sections with cut-off frequency of 1 KHz, design impedance of 400 Ω and resonant frequency of 1100 Hz.

SLR-BD-178

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONIC & TELECOMMUNICATION ENGINEERING
Electronics Circuit Analysis & Design (ENTPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figure to the right indicates full marks.
4) Assume suitable data if necessary.

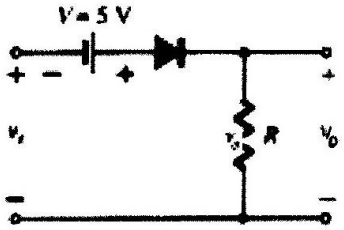
MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) If input frequency is 50Hz for a full wave rectifier, the ripple frequency of it would be _____.
a) 100 Hz b) 50Hz
c) 25Hz d) 500Hz

2) What is the circuit in the given diagram called?



a) Clipper b) Clamper
c) Half wave rectifier d) Full wave rectifier

3) Efficiency of a centre tapped full wave rectifier is _____.
a) 50% b) 46%
c) 70% d) 81.2%

4) A capacitor filter or C filter can be used in a rectifier by connecting it _____.
a) in parallel with the load b) in series with the load
c) in parallel with the supply d) in series with the supply

5) A full wave rectifier uses a capacitor filter with 500μF capacitor and provides a load current of 200mA at 8% ripple. Calculate the dc voltage.
a) 15.56V b) 20.43V
c) 11.98V d) 14.43V

6) If no load voltage across DC power supply is 10V and full load voltage is 9.8V. Then calculate the load regulation of DC power supply.

a) 5% b) 8%
c) 2% d) 10%

7) An ideal voltage regulator has _____ load regulation.

a) 0% b) 50%
c) 100% d) 10%

8) The current gain for a transistor working as common-base amplifier is 0.96. If the emitter current is7.2 mA, then the base current is _____.

a) 0.29 mA b) 0.35 mA
c) 0.39 mA d) 0.43 mA

9) There are _____ h parameters of a transistor.

a) Two b) Four
c) Three d) None of these

10) Which of the following is valid for both P-N-P as well as N-P-N transistor?

a) The emitter injects holes into the base region.
b) The electrons are the minority carriers in the base region.
c) The EB junction is forward biased for active operation.
d) When biased in the active region, current flows into their emitter terminal.

11) The gain of an amplifier with feedback is known as _____ gain.

a) Resonant b) Open loop
c) Closed loop d) None of the above

12) The value of negative feedback fraction is always _____.

a) Less than 1 b) More than 1
c) Equal to 1 d) None of the above

13) Which of the following statement is true about FET?

a) It has high output impedance.
b) It has high input impedance.
c) It has low input impedance.
d) It does not offer any resistance.

14) When drain voltage equals the pinch-off-voltage, then drain current _____ with the increase in drain voltage.

a) decreases b) increases
c) remains constant d) None of the above

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONIC & TELECOMMUNICATION ENGINEERING
Electronics Circuit Analysis & Design (ENTPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagram whenever necessary.

Section – I

Q.2 Attempt any Four. **16**

a) List different types of Clipper circuits and explain negative clipper with transfer characteristics.
b) Explain the operation of voltage doubler, Give its one application.
c) Explain operation of capacitor filter. Derive the expression for ripple factor of capacitor filter.
d) Explain how the zener diode maintains the output voltage constant.
e) Explain unregulated power supply with block diagram.

Q.3 Attempt any Two. **12**

a) Explain with neat diagram operation of full wave rectifier. Derive expression for following parameters Vo avg, Vo rms, ripple factor, efficiency, TUF and PIV.
b) A full wave rectifier has a peak output voltage of 30V at 50 Hz and feeds a resistive load of 1KΩ. The filter used is shunt capacitor one with C=20 μF. Determine.
i) DC load current
ii) DC output voltage
iii) Ripple voltage
iv) Ripple factor
c) In a zener regulator, the DC input is 10 V $\pm$20%. The output requirements are 5V, 20mA. Assume Iz(min) and Iz(max) as 5mA and 80A. Design the zener regulator.

Section – II

Q.4 Attempt any Four. **16**

a) Explain DC Load Line analysis.
b) List different coupling schemes & explain Direct Coupled amplifier.
c) Briefly explain the concept of feedback, what are the characteristics of negative feedback amplifier.
d) Explain JFET VI & Transfer characteristics.
e) Give a short note on CMOS.

Q.5 Attempt any Two. **12**

a) List BJT Biasing & explain Voltage divider bias.
b) Explain & derive effect of negative feedback on Stability, Bandwidth, and Noise, Distortion I/P Resistance and O/P Resistance amplifier.
c) Explain MOSFET- Construction, working & V I characteristics.

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONIC & TELECOMMUNICATION ENGINEERING
Electronics Circuit Analysis & Design (ENTPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figure to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) The current gain for a transistor working as common-base amplifier is 0.96. If the emitter current is7.2 mA, then the base current is _____.
a) 0.29 mA b) 0.35 mA
c) 0.39 mA d) 0.43 mA

2) There are _____ h parameters of a transistor.
a) Two b) Four
c) Three d) None of these

3) Which of the following is valid for both P-N-P as well as N-P-N transistor?
a) The emitter injects holes into the base region.
b) The electrons are the minority carriers in the base region.
c) The EB junction is forward biased for active operation.
d) When biased in the active region, current flows into their emitter terminal.

4) The gain of an amplifier with feedback is known as _____ gain.
a) Resonant b) Open loop
c) Closed loop d) None of the above

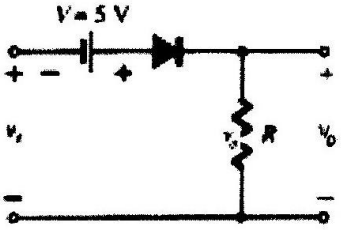
5) The value of negative feedback fraction is always _____.
a) Less than 1 b) More than 1
c) Equal to 1 d) None of the above

6) Which of the following statement is true about FET?
a) It has high output impedance.
b) It has high input impedance.
c) It has low input impedance.
d) It does not offer any resistance.

7) When drain voltage equals the pinch-off-voltage, then drain current _____ with the increase in drain voltage.
a) decreases b) increases
c) remains constant d) None of the above

8) If input frequency is 50Hz for a full wave rectifier, the ripple frequency of it would be _____.
a) 100 Hz b) 50Hz
c) 25Hz d) 500Hz

9) What is the circuit in the given diagram called?



a) Clipper b) Clamper
c) Half wave rectifier d) Full wave rectifier

10) Efficiency of a centre tapped full wave rectifier is _____.
a) 50% b) 46%
c) 70% d) 81.2%

11) A capacitor filter or C filter can be used in a rectifier by connecting it _____.
a) in parallel with the load b) in series with the load
c) in parallel with the supply d) in series with the supply

12) A full wave rectifier uses a capacitor filter with 500μF capacitor and provides a load current of 200mA at 8% ripple. Calculate the dc voltage.
a) 15.56V b) 20.43V
c) 11.98V d) 14.43V

13) If no load voltage across DC power supply is 10V and full load voltage is 9.8V. Then calculate the load regulation of DC power supply.
a) 5% b) 8%
c) 2% d) 10%

14) An ideal voltage regulator has _____ load regulation.
a) 0% b) 50%
c) 100% d) 10%

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONIC & TELECOMMUNICATION ENGINEERING
Electronics Circuit Analysis & Design (ENTPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagram whenever necessary.

Section – I

Q.2 Attempt any Four. **16**

a) List different types of Clipper circuits and explain negative clipper with transfer characteristics.
b) Explain the operation of voltage doubler, Give its one application.
c) Explain operation of capacitor filter. Derive the expression for ripple factor of capacitor filter.
d) Explain how the zener diode maintains the output voltage constant.
e) Explain unregulated power supply with block diagram.

Q.3 Attempt any Two. **12**

a) Explain with neat diagram operation of full wave rectifier. Derive expression for following parameters Vo avg, Vo rms, ripple factor, efficiency, TUF and PIV.
b) A full wave rectifier has a peak output voltage of 30V at 50 Hz and feeds a resistive load of 1KΩ. The filter used is shunt capacitor one with C=20 μF. Determine.
i) DC load current
ii) DC output voltage
iii) Ripple voltage
iv) Ripple factor
c) In a zener regulator, the DC input is 10 V $\pm$20%. The output requirements are 5V, 20mA. Assume Iz(min) and Iz(max) as 5mA and 80A. Design the zener regulator.

Section – II

Q.4 Attempt any Four. **16**

a) Explain DC Load Line analysis.
b) List different coupling schemes & explain Direct Coupled amplifier.
c) Briefly explain the concept of feedback, what are the characteristics of negative feedback amplifier.
d) Explain JFET VI & Transfer characteristics.
e) Give a short note on CMOS.

Q.5 Attempt any Two. **12**

a) List BJT Biasing & explain Voltage divider bias.
b) Explain & derive effect of negative feedback on Stability, Bandwidth, and Noise, Distortion I/P Resistance and O/P Resistance amplifier.
c) Explain MOSFET- Construction, working & V I characteristics.

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONIC & TELECOMMUNICATION ENGINEERING
Electronics Circuit Analysis & Design (ENTPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figure to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) The gain of an amplifier with feedback is known as _____ gain.
a) Resonant b) Open loop
c) Closed loop d) None of the above

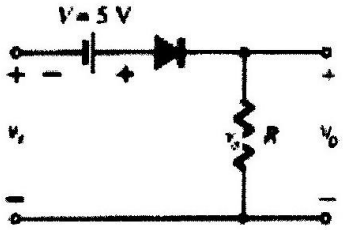
2) The value of negative feedback fraction is always _____.
a) Less than 1 b) More than 1
c) Equal to 1 d) None of the above

3) Which of the following statement is true about FET?
a) It has high output impedance.
b) It has high input impedance.
c) It has low input impedance.
d) It does not offer any resistance.

4) When drain voltage equals the pinch-off-voltage, then drain current _____ with the increase in drain voltage.
a) decreases b) increases
c) remains constant d) None of the above

5) If input frequency is 50Hz for a full wave rectifier, the ripple frequency of it would be _____.
a) 100 Hz b) 50Hz
c) 25Hz d) 500Hz

6) What is the circuit in the given diagram called?



a) Clipper
b) Clamper
c) Half wave rectifier
d) Full wave rectifier

7) Efficiency of a centre tapped full wave rectifier is _____.

a) 50%
b) 46%
c) 70%
d) 81.2%

8) A capacitor filter or C filter can be used in a rectifier by connecting it _____.

a) in parallel with the load
b) in series with the load
c) in parallel with the supply
d) in series with the supply

9) A full wave rectifier uses a capacitor filter with 500μF capacitor and provides a load current of 200mA at 8% ripple. Calculate the dc voltage.

a) 15.56V
b) 20.43V
c) 11.98V
d) 14.43V

10) If no load voltage across DC power supply is 10V and full load voltage is 9.8V. Then calculate the load regulation of DC power supply.

a) 5%
b) 8%
c) 2%
d) 10%

11) An ideal voltage regulator has _____ load regulation.

a) 0%
b) 50%
c) 100%
d) 10%

12) The current gain for a transistor working as common-base amplifier is 0.96. If the emitter current is7.2 mA, then the base current is _____.

a) 0.29 mA
b) 0.35 mA
c) 0.39 mA
d) 0.43 mA

13) There are _____ h parameters of a transistor.

a) Two
b) Four
c) Three
d) None of these

14) Which of the following is valid for both P-N-P as well as N-P-N transistor?

a) The emitter injects holes into the base region.
b) The electrons are the minority carriers in the base region.
c) The EB junction is forward biased for active operation.
d) When biased in the active region, current flows into their emitter terminal.

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONIC & TELECOMMUNICATION ENGINEERING
Electronics Circuit Analysis & Design (ENTPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagram whenever necessary.

Section – I

Q.2 Attempt any Four. **16**

a) List different types of Clipper circuits and explain negative clipper with transfer characteristics.
b) Explain the operation of voltage doubler, Give its one application.
c) Explain operation of capacitor filter. Derive the expression for ripple factor of capacitor filter.
d) Explain how the zener diode maintains the output voltage constant.
e) Explain unregulated power supply with block diagram.

Q.3 Attempt any Two. **12**

a) Explain with neat diagram operation of full wave rectifier. Derive expression for following parameters Vo avg, Vo rms, ripple factor, efficiency, TUF and PIV.
b) A full wave rectifier has a peak output voltage of 30V at 50 Hz and feeds a resistive load of 1KΩ. The filter used is shunt capacitor one with C=20 μF. Determine.
i) DC load current
ii) DC output voltage
iii) Ripple voltage
iv) Ripple factor
c) In a zener regulator, the DC input is 10 V $\pm$20%. The output requirements are 5V, 20mA. Assume Iz(min) and Iz(max) as 5mA and 80A. Design the zener regulator.

Section – II

Q.4 Attempt any Four. **16**

a) Explain DC Load Line analysis.
b) List different coupling schemes & explain Direct Coupled amplifier.
c) Briefly explain the concept of feedback, what are the characteristics of negative feedback amplifier.
d) Explain JFET VI & Transfer characteristics.
e) Give a short note on CMOS.

Q.5 Attempt any Two. **12**

a) List BJT Biasing & explain Voltage divider bias.
b) Explain & derive effect of negative feedback on Stability, Bandwidth, and Noise, Distortion I/P Resistance and O/P Resistance amplifier.
c) Explain MOSFET- Construction, working & V I characteristics.

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONIC & TELECOMMUNICATION ENGINEERING
Electronics Circuit Analysis & Design (ENTPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figure to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) If no load voltage across DC power supply is 10V and full load voltage is 9.8V. Then calculate the load regulation of DC power supply.
a) 5% b) 8%
c) 2% d) 10%

2) An ideal voltage regulator has _____ load regulation.
a) 0% b) 50%
c) 100% d) 10%

3) The current gain for a transistor working as common-base amplifier is 0.96. If the emitter current is7.2 mA, then the base current is _____.
a) 0.29 mA b) 0.35 mA
c) 0.39 mA d) 0.43 mA

4) There are _____ h parameters of a transistor.
a) Two b) Four
c) Three d) None of these

5) Which of the following is valid for both P-N-P as well as N-P-N transistor?
a) The emitter injects holes into the base region.
b) The electrons are the minority carriers in the base region.
c) The EB junction is forward biased for active operation.
d) When biased in the active region, current flows into their emitter terminal.

6) The gain of an amplifier with feedback is known as _____ gain.
a) Resonant b) Open loop
c) Closed loop d) None of the above

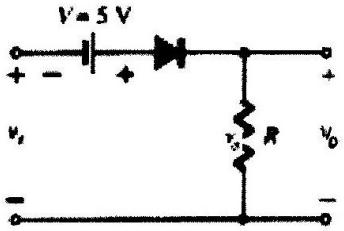
7) The value of negative feedback fraction is always _____.
a) Less than 1 b) More than 1
c) Equal to 1 d) None of the above

8) Which of the following statement is true about FET?
a) It has high output impedance.
b) It has high input impedance.
c) It has low input impedance.
d) It does not offer any resistance.

9) When drain voltage equals the pinch-off-voltage, then drain current _____ with the increase in drain voltage.
a) decreases b) increases
c) remains constant d) None of the above

10) If input frequency is 50Hz for a full wave rectifier, the ripple frequency of it would be _____.
a) 100 Hz b) 50Hz
c) 25Hz d) 500Hz

11) What is the circuit in the given diagram called?



a) Clipper b) Clamper
c) Half wave rectifier d) Full wave rectifier

12) Efficiency of a centre tapped full wave rectifier is _____.
a) 50% b) 46%
c) 70% d) 81.2%

13) A capacitor filter or C filter can be used in a rectifier by connecting it _____.
a) in parallel with the load b) in series with the load
c) in parallel with the supply d) in series with the supply

14) A full wave rectifier uses a capacitor filter with 500μF capacitor and provides a load current of 200mA at 8% ripple. Calculate the dc voltage.
a) 15.56V b) 20.43V
c) 11.98V d) 14.43V

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONIC & TELECOMMUNICATION ENGINEERING
Electronics Circuit Analysis & Design (ENTPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagram whenever necessary.

Section – I

Q.2 Attempt any Four. **16**

a) List different types of Clipper circuits and explain negative clipper with transfer characteristics.
b) Explain the operation of voltage doubler, Give its one application.
c) Explain operation of capacitor filter. Derive the expression for ripple factor of capacitor filter.
d) Explain how the zener diode maintains the output voltage constant.
e) Explain unregulated power supply with block diagram.

Q.3 Attempt any Two. **12**

a) Explain with neat diagram operation of full wave rectifier. Derive expression for following parameters Vo avg, Vo rms, ripple factor, efficiency, TUF and PIV.
b) A full wave rectifier has a peak output voltage of 30V at 50 Hz and feeds a resistive load of 1KΩ. The filter used is shunt capacitor one with C=20 μF. Determine.
i) DC load current
ii) DC output voltage
iii) Ripple voltage
iv) Ripple factor
c) In a zener regulator, the DC input is 10 V $\pm$20%. The output requirements are 5V, 20mA. Assume Iz(min) and Iz(max) as 5mA and 80A. Design the zener regulator.

Section – II

Q.4 Attempt any Four. **16**

a) Explain DC Load Line analysis.
b) List different coupling schemes & explain Direct Coupled amplifier.
c) Briefly explain the concept of feedback, what are the characteristics of negative feedback amplifier.
d) Explain JFET VI & Transfer characteristics.
e) Give a short note on CMOS.

Q.5 Attempt any Two. **12**

a) List BJT Biasing & explain Voltage divider bias.
b) Explain & derive effect of negative feedback on Stability, Bandwidth, and Noise, Distortion I/P Resistance and O/P Resistance amplifier.
c) Explain MOSFET- Construction, working & V I characteristics.

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Analog and Digital Communication (ENTPCC-03)

Day & Date: Tuesday 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which one of the following is not an internal noise?
a) Thermal agitation b) Shot noise
c) Transit time d) Solar Noise

2) Sensitivity is measured in _____.
a) Microvolts b) Mili amp
c) Ohms d) Siemens

3) Image frequency is _____.
a) Unwanted b) Useful and required
c) Improves S/N d) None

4) In FM Automatic Gain Control is derived from _____.
a) Diode Detector b) Limiter
c) Local Oscillator d) None

5) Noise in FM is less because _____.
a) Amplitude is constant
b) Pre emphasis- De-emphasis is used
c) Limiter is used
d) All above

6) Noise figure is given by _____.
a) Signal/noise
b) Input S/N divided by output S/N
c) Output S/N divided by input S/N
d) None

7) Function of balanced modulator is _____.
a) To remove carrier b) side band suppression
c) To reduce bandwidth d) None of these

8) The maximum value of H is reached for two messages when its probability is _____.

a) P = 0.5 b) P = 1
c) P = 0 d) P = 2

9) Granular noise is associated with _____.

a) PCM b) Delta Modulation
c) DPCM d) QAM

10) The main disadvantage of PCM is _____.

a) Large bandwidth b) Large power
c) Complex circuitry d) Quantization noise

11) Quantization Noise can be reduced by_____.

a) Increasing BW b) Increasing quantization level
c) Reducing BW d) None of these

12) _____ most affected by noise.

a) PSK b) ASK
c) FSK d) MSK

13) If the baud rate for QPSK is 100 then bit rate is _____.

a) 100 b) 200
c) 300 d) 400

14) In FSK max frequencies present will be _____.

a) Four b) Two
c) Six d) None of these

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Analog and Digital Communication (ENTPCC-03)

Day & Date: Tuesday 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt the following (Any Four). 16

a) Explain what is the need of modulation with relevant examples.
b) Give broad classification of noise, Elaborate each type in detail
c) What is SSB? how it is useful? Explain any one method of SSB generation.
d) What is difference between TRF and Superhetrodyne receiver. With neat block diagram explain Superhetrodyne principle
e) Equation of Angle modulated wave is given by $v = 10\sin(10^8 t + 3\sin 10^4 t)$ What is form of modulation?
Calculate carrier, modulating frequencies, modulation index and power dissipated in 100 ohm.

Q.3 Attempt the following (Any Two). 12

a) Give broad classification of Modulations. What is AM derive an expression for AM. Draw frequency response of AM. Calculate Band width from frequency response
b) Compare AM and FM? What kind of modulation is used in TV transmission? Explain VSB in brief.
c) The antenna current of AM transmitter is 8A when only carrier is sent but it increases to 8.93 A when carrier modulated by single sin wave. Find percentage modulation. Determine antenna current when parentage modulation change to 0.8.

Section – II

Q.4 Attempt the following (Any Four). 16

a) Explain PCM detail. What is major drawback of it. What is method to minimize the drawback?
b) Define entropy. Prove that the entropy is maximum when all the messages are equiprobable.
c) With suitable block diagram explain DM in detail. What are its limitations? Which method you will suggest to minimize limitations?
d) Compare different digital modulation techniques.
e) Explain FSK with suitable block diagram and waveforms.

Q.5 Attempt the following (Any Two). **12**

a) Explain concept of rate of information. What is its significance? Why it is useful?
Apply Shannon Fano coding procedure for below messages. Also find efficiency and redundancy.
[X] = [x1, x2, x3, x4, x5, x6, x7]
[P(X)] = [0.4, 0.2, 0.12, 0.08, 0.08, 0.08, 0.04]

b) Consider (7,4) block code generated by following. Find all the code vectors. Explain how syndrome S helps in correcting a single error. What happens when more than one error occurs.

$$G = \begin{matrix} 1 & 0 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 1 & 1 & 1 & 1 \end{matrix}$$

c) Explain QPSK signaling scheme in detail.

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Analog and Digital Communication (ENTPCC-03)

Day & Date: Tuesday 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The maximum value of H is reached for two messages when its probability is _____.
a) P = 0.5 b) P = 1
c) P = 0 d) P = 2

2) Granular noise is associated with _____.
a) PCM b) Delta Modulation
c) DPCM d) QAM

3) The main disadvantage of PCM is _____.
a) Large bandwidth b) Large power
c) Complex circuitry d) Quantization noise

4) Quantization Noise can be reduced by_____.
a) Increasing BW b) Increasing quantization level
c) Reducing BW d) None of these

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

6) If the baud rate for QPSK is 100 then bit rate is _____.
a) 100 b) 200
c) 300 d) 400

7) In FSK max frequencies present will be _____.
a) Four b) Two
c) Six d) None of these

8) Which one of the following is not an internal noise?
a) Thermal agitation b) Shot noise
c) Transit time d) Solar Noise

9) Sensitivity is measured in _____.
a) Microvolts b) Mili amp
c) Ohms d) Siemens

10) Image frequency is _____.
a) Unwanted b) Useful and required
c) Improves S/N d) None

11) In FM Automatic Gain Control is derived from _____.
a) Diode Detector b) Limiter
c) Local Oscillator d) None

12) Noise in FM is less because _____.
a) Amplitude is constant
b) Pre emphasis- De-emphasis is used
c) Limiter is used
d) All above

13) Noise figure is given by _____.
a) Signal/noise
b) Input S/N divided by output S/N
c) Output S/N divided by input S/N
d) None

14) Function of balanced modulator is _____.
a) To remove carrier b) side band suppression
c) To reduce bandwidth d) None of these

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Analog and Digital Communication (ENTPCC-03)

Day & Date: Tuesday 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt the following (Any Four). **16**

a) Explain what is the need of modulation with relevant examples.
b) Give broad classification of noise, Elaborate each type in detail
c) What is SSB? how it is useful? Explain any one method of SSB generation.
d) What is difference between TRF and Superhetrodyne receiver. With neat block diagram explain Superhetrodyne principle
e) Equation of Angle modulated wave is given by $v = 10\sin(10^8 t + 3\sin 10^4 t)$ What is form of modulation?
Calculate carrier, modulating frequencies, modulation index and power dissipated in 100 ohm.

Q.3 Attempt the following (Any Two). **12**

a) Give broad classification of Modulations. What is AM derive an expression for AM. Draw frequency response of AM. Calculate Band width from frequency response
b) Compare AM and FM? What kind of modulation is used in TV transmission? Explain VSB in brief.
c) The antenna current of AM transmitter is 8A when only carrier is sent but it increases to 8.93 A when carrier modulated by single sin wave. Find percentage modulation. Determine antenna current when parentage modulation change to 0.8.

Section – II

Q.4 Attempt the following (Any Four). **16**

a) Explain PCM detail. What is major drawback of it. What is method to minimize the drawback?
b) Define entropy. Prove that the entropy is maximum when all the messages are equiprobable.
c) With suitable block diagram explain DM in detail. What are its limitations? Which method you will suggest to minimize limitations?
d) Compare different digital modulation techniques.
e) Explain FSK with suitable block diagram and waveforms.

Q.5 Attempt the following (Any Two). **12**

a) Explain concept of rate of information. What is its significance? Why it is useful?
Apply Shannon Fano coding procedure for below messages. Also find efficiency and redundancy.
[X] = [x1, x2, x3, x4, x5, x6, x7]
[P(X)] = [0.4, 0.2, 0.12, 0.08, 0.08, 0.08, 0.04]

b) Consider (7,4) block code generated by following. Find all the code vectors. Explain how syndrome S helps in correcting a single error. What happens when more than one error occurs.

$$G = \begin{matrix} 1 & 0 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 1 & 1 & 1 & 1 \end{matrix}$$

c) Explain QPSK signaling scheme in detail.

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Analog and Digital Communication (ENTPCC-03)

Day & Date: Tuesday 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Quantization Noise can be reduced by_____.
a) Increasing BW b) Increasing quantization level
c) Reducing BW d) None of these

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

3) If the baud rate for QPSK is 100 then bit rate is _____.
a) 100 b) 200
c) 300 d) 400

4) In FSK max frequencies present will be _____.
a) Four b) Two
c) Six d) None of these

5) Which one of the following is not an internal noise?
a) Thermal agitation b) Shot noise
c) Transit time d) Solar Noise

6) Sensitivity is measured in _____.
a) Microvolts b) Mili amp
c) Ohms d) Siemens

7) Image frequency is _____.
a) Unwanted b) Useful and required
c) Improves S/N d) None

8) In FM Automatic Gain Control is derived from _____.
a) Diode Detector b) Limiter
c) Local Oscillator d) None

9) Noise in FM is less because _____.
a) Amplitude is constant
b) Pre emphasis- De-emphasis is used
c) Limiter is used
d) All above

10) Noise figure is given by _____.
a) Signal/noise
b) Input S/N divided by output S/N
c) Output S/N divided by input S/N
d) None

11) Function of balanced modulator is _____.
a) To remove carrier b) side band suppression
c) To reduce bandwidth d) None of these

12) The maximum value of H is reached for two messages when its probability is _____.
a) P = 0.5 b) P = 1
c) P = 0 d) P = 2

13) Granular noise is associated with _____.
a) PCM b) Delta Modulation
c) DPCM d) QAM

14) The main disadvantage of PCM is _____.
a) Large bandwidth b) Large power
c) Complex circuitry d) Quantization noise

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Analog and Digital Communication (ENTPCC-03)

Day & Date: Tuesday 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt the following (Any Four). **16**

a) Explain what is the need of modulation with relevant examples.
b) Give broad classification of noise, Elaborate each type in detail
c) What is SSB? how it is useful? Explain any one method of SSB generation.
d) What is difference between TRF and Superhetrodyne receiver. With neat block diagram explain Superhetrodyne principle
e) Equation of Angle modulated wave is given by $v = 10\sin(10^8 t + 3\sin 10^4 t)$ What is form of modulation?
Calculate carrier, modulating frequencies, modulation index and power dissipated in 100 ohm.

Q.3 Attempt the following (Any Two). **12**

a) Give broad classification of Modulations. What is AM derive an expression for AM. Draw frequency response of AM. Calculate Band width from frequency response
b) Compare AM and FM? What kind of modulation is used in TV transmission? Explain VSB in brief.
c) The antenna current of AM transmitter is 8A when only carrier is sent but it increases to 8.93 A when carrier modulated by single sin wave. Find percentage modulation. Determine antenna current when parentage modulation change to 0.8.

Section – II

Q.4 Attempt the following (Any Four). **16**

a) Explain PCM detail. What is major drawback of it. What is method to minimize the drawback?
b) Define entropy. Prove that the entropy is maximum when all the messages are equiprobable.
c) With suitable block diagram explain DM in detail. What are its limitations? Which method you will suggest to minimize limitations?
d) Compare different digital modulation techniques.
e) Explain FSK with suitable block diagram and waveforms.

Q.5 Attempt the following (Any Two). **12**

a) Explain concept of rate of information. What is its significance? Why it is useful?
Apply Shannon Fano coding procedure for below messages. Also find efficiency and redundancy.
[X] = [x1, x2, x3, x4, x5, x6, x7]
[P(X)] = [0.4, 0.2, 0.12, 0.08, 0.08, 0.08, 0.04]

b) Consider (7,4) block code generated by following. Find all the code vectors. Explain how syndrome S helps in correcting a single error. What happens when more than one error occurs.

$$G = \begin{matrix} 1 & 0 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 1 & 1 & 1 & 1 \end{matrix}$$

c) Explain QPSK signaling scheme in detail.

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Analog and Digital Communication (ENTPCC-03)

Day & Date: Tuesday 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Noise figure is given by _____.
a) Signal/noise
b) Input S/N divided by output S/N
c) Output S/N divided by input S/N
d) None

2) Function of balanced modulator is _____.
a) To remove carrier b) side band suppression
c) To reduce bandwidth d) None of these

3) The maximum value of H is reached for two messages when its probability is _____.
a) P = 0.5 b) P = 1
c) P = 0 d) P = 2

4) Granular noise is associated with _____.
a) PCM b) Delta Modulation
c) DPCM d) QAM

5) The main disadvantage of PCM is _____.
a) Large bandwidth b) Large power
c) Complex circuitry d) Quantization noise

6) Quantization Noise can be reduced by_____.
a) Increasing BW b) Increasing quantization level
c) Reducing BW d) None of these

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

8) If the baud rate for QPSK is 100 then bit rate is _____.
a) 100 b) 200
c) 300 d) 400

9) In FSK max frequencies present will be _____.
a) Four b) Two
c) Six d) None of these

10) Which one of the following is not an internal noise?
a) Thermal agitation b) Shot noise
c) Transit time d) Solar Noise

11) Sensitivity is measured in _____.
a) Microvolts b) Mili amp
c) Ohms d) Siemens

12) Image frequency is _____.
a) Unwanted b) Useful and required
c) Improves S/N d) None

13) In FM Automatic Gain Control is derived from _____.
a) Diode Detector b) Limiter
c) Local Oscillator d) None

14) Noise in FM is less because _____.
a) Amplitude is constant
b) Pre emphasis- De-emphasis is used
c) Limiter is used
d) All above

Seat No.	

Set **S**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Analog and Digital Communication (ENTPCC-03)

Day & Date: Tuesday 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt the following (Any Four). **16**

a) Explain what is the need of modulation with relevant examples.
b) Give broad classification of noise, Elaborate each type in detail
c) What is SSB? how it is useful? Explain any one method of SSB generation.
d) What is difference between TRF and Superhetrodyne receiver. With neat block diagram explain Superhetrodyne principle
e) Equation of Angle modulated wave is given by $v = 10\sin(10^8 t + 3\sin 10^4 t)$ What is form of modulation?
Calculate carrier, modulating frequencies, modulation index and power dissipated in 100 ohm.

Q.3 Attempt the following (Any Two). **12**

a) Give broad classification of Modulations. What is AM derive an expression for AM. Draw frequency response of AM. Calculate Band width from frequency response
b) Compare AM and FM? What kind of modulation is used in TV transmission? Explain VSB in brief.
c) The antenna current of AM transmitter is 8A when only carrier is sent but it increases to 8.93 A when carrier modulated by single sin wave. Find percentage modulation. Determine antenna current when parentage modulation change to 0.8.

Section – II

Q.4 Attempt the following (Any Four). **16**

a) Explain PCM detail. What is major drawback of it. What is method to minimize the drawback?
b) Define entropy. Prove that the entropy is maximum when all the messages are equiprobable.
c) With suitable block diagram explain DM in detail. What are its limitations? Which method you will suggest to minimize limitations?
d) Compare different digital modulation techniques.
e) Explain FSK with suitable block diagram and waveforms.

Q.5 Attempt the following (Any Two). **12**

a) Explain concept of rate of information. What is its significance? Why it is useful?
Apply Shannon Fano coding procedure for below messages. Also find efficiency and redundancy.
[X] = [x1, x2, x3, x4, x5, x6, x7]
[P(X)] = [0.4, 0.2, 0.12, 0.08, 0.08, 0.08, 0.04]

b) Consider (7,4) block code generated by following. Find all the code vectors. Explain how syndrome S helps in correcting a single error. What happens when more than one error occurs.

$$G = \begin{matrix} 1 & 0 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 1 & 1 & 1 & 1 \end{matrix}$$

c) Explain QPSK signaling scheme in detail.

Seat No.	

Set **P**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) If a linear differential equation with constant coefficients and r.h.s. equal to zero has a real root m_1 repeated Two times, then the corresponding part of the integral is _____.

a) $(c_1 + c_2)e^{m_1 X}$ b) $(c_1 + c_2 x)e^{m_1 X}$

c) $(c_1 x + c_2 x^2)e^{m_1 X}$ d) $(c_1 + c_2 x^3)e^{m_1 X}$

2) $\frac{1}{D-a} X$ is equal to _____.

a) $\int X e^{ax} dx$ b) $e^{ax} \int X . e^{-ax} dx$

c) $\int X e^{-ax} dx$ d) $e^{-ax} \int X e^{-ax} dx$

3) $\frac{1}{D+1}(\log x + \frac{1}{x})$ is equal to _____.

a) e^x b) 1

c) x d) $\log x$

4) The solution of $q = e^{-p}$ is _____.

a) $z = ax + by + c$ b) $z = a^x + b^y + c$

c) $z = ax + y^{-b} + c$ d) $z = ax + e^{-a} y + c$

5) The solution of the equation $pq = p + q$ is _____.

a) $z = ax + (a+1)y + c$

b) $z = (a+1)x + a(a-1)y + c$

c) $z = (a-1)x + a(a+1)y + c$

d) $z(a-1) = a(a-1)x + ay + c$

6) If μ_1', μ_2', μ_3', μ_4' are the first four moments of the distribution about certain number then fourth moment μ_4 of the distribution about the arithmetic mean is given by _____.

a) $\mu_4' + 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^4 + 3(\mu_1')^4$

b) $\mu_4' - 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^2 - 3(\mu_1')^4$

c) $\mu_4' + 4\mu_3'\mu_1' - 6\mu_2'(\mu_1')^4 - 3(\mu_1')^4$

d) $\mu_4' + 2\mu_3'\mu_1' + 6\mu_2'(\mu_1')^4 - 3(\mu_1')^4$

7) Coefficient of kurtosis β_2 is given by _____.

a) $\frac{\mu_4}{\mu_3}$ b) $\frac{\mu_4}{\mu_2^2}$

c) $\frac{\mu_3}{\mu_2^2}$ d) $\frac{\mu_4}{\mu_2^3}$

8) If value of x for normal distribution is 35, mean of normal distribution is 65 and standard deviation is 25 then standardized random variable is ___.

a) -1.5 b) -1.7

c) -1.2 d) -4

9) A continuous random variable has the following probability density function $f(x) = kx(1-x), 0 \le x \le 1$ then $k =$ _____.

a) 6 b) 2

c) 3 d) 5

10) The area under the standard normal curve from $z = -\infty$ to $z = 0$ is ___.

a) 1 b) ½

c) 3/2 d) 0

11) If X, Y denotes the deviations from their means and if $\sum X^2 = 40, \sum Y^2 = 100, \sum XY = 50,$ then $r =$ _____.

a) 0.63 b) 0.82

c) 0.91 d) 0.79

12) The line of regression of x and y is given by _____.

a) $x - \bar{x} = b_{xy}(y - \bar{y})$ b) $x - \bar{y} = b_{xy}(x - \bar{x})$

c) $x - \bar{x} = b_{xx}(y - \bar{y})$ d) $x - \bar{x} = b_{yx}(y - \bar{y})$

13) The following mistakes per page were found in a book.

No. of mistakes:	0	1	2	3	4
Pages:	211	90	19	5	0

Then χ^2 is _____.

a) 0.59 b) 0.069

c) 0.81 d) 0.79

14) The 't-statistic' is defined as _____.

a) $\frac{\bar{x}-\mu}{\sigma/\sqrt{n}}$ b) $\frac{\bar{x}-\mu}{s/\sqrt{n}}$

c) $\frac{\bar{x}-\mu}{\sigma/n}$ d) $\frac{\bar{x}-\mu}{s/n}$

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **09**

a) Find the Arithmetic mean, Median and standard deviation for the following frequency distribution.

x	5	9	12	15	20	24	30	35	42	49
f	3	6	8	8	9	10	8	7	6	2

b) Solve $(D^2 - 4D + 4)y = 8.x^2e^{2x}\sin 2x$

c) Solve $(D^2 + D + 1)y = \sin 2x$

d) Calculate Mode for the following frequency distribution.

C.I.	00-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency (f)	4	7	8	12	25	18	10

e) Solve $p^2q^3 = x^2y^3$

Q.3 Attempt any Three. **09**

a) Solve: $(2D + 1)^2y = 4e^{-x/2}$

b) Solve: $p + q = pqz$

c) Find Q_1, Q_2, Q_3 from the following data.
5,7,12,14,15,22,25,30,36,42,53

d) Solve $x(y - z)p + y(z - x)q = z(x - y)$

e) Solve $(D^3 - 3D + 2)y = x$

Q.4 Attempt any Two **10**

a) The first four moments of a distribution about the value 5 are 2,20,40 and 50. from the given information obtain the first four central moments, coefficient of skewness and kurtosis.

b) Solve the following differential equation by the method of separation of variables.
$\frac{\partial z}{\partial x} - 2\frac{\partial z}{\partial y} = z$ given that $z(x, 0) = 3e^{-5x}$

c) Solve: $(D^2 - D - 2)y = 2\log x + \frac{1}{x} + \frac{1}{x^2}$

Section – II

Q.5 Attempt any three of the following. **09**

a) Find the value of k if each of the following functions is a probability density function.

$$f(x) = \begin{cases} kx^2(1-x^3), & 0 \le x \le 1 \\ 0, & \text{otherwise} \end{cases}$$

b) The mean life time of 100 fluorescent light bulbs produced by a Company is computed to be 1570 Hrs. with S.D. of 120 Hrs. If μ is the mean lifetime of all the bulbs produced by the Company, Test the Hypothesis $\mu = 1600$ Hrs. Against the alternative Hypothesis $\mu \neq 1600$ Hrs. using 5% level of Significance.
(Given Expected value at 5% LOS is 1.96)

c) Calculate the coefficient of correlation between height of father and height of son from the following data.

Height of father	64	65	66	67	68	69	70
Height of son	66	67	65	68	70	68	71

d) Two independent random sample have the following data,
$\overline{x_1} = 110, \sigma_1 = 25, n_1 = 16$
$\overline{x_2} = 120, \sigma_2 = 30, n_2 = 9$
If σ_1 and σ_2 are the S. D. of the populations. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance. (The table value of t at $\alpha = 0.05$ for $v = 23$ degrees of freedom is 2.069)

e) If in a lot of 500 solenoids 25 are defective, find the probability that there will be 0, 1, 2 defective solenoids in a random sample of 20 solenoids.

Q.6 Attempt any three of the following. **09**

a) If two independent random samples of sizes 15 and 8 have respectively the following mean and population standard deviations, $\overline{x_1} = 980, \overline{x_2} = 1012; \sigma_1 = 75, \sigma_2 = 80$. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance.
(Given Expected value at 5% LOS with 21 DF is 2.080)

b) The number of telephone calls received by an operator in a ten-minute interval follows a Poisson distribution with mean 1. What is the probability of receiving (i) no call, (ii) less than four calls, in the interval? What is the most likely number of calls?

c) Calculate the equations of the lines of regression. Given
Mean of $x = 50.07$, S.D. of $x = 5.26$
Mean of $y = 9.98$, S.D. of $y = 2.59$
$r = 0.898$

d) In an intelligence test administered to 1000 children the mean score was, 42 with s.d. 24. Find the number of children (i) scoring more than 60 and (ii) between 20 and 40 assuming the distribution to be normal.
(Given: For S.N.V. z area from z = 0 to z = 0.75 is 0.2734, that between z = 0 and z = 0.9167 is 0.3202 and that between z = 0 to z = 0.08333 is 0.0332.)

e) Fit a Straight line $y = a + bx$ to the following data.

x	0	1	2	3	4	5
y	1	2	3	4.5	6	7.5

Q.7 Attempt any Two. **10**

a) Fit a Poisson's distribution to the following data :

X	0	1	2	3	4	Total
f	112	63	20	4	1	200

b) Obtain a second-degree curve to the following data.

Year	1965	1966	1967	1968	1969	1970	1971	1972
Profit (in Corers Rs.)	125	140	165	195	200	215	220	230

Also estimate the profit in 1973.

c) Ten school boys were given a test in Statistics and their scores were recorded. They were given a month's special coaching and a second test was given to them in the same subject at the end of the coaching period. Test if the marks given below give evidence to the fact that the students are benefitted by coaching.
Marks in test I: 70, 68, 56, 75, 80, 90, 68, 75, 56, 58
Marks in Test II: 68, 70, 52, 73, 75, 78, 80, 92, 54, 55
(Given that value of t_α at 5 % LOS for v = 9 degrees of freedom is 1.86 for one tailed test)

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) If value of x for normal distribution is 35, mean of normal distribution is 65 and standard deviation is 25 then standardized random variable is ___.
a) -1.5 b) -1.7
c) -1.2 d) -4

2) A continuous random variable has the following probability density function $f(x) = kx(1-x), 0 \leq x \leq 1$ then $k =$ _____.
a) 6 b) 2
c) 3 d) 5

3) The area under the standard normal curve from $z = -\infty$ to $z = 0$ is ___.
a) 1 b) ½
c) 3/2 d) 0

4) If X, Y denotes the deviations from their means and if $\sum X^2 = 40, \sum Y^2 = 100, \sum XY = 50,$ then $r =$ _____.
a) 0.63 b) 0.82
c) 0.91 d) 0.79

5) The line of regression of x and y is given by _____.
a) $x - \bar{x} = b_{xy}(y - \bar{y})$ b) $x - \bar{y} = b_{xy}(x - \bar{x})$
c) $x - \bar{x} = b_{xx}(y - \bar{y})$ d) $x - \bar{x} = b_{yx}(y - \bar{y})$

6) The following mistakes per page were found in a book.

No. of mistakes:	0	1	2	3	4
Pages:	211	90	19	5	0

Then χ^2 is _____.
a) 0.59 b) 0.069
c) 0.81 d) 0.79

7) The 't-statistic' is defined as _____.

a) $\frac{\bar{x}-\mu}{\sigma/\sqrt{n}}$ b) $\frac{\bar{x}-\mu}{s/\sqrt{n}}$

c) $\frac{\bar{x}-\mu}{\sigma/n}$ d) $\frac{\bar{x}-\mu}{s/n}$

8) If a linear differential equation with constant coefficients and r.h.s. equal to zero has a real root m_1 repeated Two times, then the corresponding part of the integral is _____.

a) $(c_1 + c_2)e^{m_1 X}$ b) $(c_1 + c_2 x)e^{m_1 X}$

c) $(c_1 x + c_2 x^2)e^{m_1 X}$ d) $(c_1 + c_2 x^3)e^{m_1 X}$

9) $\frac{1}{D-a}X$ is equal to _____.

a) $\int Xe^{ax}dx$ b) $e^{ax}\int X.e^{-ax}dx$

c) $\int Xe^{-ax}dx$ d) $e^{-ax}\int Xe^{-ax}dx$

10) $\frac{1}{D+1}(\log x + \frac{1}{x})$ is equal to _____.

a) e^x b) 1

c) x d) $\log x$

11) The solution of $q = e^{-p}$ is _____.

a) $z = ax + by + c$ b) $z = a^x + b^y + c$

c) $z = ax + y^{-b} + c$ d) $z = ax + e^{-a}y + c$

12) The solution of the equation $pq = p + q$ is _____.

a) $z = ax + (a+1)y + c$

b) $z = (a+1)x + a(a-1)y + c$

c) $z = (a-1)x + a(a+1)y + c$

d) $z(a-1) = a(a-1)x + ay + c$

13) If μ_1', μ_2', μ_3', μ_4' are the first four moments of the distribution about certain number then fourth moment μ_4 of the distribution about the arithmetic mean is given by _____.

a) $\mu_4' + 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^4 + 3(\mu_1')^4$

b) $\mu_4' - 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^2 - 3(\mu_1')^4$

c) $\mu_4' + 4\mu_3'\mu_1' - 6\mu_2'(\mu_1')^4 - 3(\mu_1')^4$

d) $\mu_4' + 2\mu_3'\mu_1' + 6\mu_2'(\mu_1')^4 - 3(\mu_1')^4$

14) Coefficient of kurtosis β_2 is given by _____.

a) $\frac{\mu_4}{\mu_3}$ b) $\frac{\mu_4}{\mu_2^2}$

c) $\frac{\mu_3}{\mu_2^2}$ d) $\frac{\mu_4}{\mu_2^3}$

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **09**

a) Find the Arithmetic mean, Median and standard deviation for the following frequency distribution.

x	5	9	12	15	20	24	30	35	42	49
f	3	6	8	8	9	10	8	7	6	2

b) Solve $(D^2 - 4D + 4)y = 8.x^2e^{2x}\sin 2x$

c) Solve $(D^2 + D + 1)y = \sin 2x$

d) Calculate Mode for the following frequency distribution.

C.I.	00-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency (f)	4	7	8	12	25	18	10

e) Solve $p^2q^3 = x^2y^3$

Q.3 Attempt any Three. **09**

a) Solve: $(2D + 1)^2y = 4e^{-x/2}$

b) Solve: $p + q = pqz$

c) Find Q_1, Q_2, Q_3 from the following data.
5,7,12,14,15,22,25,30,36,42,53

d) Solve $x(y - z)p + y(z - x)q = z(x - y)$

e) Solve $(D^3 - 3D + 2)y = x$

Q.4 Attempt any Two **10**

a) The first four moments of a distribution about the value 5 are 2,20,40 and 50. from the given information obtain the first four central moments, coefficient of skewness and kurtosis.

b) Solve the following differential equation by the method of separation of variables.
$\frac{\partial z}{\partial x} - 2\frac{\partial z}{\partial y} = z$ given that $z(x, 0) = 3e^{-5x}$

c) Solve: $(D^2 - D - 2)y = 2\log x + \frac{1}{x} + \frac{1}{x^2}$

Section – II

Q.5 Attempt any three of the following. **09**

a) Find the value of k if each of the following functions is a probability density function.

$$f(x) = \begin{cases} kx^2(1-x^3), & 0 \le x \le 1 \\ 0, & \text{otherwise} \end{cases}$$

b) The mean life time of 100 fluorescent light bulbs produced by a Company is computed to be 1570 Hrs. with S.D. of 120 Hrs. If μ is the mean lifetime of all the bulbs produced by the Company, Test the Hypothesis $\mu = 1600$ Hrs. Against the alternative Hypothesis $\mu \neq 1600$ Hrs. using 5% level of Significance.
(Given Expected value at 5% LOS is 1.96)

c) Calculate the coefficient of correlation between height of father and height of son from the following data.

Height of father	64	65	66	67	68	69	70
Height of son	66	67	65	68	70	68	71

d) Two independent random sample have the following data,
$\overline{x_1} = 110, \sigma_1 = 25, n_1 = 16$
$\overline{x_2} = 120, \sigma_2 = 30, n_2 = 9$
If σ_1 and σ_2 are the S. D. of the populations. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance. (The table value of t at $\alpha = 0.05$ for $v = 23$ degrees of freedom is 2.069)

e) If in a lot of 500 solenoids 25 are defective, find the probability that there will be 0, 1, 2 defective solenoids in a random sample of 20 solenoids.

Q.6 Attempt any three of the following. **09**

a) If two independent random samples of sizes 15 and 8 have respectively the following mean and population standard deviations, $\overline{x_1} = 980, \overline{x_2} = 1012; \sigma_1 = 75, \sigma_2 = 80$. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance.
(Given Expected value at 5% LOS with 21 DF is 2.080)

b) The number of telephone calls received by an operator in a ten-minute interval follows a Poisson distribution with mean 1. What is the probability of receiving (i) no call, (ii) less than four calls, in the interval? What is the most likely number of calls?

c) Calculate the equations of the lines of regression. Given
Mean of $x = 50.07$, S.D. of $x = 5.26$
Mean of $y = 9.98$, S.D. of $y = 2.59$
$r = 0.898$

d) In an intelligence test administered to 1000 children the mean score was, 42 with s.d. 24. Find the number of children (i) scoring more than 60 and (ii) between 20 and 40 assuming the distribution to be normal.
(Given: For S.N.V. z area from z = 0 to z = 0.75 is 0.2734, that between z = 0 and z = 0.9167 is 0.3202 and that between z = 0 to z = 0.08333 is 0.0332.)

e) Fit a Straight line $y = a + bx$ to the following data.

x	0	1	2	3	4	5
y	1	2	3	4.5	6	7.5

Q.7 Attempt any Two. **10**

a) Fit a Poisson's distribution to the following data :

X	0	1	2	3	4	Total
f	112	63	20	4	1	200

b) Obtain a second-degree curve to the following data.

Year	1965	1966	1967	1968	1969	1970	1971	1972
Profit (in Corers Rs.)	125	140	165	195	200	215	220	230

Also estimate the profit in 1973.

c) Ten school boys were given a test in Statistics and their scores were recorded. They were given a month's special coaching and a second test was given to them in the same subject at the end of the coaching period. Test if the marks given below give evidence to the fact that the students are benefitted by coaching.
Marks in test I: 70, 68, 56, 75, 80, 90, 68, 75, 56, 58
Marks in Test II: 68, 70, 52, 73, 75, 78, 80, 92, 54, 55
(Given that value of t_α at 5 % LOS for v = 9 degrees of freedom is 1.86 for one tailed test)

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) If X, Y denotes the deviations from their means and if $\sum X^2 = 40, \sum Y^2 = 100, \sum XY = 50,$ then $r =$ _____.
a) 0.63 b) 0.82
c) 0.91 d) 0.79

2) The line of regression of x and y is given by _____.
a) $x - \bar{x} = b_{xy}(y - \bar{y})$ b) $x - \bar{y} = b_{xy}(x - \bar{x})$
c) $x - \bar{x} = b_{xx}(y - \bar{y})$ d) $x - \bar{x} = b_{yx}(y - \bar{y})$

3) The following mistakes per page were found in a book.

No. of mistakes:	0	1	2	3	4
Pages:	211	90	19	5	0

Then χ^2 is _____.
a) 0.59 b) 0.069
c) 0.81 d) 0.79

4) The 't-statistic' is defined as _____.
a) $\frac{\bar{x}-\mu}{\sigma/\sqrt{n}}$ b) $\frac{\bar{x}-\mu}{s/\sqrt{n}}$
c) $\frac{\bar{x}-\mu}{\sigma/n}$ d) $\frac{\bar{x}-\mu}{s/n}$

5) If a linear differential equation with constant coefficients and r.h.s. equal to zero has a real root m_1 repeated Two times, then the corresponding part of the integral is _____.
a) $(c_1 + c_2)e^{m_1 X}$ b) $(c_1 + c_2 x)e^{m_1 X}$
c) $(c_1 x + c_2 x^2)e^{m_1 X}$ d) $(c_1 + c_2 x^3)e^{m_1 X}$

6) $\frac{1}{D-a}X$ is equal to _____.

a) $\int Xe^{ax}dx$ b) $e^{ax}\int X.e^{-ax}dx$

c) $\int Xe^{-ax}dx$ d) $e^{-ax}\int Xe^{-ax}dx$

7) $\frac{1}{D+1}(\log x+\frac{1}{x})$ is equal to _____.

a) e^x b) 1

c) x d) $\log x$

8) The solution of $q=e^{-p}$ is _____.

a) $z=ax+by+c$ b) $z=a^x+b^y+c$

c) $z=ax+y^{-b}+c$ d) $z=ax+e^{-a}y+c$

9) The solution of the equation $pq=p+q$ is _____.

a) $z=ax+(a+1)y+c$

b) $z=(a+1)x+a(a-1)y+c$

c) $z=(a-1)x+a(a+1)y+c$

d) $z(a-1)=a(a-1)x+ay+c$

10) If μ_1', μ_2', μ_3', μ_4' are the first four moments of the distribution about certain number then fourth moment μ_4 of the distribution about the arithmetic mean is given by _____.

a) $\mu_4'+4\mu_3'\mu_1'+6\mu_2'(\mu_1')^4+3(\mu_1')^4$

b) $\mu_4'-4\mu_3'\mu_1'+6\mu_2'(\mu_1')^2-3(\mu_1')^4$

c) $\mu_4'+4\mu_3'\mu_1'-6\mu_2'(\mu_1')^4-3(\mu_1')^4$

d) $\mu_4'+2\mu_3'\mu_1'+6\mu_2'(\mu_1')^4-3(\mu_1')^4$

11) Coefficient of kurtosis β_2 is given by _____.

a) $\frac{\mu_4}{\mu_3}$ b) $\frac{\mu_4}{\mu_2^2}$

c) $\frac{\mu_3}{\mu_2^2}$ d) $\frac{\mu_4}{\mu_2^3}$

12) If value of x for normal distribution is 35, mean of normal distribution is 65 and standard deviation is 25 then standardized random variable is ___.

a) -1.5 b) -1.7

c) -1.2 d) -4

13) A continuous random variable has the following probability density function $f(x)=kx(1-x),0\le x\le 1$ then $k=$ _____.

a) 6 b) 2

c) 3 d) 5

14) The area under the standard normal curve from $z = -\infty$ to $z = 0$ is ___.

a) 1 b) ½

c) 3/2 d) 0

SLR-BD-180

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **09**

a) Find the Arithmetic mean, Median and standard deviation for the following frequency distribution.

x	5	9	12	15	20	24	30	35	42	49
f	3	6	8	8	9	10	8	7	6	2

b) Solve $(D^2 - 4D + 4)y = 8.x^2e^{2x}\sin 2x$

c) Solve $(D^2 + D + 1)y = \sin 2x$

d) Calculate Mode for the following frequency distribution.

C.I.	00-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency (f)	4	7	8	12	25	18	10

e) Solve $p^2q^3 = x^2y^3$

Q.3 Attempt any Three. **09**

a) Solve: $(2D + 1)^2y = 4e^{-x/2}$

b) Solve: $p + q = pqz$

c) Find Q_1, Q_2, Q_3 from the following data.
5,7,12,14,15,22,25,30,36,42,53

d) Solve $x(y - z)p + y(z - x)q = z(x - y)$

e) Solve $(D^3 - 3D + 2)y = x$

Q.4 Attempt any Two **10**

a) The first four moments of a distribution about the value 5 are 2,20,40 and 50. from the given information obtain the first four central moments, coefficient of skewness and kurtosis.

b) Solve the following differential equation by the method of separation of variables.
$\frac{\partial z}{\partial x} - 2\frac{\partial z}{\partial y} = z$ given that $z(x, 0) = 3e^{-5x}$

c) Solve: $(D^2 - D - 2)y = 2\log x + \frac{1}{x} + \frac{1}{x^2}$

Section – II

Q.5 Attempt any three of the following. **09**

a) Find the value of k if each of the following functions is a probability density function.

$$f(x) = \begin{cases} kx^2(1-x^3), & 0 \le x \le 1 \\ 0, & \text{otherwise} \end{cases}$$

b) The mean life time of 100 fluorescent light bulbs produced by a Company is computed to be 1570 Hrs. with S.D. of 120 Hrs. If μ is the mean lifetime of all the bulbs produced by the Company, Test the Hypothesis $\mu = 1600$ Hrs. Against the alternative Hypothesis $\mu \neq 1600$ Hrs. using 5% level of Significance.
(Given Expected value at 5% LOS is 1.96)

c) Calculate the coefficient of correlation between height of father and height of son from the following data.

Height of father	64	65	66	67	68	69	70
Height of son	66	67	65	68	70	68	71

d) Two independent random sample have the following data,
$\overline{x_1} = 110, \sigma_1 = 25, n_1 = 16$
$\overline{x_2} = 120, \sigma_2 = 30, n_2 = 9$
If σ_1 and σ_2 are the S. D. of the populations. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance. (The table value of t at $\alpha = 0.05$ for $v = 23$ degrees of freedom is 2.069)

e) If in a lot of 500 solenoids 25 are defective, find the probability that there will be 0, 1, 2 defective solenoids in a random sample of 20 solenoids.

Q.6 Attempt any three of the following. **09**

a) If two independent random samples of sizes 15 and 8 have respectively the following mean and population standard deviations, $\overline{x_1} = 980, \overline{x_2} = 1012; \sigma_1 = 75, \sigma_2 = 80$. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance.
(Given Expected value at 5% LOS with 21 DF is 2.080)

b) The number of telephone calls received by an operator in a ten-minute interval follows a Poisson distribution with mean 1. What is the probability of receiving (i) no call, (ii) less than four calls, in the interval? What is the most likely number of calls?

c) Calculate the equations of the lines of regression. Given
Mean of $x = 50.07$, S.D. of $x = 5.26$
Mean of $y = 9.98$, S.D. of $y = 2.59$
$r = 0.898$

d) In an intelligence test administered to 1000 children the mean score was, 42 with s.d. 24. Find the number of children (i) scoring more than 60 and (ii) between 20 and 40 assuming the distribution to be normal.
(Given: For S.N.V. z area from z = 0 to z = 0.75 is 0.2734, that between z = 0 and z = 0.9167 is 0.3202 and that between z = 0 to z = 0.08333 is 0.0332.)

e) Fit a Straight line $y = a + bx$ to the following data.

x	0	1	2	3	4	5
y	1	2	3	4.5	6	7.5

Q.7 Attempt any Two. **10**

a) Fit a Poisson's distribution to the following data :

X	0	1	2	3	4	Total
f	112	63	20	4	1	200

b) Obtain a second-degree curve to the following data.

Year	1965	1966	1967	1968	1969	1970	1971	1972
Profit (in Corers Rs.)	125	140	165	195	200	215	220	230

Also estimate the profit in 1973.

c) Ten school boys were given a test in Statistics and their scores were recorded. They were given a month's special coaching and a second test was given to them in the same subject at the end of the coaching period. Test if the marks given below give evidence to the fact that the students are benefitted by coaching.
Marks in test I: 70, 68, 56, 75, 80, 90, 68, 75, 56, 58
Marks in Test II: 68, 70, 52, 73, 75, 78, 80, 92, 54, 55
(Given that value of t_α at 5 % LOS for v = 9 degrees of freedom is 1.86 for one tailed test)

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) If $\mu_1', \mu_2', \mu_3', \mu_4'$ are the first four moments of the distribution about certain number then fourth moment μ_4 of the distribution about the arithmetic mean is given by _____.

a) $\mu_4' + 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^4 + 3(\mu_1')^4$

b) $\mu_4' - 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^2 - 3(\mu_1')^4$

c) $\mu_4' + 4\mu_3'\mu_1' - 6\mu_2'(\mu_1')^4 - 3(\mu_1')^4$

d) $\mu_4' + 2\mu_3'\mu_1' + 6\mu_2'(\mu_1')^4 - 3(\mu_1')^4$

2) Coefficient of kurtosis β_2 is given by _____.

a) $\frac{\mu_4}{\mu_3}$ b) $\frac{\mu_4}{\mu_2^2}$

c) $\frac{\mu_3}{\mu_2^2}$ d) $\frac{\mu_4}{\mu_2^3}$

3) If value of x for normal distribution is 35, mean of normal distribution is 65 and standard deviation is 25 then standardized random variable is ___.

a) -1.5 b) -1.7
c) -1.2 d) -4

4) A continuous random variable has the following probability density function $f(x) = kx(1-x), 0 \leq x \leq 1$ then $k =$ _____.

a) 6 b) 2
c) 3 d) 5

5) The area under the standard normal curve from $z = -\infty$ to $z = 0$ is ___.

a) 1 b) ½
c) 3/2 d) 0

6) If X, Y denotes the deviations from their means and if $\sum X^2 = 40, \sum Y^2 = 100, \sum XY = 50,$ then $r =$ _____.

a) 0.63 b) 0.82
c) 0.91 d) 0.79

7) The line of regression of x and y is given by _____.

a) $x - \bar{x} = b_{xy}(y - \bar{y})$ b) $x - \bar{y} = b_{xy}(x - \bar{x})$
c) $x - \bar{x} = b_{xx}(y - \bar{y})$ d) $x - \bar{x} = b_{yx}(y - \bar{y})$

8) The following mistakes per page were found in a book.

No. of mistakes:	0	1	2	3	4
Pages:	211	90	19	5	0

Then χ^2 is _____.

a) 0.59 b) 0.069
c) 0.81 d) 0.79

9) The 't-statistic' is defined as _____.

a) $\frac{\bar{x}-\mu}{\sigma/\sqrt{n}}$ b) $\frac{\bar{x}-\mu}{s/\sqrt{n}}$
c) $\frac{\bar{x}-\mu}{\sigma/n}$ d) $\frac{\bar{x}-\mu}{s/n}$

10) If a linear differential equation with constant coefficients and r.h.s. equal to zero has a real root m_1 repeated Two times, then the corresponding part of the integral is _____.

a) $(c_1 + c_2)e^{m_1 X}$ b) $(c_1 + c_2 x)e^{m_1 X}$
c) $(c_1 x + c_2 x^2)e^{m_1 X}$ d) $(c_1 + c_2 x^3)e^{m_1 X}$

11) $\frac{1}{D-a}X$ is equal to _____.

a) $\int Xe^{ax}dx$ b) $e^{ax}\int X.e^{-ax}dx$
c) $\int Xe^{-ax}dx$ d) $e^{-ax}\int Xe^{-ax}dx$

12) $\frac{1}{D+1}(\log x + \frac{1}{x})$ is equal to _____.

a) e^x b) 1
c) x d) $\log x$

13) The solution of $q = e^{-p}$ is _____.

a) $z = ax + by + c$ b) $z = a^x + b^y + c$
c) $z = ax + y^{-b} + c$ d) $z = ax + e^{-a}y + c$

14) The solution of the equation $pq = p + q$ is _____.

a) $z = ax + (a+1)y + c$
b) $z = (a+1)x + a(a-1)y + c$
c) $z = (a-1)x + a(a+1)y + c$

d) $z(a-1) = a(a-1)x + ay + c$

SLR-BD-180

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **09**

a) Find the Arithmetic mean, Median and standard deviation for the following frequency distribution.

x	5	9	12	15	20	24	30	35	42	49
f	3	6	8	8	9	10	8	7	6	2

b) Solve $(D^2 - 4D + 4)y = 8.x^2e^{2x}\sin 2x$

c) Solve $(D^2 + D + 1)y = \sin 2x$

d) Calculate Mode for the following frequency distribution.

C.I.	00-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency (f)	4	7	8	12	25	18	10

e) Solve $p^2q^3 = x^2y^3$

Q.3 Attempt any Three. **09**

a) Solve: $(2D+1)^2y = 4e^{-x/2}$

b) Solve: $p + q = pqz$

c) Find Q_1, Q_2, Q_3 from the following data.
5,7,12,14,15,22,25,30,36,42,53

d) Solve $x(y-z)p + y(z-x)q = z(x-y)$

e) Solve $(D^3 - 3D + 2)y = x$

Q.4 Attempt any Two **10**

a) The first four moments of a distribution about the value 5 are 2,20,40 and 50. from the given information obtain the first four central moments, coefficient of skewness and kurtosis.

b) Solve the following differential equation by the method of separation of variables.
$\frac{\partial z}{\partial x} - 2\frac{\partial z}{\partial y} = z$ given that $z(x,0) = 3e^{-5x}$

c) Solve: $(D^2 - D - 2)y = 2\log x + \frac{1}{x} + \frac{1}{x^2}$

Section – II

Q.5 Attempt any three of the following. **09**

a) Find the value of k if each of the following functions is a probability density function.

$$f(x) = \begin{cases} kx^2(1-x^3), & 0 \le x \le 1 \\ 0, & \text{otherwise} \end{cases}$$

b) The mean life time of 100 fluorescent light bulbs produced by a Company is computed to be 1570 Hrs. with S.D. of 120 Hrs. If μ is the mean lifetime of all the bulbs produced by the Company, Test the Hypothesis $\mu = 1600$ Hrs. Against the alternative Hypothesis $\mu \neq 1600$ Hrs. using 5% level of Significance.
(Given Expected value at 5% LOS is 1.96)

c) Calculate the coefficient of correlation between height of father and height of son from the following data.

Height of father	64	65	66	67	68	69	70
Height of son	66	67	65	68	70	68	71

d) Two independent random sample have the following data,
$\overline{x_1} = 110, \sigma_1 = 25, n_1 = 16$
$\overline{x_2} = 120, \sigma_2 = 30, n_2 = 9$
If σ_1 and σ_2 are the S. D. of the populations. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance. (The table value of t at $\alpha = 0.05$ for $v = 23$ degrees of freedom is 2.069)

e) If in a lot of 500 solenoids 25 are defective, find the probability that there will be 0, 1, 2 defective solenoids in a random sample of 20 solenoids.

Q.6 Attempt any three of the following. **09**

a) If two independent random samples of sizes 15 and 8 have respectively the following mean and population standard deviations, $\overline{x_1} = 980, \overline{x_2} = 1012; \sigma_1 = 75, \sigma_2 = 80$. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance.
(Given Expected value at 5% LOS with 21 DF is 2.080)

b) The number of telephone calls received by an operator in a ten-minute interval follows a Poisson distribution with mean 1. What is the probability of receiving (i) no call, (ii) less than four calls, in the interval? What is the most likely number of calls?

c) Calculate the equations of the lines of regression. Given
Mean of $x = 50.07$, S.D. of $x = 5.26$
Mean of $y = 9.98$, S.D. of $y = 2.59$
$r = 0.898$

d) In an intelligence test administered to 1000 children the mean score was, 42 with s.d. 24. Find the number of children (i) scoring more than 60 and (ii) between 20 and 40 assuming the distribution to be normal.
(Given: For S.N.V. z area from z = 0 to z = 0.75 is 0.2734, that between z = 0 and z = 0.9167 is 0.3202 and that between z = 0 to z = 0.08333 is 0.0332.)

e) Fit a Straight line $y = a + bx$ to the following data.

x	0	1	2	3	4	5
y	1	2	3	4.5	6	7.5

Q.7 Attempt any Two. **10**

a) Fit a Poisson's distribution to the following data :

X	0	1	2	3	4	Total
f	112	63	20	4	1	200

b) Obtain a second-degree curve to the following data.

Year	1965	1966	1967	1968	1969	1970	1971	1972
Profit (in Corers Rs.)	125	140	165	195	200	215	220	230

Also estimate the profit in 1973.

c) Ten school boys were given a test in Statistics and their scores were recorded. They were given a month's special coaching and a second test was given to them in the same subject at the end of the coaching period. Test if the marks given below give evidence to the fact that the students are benefitted by coaching.
Marks in test I: 70, 68, 56, 75, 80, 90, 68, 75, 56, 58
Marks in Test II: 68, 70, 52, 73, 75, 78, 80, 92, 54, 55
(Given that value of t_α at 5 % LOS for v = 9 degrees of freedom is 1.86 for one tailed test)

SLR-BD-181

Seat No.		Set	P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which dimension of e-commerce enables commerce beyond the boundaries of the country?
a) Richness b) Interactivity
c) Global Reach d) Ubiquity

2) Which of the following describes the definition of electronic commerce?
a) Doing business
b) Sale and purchase of goods
c) Doing business electronically
d) All of the above mentioned

3) Which e-commerce model involves the sale of goods or services from businesses to the general public?
a) Business to Government b) Business to Consumer
c) Business to Business d) Consumer to Business

4) All of the following are major B2C business models except _____.
a) content provider b) industry consortium
c) transaction broker d) service provider

5) Which of the following advantage of E-commerce?
a) Ability to operate 24/7
b) Inability to personalize the shopping
c) Higher operational cost
d) Limited reach CO1 I

6) Which e-commerce transaction provides the benefits of eliminating the requirement of a middleman?

a) Business to Business b) Business to Government
c) Consumer to Business d) Business to Consumer

7) After completing an E-Commerce transaction, the seller and buyer should be provided an opportunity to _____ their transaction experience.

a) undo b) regret
c) provide rating for d) forget

8) Which of the following is a common digital marketing strategy used in E-commerce?

a) Search Engine Optimization (SEO)
b) Traditional print advertising
c) Cold-calling potential customers
d) Distributing flyers in local neighborhoods

9) Digital Cash has following characteristic _____.

a) Anonymity b) Security
c) Confidentiality d) All above

10) Which component of E-commerce ensures secure online transactions and customer data protection?

a) Payment gateways b) Shopping carts
c) Product catalogs d) Data warehouses

11) Which type of attack is a method of defeating a cryptographic scheme of trying a large number of possibilities?

a) Teardrop attack b) Brute force attack
c) Phlashing d) Smurf attack

12) What is the another name called PDoS?

a) Brute force attack b) Non technical attack
c) Phlashing d) Smurf attack

13) What does the term “data security” refer to in E-commerce?

a) The use of cookies to track customer behavior
b) The protection of customer data from unauthorized access and breaches
c) The analysis of customer browsing history for personalized recommendations
d) The process of categorizing customer data for marketing purposes

14) Which of the following is a characteristic of E-commerce marketplaces?

a) They only allow B2C transactions
b) They sell physical products exclusively
c) They are limited to a specific geographical area
d) Multiple sellers can list their products to reach a broader audience

Seat No.	

Set **P**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve any four of the following. **16**

a) What is electronic commerce? Explain its applications?
b) Describe the web 2.0 in detail.
c) What do you mean by Supply Chain Execution Framework?
d) Discuss in brief virtual auction. Explain the differences between virtual auction and reverse auction.
e) Give the types of E payment methods. Explain in detail the EPS?

Q.3 Solve any two of the following. **12**

a) Define Electronic Data Interchange. What are the components of Electronic Data Interchange?
b) Explain in detail Business to consumer e-Commerce model.
c) What are the key technologies for B2B E-commerce? Explain architectural models of B2B E-commerce.

Section – II

Q.4 Solve any four of the following. **16**

a) What is the purpose of using social media in E-commerce marketing?
b) Explain technical malware attack method related to different services.
c) Explain E-Commerce micro payments in detail.
d) Explain SEO in detail.
e) Explain web advertising types in detail.

Q.5 Solve any two of the following. **12**

a) Define digital cash or e-cash. Explain with example how an online banking system works.
b) What are the different strategies to increase the sale?
c) What are the security challenges and protection measure available to any e business?

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is a common digital marketing strategy used in E-commerce?
a) Search Engine Optimization (SEO)
b) Traditional print advertising
c) Cold-calling potential customers
d) Distributing flyers in local neighborhoods

2) Digital Cash has following characteristic _____.
a) Anonymity b) Security
c) Confidentiality d) All above

3) Which component of E-commerce ensures secure online transactions and customer data protection?
a) Payment gateways b) Shopping carts
c) Product catalogs d) Data warehouses

4) Which type of attack is a method of defeating a cryptographic scheme of trying a large number of possibilities?
a) Teardrop attack b) Brute force attack
c) Phlashing d) Smurf attack

5) What is the another name called PDoS?
a) Brute force attack b) Non technical attack
c) Phlashing d) Smurf attack

6) What does the term “data security” refer to in E-commerce?
a) The use of cookies to track customer behavior
b) The protection of customer data from unauthorized access and breaches
c) The analysis of customer browsing history for personalized recommendations
d) The process of categorizing customer data for marketing purposes

7) Which of the following is a characteristic of E-commerce marketplaces?
a) They only allow B2C transactions
b) They sell physical products exclusively
c) They are limited to a specific geographical area
d) Multiple sellers can list their products to reach a broader audience

8) Which dimension of e-commerce enables commerce beyond the boundaries of the country?
a) Richness b) Interactivity
c) Global Reach d) Ubiquity

9) Which of the following describes the definition of electronic commerce?
a) Doing business
b) Sale and purchase of goods
c) Doing business electronically
d) All of the above mentioned

10) Which e-commerce model involves the sale of goods or services from businesses to the general public?
a) Business to Government b) Business to Consumer
c) Business to Business d) Consumer to Business

11) All of the following are major B2C business models except _____.
a) content provider b) industry consortium
c) transaction broker d) service provider

12) Which of the following advantage of E-commerce?
a) Ability to operate 24/7
b) Inability to personalize the shopping
c) Higher operational cost
d) Limited reach CO1 I

13) Which e-commerce transaction provides the benefits of eliminating the requirement of a middleman?
a) Business to Business b) Business to Government
c) Consumer to Business d) Business to Consumer

14) After completing an E-Commerce transaction, the seller and buyer should be provided an opportunity to _____ their transaction experience.
a) undo b) regret
c) provide rating for d) forget

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve any four of the following. **16**

a) What is electronic commerce? Explain its applications?
b) Describe the web 2.0 in detail.
c) What do you mean by Supply Chain Execution Framework?
d) Discuss in brief virtual auction. Explain the differences between virtual auction and reverse auction.
e) Give the types of E payment methods. Explain in detail the EPS?

Q.3 Solve any two of the following. **12**

a) Define Electronic Data Interchange. What are the components of Electronic Data Interchange?
b) Explain in detail Business to consumer e-Commerce model.
c) What are the key technologies for B2B E-commerce? Explain architectural models of B2B E-commerce.

Section – II

Q.4 Solve any four of the following. **16**

a) What is the purpose of using social media in E-commerce marketing?
b) Explain technical malware attack method related to different services.
c) Explain E-Commerce micro payments in detail.
d) Explain SEO in detail.
e) Explain web advertising types in detail.

Q.5 Solve any two of the following. **12**

a) Define digital cash or e-cash. Explain with example how an online banking system works.
b) What are the different strategies to increase the sale?
c) What are the security challenges and protection measure available to any e business?

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Which type of attack is a method of defeating a cryptographic scheme of trying a large number of possibilities?
a) Teardrop attack b) Brute force attack
c) Phlashing d) Smurf attack

2) What is the another name called PDoS?
a) Brute force attack b) Non technical attack
c) Phlashing d) Smurf attack

3) What does the term "data security" refer to in E-commerce?
a) The use of cookies to track customer behavior
b) The protection of customer data from unauthorized access and breaches
c) The analysis of customer browsing history for personalized recommendations
d) The process of categorizing customer data for marketing purposes

4) Which of the following is a characteristic of E-commerce marketplaces?
a) They only allow B2C transactions
b) They sell physical products exclusively
c) They are limited to a specific geographical area
d) Multiple sellers can list their products to reach a broader audience

5) Which dimension of e-commerce enables commerce beyond the boundaries of the country?
a) Richness b) Interactivity
c) Global Reach d) Ubiquity

6) Which of the following describes the definition of electronic commerce?
a) Doing business
b) Sale and purchase of goods
c) Doing business electronically
d) All of the above mentioned

7) Which e-commerce model involves the sale of goods or services from businesses to the general public?
a) Business to Government b) Business to Consumer
c) Business to Business d) Consumer to Business

8) All of the following are major B2C business models except _____.
a) content provider b) industry consortium
c) transaction broker d) service provider

9) Which of the following advantage of E-commerce?
a) Ability to operate 24/7
b) Inability to personalize the shopping
c) Higher operational cost
d) Limited reach CO1 I

10) Which e-commerce transaction provides the benefits of eliminating the requirement of a middleman?
a) Business to Business b) Business to Government
c) Consumer to Business d) Business to Consumer

11) After completing an E-Commerce transaction, the seller and buyer should be provided an opportunity to _____ their transaction experience.
a) undo b) regret
c) provide rating for d) forget

12) Which of the following is a common digital marketing strategy used in E-commerce?
a) Search Engine Optimization (SEO)
b) Traditional print advertising
c) Cold-calling potential customers
d) Distributing flyers in local neighborhoods

13) Digital Cash has following characteristic _____.
a) Anonymity b) Security
c) Confidentiality d) All above

14) Which component of E-commerce ensures secure online transactions and customer data protection?
a) Payment gateways b) Shopping carts
c) Product catalogs d) Data warehouses

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve any four of the following. **16**

a) What is electronic commerce? Explain its applications?
b) Describe the web 2.0 in detail.
c) What do you mean by Supply Chain Execution Framework?
d) Discuss in brief virtual auction. Explain the differences between virtual auction and reverse auction.
e) Give the types of E payment methods. Explain in detail the EPS?

Q.3 Solve any two of the following. **12**

a) Define Electronic Data Interchange. What are the components of Electronic Data Interchange?
b) Explain in detail Business to consumer e-Commerce model.
c) What are the key technologies for B2B E-commerce? Explain architectural models of B2B E-commerce.

Section – II

Q.4 Solve any four of the following. **16**

a) What is the purpose of using social media in E-commerce marketing?
b) Explain technical malware attack method related to different services.
c) Explain E-Commerce micro payments in detail.
d) Explain SEO in detail.
e) Explain web advertising types in detail.

Q.5 Solve any two of the following. **12**

a) Define digital cash or e-cash. Explain with example how an online banking system works.
b) What are the different strategies to increase the sale?
c) What are the security challenges and protection measure available to any e business?

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which e-commerce transaction provides the benefits of eliminating the requirement of a middleman?
a) Business to Business b) Business to Government
c) Consumer to Business d) Business to Consumer

2) After completing an E-Commerce transaction, the seller and buyer should be provided an opportunity to _____ their transaction experience.
a) undo b) regret
c) provide rating for d) forget

3) Which of the following is a common digital marketing strategy used in E-commerce?
a) Search Engine Optimization (SEO)
b) Traditional print advertising
c) Cold-calling potential customers
d) Distributing flyers in local neighborhoods

4) Digital Cash has following characteristic _____.
a) Anonymity b) Security
c) Confidentiality d) All above

5) Which component of E-commerce ensures secure online transactions and customer data protection?
a) Payment gateways b) Shopping carts
c) Product catalogs d) Data warehouses

6) Which type of attack is a method of defeating a cryptographic scheme of trying a large number of possibilities?
a) Teardrop attack b) Brute force attack
c) Phlashing d) Smurf attack

7) What is the another name called PDoS?
a) Brute force attack b) Non technical attack
c) Phlashing d) Smurf attack

8) What does the term “data security” refer to in E-commerce?
a) The use of cookies to track customer behavior
b) The protection of customer data from unauthorized access and breaches
c) The analysis of customer browsing history for personalized recommendations
d) The process of categorizing customer data for marketing purposes

9) Which of the following is a characteristic of E-commerce marketplaces?
a) They only allow B2C transactions
b) They sell physical products exclusively
c) They are limited to a specific geographical area
d) Multiple sellers can list their products to reach a broader audience

10) Which dimension of e-commerce enables commerce beyond the boundaries of the country?
a) Richness b) Interactivity
c) Global Reach d) Ubiquity

11) Which of the following describes the definition of electronic commerce?
a) Doing business
b) Sale and purchase of goods
c) Doing business electronically
d) All of the above mentioned

12) Which e-commerce model involves the sale of goods or services from businesses to the general public?
a) Business to Government b) Business to Consumer
c) Business to Business d) Consumer to Business

13) All of the following are major B2C business models except _____.
a) content provider b) industry consortium
c) transaction broker d) service provider

14) Which of the following advantage of E-commerce?
a) Ability to operate 24/7
b) Inability to personalize the shopping
c) Higher operational cost
d) Limited reach CO1 I

SLR-BD-181

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve any four of the following. **16**

a) What is electronic commerce? Explain its applications?
b) Describe the web 2.0 in detail.
c) What do you mean by Supply Chain Execution Framework?
d) Discuss in brief virtual auction. Explain the differences between virtual auction and reverse auction.
e) Give the types of E payment methods. Explain in detail the EPS?

Q.3 Solve any two of the following. **12**

a) Define Electronic Data Interchange. What are the components of Electronic Data Interchange?
b) Explain in detail Business to consumer e-Commerce model.
c) What are the key technologies for B2B E-commerce? Explain architectural models of B2B E-commerce.

Section – II

Q.4 Solve any four of the following. **16**

a) What is the purpose of using social media in E-commerce marketing?
b) Explain technical malware attack method related to different services.
c) Explain E-Commerce micro payments in detail.
d) Explain SEO in detail.
e) Explain web advertising types in detail.

Q.5 Solve any two of the following. **12**

a) Define digital cash or e-cash. Explain with example how an online banking system works.
b) What are the different strategies to increase the sale?
c) What are the security challenges and protection measure available to any e business?

SLR-BD-182

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The main focus of the humanities is: _____.
a) Scientific experiments
b) Human culture and expression
c) Market trends and economies
d) Medical advancements

2) Which of the following does not come under the humanities?
a) Philosophy b) Literature
c) Physics d) Art History

3) The main focus of social sciences is on:
a) The physical and natural world
b) Human society and social relationships
c) Ancient artifacts
d) Chemical compositions

4) The study of language structure and its evolution is called: _____.
a) Sociology b) Linguistics
c) Psychology d) Anthropology

5) Identify the key person in philosophy _____.
a) Isaac Newton b) Leonardo da Vinci
c) Aristotle d) Charles Darwin

6) The archaeology focuses on: _____.
a) Economic theories
b) The study of celestial bodies
c) Material remains of past societies
d) Genetic research

7) Which of the following disciplines deals with political systems and governance?

a) Economics b) Political Science
c) Sociology d) Cultural Studies

8) Sociology mainly focuses on: _____.

a) Artistic techniques
b) Social behaviour and societal structures
c) Social economics
d) Historical events

9) Which discipline studies the production, distribution, and consumption of goods and services?

a) Sociology b) Political Science
c) Economics d) History

10) In which ancient civilization did the term "democracy" originate?

a) Ancient Egypt b) Ancient Greece
c) Ancient Rome d) Mesopotamia

11) Identify the primary focus of ethics in philosophy _____.

a) Logic and reasoning b) Moral principles and conduct
c) Aesthetics and beauty d) Scientific discovery

12) Feminism primarily addresses issues related to: _____.

a) Economic inequality
b) Gender equality and women's rights
c) Political ideologies
d) Technological advancements

13) What is the fundamental problem of economics?

a) Production of goods b) Scarcity of resources
c) Inflation d) Trade barriers

14) Dr. Sigmund Freud is best known for his contributions to: _____.

a) Political science b) Psychoanalysis
c) Economic theory d) Structural linguistics

Seat No.	

Set **P**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **12**

a) Explain the interdisciplinary nature of disciplines under humanities and social sciences.
b) Write a short note on: Scope of humanities.
c) Explain how perceptual processes shape human behaviour.
d) Write a short note on: Different aspects of perception.
e) Write a short note on: Major philosophical movements and their impact.

Q.3 Attempt any Two. **16**

a) Explain the advantages and disadvantages of democracy.
b) Explain major theories of psychology.
c) Explain how different psychological aspects affect social communication.

Section – II

Q.4 Attempt any Three. **12**

a) Write a short note on: Social Institutions.
b) Explain different elements of culture and society.
c) Write a short note on: Contributions of ancient civilizations to modern society.
d) How did industrial revolution contribute to technical advancements?
e) Write a short note on: Ethics in Engineering.

Q.5 Attempt any Two. **16**

a) What is industrialization? Explain the social and economic consequences of industrialization.
b) Describe different economic theories and thinkers.
c) Explain the technological innovations in 18^{th} & 19^{th} century.

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Sociology mainly focuses on: _____.
a) Artistic techniques
b) Social behaviour and societal structures
c) Social economics
d) Historical events

2) Which discipline studies the production, distribution, and consumption of goods and services?
a) Sociology b) Political Science
c) Economics d) History

3) In which ancient civilization did the term "democracy" originate?
a) Ancient Egypt b) Ancient Greece
c) Ancient Rome d) Mesopotamia

4) Identify the primary focus of ethics in philosophy _____.
a) Logic and reasoning b) Moral principles and conduct
c) Aesthetics and beauty d) Scientific discovery

5) Feminism primarily addresses issues related to: _____.
a) Economic inequality
b) Gender equality and women's rights
c) Political ideologies
d) Technological advancements

6) What is the fundamental problem of economics?
a) Production of goods b) Scarcity of resources
c) Inflation d) Trade barriers

7) Dr. Sigmund Freud is best known for his contributions to: _____.
a) Political science b) Psychoanalysis
c) Economic theory d) Structural linguistics

8) The main focus of the humanities is: _____.
a) Scientific experiments
b) Human culture and expression
c) Market trends and economies
d) Medical advancements

9) Which of the following does not come under the humanities?
a) Philosophy b) Literature
c) Physics d) Art History

10) The main focus of social sciences is on:
a) The physical and natural world
b) Human society and social relationships
c) Ancient artifacts
d) Chemical compositions

11) The study of language structure and its evolution is called: _____.
a) Sociology b) Linguistics
c) Psychology d) Anthropology

12) Identify the key person in philosophy _____.
a) Isaac Newton b) Leonardo da Vinci
c) Aristotle d) Charles Darwin

13) The archaeology focuses on: _____.
a) Economic theories
b) The study of celestial bodies
c) Material remains of past societies
d) Genetic research

14) Which of the following disciplines deals with political systems and governance?
a) Economics b) Political Science
c) Sociology d) Cultural Studies

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **12**

a) Explain the interdisciplinary nature of disciplines under humanities and social sciences.
b) Write a short note on: Scope of humanities.
c) Explain how perceptual processes shape human behaviour.
d) Write a short note on: Different aspects of perception.
e) Write a short note on: Major philosophical movements and their impact.

Q.3 Attempt any Two. **16**

a) Explain the advantages and disadvantages of democracy.
b) Explain major theories of psychology.
c) Explain how different psychological aspects affect social communication.

Section – II

Q.4 Attempt any Three. **12**

a) Write a short note on: Social Institutions.
b) Explain different elements of culture and society.
c) Write a short note on: Contributions of ancient civilizations to modern society.
d) How did industrial revolution contribute to technical advancements?
e) Write a short note on: Ethics in Engineering.

Q.5 Attempt any Two. **16**

a) What is industrialization? Explain the social and economic consequences of industrialization.
b) Describe different economic theories and thinkers.
c) Explain the technological innovations in 18^{th} & 19^{th} century.

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Identify the primary focus of ethics in philosophy _____.
a) Logic and reasoning b) Moral principles and conduct
c) Aesthetics and beauty d) Scientific discovery

2) Feminism primarily addresses issues related to: _____.
a) Economic inequality
b) Gender equality and women's rights
c) Political ideologies
d) Technological advancements

3) What is the fundamental problem of economics?
a) Production of goods b) Scarcity of resources
c) Inflation d) Trade barriers

4) Dr. Sigmund Freud is best known for his contributions to: _____.
a) Political science b) Psychoanalysis
c) Economic theory d) Structural linguistics

5) The main focus of the humanities is: _____.
a) Scientific experiments
b) Human culture and expression
c) Market trends and economies
d) Medical advancements

6) Which of the following does not come under the humanities?
a) Philosophy b) Literature
c) Physics d) Art History

7) The main focus of social sciences is on:
a) The physical and natural world
b) Human society and social relationships
c) Ancient artifacts
d) Chemical compositions

8) The study of language structure and its evolution is called: _____.
a) Sociology b) Linguistics
c) Psychology d) Anthropology

9) Identify the key person in philosophy _____.
a) Isaac Newton b) Leonardo da Vinci
c) Aristotle d) Charles Darwin

10) The archaeology focuses on: _____.
a) Economic theories
b) The study of celestial bodies
c) Material remains of past societies
d) Genetic research

11) Which of the following disciplines deals with political systems and governance?
a) Economics b) Political Science
c) Sociology d) Cultural Studies

12) Sociology mainly focuses on: _____.
a) Artistic techniques
b) Social behaviour and societal structures
c) Social economics
d) Historical events

13) Which discipline studies the production, distribution, and consumption of goods and services?
a) Sociology b) Political Science
c) Economics d) History

14) In which ancient civilization did the term "democracy" originate?
a) Ancient Egypt b) Ancient Greece
c) Ancient Rome d) Mesopotamia

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **12**

a) Explain the interdisciplinary nature of disciplines under humanities and social sciences.
b) Write a short note on: Scope of humanities.
c) Explain how perceptual processes shape human behaviour.
d) Write a short note on: Different aspects of perception.
e) Write a short note on: Major philosophical movements and their impact.

Q.3 Attempt any Two. **16**

a) Explain the advantages and disadvantages of democracy.
b) Explain major theories of psychology.
c) Explain how different psychological aspects affect social communication.

Section – II

Q.4 Attempt any Three. **12**

a) Write a short note on: Social Institutions.
b) Explain different elements of culture and society.
c) Write a short note on: Contributions of ancient civilizations to modern society.
d) How did industrial revolution contribute to technical advancements?
e) Write a short note on: Ethics in Engineering.

Q.5 Attempt any Two. **16**

a) What is industrialization? Explain the social and economic consequences of industrialization.
b) Describe different economic theories and thinkers.
c) Explain the technological innovations in 18^{th} & 19^{th} century.

Seat No.	

Set **S**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The archaeology focuses on: _____.

a) Economic theories
b) The study of celestial bodies
c) Material remains of past societies
d) Genetic research

2) Which of the following disciplines deals with political systems and governance?

a) Economics b) Political Science
c) Sociology d) Cultural Studies

3) Sociology mainly focuses on: _____.

a) Artistic techniques
b) Social behaviour and societal structures
c) Social economics
d) Historical events

4) Which discipline studies the production, distribution, and consumption of goods and services?

a) Sociology b) Political Science
c) Economics d) History

5) In which ancient civilization did the term "democracy" originate?

a) Ancient Egypt b) Ancient Greece
c) Ancient Rome d) Mesopotamia

6) Identify the primary focus of ethics in philosophy _____.

a) Logic and reasoning b) Moral principles and conduct
c) Aesthetics and beauty d) Scientific discovery

7) Feminism primarily addresses issues related to: _____.
a) Economic inequality
b) Gender equality and women's rights
c) Political ideologies
d) Technological advancements

8) What is the fundamental problem of economics?
a) Production of goods
b) Scarcity of resources
c) Inflation
d) Trade barriers

9) Dr. Sigmund Freud is best known for his contributions to: _____.
a) Political science
b) Psychoanalysis
c) Economic theory
d) Structural linguistics

10) The main focus of the humanities is: _____.
a) Scientific experiments
b) Human culture and expression
c) Market trends and economies
d) Medical advancements

11) Which of the following does not come under the humanities?
a) Philosophy
b) Literature
c) Physics
d) Art History

12) The main focus of social sciences is on:
a) The physical and natural world
b) Human society and social relationships
c) Ancient artifacts
d) Chemical compositions

13) The study of language structure and its evolution is called: _____.
a) Sociology
b) Linguistics
c) Psychology
d) Anthropology

14) Identify the key person in philosophy _____.
a) Isaac Newton
b) Leonardo da Vinci
c) Aristotle
d) Charles Darwin

Seat No.	

Set **S**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **12**

a) Explain the interdisciplinary nature of disciplines under humanities and social sciences.
b) Write a short note on: Scope of humanities.
c) Explain how perceptual processes shape human behaviour.
d) Write a short note on: Different aspects of perception.
e) Write a short note on: Major philosophical movements and their impact.

Q.3 Attempt any Two. **16**

a) Explain the advantages and disadvantages of democracy.
b) Explain major theories of psychology.
c) Explain how different psychological aspects affect social communication.

Section – II

Q.4 Attempt any Three. **12**

a) Write a short note on: Social Institutions.
b) Explain different elements of culture and society.
c) Write a short note on: Contributions of ancient civilizations to modern society.
d) How did industrial revolution contribute to technical advancements?
e) Write a short note on: Ethics in Engineering.

Q.5 Attempt any Two. **16**

a) What is industrialization? Explain the social and economic consequences of industrialization.
b) Describe different economic theories and thinkers.
c) Explain the technological innovations in 18^{th} & 19^{th} century.

SLR-BD-183

Seat No.		Set	P

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ is defined as "the discipline dealing with what is good & bad & with moral duty & obligation".
a) Rule b) Organisation culture
c) Protocol d) Ethics

2) _____ involves establishing the amount of work to be done & the time when each element of the work will start.
a) Planning b) Routing
c) Scheduling d) Organizing

3) In _____ concept product enjoys the supreme importance.
a) Selling b) Marketing
c) Manufacturing d) Business

4) _____ are the greatest importance at the supervisory level.
a) Supervisory skills b) Human relation skills
c) Technical skills d) Planning skills

5) The responsibilities of the operations manager include _____.
a) Planning , organizing , staffing , procuring , and reviewing
b) Forecasting , designing , planning , organizing , and controlling
c) Forecasting , designing , operating , procuring , and reviewing
d) Planning , organizing , staffing , leading , and controlling
e) Designing & operating

6) Self-esteem, status affiliation with others, affection those come under _____ needs.
a) Basic b) Primary
c) Third level of d) Secondary

7) _____ is ability of individual or group to induce or influence the beliefs or action of other person or group.

a) Power b) Authority
c) Post d) Leadership

8) The basic objective of quality control in any organization is to _____.

a) Quality development, quality maintenance and quality improvement activities in organization
b) Achieve optimum cost
c) Achieve customer's satisfaction
d) Achieve all the above

9) Cost associated with defective products being shipped to the customers are called as _____.

a) Cost of internal failure b) Total cost of failure
c) Rejection cost d) Cost of external failure

10) For identification of vital few for the given data, the tool used is _____.

a) Cause-Effect diagram b) Scatter diagram
c) Pareto Analysis d) Check Sheet

11) Total quality management (TQM) mainly aims for _____.

a) Control for quality b) Usefulness of product
c) Customer satisfaction d) Cost control

12) The statistician who invented the control chart for use in industrial quality control was: _____.

a) Deming b) Taguchi
c) Pareto d) Shewhart
e) None of the above

13) The method of accepting or rejecting the lot is known as _____.

a) Lot sampling b) Acceptance sampling
c) Batch sampling d) Quality control

14) In double sampling plan, second sample is taken when the number of defectives _____.

a) > C1 but < C2 b) > C1
c) > C1 and C2 d) < C2

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2	**a)**	Explain the Social responsibilities and ethics in management.	**07**
	b)	Explain decision making process with types of decision.	**07**
Q.3	**a)**	What is planning process? Explain steps in planning.	**07**
	b)	What is leadership? Explain any four styles.	**07**
Q.4	**a)**	Explain communication and Various types of communications.	**07**
	b)	What is motivation? Explain Maslow's theory of motivation.	**07**

Section – II

Q.5	**a)**	Define quality and state the Steps in quality control.	**07**
	b)	Explain Benchmarking with advantages and disadvantages.	**07**
Q.6	**a)**	Explain Deming Wheel with suitable example.	**07**
	b)	Explain the following as applied to quality control: 1) Appraisal costs 2) Prevention costs 3) Failure costs 4) Optimum costs	**07**

Q.7 **a)** In a manufacturing process the number of defectives found in the inspection of 20 lots of 100 samples is given below. **07**

1) Determine the control limit of P chart and state whether the process is in control or not.
2) Determine the new value of mean fraction defective if some points are out of control. Compute the corresponding control limits and state whether the process is still in control or not.

Lot No.	No. of defectives	Lot No.	No. of Defectives
1	5	11	7
2	4	12	6
3	3	13	3
4	5	14	5
5	4	15	4
6	6	16	2
7	9	17	8
8	15	18	7
9	11	19	6
10	6	20	4

b) Differentiate between single sampling plan & double sampling plan. **07**

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The basic objective of quality control in any organization is to _____.
a) Quality development, quality maintenance and quality improvement activities in organization
b) Achieve optimum cost
c) Achieve customer's satisfaction
d) Achieve all the above

2) Cost associated with defective products being shipped to the customers are called as _____.
a) Cost of internal failure b) Total cost of failure
c) Rejection cost d) Cost of external failure

3) For identification of vital few for the given data, the tool used is _____.
a) Cause-Effect diagram b) Scatter diagram
c) Pareto Analysis d) Check Sheet

4) Total quality management (TQM) mainly aims for _____.
a) Control for quality b) Usefulness of product
c) Customer satisfaction d) Cost control

5) The statistician who invented the control chart for use in industrial quality control was: _____.
a) Deming b) Taguchi
c) Pareto d) Shewhart
e) None of the above

6) The method of accepting or rejecting the lot is known as _____.
a) Lot sampling b) Acceptance sampling
c) Batch sampling d) Quality control

7) In double sampling plan, second sample is taken when the number of defectives _____.
a) > C1 but < C2 b) > C1
c) > C1 and C2 d) < C2

8) _____ is defined as “the discipline dealing with what is good & bad & with moral duty & obligation”.
a) Rule b) Organisation culture
c) Protocol d) Ethics

9) _____ involves establishing the amount of work to be done & the time when each element of the work will start.
a) Planning b) Routing
c) Scheduling d) Organizing

10) In _____ concept product enjoys the supreme importance.
a) Selling b) Marketing
c) Manufacturing d) Business

11) _____ are the greatest importance at the supervisory level.
a) Supervisory skills b) Human relation skills
c) Technical skills d) Planning skills

12) The responsibilities of the operations manager include _____.
a) Planning , organizing , staffing , procuring , and reviewing
b) Forecasting , designing , planning , organizing , and controlling
c) Forecasting , designing , operating , procuring , and reviewing
d) Planning , organizing , staffing , leading , and controlling
e) Designing & operating

13) Self-esteem, status affiliation with others, affection those come under _____ needs.
a) Basic b) Primary
c) Third level of d) Secondary

14) _____ is ability of individual or group to induce or influence the beliefs or action of other person or group.
a) Power b) Authority
c) Post d) Leadership

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2	**a)**	Explain the Social responsibilities and ethics in management.	**07**
	b)	Explain decision making process with types of decision.	**07**
Q.3	**a)**	What is planning process? Explain steps in planning.	**07**
	b)	What is leadership? Explain any four styles.	**07**
Q.4	**a)**	Explain communication and Various types of communications.	**07**
	b)	What is motivation? Explain Maslow's theory of motivation.	**07**

Section – II

Q.5	**a)**	Define quality and state the Steps in quality control.	**07**
	b)	Explain Benchmarking with advantages and disadvantages.	**07**
Q.6	**a)**	Explain Deming Wheel with suitable example.	**07**
	b)	Explain the following as applied to quality control: 1) Appraisal costs 2) Prevention costs 3) Failure costs 4) Optimum costs	**07**

Q.7 **a)** In a manufacturing process the number of defectives found in the inspection of 20 lots of 100 samples is given below. **07**

1) Determine the control limit of P chart and state whether the process is in control or not.
2) Determine the new value of mean fraction defective if some points are out of control. Compute the corresponding control limits and state whether the process is still in control or not.

Lot No.	No. of defectives	Lot No.	No. of Defectives
1	5	11	7
2	4	12	6
3	3	13	3
4	5	14	5
5	4	15	4
6	6	16	2
7	9	17	8
8	15	18	7
9	11	19	6
10	6	20	4

b) Differentiate between single sampling plan & double sampling plan. **07**

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Total quality management (TQM) mainly aims for _____.
a) Control for quality b) Usefulness of product
c) Customer satisfaction d) Cost control

2) The statistician who invented the control chart for use in industrial quality control was: _____.
a) Deming b) Taguchi
c) Pareto d) Shewhart
e) None of the above

3) The method of accepting or rejecting the lot is known as _____.
a) Lot sampling b) Acceptance sampling
c) Batch sampling d) Quality control

4) In double sampling plan, second sample is taken when the number of defectives _____.
a) > C1 but < C2 b) > C1
c) > C1 and C2 d) < C2

5) _____ is defined as "the discipline dealing with what is good & bad & with moral duty & obligation".
a) Rule b) Organisation culture
c) Protocol d) Ethics

6) _____ involves establishing the amount of work to be done & the time when each element of the work will start.
a) Planning b) Routing
c) Scheduling d) Organizing

7) In _____ concept product enjoys the supreme importance.
a) Selling b) Marketing
c) Manufacturing d) Business

8) _____ are the greatest importance at the supervisory level.
a) Supervisory skills b) Human relation skills
c) Technical skills d) Planning skills

9) The responsibilities of the operations manager include _____.
a) Planning , organizing , staffing , procuring , and reviewing
b) Forecasting , designing , planning , organizing , and controlling
c) Forecasting , designing , operating , procuring , and reviewing
d) Planning , organizing , staffing , leading , and controlling
e) Designing & operating

10) Self-esteem, status affiliation with others, affection those come under _____ needs.
a) Basic b) Primary
c) Third level of d) Secondary

11) _____ is ability of individual or group to induce or influence the beliefs or action of other person or group.
a) Power b) Authority
c) Post d) Leadership

12) The basic objective of quality control in any organization is to _____.
a) Quality development, quality maintenance and quality improvement activities in organization
b) Achieve optimum cost
c) Achieve customer's satisfaction
d) Achieve all the above

13) Cost associated with defective products being shipped to the customers are called as _____.
a) Cost of internal failure b) Total cost of failure
c) Rejection cost d) Cost of external failure

14) For identification of vital few for the given data, the tool used is _____.
a) Cause-Effect diagram b) Scatter diagram
c) Pareto Analysis d) Check Sheet

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2	**a)**	Explain the Social responsibilities and ethics in management.	**07**
	b)	Explain decision making process with types of decision.	**07**
Q.3	**a)**	What is planning process? Explain steps in planning.	**07**
	b)	What is leadership? Explain any four styles.	**07**
Q.4	**a)**	Explain communication and Various types of communications.	**07**
	b)	What is motivation? Explain Maslow's theory of motivation.	**07**

Section – II

Q.5	**a)**	Define quality and state the Steps in quality control.	**07**
	b)	Explain Benchmarking with advantages and disadvantages.	**07**
Q.6	**a)**	Explain Deming Wheel with suitable example.	**07**
	b)	Explain the following as applied to quality control: 1) Appraisal costs 2) Prevention costs 3) Failure costs 4) Optimum costs	**07**

Q.7 **a)** In a manufacturing process the number of defectives found in the inspection of 20 lots of 100 samples is given below. **07**

1) Determine the control limit of P chart and state whether the process is in control or not.
2) Determine the new value of mean fraction defective if some points are out of control. Compute the corresponding control limits and state whether the process is still in control or not.

Lot No.	No. of defectives	Lot No.	No. of Defectives
1	5	11	7
2	4	12	6
3	3	13	3
4	5	14	5
5	4	15	4
6	6	16	2
7	9	17	8
8	15	18	7
9	11	19	6
10	6	20	4

b) Differentiate between single sampling plan & double sampling plan. **07**

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Self-esteem, status affiliation with others, affection those come under _____ needs.
a) Basic b) Primary
c) Third level of d) Secondary

2) _____ is ability of individual or group to induce or influence the beliefs or action of other person or group.
a) Power b) Authority
c) Post d) Leadership

3) The basic objective of quality control in any organization is to _____.
a) Quality development, quality maintenance and quality improvement activities in organization
b) Achieve optimum cost
c) Achieve customer's satisfaction
d) Achieve all the above

4) Cost associated with defective products being shipped to the customers are called as _____.
a) Cost of internal failure b) Total cost of failure
c) Rejection cost d) Cost of external failure

5) For identification of vital few for the given data, the tool used is _____.
a) Cause-Effect diagram b) Scatter diagram
c) Pareto Analysis d) Check Sheet

6) Total quality management (TQM) mainly aims for _____.
a) Control for quality b) Usefulness of product
c) Customer satisfaction d) Cost control

7) The statistician who invented the control chart for use in industrial quality control was: _____.

a) Deming b) Taguchi
c) Pareto d) Shewhart
e) None of the above

8) The method of accepting or rejecting the lot is known as _____.

a) Lot sampling b) Acceptance sampling
c) Batch sampling d) Quality control

9) In double sampling plan, second sample is taken when the number of defectives _____.

a) > C1 but < C2 b) > C1
c) > C1 and C2 d) < C2

10) _____ is defined as “the discipline dealing with what is good & bad & with moral duty & obligation”.

a) Rule b) Organisation culture
c) Protocol d) Ethics

11) _____ involves establishing the amount of work to be done & the time when each element of the work will start.

a) Planning b) Routing
c) Scheduling d) Organizing

12) In _____ concept product enjoys the supreme importance.

a) Selling b) Marketing
c) Manufacturing d) Business

13) _____ are the greatest importance at the supervisory level.

a) Supervisory skills b) Human relation skills
c) Technical skills d) Planning skills

14) The responsibilities of the operations manager include _____.

a) Planning , organizing , staffing , procuring , and reviewing
b) Forecasting , designing , planning , organizing , and controlling
c) Forecasting , designing , operating , procuring , and reviewing
d) Planning , organizing , staffing , leading , and controlling
e) Designing & operating

SLR-BD-18

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2	**a)**	Explain the Social responsibilities and ethics in management.	**07**
	b)	Explain decision making process with types of decision.	**07**
Q.3	**a)**	What is planning process? Explain steps in planning.	**07**
	b)	What is leadership? Explain any four styles.	**07**
Q.4	**a)**	Explain communication and Various types of communications.	**07**
	b)	What is motivation? Explain Maslow's theory of motivation.	**07**

Section – II

Q.5	**a)**	Define quality and state the Steps in quality control.	**07**
	b)	Explain Benchmarking with advantages and disadvantages.	**07**
Q.6	**a)**	Explain Deming Wheel with suitable example.	**07**
	b)	Explain the following as applied to quality control: 1) Appraisal costs 2) Prevention costs 3) Failure costs 4) Optimum costs	**07**

Q.7 **a)** In a manufacturing process the number of defectives found in the inspection of 20 lots of 100 samples is given below. **07**

1) Determine the control limit of P chart and state whether the process is in control or not.
2) Determine the new value of mean fraction defective if some points are out of control. Compute the corresponding control limits and state whether the process is still in control or not.

Lot No.	No. of defectives	Lot No.	No. of Defectives
1	5	11	7
2	4	12	6
3	3	13	3
4	5	14	5
5	4	15	4
6	6	16	2
7	9	17	8
8	15	18	7
9	11	19	6
10	6	20	4

b) Differentiate between single sampling plan & double sampling plan. **07**

Seat No.		Set	P

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Laplace transform of $\int_0^t u^3 du =$_____.

a) $\frac{3}{s^5}$ b) $\frac{6}{s^5}$

c) $\frac{1}{s^5}$ d) $\frac{6}{s^4}$

2) If $L\{f(t)\} = \emptyset(s)$, then $L\{f(at)\} =$ _____.

a) $\emptyset\left(\frac{s}{a}\right)$ b) $\frac{1}{s}\emptyset\left(\frac{s}{a}\right)$

c) $\emptyset'\left(\frac{s}{a}\right)$ d) $\frac{1}{a}\emptyset\left(\frac{s}{a}\right)$

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

a) $\frac{1}{3}\sin 3t$ b) $\frac{1}{3}\cos 3t$

c) $\frac{1}{3}\cosh 3t$ d) $\frac{1}{3}\sinh 3t$

4) For $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 3y = 3e^{2x}$, the particular integral is _____.

a) $\frac{1}{15}e^{2x}$ b) $3e^{2x}$

c) $\frac{1}{5}e^{2x}$ d) $C_1e^{-x} + C_2e^{-2x}$

5) The general solution of the equation $(D^3 - 7D - 6)y = 0$ is _____.

a) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{-3x}$

b) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{3x}$

c) $y = c_1e^{-x} + c_2e^{-2x} + c_3e^{-3x}$

d) None of these

6) $z\{k\} =$_____ for $|z| > 1$

a) $\frac{z}{z-1}$ b) $\frac{1}{(z-1)^2}$

c) $\frac{z}{(z-1)^2}$ d) $\frac{z}{(z+1)^2}$

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

a) $f\left(\frac{a}{z}\right)$ b) $f\left(\frac{z}{a}\right)$

c) $\frac{1}{a}f\left(\frac{z}{a}\right)$ d) None

8) $Z\left\{\frac{1}{k!}\right\} =?$ for $k \geq 0$

a) e^z b) $e^{\frac{1}{z}}$

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

9) The Fourier sine transform of $f(x)$ is given by _____.

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

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

10) From the result $\int_{-\infty}^{\infty} \frac{\cos sx.\sin sk}{s} ds = \begin{cases} \pi & , \ |x| < k \\ 0 & , \ |x| > k \end{cases}$ we can deduce that $\int_0^{\infty} \frac{\sin sk}{s}\, ds =$ _____.

a) 0 b) 1

c) π d) $\frac{\pi}{2}$

11) The first real positive root of $x^3 = 6x - 4$ by Newton Raphson method near $x_0 = 1$ is _____.

a) 0.6667 b) 0.6

c) 0.4 d) 0.3

12) How many steps does the fourth-order Runge-Kutta method use?

a) Two steps b) Five steps

c) Four steps d) Three steps

13) In the interval $(0, a)$ the constant term in the Fourier series of $f(x) = \frac{a}{2} - x$ is _____.

a) 0 b) 1

c) $\frac{a^2}{2\pi}$ d) $\frac{a^2}{4\pi}$

14) Fourier series of $f(x) = x\ in(-\pi, \pi)$ will contain ____

a) No sine term b) No cosine term

c) Both cosine and sine term d) None of these

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any three **09**

a) Solve : $(D^2 + 4D + 5)y = -2\cos hx + 2^x$

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

c) Find Z-transform of $x_k = 2^k \cos(3k + 2)\,, k \geq 0$

d) Find Z-transform of $x_k = k^2 e^{-ak}, k \geq 0$

e) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{1}{s(s^2+4)}\right]$

Q.3 Attempt any three of the following. **09**

a) Evaluate by using Laplace transform $\int_0^\infty \left(\frac{e^{-t}-e^{-3t}}{t}\right) dt$

b) Find the inverse Z-transform of $f(k) = \begin{cases} 4^k, & k < 0 \\ 3^k, & k \geq 0 \end{cases}$

c) Find $Z\{e^{-3k}\sin 2k\}, k \geq 0$

d) Solve $(D^2 - 1)y = (1 + e^{-x})^2$

e) Find Laplace Transform of $\{t\cos 2t\}$

Q.4 Attempt any two **10**

a) Find the inverse Z-transform of $\frac{1}{(z-a)^2}$ if

1) $|z| < a$,
2) $|z| > a$,

b) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$

c) Solve $(D^2 - 6D + 13)y = e^{x\log 2} + 8e^{3x}\sin 4x$

Section – II

Q.5 Attempt any three **09**

a) Evaluate $\int_0^5 \frac{1}{4x+5} dx$ using $n = 5$ by Trapezoidal rule.

b) Evaluate $I = \int_0^2 e^{-x} dx$ by using the Simpson's 1/3rd rule given h= 0.5

c) Obtain half range cosine series $f(x) = x$ in $0 < x < 1$

d) Find the Fourier series expansion of $f(x) = x^2$ in $(-\pi, \pi)$

e) Find the Fourier transform of $f(x) = \begin{cases} \frac{1}{2\epsilon}, & |x| \leq \epsilon \\ 0, & |x| > \epsilon \end{cases}$

Q.6 Attempt any three **09**

a) Find f(x) if its Fourier sine transform e^{-as}

b) Find the Fourier cosine transform of

$f(x)$, if $f(x) = \begin{cases} 1, & 0 \leq x < 1 \\ 0, & x \geq 1 \end{cases}$

c) Find the Fourier series expansion of $f(x) = x$ in $(-\pi, \pi)$

d) Solve by Newton Raphson method $x^4 - x = 10$ correct to four decimal places. (perform two iterations only)

e) Find $\int_0^6 \frac{1}{1+x^2} dx\ n = 6$ using Simpson's 3/8th rule.

Q.7 Attempt any two. **10**

a) Find $\int_1^8 \frac{1}{1+x} dx\ h = 1$ by using Trapezoidal rule and Simpson's 1/3rd rule.

b) Find Fourier transform of

$f(x) = 1\ |x| < k$

$= 0\ |x| > k$ and

Hence evaluate i) $\int_{-\infty}^{\infty} \frac{\sin sk . \cos sk}{s} ds$ ii) $\int_{-\infty}^{\infty} \frac{sin\ ks}{s} ds$

c) Find the Fourier series expansion of the function $f(x) = e^{-\alpha x}$ in $(0, 2\pi)$

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) $Z\left\{\frac{1}{k!}\right\} = ?$ for $k \geq 0$

a) e^z b) $e^{\frac{1}{z}}$

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

2) The Fourier sine transform of $f(x)$ is given by _____.

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

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

3) From the result $\int_{-\infty}^{\infty}\frac{\cos sx.\sin sk}{s}ds = \begin{cases}\pi & , \ |x| < k \\ 0 & , \ |x| > k\end{cases}$ we can deduce that $\int_0^{\infty}\frac{\sin sk}{s}\, ds =$ _____.

a) 0 b) 1

c) π d) $\frac{\pi}{2}$

4) The first real positive root of $x^3 = 6x - 4$ by Newton Raphson method near $x_0 = 1$ is _____.

a) 0.6667 b) 0.6

c) 0.4 d) 0.3

5) How many steps does the fourth-order Runge-Kutta method use?

a) Two steps b) Five steps

c) Four steps d) Three steps

6) In the interval $(0, a)$ the constant term in the Fourier series of $f(x) = \frac{a}{2} - x$ is _____.

a) 0 b) 1

c) $\frac{a^2}{2\pi}$ d) $\frac{a^2}{4\pi}$

7) Fourier series of $f(x) = x\ in(-\pi, \pi)$ will contain _____

a) No sine term b) No cosine term

c) Both cosine and sine term d) None of these

8) Laplace transform of $\int_0^t u^3 du =$_____.

a) $\frac{3}{s^5}$ b) $\frac{6}{s^5}$

c) $\frac{1}{s^5}$ d) $\frac{6}{s^4}$

9) If $L\{f(t)\} = \emptyset(s)$, then $L\{f(at)\} =$ _____.

a) $\emptyset\left(\frac{s}{a}\right)$ b) $\frac{1}{s}\emptyset\left(\frac{s}{a}\right)$

c) $\emptyset'\left(\frac{s}{a}\right)$ d) $\frac{1}{a}\emptyset\left(\frac{s}{a}\right)$

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

a) $\frac{1}{3}\sin 3t$ b) $\frac{1}{3}\cos 3t$

c) $\frac{1}{3}\cosh 3t$ d) $\frac{1}{3}\sinh 3t$

11) For $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 3y = 3e^{2x}$, the particular integral is _____.

a) $\frac{1}{15}e^{2x}$ b) $3e^{2x}$

c) $\frac{1}{5}e^{2x}$ d) $C_1e^{-x} + C_2e^{-2x}$

12) The general solution of the equation $(D^3 - 7D - 6)y = 0$ is _____.

a) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{-3x}$

b) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{3x}$

c) $y = c_1e^{-x} + c_2e^{-2x} + c_3e^{-3x}$

d) None of these

13) $z\{k\} =$_____ for $|z| > 1$

a) $\frac{z}{z-1}$ b) $\frac{1}{(z-1)^2}$

c) $\frac{z}{(z-1)^2}$ d) $\frac{z}{(z+1)^2}$

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

a) $f\left(\frac{a}{z}\right)$ b) $f\left(\frac{z}{a}\right)$

c) $\frac{1}{a} f\left(\frac{z}{a}\right)$ d) None

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any three **09**

a) Solve : $(D^2 + 4D + 5)y = -2\cos hx + 2^x$

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

c) Find Z-transform of $x_k = 2^k \cos(3k + 2)\,, k \geq 0$

d) Find Z-transform of $x_k = k^2 e^{-ak}, k \geq 0$

e) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{1}{s(s^2+4)}\right]$

Q.3 Attempt any three of the following. **09**

a) Evaluate by using Laplace transform $\int_0^\infty \left(\frac{e^{-t}-e^{-3t}}{t}\right) dt$

b) Find the inverse Z-transform of $f(k) = \begin{cases} 4^k, & k < 0 \\ 3^k, & k \geq 0 \end{cases}$

c) Find $Z\{e^{-3k}\sin 2k\}, k \geq 0$

d) Solve $(D^2 - 1)y = (1 + e^{-x})^2$

e) Find Laplace Transform of $\{t\cos 2t\}$

Q.4 Attempt any two **10**

a) Find the inverse Z-transform of $\frac{1}{(z-a)^2}$ if

1) $|z| < a$,
2) $|z| > a$,

b) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$

c) Solve $(D^2 - 6D + 13)y = e^{x\log 2} + 8e^{3x}\sin 4x$

Section – II

Q.5 Attempt any three **09**

a) Evaluate $\int_0^5 \frac{1}{4x+5} dx$ using $n = 5$ by Trapezoidal rule.

b) Evaluate $I = \int_0^2 e^{-x} dx$ by using the Simpson's 1/3rd rule given h= 0.5

c) Obtain half range cosine series $f(x) = x$ in $0 < x < 1$

d) Find the Fourier series expansion of $f(x) = x^2$ in $(-\pi, \pi)$

e) Find the Fourier transform of $f(x) = \begin{cases} \frac{1}{2\epsilon}, & |x| \leq \epsilon \\ 0, & |x| > \epsilon \end{cases}$

Q.6 Attempt any three **09**

a) Find f(x) if its Fourier sine transform e^{-as}

b) Find the Fourier cosine transform of

$f(x)$, if $f(x) = \begin{cases} 1, & 0 \leq x < 1 \\ 0, & x \geq 1 \end{cases}$

c) Find the Fourier series expansion of $f(x) = x$ in $(-\pi, \pi)$

d) Solve by Newton Raphson method $x^4 - x = 10$ correct to four decimal places. (perform two iterations only)

e) Find $\int_0^6 \frac{1}{1+x^2} dx\ n = 6$ using Simpson's 3/8th rule.

Q.7 Attempt any two. **10**

a) Find $\int_1^8 \frac{1}{1+x} dx\ h = 1$ by using Trapezoidal rule and Simpson's 1/3rd rule.

b) Find Fourier transform of

$f(x) = 1\ |x| < k$

$= 0\ |x| > k$ and

Hence evaluate i) $\int_{-\infty}^{\infty} \frac{\sin sk . \cos sk}{s} ds$ ii) $\int_{-\infty}^{\infty} \frac{sin\ ks}{s} ds$

c) Find the Fourier series expansion of the function $f(x) = e^{-\alpha x}$ in $(0, 2\pi)$

Seat No.	

Set R

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The first real positive root of $x^3 = 6x - 4$ by Newton Raphson method near $x_0 = 1$ is _____.

a) 0.6667 b) 0.6
c) 0.4 d) 0.3

2) How many steps does the fourth-order Runge-Kutta method use?

a) Two steps b) Five steps
c) Four steps d) Three steps

3) In the interval $(0, a)$ the constant term in the Fourier series of $f(x) = \frac{a}{2} - x$ is _____.

a) 0 b) 1
c) $\frac{a^2}{2\pi}$ d) $\frac{a^2}{4\pi}$

4) Fourier series of $f(x) = x\ in(-\pi, \pi)$ will contain ____

a) No sine term b) No cosine term
c) Both cosine and sine term d) None of these

5) Laplace transform of $\int_0^t u^3 du$ =_____.

a) $\frac{3}{s^5}$ b) $\frac{6}{s^5}$
c) $\frac{1}{s^5}$ d) $\frac{6}{s^4}$

6) If $L\{f(t)\} = \emptyset(s)$, then $L\{f(at)\} =$ _____.

a) $\emptyset\left(\frac{s}{a}\right)$ b) $\frac{1}{s}\emptyset\left(\frac{s}{a}\right)$

c) $\emptyset'\left(\frac{s}{a}\right)$ d) $\frac{1}{a}\emptyset\left(\frac{s}{a}\right)$

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

a) $\frac{1}{3}\sin 3t$ b) $\frac{1}{3}\cos 3t$

c) $\frac{1}{3}\cosh 3t$ d) $\frac{1}{3}\sinh 3t$

8) For $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 3y = 3e^{2x}$, the particular integral is _____.

a) $\frac{1}{15}e^{2x}$ b) $3e^{2x}$

c) $\frac{1}{5}e^{2x}$ d) $C_1e^{-x} + C_2e^{-2x}$

9) The general solution of the equation $(D^3 - 7D - 6)y = 0$ is _____.

a) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{-3x}$

b) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{3x}$

c) $y = c_1e^{-x} + c_2e^{-2x} + c_3e^{-3x}$

d) None of these

10) $z\{k\} =$_____ for $|z| > 1$

a) $\frac{z}{z-1}$ b) $\frac{1}{(z-1)^2}$

c) $\frac{z}{(z-1)^2}$ d) $\frac{z}{(z+1)^2}$

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

a) $f\left(\frac{a}{z}\right)$ b) $f\left(\frac{z}{a}\right)$

c) $\frac{1}{a}f\left(\frac{z}{a}\right)$ d) None

12) $Z\left\{\frac{1}{k!}\right\} =$? for $k \geq 0$

a) e^z b) $e^{\frac{1}{z}}$

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

13) The Fourier sine transform of $f(x)$ is given by _____.

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

b) $\int_{-\infty}^{\infty} f(x)\cos sx\ dx$

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

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

14) From the result $\int_{-\infty}^{\infty}\frac{\cos sx.\sin sk}{s}ds = \begin{cases}\pi & , \ |x| < k \\ 0 & , \ |x| > k\end{cases}$ we can deduce that $\int_{0}^{\infty}\frac{\sin sk}{s}\ ds =$ _____.

a) 0

b) 1

c) π

d) $\frac{\pi}{2}$

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any three **09**

a) Solve : $(D^2 + 4D + 5)y = -2\cos hx + 2^x$

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

c) Find Z-transform of $x_k = 2^k \cos(3k + 2)\,, k \geq 0$

d) Find Z-transform of $x_k = k^2 e^{-ak}, k \geq 0$

e) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{1}{s(s^2+4)}\right]$

Q.3 Attempt any three of the following. **09**

a) Evaluate by using Laplace transform $\int_0^\infty \left(\frac{e^{-t}-e^{-3t}}{t}\right) dt$

b) Find the inverse Z-transform of $f(k) = \begin{cases} 4^k, & k < 0 \\ 3^k, & k \geq 0 \end{cases}$

c) Find $Z\{e^{-3k}\sin 2k\}, k \geq 0$

d) Solve $(D^2 - 1)y = (1 + e^{-x})^2$

e) Find Laplace Transform of $\{t\cos 2t\}$

Q.4 Attempt any two **10**

a) Find the inverse Z-transform of $\frac{1}{(z-a)^2}$ if

1) $|z| < a$,
2) $|z| > a$,

b) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$

c) Solve $(D^2 - 6D + 13)y = e^{x\log 2} + 8e^{3x}\sin 4x$

Section – II

Q.5 Attempt any three **09**

a) Evaluate $\int_0^5 \frac{1}{4x+5} dx$ using $n = 5$ by Trapezoidal rule.

b) Evaluate $I = \int_0^2 e^{-x} dx$ by using the Simpson's 1/3rd rule given h= 0.5

c) Obtain half range cosine series $f(x) = x$ in $0 < x < 1$

d) Find the Fourier series expansion of $f(x) = x^2$ in $(-\pi, \pi)$

e) Find the Fourier transform of $f(x) = \begin{cases} \frac{1}{2\epsilon}, & |x| \leq \epsilon \\ 0, & |x| > \epsilon \end{cases}$

Q.6 Attempt any three **09**

a) Find f(x) if its Fourier sine transform e^{-as}

b) Find the Fourier cosine transform of

$f(x)$, if $f(x) = \begin{cases} 1, & 0 \leq x < 1 \\ 0, & x \geq 1 \end{cases}$

c) Find the Fourier series expansion of $f(x) = x$ in $(-\pi, \pi)$

d) Solve by Newton Raphson method $x^4 - x = 10$ correct to four decimal places. (perform two iterations only)

e) Find $\int_0^6 \frac{1}{1+x^2} dx\ n = 6$ using Simpson's 3/8th rule.

Q.7 Attempt any two. **10**

a) Find $\int_1^8 \frac{1}{1+x} dx\ h = 1$ by using Trapezoidal rule and Simpson's 1/3rd rule.

b) Find Fourier transform of

$f(x) = 1\ |x| < k$

$= 0\ |x| > k$ and

Hence evaluate i) $\int_{-\infty}^{\infty} \frac{\sin sk . \cos sk}{s} ds$ ii) $\int_{-\infty}^{\infty} \frac{sin\ ks}{s} ds$

c) Find the Fourier series expansion of the function $f(x) = e^{-\alpha x}$ in $(0, 2\pi)$

Seat No.		Set	S

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) $z\{k\} =$_____ for $|z| > 1$

a) $\frac{z}{z-1}$ b) $\frac{1}{(z-1)^2}$

c) $\frac{z}{(z-1)^2}$ d) $\frac{z}{(z+1)^2}$

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

a) $f\left(\frac{a}{z}\right)$ b) $f\left(\frac{z}{a}\right)$

c) $\frac{1}{a} f\left(\frac{z}{a}\right)$ d) None

3) $Z\left\{\frac{1}{k!}\right\} =?$ for $k \geq 0$

a) e^z b) $e^{\frac{1}{z}}$

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

4) The Fourier sine transform of $f(x)$ is given by _____.

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

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

5) From the result $\int_{-\infty}^{\infty} \frac{\cos sx.\sin sk}{s} ds = \begin{cases} \pi & , \ |x| < k \\ 0 & , \ |x| > k \end{cases}$ we can deduce that $\int_0^{\infty} \frac{\sin sk}{s} \, ds =$ _____.

a) 0 b) 1

c) π d) $\frac{\pi}{2}$

6) The first real positive root of $x^3 = 6x - 4$ by Newton Raphson method near $x_0 = 1$ is _____.

a) 0.6667 b) 0.6

c) 0.4 d) 0.3

7) How many steps does the fourth-order Runge-Kutta method use?

a) Two steps b) Five steps

c) Four steps d) Three steps

8) In the interval $(0, a)$ the constant term in the Fourier series of $f(x) = \frac{a}{2} - x$ is _____.

a) 0 b) 1

c) $\frac{a^2}{2\pi}$ d) $\frac{a^2}{4\pi}$

9) Fourier series of $f(x) = x \ in(-\pi, \pi)$ will contain ____

a) No sine term b) No cosine term

c) Both cosine and sine term d) None of these

10) Laplace transform of $\int_0^t u^3 du =$_____.

a) $\frac{3}{s^5}$ b) $\frac{6}{s^5}$

c) $\frac{1}{s^5}$ d) $\frac{6}{s^4}$

11) If $L\{f(t)\} = \emptyset(s)$, then $L\{f(at)\} =$ _____.

a) $\emptyset\left(\frac{s}{a}\right)$ b) $\frac{1}{s}\emptyset\left(\frac{s}{a}\right)$

c) $\emptyset'\left(\frac{s}{a}\right)$ d) $\frac{1}{a}\emptyset\left(\frac{s}{a}\right)$

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

a) $\frac{1}{3}\sin 3t$ b) $\frac{1}{3}\cos 3t$

c) $\frac{1}{3}\cosh 3t$ d) $\frac{1}{3}\sinh 3t$

13) For $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 3y = 3e^{2x}$, the particular integral is _____.

a) $\frac{1}{15}e^{2x}$ b) $3e^{2x}$

c) $\frac{1}{5}e^{2x}$ d) $C_1e^{-x} + C_2e^{-2x}$

14) The general solution of the equation $(D^3 - 7D - 6)y = 0$ is _____.

a) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{-3x}$

b) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{3x}$

c) $y = c_1e^{-x} + c_2e^{-2x} + c_3e^{-3x}$

d) None of these

Seat No.	

Set **S**

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any three **09**

a) Solve : $(D^2 + 4D + 5)y = -2\cos hx + 2^x$

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

c) Find Z-transform of $x_k = 2^k \cos(3k + 2)\,, k \geq 0$

d) Find Z-transform of $x_k = k^2 e^{-ak}, k \geq 0$

e) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{1}{s(s^2+4)}\right]$

Q.3 Attempt any three of the following. **09**

a) Evaluate by using Laplace transform $\int_0^\infty \left(\frac{e^{-t}-e^{-3t}}{t}\right) dt$

b) Find the inverse Z-transform of $f(k) = \begin{cases} 4^k, & k < 0 \\ 3^k, & k \geq 0 \end{cases}$

c) Find $Z\{e^{-3k}\sin 2k\}, k \geq 0$

d) Solve $(D^2 - 1)y = (1 + e^{-x})^2$

e) Find Laplace Transform of $\{t\cos 2t\}$

Q.4 Attempt any two **10**

a) Find the inverse Z-transform of $\frac{1}{(z-a)^2}$ if

1) $|z| < a$,
2) $|z| > a$,

b) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$

c) Solve $(D^2 - 6D + 13)y = e^{x\log 2} + 8e^{3x}\sin 4x$

Section – II

Q.5 Attempt any three **09**

a) Evaluate $\int_0^5 \frac{1}{4x+5} dx$ using $n = 5$ by Trapezoidal rule.

b) Evaluate $I = \int_0^2 e^{-x} dx$ by using the Simpson's 1/3rd rule given h= 0.5

c) Obtain half range cosine series $f(x) = x$ in $0 < x < 1$

d) Find the Fourier series expansion of $f(x) = x^2$ in $(-\pi, \pi)$

e) Find the Fourier transform of $f(x) = \begin{cases} \frac{1}{2\epsilon}, & |x| \leq \epsilon \\ 0, & |x| > \epsilon \end{cases}$

Q.6 Attempt any three **09**

a) Find f(x) if its Fourier sine transform e^{-as}

b) Find the Fourier cosine transform of

$f(x)$, if $f(x) = \begin{cases} 1, & 0 \leq x < 1 \\ 0, & x \geq 1 \end{cases}$

c) Find the Fourier series expansion of $f(x) = x$ in $(-\pi, \pi)$

d) Solve by Newton Raphson method $x^4 - x = 10$ correct to four decimal places. (perform two iterations only)

e) Find $\int_0^6 \frac{1}{1+x^2} dx \; n = 6$ using Simpson's 3/8th rule.

Q.7 Attempt any two. **10**

a) Find $\int_1^8 \frac{1}{1+x} dx \; h = 1$ by using Trapezoidal rule and Simpson's 1/3rd rule.

b) Find Fourier transform of

$f(x) = 1 \; |x| < k$

$= 0 \; |x| > k$ and

Hence evaluate i) $\int_{-\infty}^{\infty} \frac{\sin sk . \cos sk}{s} ds$ ii) $\int_{-\infty}^{\infty} \frac{\sin ks}{s} ds$

c) Find the Fourier series expansion of the function $f(x) = e^{-\alpha x}$ in $(0, 2\pi)$

SLR-BD-185

Seat No.		Set	P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is feedback in communication?
a) The process of encoding a message.
b) The process of transmitting the message.
c) The response or reaction to a message.
d) The process of decoding a message.

2) In the process of communication 'Encoding' means _____.
a) Using symbol to express an idea
b) Deciphering the message
c) Creating noise in the communication
d) Interpreting the meaning of message

3) Empathy refers to: _____.
a) Capacity to understand or feel what another person feels
b) Having better understanding of partner's emotions
c) The higher the likelihood of self harm
d) Getting what one wants out of the relationship

4) Repots, suggestions, appeals grievances etc. are examples of: _____.
a) Down ward communication
b) Upward communication
c) Horizontal communication
d) Informal communication

5) Informal communication is commonly known as: _____.
a) Down ward communication b) Upward communication
c) Horizontal communication d) Grapevine

6) _____ is not a communication barrier?
a) Language b) Culture
c) Habits d) Physical

7) Which of the following is NOT a component of communication?
a) Sender b) Message
c) Receiver d) Translator

8) Emotional Intelligence primarily refers to the ability to: _____.
a) Understand and manage one's own emotions and the emotions of others
b) Solve mathematical problems
c) Memorize large amounts of information
d) Make logical decisions without emotions

9) Time management can help reduce stress by: _____
a) Creating unnecessary pressure
b) Organizing tasks and prioritizing effectively
c) Avoiding responsibilities altogether
d) Increasing the workload

10) The term “self-regulation” in Emotional Intelligence means: _____.
a) Hiding your emotions from others
b) Controlling impulsive behaviours and adapting to changing circumstances
c) Ignoring your emotional responses
d) Following strict rules without considering emotions

11) What is the primary purpose of a job interview?
a) To test the candidate's academic knowledge
b) To compare the candidate's qualifications with others
c) To discuss salary expectations only
d) To assess the candidate’s suitability for the job role

12) What kind of information will you collect before going to an interview?
a) About the job you are applying for
b) About the company
c) About the work culture
d) All of the above

13) Which of the following is an effective stress management technique?
a) Procrastination
b) Deep breathing and relaxation exercises
c) Avoiding physical activity
d) Excessive multitasking

14) Which of the following is an important step to prepare for an interview?
a) Memorizing answers word for word
b) Arriving late to showcase confidence
c) Avoiding practice to appear natural
d) Researching the company and role

Seat No.	

Set **P**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Two. **12**

a) Define human communication and explain importance of communication.
b) Explain in brief:
1) Personal Barrier
2) Social Barrier
c) Enlighten in a brief strategy to improve emotional intelligence.

Q.3 Attempt any Four. **16**

a) Explain importance of emotional intelligence.
b) State advantages and disadvantages of informal communication.
c) Describe different modes of communication.
d) Highlight role of social awareness as key factor of emotional intelligence.
e) Explain relationship management as key factor of emotional intelligence.

Section – II

Q.4 Attempt any Two. **12**

a) What is interview? Explain various steps in the process of interview.
b) Explain importance of time management.
c) Explain the four P's of effective presentation.

Q.5 Attempt any Four. **16**

a) Explain importance of stress management.
b) Explain various types of interviews.
c) Describe various strategies for effective time management.
d) Explain various strategies of stress management.
e) Write short note on: Non- verbal aspects of presentation.

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Emotional Intelligence primarily refers to the ability to: _____.
a) Understand and manage one's own emotions and the emotions of others
b) Solve mathematical problems
c) Memorize large amounts of information
d) Make logical decisions without emotions

2) Time management can help reduce stress by: _____
a) Creating unnecessary pressure
b) Organizing tasks and prioritizing effectively
c) Avoiding responsibilities altogether
d) Increasing the workload

3) The term "self-regulation" in Emotional Intelligence means: _____.
a) Hiding your emotions from others
b) Controlling impulsive behaviours and adapting to changing circumstances
c) Ignoring your emotional responses
d) Following strict rules without considering emotions

4) What is the primary purpose of a job interview?
a) To test the candidate's academic knowledge
b) To compare the candidate's qualifications with others
c) To discuss salary expectations only
d) To assess the candidate's suitability for the job role

5) What kind of information will you collect before going to an interview?
a) About the job you are applying for
b) About the company
c) About the work culture
d) All of the above

6) Which of the following is an effective stress management technique?
a) Procrastination
b) Deep breathing and relaxation exercises
c) Avoiding physical activity
d) Excessive multitasking

7) Which of the following is an important step to prepare for an interview?
a) Memorizing answers word for word
b) Arriving late to showcase confidence
c) Avoiding practice to appear natural
d) Researching the company and role

8) What is feedback in communication?
a) The process of encoding a message.
b) The process of transmitting the message.
c) The response or reaction to a message.
d) The process of decoding a message.

9) In the process of communication 'Encoding' means _____.
a) Using symbol to express an idea
b) Deciphering the message
c) Creating noise in the communication
d) Interpreting the meaning of message

10) Empathy refers to: _____.
a) Capacity to understand or feel what another person feels
b) Having better understanding of partner's emotions
c) The higher the likelihood of self harm
d) Getting what one wants out of the relationship

11) Repots, suggestions, appeals grievances etc. are examples of: _____.
a) Down ward communication
b) Upward communication
c) Horizontal communication
d) Informal communication

12) Informal communication is commonly known as: _____.
a) Down ward communication b) Upward communication
c) Horizontal communication d) Grapevine

13) _____ is not a communication barrier?
a) Language b) Culture
c) Habits d) Physical

14) Which of the following is NOT a component of communication?
a) Sender b) Message
c) Receiver d) Translator

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Two. **12**

a) Define human communication and explain importance of communication.
b) Explain in brief:
1) Personal Barrier
2) Social Barrier
c) Enlighten in a brief strategy to improve emotional intelligence.

Q.3 Attempt any Four. **16**

a) Explain importance of emotional intelligence.
b) State advantages and disadvantages of informal communication.
c) Describe different modes of communication.
d) Highlight role of social awareness as key factor of emotional intelligence.
e) Explain relationship management as key factor of emotional intelligence.

Section – II

Q.4 Attempt any Two. **12**

a) What is interview? Explain various steps in the process of interview.
b) Explain importance of time management.
c) Explain the four P's of effective presentation.

Q.5 Attempt any Four. **16**

a) Explain importance of stress management.
b) Explain various types of interviews.
c) Describe various strategies for effective time management.
d) Explain various strategies of stress management.
e) Write short note on: Non- verbal aspects of presentation.

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the primary purpose of a job interview?
a) To test the candidate's academic knowledge
b) To compare the candidate's qualifications with others
c) To discuss salary expectations only
d) To assess the candidate's suitability for the job role

2) What kind of information will you collect before going to an interview?
a) About the job you are applying for
b) About the company
c) About the work culture
d) All of the above

3) Which of the following is an effective stress management technique?
a) Procrastination
b) Deep breathing and relaxation exercises
c) Avoiding physical activity
d) Excessive multitasking

4) Which of the following is an important step to prepare for an interview?
a) Memorizing answers word for word
b) Arriving late to showcase confidence
c) Avoiding practice to appear natural
d) Researching the company and role

5) What is feedback in communication?
a) The process of encoding a message.
b) The process of transmitting the message.
c) The response or reaction to a message.
d) The process of decoding a message.

6) In the process of communication 'Encoding' means _____.
a) Using symbol to express an idea
b) Deciphering the message
c) Creating noise in the communication
d) Interpreting the meaning of message

7) Empathy refers to: _____.
a) Capacity to understand or feel what another person feels
b) Having better understanding of partner's emotions
c) The higher the likelihood of self harm
d) Getting what one wants out of the relationship

8) Repots, suggestions, appeals grievances etc. are examples of: _____.
a) Down ward communication
b) Upward communication
c) Horizontal communication
d) Informal communication

9) Informal communication is commonly known as: _____.
a) Down ward communication b) Upward communication
c) Horizontal communication d) Grapevine

10) _____ is not a communication barrier?
a) Language b) Culture
c) Habits d) Physical

11) Which of the following is NOT a component of communication?
a) Sender b) Message
c) Receiver d) Translator

12) Emotional Intelligence primarily refers to the ability to: _____.
a) Understand and manage one's own emotions and the emotions of others
b) Solve mathematical problems
c) Memorize large amounts of information
d) Make logical decisions without emotions

13) Time management can help reduce stress by: _____
a) Creating unnecessary pressure
b) Organizing tasks and prioritizing effectively
c) Avoiding responsibilities altogether
d) Increasing the workload

14) The term "self-regulation" in Emotional Intelligence means: _____.
a) Hiding your emotions from others
b) Controlling impulsive behaviours and adapting to changing circumstances
c) Ignoring your emotional responses
d) Following strict rules without considering emotions

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Two. **12**

a) Define human communication and explain importance of communication.
b) Explain in brief:
1) Personal Barrier
2) Social Barrier
c) Enlighten in a brief strategy to improve emotional intelligence.

Q.3 Attempt any Four. **16**

a) Explain importance of emotional intelligence.
b) State advantages and disadvantages of informal communication.
c) Describe different modes of communication.
d) Highlight role of social awareness as key factor of emotional intelligence.
e) Explain relationship management as key factor of emotional intelligence.

Section – II

Q.4 Attempt any Two. **12**

a) What is interview? Explain various steps in the process of interview.
b) Explain importance of time management.
c) Explain the four P's of effective presentation.

Q.5 Attempt any Four. **16**

a) Explain importance of stress management.
b) Explain various types of interviews.
c) Describe various strategies for effective time management.
d) Explain various strategies of stress management.
e) Write short note on: Non- verbal aspects of presentation.

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ is not a communication barrier?
a) Language b) Culture
c) Habits d) Physical

2) Which of the following is NOT a component of communication?
a) Sender b) Message
c) Receiver d) Translator

3) Emotional Intelligence primarily refers to the ability to: _____.
a) Understand and manage one's own emotions and the emotions of others
b) Solve mathematical problems
c) Memorize large amounts of information
d) Make logical decisions without emotions

4) Time management can help reduce stress by: _____
a) Creating unnecessary pressure
b) Organizing tasks and prioritizing effectively
c) Avoiding responsibilities altogether
d) Increasing the workload

5) The term "self-regulation" in Emotional Intelligence means: _____.
a) Hiding your emotions from others
b) Controlling impulsive behaviours and adapting to changing circumstances
c) Ignoring your emotional responses
d) Following strict rules without considering emotions

6) What is the primary purpose of a job interview?
a) To test the candidate's academic knowledge
b) To compare the candidate's qualifications with others
c) To discuss salary expectations only
d) To assess the candidate's suitability for the job role

7) What kind of information will you collect before going to an interview?
a) About the job you are applying for
b) About the company
c) About the work culture
d) All of the above

8) Which of the following is an effective stress management technique?
a) Procrastination
b) Deep breathing and relaxation exercises
c) Avoiding physical activity
d) Excessive multitasking

9) Which of the following is an important step to prepare for an interview?
a) Memorizing answers word for word
b) Arriving late to showcase confidence
c) Avoiding practice to appear natural
d) Researching the company and role

10) What is feedback in communication?
a) The process of encoding a message.
b) The process of transmitting the message.
c) The response or reaction to a message.
d) The process of decoding a message.

11) In the process of communication 'Encoding' means _____.
a) Using symbol to express an idea
b) Deciphering the message
c) Creating noise in the communication
d) Interpreting the meaning of message

12) Empathy refers to: _____.
a) Capacity to understand or feel what another person feels
b) Having better understanding of partner's emotions
c) The higher the likelihood of self harm
d) Getting what one wants out of the relationship

13) Repots, suggestions, appeals grievances etc. are examples of: _____.
a) Down ward communication
b) Upward communication
c) Horizontal communication
d) Informal communication

14) Informal communication is commonly known as: _____.
a) Down ward communication b) Upward communication
c) Horizontal communication d) Grapevine

SLR-BD-185

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Two. **12**

a) Define human communication and explain importance of communication.
b) Explain in brief:
1) Personal Barrier
2) Social Barrier
c) Enlighten in a brief strategy to improve emotional intelligence.

Q.3 Attempt any Four. **16**

a) Explain importance of emotional intelligence.
b) State advantages and disadvantages of informal communication.
c) Describe different modes of communication.
d) Highlight role of social awareness as key factor of emotional intelligence.
e) Explain relationship management as key factor of emotional intelligence.

Section – II

Q.4 Attempt any Two. **12**

a) What is interview? Explain various steps in the process of interview.
b) Explain importance of time management.
c) Explain the four P's of effective presentation.

Q.5 Attempt any Four. **16**

a) Explain importance of stress management.
b) Explain various types of interviews.
c) Describe various strategies for effective time management.
d) Explain various strategies of stress management.
e) Write short note on: Non- verbal aspects of presentation.

Seat No.	

Set **P**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the primary focus of Design Thinking?
a) Maximizing shareholder
b) Developing innovative and user-centered solutions
c) Streamlining manufacturing processes
d) Enhancing employee productivity

2) Which of the following correctly lists the first three phases of the Design Thinking process?
a) Empathize, Ideate, Prototype
b) Define, Ideate, Test
c) Empathize, Define, Ideate
d) Prototype, Test, Implement

3) In the context of Design Thinking, what is "brainstorming" used for?
a) Generating a wide range of ideas
b) Testing final products
c) Developing financial models
d) Identifying user pain points

4) What does a "customer journey map" help to visualize?
a) The financial cost of product development
b) The steps a customer goes through while interacting with a product or service
c) The design specifications of a product
d) The competitive landscape of a market

5) Which tool in Design Thinking helps in understanding the target user's needs and behaviors?
a) Prototype b) Persona
c) SWOT analysis d) Business model canvas

6) What is the final phase in the Design Thinking process?
a) Test b) Implement
c) Prototype d) Ideate

7) Which of the following is NOT an objective of design thinking?
a) To create user-friendly products
b) To streamline manufacturing processes
c) To encourage iterative prototyping
d) To enhance collaboration among teams

8) Which of the following is a benefit of using design thinking?
a) Reduces product variety b) Increases customer satisfaction
c) Limits team collaboration d) Eliminates risk in decision-making

9) What role does technology play in innovation management?
a) It complicates processes
b) It is irrelevant to innovation
c) It serves as a tool for enhancing efficiency and creativity
d) It replaces human input

10) Which leadership style involves making decisions based on input from team members?
a) Autocratic b) Laissez-faire
c) Democratic d) Transactional

11) What does "Product Solution Fit" refer to?
a) The alignment of the product with customer needs and problems
b) The product's price in relation to competitors
c) The marketing strategy for the product
d) The technical specifications of the product

12) Which of the following best defines "Product Market Fit"?
a) The degree to which a product meets the demands of a specific market
b) The number of products available in the market
c) The financial performance of a product
d) The product's popularity on social media

13) What is the primary goal of service design?
a) To reduce costs
b) To enhance customer experience
c) To standardize services
d) To simplify service offerings

14) Which of the following is a key principle of service design?
a) Focus on profitability over customer satisfaction
b) User-centered design
c) Minimal feedback from users
d) Rigid service processes

Seat No.	

Set **P**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Describe each phase of the Design Thinking process in detail, explaining how they contribute to the overall methodology. **06**

b) Provide a comprehensive definition of Design Thinking, including its essential characteristics and principles. **04**

Q.3 **Attempt any three.** **18**

a) Discuss the role of creativity and innovation in organizations and their impact on business performance.

b) What is the importance of empathy in Design Thinking?

c) Define leadership and explain its different types. How can effective leadership influence the success of an organization? Provide examples.

d) Explain the utilization of cognitive technology in decision-making processes.

e) Explain exemplary practices of effective leadership with relevant case studies.

Section – II

Q.4 **a)** Explain exemplary practices of effective leadership with relevant case studies. **06**

b) What is product solution fit, and how does it differ from product market fit? **04**

Q.5 **Attempt any three.** **18**

a) Define the development lifecycle and explain its significance in product development.

b) What are the benefits of implementing service design in organizations?

c) How can organizations effectively design a service to meet customer needs?

d) How does Intellectual Property (IP) play a role in product development and design thinking?

e) Explain any two successful case studies demonstrating design thinking in various engineering sectors.

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is a benefit of using design thinking?
a) Reduces product variety b) Increases customer satisfaction
c) Limits team collaboration d) Eliminates risk in decision-making

2) What role does technology play in innovation management?
a) It complicates processes
b) It is irrelevant to innovation
c) It serves as a tool for enhancing efficiency and creativity
d) It replaces human input

3) Which leadership style involves making decisions based on input from team members?
a) Autocratic b) Laissez-faire
c) Democratic d) Transactional

4) What does "Product Solution Fit" refer to?
a) The alignment of the product with customer needs and problems
b) The product's price in relation to competitors
c) The marketing strategy for the product
d) The technical specifications of the product

5) Which of the following best defines "Product Market Fit"?
a) The degree to which a product meets the demands of a specific market
b) The number of products available in the market
c) The financial performance of a product
d) The product's popularity on social media

6) What is the primary goal of service design?
a) To reduce costs
b) To enhance customer experience
c) To standardize services
d) To simplify service offerings

7) Which of the following is a key principle of service design?
a) Focus on profitability over customer satisfaction
b) User-centered design
c) Minimal feedback from users
d) Rigid service processes

8) What is the primary focus of Design Thinking?
a) Maximizing shareholder
b) Developing innovative and user-centered solutions
c) Streamlining manufacturing processes
d) Enhancing employee productivity

9) Which of the following correctly lists the first three phases of the Design Thinking process?
a) Empathize, Ideate, Prototype
b) Define, Ideate, Test
c) Empathize, Define, Ideate
d) Prototype, Test, Implement

10) In the context of Design Thinking, what is "brainstorming" used for?
a) Generating a wide range of ideas
b) Testing final products
c) Developing financial models
d) Identifying user pain points

11) What does a "customer journey map" help to visualize?
a) The financial cost of product development
b) The steps a customer goes through while interacting with a product or service
c) The design specifications of a product
d) The competitive landscape of a market

12) Which tool in Design Thinking helps in understanding the target user's needs and behaviors?
a) Prototype
b) Persona
c) SWOT analysis
d) Business model canvas

13) What is the final phase in the Design Thinking process?
a) Test
b) Implement
c) Prototype
d) Ideate

14) Which of the following is NOT an objective of design thinking?

a) To create user-friendly products
b) To streamline manufacturing processes
c) To encourage iterative prototyping
d) To enhance collaboration among teams

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Describe each phase of the Design Thinking process in detail, explaining how they contribute to the overall methodology. **06**

b) Provide a comprehensive definition of Design Thinking, including its essential characteristics and principles. **04**

Q.3 **Attempt any three.** **18**

a) Discuss the role of creativity and innovation in organizations and their impact on business performance.

b) What is the importance of empathy in Design Thinking?

c) Define leadership and explain its different types. How can effective leadership influence the success of an organization? Provide examples.

d) Explain the utilization of cognitive technology in decision-making processes.

e) Explain exemplary practices of effective leadership with relevant case studies.

Section – II

Q.4 **a)** Explain exemplary practices of effective leadership with relevant case studies. **06**

b) What is product solution fit, and how does it differ from product market fit? **04**

Q.5 **Attempt any three.** **18**

a) Define the development lifecycle and explain its significance in product development.

b) What are the benefits of implementing service design in organizations?

c) How can organizations effectively design a service to meet customer needs?

d) How does Intellectual Property (IP) play a role in product development and design thinking?

e) Explain any two successful case studies demonstrating design thinking in various engineering sectors.

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) What does "Product Solution Fit" refer to?
a) The alignment of the product with customer needs and problems
b) The product's price in relation to competitors
c) The marketing strategy for the product
d) The technical specifications of the product

2) Which of the following best defines "Product Market Fit"?
a) The degree to which a product meets the demands of a specific market
b) The number of products available in the market
c) The financial performance of a product
d) The product's popularity on social media

3) What is the primary goal of service design?
a) To reduce costs
b) To enhance customer experience
c) To standardize services
d) To simplify service offerings

4) Which of the following is a key principle of service design?
a) Focus on profitability over customer satisfaction
b) User-centered design
c) Minimal feedback from users
d) Rigid service processes

5) What is the primary focus of Design Thinking?
a) Maximizing shareholder
b) Developing innovative and user-centered solutions
c) Streamlining manufacturing processes
d) Enhancing employee productivity

6) Which of the following correctly lists the first three phases of the Design Thinking process?
a) Empathize, Ideate, Prototype
b) Define, Ideate, Test
c) Empathize, Define, Ideate
d) Prototype, Test, Implement

7) In the context of Design Thinking, what is "brainstorming" used for?
a) Generating a wide range of ideas
b) Testing final products
c) Developing financial models
d) Identifying user pain points

8) What does a "customer journey map" help to visualize?
a) The financial cost of product development
b) The steps a customer goes through while interacting with a product or service
c) The design specifications of a product
d) The competitive landscape of a market

9) Which tool in Design Thinking helps in understanding the target user's needs and behaviors?
a) Prototype b) Persona
c) SWOT analysis d) Business model canvas

10) What is the final phase in the Design Thinking process?
a) Test b) Implement
c) Prototype d) Ideate

11) Which of the following is NOT an objective of design thinking?
a) To create user-friendly products
b) To streamline manufacturing processes
c) To encourage iterative prototyping
d) To enhance collaboration among teams

12) Which of the following is a benefit of using design thinking?
a) Reduces product variety b) Increases customer satisfaction
c) Limits team collaboration d) Eliminates risk in decision-making

13) What role does technology play in innovation management?
a) It complicates processes
b) It is irrelevant to innovation
c) It serves as a tool for enhancing efficiency and creativity
d) It replaces human input

14) Which leadership style involves making decisions based on input from team members?
a) Autocratic b) Laissez-faire
c) Democratic d) Transactional

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Describe each phase of the Design Thinking process in detail, explaining how they contribute to the overall methodology. **06**

b) Provide a comprehensive definition of Design Thinking, including its essential characteristics and principles. **04**

Q.3 **Attempt any three.** **18**

a) Discuss the role of creativity and innovation in organizations and their impact on business performance.

b) What is the importance of empathy in Design Thinking?

c) Define leadership and explain its different types. How can effective leadership influence the success of an organization? Provide examples.

d) Explain the utilization of cognitive technology in decision-making processes.

e) Explain exemplary practices of effective leadership with relevant case studies.

Section – II

Q.4 **a)** Explain exemplary practices of effective leadership with relevant case studies. **06**

b) What is product solution fit, and how does it differ from product market fit? **04**

Q.5 **Attempt any three.** **18**

a) Define the development lifecycle and explain its significance in product development.

b) What are the benefits of implementing service design in organizations?

c) How can organizations effectively design a service to meet customer needs?

d) How does Intellectual Property (IP) play a role in product development and design thinking?

e) Explain any two successful case studies demonstrating design thinking in various engineering sectors.

Seat No.	

Set **S**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the final phase in the Design Thinking process?
a) Test b) Implement
c) Prototype d) Ideate

2) Which of the following is NOT an objective of design thinking?
a) To create user-friendly products
b) To streamline manufacturing processes
c) To encourage iterative prototyping
d) To enhance collaboration among teams

3) Which of the following is a benefit of using design thinking?
a) Reduces product variety b) Increases customer satisfaction
c) Limits team collaboration d) Eliminates risk in decision-making

4) What role does technology play in innovation management?
a) It complicates processes
b) It is irrelevant to innovation
c) It serves as a tool for enhancing efficiency and creativity
d) It replaces human input

5) Which leadership style involves making decisions based on input from team members?
a) Autocratic b) Laissez-faire
c) Democratic d) Transactional

6) What does "Product Solution Fit" refer to?
a) The alignment of the product with customer needs and problems
b) The product's price in relation to competitors
c) The marketing strategy for the product
d) The technical specifications of the product

7) Which of the following best defines "Product Market Fit"?
a) The degree to which a product meets the demands of a specific market
b) The number of products available in the market
c) The financial performance of a product
d) The product's popularity on social media

8) What is the primary goal of service design?
a) To reduce costs
b) To enhance customer experience
c) To standardize services
d) To simplify service offerings

9) Which of the following is a key principle of service design?
a) Focus on profitability over customer satisfaction
b) User-centered design
c) Minimal feedback from users
d) Rigid service processes

10) What is the primary focus of Design Thinking?
a) Maximizing shareholder
b) Developing innovative and user-centered solutions
c) Streamlining manufacturing processes
d) Enhancing employee productivity

11) Which of the following correctly lists the first three phases of the Design Thinking process?
a) Empathize, Ideate, Prototype
b) Define, Ideate, Test
c) Empathize, Define, Ideate
d) Prototype, Test, Implement

12) In the context of Design Thinking, what is "brainstorming" used for?
a) Generating a wide range of ideas
b) Testing final products
c) Developing financial models
d) Identifying user pain points

13) What does a "customer journey map" help to visualize?
a) The financial cost of product development
b) The steps a customer goes through while interacting with a product or service
c) The design specifications of a product
d) The competitive landscape of a market

14) Which tool in Design Thinking helps in understanding the target user's needs and behaviors?
a) Prototype
b) Persona
c) SWOT analysis
d) Business model canvas

SLR-BD-186

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Describe each phase of the Design Thinking process in detail, explaining how they contribute to the overall methodology. **06**

b) Provide a comprehensive definition of Design Thinking, including its essential characteristics and principles. **04**

Q.3 **Attempt any three.** **18**

a) Discuss the role of creativity and innovation in organizations and their impact on business performance.

b) What is the importance of empathy in Design Thinking?

c) Define leadership and explain its different types. How can effective leadership influence the success of an organization? Provide examples.

d) Explain the utilization of cognitive technology in decision-making processes.

e) Explain exemplary practices of effective leadership with relevant case studies.

Section – II

Q.4 **a)** Explain exemplary practices of effective leadership with relevant case studies. **06**

b) What is product solution fit, and how does it differ from product market fit? **04**

Q.5 **Attempt any three.** **18**

a) Define the development lifecycle and explain its significance in product development.

b) What are the benefits of implementing service design in organizations?

c) How can organizations effectively design a service to meet customer needs?

d) How does Intellectual Property (IP) play a role in product development and design thinking?

e) Explain any two successful case studies demonstrating design thinking in various engineering sectors.

SLR-BD-187

Seat No.	

Set P

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options. 14

1) What does GIS integrate spatial data with?
a) Other data resources b) Only tabular data
c) Only hard copy maps d) Only digital maps

2) What is the purpose of GIS software?
a) Data management and analysis
b) Creating physical maps
c) Collecting data only
d) Storing non-spatial data

3) Which of the following is a key function of an information system?
a) Data storage only
b) Data collection and processing
c) Document shredding
d) Manual calculations

4) Statistical data in GIS is primarily used for _____.
a) Data visualization b) Data analysis and interpretation
c) Data storage d) Data collection

5) Satellite data is most commonly used in GIS for _____.
a) Remote sensing b) Data entry
c) Statistical analysis d) Map digitization

6) A zone with a width created around a spatial feature is called as ____.
a) dissolve b) buffer
c) relation d) overlay

7) Network databases is to support relationships of _____.
a) many to many
b) one to many
c) none of above
d) all of above

8) The sensitivity of a sensor to detect slight differences in energy (brightness) is _____.
a) Spectral resolution
b) Spatial resolution
c) Temporal resolution
d) Radiometric resolution

9) Descriptive information provides qualitative data about the characteristics and conditions of Earth's surface features _____.
a) qualitative
b) quantitative
c) both
d) none

10) The instruments which provide electromagnetic radiation of specified wave length or a band of wave lengths to illuminate the earth surface, are called _____.
a) scanner
b) passive sensors
c) active sensors
d) none of these

11) Canal site selection using GIS is primarily concerned with _____.
a) Mapping the soil composition along the canal route
b) Studying land use in the surrounding areas
c) Identifying areas with the most water flow potential
d) Both a and c

12) What is the primary application of GIS in map revision?
a) To create new maps from scratch
b) To update and modify existing maps with current data
c) To design and print physical maps
d) To analyze spatial data for new projects

13) Which phase of GIS project planning involves the most detailed work on defining technical requirements and hardware/software needs?
a) feasibility study
b) planning and requirements analysis
c) design phase
d) testing phase

14) Which of the following is an example of a GIS design project task?
a) data model development
b) stakeholder consultation
c) site analysis and requirement definition
d) all of these

Seat No.	

Set **P**

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch whenever necessary.

Section - I

Q.2 Attempt any four from the following. **16**

a) Describe commercial & open source GIS softwares.
b) Describe in detail data organisation method-layered based approach.
c) Describe field data & its collection methods.
d) Discuss advantages & disadvantages of aerial photographs.
e) Describe in detail run-length encoding.
f) Describe in detail about data analysis.

Q.3 Attempt any two from the following. **12**

a) Describe in detail digitizers, its process, advantages & disadvantages.
b) Describe the organisation of data in GIS.
c) Explain various data models used in DBMS in detail.

Section - II

Q.4 Attempt any four from the following. **16**

a) Explain in detail passive & active remote sensing with sketch.
b) Describe in detail metric information.
c) Describe application of GIS in dam site selection.
d) Describe application of GIS in soil erosion.
e) Explain in detail phases of planning & implementation.
f) Describe characteristics of advanced GIS projects.

Q.5 Attempt any two from the following. **12**

a) Describe need of integration of remote sensing & GIS in detail.
b) Describe key application of GIS in map revision.
c) Describe benefits of GIS implementation plan.

Seat No.	

Set **Q**

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options. **14**

1) The sensitivity of a sensor to detect slight differences in energy (brightness) is _____.
a) Spectral resolution b) Spatial resolution
c) Temporal resolution d) Radiometric resolution

2) Descriptive information provides qualitative data about the characteristics and conditions of Earth's surface features _____.
a) qualitative b) quantitative
c) both d) none

3) The instruments which provide electromagnetic radiation of specified wave length or a band of wave lengths to illuminate the earth surface, are called _____.
a) scanner b) passive sensors
c) active sensors d) none of these

4) Canal site selection using GIS is primarily concerned with _____.
a) Mapping the soil composition along the canal route
b) Studying land use in the surrounding areas
c) Identifying areas with the most water flow potential
d) Both a and c

5) What is the primary application of GIS in map revision?
a) To create new maps from scratch
b) To update and modify existing maps with current data
c) To design and print physical maps
d) To analyze spatial data for new projects

6) Which phase of GIS project planning involves the most detailed work on defining technical requirements and hardware/software needs?
a) feasibility study
b) planning and requirements analysis
c) design phase
d) testing phase

7) Which of the following is an example of a GIS design project task?
a) data model development
b) stakeholder consultation
c) site analysis and requirement definition
d) all of these

8) What does GIS integrate spatial data with?
a) Other data resources
b) Only tabular data
c) Only hard copy maps
d) Only digital maps

9) What is the purpose of GIS software?
a) Data management and analysis
b) Creating physical maps
c) Collecting data only
d) Storing non-spatial data

10) Which of the following is a key function of an information system?
a) Data storage only
b) Data collection and processing
c) Document shredding
d) Manual calculations

11) Statistical data in GIS is primarily used for _____.
a) Data visualization
b) Data analysis and interpretation
c) Data storage
d) Data collection

12) Satellite data is most commonly used in GIS for _____.
a) Remote sensing
b) Data entry
c) Statistical analysis
d) Map digitization

13) A zone with a width created around a spatial feature is called as ____.
a) dissolve
b) buffer
c) relation
d) overlay

14) Network databases is to support relationships of _____.
a) many to many
b) one to many
c) none of above
d) all of above

Seat No.	

Set **Q**

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch whenever necessary.

Section - I

Q.2 Attempt any four from the following. **16**

a) Describe commercial & open source GIS softwares.
b) Describe in detail data organisation method-layered based approach.
c) Describe field data & its collection methods.
d) Discuss advantages & disadvantages of aerial photographs.
e) Describe in detail run-length encoding.
f) Describe in detail about data analysis.

Q.3 Attempt any two from the following. **12**

a) Describe in detail digitizers, its process, advantages & disadvantages.
b) Describe the organisation of data in GIS.
c) Explain various data models used in DBMS in detail.

Section - II

Q.4 Attempt any four from the following. **16**

a) Explain in detail passive & active remote sensing with sketch.
b) Describe in detail metric information.
c) Describe application of GIS in dam site selection.
d) Describe application of GIS in soil erosion.
e) Explain in detail phases of planning & implementation.
f) Describe characteristics of advanced GIS projects.

Q.5 Attempt any two from the following. **12**

a) Describe need of integration of remote sensing & GIS in detail.
b) Describe key application of GIS in map revision.
c) Describe benefits of GIS implementation plan.

Seat No.		Set	R

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options. 14

1) Canal site selection using GIS is primarily concerned with _____.
a) Mapping the soil composition along the canal route
b) Studying land use in the surrounding areas
c) Identifying areas with the most water flow potential
d) Both a and c

2) What is the primary application of GIS in map revision?
a) To create new maps from scratch
b) To update and modify existing maps with current data
c) To design and print physical maps
d) To analyze spatial data for new projects

3) Which phase of GIS project planning involves the most detailed work on defining technical requirements and hardware/software needs?
a) feasibility study
b) planning and requirements analysis
c) design phase
d) testing phase

4) Which of the following is an example of a GIS design project task?
a) data model development
b) stakeholder consultation
c) site analysis and requirement definition
d) all of these

5) What does GIS integrate spatial data with?
a) Other data resources b) Only tabular data
c) Only hard copy maps d) Only digital maps

6) What is the purpose of GIS software?
a) Data management and analysis
b) Creating physical maps
c) Collecting data only
d) Storing non-spatial data

7) Which of the following is a key function of an information system?
a) Data storage only
b) Data collection and processing
c) Document shredding
d) Manual calculations

8) Statistical data in GIS is primarily used for _____.
a) Data visualization
b) Data analysis and interpretation
c) Data storage
d) Data collection

9) Satellite data is most commonly used in GIS for _____.
a) Remote sensing
b) Data entry
c) Statistical analysis
d) Map digitization

10) A zone with a width created around a spatial feature is called as ____.
a) dissolve
b) buffer
c) relation
d) overlay

___

11) Network databases is to support relationships of _____.
a) many to many
b) one to many
c) none of above
d) all of above

12) The sensitivity of a sensor to detect slight differences in energy (brightness) is _____.
a) Spectral resolution
b) Spatial resolution
c) Temporal resolution
d) Radiometric resolution

13) Descriptive information provides qualitative data about the characteristics and conditions of Earth's surface features _____.
a) qualitative
b) quantitative
c) both
d) none

14) The instruments which provide electromagnetic radiation of specified wave length or a band of wave lengths to illuminate the earth surface, are called _____.
a) scanner
b) passive sensors
c) active sensors
d) none of these

Seat No.	

Set **R**

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch whenever necessary.

Section - I

Q.2 Attempt any four from the following. **16**

a) Describe commercial & open source GIS softwares.
b) Describe in detail data organisation method-layered based approach.
c) Describe field data & its collection methods.
d) Discuss advantages & disadvantages of aerial photographs.
e) Describe in detail run-length encoding.
f) Describe in detail about data analysis.

Q.3 Attempt any two from the following. **12**

a) Describe in detail digitizers, its process, advantages & disadvantages.
b) Describe the organisation of data in GIS.
c) Explain various data models used in DBMS in detail.

Section - II

Q.4 Attempt any four from the following. **16**

a) Explain in detail passive & active remote sensing with sketch.
b) Describe in detail metric information.
c) Describe application of GIS in dam site selection.
d) Describe application of GIS in soil erosion.
e) Explain in detail phases of planning & implementation.
f) Describe characteristics of advanced GIS projects.

Q.5 Attempt any two from the following. **12**

a) Describe need of integration of remote sensing & GIS in detail.
b) Describe key application of GIS in map revision.
c) Describe benefits of GIS implementation plan.

Seat No.		Set	S

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options. 14

1) A zone with a width created around a spatial feature is called as ____.
a) dissolve b) buffer
c) relation d) overlay

2) Network databases is to support relationships of _____.
a) many to many b) one to many
c) none of above d) all of above

3) The sensitivity of a sensor to detect slight differences in energy (brightness) is _____.
a) Spectral resolution b) Spatial resolution
c) Temporal resolution d) Radiometric resolution

4) Descriptive information provides qualitative data about the characteristics and conditions of Earth's surface features _____.
a) qualitative b) quantitative
c) both d) none

5) The instruments which provide electromagnetic radiation of specified wave length or a band of wave lengths to illuminate the earth surface, are called _____.
a) scanner b) passive sensors
c) active sensors d) none of these

6) Canal site selection using GIS is primarily concerned with _____.
a) Mapping the soil composition along the canal route
b) Studying land use in the surrounding areas
c) Identifying areas with the most water flow potential
d) Both a and c

7) What is the primary application of GIS in map revision?
a) To create new maps from scratch
b) To update and modify existing maps with current data
c) To design and print physical maps
d) To analyze spatial data for new projects

8) Which phase of GIS project planning involves the most detailed work on defining technical requirements and hardware/software needs?
a) feasibility study
b) planning and requirements analysis
c) design phase
d) testing phase

9) Which of the following is an example of a GIS design project task?
a) data model development
b) stakeholder consultation
c) site analysis and requirement definition
d) all of these

10) What does GIS integrate spatial data with?
a) Other data resources
b) Only tabular data
c) Only hard copy maps
d) Only digital maps

11) What is the purpose of GIS software?
a) Data management and analysis
b) Creating physical maps
c) Collecting data only
d) Storing non-spatial data

12) Which of the following is a key function of an information system?
a) Data storage only
b) Data collection and processing
c) Document shredding
d) Manual calculations

13) Statistical data in GIS is primarily used for _____.
a) Data visualization
b) Data analysis and interpretation
c) Data storage
d) Data collection

14) Satellite data is most commonly used in GIS for _____.
a) Remote sensing
b) Data entry
c) Statistical analysis
d) Map digitization

SLR-BD-187

Seat No.		Set	S

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch whenever necessary.

Section - I

Q.2 Attempt any four from the following. **16**
a) Describe commercial & open source GIS softwares.
b) Describe in detail data organisation method-layered based approach.
c) Describe field data & its collection methods.
d) Discuss advantages & disadvantages of aerial photographs.
e) Describe in detail run-length encoding.
f) Describe in detail about data analysis.

Q.3 Attempt any two from the following. **12**
a) Describe in detail digitizers, its process, advantages & disadvantages.
b) Describe the organisation of data in GIS.
c) Explain various data models used in DBMS in detail.

Section - II

Q.4 Attempt any four from the following. **16**
a) Explain in detail passive & active remote sensing with sketch.
b) Describe in detail metric information.
c) Describe application of GIS in dam site selection.
d) Describe application of GIS in soil erosion.
e) Explain in detail phases of planning & implementation.
f) Describe characteristics of advanced GIS projects.

Q.5 Attempt any two from the following. **12**
a) Describe need of integration of remote sensing & GIS in detail.
b) Describe key application of GIS in map revision.
c) Describe benefits of GIS implementation plan.

Seat No.	

Set **P**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is not a primary classification of engineering materials?
a) Metals b) Ceramics
c) Gases d) Polymers

2) Which property is most associated with metals?
a) High electrical conductivity b) High brittleness
c) Low melting point d) Low density

3) The Gibbs phase rule is given by:
a) $P + F = C - 1$ b) $P + F = C + 1$
c) $F = C - P + 2$ d) $F = C + P - 2$

4) Non-ferrous metals are primarily used for their:
a) High strength
b) High corrosion resistance and low density
c) Magnetic properties
d) Low melting point

5) In the eutectic transformation, liquid transforms into:
a) One solid phase b) Two solid phases
c) One liquid and one solid phase d) Three solid phases

6) Which of the following is a characteristic of brass alloy?
a) Primarily composed of copper and tin
b) Primarily composed of copper and zinc
c) Primarily composed, of copper and aluminum
d) Primarily composed of copper ana nickel

7) Bronze alloys are primarily composed of copper and:
a) Zinc b) Aluminum
c) Nickel d) Tin

8) Which of the following is an example of a thermoplastic polymer?
a) Bakelite b) Epoxy resin
c) Polystyrene d) Rubber

9) The ability of a polymer to return to its original shape after deformation is known as:
a) Ductility b) Elasticity
c) Malleability d) Toughness

10) Which of the following properties is enhanced by vulcanization of rubber?
a) High flexibility
b) Increased strength and resistance to wear
c) Decreased thermal stability
d) Decreased electrical resistance

11) Which of the following is NOT a characteristic of ceramic materials?
a) High melting points b) High electrical conductivity
c) Brittle nature d) Good wear resistance

12) Advanced ceramics are typically characterized by:
a) High ductility
b) Low strength
c) High thermal and electrical conductivity
d) High performance at high temperatures

13) Composite materials are widely used in the aerospace industry because they:
a) Are cost-effective and easily available
b) Provide high strength-to-weight ratio
c) Have low thermal resistance
d) Are magnetic in nature

14) Nanomaterials are commonly used in which of the following fields?
a) Drug delivery systems
b) Large-scale structural applications
c) Agricultural machinery
d) Waste disposal

Seat No.	

Set **P**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two full questions from each section.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

SECTION – I

Q.2	**a)**	What are engineering materials, and how are they classified?	**07**
	b)	What is a phase diagram? Explain the different types of phase diagrams.	**07**
Q.3	**a)**	Discuss the phases present in the Fe-Fe_3C diagram at different compositions of carbon.	**07**
	b)	Discuss the composition and properties of plain carbon steels.	**07**
Q.4	**a)**	Discuss the composition and properties of brass and bronze.	**07**
	b)	Explain the properties and applications of Al-Cu alloys.	**07**

SECTION – II

Q.5	**a)**	Discuss the differences between thermoplastic and thermosetting polymers.	**07**
	b)	Explain how vulcanization is used to modify the physical properties of natural rubber.	**07**
Q.6	**a)**	What are ceramics, and what makes them different from metals and polymers?	**07**
	b)	Discuss the role of ceramics in the aerospace industry.	**07**
Q.7	**a)**	Explain the classification of composite materials.	**07**
	b)	Explain the role of nanomaterials in electronics and semiconductors.	**07**

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is an example of a thermoplastic polymer?
a) Bakelite b) Epoxy resin
c) Polystyrene d) Rubber

2) The ability of a polymer to return to its original shape after deformation is known as:
a) Ductility b) Elasticity
c) Malleability d) Toughness

3) Which of the following properties is enhanced by vulcanization of rubber?
a) High flexibility
b) Increased strength and resistance to wear
c) Decreased thermal stability
d) Decreased electrical resistance

4) Which of the following is NOT a characteristic of ceramic materials?
a) High melting points b) High electrical conductivity
c) Brittle nature d) Good wear resistance

5) Advanced ceramics are typically characterized by:
a) High ductility
b) Low strength
c) High thermal and electrical conductivity
d) High performance at high temperatures

6) Composite materials are widely used in the aerospace industry because they:
a) Are cost-effective and easily available
b) Provide high strength-to-weight ratio
c) Have low thermal resistance
d) Are magnetic in nature

7) Nanomaterials are commonly used in which of the following fields?
a) Drug delivery systems
b) Large-scale structural applications
c) Agricultural machinery
d) Waste disposal

8) Which of the following is not a primary classification of engineering materials?
a) Metals
b) Ceramics
c) Gases
d) Polymers

9) Which property is most associated with metals?
a) High electrical conductivity
b) High brittleness
c) Low melting point
d) Low density

10) The Gibbs phase rule is given by:
a) $\mathrm{P} + \mathrm{F} = \mathrm{C} - 1$
b) $\mathrm{P} + \mathrm{F} = \mathrm{C} + 1$
c) $\mathrm{F} = \mathrm{C} - \mathrm{P} + 2$
d) $\mathrm{F} = \mathrm{C} + \mathrm{P} - 2$

11) Non-ferrous metals are primarily used for their:
a) High strength
b) High corrosion resistance and low density
c) Magnetic properties
d) Low melting point

12) In the eutectic transformation, liquid transforms into:
a) One solid phase
b) Two solid phases
c) One liquid and one solid phase
d) Three solid phases

13) Which of the following is a characteristic of brass alloy?
a) Primarily composed of copper and tin
b) Primarily composed of copper and zinc
c) Primarily composed, of copper and aluminum
d) Primarily composed of copper ana nickel

14) Bronze alloys are primarily composed of copper and:
a) Zinc
b) Aluminum
c) Nickel
d) Tin

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two full questions from each section.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

SECTION – I

Q.2	**a)**	What are engineering materials, and how are they classified?	**07**
	b)	What is a phase diagram? Explain the different types of phase diagrams.	**07**
Q.3	**a)**	Discuss the phases present in the Fe-Fe_3C diagram at different compositions of carbon.	**07**
	b)	Discuss the composition and properties of plain carbon steels.	**07**
Q.4	**a)**	Discuss the composition and properties of brass and bronze.	**07**
	b)	Explain the properties and applications of Al-Cu alloys.	**07**

SECTION – II

Q.5	**a)**	Discuss the differences between thermoplastic and thermosetting polymers.	**07**
	b)	Explain how vulcanization is used to modify the physical properties of natural rubber.	**07**
Q.6	**a)**	What are ceramics, and what makes them different from metals and polymers?	**07**
	b)	Discuss the role of ceramics in the aerospace industry.	**07**
Q.7	**a)**	Explain the classification of composite materials.	**07**
	b)	Explain the role of nanomaterials in electronics and semiconductors.	**07**

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is NOT a characteristic of ceramic materials?
a) High melting points b) High electrical conductivity
c) Brittle nature d) Good wear resistance

2) Advanced ceramics are typically characterized by:
a) High ductility
b) Low strength
c) High thermal and electrical conductivity
d) High performance at high temperatures

3) Composite materials are widely used in the aerospace industry because they:
a) Are cost-effective and easily available
b) Provide high strength-to-weight ratio
c) Have low thermal resistance
d) Are magnetic in nature

4) Nanomaterials are commonly used in which of the following fields?
a) Drug delivery systems
b) Large-scale structural applications
c) Agricultural machinery
d) Waste disposal

5) Which of the following is not a primary classification of engineering materials?
a) Metals b) Ceramics
c) Gases d) Polymers

6) Which property is most associated with metals?
a) High electrical conductivity b) High brittleness
c) Low melting point d) Low density

7) The Gibbs phase rule is given by:
a) $P + F = C - 1$ b) $P + F = C + 1$
c) $F = C - P + 2$ d) $F = C + P - 2$

8) Non-ferrous metals are primarily used for their:
a) High strength
b) High corrosion resistance and low density
c) Magnetic properties
d) Low melting point

9) In the eutectic transformation, liquid transforms into:
a) One solid phase b) Two solid phases
c) One liquid and one solid phase d) Three solid phases

10) Which of the following is a characteristic of brass alloy?
a) Primarily composed of copper and tin
b) Primarily composed of copper and zinc
c) Primarily composed, of copper and aluminum
d) Primarily composed of copper ana nickel

11) Bronze alloys are primarily composed of copper and:
a) Zinc b) Aluminum
c) Nickel d) Tin

12) Which of the following is an example of a thermoplastic polymer?
a) Bakelite b) Epoxy resin
c) Polystyrene d) Rubber

13) The ability of a polymer to return to its original shape after deformation is known as:
a) Ductility b) Elasticity
c) Malleability d) Toughness

14) Which of the following properties is enhanced by vulcanization of rubber?
a) High flexibility
b) Increased strength and resistance to wear
c) Decreased thermal stability
d) Decreased electrical resistance

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two full questions from each section.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

SECTION – I

Q.2	**a)**	What are engineering materials, and how are they classified?	**07**
	b)	What is a phase diagram? Explain the different types of phase diagrams.	**07**
Q.3	**a)**	Discuss the phases present in the Fe-Fe_3C diagram at different compositions of carbon.	**07**
	b)	Discuss the composition and properties of plain carbon steels.	**07**
Q.4	**a)**	Discuss the composition and properties of brass and bronze.	**07**
	b)	Explain the properties and applications of Al-Cu alloys.	**07**

SECTION – II

Q.5	**a)**	Discuss the differences between thermoplastic and thermosetting polymers.	**07**
	b)	Explain how vulcanization is used to modify the physical properties of natural rubber.	**07**
Q.6	**a)**	What are ceramics, and what makes them different from metals and polymers?	**07**
	b)	Discuss the role of ceramics in the aerospace industry.	**07**
Q.7	**a)**	Explain the classification of composite materials.	**07**
	b)	Explain the role of nanomaterials in electronics and semiconductors.	**07**

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is a characteristic of brass alloy?
a) Primarily composed of copper and tin
b) Primarily composed of copper and zinc
c) Primarily composed, of copper and aluminum
d) Primarily composed of copper ana nickel

2) Bronze alloys are primarily composed of copper and:
a) Zinc b) Aluminum
c) Nickel d) Tin

3) Which of the following is an example of a thermoplastic polymer?
a) Bakelite b) Epoxy resin
c) Polystyrene d) Rubber

4) The ability of a polymer to return to its original shape after deformation is known as:
a) Ductility b) Elasticity
c) Malleability d) Toughness

5) Which of the following properties is enhanced by vulcanization of rubber?
a) High flexibility
b) Increased strength and resistance to wear
c) Decreased thermal stability
d) Decreased electrical resistance

6) Which of the following is NOT a characteristic of ceramic materials?
a) High melting points b) High electrical conductivity
c) Brittle nature d) Good wear resistance

7) Advanced ceramics are typically characterized by:
a) High ductility
b) Low strength
c) High thermal and electrical conductivity
d) High performance at high temperatures

8) Composite materials are widely used in the aerospace industry because they:
a) Are cost-effective and easily available
b) Provide high strength-to-weight ratio
c) Have low thermal resistance
d) Are magnetic in nature

9) Nanomaterials are commonly used in which of the following fields?
a) Drug delivery systems
b) Large-scale structural applications
c) Agricultural machinery
d) Waste disposal

10) Which of the following is not a primary classification of engineering materials?
a) Metals
b) Ceramics
c) Gases
d) Polymers

11) Which property is most associated with metals?
a) High electrical conductivity
b) High brittleness
c) Low melting point
d) Low density

12) The Gibbs phase rule is given by:
a) $\mathrm{P} + \mathrm{F} = \mathrm{C} - 1$
b) $\mathrm{P} + \mathrm{F} = \mathrm{C} + 1$
c) $\mathrm{F} = \mathrm{C} - \mathrm{P} + 2$
d) $\mathrm{F} = \mathrm{C} + \mathrm{P} - 2$

13) Non-ferrous metals are primarily used for their:
a) High strength
b) High corrosion resistance and low density
c) Magnetic properties
d) Low melting point

14) In the eutectic transformation, liquid transforms into:
a) One solid phase
b) Two solid phases
c) One liquid and one solid phase
d) Three solid phases

SLR-BD-188

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two full questions from each section.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

SECTION – I

Q.2	**a)**	What are engineering materials, and how are they classified?	**07**
	b)	What is a phase diagram? Explain the different types of phase diagrams.	**07**
Q.3	**a)**	Discuss the phases present in the Fe-Fe_3C diagram at different compositions of carbon.	**07**
	b)	Discuss the composition and properties of plain carbon steels.	**07**
Q.4	**a)**	Discuss the composition and properties of brass and bronze.	**07**
	b)	Explain the properties and applications of Al-Cu alloys.	**07**

SECTION – II

Q.5	**a)**	Discuss the differences between thermoplastic and thermosetting polymers.	**07**
	b)	Explain how vulcanization is used to modify the physical properties of natural rubber.	**07**
Q.6	**a)**	What are ceramics, and what makes them different from metals and polymers?	**07**
	b)	Discuss the role of ceramics in the aerospace industry.	**07**
Q.7	**a)**	Explain the classification of composite materials.	**07**
	b)	Explain the role of nanomaterials in electronics and semiconductors.	**07**

SLR-BD-189

Seat No.		Set	P

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the primary purpose of management?
a) To maximize profits
b) To achieve organizational goals efficiently
c) To manage resources effectively
d) To implement policies

2) Which approach emphasizes the interdependence of various organizational functions?
a) Classical Approach b) Systems Approach
c) Behavioral Approach d) Contingency Approach

3) What is NOT a function of managers?
a) Planning b) Organizing
c) Playing d) Controlling

4) Which of the following is a responsibility of managers regarding social responsibility?
a) Maximizing shareholder wealth
b) Ensuring employee satisfaction
c) Contributing to community welfare
d) Minimizing costs

5) What is the first step in the planning process?
a) Developing alternatives b) Setting objectives
c) Implementing plans d) Evaluating results

6) Which type of plan is designed to cover a short period?
a) Strategic Plan b) Tactical Plan
c) Operational Plan d) Contingency Plan

7) Which of the following is a part of the staffing function?
a) Budgeting b) Training
c) Planning d) Controlling

8) Which theory focuses on the hierarchy of needs to motivate employees?
a) Herzberg's Two-Factor Theory
b) McGregor's Theory X and Y
c) Maslow's Hierarchy of Needs
d) Adams' Equity Theory

9) What is the main purpose of controlling in management?
a) To set goals
b) To ensure that organizational activities are aligned with plans
c) To improve employee morale
d) To increase production

10) What type of costs includes costs associated with preventing defects?
a) Internal failure costs b) External failure costs
c) Appraisal costs d) Prevention costs

11) Which quality guru is known for his work in the field of quality improvement through statistical methods?
a) Philip Crosby b) W. Edwards Deming
c) Joseph Juran d) Kaoru Ishikawa

12) Which chart is used to monitor the mean of a process over time?
a) R-chart b) P-chart
c) C-chart d) X-bar chart

13) Acceptance sampling is primarily concerned with:
a) Evaluating the entire production process
b) Inspecting all items produced
c) Testing a sample to infer about the quality of the entire lot
d) Conducting customer satisfaction surveys

14) What is the primary goal of employee involvement in TQM?
a) To increase profits
b) To enhance product quality through teamwork and engagement
c) To reduce the number of employees
d) To focus solely on production output

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section – I, Q. No. 3 is compulsory and attempt any two questions from the remaining questions.
1) In Section – II, Q. No. 6 is compulsory and attempt any two questions from the remaining questions.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.
4) Draw neat-labelled diagrams wherever necessary.
5) Use of log table and calculators is allowed.

Section – I

Q.2 **a)** What are managerial skills and managerial roles? **05**
b) Explain the Social responsibilities and ethics in management. **04**

Q.3 **a)** What is planning? Explain advantages and disadvantages of planning? **05**
b) What are the types of organizations? Explain Problems with organizational level. **05**

Q.4 **a)** Define Leadership. Explain four extreme styles. **05**
b) Discuss types of communication by taking suitable example. **04**

Q.5 **Write short note on any three.** **09**
a) Channel of distribution
b) Functions of Managers
c) Methods of Departmentation
d) Explain Maslow's theory
e) Decision making

Section – II

Q.6 **a)** Define productivity. How does material management impact the productivity of a manufacturing unit? **05**
b) Explain how the production process is planned and controlled in batch production systems. **05**

Q.7	**a)**	Describe the importance of supplier partnerships in Total Quality Management. What are the key aspects that define a successful supplier partnership?	**05**
	b)	Explain the concept of employee involvement in TQM. How does fostering employee participation contribute to improved quality and productivity?	**04**
Q.8	**a)**	Explain the importance of Training and Development in enhancing employee performance. How can training programs be aligned with organizational goals?	**05**
	b)	What are the objectives of Human Resource Management (HRM)? Discuss how HRM helps in managing employee relations and improving organizational efficiency.	**04**

Q.9 Write short note on any three. **09**

- **a)** Material Requirement Planning (MRP)
- **b)** Batch Production
- **c)** Factors to improve productivity
- **d)** Functions of Production Planning and Control (PPC)
- **e)** Mass Production - Advantages and Disadvantages

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Which theory focuses on the hierarchy of needs to motivate employees?
a) Herzberg's Two-Factor Theory
b) McGregor's Theory X and Y
c) Maslow's Hierarchy of Needs
d) Adams' Equity Theory

2) What is the main purpose of controlling in management?
a) To set goals
b) To ensure that organizational activities are aligned with plans
c) To improve employee morale
d) To increase production

3) What type of costs includes costs associated with preventing defects?
a) Internal failure costs b) External failure costs
c) Appraisal costs d) Prevention costs

4) Which quality guru is known for his work in the field of quality improvement through statistical methods?
a) Philip Crosby b) W. Edwards Deming
c) Joseph Juran d) Kaoru Ishikawa

5) Which chart is used to monitor the mean of a process over time?
a) R-chart b) P-chart
c) C-chart d) X-bar chart

6) Acceptance sampling is primarily concerned with:
a) Evaluating the entire production process
b) Inspecting all items produced
c) Testing a sample to infer about the quality of the entire lot
d) Conducting customer satisfaction surveys

7) What is the primary goal of employee involvement in TQM?
a) To increase profits
b) To enhance product quality through teamwork and engagement
c) To reduce the number of employees
d) To focus solely on production output

8) What is the primary purpose of management?
a) To maximize profits
b) To achieve organizational goals efficiently
c) To manage resources effectively
d) To implement policies

9) Which approach emphasizes the interdependence of various organizational functions?
a) Classical Approach b) Systems Approach
c) Behavioral Approach d) Contingency Approach

10) What is NOT a function of managers?
a) Planning b) Organizing
c) Playing d) Controlling

11) Which of the following is a responsibility of managers regarding social responsibility?
a) Maximizing shareholder wealth
b) Ensuring employee satisfaction
c) Contributing to community welfare
d) Minimizing costs

12) What is the first step in the planning process?
a) Developing alternatives b) Setting objectives
c) Implementing plans d) Evaluating results

13) Which type of plan is designed to cover a short period?
a) Strategic Plan b) Tactical Plan
c) Operational Plan d) Contingency Plan

14) Which of the following is a part of the staffing function?
a) Budgeting b) Training
c) Planning d) Controlling

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section – I, Q. No. 3 is compulsory and attempt any two questions from the remaining questions.
1) In Section – II, Q. No. 6 is compulsory and attempt any two questions from the remaining questions.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.
4) Draw neat-labelled diagrams wherever necessary.
5) Use of log table and calculators is allowed.

Section – I

Q.2 **a)** What are managerial skills and managerial roles? **05**
b) Explain the Social responsibilities and ethics in management. **04**

Q.3 **a)** What is planning? Explain advantages and disadvantages of planning? **05**
b) What are the types of organizations? Explain Problems with organizational level. **05**

Q.4 **a)** Define Leadership. Explain four extreme styles. **05**
b) Discuss types of communication by taking suitable example. **04**

Q.5 **Write short note on any three.** **09**
a) Channel of distribution
b) Functions of Managers
c) Methods of Departmentation
d) Explain Maslow's theory
e) Decision making

Section – II

Q.6 **a)** Define productivity. How does material management impact the productivity of a manufacturing unit? **05**
b) Explain how the production process is planned and controlled in batch production systems. **05**

Q.7	**a)**	Describe the importance of supplier partnerships in Total Quality Management. What are the key aspects that define a successful supplier partnership?	**05**
	b)	Explain the concept of employee involvement in TQM. How does fostering employee participation contribute to improved quality and productivity?	**04**
Q.8	**a)**	Explain the importance of Training and Development in enhancing employee performance. How can training programs be aligned with organizational goals?	**05**
	b)	What are the objectives of Human Resource Management (HRM)? Discuss how HRM helps in managing employee relations and improving organizational efficiency.	**04**
Q.9	**Write short note on any three.**		**09**
	a)	Material Requirement Planning (MRP)	
	b)	Batch Production	
	c)	Factors to improve productivity	
	d)	Functions of Production Planning and Control (PPC)	
	e)	Mass Production - Advantages and Disadvantages	

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which quality guru is known for his work in the field of quality improvement through statistical methods?
a) Philip Crosby b) W. Edwards Deming
c) Joseph Juran d) Kaoru Ishikawa

2) Which chart is used to monitor the mean of a process over time?
a) R-chart b) P-chart
c) C-chart d) X-bar chart

3) Acceptance sampling is primarily concerned with:
a) Evaluating the entire production process
b) Inspecting all items produced
c) Testing a sample to infer about the quality of the entire lot
d) Conducting customer satisfaction surveys

4) What is the primary goal of employee involvement in TQM?
a) To increase profits
b) To enhance product quality through teamwork and engagement
c) To reduce the number of employees
d) To focus solely on production output

5) What is the primary purpose of management?
a) To maximize profits
b) To achieve organizational goals efficiently
c) To manage resources effectively
d) To implement policies

6) Which approach emphasizes the interdependence of various organizational functions?

a) Classical Approach b) Systems Approach
c) Behavioral Approach d) Contingency Approach

7) What is NOT a function of managers?

a) Planning b) Organizing
c) Playing d) Controlling

8) Which of the following is a responsibility of managers regarding social responsibility?

a) Maximizing shareholder wealth
b) Ensuring employee satisfaction
c) Contributing to community welfare
d) Minimizing costs

9) What is the first step in the planning process?

a) Developing alternatives b) Setting objectives
c) Implementing plans d) Evaluating results

10) Which type of plan is designed to cover a short period?

a) Strategic Plan b) Tactical Plan
c) Operational Plan d) Contingency Plan

11) Which of the following is a part of the staffing function?

a) Budgeting b) Training
c) Planning d) Controlling

12) Which theory focuses on the hierarchy of needs to motivate employees?

a) Herzberg's Two-Factor Theory
b) McGregor's Theory X and Y
c) Maslow's Hierarchy of Needs
d) Adams' Equity Theory

13) What is the main purpose of controlling in management?

a) To set goals
b) To ensure that organizational activities are aligned with plans
c) To improve employee morale
d) To increase production

14) What type of costs includes costs associated with preventing defects?

a) Internal failure costs b) External failure costs
c) Appraisal costs d) Prevention costs

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section – I, Q. No. 3 is compulsory and attempt any two questions from the remaining questions.
1) In Section – II, Q. No. 6 is compulsory and attempt any two questions from the remaining questions.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.
4) Draw neat-labelled diagrams wherever necessary.
5) Use of log table and calculators is allowed.

Section – I

Q.2 **a)** What are managerial skills and managerial roles? **05**
b) Explain the Social responsibilities and ethics in management. **04**

Q.3 **a)** What is planning? Explain advantages and disadvantages of planning? **05**
b) What are the types of organizations? Explain Problems with organizational level. **05**

Q.4 **a)** Define Leadership. Explain four extreme styles. **05**
b) Discuss types of communication by taking suitable example. **04**

Q.5 **Write short note on any three.** **09**
a) Channel of distribution
b) Functions of Managers
c) Methods of Departmentation
d) Explain Maslow's theory
e) Decision making

Section – II

Q.6 **a)** Define productivity. How does material management impact the productivity of a manufacturing unit? **05**
b) Explain how the production process is planned and controlled in batch production systems. **05**

Q.7	**a)**	Describe the importance of supplier partnerships in Total Quality Management. What are the key aspects that define a successful supplier partnership?	**05**
	b)	Explain the concept of employee involvement in TQM. How does fostering employee participation contribute to improved quality and productivity?	**04**
Q.8	**a)**	Explain the importance of Training and Development in enhancing employee performance. How can training programs be aligned with organizational goals?	**05**
	b)	What are the objectives of Human Resource Management (HRM)? Discuss how HRM helps in managing employee relations and improving organizational efficiency.	**04**

Q.9 Write short note on any three. **09**

- **a)** Material Requirement Planning (MRP)
- **b)** Batch Production
- **c)** Factors to improve productivity
- **d)** Functions of Production Planning and Control (PPC)
- **e)** Mass Production - Advantages and Disadvantages

Seat No.	

Set | S

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which type of plan is designed to cover a short period?
a) Strategic Plan b) Tactical Plan
c) Operational Plan d) Contingency Plan

2) Which of the following is a part of the staffing function?
a) Budgeting b) Training
c) Planning d) Controlling

3) Which theory focuses on the hierarchy of needs to motivate employees?
a) Herzberg's Two-Factor Theory
b) McGregor's Theory X and Y
c) Maslow's Hierarchy of Needs
d) Adams' Equity Theory

4) What is the main purpose of controlling in management?
a) To set goals
b) To ensure that organizational activities are aligned with plans
c) To improve employee morale
d) To increase production

5) What type of costs includes costs associated with preventing defects?
a) Internal failure costs b) External failure costs
c) Appraisal costs d) Prevention costs

6) Which quality guru is known for his work in the field of quality improvement through statistical methods?
a) Philip Crosby b) W. Edwards Deming
c) Joseph Juran d) Kaoru Ishikawa

7) Which chart is used to monitor the mean of a process over time?
a) R-chart b) P-chart
c) C-chart d) X-bar chart

8) Acceptance sampling is primarily concerned with:
a) Evaluating the entire production process
b) Inspecting all items produced
c) Testing a sample to infer about the quality of the entire lot
d) Conducting customer satisfaction surveys

9) What is the primary goal of employee involvement in TQM?
a) To increase profits
b) To enhance product quality through teamwork and engagement
c) To reduce the number of employees
d) To focus solely on production output

10) What is the primary purpose of management?
a) To maximize profits
b) To achieve organizational goals efficiently
c) To manage resources effectively
d) To implement policies

11) Which approach emphasizes the interdependence of various organizational functions?
a) Classical Approach b) Systems Approach
c) Behavioral Approach d) Contingency Approach

12) What is NOT a function of managers?
a) Planning b) Organizing
c) Playing d) Controlling

13) Which of the following is a responsibility of managers regarding social responsibility?
a) Maximizing shareholder wealth
b) Ensuring employee satisfaction
c) Contributing to community welfare
d) Minimizing costs

14) What is the first step in the planning process?
a) Developing alternatives b) Setting objectives
c) Implementing plans d) Evaluating results

SLR-BD-189

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section – I, Q. No. 3 is compulsory and attempt any two questions from the remaining questions.
1) In Section – II, Q. No. 6 is compulsory and attempt any two questions from the remaining questions.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.
4) Draw neat-labelled diagrams wherever necessary.
5) Use of log table and calculators is allowed.

Section – I

Q.2	**a)**	What are managerial skills and managerial roles?	**05**
	b)	Explain the Social responsibilities and ethics in management.	**04**
Q.3	**a)**	What is planning? Explain advantages and disadvantages of planning?	**05**
	b)	What are the types of organizations? Explain Problems with organizational level.	**05**
Q.4	**a)**	Define Leadership. Explain four extreme styles.	**05**
	b)	Discuss types of communication by taking suitable example.	**04**
Q.5	**Write short note on any three.**		**09**
	a)	Channel of distribution	
	b)	Functions of Managers	
	c)	Methods of Departmentation	
	d)	Explain Maslow's theory	
	e)	Decision making	

Section – II

Q.6	**a)**	Define productivity. How does material management impact the productivity of a manufacturing unit?	**05**
	b)	Explain how the production process is planned and controlled in batch production systems.	**05**

Q.7	**a)**	Describe the importance of supplier partnerships in Total Quality Management. What are the key aspects that define a successful supplier partnership?	**05**
	b)	Explain the concept of employee involvement in TQM. How does fostering employee participation contribute to improved quality and productivity?	**04**
Q.8	**a)**	Explain the importance of Training and Development in enhancing employee performance. How can training programs be aligned with organizational goals?	**05**
	b)	What are the objectives of Human Resource Management (HRM)? Discuss how HRM helps in managing employee relations and improving organizational efficiency.	**04**

Q.9 Write short note on any three. **09**

- **a)** Material Requirement Planning (MRP)
- **b)** Batch Production
- **c)** Factors to improve productivity
- **d)** Functions of Production Planning and Control (PPC)
- **e)** Mass Production - Advantages and Disadvantages

SLR-BD-190

Seat No.		Set	P

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the output of print(3 * 4.5 // 2)?
a) 5 b) 6
c) 7 d) 8

2) Which data type is mutable in Python?
a) int b) float
c) tuple d) list

3) What is the primary purpose of the Python interpreter?
a) To convert Python code into machine code directly.
b) To compile Python code into a .exe file.
c) To interpret and execute Python code line by line.
d) To optimize Python code for faster execution.

4) How do you import a function myfunc from a module mymodule?
a) import mymodule .myfunc
b) from mymodule import myfunc
c) import myfunc from mymodule
d) from myfunc import mymodule

5) Which statement about tuples in Python is true?
a) Tuples can be modified after creation.
b) Tuples are indexed starting from 1.
c) Tuples use square brackets for element access.
d) Tuples are immutable.

6) Given s = 'Hello World!', what does s[1:5] evaluate to?
a) 'Hell' b) 'ello'
c) 'ello ' d) None of the above

7) Which keyword is used to handle exceptions in Python?

a) catch b) except
c) handle d) recover

8) What does the self parameter represent in Python class methods?

a) It refers to the current instance of the class.
b) It is used to denote private attributes.
c) It is used for method overloading.
d) It refers to the superclass.

9) What does the following code output?

```
class MyClass:
    def greet(self):
    return "Hello!"
obj = MyClass()
print(obj.greet())
```

a) Hello! b) greet
c) Error d) None

10) How do you open a file myfile.txt in read mode in Python?

a) file = open('myfile.txt', 'r')
b) file = open('myfile.txf)
c) file = open('myfile.txt', mode='read')
d) file = open('myfile.txt', mode='w')

11) Which Python library is used for numerical operations and array manipulations?

a) numpy b) math
c) scipy d) statistics

12) Which Python module is commonly used for writing unit tests?

a) unittest b) pytest
c) testing d) check

13) Which module is used to generate pseudo-random numbers in Python?

a) random b) numpy
c) math d) os

14) What is the default logging level in Python?

a) DEBUG b) INFO
c) WARNING d) ERROR

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) What is python interpreter? Explain with neat diagram.
b) Differentiate between list and tuples in python.
c) Write a python program to check whether a given string is palindrome.
d) What are the class and objects in python? Explain with syntax and example.
e) What is exceptional handling in python? How it is implemented using try, except and finally block?

Q.3 Attempt any two. **12**

a) Illustrate following control structures and write syntax for each type of control structure.
1) Decision making statements
2) Iterative statements (Loop control statements)
3) Transfer statements
b) Explain string handling functions with syntax and example.
c) Explain inheritance in python with their types.

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic date and time types with syntax and example.
b) Differentiate between shallow copy and deep copy operations.
c) Write a python program to create a 2D Numpy array and perform basic operations like addition, subtraction, division and multiplication.
d) Implement a program to measure execution time of small code snippets.
e) Explain Logging facility in python with all levels of logging.

Q.5 Attempt any two. **12**

a) Explain mathematical functions and pseudo random functions with syntax and example.
b) Define data persistence and implement program for read & write operations on .csv file.
c) Explain the methods of testing and debugging in python. Explain unit test in python.

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What does the self parameter represent in Python class methods?
a) It refers to the current instance of the class.
b) It is used to denote private attributes.
c) It is used for method overloading.
d) It refers to the superclass.

2) What does the following code output?

```
class MyClass:
    def greet(self):
    return "Hello!"
obj = MyClass()
print(obj.greet())
```

a) Hello! b) greet
c) Error d) None

3) How do you open a file myfile.txt in read mode in Python?
a) file = open('myfile.txt', 'r')
b) file = open('myfile.txf)
c) file = open('myfile.txt', mode='read')
d) file = open('myfile.txt', mode='w')

4) Which Python library is used for numerical operations and array manipulations?
a) numpy b) math
c) scipy d) statistics

5) Which Python module is commonly used for writing unit tests?
a) unittest b) pytest
c) testing d) check

6) Which module is used to generate pseudo-random numbers in Python?

a) random b) numpy
c) math d) os

7) What is the default logging level in Python?

a) DEBUG b) INFO
c) WARNING d) ERROR

8) What is the output of print(3 * 4.5 // 2)?

a) 5 b) 6
c) 7 d) 8

9) Which data type is mutable in Python?

a) int b) float
c) tuple d) list

10) What is the primary purpose of the Python interpreter?

a) To convert Python code into machine code directly.
b) To compile Python code into a .exe file.
c) To interpret and execute Python code line by line.
d) To optimize Python code for faster execution.

11) How do you import a function myfunc from a module mymodule?

a) import mymodule .myfunc
b) from mymodule import myfunc
c) import myfunc from mymodule
d) from myfunc import mymodule

12) Which statement about tuples in Python is true?

a) Tuples can be modified after creation.
b) Tuples are indexed starting from 1.
c) Tuples use square brackets for element access.
d) Tuples are immutable.

13) Given s = 'Hello World!', what does s[1:5] evaluate to?

a) 'Hell' b) 'ello'
c) 'ello ' d) None of the above

14) Which keyword is used to handle exceptions in Python?

a) catch b) except
c) handle d) recover

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) What is python interpreter? Explain with neat diagram.
b) Differentiate between list and tuples in python.
c) Write a python program to check whether a given string is palindrome.
d) What are the class and objects in python? Explain with syntax and example.
e) What is exceptional handling in python? How it is implemented using try, except and finally block?

Q.3 Attempt any two. **12**

a) Illustrate following control structures and write syntax for each type of control structure.
1) Decision making statements
2) Iterative statements (Loop control statements)
3) Transfer statements
b) Explain string handling functions with syntax and example.
c) Explain inheritance in python with their types.

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic date and time types with syntax and example.
b) Differentiate between shallow copy and deep copy operations.
c) Write a python program to create a 2D Numpy array and perform basic operations like addition, subtraction, division and multiplication.
d) Implement a program to measure execution time of small code snippets.
e) Explain Logging facility in python with all levels of logging.

Q.5 Attempt any two. **12**

a) Explain mathematical functions and pseudo random functions with syntax and example.
b) Define data persistence and implement program for read & write operations on .csv file.
c) Explain the methods of testing and debugging in python. Explain unit test in python.

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which Python library is used for numerical operations and array manipulations?
a) numpy b) math
c) scipy d) statistics

2) Which Python module is commonly used for writing unit tests?
a) unittest b) pytest
c) testing d) check

3) Which module is used to generate pseudo-random numbers in Python?
a) random b) numpy
c) math d) os

4) What is the default logging level in Python?
a) DEBUG b) INFO
c) WARNING d) ERROR

5) What is the output of print(3 * 4.5 // 2)?
a) 5 b) 6
c) 7 d) 8

6) Which data type is mutable in Python?
a) int b) float
c) tuple d) list

7) What is the primary purpose of the Python interpreter?
a) To convert Python code into machine code directly.
b) To compile Python code into a .exe file.
c) To interpret and execute Python code line by line.
d) To optimize Python code for faster execution.

8) How do you import a function myfunc from a module mymodule?
a) import mymodule .myfunc
b) from mymodule import myfunc
c) import myfunc from mymodule
d) from myfunc import mymodule

9) Which statement about tuples in Python is true?
a) Tuples can be modified after creation.
b) Tuples are indexed starting from 1.
c) Tuples use square brackets for element access.
d) Tuples are immutable.

10) Given s = 'Hello World!', what does s[1:5] evaluate to?
a) 'Hell' b) 'ello'
c) 'ello ' d) None of the above

11) Which keyword is used to handle exceptions in Python?
a) catch b) except
c) handle d) recover

12) What does the self parameter represent in Python class methods?
a) It refers to the current instance of the class.
b) It is used to denote private attributes.
c) It is used for method overloading.
d) It refers to the superclass.

13) What does the following code output?

```
class MyClass:
    def greet(self):
    return "Hello!"
obj = MyClass()
print(obj.greet())
```

a) Hello! b) greet
c) Error d) None

14) How do you open a file myfile.txt in read mode in Python?
a) file = open('myfile.txt', 'r')
b) file = open('myfile.txf)
c) file = open('myfile.txt', mode='read')
d) file = open('myfile.txt', mode='w')

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) What is python interpreter? Explain with neat diagram.
b) Differentiate between list and tuples in python.
c) Write a python program to check whether a given string is palindrome.
d) What are the class and objects in python? Explain with syntax and example.
e) What is exceptional handling in python? How it is implemented using try, except and finally block?

Q.3 Attempt any two. **12**

a) Illustrate following control structures and write syntax for each type of control structure.
1) Decision making statements
2) Iterative statements (Loop control statements)
3) Transfer statements
b) Explain string handling functions with syntax and example.
c) Explain inheritance in python with their types.

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic date and time types with syntax and example.
b) Differentiate between shallow copy and deep copy operations.
c) Write a python program to create a 2D Numpy array and perform basic operations like addition, subtraction, division and multiplication.
d) Implement a program to measure execution time of small code snippets.
e) Explain Logging facility in python with all levels of logging.

Q.5 Attempt any two. **12**

a) Explain mathematical functions and pseudo random functions with syntax and example.
b) Define data persistence and implement program for read & write operations on .csv file.
c) Explain the methods of testing and debugging in python. Explain unit test in python.

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Given s = 'Hello World!', what does s[1:5] evaluate to?
a) 'Hell' b) 'ello'
c) 'ello ' d) None of the above

2) Which keyword is used to handle exceptions in Python?
a) catch b) except
c) handle d) recover

3) What does the self parameter represent in Python class methods?
a) It refers to the current instance of the class.
b) It is used to denote private attributes.
c) It is used for method overloading.
d) It refers to the superclass.

4) What does the following code output?

```
class MyClass:
    def greet(self):
    return "Hello!"
obj = MyClass()
print(obj.greet())
```

a) Hello! b) greet
c) Error d) None

5) How do you open a file myfile.txt in read mode in Python?
a) file = open('myfile.txt', 'r')
b) file = open('myfile.txf)
c) file = open('myfile.txt', mode='read')
d) file = open('myfile.txt', mode='w')

6) Which Python library is used for numerical operations and array manipulations?

a) numpy b) math
c) scipy d) statistics

7) Which Python module is commonly used for writing unit tests?

a) unittest b) pytest
c) testing d) check

8) Which module is used to generate pseudo-random numbers in Python?

a) random b) numpy
c) math d) os

9) What is the default logging level in Python?

a) DEBUG b) INFO
c) WARNING d) ERROR

10) What is the output of print(3 * 4.5 // 2)?

a) 5 b) 6
c) 7 d) 8

11) Which data type is mutable in Python?

a) int b) float
c) tuple d) list

12) What is the primary purpose of the Python interpreter?

a) To convert Python code into machine code directly.
b) To compile Python code into a .exe file.
c) To interpret and execute Python code line by line.
d) To optimize Python code for faster execution.

13) How do you import a function myfunc from a module mymodule?

a) import mymodule .myfunc
b) from mymodule import myfunc
c) import myfunc from mymodule
d) from myfunc import mymodule

14) Which statement about tuples in Python is true?

a) Tuples can be modified after creation.
b) Tuples are indexed starting from 1.
c) Tuples use square brackets for element access.
d) Tuples are immutable.

SLR-BD-190

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) What is python interpreter? Explain with neat diagram.
b) Differentiate between list and tuples in python.
c) Write a python program to check whether a given string is palindrome.
d) What are the class and objects in python? Explain with syntax and example.
e) What is exceptional handling in python? How it is implemented using try, except and finally block?

Q.3 Attempt any two. **12**

a) Illustrate following control structures and write syntax for each type of control structure.
1) Decision making statements
2) Iterative statements (Loop control statements)
3) Transfer statements
b) Explain string handling functions with syntax and example.
c) Explain inheritance in python with their types.

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic date and time types with syntax and example.
b) Differentiate between shallow copy and deep copy operations.
c) Write a python program to create a 2D Numpy array and perform basic operations like addition, subtraction, division and multiplication.
d) Implement a program to measure execution time of small code snippets.
e) Explain Logging facility in python with all levels of logging.

Q.5 Attempt any two. **12**

a) Explain mathematical functions and pseudo random functions with syntax and example.
b) Define data persistence and implement program for read & write operations on .csv file.
c) Explain the methods of testing and debugging in python. Explain unit test in python.

SLR-BD-191

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ model is good for well understood problems, short duration project, and automation of existing manual systems.
a) Waterfall b) Iterative enhancement
c) Prototyping d) Spiral

2) Software consists of ____.
a) Set of instructions + operating procedures
b) Set of programs
c) Programs + documentation + operating procedures
d) Programs + hardware manuals

3) SDLC is framework for ____
a) Requirement b) Design
c) Code & Test d) All of above

4) Black box testing is also called as ____.
a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

5) A detailed project schedule is never ____.
a) fixed b) variable
c) dynamic d) static

6) What is the sequence of maturity levels in CMM framework?
a) Initial, defined, repeatable, managed, and optimizing
b) Initial, defined, repeatable, optimizing, and managed
c) Initial, repeatable, defined, managed, and optimizing
d) Initial, repeatable, defined, optimizing, and managed

7) A ____ is logically separable part of program. It is a program unit that is discrete and identifiable with respect to compiling and loading.

a) Component b) Connector
c) Module d) None of above

8) Risk Management aims to ____ and then take action to minimize their effect on project.

a) Identify cost and estimation
b) Identify risks
c) Identify plan
d) All of above

9) The output of requirement process is ____

a) Validated SRS b) Validation
c) Problem analysis d) Verification

10) White Box Testing is also called as ____.

a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

11) Agile Software Development is depends on ____.

a) Incremental Development
b) Iterative Development
c) Linear Development
d) Both Incremental and Iterative Development

12) ____ is a first level of testing.

a) Unit testing b) Integration Testing
c) System Testing d) None of above

13) CMM means ____.

a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

14) Which of the following is/are characteristics of SRS?

a) Unambiguous b) Verifiable
c) Consistent d) All of above

Seat No.	

Set **P**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Solve: (Any Four) **16**

a) Explain Prototype model.
b) What is SRS? Explain characteristics of SRS.
c) Explain Entity Relationship diagram in detail.
d) Write a short note on Function Oriented Design.
e) Explain characteristics of software process.

Q.3 Solve: (Any Two) **12**

a) Define DFD with all notations and levels. Draw Zero level DFD for Hotel Management System.
b) Draw and Explain waterfall model with its strength and weaknesses.
c) Write a short note on high level design & detailed design.

SECTION – II

Q.4 Solve: (Any Two) **16**

a) Compare White and Black box testing.
b) Explain equivalence partitioning technique of black box testing.
c) Explain CMM with diagram.
d) What are levels of testing? Explain Unit Testing in detail.
e) Write a short note on Agile Project Management.

Q.5 Solve: (Any Two) **12**

a) Explain top down & bottom-up effort estimation technique.
b) Explain Software Configuration Management Process.
c) What is Scrum? Explain in detail Scrum methodology.

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Risk Management aims to ____ and then take action to minimize their effect on project.
a) Identify cost and estimation
b) Identify risks
c) Identify plan
d) All of above

2) The output of requirement process is ____
a) Validated SRS b) Validation
c) Problem analysis d) Verification

3) White Box Testing is also called as ____.
a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

4) Agile Software Development is depends on ____.
a) Incremental Development
b) Iterative Development
c) Linear Development
d) Both Incremental and Iterative Development

5) ____ is a first level of testing.
a) Unit testing b) Integration Testing
c) System Testing d) None of above

6) CMM means ____.
a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

7) Which of the following is/are characteristics of SRS?
a) Unambiguous b) Verifiable
c) Consistent d) All of above

8) ____ model is good for well understood problems, short duration project, and automation of existing manual systems.
a) Waterfall b) Iterative enhancement
c) Prototyping d) Spiral

9) Software consists of ____.
a) Set of instructions + operating procedures
b) Set of programs
c) Programs + documentation + operating procedures
d) Programs + hardware manuals

10) SDLC is framework for ____
a) Requirement b) Design
c) Code & Test d) All of above

11) Black box testing is also called as ____.
a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

12) A detailed project schedule is never ____.
a) fixed b) variable
c) dynamic d) static

13) What is the sequence of maturity levels in CMM framework?
a) Initial, defined, repeatable, managed, and optimizing
b) Initial, defined, repeatable, optimizing, and managed
c) Initial, repeatable, defined, managed, and optimizing
d) Initial, repeatable, defined, optimizing, and managed

14) A ____ is logically separable part of program. It is a program unit that is discrete and identifiable with respect to compiling and loading.
a) Component b) Connector
c) Module d) None of above

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Solve: (Any Four) **16**

a) Explain Prototype model.
b) What is SRS? Explain characteristics of SRS.
c) Explain Entity Relationship diagram in detail.
d) Write a short note on Function Oriented Design.
e) Explain characteristics of software process.

Q.3 Solve: (Any Two) **12**

a) Define DFD with all notations and levels. Draw Zero level DFD for Hotel Management System.
b) Draw and Explain waterfall model with its strength and weaknesses.
c) Write a short note on high level design & detailed design.

SECTION – II

Q.4 Solve: (Any Two) **16**

a) Compare White and Black box testing.
b) Explain equivalence partitioning technique of black box testing.
c) Explain CMM with diagram.
d) What are levels of testing? Explain Unit Testing in detail.
e) Write a short note on Agile Project Management.

Q.5 Solve: (Any Two) **12**

a) Explain top down & bottom-up effort estimation technique.
b) Explain Software Configuration Management Process.
c) What is Scrum? Explain in detail Scrum methodology.

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Agile Software Development is depends on ____.
a) Incremental Development
b) Iterative Development
c) Linear Development
d) Both Incremental and Iterative Development

2) ____ is a first level of testing.
a) Unit testing b) Integration Testing
c) System Testing d) None of above

3) CMM means ____.
a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

4) Which of the following is/are characteristics of SRS?
a) Unambiguous b) Verifiable
c) Consistent d) All of above

5) ____ model is good for well understood problems, short duration project, and automation of existing manual systems.
a) Waterfall b) Iterative enhancement
c) Prototyping d) Spiral

6) Software consists of ____.
a) Set of instructions + operating procedures
b) Set of programs
c) Programs + documentation + operating procedures
d) Programs + hardware manuals

7) SDLC is framework for ____

a) Requirement b) Design
c) Code & Test d) All of above

8) Black box testing is also called as ____.

a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

9) A detailed project schedule is never ____.

a) fixed b) variable
c) dynamic d) static

10) What is the sequence of maturity levels in CMM framework?

a) Initial, defined, repeatable, managed, and optimizing
b) Initial, defined, repeatable, optimizing, and managed
c) Initial, repeatable, defined, managed, and optimizing
d) Initial, repeatable, defined, optimizing, and managed

11) A ____ is logically separable part of program. It is a program unit that is discrete and identifiable with respect to compiling and loading.

a) Component b) Connector
c) Module d) None of above

12) Risk Management aims to ____ and then take action to minimize their effect on project.

a) Identify cost and estimation
b) Identify risks
c) Identify plan
d) All of above

13) The output of requirement process is ____

a) Validated SRS b) Validation
c) Problem analysis d) Verification

14) White Box Testing is also called as ____.

a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Solve: (Any Four) **16**

a) Explain Prototype model.
b) What is SRS? Explain characteristics of SRS.
c) Explain Entity Relationship diagram in detail.
d) Write a short note on Function Oriented Design.
e) Explain characteristics of software process.

Q.3 Solve: (Any Two) **12**

a) Define DFD with all notations and levels. Draw Zero level DFD for Hotel Management System.
b) Draw and Explain waterfall model with its strength and weaknesses.
c) Write a short note on high level design & detailed design.

SECTION – II

Q.4 Solve: (Any Two) **16**

a) Compare White and Black box testing.
b) Explain equivalence partitioning technique of black box testing.
c) Explain CMM with diagram.
d) What are levels of testing? Explain Unit Testing in detail.
e) Write a short note on Agile Project Management.

Q.5 Solve: (Any Two) **12**

a) Explain top down & bottom-up effort estimation technique.
b) Explain Software Configuration Management Process.
c) What is Scrum? Explain in detail Scrum methodology.

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the sequence of maturity levels in CMM framework?
a) Initial, defined, repeatable, managed, and optimizing
b) Initial, defined, repeatable, optimizing, and managed
c) Initial, repeatable, defined, managed, and optimizing
d) Initial, repeatable, defined, optimizing, and managed

2) A ____ is logically separable part of program. It is a program unit that is discrete and identifiable with respect to compiling and loading.
a) Component b) Connector
c) Module d) None of above

3) Risk Management aims to ____ and then take action to minimize their effect on project.
a) Identify cost and estimation
b) Identify risks
c) Identify plan
d) All of above

4) The output of requirement process is ____
a) Validated SRS b) Validation
c) Problem analysis d) Verification

5) White Box Testing is also called as ____.
a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

6) Agile Software Development is depends on ____.
a) Incremental Development
b) Iterative Development
c) Linear Development
d) Both Incremental and Iterative Development

7) ____ is a first level of testing.
a) Unit testing b) Integration Testing
c) System Testing d) None of above

8) CMM means ____.
a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

9) Which of the following is/are characteristics of SRS?
a) Unambiguous b) Verifiable
c) Consistent d) All of above

10) ____ model is good for well understood problems, short duration project, and automation of existing manual systems.
a) Waterfall b) Iterative enhancement
c) Prototyping d) Spiral

11) Software consists of ____.
a) Set of instructions + operating procedures
b) Set of programs
c) Programs + documentation + operating procedures
d) Programs + hardware manuals

12) SDLC is framework for ____
a) Requirement b) Design
c) Code & Test d) All of above

13) Black box testing is also called as ____.
a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

14) A detailed project schedule is never ____.
a) fixed b) variable
c) dynamic d) static

SLR-BD-191

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Solve: (Any Four) **16**

a) Explain Prototype model.
b) What is SRS? Explain characteristics of SRS.
c) Explain Entity Relationship diagram in detail.
d) Write a short note on Function Oriented Design.
e) Explain characteristics of software process.

Q.3 Solve: (Any Two) **12**

a) Define DFD with all notations and levels. Draw Zero level DFD for Hotel Management System.
b) Draw and Explain waterfall model with its strength and weaknesses.
c) Write a short note on high level design & detailed design.

SECTION – II

Q.4 Solve: (Any Two) **16**

a) Compare White and Black box testing.
b) Explain equivalence partitioning technique of black box testing.
c) Explain CMM with diagram.
d) What are levels of testing? Explain Unit Testing in detail.
e) Write a short note on Agile Project Management.

Q.5 Solve: (Any Two) **12**

a) Explain top down & bottom-up effort estimation technique.
b) Explain Software Configuration Management Process.
c) What is Scrum? Explain in detail Scrum methodology.

SLR-BD-192

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is an advantage of electronic energy meters over induction-type meters?
a) Higher accuracy b) More moving parts
c) More expensive d) Require more maintenance

2) Moving iron instruments have _____.
a) Uniform scale b) Squared scale
c) Log scale d) Linear scale

3) Digital voltmeters convert _____.
a) Analog to digital signal b) Digital to analog signal
c) Current to voltage d) Resistance to voltage

4) In a separately excited DC motor, the field windings are _____.
a) Connected in series with the armature
b) Supplied from an independent source
c) Connected to the same supply as the armature
d) None of above

5) A single-phase induction motor is inherently _____.
a) Self-starting
b) Not self-starting
c) More efficient than a three-phase motor
d) Can operate on both AC and DC supplies

6) The synchronous speed of a synchronous generator is dependent on __.
a) Rotor size
b) Number of poles and frequency
c) Magnetic field strength
d) Load current

7) The synchronous generator operates at _____.
a) A variable speed
b) A constant speed
c) A speed proportional to the load
d) A speed inversely proportional to the load

8) What is the main advantage of a permanent magnet DC motor over a conventional DC motor?
a) No need for a field winding b) Higher efficiency at low speeds
c) Reduced cost of construction d) All of the above

9) Which of the following is an application of PMSMs?
a) Fans b) Electric vehicles
c) HVAC systems d) All of the above

10) What is the purpose of laminated cores in AC machines?
a) Reduce mechanical stress
b) Minimize eddy current losses
c) Increase the resistance of the windings
d) Improve heat dissipation

11) In energy-efficient AC motors, the stator windings are often made of _____.
a) Aluminum b) Copper
c) Steel d) Brass

12) Which of the following does not change in a transformer?
a) Current b) Voltage
c) Frequency d) All of the above

13) When a transformer is loaded, the primary current?
a) Increases b) Decreases
c) Remains constant d) Becomes zero

14) Open circuit test on transformers is conducted to determine _____.
a) hysteresis losses b) copper losses
c) core losses d) eddy current losses

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) With neat sketch explain PMMC type instrument.
b) A 3-phase 500V motor load has a power factor of 0.4 two wattmeter connected to measure input. They show input to be 30 KW. Find the reading of each instrument.
c) With neat sketch explain the construction of DC machine.
d) What is the purpose of the auxiliary winding in a single-phase induction motor?
e) Explain the working principle of a synchronous generator.

Q.3 Attempt any two. **12**

a) Explain 1 - ø induction energy meter with neat diagram.
b) Explain the speed control techniques of separately excited dc motor.
c) Explain the principle of operation of 3ø induction motor. With the help of phasor diagram explain how rotating magnetic field is produced?

Section – II

Q.4 Attempt any Four. **16**

a) Explain with neat sketch construction of permanent magnet brushless DC motor.
b) Explain the principle of operation of a linear induction motor.
c) Discuss the techniques used to reduce iron losses in energy-efficient AC machines.
d) A 230/2300V transformer takes a no-load current of 6.5 A and absorbs 187W if the resistance of the primary is 0.6 Ω. Find.
1) the core loss
2) no load power factor
3) active component of current
4) magnetizing current
e) Derive the expression for saving of copper in autotransformer.

Q.5 Attempt any two. **12**

a) What are the applications of Synchronous Reluctance Motor? Explain with phasor diagram torque speed characteristics of Synchronous Reluctance Motor.

b) An energy-efficient AC motor has the following loss components:
Copper losses: 2 kW
Iron losses: 1.5 kW
Friction and windage losses: 0.5 kW
The input power is 25 kW. Calculate the efficiency of the motor.

c) With neat sketch explain open circuit and short circuit test of transformer. How equivalent circuit parameters and efficiency of a transformer are computed?

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the main advantage of a permanent magnet DC motor over a conventional DC motor?
a) No need for a field winding b) Higher efficiency at low speeds
c) Reduced cost of construction d) All of the above

2) Which of the following is an application of PMSMs?
a) Fans b) Electric vehicles
c) HVAC systems d) All of the above

3) What is the purpose of laminated cores in AC machines?
a) Reduce mechanical stress
b) Minimize eddy current losses
c) Increase the resistance of the windings
d) Improve heat dissipation

4) In energy-efficient AC motors, the stator windings are often made of _____.
a) Aluminum b) Copper
c) Steel d) Brass

5) Which of the following does not change in a transformer?
a) Current b) Voltage
c) Frequency d) All of the above

6) When a transformer is loaded, the primary current?
a) Increases b) Decreases
c) Remains constant d) Becomes zero

7) Open circuit test on transformers is conducted to determine _____.
a) hysteresis losses b) copper losses
c) core losses d) eddy current losses

8) Which of the following is an advantage of electronic energy meters over induction-type meters?
a) Higher accuracy b) More moving parts
c) More expensive d) Require more maintenance

9) Moving iron instruments have _____.
a) Uniform scale b) Squared scale
c) Log scale d) Linear scale

10) Digital voltmeters convert _____.
a) Analog to digital signal b) Digital to analog signal
c) Current to voltage d) Resistance to voltage

11) In a separately excited DC motor, the field windings are _____.
a) Connected in series with the armature
b) Supplied from an independent source
c) Connected to the same supply as the armature
d) None of above

12) A single-phase induction motor is inherently _____.
a) Self-starting
b) Not self-starting
c) More efficient than a three-phase motor
d) Can operate on both AC and DC supplies

13) The synchronous speed of a synchronous generator is dependent on __.
a) Rotor size
b) Number of poles and frequency
c) Magnetic field strength
d) Load current

14) The synchronous generator operates at _____.
a) A variable speed
b) A constant speed
c) A speed proportional to the load
d) A speed inversely proportional to the load

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) With neat sketch explain PMMC type instrument.
b) A 3-phase 500V motor load has a power factor of 0.4 two wattmeter connected to measure input. They show input to be 30 KW. Find the reading of each instrument.
c) With neat sketch explain the construction of DC machine.
d) What is the purpose of the auxiliary winding in a single-phase induction motor?
e) Explain the working principle of a synchronous generator.

Q.3 Attempt any two. **12**

a) Explain 1 - ø induction energy meter with neat diagram.
b) Explain the speed control techniques of separately excited dc motor.
c) Explain the principle of operation of 3ø induction motor. With the help of phasor diagram explain how rotating magnetic field is produced?

Section – II

Q.4 Attempt any Four. **16**

a) Explain with neat sketch construction of permanent magnet brushless DC motor.
b) Explain the principle of operation of a linear induction motor.
c) Discuss the techniques used to reduce iron losses in energy-efficient AC machines.
d) A 230/2300V transformer takes a no-load current of 6.5 A and absorbs 187W if the resistance of the primary is 0.6 Ω. Find.
1) the core loss
2) no load power factor
3) active component of current
4) magnetizing current
e) Derive the expression for saving of copper in autotransformer.

Q.5 Attempt any two. **12**

a) What are the applications of Synchronous Reluctance Motor? Explain with phasor diagram torque speed characteristics of Synchronous Reluctance Motor.

b) An energy-efficient AC motor has the following loss components:
Copper losses: 2 kW
Iron losses: 1.5 kW
Friction and windage losses: 0.5 kW
The input power is 25 kW. Calculate the efficiency of the motor.

c) With neat sketch explain open circuit and short circuit test of transformer. How equivalent circuit parameters and efficiency of a transformer are computed?

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) In energy-efficient AC motors, the stator windings are often made of _____.
a) Aluminum b) Copper
c) Steel d) Brass

2) Which of the following does not change in a transformer?
a) Current b) Voltage
c) Frequency d) All of the above

3) When a transformer is loaded, the primary current?
a) Increases b) Decreases
c) Remains constant d) Becomes zero

4) Open circuit test on transformers is conducted to determine _____.
a) hysteresis losses b) copper losses
c) core losses d) eddy current losses

5) Which of the following is an advantage of electronic energy meters over induction-type meters?
a) Higher accuracy b) More moving parts
c) More expensive d) Require more maintenance

6) Moving iron instruments have _____.
a) Uniform scale b) Squared scale
c) Log scale d) Linear scale

7) Digital voltmeters convert _____.
a) Analog to digital signal b) Digital to analog signal
c) Current to voltage d) Resistance to voltage

8) In a separately excited DC motor, the field windings are _____.
a) Connected in series with the armature
b) Supplied from an independent source
c) Connected to the same supply as the armature
d) None of above

9) A single-phase induction motor is inherently _____.
a) Self-starting
b) Not self-starting
c) More efficient than a three-phase motor
d) Can operate on both AC and DC supplies

10) The synchronous speed of a synchronous generator is dependent on __.
a) Rotor size
b) Number of poles and frequency
c) Magnetic field strength
d) Load current

11) The synchronous generator operates at _____.
a) A variable speed
b) A constant speed
c) A speed proportional to the load
d) A speed inversely proportional to the load

12) What is the main advantage of a permanent magnet DC motor over a conventional DC motor?
a) No need for a field winding b) Higher efficiency at low speeds
c) Reduced cost of construction d) All of the above

13) Which of the following is an application of PMSMs?
a) Fans b) Electric vehicles
c) HVAC systems d) All of the above

14) What is the purpose of laminated cores in AC machines?
a) Reduce mechanical stress
b) Minimize eddy current losses
c) Increase the resistance of the windings
d) Improve heat dissipation

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) With neat sketch explain PMMC type instrument.
b) A 3-phase 500V motor load has a power factor of 0.4 two wattmeter connected to measure input. They show input to be 30 KW. Find the reading of each instrument.
c) With neat sketch explain the construction of DC machine.
d) What is the purpose of the auxiliary winding in a single-phase induction motor?
e) Explain the working principle of a synchronous generator.

Q.3 Attempt any two. **12**

a) Explain 1 - ø induction energy meter with neat diagram.
b) Explain the speed control techniques of separately excited dc motor.
c) Explain the principle of operation of 3ø induction motor. With the help of phasor diagram explain how rotating magnetic field is produced?

Section – II

Q.4 Attempt any Four. **16**

a) Explain with neat sketch construction of permanent magnet brushless DC motor.
b) Explain the principle of operation of a linear induction motor.
c) Discuss the techniques used to reduce iron losses in energy-efficient AC machines.
d) A 230/2300V transformer takes a no-load current of 6.5 A and absorbs 187W if the resistance of the primary is 0.6 Ω. Find.
1) the core loss
2) no load power factor
3) active component of current
4) magnetizing current
e) Derive the expression for saving of copper in autotransformer.

Q.5 Attempt any two. **12**

a) What are the applications of Synchronous Reluctance Motor? Explain with phasor diagram torque speed characteristics of Synchronous Reluctance Motor.

b) An energy-efficient AC motor has the following loss components:
Copper losses: 2 kW
Iron losses: 1.5 kW
Friction and windage losses: 0.5 kW
The input power is 25 kW. Calculate the efficiency of the motor.

c) With neat sketch explain open circuit and short circuit test of transformer. How equivalent circuit parameters and efficiency of a transformer are computed?

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) The synchronous speed of a synchronous generator is dependent on __.
a) Rotor size
b) Number of poles and frequency
c) Magnetic field strength
d) Load current

2) The synchronous generator operates at _____.
a) A variable speed
b) A constant speed
c) A speed proportional to the load
d) A speed inversely proportional to the load

3) What is the main advantage of a permanent magnet DC motor over a conventional DC motor?
a) No need for a field winding b) Higher efficiency at low speeds
c) Reduced cost of construction d) All of the above

4) Which of the following is an application of PMSMs?
a) Fans b) Electric vehicles
c) HVAC systems d) All of the above

5) What is the purpose of laminated cores in AC machines?
a) Reduce mechanical stress
b) Minimize eddy current losses
c) Increase the resistance of the windings
d) Improve heat dissipation

6) In energy-efficient AC motors, the stator windings are often made of _____.
a) Aluminum b) Copper
c) Steel d) Brass

7) Which of the following does not change in a transformer?
a) Current b) Voltage
c) Frequency d) All of the above

8) When a transformer is loaded, the primary current?
a) Increases b) Decreases
c) Remains constant d) Becomes zero

9) Open circuit test on transformers is conducted to determine _____.
a) hysteresis losses b) copper losses
c) core losses d) eddy current losses

10) Which of the following is an advantage of electronic energy meters over induction-type meters?
a) Higher accuracy b) More moving parts
c) More expensive d) Require more maintenance

11) Moving iron instruments have _____.
a) Uniform scale b) Squared scale
c) Log scale d) Linear scale

12) Digital voltmeters convert _____.
a) Analog to digital signal b) Digital to analog signal
c) Current to voltage d) Resistance to voltage

13) In a separately excited DC motor, the field windings are _____.
a) Connected in series with the armature
b) Supplied from an independent source
c) Connected to the same supply as the armature
d) None of above

14) A single-phase induction motor is inherently _____.
a) Self-starting
b) Not self-starting
c) More efficient than a three-phase motor
d) Can operate on both AC and DC supplies

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Electrical Technology (EEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) With neat sketch explain PMMC type instrument.
b) A 3-phase 500V motor load has a power factor of 0.4 two wattmeter connected to measure input. They show input to be 30 KW. Find the reading of each instrument.
c) With neat sketch explain the construction of DC machine.
d) What is the purpose of the auxiliary winding in a single-phase induction motor?
e) Explain the working principle of a synchronous generator.

Q.3 Attempt any two. **12**

a) Explain 1 - ø induction energy meter with neat diagram.
b) Explain the speed control techniques of separately excited dc motor.
c) Explain the principle of operation of 3ø induction motor. With the help of phasor diagram explain how rotating magnetic field is produced?

Section – II

Q.4 Attempt any Four. **16**

a) Explain with neat sketch construction of permanent magnet brushless DC motor.
b) Explain the principle of operation of a linear induction motor.
c) Discuss the techniques used to reduce iron losses in energy-efficient AC machines.
d) A 230/2300V transformer takes a no-load current of 6.5 A and absorbs 187W if the resistance of the primary is 0.6 Ω. Find.
1) the core loss
2) no load power factor
3) active component of current
4) magnetizing current
e) Derive the expression for saving of copper in autotransformer.

Q.5 Attempt any two. **12**

a) What are the applications of Synchronous Reluctance Motor? Explain with phasor diagram torque speed characteristics of Synchronous Reluctance Motor.

b) An energy-efficient AC motor has the following loss components:
Copper losses: 2 kW
Iron losses: 1.5 kW
Friction and windage losses: 0.5 kW
The input power is 25 kW. Calculate the efficiency of the motor.

c) With neat sketch explain open circuit and short circuit test of transformer. How equivalent circuit parameters and efficiency of a transformer are computed?

SLR-BD-193

Seat No.		Set	P

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is an electric vehicle?
a) Vehicle powered by gasoline
b) Vehicle powered by Electricity
c) Vehicle powered by Diesel
d) Vehicle powered by solar energy

2) What is the function of electric motor in an EV?
a) To charge the battery b) To power the wheels
c) To generate electricity d) To cool the vehicle

3) What is the purpose of battery management system (BMS) in an EV?
a) To monitor and control the battery's state of charge
b) To power the electric motor
c) To generate electricity
d) To cool the vehicle

4) What is the primary advantage of hybrid electric vehicle?
a) Increase driving range
b) Decreased operating cost
c) Reduced Greenhouse gas emissions
d) All of above

5) What type of battery is commonly used in Battery Electric Vehicles?
a) Lead -acid battery b) Nickel- metal hybrid battery
c) Lithium- ion battery d) All of above

6) Which is the types of electric vehicle charging?
a) Level one charging b) Level two charging
c) DC fast charging d) All of the above

7) Which of the following affects battery lifespan?
a) Depth of discharge (DOD) b) Temperature
c) Charging Frequency d) All of above

8) What type of fuel do Fuel Cell Electric Vehicles use?
a) Gasoline b) Diesel
c) Hydrogen d) Natural gas

9) What is the primary cause of battery degradation?
a) Overcharge b) Undercharge
c) Depth of discharge d) High temperature

10) How does battery storage system help in grid stability?
a) By supplying reactive power
b) By absorbing excess energy
c) By providing frequency regulation
d) All of above

11) Which of the following is the benefit of Electric Vehicles?
a) Zero emission b) Lower operating cost
c) Improved performance d) All of above

12) What is the purpose of power electronic controller in electric vehicle?
a) To regulate the flow of electrical energy
b) To monitor the vehicles speed
c) To control the onboard charger
d) To regulate the battery's state of charge

13) What is the purpose of equalization in battery Storage?
a) To balance cell voltage b) To increase battery capacity
c) To reduce charging time d) To improve discharge rate

14) What is the primary function of the on board charger in electric vehicle?
a) To charge the battery from an external power source
b) To convert AC power to DC power
c) To regulate battery's state of charge
d) To monitor the vehicles speed

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four **16**

a) State and explain challenges faced by Hybrid electric vehicle.
b) State and explain Economics and Environmental impacts of using electrical vehicles.
c) State and explain need of Electrical Vehicle.
d) State and Explain common part between ICE and EV drivetrain.
e) State and explain battery pack and battery management system.

Q.3 Attempt any two. **12**

a) State and explain major requirements of electrical vehicles.
b) State and explain types of electric vehicles in brief.
c) State and explain electric vehicle configuration in brief.

Section – II

Q.4 Attempt any Four. **16**

a) State and explain battery based energy storage system.
b) State and Explain components of HEVs drive train system.
c) State and explain alternative novel energy source solar photovoltaic cells, fuel cells, super capacitors and flywheels.
d) State and explain HEVs basic architecture.
e) Compare between Hybrid electric vehicle and Fuel cell electric vehicle.

Q.5 Attempt any two. **12**

a) State and explain overview of batteries and battery parameters, battery charging, regenerative braking.
b) State and Explain classification of HEVs: Conventional HEVs, Grid able HEVs.
c) State and explain fuel efficiency in HEV.

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What type of fuel do Fuel Cell Electric Vehicles use?
a) Gasoline b) Diesel
c) Hydrogen d) Natural gas

2) What is the primary cause of battery degradation?
a) Overcharge b) Undercharge
c) Depth of discharge d) High temperature

3) How does battery storage system help in grid stability?
a) By supplying reactive power
b) By absorbing excess energy
c) By providing frequency regulation
d) All of above

4) Which of the following is the benefit of Electric Vehicles?
a) Zero emission b) Lower operating cost
c) Improved performance d) All of above

5) What is the purpose of power electronic controller in electric vehicle?
a) To regulate the flow of electrical energy
b) To monitor the vehicles speed
c) To control the onboard charger
d) To regulate the battery's state of charge

6) What is the purpose of equalization in battery Storage?
a) To balance cell voltage b) To increase battery capacity
c) To reduce charging time d) To improve discharge rate

7) What is the primary function of the on board charger in electric vehicle?
a) To charge the battery from an external power source
b) To convert AC power to DC power
c) To regulate battery's state of charge
d) To monitor the vehicles speed

8) What is an electric vehicle?
a) Vehicle powered by gasoline
b) Vehicle powered by Electricity
c) Vehicle powered by Diesel
d) Vehicle powered by solar energy

9) What is the function of electric motor in an EV?
a) To charge the battery b) To power the wheels
c) To generate electricity d) To cool the vehicle

10) What is the purpose of battery management system (BMS) in an EV?
a) To monitor and control the battery's state of charge
b) To power the electric motor
c) To generate electricity
d) To cool the vehicle

11) What is the primary advantage of hybrid electric vehicle?
a) Increase driving range
b) Decreased operating cost
c) Reduced Greenhouse gas emissions
d) All of above

12) What type of battery is commonly used in Battery Electric Vehicles?
a) Lead -acid battery b) Nickel- metal hybrid battery
c) Lithium- ion battery d) All of above

13) Which is the types of electric vehicle charging?
a) Level one charging b) Level two charging
c) DC fast charging d) All of the above

14) Which of the following affects battery lifespan?
a) Depth of discharge (DOD) b) Temperature
c) Charging Frequency d) All of above

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four **16**

a) State and explain challenges faced by Hybrid electric vehicle.
b) State and explain Economics and Environmental impacts of using electrical vehicles.
c) State and explain need of Electrical Vehicle.
d) State and Explain common part between ICE and EV drivetrain.
e) State and explain battery pack and battery management system.

Q.3 Attempt any two. **12**

a) State and explain major requirements of electrical vehicles.
b) State and explain types of electric vehicles in brief.
c) State and explain electric vehicle configuration in brief.

Section – II

Q.4 Attempt any Four. **16**

a) State and explain battery based energy storage system.
b) State and Explain components of HEVs drive train system.
c) State and explain alternative novel energy source solar photovoltaic cells, fuel cells, super capacitors and flywheels.
d) State and explain HEVs basic architecture.
e) Compare between Hybrid electric vehicle and Fuel cell electric vehicle.

Q.5 Attempt any two. **12**

a) State and explain overview of batteries and battery parameters, battery charging, regenerative braking.
b) State and Explain classification of HEVs: Conventional HEVs, Grid able HEVs.
c) State and explain fuel efficiency in HEV.

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is the benefit of Electric Vehicles?
a) Zero emission b) Lower operating cost
c) Improved performance d) All of above

2) What is the purpose of power electronic controller in electric vehicle?
a) To regulate the flow of electrical energy
b) To monitor the vehicles speed
c) To control the onboard charger
d) To regulate the battery's state of charge

3) What is the purpose of equalization in battery Storage?
a) To balance cell voltage b) To increase battery capacity
c) To reduce charging time d) To improve discharge rate

4) What is the primary function of the on board charger in electric vehicle?
a) To charge the battery from an external power source
b) To convert AC power to DC power
c) To regulate battery's state of charge
d) To monitor the vehicles speed

5) What is an electric vehicle?
a) Vehicle powered by gasoline
b) Vehicle powered by Electricity
c) Vehicle powered by Diesel
d) Vehicle powered by solar energy

6) What is the function of electric motor in an EV?
a) To charge the battery b) To power the wheels
c) To generate electricity d) To cool the vehicle

7) What is the purpose of battery management system (BMS) in an EV?
a) To monitor and control the battery's state of charge
b) To power the electric motor
c) To generate electricity
d) To cool the vehicle

8) What is the primary advantage of hybrid electric vehicle?
a) Increase driving range
b) Decreased operating cost
c) Reduced Greenhouse gas emissions
d) All of above

9) What type of battery is commonly used in Battery Electric Vehicles?
a) Lead -acid battery b) Nickel- metal hybrid battery
c) Lithium- ion battery d) All of above

10) Which is the types of electric vehicle charging?
a) Level one charging b) Level two charging
c) DC fast charging d) All of the above

11) Which of the following affects battery lifespan?
a) Depth of discharge (DOD) b) Temperature
c) Charging Frequency d) All of above

12) What type of fuel do Fuel Cell Electric Vehicles use?
a) Gasoline b) Diesel
c) Hydrogen d) Natural gas

13) What is the primary cause of battery degradation?
a) Overcharge b) Undercharge
c) Depth of discharge d) High temperature

14) How does battery storage system help in grid stability?
a) By supplying reactive power
b) By absorbing excess energy
c) By providing frequency regulation
d) All of above

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four **16**

a) State and explain challenges faced by Hybrid electric vehicle.
b) State and explain Economics and Environmental impacts of using electrical vehicles.
c) State and explain need of Electrical Vehicle.
d) State and Explain common part between ICE and EV drivetrain.
e) State and explain battery pack and battery management system.

Q.3 Attempt any two. **12**

a) State and explain major requirements of electrical vehicles.
b) State and explain types of electric vehicles in brief.
c) State and explain electric vehicle configuration in brief.

Section – II

Q.4 Attempt any Four. **16**

a) State and explain battery based energy storage system.
b) State and Explain components of HEVs drive train system.
c) State and explain alternative novel energy source solar photovoltaic cells, fuel cells, super capacitors and flywheels.
d) State and explain HEVs basic architecture.
e) Compare between Hybrid electric vehicle and Fuel cell electric vehicle.

Q.5 Attempt any two. **12**

a) State and explain overview of batteries and battery parameters, battery charging, regenerative braking.
b) State and Explain classification of HEVs: Conventional HEVs, Grid able HEVs.
c) State and explain fuel efficiency in HEV.

Seat No.		Set	S

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which is the types of electric vehicle charging?
a) Level one charging b) Level two charging
c) DC fast charging d) All of the above

2) Which of the following affects battery lifespan?
a) Depth of discharge (DOD) b) Temperature
c) Charging Frequency d) All of above

3) What type of fuel do Fuel Cell Electric Vehicles use?
a) Gasoline b) Diesel
c) Hydrogen d) Natural gas

4) What is the primary cause of battery degradation?
a) Overcharge b) Undercharge
c) Depth of discharge d) High temperature

5) How does battery storage system help in grid stability?
a) By supplying reactive power
b) By absorbing excess energy
c) By providing frequency regulation
d) All of above

6) Which of the following is the benefit of Electric Vehicles?
a) Zero emission b) Lower operating cost
c) Improved performance d) All of above

7) What is the purpose of power electronic controller in electric vehicle?
a) To regulate the flow of electrical energy
b) To monitor the vehicles speed
c) To control the onboard charger
d) To regulate the battery's state of charge

8) What is the purpose of equalization in battery Storage?
a) To balance cell voltage
b) To increase battery capacity
c) To reduce charging time
d) To improve discharge rate

9) What is the primary function of the on board charger in electric vehicle?
a) To charge the battery from an external power source
b) To convert AC power to DC power
c) To regulate battery's state of charge
d) To monitor the vehicles speed

10) What is an electric vehicle?
a) Vehicle powered by gasoline
b) Vehicle powered by Electricity
c) Vehicle powered by Diesel
d) Vehicle powered by solar energy

11) What is the function of electric motor in an EV?
a) To charge the battery
b) To power the wheels
c) To generate electricity
d) To cool the vehicle

12) What is the purpose of battery management system (BMS) in an EV?
a) To monitor and control the battery's state of charge
b) To power the electric motor
c) To generate electricity
d) To cool the vehicle

13) What is the primary advantage of hybrid electric vehicle?
a) Increase driving range
b) Decreased operating cost
c) Reduced Greenhouse gas emissions
d) All of above

14) What type of battery is commonly used in Battery Electric Vehicles?
a) Lead -acid battery
b) Nickel- metal hybrid battery
c) Lithium- ion battery
d) All of above

SLR-BD-193

Seat No.	

Set S

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Basics of Electrical Vehicle (EEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four **16**

a) State and explain challenges faced by Hybrid electric vehicle.
b) State and explain Economics and Environmental impacts of using electrical vehicles.
c) State and explain need of Electrical Vehicle.
d) State and Explain common part between ICE and EV drivetrain.
e) State and explain battery pack and battery management system.

Q.3 Attempt any two. **12**

a) State and explain major requirements of electrical vehicles.
b) State and explain types of electric vehicles in brief.
c) State and explain electric vehicle configuration in brief.

Section – II

Q.4 Attempt any Four. **16**

a) State and explain battery based energy storage system.
b) State and Explain components of HEVs drive train system.
c) State and explain alternative novel energy source solar photovoltaic cells, fuel cells, super capacitors and flywheels.
d) State and explain HEVs basic architecture.
e) Compare between Hybrid electric vehicle and Fuel cell electric vehicle.

Q.5 Attempt any two. **12**

a) State and explain overview of batteries and battery parameters, battery charging, regenerative braking.
b) State and Explain classification of HEVs: Conventional HEVs, Grid able HEVs.
c) State and explain fuel efficiency in HEV.

SLR-BD-194

Seat No.	

Set P

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Computational Statistics (ENTHON-01A)

Day & Date: Friday 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) A die is thrown once. What is the probability that the score is a factor of 6?
a) 1/6 b) 1/2
c) 2/3 d) 1

2) Rank of a (m x n) matrix is determined by the number of linearly rows present in the matrix.
a) Dependent b) Independent
c) Both d) None

3) Correlation values ranges from to _____.
a) -1, 1 b) -2, 1
c) -1, 2 d) None

4) For orthogonal variables, correlation value is _____.
a) 0 b) 1
c) -1 d) None

5) Linear regression is example of learning _____.
a) Supervised b) Un supervised
c) Reinforcement d) None

6) _____ is a state where the model cannot model itself on the training data.
a) Underfitting b) Overfitting
c) Both d) None

7) Overfitting has high _____.
a) bias b) variance
c) Both d) None

8) Following is/are applications of Machine Learning _____.
a) Self driving car b) Email spam filtering
c) Product recommendation d) all

9) In the regression equation Y = 21 - 3X, the slope is _____.
a) 21 b) -21
c) 3 d) -3

10) The difference between the actual Y value and predicted Y value found using a regression equation is called the _____.
a) slope b) residual
c) outlier d) scatter plot

11) All symmetrical distributions are Gaussian distribution.
a) True b) False
c) Both d) None of these

12) In square matrix, Sum of diagonal elements is given as _____.
a) trace b) rank
c) eigen value d) none

13) Skewness for Gaussian distribution is _____.
a) zero b) infinite
c) one d) none of these

14) In the regression equation Y = 75.65 + 0.50X, the intercept is _____.
a) 0.50 b) 75.65
c) 1.00 d) indeterminable

Seat No.	

Set **P**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Computational Statistics (ENTHON-01A)

Day & Date: Friday 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four Questions. **16**

a) A fair coin is tossed three times. What is probability of obtaining one Head and two Tails?
b) Explain Conditional Probability suitable example.
c) Describe maximum likelihood estimation in brief.
d) Explain Trace of matrix in brief with example.
e) Explain the type of regression. Illustrate K means clustering algorithm with an example.

Q.3 Attempt any Two Questions. **12**

a) Explain various rules in probability with proper example.
b) Explain construction of probability space. Also discuss Discrete and Continuous Probabilities in brief.
c) Explain Rank of matrix with a suitable example.

Section – II

Q.4 Attempt any Four Questions. **16**

a) Explain Bias. Discuss various methods to remove data bias.
b) Discuss independent event. Explain independent event with example.
c) Explain in short applications of machine learning.
d) Describe backward feature elimination technique for dimensionality reduction.
e) Explain steps in PCA.

Q.5 Attempt any Two Questions. **12**

a) Differentiate between Supervised, Unsupervised and Reinforcement Learning.
b) Explain Eigen Decomposition and diagonalization.
c) Explain dimensionality reduction with benefits and disadvantages.

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Computational Statistics (ENTHON-01A)

Day & Date: Friday 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Following is/are applications of Machine Learning _____.
a) Self driving car b) Email spam filtering
c) Product recommendation d) all

2) In the regression equation Y = 21 - 3X, the slope is _____.
a) 21 b) -21
c) 3 d) -3

3) The difference between the actual Y value and predicted Y value found using a regression equation is called the _____.
a) slope b) residual
c) outlier d) scatter plot

4) All symmetrical distributions are Gaussian distribution.
a) True b) False
c) Both d) None of these

5) In square matrix, Sum of diagonal elements is given as _____.
a) trace b) rank
c) eigen value d) none

6) Skewness for Gaussian distribution is _____.
a) zero b) infinite
c) one d) none of these

7) In the regression equation Y = 75.65 + 0.50X, the intercept is _____.
a) 0.50 b) 75.65
c) 1.00 d) indeterminable

8) A die is thrown once. What is the probability that the score is a factor of 6?

a) 1/6 b) 1/2
c) 2/3 d) 1

9) Rank of a (m x n) matrix is determined by the number of linearly rows present in the matrix.

a) Dependent b) Independent
c) Both d) None

10) Correlation values ranges from to _____.

a) -1, 1 b) -2, 1
c) -1, 2 d) None

11) For orthogonal variables, correlation value is _____.

a) 0 b) 1
c) -1 d) None

12) Linear regression is example of learning _____.

a) Supervised b) Un supervised
c) Reinforcement d) None

13) _____ is a state where the model cannot model itself on the training data.

a) Underfitting b) Overfitting
c) Both d) None

14) Overfitting has high _____.

a) bias b) variance
c) Both d) None

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Computational Statistics (ENTHON-01A)

Day & Date: Friday 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four Questions. **16**

a) A fair coin is tossed three times. What is probability of obtaining one Head and two Tails?
b) Explain Conditional Probability suitable example.
c) Describe maximum likelihood estimation in brief.
d) Explain Trace of matrix in brief with example.
e) Explain the type of regression. Illustrate K means clustering algorithm with an example.

Q.3 Attempt any Two Questions. **12**

a) Explain various rules in probability with proper example.
b) Explain construction of probability space. Also discuss Discrete and Continuous Probabilities in brief.
c) Explain Rank of matrix with a suitable example.

Section – II

Q.4 Attempt any Four Questions. **16**

a) Explain Bias. Discuss various methods to remove data bias.
b) Discuss independent event. Explain independent event with example.
c) Explain in short applications of machine learning.
d) Describe backward feature elimination technique for dimensionality reduction.
e) Explain steps in PCA.

Q.5 Attempt any Two Questions. **12**

a) Differentiate between Supervised, Unsupervised and Reinforcement Learning.
b) Explain Eigen Decomposition and diagonalization.
c) Explain dimensionality reduction with benefits and disadvantages.

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Computational Statistics (ENTHON-01A)

Day & Date: Friday 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) All symmetrical distributions are Gaussian distribution.
a) True b) False
c) Both d) None of these

2) In square matrix, Sum of diagonal elements is given as _____.
a) trace b) rank
c) eigen value d) none

3) Skewness for Gaussian distribution is _____.
a) zero b) infinite
c) one d) none of these

4) In the regression equation Y = 75.65 + 0.50X, the intercept is _____.
a) 0.50 b) 75.65
c) 1.00 d) indeterminable

5) A die is thrown once. What is the probability that the score is a factor of 6?
a) 1/6 b) 1/2
c) 2/3 d) 1

6) Rank of a (m x n) matrix is determined by the number of linearly rows present in the matrix.
a) Dependent b) Independent
c) Both d) None

7) Correlation values ranges from to _____.
a) -1, 1 b) -2, 1
c) -1, 2 d) None

8) For orthogonal variables, correlation value is _____.

a) 0 b) 1
c) -1 d) None

9) Linear regression is example of learning _____.

a) Supervised b) Un supervised
c) Reinforcement d) None

10) _____ is a state where the model cannot model itself on the training data.

a) Underfitting b) Overfitting
c) Both d) None

11) Overfitting has high _____.

a) bias b) variance
c) Both d) None

12) Following is/are applications of Machine Learning _____.

a) Self driving car b) Email spam filtering
c) Product recommendation d) all

13) In the regression equation Y = 21 - 3X, the slope is _____.

a) 21 b) -21
c) 3 d) -3

14) The difference between the actual Y value and predicted Y value found using a regression equation is called the _____.

a) slope b) residual
c) outlier d) scatter plot

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Computational Statistics (ENTHON-01A)

Day & Date: Friday 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four Questions. **16**

a) A fair coin is tossed three times. What is probability of obtaining one Head and two Tails?
b) Explain Conditional Probability suitable example.
c) Describe maximum likelihood estimation in brief.
d) Explain Trace of matrix in brief with example.
e) Explain the type of regression. Illustrate K means clustering algorithm with an example.

Q.3 Attempt any Two Questions. **12**

a) Explain various rules in probability with proper example.
b) Explain construction of probability space. Also discuss Discrete and Continuous Probabilities in brief.
c) Explain Rank of matrix with a suitable example.

Section – II

Q.4 Attempt any Four Questions. **16**

a) Explain Bias. Discuss various methods to remove data bias.
b) Discuss independent event. Explain independent event with example.
c) Explain in short applications of machine learning.
d) Describe backward feature elimination technique for dimensionality reduction.
e) Explain steps in PCA.

Q.5 Attempt any Two Questions. **12**

a) Differentiate between Supervised, Unsupervised and Reinforcement Learning.
b) Explain Eigen Decomposition and diagonalization.
c) Explain dimensionality reduction with benefits and disadvantages.

Seat No.		Set	S

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Computational Statistics (ENTHON-01A)

Day & Date: Friday 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) _____ is a state where the model cannot model itself on the training data.
a) Underfitting b) Overfitting
c) Both d) None

2) Overfitting has high _____.
a) bias b) variance
c) Both d) None

3) Following is/are applications of Machine Learning _____.
a) Self driving car b) Email spam filtering
c) Product recommendation d) all

4) In the regression equation Y = 21 - 3X, the slope is _____.
a) 21 b) -21
c) 3 d) -3

5) The difference between the actual Y value and predicted Y value found using a regression equation is called the _____.
a) slope b) residual
c) outlier d) scatter plot

6) All symmetrical distributions are Gaussian distribution.
a) True b) False
c) Both d) None of these

7) In square matrix, Sum of diagonal elements is given as _____.
a) trace b) rank
c) eigen value d) none

8) Skewness for Gaussian distribution is _____.

a) zero b) infinite
c) one d) none of these

9) In the regression equation Y = 75.65 + 0.50X, the intercept is _____.

a) 0.50 b) 75.65
c) 1.00 d) indeterminable

10) A die is thrown once. What is the probability that the score is a factor of 6?

a) 1/6 b) 1/2
c) 2/3 d) 1

11) Rank of a (m x n) matrix is determined by the number of linearly rows present in the matrix.

a) Dependent b) Independent
c) Both d) None

12) Correlation values ranges from to _____.

a) -1, 1 b) -2, 1
c) -1, 2 d) None

13) For orthogonal variables, correlation value is _____.

a) 0 b) 1
c) -1 d) None

14) Linear regression is example of learning _____.

a) Supervised b) Un supervised
c) Reinforcement d) None

Seat No.	

Set **S**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Computational Statistics (ENTHON-01A)

Day & Date: Friday 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four Questions. **16**

a) A fair coin is tossed three times. What is probability of obtaining one Head and two Tails?
b) Explain Conditional Probability suitable example.
c) Describe maximum likelihood estimation in brief.
d) Explain Trace of matrix in brief with example.
e) Explain the type of regression. Illustrate K means clustering algorithm with an example.

Q.3 Attempt any Two Questions. **12**

a) Explain various rules in probability with proper example.
b) Explain construction of probability space. Also discuss Discrete and Continuous Probabilities in brief.
c) Explain Rank of matrix with a suitable example.

Section – II

Q.4 Attempt any Four Questions. **16**

a) Explain Bias. Discuss various methods to remove data bias.
b) Discuss independent event. Explain independent event with example.
c) Explain in short applications of machine learning.
d) Describe backward feature elimination technique for dimensionality reduction.
e) Explain steps in PCA.

Q.5 Attempt any Two Questions. **12**

a) Differentiate between Supervised, Unsupervised and Reinforcement Learning.
b) Explain Eigen Decomposition and diagonalization.
c) Explain dimensionality reduction with benefits and disadvantages.

SLR-BD-195

Seat No.		Set	P

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Database Management System (ENTHON-01B)

Day & Date: Friday 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) What is DBMS?
a) DBMS is a collection of queries
b) DBMS is a high-level language
c) DBMS is a programming language
d) DBMS stores, modifies and retrieves data

2) Who created the first DBMS?
a) Edgar Frank Codd b) Charles Bachman
c) Charles Babbage d) Sharon B. Codd

3) Which of the following is not an example of DBMS?
a) MySQL b) Microsoft Access
c) IBM DB2 d) Google

4) We indicate roles in E-R diagrams by labeling the lines that connect _____ to _____.
a) Diamond, diamond b) Rectangle, diamond
c) Rectangle, rectangle d) Diamond, rectangle

5) The relation with the attribute which is the primary key is referenced in another relation. The relation which has the attribute as a primary key is called _____.
a) Referential relation b) Referencing relation
c) Referenced relation d) Referred relation

6) The intersection operator is used to get the _____ tuples.
a) different b) common
c) all d) repeating

7) The number of attributes in relation is called as its _____.
a) Cardinality b) Degree
c) Tuples d) Entity

8) The _____ clause allows us to select only those rows in the result relation of the _____clause that satisfy a specified predicate.
a) Where, from b) From, select
c) Select, from d) From, where

9) What is true about indexes?
a) Indexes enhance the performance even if the table is updated frequently.
b) It makes harder for sql server engines to work to work on index which have large keys.
c) It doesn't make harder for sql server engines to work to work on index which have large keys.
d) None of the mentioned

10) If an index is _____ the metadata and statistics continue to exists.
a) Disabling b) Dropping
c) Altering d) Both Disabling and Dropping

11) Which forms has a relation that possesses data about an individual entity?
a) 2NF b) 3NF
c) 4NF d) 5NF

12) A transaction is delimited by statements (or function calls) of the form _____.
a) Begin transaction and end transaction
b) Start transaction and stop transaction
c) Get transaction and post transaction
d) Read transaction and write transaction

13) Which of the following has "all-or-none" property?
a) Atomicity b) Durability
c) Isolation d) All of the mentioned

14) The deadlock state can be changed back to stable state by using _____ statement.
a) Commit b) Rollback
c) Savepoint d) Deadlock

Seat No.	

Set **P**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Database Management System (ENTHON-01B)

Day & Date: Friday 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four questions. **16**

a) Write in detail about different types of Attributes.
b) List and explain drawbacks of file processing system over database system.
c) Elaborate following SQL queries with examples.
1) CREATE
2) DELETE
3) SELECT
4) ORDER BY
d) What is the concepts of Keys in relational model?
e) Which are the different string operations in SQL explain with example.

Q.3 Attempt any Two questions. **12**

a) With a neat diagram explain Database Architecture.
b) Explain with proper example following Relational Algebra Operations.
1) Select
2) Project
3) Union
4) Set-Difference
5) Cartesian-Product
6) Set – Intersection
c) Elaborate Extended Relational Algebra operation with example.

Section – II

Q.4 Attempt any Four questions. **16**

a) What is the concept of shadow paging?
b) Explain different states of transaction with neat diagram.
c) Give a difference between B^+ tree and B tree index files.
d) Explain in detail the concept of view serializability with example.
e) Write a short note on Dense and Sparse indexing with suitable diagram.

Q.5 Attempt any Two questions. **12**

a) What is the Two-Phase Locking Protocol? What are its disadvantages?

b) Explain in detail B^+ tree file organization with an example.

c) Write in brief about transaction model with example.

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Database Management System (ENTHON-01B)

Day & Date: Friday 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The _____ clause allows us to select only those rows in the result relation of the _____clause that satisfy a specified predicate.
a) Where, from b) From, select
c) Select, from d) From, where

2) What is true about indexes?
a) Indexes enhance the performance even if the table is updated frequently.
b) It makes harder for sql server engines to work to work on index which have large keys.
c) It doesn't make harder for sql server engines to work to work on index which have large keys.
d) None of the mentioned

3) If an index is _____ the metadata and statistics continue to exists.
a) Disabling b) Dropping
c) Altering d) Both Disabling and Dropping

4) Which forms has a relation that possesses data about an individual entity?
a) 2NF b) 3NF
c) 4NF d) 5NF

5) A transaction is delimited by statements (or function calls) of the form _____.
a) Begin transaction and end transaction
b) Start transaction and stop transaction
c) Get transaction and post transaction
d) Read transaction and write transaction

6) Which of the following has “all-or-none” property?
a) Atomicity b) Durability
c) Isolation d) All of the mentioned

7) The deadlock state can be changed back to stable state by using _____ statement.
a) Commit b) Rollback
c) Savepoint d) Deadlock

8) What is DBMS?
a) DBMS is a collection of queries
b) DBMS is a high-level language
c) DBMS is a programming language
d) DBMS stores, modifies and retrieves data

9) Who created the first DBMS?
a) Edgar Frank Codd b) Charles Bachman
c) Charles Babbage d) Sharon B. Codd

10) Which of the following is not an example of DBMS?
a) MySQL b) Microsoft Access
c) IBM DB2 d) Google

11) We indicate roles in E-R diagrams by labeling the lines that connect _____ to _____.
a) Diamond, diamond b) Rectangle, diamond
c) Rectangle, rectangle d) Diamond, rectangle

12) The relation with the attribute which is the primary key is referenced in another relation. The relation which has the attribute as a primary key is called _____.
a) Referential relation b) Referencing relation
c) Referenced relation d) Referred relation

13) The intersection operator is used to get the _____ tuples.
a) different b) common
c) all d) repeating

14s) The number of attributes in relation is called as its _____.
a) Cardinality b) Degree
c) Tuples d) Entity

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Database Management System (ENTHON-01B)

Day & Date: Friday 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four questions. **16**

a) Write in detail about different types of Attributes.
b) List and explain drawbacks of file processing system over database system.
c) Elaborate following SQL queries with examples.
1) CREATE
2) DELETE
3) SELECT
4) ORDER BY
d) What is the concepts of Keys in relational model?
e) Which are the different string operations in SQL explain with example.

Q.3 Attempt any Two questions. **12**

a) With a neat diagram explain Database Architecture.
b) Explain with proper example following Relational Algebra Operations.
1) Select
2) Project
3) Union
4) Set-Difference
5) Cartesian-Product
6) Set – Intersection
c) Elaborate Extended Relational Algebra operation with example.

Section – II

Q.4 Attempt any Four questions. **16**

a) What is the concept of shadow paging?
b) Explain different states of transaction with neat diagram.
c) Give a difference between B^+ tree and B tree index files.
d) Explain in detail the concept of view serializability with example.
e) Write a short note on Dense and Sparse indexing with suitable diagram.

Q.5 Attempt any Two questions. **12**

a) What is the Two-Phase Locking Protocol? What are its disadvantages?

b) Explain in detail B^+ tree file organization with an example.

c) Write in brief about transaction model with example.

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Database Management System (ENTHON-01B)

Day & Date: Friday 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which forms has a relation that possesses data about an individual entity?
a) 2NF b) 3NF
c) 4NF d) 5NF

2) A transaction is delimited by statements (or function calls) of the form _____.
a) Begin transaction and end transaction
b) Start transaction and stop transaction
c) Get transaction and post transaction
d) Read transaction and write transaction

3) Which of the following has "all-or-none" property?
a) Atomicity b) Durability
c) Isolation d) All of the mentioned

4) The deadlock state can be changed back to stable state by using _____ statement.
a) Commit b) Rollback
c) Savepoint d) Deadlock

5) What is DBMS?
a) DBMS is a collection of queries
b) DBMS is a high-level language
c) DBMS is a programming language
d) DBMS stores, modifies and retrieves data

6) Who created the first DBMS?
a) Edgar Frank Codd b) Charles Bachman
c) Charles Babbage d) Sharon B. Codd

7) Which of the following is not an example of DBMS?
a) MySQL b) Microsoft Access
c) IBM DB2 d) Google

8) We indicate roles in E-R diagrams by labeling the lines that connect _____ to _____.
a) Diamond, diamond b) Rectangle, diamond
c) Rectangle, rectangle d) Diamond, rectangle

9) The relation with the attribute which is the primary key is referenced in another relation. The relation which has the attribute as a primary key is called _____.
a) Referential relation b) Referencing relation
c) Referenced relation d) Referred relation

10) The intersection operator is used to get the _____ tuples.
a) different b) common
c) all d) repeating

11) The number of attributes in relation is called as its _____.
a) Cardinality b) Degree
c) Tuples d) Entity

12) The _____ clause allows us to select only those rows in the result relation of the _____clause that satisfy a specified predicate.
a) Where, from b) From, select
c) Select, from d) From, where

13) What is true about indexes?
a) Indexes enhance the performance even if the table is updated frequently.
b) It makes harder for sql server engines to work to work on index which have large keys.
c) It doesn't make harder for sql server engines to work to work on index which have large keys.
d) None of the mentioned

14) If an index is _____ the metadata and statistics continue to exists.
a) Disabling b) Dropping
c) Altering d) Both Disabling and Dropping

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Database Management System (ENTHON-01B)

Day & Date: Friday 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four questions. **16**

a) Write in detail about different types of Attributes.
b) List and explain drawbacks of file processing system over database system.
c) Elaborate following SQL queries with examples.
1) CREATE
2) DELETE
3) SELECT
4) ORDER BY
d) What is the concepts of Keys in relational model?
e) Which are the different string operations in SQL explain with example.

Q.3 Attempt any Two questions. **12**

a) With a neat diagram explain Database Architecture.
b) Explain with proper example following Relational Algebra Operations.
1) Select
2) Project
3) Union
4) Set-Difference
5) Cartesian-Product
6) Set – Intersection
c) Elaborate Extended Relational Algebra operation with example.

Section – II

Q.4 Attempt any Four questions. **16**

a) What is the concept of shadow paging?
b) Explain different states of transaction with neat diagram.
c) Give a difference between B^+ tree and B tree index files.
d) Explain in detail the concept of view serializability with example.
e) Write a short note on Dense and Sparse indexing with suitable diagram.

Q.5 Attempt any Two questions. **12**

a) What is the Two-Phase Locking Protocol? What are its disadvantages?

b) Explain in detail B^+ tree file organization with an example.

c) Write in brief about transaction model with example.

Seat No.		Set	S

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Database Management System (ENTHON-01B)

Day & Date: Friday 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The intersection operator is used to get the _____ tuples.
a) different b) common
c) all d) repeating

2) The number of attributes in relation is called as its _____.
a) Cardinality b) Degree
c) Tuples d) Entity

3) The _____ clause allows us to select only those rows in the result relation of the _____clause that satisfy a specified predicate.
a) Where, from b) From, select
c) Select, from d) From, where

4) What is true about indexes?
a) Indexes enhance the performance even if the table is updated frequently.
b) It makes harder for sql server engines to work to work on index which have large keys.
c) It doesn't make harder for sql server engines to work to work on index which have large keys.
d) None of the mentioned

5) If an index is _____ the metadata and statistics continue to exists.
a) Disabling b) Dropping
c) Altering d) Both Disabling and Dropping

6) Which forms has a relation that possesses data about an individual entity?
a) 2NF b) 3NF
c) 4NF d) 5NF

7) A transaction is delimited by statements (or function calls) of the form _____.
a) Begin transaction and end transaction
b) Start transaction and stop transaction
c) Get transaction and post transaction
d) Read transaction and write transaction

8) Which of the following has “all-or-none” property?
a) Atomicity b) Durability
c) Isolation d) All of the mentioned

9) The deadlock state can be changed back to stable state by using _____ statement.
a) Commit b) Rollback
c) Savepoint d) Deadlock

10) What is DBMS?
a) DBMS is a collection of queries
b) DBMS is a high-level language
c) DBMS is a programming language
d) DBMS stores, modifies and retrieves data

11) Who created the first DBMS?
a) Edgar Frank Codd b) Charles Bachman
c) Charles Babbage d) Sharon B. Codd

12) Which of the following is not an example of DBMS?
a) MySQL b) Microsoft Access
c) IBM DB2 d) Google

13) We indicate roles in E-R diagrams by labeling the lines that connect _____ to _____.
a) Diamond, diamond b) Rectangle, diamond
c) Rectangle, rectangle d) Diamond, rectangle

14) The relation with the attribute which is the primary key is referenced in another relation. The relation which has the attribute as a primary key is called _____.
a) Referential relation b) Referencing relation
c) Referenced relation d) Referred relation

Seat No.	

Set **S**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Database Management System (ENTHON-01B)

Day & Date: Friday 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four questions. **16**

a) Write in detail about different types of Attributes.
b) List and explain drawbacks of file processing system over database system.
c) Elaborate following SQL queries with examples.
1) CREATE
2) DELETE
3) SELECT
4) ORDER BY
d) What is the concepts of Keys in relational model?
e) Which are the different string operations in SQL explain with example.

Q.3 Attempt any Two questions. **12**

a) With a neat diagram explain Database Architecture.
b) Explain with proper example following Relational Algebra Operations.
1) Select
2) Project
3) Union
4) Set-Difference
5) Cartesian-Product
6) Set – Intersection
c) Elaborate Extended Relational Algebra operation with example.

Section – II

Q.4 Attempt any Four questions. **16**

a) What is the concept of shadow paging?
b) Explain different states of transaction with neat diagram.
c) Give a difference between B^+ tree and B tree index files.
d) Explain in detail the concept of view serializability with example.
e) Write a short note on Dense and Sparse indexing with suitable diagram.

Q.5 Attempt any Two questions. **12**

a) What is the Two-Phase Locking Protocol? What are its disadvantages?

b) Explain in detail B^+ tree file organization with an example.

c) Write in brief about transaction model with example.

Seat No.		Set	P

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Railway Engineering: A Beginner's Perspective (ENTHON-01D)

Day & Date: Friday 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The major commodities carried by Indian Railways are _____.
a) Petroleum products, Fertilizer
b) Containerized Traffic
c) Coal, Iron Ore
d) All Above

2) The _____ is the centralized agency for railway electrification of Indian Railways.
a) CORE b) CRIS
c) PRS d) Central Railway Board

3) The entire electrified mainline rail network in India uses _____.
a) 30 kV AC b) 25 kV AC
c) 230 kV AC d) 240 kV AC

4) Which is not part of Rail?
a) Head b) Web
c) Foot d) Frog

5) The safety in Railway in India is looked after by _____.
a) Ministry of Railways b) Commission of Railway Safety
c) Railway Board d) Headquarter Office

6) Modern locomotives employ _____ brake systems.
a) Compressed air brake b) Mechanical Brake
c) Vacuum Brake d) Electromagnetic Brake

7) The World's largest railway network is in _____ Country.
a) Japan b) China
c) United States d) India

8) Which is not part of Railway track layer?
a) Ballast b) Fishplate
c) Pantograph d) Subgrade

9) The First digit of FOIS in IR indicates _____.
a) Type of traffic b) Payment mode
c) Originating Railway d) Destination Railway

10) Which is not Problem with overhead equipment?
a) Power storms can knock the power out
b) Ice may coat overhead lines
c) Dewirement due to rails
d) Lines may sag during hot weather

11) _____ Fastest train in India is also known as Train 18.
a) Gatiman Express b) Duronto Express
c) Rajdhani Express d) Vande Bharat Express

12) The first Metro train in India _____?
a) Mumbai b) Kolkatta
c) Delhi d) Chennai

13) Which technology does Maglev trains uses for transportation?
a) Hydroelectric b) Electrification
c) Magnetic levitation d) Using fossil fuels

14) Which is the key function of Automatic Train Supervision (ATS)?
a) Real-time tracking of train locations
b) Automatic scheduling and dispatching of trains
c) Dynamic re-routing of trains in case of accidents or delays
d) All the Above

SLR-BD-196

Seat No.	

Set P

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Railway Engineering: A Beginner's Perspective (ENTHON-01D)

Day & Date: Friday 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four questions. **16**

a) Define the general features of Indian Railway.
b) Enlist the different corporations/organizations related with Indian Railway.
c) Write note on Indian Railways.Statistics.
d) What is mean by Rail? Explain its types.
e) Define Terms.
1) Coaches & Bogie
2) Junction & Terminal
3) Sleepers
4) Rail

Q.3 Attempt any Two questions. **12**

a) Write a short note on Safety measures in Railways.
b) Which are the Layers of material on Tracks? Explain.
c) Explain classification of Railway bridges.

Section – II

Q.4 Attempt any Four questions. **16**

a) Write note on Rail Display Network.
b) What is Clean Energy concept in Railways? Explain
c) Write note on "Anubhuti" Coaches in Indian Railways.
d) Give details of Bullet Trains and Metro in India.
e) Explain the concept of Bio Toilets in Indian Railway.

Q.5 Attempt any Two questions. **12**

a) Give advantages/successes of Metro Train.
b) Write note on development of Railway Systems.
c) Explain concept Maglev Technology in Railways.

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Railway Engineering: A Beginner's Perspective (ENTHON-01D)

Day & Date: Friday 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which is not part of Railway track layer?
a) Ballast b) Fishplate
c) Pantograph d) Subgrade

2) The First digit of FOIS in IR indicates _____.
a) Type of traffic b) Payment mode
c) Originating Railway d) Destination Railway

3) Which is not Problem with overhead equipment?
a) Power storms can knock the power out
b) Ice may coat overhead lines
c) Dewirement due to rails
d) Lines may sag during hot weather

4) _____ Fastest train in India is also known as Train 18.
a) Gatiman Express b) Duronto Express
c) Rajdhani Express d) Vande Bharat Express

5) The first Metro train in India _____?
a) Mumbai b) Kolkatta
c) Delhi d) Chennai

6) Which technology does Maglev trains uses for transportation?
a) Hydroelectric b) Electrification
c) Magnetic levitation d) Using fossil fuels

7) Which is the key function of Automatic Train Supervision (ATS)?
a) Real-time tracking of train locations
b) Automatic scheduling and dispatching of trains
c) Dynamic re-routing of trains in case of accidents or delays
d) All the Above

8) The major commodities carried by Indian Railways are _____.
a) Petroleum products, Fertilizer
b) Containerized Traffic
c) Coal, Iron Ore
d) All Above

9) The _____ is the centralized agency for railway electrification of Indian Railways.
a) CORE
b) CRIS
c) PRS
d) Central Railway Board

10) The entire electrified mainline rail network in India uses _____.
a) 30 kV AC
b) 25 kV AC
c) 230 kV AC
d) 240 kV AC

11) Which is not part of Rail?
a) Head
b) Web
c) Foot
d) Frog

12) The safety in Railway in India is looked after by _____.
a) Ministry of Railways
b) Commission of Railway Safety
c) Railway Board
d) Headquarter Office

13) Modern locomotives employ _____ brake systems.
a) Compressed air brake
b) Mechanical Brake
c) Vacuum Brake
d) Electromagnetic Brake

14) The World's largest railway network is in _____ Country.
a) Japan
b) China
c) United States
d) India

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Railway Engineering: A Beginner's Perspective (ENTHON-01D)

Day & Date: Friday 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four questions. **16**

a) Define the general features of Indian Railway.
b) Enlist the different corporations/organizations related with Indian Railway.
c) Write note on Indian Railways.Statistics.
d) What is mean by Rail? Explain its types.
e) Define Terms.
1) Coaches & Bogie
2) Junction & Terminal
3) Sleepers
4) Rail

Q.3 Attempt any Two questions. **12**

a) Write a short note on Safety measures in Railways.
b) Which are the Layers of material on Tracks? Explain.
c) Explain classification of Railway bridges.

Section – II

Q.4 Attempt any Four questions. **16**

a) Write note on Rail Display Network.
b) What is Clean Energy concept in Railways? Explain
c) Write note on "Anubhuti" Coaches in Indian Railways.
d) Give details of Bullet Trains and Metro in India.
e) Explain the concept of Bio Toilets in Indian Railway.

Q.5 Attempt any Two questions. **12**

a) Give advantages/successes of Metro Train.
b) Write note on development of Railway Systems.
c) Explain concept Maglev Technology in Railways.

Seat No.		Set	R

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Railway Engineering: A Beginner's Perspective (ENTHON-01D)

Day & Date: Friday 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ Fastest train in India is also known as Train 18.
a) Gatiman Express b) Duronto Express
c) Rajdhani Express d) Vande Bharat Express

2) The first Metro train in India _____?
a) Mumbai b) Kolkatta
c) Delhi d) Chennai

3) Which technology does Maglev trains uses for transportation?
a) Hydroelectric b) Electrification
c) Magnetic levitation d) Using fossil fuels

4) Which is the key function of Automatic Train Supervision (ATS)?
a) Real-time tracking of train locations
b) Automatic scheduling and dispatching of trains
c) Dynamic re-routing of trains in case of accidents or delays
d) All the Above

5) The major commodities carried by Indian Railways are _____.
a) Petroleum products, Fertilizer
b) Containerized Traffic
c) Coal, Iron Ore
d) All Above

6) The _____ is the centralized agency for railway electrification of Indian Railways.
a) CORE b) CRIS
c) PRS d) Central Railway Board

7) The entire electrified mainline rail network in India uses _____.
a) 30 kV AC b) 25 kV AC
c) 230 kV AC d) 240 kV AC

8) Which is not part of Rail?
a) Head b) Web
c) Foot d) Frog

9) The safety in Railway in India is looked after by _____.
a) Ministry of Railways b) Commission of Railway Safety
c) Railway Board d) Headquarter Office

10) Modern locomotives employ _____ brake systems.
a) Compressed air brake b) Mechanical Brake
c) Vacuum Brake d) Electromagnetic Brake

11) The World's largest railway network is in _____ Country.
a) Japan b) China
c) United States d) India

12) Which is not part of Railway track layer?
a) Ballast b) Fishplate
c) Pantograph d) Subgrade

13) The First digit of FOIS in IR indicates _____.
a) Type of traffic b) Payment mode
c) Originating Railway d) Destination Railway

14) Which is not Problem with overhead equipment?
a) Power storms can knock the power out
b) Ice may coat overhead lines
c) Dewirement due to rails
d) Lines may sag during hot weather

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Railway Engineering: A Beginner's Perspective (ENTHON-01D)

Day & Date: Friday 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four questions. **16**

a) Define the general features of Indian Railway.
b) Enlist the different corporations/organizations related with Indian Railway.
c) Write note on Indian Railways.Statistics.
d) What is mean by Rail? Explain its types.
e) Define Terms.
1) Coaches & Bogie
2) Junction & Terminal
3) Sleepers
4) Rail

Q.3 Attempt any Two questions. **12**

a) Write a short note on Safety measures in Railways.
b) Which are the Layers of material on Tracks? Explain.
c) Explain classification of Railway bridges.

Section – II

Q.4 Attempt any Four questions. **16**

a) Write note on Rail Display Network.
b) What is Clean Energy concept in Railways? Explain
c) Write note on "Anubhuti" Coaches in Indian Railways.
d) Give details of Bullet Trains and Metro in India.
e) Explain the concept of Bio Toilets in Indian Railway.

Q.5 Attempt any Two questions. **12**

a) Give advantages/successes of Metro Train.
b) Write note on development of Railway Systems.
c) Explain concept Maglev Technology in Railways.

Seat No.		Set	S

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Railway Engineering: A Beginner's Perspective (ENTHON-01D)

Day & Date: Friday 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Modern locomotives employ _____ brake systems.
a) Compressed air brake b) Mechanical Brake
c) Vacuum Brake d) Electromagnetic Brake

2) The World's largest railway network is in _____ Country.
a) Japan b) China
c) United States d) India

3) Which is not part of Railway track layer?
a) Ballast b) Fishplate
c) Pantograph d) Subgrade

4) The First digit of FOIS in IR indicates _____.
a) Type of traffic b) Payment mode
c) Originating Railway d) Destination Railway

5) Which is not Problem with overhead equipment?
a) Power storms can knock the power out
b) Ice may coat overhead lines
c) Dewirement due to rails
d) Lines may sag during hot weather

6) _____ Fastest train in India is also known as Train 18.
a) Gatiman Express b) Duronto Express
c) Rajdhani Express d) Vande Bharat Express

7) The first Metro train in India _____?
a) Mumbai b) Kolkatta
c) Delhi d) Chennai

8) Which technology does Maglev trains uses for transportation?
a) Hydroelectric b) Electrification
c) Magnetic levitation d) Using fossil fuels

9) Which is the key function of Automatic Train Supervision (ATS)?
a) Real-time tracking of train locations
b) Automatic scheduling and dispatching of trains
c) Dynamic re-routing of trains in case of accidents or delays
d) All the Above

10) The major commodities carried by Indian Railways are _____.
a) Petroleum products, Fertilizer
b) Containerized Traffic
c) Coal, Iron Ore
d) All Above

11) The _____ is the centralized agency for railway electrification of Indian Railways.
a) CORE b) CRIS
c) PRS d) Central Railway Board

12) The entire electrified mainline rail network in India uses _____.
a) 30 kV AC b) 25 kV AC
c) 230 kV AC d) 240 kV AC

13) Which is not part of Rail?
a) Head b) Web
c) Foot d) Frog

14) The safety in Railway in India is looked after by _____.
a) Ministry of Railways b) Commission of Railway Safety
c) Railway Board d) Headquarter Office

SLR-BD-196

Seat No.	

Set S

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Railway Engineering: A Beginner's Perspective (ENTHON-01D)

Day & Date: Friday 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four questions. **16**

a) Define the general features of Indian Railway.
b) Enlist the different corporations/organizations related with Indian Railway.
c) Write note on Indian Railways.Statistics.
d) What is mean by Rail? Explain its types.
e) Define Terms.
1) Coaches & Bogie
2) Junction & Terminal
3) Sleepers
4) Rail

Q.3 Attempt any Two questions. **12**

a) Write a short note on Safety measures in Railways.
b) Which are the Layers of material on Tracks? Explain.
c) Explain classification of Railway bridges.

Section – II

Q.4 Attempt any Four questions. **16**

a) Write note on Rail Display Network.
b) What is Clean Energy concept in Railways? Explain
c) Write note on "Anubhuti" Coaches in Indian Railways.
d) Give details of Bullet Trains and Metro in India.
e) Explain the concept of Bio Toilets in Indian Railway.

Q.5 Attempt any Two questions. **12**

a) Give advantages/successes of Metro Train.
b) Write note on development of Railway Systems.
c) Explain concept Maglev Technology in Railways.

SLR-BD-197

Seat No.		Set	P

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Universal Human Values (VEC-01)

Day & Date: Saturday, 24-05-2025 Max. Marks: 50
Time: 03:00 PM To 4:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) Basic unit of human interaction is _____.
a) Family b) Society
c) Group d) None of the above

2) The Self(I) is the seer, _____.
a) Doer b) Enjoyer
c) Doer & Enjoyer d) None

3) PROSPERITY deals with _____.
a) Right understanding in the self
b) Fulfilment in relationship
c) Ensuring more than required physical facility
d) None

4) When we expect feelings from others for our happiness, it is a state of _____.
a) Swatantrata b) Partantrata
c) Prosperity d) None

5) For continuity of happiness, what is essential?
a) Right understanding in the Self
b) Right feeling and right thought in the Self
c) Recognition of needs, ensure more than required, make right utilisation of it
d) All the above

6) Right Understanding and Right Feeling is matter of _____.
a) Self b) Body
c) Both d) None

7) Acceptance of excellence in others is called _____.

a) Gratitude b) Reverence
c) Glory d) None of above

8) Self and _____ are different in nature, materiality, needs and activities.

a) Prosperity b) Right Understanding
c) Body d) None of above

9) _____ is assuming without knowing.

a) Knowing b) Assuming
c) Preconditioning d) Relationship

10) Imagination is combination of _____.

a) Desire & thought
b) Desire, thought & expectation
c) Expectation & thought
d) None of above

11) Following are the basic guidelines for value education except _____.

a) Universal b) Personal
c) Rational d) Natural

12) Natural acceptance and _____ are the two processes of knowing.

a) Self-Actualization b) Self-exploration
c) Self Evaluation d) Self control

13) Human Life is lived at four levels: Individual, Family, and Society and _____.

a) Nature b) Nurture
c) World d) Universe

14) Value education should not be based on dogmas or blind beliefs _____.

a) True b) False

15) Value of an entity is _____.

a) Physical Facility
b) Prosperity
c) Its participation in the larger order of which it is part
d) both a and b

16) _____ are as Basic Human Aspirations.

a) Money
b) Relationship without money
c) Physical Facility
d) Continuous Happiness and Prosperity

17) Please give the correct priority for Physical Facilities, Right Understanding and Relationship _____.

a) Physical Facilities, Right Understanding and Relationship
b) Relationship, Right Understanding and Physical Facilities
c) Right Understanding, Relationship and Physical Facilities
d) None of the above

18) Right Understanding in relationship lead to _____.

a) Mutual Happiness b) Mutual Prosperity
c) Both a and b d) All are wrong

19) SSDD stands for _____.

a) Sadhan Viheen Dukhi Daridra
b) Sadhan Sampan Dukhi Daridra
c) Sadhan Sampan Sukhi Samridha
d) None of the above

20) Natural acceptance does not change with _____.

a) Time b) Place
c) Beliefs d) All of above

21) Human being is co-existence of the _____ and the _____.

a) self, self b) body, body
c) self, body d) None

22) _____ is the feeling of responsibility for nurturing, protecting and right utilizing the body.

a) Swasthya b) Sanyam
c) Prosperity d) None

23) The _____ is an instrument of _____.

a) I, Body b) Body, I
c) Both a and b d) None

24) _____ is the information we get from the Body through the five sense organs.

a) Precondition b) Sensation
c) Natural acceptance d) None

25) Which of the following is NOT a response of the Self?

a) Knowing b) Assuming
c) Recognising d) Preconditioning

26) Needs of Body are quantitative whereas needs of Self are qualitative _____.

a) True b) False

27) Sah-astitva means _____.

a) Co-existence b) Co-operation
c) Cooption d) Corporate identity

28) Ensuring justice in the relationship, on the basis of values leads to _____ in society.

a) Fearlessness b) Confusion
c) Confidence d) Fear

29) _____ is the complete value in relationship.

a) Respect b) Love
c) Trust d) Glory

30) The feeling to nurture and protect the body of our relative is called _____.

a) Care b) Affection
c) Gratitude d) Respect

31) _____ is the feeling of acceptance for those who have made efforts for my excellence.

a) Reverence b) Glory
c) Gratitude d) Guidance

32) We all are similar at the level of our _____ but differ in our _____.

a) Competence, Intension b) Intension, Competence
c) Competence, Competence d) None

33) Abhay means _____.

a) Right understanding b) Trust and fearlessness
c) Prosperity d) Co-existance

34) All the units of nature can be classified into _____ orders.

a) Two b) Three
c) Four d) Six

35) Which of the following does not form an order in nature?

a) Bio b) Animal
c) Consciousness d) Human

36) According to quantity, which of the following is true for the orders in nature?

a) Bio order >> Physical order >> Animal order >> Human order
b) Animal order >> Bio order >> Physical order >> Human order
c) Physical order >> Bio order >> Animal order >> Human order
d) Physical order >> Animal order >> Bio order >> Human order

37) What is NOT acceptable naturally in the nature?

a) Enrichment of nature b) Pollution in nature
c) Protection of nature d) Right Utilization of nature

38) Which of the following is NOT a unit of physical order?

a) Soil b) Air
c) Tree d) Water

39) There is justice in relationship when there is _____.
a) Self-regulation b) Freedom
c) Mutual fulfillment d) None

40) Justice from family to world family leads to _____.
a) Powerful nation
b) Strong political ties between nations
c) Undivided society
d) Disruption of the family structure

41) _____ is and it exists between one self (I1) and other self (I2).
a) Body b) Relationship
c) Health d) All

42) Which of the following results from over-evaluation _____.
a) Ego b) Depression
c) Self-confidence d) Trust

43) Which of the following statement is true?
a) Intention of a human being is always doubtful
b) One's intension is always to make the other happy
c) Intension of a human keeps varying from time to time
d) Intension of a human being can never be understood

44) Feeling of relationship exist between _____.
a) Self and self b) Body and Body
c) Self and body d) None of the above

45) Which of the following is NOT one of the goals at the level of society?
a) Right Understanding b) Fearlessness
c) Madness for profit d) Prosperity

46) Intension of a human being is the same as _____.
a) Natural acceptance b) Competence
c) Thought d) Pre-conditioning

47) Harmony should be maintained in _____.
a) Between body and life b) Between self and body
c) Between self and society d) All of the above

48) If something is _____ to us without any force or compulsion, then it is often correct and does not change with time and people.
a) Not acceptable b) Completely acceptable
c) Naturally acceptable d) Less acceptable

49) Nurturing on the Body depends upon _____.
a) Ingestion b) Digestion
c) Excretion d) All of the above

50) Sensation is related to _____.

a) Body
b) Self 'I'
c) Both a and b
d) None of the above

SLR-BD-197

Seat No.		Set	Q

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Universal Human Values (VEC-01)

Day & Date: Saturday, 24-05-2025 Max. Marks: 50
Time: 03:00 PM To 4:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) _____ is the feeling of acceptance for those who have made efforts for my excellence.
a) Reverence b) Glory
c) Gratitude d) Guidance

2) We all are similar at the level of our _____ but differ in our _____.
a) Competence, Intension b) Intension, Competence
c) Competence, Competence d) None

3) Abhay means _____.
a) Right understanding b) Trust and fearlessness
c) Prosperity d) Co-existance

4) All the units of nature can be classified into _____ orders.
a) Two b) Three
c) Four d) Six

5) Which of the following does not form an order in nature?
a) Bio b) Animal
c) Consciousness d) Human

6) According to quantity, which of the following is true for the orders in nature?
a) Bio order >> Physical order >> Animal order >> Human order
b) Animal order >> Bio order >> Physical order >> Human order
c) Physical order >> Bio order >> Animal order >> Human order
d) Physical order >> Animal order >> Bio order >> Human order

7) What is NOT acceptable naturally in the nature?
a) Enrichment of nature b) Pollution in nature
c) Protection of nature d) Right Utilization of nature

8) Which of the following is NOT a unit of physical order?
a) Soil b) Air
c) Tree d) Water

9) There is justice in relationship when there is _____.
a) Self-regulation b) Freedom
c) Mutual fulfillment d) None

10) Justice from family to world family leads to _____.
a) Powerful nation
b) Strong political ties between nations
c) Undivided society
d) Disruption of the family structure

11) _____ is and it exists between one self (I1) and other self (I2).
a) Body b) Relationship
c) Health d) All

12) Which of the following results from over-evaluation _____.
a) Ego b) Depression
c) Self-confidence d) Trust

13) Which of the following statement is true?
a) Intention of a human being is always doubtful
b) One's intension is always to make the other happy
c) Intension of a human keeps varying from time to time
d) Intension of a human being can never be understood

14) Feeling of relationship exist between _____.
a) Self and self b) Body and Body
c) Self and body d) None of the above

15) Which of the following is NOT one of the goals at the level of society?
a) Right Understanding b) Fearlessness
c) Madness for profit d) Prosperity

16) Intension of a human being is the same as _____.
a) Natural acceptance b) Competence
c) Thought d) Pre-conditioning

17) Harmony should be maintained in _____.
a) Between body and life b) Between self and body
c) Between self and society d) All of the above

18) If something is _____ to us without any force or compulsion, then it is often correct and does not change with time and people.
a) Not acceptable b) Completely acceptable
c) Naturally acceptable d) Less acceptable

19) Nurturing on the Body depends upon _____.

a) Ingestion b) Digestion
c) Excretion d) All of the above

20) Sensation is related to _____.

a) Body b) Self 'I'
c) Both a and b d) None of the above

21) Basic unit of human interaction is _____.

a) Family b) Society
c) Group d) None of the above

22) The Self(I) is the seer, _____.

a) Doer b) Enjoyer
c) Doer & Enjoyer d) None

23) PROSPERITY deals with _____.

a) Right understanding in the self
b) Fulfilment in relationship
c) Ensuring more than required physical facility
d) None

24) When we expect feelings from others for our happiness, it is a state of _____.

a) Swatantrata b) Partantrata
c) Prosperity d) None

25) For continuity of happiness, what is essential?

a) Right understanding in the Self
b) Right feeling and right thought in the Self
c) Recognition of needs, ensure more than required, make right utilisation of it
d) All the above

26) Right Understanding and Right Feeling is matter of _____.

a) Self b) Body
c) Both d) None

27) Acceptance of excellence in others is called _____.

a) Gratitude b) Reverence
c) Glory d) None of above

28) Self and _____ are different in nature, materiality, needs and activities.

a) Prosperity b) Right Understanding
c) Body d) None of above

29) _____ is assuming without knowing.

a) Knowing b) Assuming
c) Preconditioning d) Relationship

30) Imagination is combination of _____.

a) Desire & thought
b) Desire, thought & expectation
c) Expectation & thought
d) None of above

31) Following are the basic guidelines for value education except _____.

a) Universal b) Personal
c) Rational d) Natural

32) Natural acceptance and _____ are the two processes of knowing.

a) Self-Actualization b) Self-exploration
c) Self Evaluation d) Self control

33) Human Life is lived at four levels: Individual, Family, and Society and _____.

a) Nature b) Nurture
c) World d) Universe

34) Value education should not be based on dogmas or blind beliefs _____.

a) True b) False

35) Value of an entity is _____.

a) Physical Facility
b) Prosperity
c) Its participation in the larger order of which it is part
d) both a and b

36) _____ are as Basic Human Aspirations.

a) Money
b) Relationship without money
c) Physical Facility
d) Continuous Happiness and Prosperity

37) Please give the correct priority for Physical Facilities, Right Understanding and Relationship _____.

a) Physical Facilities, Right Understanding and Relationship
b) Relationship, Right Understanding and Physical Facilities
c) Right Understanding, Relationship and Physical Facilities
d) None of the above

38) Right Understanding in relationship lead to _____.

a) Mutual Happiness b) Mutual Prosperity
c) Both a and b d) All are wrong

39) SSDD stands for _____.

a) Sadhan Viheen Dukhi Daridra
b) Sadhan Sampan Dukhi Daridra
c) Sadhan Sampan Sukhi Samridha
d) None of the above

40) Natural acceptance does not change with _____.

a) Time b) Place
c) Beliefs d) All of above

41) Human being is co-existence of the _____ and the _____.

a) self, self b) body, body
c) self, body d) None

42) _____ is the feeling of responsibility for nurturing, protecting and right utilizing the body.

a) Swasthya b) Sanyam
c) Prosperity d) None

43) The _____ is an instrument of _____.

a) I, Body b) Body, I
c) Both a and b d) None

44) _____ is the information we get from the Body through the five sense organs.

a) Precondition b) Sensation
c) Natural acceptance d) None

45) Which of the following is NOT a response of the Self?

a) Knowing b) Assuming
c) Recognising d) Preconditioning

46) Needs of Body are quantitative whereas needs of Self are qualitative _____.

a) True b) False

47) Sah-astitva means _____.

a) Co-existence b) Co-operation
c) Cooption d) Corporate identity

48) Ensuring justice in the relationship, on the basis of values leads to _____ in society.

a) Fearlessness b) Confusion
c) Confidence d) Fear

49) _____ is the complete value in relationship.

a) Respect b) Love

c) Trust d) Glory

50) The feeling to nurture and protect the body of our relative is called _____.

a) Care b) Affection

c) Gratitude d) Respect

SLR-BD-197

Seat No.		Set	R

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Universal Human Values (VEC-01)

Day & Date: Saturday, 24-05-2025 Max. Marks: 50
Time: 03:00 PM To 4:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) Following are the basic guidelines for value education except _____.
a) Universal b) Personal
c) Rational d) Natural

2) Natural acceptance and _____ are the two processes of knowing.
a) Self-Actualization b) Self-exploration
c) Self Evaluation d) Self control

3) Human Life is lived at four levels: Individual, Family, and Society and _____.
a) Nature b) Nurture
c) World d) Universe

4) Value education should not be based on dogmas or blind beliefs _____.
a) True b) False

5) Value of an entity is _____.
a) Physical Facility
b) Prosperity
c) Its participation in the larger order of which it is part
d) both a and b

6) _____ are as Basic Human Aspirations.
a) Money
b) Relationship without money
c) Physical Facility
d) Continuous Happiness and Prosperity

7) Please give the correct priority for Physical Facilities, Right Understanding and Relationship _____.

a) Physical Facilities, Right Understanding and Relationship
b) Relationship, Right Understanding and Physical Facilities
c) Right Understanding, Relationship and Physical Facilities
d) None of the above

8) Right Understanding in relationship lead to _____.

a) Mutual Happiness b) Mutual Prosperity
c) Both a and b d) All are wrong

9) SSDD stands for _____.

a) Sadhan Viheen Dukhi Daridra
b) Sadhan Sampan Dukhi Daridra
c) Sadhan Sampan Sukhi Samridha
d) None of the above

10) Natural acceptance does not change with _____.

a) Time b) Place
c) Beliefs d) All of above

11) Human being is co-existence of the _____ and the _____.

a) self, self b) body, body
c) self, body d) None

12) _____ is the feeling of responsibility for nurturing, protecting and right utilizing the body.

a) Swasthya b) Sanyam
c) Prosperity d) None

13) The _____ is an instrument of _____.

a) I, Body b) Body, I
c) Both a and b d) None

14) _____ is the information we get from the Body through the five sense organs.

a) Precondition b) Sensation
c) Natural acceptance d) None

15) Which of the following is NOT a response of the Self?

a) Knowing b) Assuming
c) Recognising d) Preconditioning

16) Needs of Body are quantitative whereas needs of Self are qualitative _____.

a) True b) False

17) Sah-astitva means _____.

a) Co-existence b) Co-operation
c) Cooption d) Corporate identity

18) Ensuring justice in the relationship, on the basis of values leads to _____ in society.

a) Fearlessness b) Confusion
c) Confidence d) Fear

19) _____ is the complete value in relationship.

a) Respect b) Love
c) Trust d) Glory

20) The feeling to nurture and protect the body of our relative is called _____.

a) Care b) Affection
c) Gratitude d) Respect

21) _____ is the feeling of acceptance for those who have made efforts for my excellence.

a) Reverence b) Glory
c) Gratitude d) Guidance

22) We all are similar at the level of our _____ but differ in our _____.

a) Competence, Intension b) Intension, Competence
c) Competence, Competence d) None

23) Abhay means _____.

a) Right understanding b) Trust and fearlessness
c) Prosperity d) Co-existance

24) All the units of nature can be classified into _____ orders.

a) Two b) Three
c) Four d) Six

25) Which of the following does not form an order in nature?

a) Bio b) Animal
c) Consciousness d) Human

26) According to quantity, which of the following is true for the orders in nature?

a) Bio order >> Physical order >> Animal order >> Human order
b) Animal order >> Bio order >> Physical order >> Human order
c) Physical order >> Bio order >> Animal order >> Human order
d) Physical order >> Animal order >> Bio order >> Human order

27) What is NOT acceptable naturally in the nature?

a) Enrichment of nature b) Pollution in nature
c) Protection of nature d) Right Utilization of nature

28) Which of the following is NOT a unit of physical order?

a) Soil b) Air
c) Tree d) Water

29) There is justice in relationship when there is _____.
a) Self-regulation b) Freedom
c) Mutual fulfillment d) None

30) Justice from family to world family leads to _____.
a) Powerful nation
b) Strong political ties between nations
c) Undivided society
d) Disruption of the family structure

31) _____ is and it exists between one self (I1) and other self (I2).
a) Body b) Relationship
c) Health d) All

32) Which of the following results from over-evaluation _____.
a) Ego b) Depression
c) Self-confidence d) Trust

33) Which of the following statement is true?
a) Intention of a human being is always doubtful
b) One's intension is always to make the other happy
c) Intension of a human keeps varying from time to time
d) Intension of a human being can never be understood

34) Feeling of relationship exist between _____.
a) Self and self b) Body and Body
c) Self and body d) None of the above

35) Which of the following is NOT one of the goals at the level of society?
a) Right Understanding b) Fearlessness
c) Madness for profit d) Prosperity

36) Intension of a human being is the same as _____.
a) Natural acceptance b) Competence
c) Thought d) Pre-conditioning

37) Harmony should be maintained in _____.
a) Between body and life b) Between self and body
c) Between self and society d) All of the above

38) If something is _____ to us without any force or compulsion, then it is often correct and does not change with time and people.
a) Not acceptable b) Completely acceptable
c) Naturally acceptable d) Less acceptable

39) Nurturing on the Body depends upon _____.
a) Ingestion b) Digestion
c) Excretion d) All of the above

40) Sensation is related to _____.

a) Body b) Self 'I'
c) Both a and b d) None of the above

41) Basic unit of human interaction is _____.

a) Family b) Society
c) Group d) None of the above

42) The Self(I) is the seer, _____.

a) Doer b) Enjoyer
c) Doer & Enjoyer d) None

43) PROSPERITY deals with _____.

a) Right understanding in the self
b) Fulfilment in relationship
c) Ensuring more than required physical facility
d) None

44) When we expect feelings from others for our happiness, it is a state of _____.

a) Swatantrata b) Partantrata
c) Prosperity d) None

45) For continuity of happiness, what is essential?

a) Right understanding in the Self
b) Right feeling and right thought in the Self
c) Recognition of needs, ensure more than required, make right utilisation of it
d) All the above

46) Right Understanding and Right Feeling is matter of _____.

a) Self b) Body
c) Both d) None

47) Acceptance of excellence in others is called _____.

a) Gratitude b) Reverence
c) Glory d) None of above

48) Self and _____ are different in nature, materiality, needs and activities.

a) Prosperity b) Right Understanding
c) Body d) None of above

49) _____ is assuming without knowing.

a) Knowing b) Assuming
c) Preconditioning d) Relationship

50) Imagination is combination of _____.

a) Desire & thought
b) Desire, thought & expectation
c) Expectation & thought
d) None of above

SLR-BD-197

Seat No.		Set	S

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Universal Human Values (VEC-01)

Day & Date: Saturday, 24-05-2025 Max. Marks: 50
Time: 03:00 PM To 4:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) _____ is and it exists between one self (I1) and other self (I2).
a) Body b) Relationship
c) Health d) All

2) Which of the following results from over-evaluation _____.
a) Ego b) Depression
c) Self-confidence d) Trust

3) Which of the following statement is true?
a) Intention of a human being is always doubtful
b) One's intension is always to make the other happy
c) Intension of a human keeps varying from time to time
d) Intension of a human being can never be understood

4) Feeling of relationship exist between _____.
a) Self and self b) Body and Body
c) Self and body d) None of the above

5) Which of the following is NOT one of the goals at the level of society?
a) Right Understanding b) Fearlessness
c) Madness for profit d) Prosperity

6) Intension of a human being is the same as _____.
a) Natural acceptance b) Competence
c) Thought d) Pre-conditioning

7) Harmony should be maintained in _____.
a) Between body and life b) Between self and body
c) Between self and society d) All of the above

8) If something is _____ to us without any force or compulsion, then it is often correct and does not change with time and people.

a) Not acceptable
b) Completely acceptable
c) Naturally acceptable
d) Less acceptable

9) Nurturing on the Body depends upon _____.

a) Ingestion
b) Digestion
c) Excretion
d) All of the above

10) Sensation is related to _____.

a) Body
b) Self 'I'
c) Both a and b
d) None of the above

11) Basic unit of human interaction is _____.

a) Family
b) Society
c) Group
d) None of the above

12) The Self(I) is the seer, _____.

a) Doer
b) Enjoyer
c) Doer & Enjoyer
d) None

13) PROSPERITY deals with _____.

a) Right understanding in the self
b) Fulfilment in relationship
c) Ensuring more than required physical facility
d) None

14) When we expect feelings from others for our happiness, it is a state of _____.

a) Swatantrata
b) Partantrata
c) Prosperity
d) None

15) For continuity of happiness, what is essential?

a) Right understanding in the Self
b) Right feeling and right thought in the Self
c) Recognition of needs, ensure more than required, make right utilisation of it
d) All the above

16) Right Understanding and Right Feeling is matter of _____.

a) Self
b) Body
c) Both
d) None

17) Acceptance of excellence in others is called _____.

a) Gratitude
b) Reverence
c) Glory
d) None of above

18) Self and _____ are different in nature, materiality, needs and activities.

a) Prosperity
b) Right Understanding
c) Body
d) None of above

19) _____ is assuming without knowing.

a) Knowing
b) Assuming
c) Preconditioning
d) Relationship

20) Imagination is combination of _____.

a) Desire & thought
b) Desire, thought & expectation
c) Expectation & thought
d) None of above

21) Following are the basic guidelines for value education except _____.

a) Universal
b) Personal
c) Rational
d) Natural

22) Natural acceptance and _____ are the two processes of knowing.

a) Self-Actualization
b) Self-exploration
c) Self Evaluation
d) Self control

23) Human Life is lived at four levels: Individual, Family, and Society and _____.

a) Nature
b) Nurture
c) World
d) Universe

24) Value education should not be based on dogmas or blind beliefs _____.

a) True
b) False

25) Value of an entity is _____.

a) Physical Facility
b) Prosperity
c) Its participation in the larger order of which it is part
d) both a and b

26) _____ are as Basic Human Aspirations.

a) Money
b) Relationship without money
c) Physical Facility
d) Continuous Happiness and Prosperity

27) Please give the correct priority for Physical Facilities, Right Understanding and Relationship _____.

a) Physical Facilities, Right Understanding and Relationship
b) Relationship, Right Understanding and Physical Facilities
c) Right Understanding, Relationship and Physical Facilities
d) None of the above

28) Right Understanding in relationship lead to _____.

a) Mutual Happiness
b) Mutual Prosperity
c) Both a and b
d) All are wrong

29) SSDD stands for _____.

a) Sadhan Viheen Dukhi Daridra
b) Sadhan Sampan Dukhi Daridra
c) Sadhan Sampan Sukhi Samridha
d) None of the above

30) Natural acceptance does not change with _____.

a) Time
b) Place
c) Beliefs
d) All of above

31) Human being is co-existence of the _____ and the _____.

a) self, self
b) body, body
c) self, body
d) None

32) _____ is the feeling of responsibility for nurturing, protecting and right utilizing the body.

a) Swasthya
b) Sanyam
c) Prosperity
d) None

33) The _____ is an instrument of _____.

a) I, Body
b) Body, I
c) Both a and b
d) None

34) _____ is the information we get from the Body through the five sense organs.

a) Precondition
b) Sensation
c) Natural acceptance
d) None

35) Which of the following is NOT a response of the Self?

a) Knowing
b) Assuming
c) Recognising
d) Preconditioning

36) Needs of Body are quantitative whereas needs of Self are qualitative _____.

a) True
b) False

37) Sah-astitva means _____.

a) Co-existence
b) Co-operation
c) Cooption
d) Corporate identity

38) Ensuring justice in the relationship, on the basis of values leads to _____ in society.

a) Fearlessness b) Confusion
c) Confidence d) Fear

39) _____ is the complete value in relationship.

a) Respect b) Love
c) Trust d) Glory

40) The feeling to nurture and protect the body of our relative is called _____.

a) Care b) Affection
c) Gratitude d) Respect

41) _____ is the feeling of acceptance for those who have made efforts for my excellence.

a) Reverence b) Glory
c) Gratitude d) Guidance

42) We all are similar at the level of our _____ but differ in our _____.

a) Competence, Intension b) Intension, Competence
c) Competence, Competence d) None

43) Abhay means _____.

a) Right understanding b) Trust and fearlessness
c) Prosperity d) Co-existance

44) All the units of nature can be classified into _____ orders.

a) Two b) Three
c) Four d) Six

45) Which of the following does not form an order in nature?

a) Bio b) Animal
c) Consciousness d) Human

46) According to quantity, which of the following is true for the orders in nature?

a) Bio order >> Physical order >> Animal order >> Human order
b) Animal order >> Bio order >> Physical order >> Human order
c) Physical order >> Bio order >> Animal order >> Human order
d) Physical order >> Animal order >> Bio order >> Human order

47) What is NOT acceptable naturally in the nature?

a) Enrichment of nature b) Pollution in nature
c) Protection of nature d) Right Utilization of nature

48) Which of the following is NOT a unit of physical order?

a) Soil b) Air
c) Tree d) Water

49) There is justice in relationship when there is _____.

a) Self-regulation b) Freedom

c) Mutual fulfillment d) None

50) Justice from family to world family leads to _____.

a) Powerful nation

b) Strong political ties between nations

c) Undivided society

d) Disruption of the family structure

Seat No.	

Set P

S.Y. (B.Tech. Electronics & Telecommunication Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2025 Engineering Mathematics – III (BTN06301)

Day & Date: Saturday 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book Page no 03 (Starring page of the Answer Book Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of Page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) $\frac{1}{D+a}x$ is equal to _____.

a) $\int xe^{ax}dx$ b) $\int xe^{-ax}dx$

c) $e^{ax}\int xe^{-ax}dx$ d) $e^{-ax}\int xe^{ax}dx$

2) The general solution of the Differential equation $\frac{d^2y}{dx^2}+\frac{dy}{dx}+y=0$ is _____.

a) $c_1e^x+c_2e^{-x}$

b) $(c_1+c_2x)e^x$

c) $e^{\frac{x}{2}}\left[c_1\cos\frac{\sqrt{3}}{2}x+c_2\sin\frac{\sqrt{3}}{2}x\right]$

d) $e^{-\frac{x}{2}}\left[c_1\cos\frac{\sqrt{3}}{2}x+c_2\sin\frac{\sqrt{3}}{2}x\right]$

3) $\frac{1}{D^2+9}cos3x$ is equal to _____.

a) $\frac{x\cos 3x}{3}$ b) $\frac{x\sin 3x}{3}$

c) $\frac{x\sin 3x}{6}$ d) $-\frac{x\sin 3x}{6}$

4) The function can be expanded in Fourier series if it satisfies _____.

a) Fourier conditions b) Euler's conditions

c) Riemann's conditions d) Dirichlet's conditions

5) $f(x) = x \quad -\pi \leq x \leq 0$
$= -x \qquad 0 \leq x \leq \pi$

a) No cosine term
b) no sine term
c) both cosine and sine term
d) none

6) For a binomial distribution the $n = 6$ and $p = 1/3$ then mean and variance are _____.

a) $2, 4/3$
b) $2, 4$
c) $1/3, 3$
d) $3, 4/3$

7) If the mean of $x = 70$, the mean of $y = 149, b_{yx} = 0.7$, then the equation of the line of regression of y on x is _____.

a) $y = 0.5x + 60$
b) $y = 0.6x + 80$
c) $y = 0.7x + 100$
d) $y = 0.8x + 120$

8) The value of the integral $\int_0^\infty e^{-3t} \cos t \ dt$ is _____.

a) $\frac{3}{10}$
b) $-\frac{3}{10}$
c) 3
d) 10

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

a) $\frac{t^2}{2!}$
b) $\frac{t}{2}$
c) t^2
d) t

10) The formula used for solving the equation using Regula Falsi method is _____.

I) $x = \frac{bf(a) - af(b)}{f(a) - f(b)}$

II) $x = \frac{af(b) - bf(a)}{f(a) - f(b)}$

a) Only I is correct
b) Only II is Correct
c) Both I, II are correct
d) Both I, 11 are Incorrect

11) If $L\{f(t)\} = \frac{1}{s} e^{-1/s}$, then $L\{f(3t)\} =$ _____.

a) $\frac{1}{s} e^{-3/s}$
b) $\frac{1}{3s} e^{-3/s}$
c) $\frac{1}{3} e^{-3/s}$
d) $\frac{1}{3} e^{-s/3}$

12) In case of Simpson's $(1/3)^{rd}$ rule, the interval is divided into _____.

a) Equal even number of subintervals
b) Equal odd number of subintervals
c) Equal even or odd of subintervals
d) Any number of subintervals

13) The Fourier sine transform of $f(x) = e^{-x}, x \geq 0$ is _____.

a) $\frac{s}{1+s^2}$

b) $\frac{2}{\pi}.\frac{s}{1+s^2}$

c) $\frac{s}{1-s^2}$

d) $\sqrt{\frac{2}{\pi}}.\frac{s}{1+s^2}$

14) The Fourier Cosine integral form of $f(x)$ is _____.

a) $\int_0^\infty f(s)\cos ws\, ds$

b) $\int_0^\infty \cos wx \left(\int_0^\infty f(s)\cos ws\, ds\right) dw$

c) $\frac{2}{\pi}\int_0^\infty \cos wx \left(\int_0^\infty f(s)\cos ws\, ds\right) dw$

d) None of these

Seat No.	

Set **P**

S.Y. (B.Tech. Electronics & Telecommunication Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2025
Engineering Mathematics – III (BTN06301)

Day & Date: Saturday 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Use of non-programmable calculators is allowed.

Section – I

Q.2 Attempt any three of the following question. **09**

a) Solve $(D^3 - 2D^2 - 5D + 6)y = e^{4x}$

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

c) Calculate Karl Pearson's coefficient of correlation
$\sum x = 120, \sum y = 100, \sum x^2 = 650, \sum y^2 = 450, \sum xy = 500, N = 25$

d) Find the Fourier half range sine series of $\begin{matrix} f(x) = mx & 0 \le x \le \frac{\pi}{2} \\ = m(\pi - x) & \frac{\pi}{2} \le x < \pi \end{matrix}$

e) Four coins are tossed 160 times and the following results were obtained.

No. of head:	0	1	2	3	4
Frequency:	17	52	54	31	6

Fit a Binomial distribution

Q.3 Attempt any three of the following question. **09**

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

b) Find the Fourier half range cosine series of $f(x) = x - x^2$ $0 \le x \le 1$.

c) An insurance company found that only 0.01 per cent of the population is involved in a certain type of accident each year. If its 1000 policyholders were randomly selected from the population, what is the probability that more than two of its clients are involved in such an accident next year?

d) The line of regression of y on x is $10y = x + 17$ and the line of regression of x on y is $x = 5y - 7$. Find
i) means of x and y
ii) the coefficient of correlation r

e) Find the Fourier expansion of $f(x) = x$ in $(-1,1)$

Q.4 Attempt any two of the following question. **10**

a) The life -time of certain type of battery has mean life of 400 hours and a standard deviation of 50 hours. Assuming the distribution of life -time to be normal, Find

i) percentage of batteries which have life time of more than 350 hours

ii) the population of batteries which have life time between 300 and 500 hours (For $S.N.V.Z$ area between $z = 0$ and $z = 1$ is 0.3413, For $z = 0$ and $z = 2$ is 0.4772)

b) Find the Fourier expansion of $f(x) = \pi x \quad 0 < x \leq 1$
$= 0 \quad 1 < x \leq 2$

c) Solve $(D^2 + D)y = \frac{1}{1+e^x}$

Section – II

Q.5 Solve any Three of the following. **09**

a) Calculate $L\{te^{3t}\sin^2 3t\}$

b) Find the root of the equation $x^3 - 5.4x^2 + 9.24x - 5.096 = 0$ given that it is near to 1.5 by using Newton Raphson method.

c) Find the Fourier Transform of $f(x) = e^{-x^2/2}$

d) Find $L^{-1}\left\{\frac{1}{(s^2+1)(s^2+9)}\right\}$ by using Convolution theorem.

e) Apply Trapezoidal rule to evaluate $\int_0^1 \frac{x^2}{1+x^3}dx$ with $h = 0.25$

Q.6 Solve any Three of the following. **09**

a) Calculate $L\left\{\int_0^t \frac{e^{-3u}\sin 2u}{u}du\right\}$

b) Find the Fourier sine transform of $f(x) = \frac{1}{x}$

c) Apply Gaussian Quadrature 2-point formula to evaluate $\int_{-2}^{2} e^{-x/2}dx$

d) Calculate inverse Laplace transform of $\tan^{-1}\left(\frac{2}{s}\right)$

e) Evaluate by using Simpson's three-eighth rule $\int_0^6 \frac{1}{1+x^2}\,dx$ Also check the result with actual result.

Q.7 Solve any Two of the following. **10**

a) Solve the system of non-linear equations $x^2 + y = 11, y^2 + x = 7$ take initial approximations as $x_0 = 3.5$ and $y_0 = -1.5$

b) Express $f(x) = \sin x, 0 \leq x < \pi$
$= 0, x = \pi$
$= 0, x > \pi$

as Fourier integral and hence deduce that $\int_0^\infty \frac{\cos(\omega\pi/2)}{1-\omega^2}d\omega = \frac{\pi}{2}$.

c) Using Laplace transform method solve $y''(t) - 2y'(t) + y(t) = e^t$, with $y(0) = 2. y'(0) = -1$

Seat No.	

Set **Q**

S.Y. (B.Tech. Electronics & Telecommunication Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2025
Engineering Mathematics – III (BTN06301)

Day & Date: Saturday 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book Page no 03 (Starring page of the Answer Book Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of Page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) The value of the integral $\int_0^\infty e^{-3t}\cos t\ dt$ is _____.

a) $\frac{3}{10}$ b) $-\frac{3}{10}$

c) 3 d) 10

2) $L^{-1}\left\{\frac{1}{s^2}\right\} =$ _____.

a) $\frac{t^2}{2!}$ b) $\frac{t}{2}$

c) t^2 d) t

3) The formula used for solving the equation using Regula Falsi method is _____.

I) $x = \frac{bf(a) - af(b)}{f(a) - f(b)}$

II) $x = \frac{af(b) - bf(a)}{f(a) - f(b)}$

a) Only I is correct b) Only II is Correct

c) Both I, II are correct d) Both I, 11 are Incorrect

4) If $L\{f(t)\} = \frac{1}{s}e^{-1/s}$, then $L\{f(3t)\} =$ _____.

a) $\frac{1}{s}e^{-3/s}$ b) $\frac{1}{3s}e^{-3/s}$

c) $\frac{1}{3}e^{-3/s}$ d) $\frac{1}{3}e^{-s/3}$

5) In case of Simpson's $(1/3)^{rd}$ rule, the interval is divided into _____.

a) Equal even number of subintervals
b) Equal odd number of subintervals
c) Equal even or odd of subintervals
d) Any number of subintervals

____

6) The Fourier sine transform of $f(x) = e^{-x}, x \geq 0$ is _____.

a) $\frac{s}{1+s^2}$ b) $\frac{2}{\pi}.\frac{s}{1+s^2}$

c) $\frac{s}{1-s^2}$ d) $\sqrt{\frac{2}{\pi}}.\frac{s}{1+s^2}$

7) The Fourier Cosine integral form of $f(x)$ is _____.

a) $\int_0^\infty f(s)\cos ws\, ds$

b) $\int_0^\infty \cos wx \left(\int_0^\infty f(s)\cos ws\, ds\right) dw$

c) $\frac{2}{\pi}\int_0^\infty \cos wx \left(\int_0^\infty f(s)\cos ws\, ds\right) dw$

d) None of these

8) $\frac{1}{D+a}x$ is equal to _____.

a) $\int xe^{ax}dx$ b) $\int xe^{-ax}dx$

c) $e^{ax}\int xe^{-ax}dx$ d) $e^{-ax}\int xe^{ax}dx$

9) The general solution of the Differential equation $\frac{d^2y}{dx^2} + \frac{dy}{dx} + y = 0$ is _____.

a) $c_1e^x + c_2e^{-x}$

b) $(c_1 + c_2x)e^x$

c) $e^{\frac{x}{2}}\left[c_1\cos\frac{\sqrt{3}}{2}x + c_2\sin\frac{\sqrt{3}}{2}x\right]$

d) $e^{-\frac{x}{2}}\left[c_1\cos\frac{\sqrt{3}}{2}x + c_2\sin\frac{\sqrt{3}}{2}x\right]$

10) $\frac{1}{D^2+9} cos3x$ is equal to _____.

a) $\frac{x \cos 3x}{3}$ b) $\frac{x \sin 3x}{3}$

c) $\frac{x \sin 3x}{6}$ d) $-\frac{x \sin 3x}{6}$

11) The function can be expanded in Fourier series if it satisfies _____.

a) Fourier conditions b) Euler's conditions

c) Riemann's conditions d) Dirichlet's conditions

12) $f(x) = x \quad -\pi \leq x \leq 0$
$= -x \quad 0 \leq x \leq \pi$

a) No cosine term b) no sine term

c) both cosine and sine term d) none

13) For a binomial distribution the $n = 6$ and $p = 1/3$ then mean and variance are _____.

a) $2, 4/3$ b) $2, 4$

c) $1/3,3$ d) $3, 4/3$

14) If the mean of $x = 70$, the mean of $y = 149, b_{yx} = 0.7$, then the equation of the line of regression of y on x is _____.

a) $y = 0.5x + 60$ b) $y = 0.6x + 80$

c) $y = 0.7x + 100$ d) $y = 0.8x + 120$

Seat No.	

Set **Q**

S.Y. (B.Tech. Electronics & Telecommunication Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2025
Engineering Mathematics – III (BTN06301)

Day & Date: Saturday 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Use of non-programmable calculators is allowed.

Section – I

Q.2 Attempt any three of the following question. **09**

a) Solve $(D^3 - 2D^2 - 5D + 6)y = e^{4x}$

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

c) Calculate Karl Pearson's coefficient of correlation
$\sum x = 120, \sum y = 100, \sum x^2 = 650, \sum y^2 = 450, \sum xy = 500, N = 25$

d) Find the Fourier half range sine series of $\begin{matrix} f(x) = mx & 0 \le x \le \frac{\pi}{2} \\ = m(\pi - x) & \frac{\pi}{2} \le x < \pi \end{matrix}$

e) Four coins are tossed 160 times and the following results were obtained.

No. of head:	0	1	2	3	4
Frequency:	17	52	54	31	6

Fit a Binomial distribution

Q.3 Attempt any three of the following question. **09**

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

b) Find the Fourier half range cosine series of $f(x) = x - x^2$ $0 \le x \le 1.$

c) An insurance company found that only 0.01 per cent of the population is involved in a certain type of accident each year. If its 1000 policyholders were randomly selected from the population, what is the probability that more than two of its clients are involved in such an accident next year?

d) The line of regression of y on x is $10y = x + 17$ and the line of regression of x on y is $x = 5y - 7$. Find
i) means of x and y
ii) the coefficient of correlation r

e) Find the Fourier expansion of $f(x) = x$ in $(-1,1)$

Q.4 Attempt any two of the following question. **10**

a) The life -time of certain type of battery has mean life of 400 hours and a standard deviation of 50 hours. Assuming the distribution of life -time to be normal, Find

i) percentage of batteries which have life time of more than 350 hours

ii) the population of batteries which have life time between 300 and 500 hours (For $S.N.V.Z$ area between $z = 0$ and $z = 1$ is 0.3413, For $z = 0$ and $z = 2$ is 0.4772)

b) Find the Fourier expansion of $f(x) = \pi x \quad 0 < x \leq 1$
$= 0 \quad 1 < x \leq 2$

c) Solve $(D^2 + D)y = \frac{1}{1+e^x}$

Section – II

Q.5 Solve any Three of the following. **09**

a) Calculate $L\{te^{3t}\sin^2 3t\}$

b) Find the root of the equation $x^3 - 5.4x^2 + 9.24x - 5.096 = 0$ given that it is near to 1.5 by using Newton Raphson method.

c) Find the Fourier Transform of $f(x) = e^{-x^2/2}$

d) Find $L^{-1}\left\{\frac{1}{(s^2+1)(s^2+9)}\right\}$ by using Convolution theorem.

e) Apply Trapezoidal rule to evaluate $\int_0^1 \frac{x^2}{1+x^3}dx$ with $h = 0.25$

Q.6 Solve any Three of the following. **09**

a) Calculate $L\left\{\int_0^t \frac{e^{-3u}\sin 2u}{u}du\right\}$

b) Find the Fourier sine transform of $f(x) = \frac{1}{x}$

c) Apply Gaussian Quadrature 2-point formula to evaluate $\int_{-2}^{2} e^{-x/2}dx$

d) Calculate inverse Laplace transform of $\tan^{-1}\left(\frac{2}{s}\right)$

e) Evaluate by using Simpson's three-eighth rule $\int_0^6 \frac{1}{1+x^2}\,dx$ Also check the result with actual result.

Q.7 Solve any Two of the following. **10**

a) Solve the system of non-linear equations $x^2 + y = 11, y^2 + x = 7$ take initial approximations as $x_0 = 3.5$ and $y_0 = -1.5$

b) Express $f(x) = \sin x, 0 \leq x < \pi$
$= 0, x = \pi$
$= 0, x > \pi$

as Fourier integral and hence deduce that $\int_0^\infty \frac{\cos(\omega\pi/2)}{1-\omega^2}d\omega = \frac{\pi}{2}$.

c) Using Laplace transform method solve $y''(t) - 2y'(t) + y(t) = e^t$, with $y(0) = 2. y'(0) = -1$

Seat No.	

Set R

S.Y. (B.Tech. Electronics & Telecommunication Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2025 Engineering Mathematics – III (BTN06301)

Day & Date: Saturday 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book Page no 03 (Starring page of the Answer Book Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of Page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) If $L\{f(t)\} = \frac{1}{s}e^{-1/s}$, then $L\{f(3t)\} =$ _____.

a) $\frac{1}{s}e^{-3/s}$ b) $\frac{1}{3s}e^{-3/s}$

c) $\frac{1}{3}e^{-3/s}$ d) $\frac{1}{3}e^{-s/3}$

2) In case of Simpson's $(1/3)^{rd}$ rule, the interval is divided into _____.

a) Equal even number of subintervals
b) Equal odd number of subintervals
c) Equal even or odd of subintervals
d) Any number of subintervals

3) The Fourier sine transform of $f(x) = e^{-x}, x \geq 0$ is _____.

a) $\frac{s}{1+s^2}$ b) $\frac{2}{\pi}.\frac{s}{1+s^2}$

c) $\frac{s}{1-s^2}$ d) $\sqrt{\frac{2}{\pi}}.\frac{s}{1+s^2}$

4) The Fourier Cosine integral form of $f(x)$ is _____.

a) $\int_0^\infty f(s)\cos ws\, ds$

b) $\int_0^\infty \cos wx \left(\int_0^\infty f(s)\cos ws\, ds\right) dw$

c) $\frac{2}{\pi}\int_0^\infty \cos wx \left(\int_0^\infty f(s)\cos ws\, ds\right) dw$

d) None of these

5) $\frac{1}{D+a}x$ is equal to _____.

a) $\int xe^{ax}dx$ b) $\int xe^{-ax}dx$

c) $e^{ax}\int xe^{-ax}dx$ d) $e^{-ax}\int xe^{ax}dx$

6) The general solution of the Differential equation $\frac{d^2y}{dx^2}+\frac{dy}{dx}+y=0$ is _____.

a) $c_1e^x + c_2e^{-x}$

b) $(c_1 + c_2x)e^x$

c) $e^{\frac{x}{2}}\left[c_1\cos\frac{\sqrt{3}}{2}x + c_2\sin\frac{\sqrt{3}}{2}x\right]$

d) $e^{-\frac{x}{2}}\left[c_1\cos\frac{\sqrt{3}}{2}x + c_2\sin\frac{\sqrt{3}}{2}x\right]$

7) $\frac{1}{D^2+9}cos3x$ is equal to _____.

a) $\frac{x\cos 3x}{3}$ b) $\frac{x\sin 3x}{3}$

c) $\frac{x\sin 3x}{6}$ d) $-\frac{x\sin 3x}{6}$

8) The function can be expanded in Fourier series if it satisfies _____.

a) Fourier conditions b) Euler's conditions

c) Riemann's conditions d) Dirichlet's conditions ___

9) $f(x) = x \quad -\pi \le x \le 0$
$\quad = -x \quad 0 \le x \le \pi$

a) No cosine term b) no sine term

c) both cosine and sine term d) none

10) For a binomial distribution the $n = 6$ and $p = 1/3$ then mean and variance are _____.

a) $2, 4/3$ b) $2, 4$

c) $1/3, 3$ d) $3, 4/3$

11) If the mean of $x = 70$, the mean of $y = 149, b_{yx} = 0.7$, then the equation of the line of regression of y on x is _____.

a) $y = 0.5x + 60$ b) $y = 0.6x + 80$

c) $y = 0.7x + 100$ d) $y = 0.8x + 120$

12) The value of the integral $\int_0^\infty e^{-3t} \cos t \ dt$ is _____.

a) $\frac{3}{10}$ b) $-\frac{3}{10}$

c) 3 d) 10

13) $L^{-1}\left\{\frac{1}{s^2}\right\} =$ _____.

a) $\frac{t^2}{2!}$ b) $\frac{t}{2}$

c) t^2 d) t

14) The formula used for solving the equation using Regula Falsi method is _____.

I) $x = \frac{bf(a) - af(b)}{f(a) - f(b)}$

II) $x = \frac{af(b) - bf(a)}{f(a) - f(b)}$

a) Only I is correct b) Only II is Correct

c) Both I, II are correct d) Both I, 11 are Incorrect

Seat No.	

Set **R**

S.Y. (B.Tech. Electronics & Telecommunication Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2025
Engineering Mathematics – III (BTN06301)

Day & Date: Saturday 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Use of non-programmable calculators is allowed.

Section – I

Q.2 Attempt any three of the following question. **09**

a) Solve $(D^3 - 2D^2 - 5D + 6)y = e^{4x}$

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

c) Calculate Karl Pearson's coefficient of correlation
$\sum x = 120, \sum y = 100, \sum x^2 = 650, \sum y^2 = 450, \sum xy = 500, N = 25$

d) Find the Fourier half range sine series of $\begin{matrix} f(x) = mx & 0 \le x \le \frac{\pi}{2} \\ = m(\pi - x) & \frac{\pi}{2} \le x < \pi \end{matrix}$

e) Four coins are tossed 160 times and the following results were obtained.

No. of head:	0	1	2	3	4
Frequency:	17	52	54	31	6

Fit a Binomial distribution

Q.3 Attempt any three of the following question. **09**

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

b) Find the Fourier half range cosine series of $f(x) = x - x^2$ $0 \le x \le 1.$

c) An insurance company found that only 0.01 per cent of the population is involved in a certain type of accident each year. If its 1000 policyholders were randomly selected from the population, what is the probability that more than two of its clients are involved in such an accident next year?

d) The line of regression of y on x is $10y = x + 17$ and the line of regression of x on y is $x = 5y - 7$. Find
i) means of x and y
ii) the coefficient of correlation r

e) Find the Fourier expansion of $f(x) = x$ in $(-1,1)$

Q.4 Attempt any two of the following question. **10**

a) The life -time of certain type of battery has mean life of 400 hours and a standard deviation of 50 hours. Assuming the distribution of life -time to be normal, Find

i) percentage of batteries which have life time of more than 350 hours

ii) the population of batteries which have life time between 300 and 500 hours (For $S.N.V.Z$ area between $z = 0$ and $z = 1$ is 0.3413, For $z = 0$ and $z = 2$ is 0.4772)

b) Find the Fourier expansion of $f(x) = \pi x \quad 0 < x \leq 1$
$= 0 \quad 1 < x \leq 2$

c) Solve $(D^2 + D)y = \frac{1}{1+e^x}$

Section – II

Q.5 Solve any Three of the following. **09**

a) Calculate $L\{te^{3t}\sin^2 3t\}$

b) Find the root of the equation $x^3 - 5.4x^2 + 9.24x - 5.096 = 0$ given that it is near to 1.5 by using Newton Raphson method.

c) Find the Fourier Transform of $f(x) = e^{-x^2/2}$

d) Find $L^{-1}\left\{\frac{1}{(s^2+1)(s^2+9)}\right\}$ by using Convolution theorem.

e) Apply Trapezoidal rule to evaluate $\int_0^1 \frac{x^2}{1+x^3}dx$ with $h = 0.25$

Q.6 Solve any Three of the following. **09**

a) Calculate $L\left\{\int_0^t \frac{e^{-3u}\sin 2u}{u}du\right\}$

b) Find the Fourier sine transform of $f(x) = \frac{1}{x}$

c) Apply Gaussian Quadrature 2-point formula to evaluate $\int_{-2}^{2} e^{-x/2}dx$

d) Calculate inverse Laplace transform of $\tan^{-1}\left(\frac{2}{s}\right)$

e) Evaluate by using Simpson's three-eighth rule $\int_0^6 \frac{1}{1+x^2}\,dx$ Also check the result with actual result.

Q.7 Solve any Two of the following. **10**

a) Solve the system of non-linear equations $x^2 + y = 11, y^2 + x = 7$ take initial approximations as $x_0 = 3.5$ and $y_0 = -1.5$

b) Express $f(x) = \sin x, 0 \leq x < \pi$
$= 0, x = \pi$
$= 0, x > \pi$

as Fourier integral and hence deduce that $\int_0^\infty \frac{\cos(\omega\pi/2)}{1-\omega^2}d\omega = \frac{\pi}{2}$.

c) Using Laplace transform method solve $y''(t) - 2y'(t) + y(t) = e^t$, with $y(0) = 2. y'(0) = -1$

Seat No.	

Set **S**

S.Y. (B.Tech. Electronics & Telecommunication Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2025 Engineering Mathematics – III (BTN06301)

Day & Date: Saturday 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book Page no 03 (Starring page of the Answer Book Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of Page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) For a binomial distribution the $n = 6$ and $p = 1/3$ then mean and variance are _____.

a) $2, 4/3$ b) $2, 4$

c) $1/3, 3$ d) $3, 4/3$

2) If the mean of $x = 70$, the mean of $y = 149, b_{yx} = 0.7$, then the equation of the line of regression of y on x is _____.

a) $y = 0.5x + 60$ b) $y = 0.6x + 80$

c) $y = 0.7x + 100$ d) $y = 0.8x + 120$

3) The value of the integral $\int_0^\infty e^{-3t} \cos t \ dt$ is _____.

a) $\frac{3}{10}$ b) $-\frac{3}{10}$

c) 3 d) 10

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

a) $\frac{t^2}{2!}$ b) $\frac{t}{2}$

c) t^2 d) t

5) The formula used for solving the equation using Regula Falsi method is _____.

I) $x = \dfrac{bf(a) - af(b)}{f(a) - f(b)}$

II) $x = \dfrac{af(b) - bf(a)}{f(a) - f(b)}$

a) Only I is correct
b) Only II is Correct
c) Both I, II are correct
d) Both I, 11 are Incorrect

6) If $L\{f(t)\} = \frac{1}{s}e^{-1/s}$, then $L\{f(3t)\} =$ _____.

a) $\dfrac{1}{s}e^{-3/s}$
b) $\dfrac{1}{3s}e^{-3/s}$
c) $\dfrac{1}{3}e^{-3/s}$
d) $\dfrac{1}{3}e^{-s/3}$

7) In case of Simpson's $(1/3)^{rd}$ rule, the interval is divided into _____.

a) Equal even number of subintervals
b) Equal odd number of subintervals
c) Equal even or odd of subintervals
d) Any number of subintervals

8) The Fourier sine transform of $f(x) = e^{-x}, x \geq 0$ is _____.

a) $\dfrac{s}{1+s^2}$
b) $\dfrac{2}{\pi}.\dfrac{s}{1+s^2}$
c) $\dfrac{s}{1-s^2}$
d) $\sqrt{\dfrac{2}{\pi}}.\dfrac{s}{1+s^2}$

9) The Fourier Cosine integral form of $f(x)$ is _____.

a) $\displaystyle\int_0^\infty f(s)\cos ws\, ds$

b) $\displaystyle\int_0^\infty \cos wx \left(\int_0^\infty f(s)\cos ws\, ds\right) dw$

c) $\dfrac{2}{\pi}\displaystyle\int_0^\infty \cos wx \left(\int_0^\infty f(s)\cos ws\, ds\right) dw$

d) None of these

10) $\frac{1}{D+a}x$ is equal to _____.

a) $\int xe^{ax}dx$
b) $\int xe^{-ax}dx$
c) $e^{ax}\int xe^{-ax}dx$
d) $e^{-ax}\int xe^{ax}dx$

11) The general solution of the Differential equation $\frac{d^2y}{dx^2}+\frac{dy}{dx}+y=0$ is _____.

a) $c_1e^x+c_2e^{-x}$

b) $(c_1+c_2x)e^x$

c) $e^{\frac{x}{2}}\left[c_1\cos\frac{\sqrt{3}}{2}x+c_2\sin\frac{\sqrt{3}}{2}x\right]$

d) $e^{-\frac{x}{2}}\left[c_1\cos\frac{\sqrt{3}}{2}x+c_2\sin\frac{\sqrt{3}}{2}x\right]$

12) $\frac{1}{D^2+9}cos3x$ is equal to _____.

a) $\frac{x\cos 3x}{3}$ b) $\frac{x\sin 3x}{3}$

c) $\frac{x\sin 3x}{6}$ d) $-\frac{x\sin 3x}{6}$

13) The function can be expanded in Fourier series if it satisfies _____.

a) Fourier conditions b) Euler's conditions

c) Riemann's conditions d) Dirichlet's conditions ____

14) $f(x)=x \quad -\pi\le x\le 0$
$\quad =-x \quad 0\le x\le\pi$

a) No cosine term b) no sine term

c) both cosine and sine term d) none

Seat No.	

Set **S**

S.Y. (B.Tech. Electronics & Telecommunication Engineering) (Semester - I) (Old) (CBCS) Examination: March/April - 2025
Engineering Mathematics – III (BTN06301)

Day & Date: Saturday 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Use of non-programmable calculators is allowed.

Section – I

Q.2 Attempt any three of the following question. **09**

a) Solve $(D^3 - 2D^2 - 5D + 6)y = e^{4x}$

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

c) Calculate Karl Pearson's coefficient of correlation
$\sum x = 120, \sum y = 100, \sum x^2 = 650, \sum y^2 = 450, \sum xy = 500, N = 25$

d) Find the Fourier half range sine series of $\begin{matrix} f(x) = mx & 0 \le x \le \frac{\pi}{2} \\ = m(\pi - x) & \frac{\pi}{2} \le x < \pi \end{matrix}$

e) Four coins are tossed 160 times and the following results were obtained.

No. of head:	0	1	2	3	4
Frequency:	17	52	54	31	6

Fit a Binomial distribution

Q.3 Attempt any three of the following question. **09**

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

b) Find the Fourier half range cosine series of $f(x) = x - x^2$ $0 \le x \le 1.$

c) An insurance company found that only 0.01 per cent of the population is involved in a certain type of accident each year. If its 1000 policyholders were randomly selected from the population, what is the probability that more than two of its clients are involved in such an accident next year?

d) The line of regression of y on x is $10y = x + 17$ and the line of regression of x on y is $x = 5y - 7$. Find
i) means of x and y
ii) the coefficient of correlation r

e) Find the Fourier expansion of $f(x) = x$ in $(-1,1)$

Q.4 Attempt any two of the following question. **10**

a) The life -time of certain type of battery has mean life of 400 hours and a standard deviation of 50 hours. Assuming the distribution of life -time to be normal, Find

i) percentage of batteries which have life time of more than 350 hours

ii) the population of batteries which have life time between 300 and 500 hours (For $S.N.V.Z$ area between $z = 0$ and $z = 1$ is 0.3413, For $z = 0$ and $z = 2$ is 0.4772)

b) Find the Fourier expansion of $f(x) = \pi x \quad 0 < x \leq 1$
$= 0 \quad 1 < x \leq 2$

c) Solve $(D^2 + D)y = \frac{1}{1+e^x}$

Section – II

Q.5 Solve any Three of the following. **09**

a) Calculate $L\{te^{3t}\sin^2 3t\}$

b) Find the root of the equation $x^3 - 5.4x^2 + 9.24x - 5.096 = 0$ given that it is near to 1.5 by using Newton Raphson method.

c) Find the Fourier Transform of $f(x) = e^{-x^2/2}$

d) Find $L^{-1}\left\{\frac{1}{(s^2+1)(s^2+9)}\right\}$ by using Convolution theorem.

e) Apply Trapezoidal rule to evaluate $\int_0^1 \frac{x^2}{1+x^3}dx$ with $h = 0.25$

Q.6 Solve any Three of the following. **09**

a) Calculate $L\left\{\int_0^t \frac{e^{-3u}\sin 2u}{u}du\right\}$

b) Find the Fourier sine transform of $f(x) = \frac{1}{x}$

c) Apply Gaussian Quadrature 2-point formula to evaluate $\int_{-2}^{2} e^{-x/2}dx$

d) Calculate inverse Laplace transform of $\tan^{-1}\left(\frac{2}{s}\right)$

e) Evaluate by using Simpson's three-eighth rule $\int_0^6 \frac{1}{1+x^2}\,dx$ Also check the result with actual result.

Q.7 Solve any Two of the following. **10**

a) Solve the system of non-linear equations $x^2 + y = 11, y^2 + x = 7$ take initial approximations as $x_0 = 3.5$ and $y_0 = -1.5$

b) Express $f(x) = \sin x, 0 \leq x < \pi$
$= 0, x = \pi$
$= 0, x > \pi$

as Fourier integral and hence deduce that $\int_0^\infty \frac{\cos(\omega\pi/2)}{1-\omega^2}d\omega = \frac{\pi}{2}$.

c) Using Laplace transform method solve $y''(t) - 2y'(t) + y(t) = e^t$, with $y(0) = 2. y'(0) = -1$

SLR-BD-200

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Electronic Circuit Analysis and Design (BTN06302)

Day & Date: Monday, 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Assume suitable data if necessary.
4) Figures to the right indicates full marks.
5) Draw neat diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) For switching application, BJT is to be operated in _____.
a) active mode
b) cut-off mode
c) saturation mode
d) both saturation and cut-off modes

2) In voltage divider bias, VCC = 25 V; R1 = 10 kΩ; R2 = 2.2 V; RC = 3.6 V and RE =1 kΩ. What is the emitter voltage? Assume BJT in saturation region.
a) 6.7 V b) 5.43 V
c) 4.9 V d) 3.8 V

3) If a three-stage amplifier has individual stage gains of 10db, 6db and 15db; then the total gain in db is _____.
a) 600db b) 31 db
c) 14db d) 24db

4) When multistage amplifier is to amplify d.c. signal, then coupling used is _____.
a) RC b) Transformer
c) Direct d) none of the above

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

6) When current series negative feedback is applied to an amplifier, its output resistance _____.

a) Increases b) Decreases
c) Does not change d) Become unpredictable

7) If the output of an amplifier is 10V and 100mV from the output is fed back to the input, then feedback fraction is _____.

a) 0.10 b) 1
c) 0.01 d) 0.15

8) Which of the following circuits provides the highest frequency stability, _____.

a) RC phase shift oscillator b) Colpitt's oscillator
c) Crystal oscillator d) Hartley oscillator

9) In an RC phase shift oscillator, the minimum number of RC network to be connected in cascade will be _____.

a) One b) Two
c) Three d) Four

10) The maximum collector efficiency of class B power amplifier is _____.

a) 25% b) 78.5%
c) 50% d) 50% & 78.5%

11) If a transistor is operated in such a way that output current flows for 60^0 of the input signal, then it is _____ operation.

a) Class A b) Class B
c) Class C d) None of the above

12) Input impedance of JFET amplifier is _____.

a) Very low b) same as transistor
c) Very high d) Both (a) and (b)

13) MOSFET is _____.

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

14) The region in which JFET works as variable resistance is called as _____.

a) Pinchoff region b) Ohmic region
c) Cutoff region d) None of these

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Electronic Circuit Analysis and Design (BTN06302)

Day & Date: Monday, 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve any FOUR. **16**

a) Justify output voltage signal is 180^0 out of phase with the input signal with a suitable diagram for the transistor Common Emitter amplifier.
b) Amplifier has following voltage gain Av1=10, Av2=20 and Av3=40. What is the overall gain? Also express each gain in dB scale and determine overall gain in dB.
c) Derive the equation for the stability factor for the self-bias circuit.
d) Compare the effect of voltage series, current series, current shunt and voltage shunt feedback topologies on amplifier characteristics.
e) Input resistance increases and output resistance decreases for voltage series feedback amplifier", Justify the statement.

Q.3 Solve any TWO. **12**

a) Design a single-stage CE amplifier with voltage divider bias to give a voltage gain of 40, Vopeak = 4V and stability factor 10. Assume hfe = 45, hie = 1.4kΩ.
b) Explain the working of TWO STAGE RC COUPLED amplifier and derive the expression for voltage gain, Current Gain, Power Gain, Input Resistance and Output Resistance.
c) Explain Voltage Series Feedback Amplifier with Input and Output Resistance.

Section – II

Q.4 Solve any FOUR. **16**

a) The tuned collector oscillator circuit used in the local oscillator of a radio receiver makes use of an LC tuned circuit with L1 = 58.6 μH and C1 = 300 pF. Calculate the frequency of oscillations.
b) Explain the operation of class C amplifier with neat circuit arrangement.
c) Explain Cross-over distortion in power amplifier. Explain method to eliminate this Distortion.
d) Explain operation of JFET as switch with output characteristics.
e) Explain common source JFET amplifier with its basic parameters.

Q.6 Solve any TWO. **12**

a) Explain the Colpitts Oscillator and derive the frequency of oscillation.

b) Explain the Direct coupled class A power amplifier and derive the efficiency.

c) What are different types of MOSFET? Explain working of N channel enhancement MOSFET with drain and transfer characteristics.

SLR-BD-200

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Electronic Circuit Analysis and Design (BTN06302)

Day & Date: Monday, 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Assume suitable data if necessary.
4) Figures to the right indicates full marks.
5) Draw neat diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) Which of the following circuits provides the highest frequency stability, _____.
a) RC phase shift oscillator b) Colpitt's oscillator
c) Crystal oscillator d) Hartley oscillator

2) In an RC phase shift oscillator, the minimum number of RC network to be connected in cascade will be _____.
a) One b) Two
c) Three d) Four

3) The maximum collector efficiency of class B power amplifier is _____.
a) 25% b) 78.5%
c) 50% d) 50% & 78.5%

4) If a transistor is operated in such a way that output current flows for 60^0 of the input signal, then it is _____ operation.
a) Class A b) Class B
c) Class C d) None of the above

5) Input impedance of JFET amplifier is _____.
a) Very low b) same as transistor
c) Very high d) Both (a) and (b)

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

7) The region in which JFET works as variable resistance is called as _____.

a) Pinchoff region
b) Ohmic region
c) Cutoff region
d) None of these

8) For switching application, BJT is to be operated in _____.

a) active mode
b) cut-off mode
c) saturation mode
d) both saturation and cut-off modes

9) In voltage divider bias, VCC = 25 V; R1 = 10 kΩ; R2 = 2.2 V; RC = 3.6 V and RE =1 kΩ. What is the emitter voltage? Assume BJT in saturation region.

a) 6.7 V
b) 5.43 V
c) 4.9 V
d) 3.8 V

10) If a three-stage amplifier has individual stage gains of 10db, 6db and 15db; then the total gain in db is _____.

a) 600db
b) 31 db
c) 14db
d) 24db

11) When multistage amplifier is to amplify d.c. signal, then coupling used is _____.

a) RC
b) Transformer
c) Direct
d) none of the above

12) If D=0.2, Av=50, k=0.01 Distortion factor with feedback is _____.

a) 133.3%
b) 1.33%
c) 13.33%
d) 40.00%

13) When current series negative feedback is applied to an amplifier, its output resistance _____.

a) Increases
b) Decreases
c) Does not change
d) Become unpredictable

14) If the output of an amplifier is 10V and 100mV from the output is fed back to the input, then feedback fraction is _____.

a) 0.10
b) 1
c) 0.01
d) 0.15

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Electronic Circuit Analysis and Design (BTN06302)

Day & Date: Monday, 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve any FOUR. **16**

a) Justify output voltage signal is 180^0 out of phase with the input signal with a suitable diagram for the transistor Common Emitter amplifier.
b) Amplifier has following voltage gain Av1=10, Av2=20 and Av3=40. What is the overall gain? Also express each gain in dB scale and determine overall gain in dB.
c) Derive the equation for the stability factor for the self-bias circuit.
d) Compare the effect of voltage series, current series, current shunt and voltage shunt feedback topologies on amplifier characteristics.
e) Input resistance increases and output resistance decreases for voltage series feedback amplifier", Justify the statement.

Q.3 Solve any TWO. **12**

a) Design a single-stage CE amplifier with voltage divider bias to give a voltage gain of 40, Vopeak = 4V and stability factor 10. Assume hfe = 45, hie = 1.4kΩ.
b) Explain the working of TWO STAGE RC COUPLED amplifier and derive the expression for voltage gain, Current Gain, Power Gain, Input Resistance and Output Resistance.
c) Explain Voltage Series Feedback Amplifier with Input and Output Resistance.

Section – II

Q.4 Solve any FOUR. **16**

a) The tuned collector oscillator circuit used in the local oscillator of a radio receiver makes use of an LC tuned circuit with L1 = 58.6 μH and C1 = 300 pF. Calculate the frequency of oscillations.
b) Explain the operation of class C amplifier with neat circuit arrangement.
c) Explain Cross-over distortion in power amplifier. Explain method to eliminate this Distortion.
d) Explain operation of JFET as switch with output characteristics.
e) Explain common source JFET amplifier with its basic parameters.

Q.6 Solve any TWO. **12**

a) Explain the Colpitts Oscillator and derive the frequency of oscillation.

b) Explain the Direct coupled class A power amplifier and derive the efficiency.

c) What are different types of MOSFET? Explain working of N channel enhancement MOSFET with drain and transfer characteristics.

SLR-BD-200

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Electronic Circuit Analysis and Design (BTN06302)

Day & Date: Monday, 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Assume suitable data if necessary.
4) Figures to the right indicates full marks.
5) Draw neat diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) If a transistor is operated in such a way that output current flows for 60^0 of the input signal, then it is _____ operation.
a) Class A b) Class B
c) Class C d) None of the above

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

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

4) The region in which JFET works as variable resistance is called as _____.
a) Pinchoff region b) Ohmic region
c) Cutoff region d) None of these

5) For switching application, BJT is to be operated in _____.
a) active mode
b) cut-off mode
c) saturation mode
d) both saturation and cut-off modes

6) In voltage divider bias, VCC = 25 V; R1 = 10 kΩ; R2 = 2.2 V; RC = 3.6 V and RE =1 kΩ. What is the emitter voltage? Assume BJT in saturation region.

a) 6.7 V b) 5.43 V
c) 4.9 V d) 3.8 V

7) If a three-stage amplifier has individual stage gains of 10db, 6db and 15db; then the total gain in db is _____.

a) 600db b) 31 db
c) 14db d) 24db

8) When multistage amplifier is to amplify d.c. signal, then coupling used is _____.

a) RC b) Transformer
c) Direct d) none of the above

9) If D=0.2, Av=50, k=0.01 Distortion factor with feedback is _____.

a) 133.3% b) 1.33%
c) 13.33% d) 40.00%

10) When current series negative feedback is applied to an amplifier, its output resistance _____.

a) Increases b) Decreases
c) Does not change d) Become unpredictable

11) If the output of an amplifier is 10V and 100mV from the output is fed back to the input, then feedback fraction is _____.

a) 0.10 b) 1
c) 0.01 d) 0.15

12) Which of the following circuits provides the highest frequency stability, _____.

a) RC phase shift oscillator b) Colpitt's oscillator
c) Crystal oscillator d) Hartley oscillator

13) In an RC phase shift oscillator, the minimum number of RC network to be connected in cascade will be _____.

a) One b) Two
c) Three d) Four

14) The maximum collector efficiency of class B power amplifier is _____.

a) 25% b) 78.5%
c) 50% d) 50% & 78.5%

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Electronic Circuit Analysis and Design (BTN06302)

Day & Date: Monday, 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve any FOUR. **16**

a) Justify output voltage signal is 180^0 out of phase with the input signal with a suitable diagram for the transistor Common Emitter amplifier.
b) Amplifier has following voltage gain Av1=10, Av2=20 and Av3=40. What is the overall gain? Also express each gain in dB scale and determine overall gain in dB.
c) Derive the equation for the stability factor for the self-bias circuit.
d) Compare the effect of voltage series, current series, current shunt and voltage shunt feedback topologies on amplifier characteristics.
e) Input resistance increases and output resistance decreases for voltage series feedback amplifier", Justify the statement.

Q.3 Solve any TWO. **12**

a) Design a single-stage CE amplifier with voltage divider bias to give a voltage gain of 40, Vopeak = 4V and stability factor 10. Assume hfe = 45, hie = 1.4kΩ.
b) Explain the working of TWO STAGE RC COUPLED amplifier and derive the expression for voltage gain, Current Gain, Power Gain, Input Resistance and Output Resistance.
c) Explain Voltage Series Feedback Amplifier with Input and Output Resistance.

Section – II

Q.4 Solve any FOUR. **16**

a) The tuned collector oscillator circuit used in the local oscillator of a radio receiver makes use of an LC tuned circuit with L1 = 58.6 μH and C1 = 300 pF. Calculate the frequency of oscillations.
b) Explain the operation of class C amplifier with neat circuit arrangement.
c) Explain Cross-over distortion in power amplifier. Explain method to eliminate this Distortion.
d) Explain operation of JFET as switch with output characteristics.
e) Explain common source JFET amplifier with its basic parameters.

Q.6 Solve any TWO. **12**

a) Explain the Colpitts Oscillator and derive the frequency of oscillation.

b) Explain the Direct coupled class A power amplifier and derive the efficiency.

c) What are different types of MOSFET? Explain working of N channel enhancement MOSFET with drain and transfer characteristics.

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Electronic Circuit Analysis and Design (BTN06302)

Day & Date: Monday, 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Assume suitable data if necessary.
4) Figures to the right indicates full marks.
5) Draw neat diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions. **14**

1) When current series negative feedback is applied to an amplifier, its output resistance _____.
a) Increases b) Decreases
c) Does not change d) Become unpredictable

2) If the output of an amplifier is 10V and 100mV from the output is fed back to the input, then feedback fraction is _____.
a) 0.10 b) 1
c) 0.01 d) 0.15

3) Which of the following circuits provides the highest frequency stability, _____.
a) RC phase shift oscillator b) Colpitt's oscillator
c) Crystal oscillator d) Hartley oscillator

4) In an RC phase shift oscillator, the minimum number of RC network to be connected in cascade will be _____.
a) One b) Two
c) Three d) Four

5) The maximum collector efficiency of class B power amplifier is _____.
a) 25% b) 78.5%
c) 50% d) 50% & 78.5%

6) If a transistor is operated in such a way that output current flows for 60^0 of the input signal, then it is _____ operation.
a) Class A b) Class B
c) Class C d) None of the above

7) Input impedance of JFET amplifier is _____.
a) Very low
b) same as transistor
c) Very high
d) Both (a) and (b)

8) MOSFET is _____.
a) Unipolar device
b) Voltage controlled device
c) Current controlled device
d) Both (a) and (b)

9) The region in which JFET works as variable resistance is called as _____.
a) Pinchoff region
b) Ohmic region
c) Cutoff region
d) None of these

10) For switching application, BJT is to be operated in _____.
a) active mode
b) cut-off mode
c) saturation mode
d) both saturation and cut-off modes

11) In voltage divider bias, VCC = 25 V; R1 = 10 kΩ; R2 = 2.2 V; RC = 3.6 V and RE =1 kΩ. What is the emitter voltage? Assume BJT in saturation region.
a) 6.7 V
b) 5.43 V
c) 4.9 V
d) 3.8 V

12) If a three-stage amplifier has individual stage gains of 10db, 6db and 15db; then the total gain in db is _____.
a) 600db
b) 31 db
c) 14db
d) 24db

13) When multistage amplifier is to amplify d.c. signal, then coupling used is _____.
a) RC
b) Transformer
c) Direct
d) none of the above

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

SLR-BD-200

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Electronic Circuit Analysis and Design (BTN06302)

Day & Date: Monday, 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve any FOUR. **16**

a) Justify output voltage signal is 180^0 out of phase with the input signal with a suitable diagram for the transistor Common Emitter amplifier.
b) Amplifier has following voltage gain Av1=10, Av2=20 and Av3=40. What is the overall gain? Also express each gain in dB scale and determine overall gain in dB.
c) Derive the equation for the stability factor for the self-bias circuit.
d) Compare the effect of voltage series, current series, current shunt and voltage shunt feedback topologies on amplifier characteristics.
e) Input resistance increases and output resistance decreases for voltage series feedback amplifier", Justify the statement.

Q.3 Solve any TWO. **12**

a) Design a single-stage CE amplifier with voltage divider bias to give a voltage gain of 40, Vopeak = 4V and stability factor 10. Assume hfe = 45, hie = 1.4kΩ.
b) Explain the working of TWO STAGE RC COUPLED amplifier and derive the expression for voltage gain, Current Gain, Power Gain, Input Resistance and Output Resistance.
c) Explain Voltage Series Feedback Amplifier with Input and Output Resistance.

Section – II

Q.4 Solve any FOUR. **16**

a) The tuned collector oscillator circuit used in the local oscillator of a radio receiver makes use of an LC tuned circuit with L1 = 58.6 μH and C1 = 300 pF. Calculate the frequency of oscillations.
b) Explain the operation of class C amplifier with neat circuit arrangement.
c) Explain Cross-over distortion in power amplifier. Explain method to eliminate this Distortion.
d) Explain operation of JFET as switch with output characteristics.
e) Explain common source JFET amplifier with its basic parameters.

Q.6 Solve any TWO. **12**

a) Explain the Colpitts Oscillator and derive the frequency of oscillation.

b) Explain the Direct coupled class A power amplifier and derive the efficiency.

c) What are different types of MOSFET? Explain working of N channel enhancement MOSFET with drain and transfer characteristics.

SLR-BD-201

Seat No.	

Set P

S.Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Network Theory and Analysis (BTN06303)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers. **14**

1) A non-linear network does not satisfy ____.
a) superposition condition
b) homogeneity condition
c) both homogeneity as well as superposition condition
d) homogeneity, superposition, and associative condition

2) Under the condition of maximum power of efficiency is ____.
a) 80% b) 75%
c) 50% d) none of the above

3) Thevenin resistance Rth, is found?
a) by removing voltage sources along with their internal resistances
b) by short-circuiting the given two terminals
c) between any two 'open' terminals
d) between same open terminals as for Eth

4) In a series resonance circuit, series resonance occurs when?
a) $X_L = 1$ b) $X_C = 1$
c) $X_L = X_C$ d) $X_L = -X_C$

5) At resonant frequency, the voltage across capacitor is ____ the voltage across inductor.
a) greater than b) less than
c) greater than or equal to d) equal to

6) If a two-port network is reciprocal, then we have, with the usual notation, the following relationship ____.

a) $h_{12} = h_{21}$ b) $h_{12} = -h_{21}$

c) $h_{11} = h_{22}$ d) $h_{11}h_{22} - h_{12}h_{21} = 1$

7) Which among the following represents the precise condition of reciprocity for transmission parameters?

a) $\mathrm{AB} - \mathrm{CD} = 1$ b) $\mathrm{AD} - \mathrm{BC} = 1$

c) $\mathrm{AB} - \mathrm{BD} = 1$ d) None of the above

8) The time constant of a series RL circuit is ____.

a) L/R b) LR

c) R/L d) $e^{-R/L}$

9) Which of the following components contribute to the oscillatory nature in system?

i) R
ii) L
iii) C

a) R, L b) L, C

c) R, C d) R, L, C

10) For the system to be stable all poles & zeros of the system should lie ____.

a) In right half of s-plan b) In left half of s-plan

c) On the imaginary axis d) None

11) The polynomial to satisfy stability condition ____.

a) Z(s) is real function
b) All the roots of $P_{(s)}$ have zero real parts, or negative real parts.
c) both a) & b)
d) None

12) The value of one decibel is equal to, where N is attenuation in Nepers ____.

a) log10 (N) b) 10 log10 (N)

c) 21 log10 (N) d) 40 log10 (N)

13) A filter which passes without attenuation all frequencies up to the cut-off frequency f_c and attenuates all other frequencies greater than f_c is called?

a) high pass filter b) low pass filter

c) band elimination filter d) band pass filter

14) Which of the following is a passive element?

a) A BJT b) An Inductor

c) A FET d) An Op-amp

Seat No.	

Set **P**

S. Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Network Theory and Analysis (BTN06303)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Use of nonprogrammable calculator is allowed.

Section – I

Q.2 Attempt the following questions: (Any Four) **16**

a) State & explain Superposition theorem with suitable example.

b) Determine Thevenin's equivalent circuit across terminals AB for given circuit as

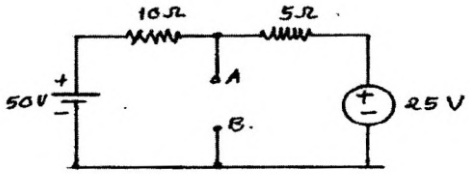


Figure 1

c) A series RLC circuit with R = 300, L= 0.5H results in a leading phase angle of 60° at a frequency of 50 Hz. At what frequency will the circuit be resonant?

d) Derive Z- parameter equations for the two-port network in terms of port voltages and currents.

e) Explain symmetrical & reciprocal two-port networks. Give their conditions.

Q.3 Attempt the following: (Any Two) **12**

a) Determine the maximum power delivered to the load in the circuit as shown in Figure 2.

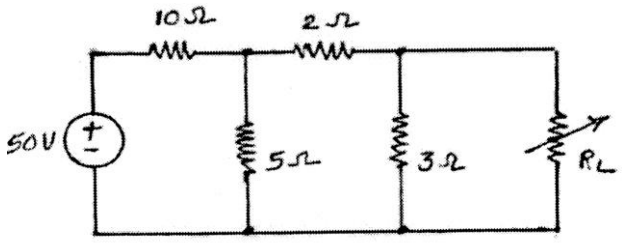


Figure 2

b) Explain parallel resonance & derive expression for resonant frequency for Tank circuit.

c) For the network shown below in Figure 3, find the Open circuit Impedance parameters.

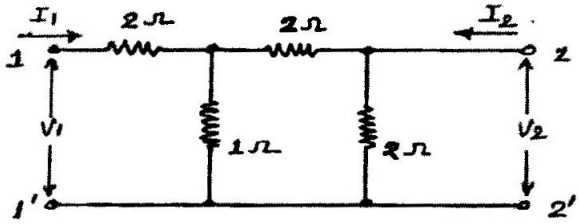


Figure 3

Section – II

Q.4 Attempt the following: (Any Four) **16**

a) Define transition state and steads state. Explain step voltage response of series RL circuit.

b) Draw pole zero plot for given function. What is condition for stability? Comment on stability of given system from pole zero plot.

$$Z(s) = \frac{8s}{(s+1)(s^2+4s+4)}$$

c) Design a low pass filter (both T and π section) having a cut off frequency of 2KHz to operate with a terminated load resistance of 500Ω.

d) A series RC circuit consists of R=10Ω and C=0.1F shown in Figure 4. Initially the switch is kept open for very long time. At t=0 switch is closed. Find the expressions for voltages across C and R and expression for current through C.

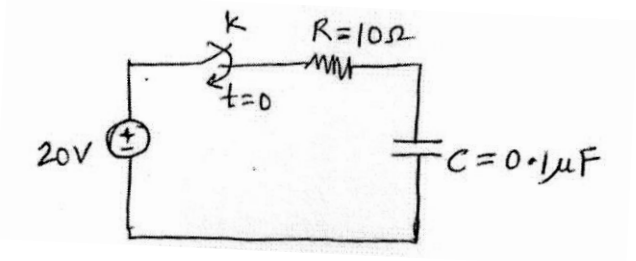


Figure 4

e) What is complex frequency? Define poles and zeros of Network function and explain their significance.

Q.5 Attempt the following: (Any Two) **12**

a) Find equation for current i(t) in Figure 5, value of current at t=0.1s Assume all initial conditions are zero.

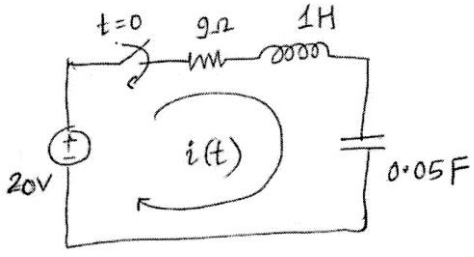


Figure 5

b) Determine the driving point impedance and driving point admittance for the given network in Figure 6.

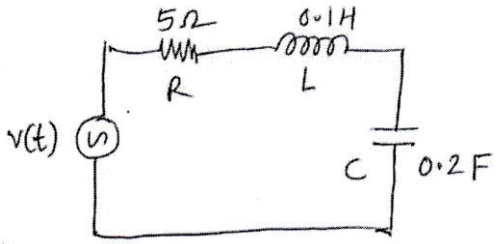


Figure 6

c) For the given network function, draw pole zero plot and hence obtain time domain response of voltage.

$$V(s) = \frac{5(s+5)}{(s+2)(s+7)}$$

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Network Theory and Analysis (BTN06303)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers. **14**

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

2) Which of the following components contribute to the oscillatory nature in system?
i) R
ii) L
iii) C
a) R, L b) L, C
c) R, C d) R, L, C

3) For the system to be stable all poles & zeros of the system should lie ____.
a) In right half of s-plan b) In left half of s-plan
c) On the imaginary axis d) None

4) The polynomial to satisfy stability condition ____.
a) Z(s) is real function
b) All the roots of P(s) have zero real parts, or negative real parts.
c) both a) & b)
d) None

5) The value of one decibel is equal to, where N is attenuation in Nepers ____.
a) log10 (N) b) 10 log10 (N)
c) 21 log10 (N) d) 40 log10 (N)

6) A filter which passes without attenuation all frequencies up to the cut-off frequency f_c and attenuates all other frequencies greater than f_c is called?

a) high pass filter b) low pass filter
c) band elimination filter d) band pass filter

7) Which of the following is a passive element?

a) A BJT b) An Inductor
c) A FET d) An Op-amp

8) A non-linear network does not satisfy ____.

a) superposition condition
b) homogeneity condition
c) both homogeneity as well as superposition condition
d) homogeneity, superposition, and associative condition

9) Under the condition of maximum power of efficiency is ____.

a) 80% b) 75%
c) 50% d) none of the above

10) Thevenin resistance Rth, is found?

a) by removing voltage sources along with their internal resistances
b) by short-circuiting the given two terminals
c) between any two 'open' terminals
d) between same open terminals as for Eth

11) In a series resonance circuit, series resonance occurs when?

a) $\mathrm{X_L} = 1$ b) $\mathrm{X_C} = 1$
c) $\mathrm{X_L} = \mathrm{X_C}$ d) $\mathrm{X_L} = -\mathrm{X_C}$

12) At resonant frequency, the voltage across capacitor is ____ the voltage across inductor.

a) greater than b) less than
c) greater than or equal to d) equal to

13) If a two-port network is reciprocal, then we have, with the usual notation, the following relationship ____.

a) $h_{12} = h_{21}$ b) $h_{12} = -h_{21}$
c) $h_{11} = h_{22}$ d) $h_{11}h_{22} - h_{12}h_{21} = 1$

14) Which among the following represents the precise condition of reciprocity for transmission parameters?

a) $\mathrm{AB} - \mathrm{CD} = 1$ b) $\mathrm{AD} - \mathrm{BC} = 1$
c) $\mathrm{AB} - \mathrm{BD} = 1$ d) None of the above

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Network Theory and Analysis (BTN06303)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Use of nonprogrammable calculator is allowed.

Section – I

Q.2 Attempt the following questions: (Any Four) **16**

a) State & explain Superposition theorem with suitable example.

b) Determine Thevenin's equivalent circuit across terminals AB for given circuit as

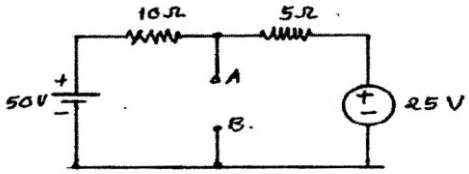


Figure 1

c) A series RLC circuit with R = 300, L= 0.5H results in a leading phase angle of 60° at a frequency of 50 Hz. At what frequency will the circuit be resonant?

d) Derive Z- parameter equations for the two-port network in terms of port voltages and currents.

e) Explain symmetrical & reciprocal two-port networks. Give their conditions.

Q.3 Attempt the following: (Any Two) **12**

a) Determine the maximum power delivered to the load in the circuit as shown in Figure 2.

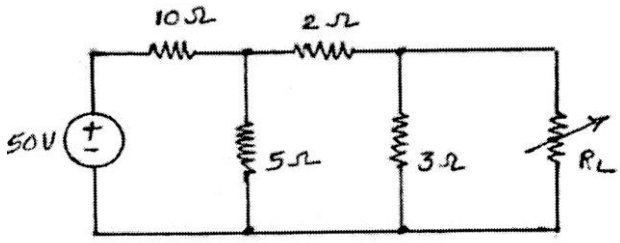


Figure 2

b) Explain parallel resonance & derive expression for resonant frequency for Tank circuit.

c) For the network shown below in Figure 3, find the Open circuit Impedance parameters.

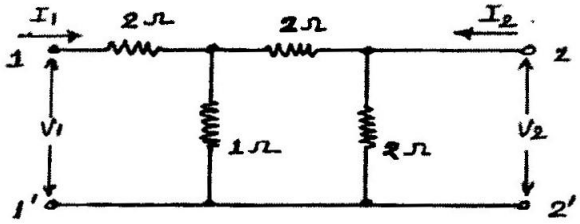


Figure 3

Section – II

Q.4 Attempt the following: (Any Four) **16**

a) Define transition state and steads state. Explain step voltage response of series RL circuit.

b) Draw pole zero plot for given function. What is condition for stability? Comment on stability of given system from pole zero plot.

$$Z(s) = \frac{8s}{(s+1)(s^2+4s+4)}$$

c) Design a low pass filter (both T and π section) having a cut off frequency of 2KHz to operate with a terminated load resistance of 500Ω.

d) A series RC circuit consists of R=10Ω and C=0.1F shown in Figure 4. Initially the switch is kept open for very long time. At t=0 switch is closed. Find the expressions for voltages across C and R and expression for current through C.

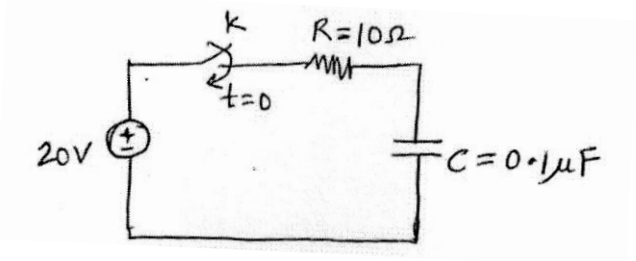


Figure 4

e) What is complex frequency? Define poles and zeros of Network function and explain their significance.

Q.5 Attempt the following: (Any Two) **12**

a) Find equation for current i(t) in Figure 5, value of current at t=0.1s Assume all initial conditions are zero.

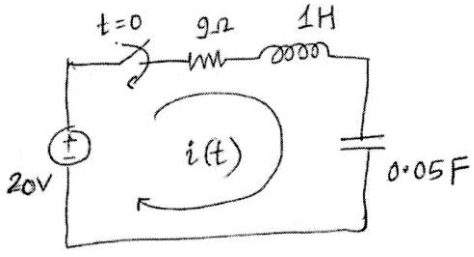


Figure 5

b) Determine the driving point impedance and driving point admittance for the given network in Figure 6.

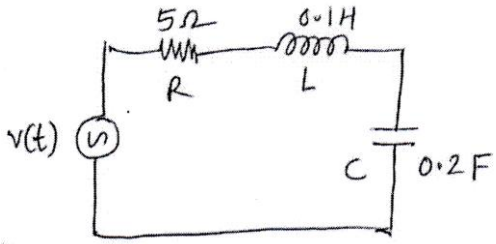


Figure 6

c) For the given network function, draw pole zero plot and hence obtain time domain response of voltage.

$$V(s) = \frac{5(s+5)}{(s+2)(s+7)}$$

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Network Theory and Analysis (BTN06303)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers. **14**

1) The polynomial to satisfy stability condition ____.
a) Z(s) is real function
b) All the roots of $P_{(s)}$ have zero real parts, or negative real parts.
c) both a) & b)
d) None

2) The value of one decibel is equal to, where N is attenuation in Nepers ____.
a) log10 (N) b) 10 log10 (N)
c) 21 log10 (N) d) 40 log10 (N)

3) A filter which passes without attenuation all frequencies up to the cut-off frequency f_c and attenuates all other frequencies greater than f_c is called?
a) high pass filter b) low pass filter
c) band elimination filter d) band pass filter

4) Which of the following is a passive element?
a) A BJT b) An Inductor
c) A FET d) An Op-amp

5) A non-linear network does not satisfy ____.
a) superposition condition
b) homogeneity condition
c) both homogeneity as well as superposition condition
d) homogeneity, superposition, and associative condition

6) Under the condition of maximum power of efficiency is ____.
a) 80% b) 75%
c) 50% d) none of the above

7) Thevenin resistance Rth, is found?
a) by removing voltage sources along with their internal resistances
b) by short-circuiting the given two terminals
c) between any two 'open' terminals
d) between same open terminals as for Eth

8) In a series resonance circuit, series resonance occurs when?
a) $\mathrm{X_L} = 1$ b) $\mathrm{X_C} = 1$
c) $\mathrm{X_L} = \mathrm{X_C}$ d) $\mathrm{X_L} = -\mathrm{X_C}$

9) At resonant frequency, the voltage across capacitor is ____ the voltage across inductor.
a) greater than b) less than
c) greater than or equal to d) equal to

10) If a two-port network is reciprocal, then we have, with the usual notation, the following relationship ____.
a) $h_{12} = h_{21}$ b) $h_{12} = -h_{21}$
c) $h_{11} = h_{22}$ d) $h_{11}h_{22} - h_{12}h_{21} = 1$

11) Which among the following represents the precise condition of reciprocity for transmission parameters?
a) $\mathrm{AB} - \mathrm{CD} = 1$ b) $\mathrm{AD} - \mathrm{BC} = 1$
c) $\mathrm{AB} - \mathrm{BD} = 1$ d) None of the above

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

13) Which of the following components contribute to the oscillatory nature in system?
i) R
ii) L
iii) C
a) R, L b) L, C
c) R, C d) R, L, C

14) For the system to be stable all poles & zeros of the system should lie ____.
a) In right half of s-plan b) In left half of s-plan
c) On the imaginary axis d) None

Seat No.	

Set R

S. Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Network Theory and Analysis (BTN06303)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Use of nonprogrammable calculator is allowed.

Section – I

Q.2 Attempt the following questions: (Any Four) **16**

a) State & explain Superposition theorem with suitable example.

b) Determine Thevenin's equivalent circuit across terminals AB for given circuit as

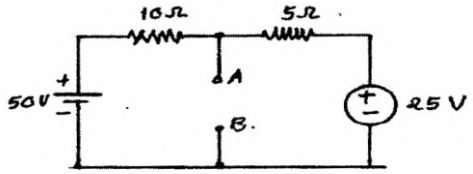


Figure 1

c) A series RLC circuit with R = 300, L= 0.5H results in a leading phase angle of 60° at a frequency of 50 Hz. At what frequency will the circuit be resonant?

d) Derive Z- parameter equations for the two-port network in terms of port voltages and currents.

e) Explain symmetrical & reciprocal two-port networks. Give their conditions.

Q.3 Attempt the following: (Any Two) **12**

a) Determine the maximum power delivered to the load in the circuit as shown in Figure 2.

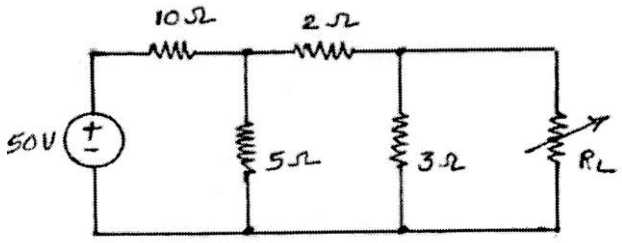


Figure 2

b) Explain parallel resonance & derive expression for resonant frequency for Tank circuit.

c) For the network shown below in Figure 3, find the Open circuit Impedance parameters.

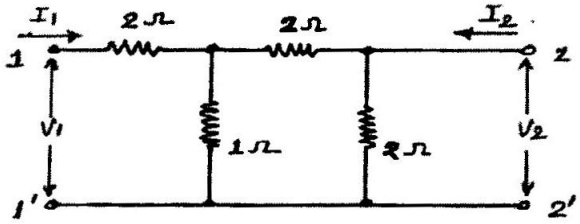


Figure 3

Section – II

Q.4 Attempt the following: (Any Four) **16**

a) Define transition state and steads state. Explain step voltage response of series RL circuit.

b) Draw pole zero plot for given function. What is condition for stability? Comment on stability of given system from pole zero plot.

$$Z(s) = \frac{8s}{(s+1)(s^2+4s+4)}$$

c) Design a low pass filter (both T and π section) having a cut off frequency of 2KHz to operate with a terminated load resistance of 500Ω.

d) A series RC circuit consists of R=10Ω and C=0.1F shown in Figure 4. Initially the switch is kept open for very long time. At t=0 switch is closed. Find the expressions for voltages across C and R and expression for current through C.

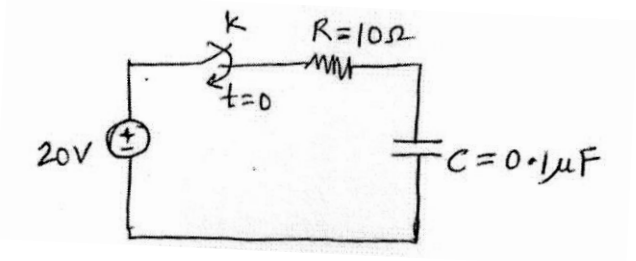


Figure 4

e) What is complex frequency? Define poles and zeros of Network function and explain their significance.

Q.5 Attempt the following: (Any Two) **12**

a) Find equation for current i(t) in Figure 5, value of current at t=0.1s Assume all initial conditions are zero.

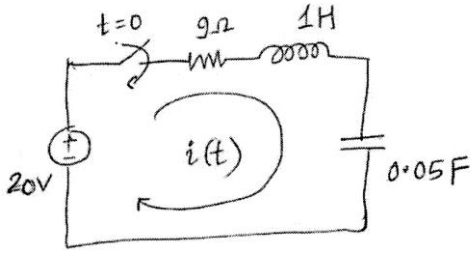


Figure 5

b) Determine the driving point impedance and driving point admittance for the given network in Figure 6.

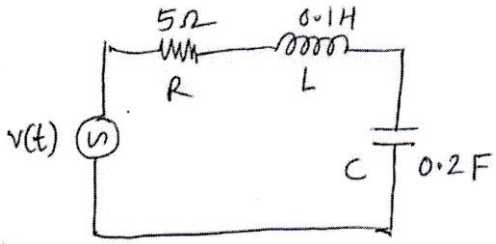


Figure 6

c) For the given network function, draw pole zero plot and hence obtain time domain response of voltage.

$$V(s) = \frac{5(s+5)}{(s+2)(s+7)}$$

Seat No.	

Set **S**

S. Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Network Theory and Analysis (BTN06303)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers. **14**

1) If a two-port network is reciprocal, then we have, with the usual notation, the following relationship ____.
a) $h_{12} = h_{21}$ b) $h_{12} = -h_{21}$
c) $h_{11} = h_{22}$ d) $h_{11}h_{22} - h_{12}h_{21} = 1$

2) Which among the following represents the precise condition of reciprocity for transmission parameters?
a) $\mathrm{AB} - \mathrm{CD} = 1$ b) $\mathrm{AD} - \mathrm{BC} = 1$
c) $\mathrm{AB} - \mathrm{BD} = 1$ d) None of the above

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

4) Which of the following components contribute to the oscillatory nature in system?
i) R
ii) L
iii) C
a) R, L b) L, C
c) R, C d) R, L, C

5) For the system to be stable all poles & zeros of the system should lie ____.
a) In right half of s-plan b) In left half of s-plan
c) On the imaginary axis d) None

6) The polynomial to satisfy stability condition ____.
a) Z(s) is real function
b) All the roots of $P_{(s)}$ have zero real parts, or negative real parts.
c) both a) & b)
d) None

7) The value of one decibel is equal to, where N is attenuation in Nepers ____.
a) log10 (N) b) 10 log10 (N)
c) 21 log10 (N) d) 40 log10 (N)

8) A filter which passes without attenuation all frequencies up to the cut-off frequency f_c and attenuates all other frequencies greater than f_c is called?
a) high pass filter b) low pass filter
c) band elimination filter d) band pass filter

9) Which of the following is a passive element?
a) A BJT b) An Inductor
c) A FET d) An Op-amp

10) A non-linear network does not satisfy ____.
a) superposition condition
b) homogeneity condition
c) both homogeneity as well as superposition condition
d) homogeneity, superposition, and associative condition

11) Under the condition of maximum power of efficiency is ____.
a) 80% b) 75%
c) 50% d) none of the above

12) Thevenin resistance Rth, is found?
a) by removing voltage sources along with their internal resistances
b) by short-circuiting the given two terminals
c) between any two 'open' terminals
d) between same open terminals as for Eth

13) In a series resonance circuit, series resonance occurs when?
a) $X_L = 1$ b) $X_C = 1$
c) $X_L = X_C$ d) $X_L = -X_C$

14) At resonant frequency, the voltage across capacitor is ____ the voltage across inductor.
a) greater than b) less than
c) greater than or equal to d) equal to

Seat No.	

Set | S

S. Y. (B. Tech) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Network Theory and Analysis (BTN06303)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Use of nonprogrammable calculator is allowed.

Section – I

Q.2 Attempt the following questions: (Any Four) **16**

a) State & explain Superposition theorem with suitable example.

b) Determine Thevenin's equivalent circuit across terminals AB for given circuit as

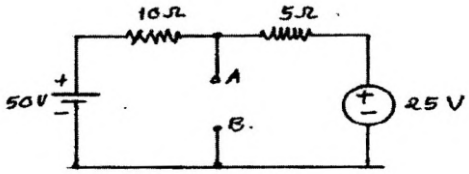


Figure 1

c) A series RLC circuit with R = 300, L= 0.5H results in a leading phase angle of 60° at a frequency of 50 Hz. At what frequency will the circuit be resonant?

d) Derive Z- parameter equations for the two-port network in terms of port voltages and currents.

e) Explain symmetrical & reciprocal two-port networks. Give their conditions.

Q.3 Attempt the following: (Any Two) **12**

a) Determine the maximum power delivered to the load in the circuit as shown in Figure 2.

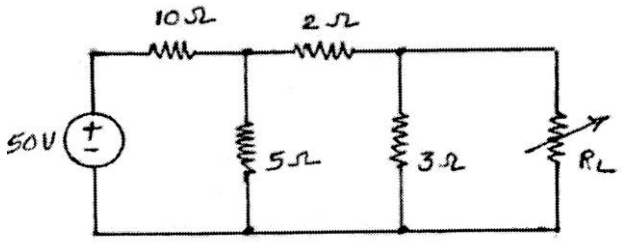


Figure 2

b) Explain parallel resonance & derive expression for resonant frequency for Tank circuit.

c) For the network shown below in Figure 3, find the Open circuit Impedance parameters.

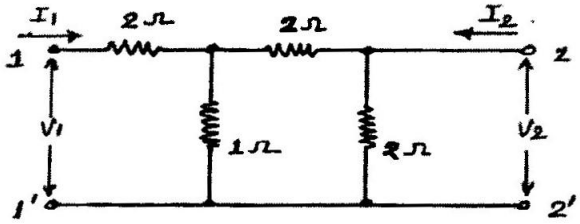


Figure 3

Section – II

Q.4 Attempt the following: (Any Four) **16**

a) Define transition state and steads state. Explain step voltage response of series RL circuit.

b) Draw pole zero plot for given function. What is condition for stability? Comment on stability of given system from pole zero plot.

$$Z(s) = \frac{8s}{(s+1)(s^2+4s+4)}$$

c) Design a low pass filter (both T and π section) having a cut off frequency of 2KHz to operate with a terminated load resistance of 500Ω.

d) A series RC circuit consists of R=10Ω and C=0.1F shown in Figure 4. Initially the switch is kept open for very long time. At t=0 switch is closed. Find the expressions for voltages across C and R and expression for current through C.

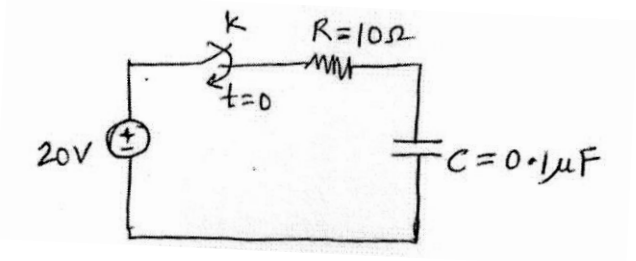


Figure 4

e) What is complex frequency? Define poles and zeros of Network function and explain their significance.

Q.5 Attempt the following: (Any Two) **12**

a) Find equation for current i(t) in Figure 5, value of current at t=0.1s Assume all initial conditions are zero.

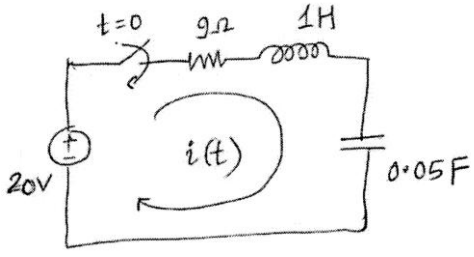


Figure 5

b) Determine the driving point impedance and driving point admittance for the given network in Figure 6.

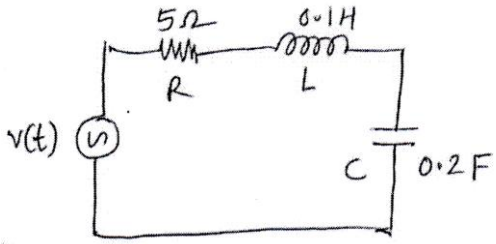


Figure 6

c) For the given network function, draw pole zero plot and hence obtain time domain response of voltage.

$$V(s) = \frac{5(s+5)}{(s+2)(s+7)}$$

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April - 2025
Electronics & Telecommunication Engineering & Engineering
Digital Techniques (BTN06304)

Day & Date: Wednesday, 21-May-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions: **14**

1) There are ____ cells in a 4-variable K-map.
a) 12 b) 16
c) 18 d) None of the Mentioned

2) The following binary system is used for K-map representation ____.
a) Binary b) BCD
c) Gray d) Hexadecimal

3) The following device selects one of the several inputs and transmits it to a single output ____.
a) Decoder b) Multiplexer
c) Demultiplexer d) Counter

4) Demultiplexer is represented by ____.
a) $2^n \times 1$ b) $2^n \times n$
c) $n \times 2^n$ d) 1×2^n

5) IC 7448 is used for ____.
a) Common anode display b) Common cathode display
c) Both(a) & (b) d) None of the above

6) SR flip-flop does not allow the input such that ____.
a) S=0, R=0 b) S=1, R=1
c) S=0, R=1 d) S=1, R=0

7) The characteristic equation of JK flip-flop is given by,____.
a) $Q_{n+1} = J\bar{Q}(n) + \bar{K}Q(n)$ b) $Q_{n+1} = JQ(n) + \bar{K}Q(n)$
c) $Q_{n+1} = J\bar{Q}(n) + KQ(n)$ d) $Q_{n+1} = J\bar{Q}(n) + \bar{K}\bar{Q}(n)$

8) An asynchronous counter differs from a synchronous counter in ____.
a) the mod number b) the type of flip-flops used
c) the method of clocking d) None of these

9) The full form of SIPO is ____.
a) Serial-in Parallel-out
b) Parallel-in Serial-out
c) Serial-in Serial-out
d) Serial-In Peripheral-Out

10) A ring counter with 5 flip flops will have ____.
a) 5 States
b) 10 States
c) 32 States
d) 25 States

11) How many clock pulses are required to completely load serially a 4 bit shift register?
a) 2
b) 3
c) 4
d) 5

12) The number of flip-flops required to implement mod-6 counter is ____.
a) 6
b) 3
c) 2
d) 5

13) The state diagram is the pictorial representation among ____.
a) present states
b) next states
c) input and output
d) all of these

14) State reduction gives, ____.
a) Reduction in number of flip-flops
b) Number of flip-flops remains same
c) (a) & (b)
d) None of these

Seat No.	

Set P

S.Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April - 2025
Electronics & Telecommunication Engineering & Engineering
Digital Techniques (BTN06304)

Day & Date: Wednesday, 21-May-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve the following: (Any Four) **16**

a) Obtain the minimized expression for the function $f(A,B,C) = \pi M\ (0,1,3,4,7)$ and implement using basic gates.
b) Compare combinational and sequential circuit.
c) What is subtractor? Explain half subtractor with design.
d) Write a note on IC 7447.
e) Define the term in detail:
i) Noise margin
ii) Propagation delay

Q.3 Solve the following: (Any Two) **12**

a) Reduce given function using K-map and implement it using NOR gate only $f(A,B,C,D) = \pi M\ (0,2,5,7,8,10,13,15)$
b) Explain the design of 2-bit magnitude comparator.
c) Convert
i) D flip-flop to JK flip-flop
ii) D flip-flop to T flip-flop

Section- II

Q.4 Solve the following: (Any Four) **16**

a) Explain serial in serial out shift register.
b) Explain twisted ring counter.
c) Design MOD-3 asynchronous up counter.
d) Design MOD-7 counter using IC7490.
e) Draw the state diagram of T and D flip-flops.

Q.5 Solve the following: (Any Two) **12**

a) Explain Parallel in Serial out shift register.
b) Design asynchronous MOD 9 counter.
c) Explain state diagram, state table, and draw Moore, Mealy state diagram for D flip-flop.

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April - 2025
Electronics & Telecommunication Engineering & Engineering
Digital Techniques (BTN06304)

Day & Date: Wednesday, 21-May-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions: **14**

1) An asynchronous counter differs from a synchronous counter in ____.
a) the mod number b) the type of flip-flops used
c) the method of clocking d) None of these

2) The full form of SIPO is ____.
a) Serial-in Parallel-out b) Parallel-in Serial-out
c) Serial-in Serial-out d) Serial-In Peripheral-Out

3) A ring counter with 5 flip flops will have ____.
a) 5 States b) 10 States
c) 32 States d) 25 States

4) How many clock pulses are required to completely load serially a 4 bit shift register?
a) 2 b) 3
c) 4 d) 5

5) The number of flip-flops required to implement mod-6 counter is ____.
a) 6 b) 3
c) 2 d) 5

6) The state diagram is the pictorial representation among ____.
a) present states b) next states
c) input and output d) all of these

7) State reduction gives, ____.
a) Reduction in number of flip-flops
b) Number of flip-flops remains same
c) (a) & (b)
d) None of these

8) There are ____ cells in a 4-variable K-map.
a) 12 b) 16
c) 18 d) None of the Mentioned

9) The following binary system is used for K-map representation ____.
a) Binary b) BCD
c) Gray d) Hexadecimal

10) The following device selects one of the several inputs and transmits it to a single output ____.
a) Decoder b) Multiplexer
c) Demultiplexer d) Counter

11) Demultiplexer is represented by ____.
a) $2^n \times 1$ b) $2^n \times n$
c) $n \times 2^n$ d) 1×2^n

12) IC 7448 is used for ____.
a) Common anode display b) Common cathode display
c) Both(a) & (b) d) None of the above

13) SR flip-flop does not allow the input such that ____.
a) S=0, R=0 b) S=1, R=1
c) S=0, R=1 d) S=1, R=0

14) The characteristic equation of JK flip-flop is given by,____.
a) $Q_{n+1} = J\bar{Q}(n) + \bar{K}Q(n)$ b) $Q_{n+1} = JQ(n) + \bar{K}Q(n)$
c) $Q_{n+1} = J\bar{Q}(n) + KQ(n)$ d) $Q_{n+1} = J\bar{Q}(n) + \bar{K}\bar{Q}(n)$

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April - 2025
Electronics & Telecommunication Engineering & Engineering
Digital Techniques (BTN06304)

Day & Date: Wednesday, 21-May-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve the following: (Any Four) **16**

a) Obtain the minimized expression for the function $f(A,B,C) = \pi M\ (0,1,3,4,7)$ and implement using basic gates.
b) Compare combinational and sequential circuit.
c) What is subtractor? Explain half subtractor with design.
d) Write a note on IC 7447.
e) Define the term in detail:
i) Noise margin
ii) Propagation delay

Q.3 Solve the following: (Any Two) **12**

a) Reduce given function using K-map and implement it using NOR gate only $f(A,B,C,D) = \pi M\ (0,2,5,7,8,10,13,15)$
b) Explain the design of 2-bit magnitude comparator.
c) Convert
i) D flip-flop to JK flip-flop
ii) D flip-flop to T flip-flop

Section- II

Q.4 Solve the following: (Any Four) **16**

a) Explain serial in serial out shift register.
b) Explain twisted ring counter.
c) Design MOD-3 asynchronous up counter.
d) Design MOD-7 counter using IC7490.
e) Draw the state diagram of T and D flip-flops.

Q.5 Solve the following: (Any Two) **12**

a) Explain Parallel in Serial out shift register.
b) Design asynchronous MOD 9 counter.
c) Explain state diagram, state table, and draw Moore, Mealy state diagram for D flip-flop.

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April - 2025
Electronics & Telecommunication Engineering & Engineering
Digital Techniques (BTN06304)

Day & Date: Wednesday, 21-May-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions: **14**

1) How many clock pulses are required to completely load serially a 4 bit shift register?
a) 2 b) 3
c) 4 d) 5

2) The number of flip-flops required to implement mod-6 counter is ____.
a) 6 b) 3
c) 2 d) 5

3) The state diagram is the pictorial representation among ____.
a) present states b) next states
c) input and output d) all of these

4) State reduction gives, ____.
a) Reduction in number of flip-flops
b) Number of flip-flops remains same
c) (a) & (b)
d) None of these

5) There are ____ cells in a 4-variable K-map.
a) 12 b) 16
c) 18 d) None of the Mentioned

6) The following binary system is used for K-map representation ____.
a) Binary b) BCD
c) Gray d) Hexadecimal

7) The following device selects one of the several inputs and transmits it to a single output ____.
a) Decoder b) Multiplexer
c) Demultiplexer d) Counter

8) Demultiplexer is represented by ____.

a) $2^n \times 1$ b) $2^n \times n$

c) $n \times 2^n$ d) 1×2^n

9) IC 7448 is used for ____.

a) Common anode display b) Common cathode display

c) Both(a) & (b) d) None of the above

10) SR flip-flop does not allow the input such that ____.

a) S=0, R=0 b) S=1, R=1

c) S=0, R=1 d) S=1, R=0

11) The characteristic equation of JK flip-flop is given by,____.

a) $Q_{n+1} = J\bar{Q}(n) + \bar{K}Q(n)$ b) $Q_{n+1} = JQ(n) + \bar{K}Q(n)$

c) $Q_{n+1} = J\bar{Q}(n) + KQ(n)$ d) $Q_{n+1} = J\bar{Q}(n) + \bar{K}\bar{Q}(n)$

12) An asynchronous counter differs from a synchronous counter in ____.

a) the mod number b) the type of flip-flops used

c) the method of clocking d) None of these

13) The full form of SIPO is ____.

a) Serial-in Parallel-out b) Parallel-in Serial-out

c) Serial-in Serial-out d) Serial-In Peripheral-Out

14) A ring counter with 5 flip flops will have ____.

a) 5 States b) 10 States

c) 32 States d) 25 States

SLR-BD-202

Seat No.	

Set R

S.Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April - 2025
Electronics & Telecommunication Engineering & Engineering
Digital Techniques (BTN06304)

Day & Date: Wednesday, 21-May-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve the following: (Any Four) **16**

a) Obtain the minimized expression for the function $f(A,B,C) = \pi M\ (0,1,3,4,7)$ and implement using basic gates.
b) Compare combinational and sequential circuit.
c) What is subtractor? Explain half subtractor with design.
d) Write a note on IC 7447.
e) Define the term in detail:
i) Noise margin
ii) Propagation delay

Q.3 Solve the following: (Any Two) **12**

a) Reduce given function using K-map and implement it using NOR gate only $f(A,B,C,D) = \pi M\ (0,2,5,7,8,10,13,15)$
b) Explain the design of 2-bit magnitude comparator.
c) Convert
i) D flip-flop to JK flip-flop
ii) D flip-flop to T flip-flop

Section- II

Q.4 Solve the following: (Any Four) **16**

a) Explain serial in serial out shift register.
b) Explain twisted ring counter.
c) Design MOD-3 asynchronous up counter.
d) Design MOD-7 counter using IC7490.
e) Draw the state diagram of T and D flip-flops.

Q.5 Solve the following: (Any Two) **12**

a) Explain Parallel in Serial out shift register.
b) Design asynchronous MOD 9 counter.
c) Explain state diagram, state table, and draw Moore, Mealy state diagram for D flip-flop.

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April - 2025
Electronics & Telecommunication Engineering & Engineering
Digital Techniques (BTN06304)

Day & Date: Wednesday, 21-May-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Multiple Choice Questions: **14**

1) SR flip-flop does not allow the input such that ____.
a) S=0, R=0 b) S=1, R=1
c) S=0, R=1 d) S=1, R=0

2) The characteristic equation of JK flip-flop is given by,____.
a) $Q_{n+1} = J\bar{Q}(n) + \bar{K}Q(n)$ b) $Q_{n+1} = JQ(n) + \bar{K}Q(n)$
c) $Q_{n+1} = J\bar{Q}(n) + KQ(n)$ d) $Q_{n+1} = J\bar{Q}(n) + \bar{K}\bar{Q}(n)$

3) An asynchronous counter differs from a synchronous counter in ____.
a) the mod number b) the type of flip-flops used
c) the method of clocking d) None of these

4) The full form of SIPO is ____.
a) Serial-in Parallel-out b) Parallel-in Serial-out
c) Serial-in Serial-out d) Serial-In Peripheral-Out

5) A ring counter with 5 flip flops will have ____.
a) 5 States b) 10 States
c) 32 States d) 25 States

6) How many clock pulses are required to completely load serially a 4 bit shift register?
a) 2 b) 3
c) 4 d) 5

7) The number of flip-flops required to implement mod-6 counter is ____.
a) 6 b) 3
c) 2 d) 5

8) The state diagram is the pictorial representation among ____.
a) present states b) next states
c) input and output d) all of these

9) State reduction gives, ____.
a) Reduction in number of flip-flops
b) Number of flip-flops remains same
c) (a) & (b)
d) None of these

10) There are ____ cells in a 4-variable K-map.
a) 12 b) 16
c) 18 d) None of the Mentioned

11) The following binary system is used for K-map representation ____.
a) Binary b) BCD
c) Gray d) Hexadecimal

12) The following device selects one of the several inputs and transmits it to a single output ____.
a) Decoder b) Multiplexer
c) Demultiplexer d) Counter

13) Demultiplexer is represented by ____.
a) $2^n \times 1$ b) $2^n \times n$
c) $n \times 2^n$ d) 1×2^n

14) IC 7448 is used for ____.
a) Common anode display b) Common cathode display
c) Both(a) & (b) d) None of the above

Seat No.	

Set S

S.Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April - 2025
Electronics & Telecommunication Engineering & Engineering
Digital Techniques (BTN06304)

Day & Date: Wednesday, 21-May-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve the following: (Any Four) **16**

a) Obtain the minimized expression for the function $f(A,B,C) = \pi M\ (0,1,3,4,7)$ and implement using basic gates.
b) Compare combinational and sequential circuit.
c) What is subtractor? Explain half subtractor with design.
d) Write a note on IC 7447.
e) Define the term in detail:
i) Noise margin
ii) Propagation delay

Q.3 Solve the following: (Any Two) **12**

a) Reduce given function using K-map and implement it using NOR gate only $f(A,B,C,D) = \pi M\ (0,2,5,7,8,10,13,15)$
b) Explain the design of 2-bit magnitude comparator.
c) Convert
i) D flip-flop to JK flip-flop
ii) D flip-flop to T flip-flop

Section- II

Q.4 Solve the following: (Any Four) **16**

a) Explain serial in serial out shift register.
b) Explain twisted ring counter.
c) Design MOD-3 asynchronous up counter.
d) Design MOD-7 counter using IC7490.
e) Draw the state diagram of T and D flip-flops.

Q.5 Solve the following: (Any Two) **12**

a) Explain Parallel in Serial out shift register.
b) Design asynchronous MOD 9 counter.
c) Explain state diagram, state table, and draw Moore, Mealy state diagram for D flip-flop.

Seat No.	

Set **P**

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING & ENGINEERING
Analog Communication (BTN06305)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) In a communication receiver, the noise is most likely to affect the signal _____.
a) at the transmitter
b) in the channel
c) in the information source
d) at the destination

2) What is the ratio of modulating power to total power at 100% modulation?
a) 1 : 3 b) 1 : 2
c) 2 : 3 d) 3 : 2

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

4) The image frequency of a super heterodyne receiver _____.
a) is created within the receiver itself
b) is due to insufficient adjacent channel rejection
c) is not rejected by the IF tuned circuits
d) is independent of the frequency to which the receiver is tuned

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

6) The equivalent noise temperature Teq of communication system varies _____.

a) Linearly with To
b) Linearly with To_2
c) Linearly with 1/To
d) Linearly with $1/To_2$

7) The M. I. of an AM wave is 50%. If carrier and one of the sideband is suppressed, then the percentage power saving is _____.

a) 66.66%
b) 83.33%
c) 50%
d) 94.44%

8) The bandwidth in frequency modulation can be calculated as _____.

a) $2(\delta + fm)$
b) $2(mf + 1)fm$
c) $2nfm$
d) All of these

9) Armstrong FM transmitter performs frequency multiplication in stages _____.

a) To increase the overall S/N ratio
b) To reduce BW
c) To find the desired value of carrier
d) For convenience frequency as well as frequency deviation

10) To boost high frequencies _____ circuit is used.

a) Amplifier
b) De-emphasis
c) Pre-emphasis
d) Filters

11) Bandwidth required by an amplitude modulated signal is _____.

a) Half the modulating signal frequency
b) Equal to carrier frequency
c) Twice the modulating signal frequency
d) Equal to modulating signal frequency

12) The audio frequency range is _____.

a) 10 Hz to 1 kHz
b) 80 MHz to 108 MHz
c) 20 Hz to 20 kHz
d) 1 kHz to 1 MHz

13) Good selectivity usually means _____ bandwidth.

a) Wide
b) Narrow
c) None of these
d) Independent of BW

14) Flicker noise is _____.

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

Seat No.	

Set **P**

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING & ENGINEERING
Analog Communication (BTN06305)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Attempt any Four **16**

a) Draw and explain the basic block diagram of communication system.
b) Prove that maximum power in AM wave is Pt = 1.5 Pc for perfect modulation.
c) The antenna current of an AM transmitter is 8 A when only the carrier is sent, but it increases to 8.93 A when the carrier is modulated by a single sine wave. Find the percentage of modulation. Determine the antenna current if depth of modulation changes to 0.8.
d) What are various SSB generation techniques? Explain phase shift method.
e) Compare AM and FM.

Q.3 Attempt any two. **12**

a) Draw and explain two stage IF amplifier. State the factors consider in choice of IF.
b) Define noise. What are the types of noise? Explain white noise.
c) Explain the different types of communication channels used in data transmission.

Section – II

Q.4 Attempt any Four. **16**

a) Differentiate between Narrowband and Wideband FM.
b) What is the need of Pre-emphasis and De-emphasis?
c) Explain the working principle of slope detector.
d) What is Nyquist rate? Explain sampling theorem.
e) An FM radio link has a frequency deviation of 30 kHz. The modulating frequency is 3 kHz. Calculate the bandwidth needed for the link. What will be the bandwidth if the deviation is reduced to 15 kHz?

Q.5 Attempt any two. **12**

a) Explain Armstrong method of FM generation.

b) With the help of circuit diagram explain the working of foster seeley discriminator.

c) Describe TDM (Time Division Multiplexing) in detail.

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING & ENGINEERING
Analog Communication (BTN06305)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The bandwidth in frequency modulation can be calculated as _____.
a) $2(\delta + fm)$ b) $2(mf + 1)fm$
c) $2nfm$ d) All of these

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

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

4) Bandwidth required by an amplitude modulated signal is _____.
a) Half the modulating signal frequency
b) Equal to carrier frequency
c) Twice the modulating signal frequency
d) Equal to modulating signal frequency

5) The audio frequency range is _____.
a) 10 Hz to 1 kHz b) 80 MHz to 108 MHz
c) 20 Hz to 20 kHz d) 1 kHz to 1 MHz

6) Good selectivity usually means _____ bandwidth.
a) Wide b) Narrow
c) None of these d) Independent of BW

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

8) In a communication receiver, the noise is most likely to affect the signal _____.
a) at the transmitter
b) in the channel
c) in the information source
d) at the destination

9) What is the ratio of modulating power to total power at 100% modulation?
a) 1 : 3 b) 1 : 2
c) 2 : 3 d) 3 : 2

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

11) The image frequency of a super heterodyne receiver _____.
a) is created within the receiver itself
b) is due to insufficient adjacent channel rejection
c) is not rejected by the IF tuned circuits
d) is independent of the frequency to which the receiver is tuned

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

13) The equivalent noise temperature Teq of communication system varies _____.
a) Linearly with To b) Linearly with To_2
c) Linearly with 1/To d) Linearly with $1/To_2$

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

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING & ENGINEERING
Analog Communication (BTN06305)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Attempt any Four **16**

a) Draw and explain the basic block diagram of communication system.
b) Prove that maximum power in AM wave is Pt = 1.5 Pc for perfect modulation.
c) The antenna current of an AM transmitter is 8 A when only the carrier is sent, but it increases to 8.93 A when the carrier is modulated by a single sine wave. Find the percentage of modulation. Determine the antenna current if depth of modulation changes to 0.8.
d) What are various SSB generation techniques? Explain phase shift method.
e) Compare AM and FM.

Q.3 Attempt any two. **12**

a) Draw and explain two stage IF amplifier. State the factors consider in choice of IF.
b) Define noise. What are the types of noise? Explain white noise.
c) Explain the different types of communication channels used in data transmission.

Section – II

Q.4 Attempt any Four. **16**

a) Differentiate between Narrowband and Wideband FM.
b) What is the need of Pre-emphasis and De-emphasis?
c) Explain the working principle of slope detector.
d) What is Nyquist rate? Explain sampling theorem.
e) An FM radio link has a frequency deviation of 30 kHz. The modulating frequency is 3 kHz. Calculate the bandwidth needed for the link. What will be the bandwidth if the deviation is reduced to 15 kHz?

Q.5 Attempt any two. **12**

a) Explain Armstrong method of FM generation.

b) With the help of circuit diagram explain the working of foster seeley discriminator.

c) Describe TDM (Time Division Multiplexing) in detail.

Seat No.	

Set R

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING & ENGINEERING
Analog Communication (BTN06305)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Bandwidth required by an amplitude modulated signal is _____.
a) Half the modulating signal frequency
b) Equal to carrier frequency
c) Twice the modulating signal frequency
d) Equal to modulating signal frequency

2) The audio frequency range is _____.
a) 10 Hz to 1 kHz b) 80 MHz to 108 MHz
c) 20 Hz to 20 kHz d) 1 kHz to 1 MHz

3) Good selectivity usually means _____ bandwidth.
a) Wide b) Narrow
c) None of these d) Independent of BW

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

5) In a communication receiver, the noise is most likely to affect the signal _____.
a) at the transmitter
b) in the channel
c) in the information source
d) at the destination

6) What is the ratio of modulating power to total power at 100% modulation?

a) 1 : 3 b) 1 : 2
c) 2 : 3 d) 3 : 2

7) Vestigial sideband modulation is used for transmission of _____.

a) HF point to point communication
b) Monaural broadcasting
c) TV broadcasting
d) Stereo broadcasting

8) The image frequency of a super heterodyne receiver _____.

a) is created within the receiver itself
b) is due to insufficient adjacent channel rejection
c) is not rejected by the IF tuned circuits
d) is independent of the frequency to which the receiver is tuned

9) A carrier is simultaneously modulated by two sine waves with modulation indices of 0.3 and 0.4. If carrier power is 10 kW, then total modulated power will be _____.

a) 12.5 kW b) 10 kW
c) 11.25 kW d) 10.5 kW

10) The equivalent noise temperature Teq of communication system varies _____.

a) Linearly with To b) Linearly with To_2
c) Linearly with 1/To d) Linearly with $1/To_2$

11) The M. I. of an AM wave is 50%. If carrier and one of the sideband is suppressed, then the percentage power saving is _____.

a) 66.66% b) 83.33%
c) 50% d) 94.44%

12) The bandwidth in frequency modulation can be calculated as _____.

a) $2(\delta + fm)$ b) $2(mf + 1)fm$
c) $2nfm$ d) All of these

13) Armstrong FM transmitter performs frequency multiplication in stages _____.

a) To increase the overall S/N ratio
b) To reduce BW
c) To find the desired value of carrier
d) For convenience frequency as well as frequency deviation

14) To boost high frequencies _____ circuit is used.

a) Amplifier b) De-emphasis
c) Pre-emphasis d) Filters

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING & ENGINEERING
Analog Communication (BTN06305)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Attempt any Four **16**

a) Draw and explain the basic block diagram of communication system.
b) Prove that maximum power in AM wave is Pt = 1.5 Pc for perfect modulation.
c) The antenna current of an AM transmitter is 8 A when only the carrier is sent, but it increases to 8.93 A when the carrier is modulated by a single sine wave. Find the percentage of modulation. Determine the antenna current if depth of modulation changes to 0.8.
d) What are various SSB generation techniques? Explain phase shift method.
e) Compare AM and FM.

Q.3 Attempt any two. **12**

a) Draw and explain two stage IF amplifier. State the factors consider in choice of IF.
b) Define noise. What are the types of noise? Explain white noise.
c) Explain the different types of communication channels used in data transmission.

Section – II

Q.4 Attempt any Four. **16**

a) Differentiate between Narrowband and Wideband FM.
b) What is the need of Pre-emphasis and De-emphasis?
c) Explain the working principle of slope detector.
d) What is Nyquist rate? Explain sampling theorem.
e) An FM radio link has a frequency deviation of 30 kHz. The modulating frequency is 3 kHz. Calculate the bandwidth needed for the link. What will be the bandwidth if the deviation is reduced to 15 kHz?

Q.5 Attempt any two. **12**

a) Explain Armstrong method of FM generation.

b) With the help of circuit diagram explain the working of foster seeley discriminator.

c) Describe TDM (Time Division Multiplexing) in detail.

Seat No.	

Set S

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING & ENGINEERING
Analog Communication (BTN06305)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The equivalent noise temperature Teq of communication system varies _____.
a) Linearly with To b) Linearly with To_2
c) Linearly with 1/To d) Linearly with $1/To_2$

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

3) The bandwidth in frequency modulation can be calculated as _____.
a) $2(\delta + fm)$ b) $2(mf + 1)fm$
c) $2nfm$ d) All of these

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

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

6) Bandwidth required by an amplitude modulated signal is _____.
a) Half the modulating signal frequency
b) Equal to carrier frequency
c) Twice the modulating signal frequency
d) Equal to modulating signal frequency

7) The audio frequency range is _____.
a) 10 Hz to 1 kHz
b) 80 MHz to 108 MHz
c) 20 Hz to 20 kHz
d) 1 kHz to 1 MHz

8) Good selectivity usually means _____ bandwidth.
a) Wide
b) Narrow
c) None of these
d) Independent of BW

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

10) In a communication receiver, the noise is most likely to affect the signal _____.
a) at the transmitter
b) in the channel
c) in the information source
d) at the destination

11) What is the ratio of modulating power to total power at 100% modulation?
a) 1 : 3
b) 1 : 2
c) 2 : 3
d) 3 : 2

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

13) The image frequency of a super heterodyne receiver _____.
a) is created within the receiver itself
b) is due to insufficient adjacent channel rejection
c) is not rejected by the IF tuned circuits
d) is independent of the frequency to which the receiver is tuned

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

Seat No.	

Set **S**

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING & ENGINEERING
Analog Communication (BTN06305)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Attempt any Four **16**

a) Draw and explain the basic block diagram of communication system.
b) Prove that maximum power in AM wave is Pt = 1.5 Pc for perfect modulation.
c) The antenna current of an AM transmitter is 8 A when only the carrier is sent, but it increases to 8.93 A when the carrier is modulated by a single sine wave. Find the percentage of modulation. Determine the antenna current if depth of modulation changes to 0.8.
d) What are various SSB generation techniques? Explain phase shift method.
e) Compare AM and FM.

Q.3 Attempt any two. **12**

a) Draw and explain two stage IF amplifier. State the factors consider in choice of IF.
b) Define noise. What are the types of noise? Explain white noise.
c) Explain the different types of communication channels used in data transmission.

Section – II

Q.4 Attempt any Four. **16**

a) Differentiate between Narrowband and Wideband FM.
b) What is the need of Pre-emphasis and De-emphasis?
c) Explain the working principle of slope detector.
d) What is Nyquist rate? Explain sampling theorem.
e) An FM radio link has a frequency deviation of 30 kHz. The modulating frequency is 3 kHz. Calculate the bandwidth needed for the link. What will be the bandwidth if the deviation is reduced to 15 kHz?

Q.5 Attempt any two. **12**

a) Explain Armstrong method of FM generation.

b) With the help of circuit diagram explain the working of foster seeley discriminator.

c) Describe TDM (Time Division Multiplexing) in detail.

SLR-BD-204

Seat No.	

Set P

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Signals and Systems (ENTPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options **14**

1) If $x(t)$ is an odd signal then which of the following statement is true?
a) $x(t) = 0$ b) $x(t) = x(-t)$
c) $x(0) = 0$ d) None

2) Identify the non-periodic signal.
a) $x(t) = \cos 2(t)$ b) $x(t) = \cos 2\pi\, t\, u(t)$
c) $x(t) = \sin(2\,\pi/3)t$ d) None

3) If signal $f(t)$ has energy, E, the energy of signal $f(2t)$ is equal to _____
a) E b) $E/2$
c) $2E$ d) $4E$

4) The system $y[n] = x[-n]$ is _____
a) Time invariant b) Time variant
c) Both a and b d) none

5) The signal $x(n) = \cos 2n$ is _____
a) periodic with period π b) periodic with period 2
c) period with period $4\,\pi$ d) Aperiodic

6) A system is said to be defined as non-causal, when _____
a) The output at the present depends on the input at an earlier time
b) The output at the present does not depend on the factor of time at all
c) The output at the present depends on the input at the current time
d) The output at the present depends on the input at a time instant in the future

7) Convolution of $x(t+5)$ with $\delta(t-7)$ is equal to _____

a) $x(t-12)$ b) $x(t+12)$

c) $x(t-2)$ d) $x(t+2)$

8) If $x(-n)$ is signal with $x(n)=0$; for $n<-2, n>4$ then $x(n-3)$ is guaranteed to be zero for _____

a) $n<0, n>7$ b) $n<-1, n<6$

c) $n<1, n>7$ d) $n>-1, n>5$

9) Choose the correct equation for finding the output of a discrete time convolution?

a) $y[n]=\sum\times[k]h[n-k], k$ from 0 to ∞

b) $y[n]=\sum\times[k]h[n-k], k$ from -∞ to +∞

c) $y[n]=\sum\times[k]h[k], k$ from 0 to ∞

d) $y[n]=\sum\times[k]h[n], k$ from -∞ to +∞

10) Who discovered the Fourier series?

a) Jean Baptiste de Fourier

b) Jean Baptiste Joseph Fourier

c) Fourier Joseph

d) Jean Fourier

11) The Fourier transform of a unit step function is given as _____

a) $F(j\omega)=1/j\omega$ b) $F(j\omega)=j\omega$

c) $F(\omega)=j/\omega$ d) None

12) Dirichlet conditions for periodic signals are in each period _____

a) function $x(t)$ has only finite number of maxima & minima

b) function $x(t)$ has finite number of discontinuities

c) function $x(t)$ is absolutely integrable over one period

d) All of above

13) Find the Z-transform of $\delta(n+3)$.

a) z b) z2

c) 1 d) z3

14) ROC of $x(n)$ contains _____

a) poles b) zeros

c) no poles d) no zeros

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Signals and Systems (ENTPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Solve any four of the following. **16**

a) Write a list of signal classification and explain any two signals.
b) Sketch the signal $x(t) = r(t\ +1) - r(t) + r(t-1)$
c) Check whether the given system is linear or nonlinear and time variant or Invariant. $y(t) = x(n^2)$
d) Derive the equation of convolution integral and write its properties.
e) Perform the convolution between $x(t) = u(t)$ and $h(t) = e^{-t}\,u(t)$

Q.3 Solve any two of the following. **12**

a) Find the Convolution of the given sequences using multiplication method $x[n] = \{1,1,0,1,1\}$ and $h[n] = \{1,-2,-3,4\}$
b) Draw the direct form I and II of the following signals.
$4\frac{d^3y(t)}{dt^3} - 3\frac{dy(t)}{dt} + y(t) = x(t) + \frac{dx(t)}{dt}$
c) Check the system properties for the given function.
$Y(t) = x(t+10) + x^2(t)$

Section – II

Q.4 Solve any four of the following **16**

a) Explain types of Fourier series and Dirichlet's conditions.
b) For the signal $x(t) = \sin \omega o t$ find the Fourier series and draw its spectrum
c) State and prove Convolution property of Fourier series.
d) Obtain the Fourier Transform of $x(t) = te^{-t}\,u(t)$
e) State and prove time shift property of Fourier transform.

Q.5 Solve any two of the following. **12**

a) Define ROC and its properties of Z-Transform.
b) Determine Z-Transform of both sided sequence.
c) Determine Inverse Z-Transform of the following function for ROC $|Z| > 1$ and $|Z| < 0.5$
$X(Z) = \frac{1}{1-1.5Z^{-1}+0.5Z^{-2}}$

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Signals and Systems (ENTPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options **14**

1) If $x(-n)$ is signal with $x(n) = 0$; for $n < -2, n > 4$ then $x(n-3)$ is guaranteed to be zero for _____

a) $n < 0, n > 7$ b) $n < -1, n < 6$
c) $n < 1, n > 7$ d) $n > -1, n > 5$

2) Choose the correct equation for finding the output of a discrete time convolution?

a) $y[n] = \sum\times [k]h[n-k], k$ from 0 to ∞
b) $y[n] = \sum\times [k]h[n-k], k$ from -∞ to +∞
c) $y[n] = \sum\times [k]h[k], k$ from 0 to ∞
d) $y[n] = \sum\times [k]h[n], k$ from -∞ to +∞

3) Who discovered the Fourier series?

a) Jean Baptiste de Fourier
b) Jean Baptiste Joseph Fourier
c) Fourier Joseph
d) Jean Fourier

4) The Fourier transform of a unit step function is given as _____

a) $F(j\omega) = 1/j\omega$ b) $F(j\omega) = j\omega$
c) $F(\omega) = j/\omega$ d) None

5) Dirichlet conditions for periodic signals are in each period _____

a) function $x(t)$ has only finite number of maxima & minima
b) function $x(t)$ has finite number of discontinuities
c) function $x(t)$ is absolutely integrable over one period
d) All of above

6) Find the Z-transform of $\delta(n+3)$.

a) z b) z2
c) 1 d) z3

7) ROC of $x(n)$ contains _____

a) poles b) zeros
c) no poles d) no zeros

8) If $x(t)$ is an odd signal then which of the following statement is true?

a) $x(t) = 0$ b) $x(t) = x(-t)$
c) $x(0) = 0$ d) None

9) Identify the non-periodic signal.

a) $x(t) = \cos 2(t)$ b) $x(t) = \cos 2\pi\ t\ u(t)$
c) $x(t) = \sin(2\ \pi/3)t$ d) None

10) If signal $f(t)$ has energy, E, the energy of signal $f(2t)$ is equal to _____

a) E b) $E/2$
c) $2E$ d) $4E$

11) The system $y[n] = x[-n]$ is _____

a) Time invariant b) Time variant
c) Both a and b d) none

12) The signal $x(n) = \cos 2n$ is _____

a) periodic with period π b) periodic with period 2
c) period with period 4 π d) Aperiodic

13) A system is said to be defined as non-causal, when _____

a) The output at the present depends on the input at an earlier time
b) The output at the present does not depend on the factor of time at all
c) The output at the present depends on the input at the current time
d) The output at the present depends on the input at a time instant in the future

14) Convolution of $x(t+5)$ with $\delta(t-7)$ is equal to _____

a) $x(t-12)$ b) $x(t+12)$
c) $x(t-2)$ d) $x(t+2)$

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Signals and Systems (ENTPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Solve any four of the following. **16**

a) Write a list of signal classification and explain any two signals.
b) Sketch the signal $x(t) = r(t\ +1) - r(t) + r(t-1)$
c) Check whether the given system is linear or nonlinear and time variant or Invariant. $y(t) = x(n^2)$
d) Derive the equation of convolution integral and write its properties.
e) Perform the convolution between $x(t) = u(t)$ and $h(t) = e^{-t}\,u(t)$

Q.3 Solve any two of the following. **12**

a) Find the Convolution of the given sequences using multiplication method $x[n] = \{1,1,0,1,1\}$ and $h[n] = \{1,-2,-3,4\}$
b) Draw the direct form I and II of the following signals.
$4\frac{d^3y(t)}{dt^3} - 3\frac{dy(t)}{dt} + y(t) = x(t) + \frac{dx(t)}{dt}$
c) Check the system properties for the given function.
$Y(t) = x(t+10) + x^2(t)$

Section – II

Q.4 Solve any four of the following **16**

a) Explain types of Fourier series and Dirichlet's conditions.
b) For the signal $x(t) = \sin \omega o t$ find the Fourier series and draw its spectrum
c) State and prove Convolution property of Fourier series.
d) Obtain the Fourier Transform of $x(t) = te^{-t}\,u(t)$
e) State and prove time shift property of Fourier transform.

Q.5 Solve any two of the following. **12**

a) Define ROC and its properties of Z-Transform.
b) Determine Z-Transform of both sided sequence.
c) Determine Inverse Z-Transform of the following function for ROC $|Z| > 1$ and $|Z| < 0.5$
$X(Z) = \frac{1}{1-1.5Z^{-1}+0.5Z^{-2}}$

Seat No.	

Set R

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Signals and Systems (ENTPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options **14**

1) The Fourier transform of a unit step function is given as _____
a) $F(j\omega) = 1/j\omega$ b) $F(j\omega) = j\omega$
c) $F(\omega) = j/\omega$ d) None

2) Dirichlet conditions for periodic signals are in each period _____
a) function $x(t)$ has only finite number of maxima & minima
b) function $x(t)$ has finite number of discontinuities
c) function $x(t)$ is absolutely integrable over one period
d) All of above

3) Find the Z-transform of $\delta(n+3)$.
a) z b) z2
c) 1 d) z3

4) ROC of $x(n)$ contains _____
a) poles b) zeros
c) no poles d) no zeros

5) If $x(t)$ is an odd signal then which of the following statement is true?
a) $x(t) = 0$ b) $x(t) = x(-t)$
c) $x(0) = 0$ d) None

6) Identify the non-periodic signal.
a) $x(t) = \cos 2(t)$ b) $x(t) = \cos 2\pi\, t\, u(t)$
c) $x(t) = \sin(2\,\pi/3)t$ d) None

7) If signal $f(t)$ has energy, E, the energy of signal $f(2t)$ is equal to _____
a) E b) $E/2$
c) $2E$ d) $4E$

8) The system $y[n] = x[-n]$ is _____

a) Time invariant b) Time variant
c) Both a and b d) none

9) The signal $x(n) = \cos 2n$ is _____

a) periodic with period π b) periodic with period 2
c) period with period 4 π d) Aperiodic

10) A system is said to be defined as non-causal, when _____

a) The output at the present depends on the input at an earlier time
b) The output at the present does not depend on the factor of time at all
c) The output at the present depends on the input at the current time
d) The output at the present depends on the input at a time instant in the future

11) Convolution of $x(t+5)$ with $\delta(t-7)$ is equal to _____

a) $x(t-12)$ b) $x(t+12)$
c) $x(t-2)$ d) $x(t+2)$

12) If $x(-n)$ is signal with $x(n) = 0$; for $n < -2, n > 4$ then $x(n-3)$ is guaranteed to be zero for _____

a) $n < 0, n > 7$ b) $n < -1, n < 6$
c) $n < 1, n > 7$ d) $n > -1, n > 5$

13) Choose the correct equation for finding the output of a discrete time convolution?

a) $y[n] = \sum\times [k]h[n-k], k$ from 0 to ∞
b) $y[n] = \sum\times [k]h[n-k], k$ from -∞ to +∞
c) $y[n] = \sum\times [k]h[k], k$ from 0 to ∞
d) $y[n] = \sum\times [k]h[n], k$ from -∞ to +∞

14) Who discovered the Fourier series?

a) Jean Baptiste de Fourier
b) Jean Baptiste Joseph Fourier
c) Fourier Joseph
d) Jean Fourier

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Signals and Systems (ENTPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Solve any four of the following. **16**

a) Write a list of signal classification and explain any two signals.
b) Sketch the signal $x(t) = r(t\ +1) - r(t) + r(t-1)$
c) Check whether the given system is linear or nonlinear and time variant or Invariant. $y(t) = x(n^2)$
d) Derive the equation of convolution integral and write its properties.
e) Perform the convolution between $x(t) = u(t)$ and $h(t) = e^{-t}\,u(t)$

Q.3 Solve any two of the following. **12**

a) Find the Convolution of the given sequences using multiplication method $x[n] = \{1,1,0,1,1\}$ and $h[n] = \{1,-2,-3,4\}$
b) Draw the direct form I and II of the following signals.
$4\frac{d^3y(t)}{dt^3} - 3\frac{dy(t)}{dt} + y(t) = x(t) + \frac{dx(t)}{dt}$
c) Check the system properties for the given function.
$Y(t) = x(t+10) + x^2(t)$

Section – II

Q.4 Solve any four of the following **16**

a) Explain types of Fourier series and Dirichlet's conditions.
b) For the signal $x(t) = \sin \omega o t$ find the Fourier series and draw its spectrum
c) State and prove Convolution property of Fourier series.
d) Obtain the Fourier Transform of $x(t) = te^{-t}\,u(t)$
e) State and prove time shift property of Fourier transform.

Q.5 Solve any two of the following. **12**

a) Define ROC and its properties of Z-Transform.
b) Determine Z-Transform of both sided sequence.
c) Determine Inverse Z-Transform of the following function for ROC $|Z| > 1$ and $|Z| < 0.5$
$X(Z) = \frac{1}{1-1.5Z^{-1}+0.5Z^{-2}}$

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Signals and Systems (ENTPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options **14**

1) A system is said to be defined as non-causal, when _____
a) The output at the present depends on the input at an earlier time
b) The output at the present does not depend on the factor of time at all
c) The output at the present depends on the input at the current time
d) The output at the present depends on the input at a time instant in the future

2) Convolution of $x(t+5)$ with $\delta(t-7)$ is equal to _____
a) $x(t-12)$ b) $x(t+12)$
c) $x(t-2)$ d) $x(t+2)$

3) If $x(-n)$ is signal with $x(n)=0$; for $n<-2, n>4$ then $x(n-3)$ is guaranteed to be zero for _____
a) $n<0, n>7$ b) $n<-1, n<6$
c) $n<1, n>7$ d) $n>-1, n>5$

4) Choose the correct equation for finding the output of a discrete time convolution?
a) $y[n]=\sum\times[k]h[n-k], k$ from 0 to ∞
b) $y[n]=\sum\times[k]h[n-k], k$ from -∞ to +∞
c) $y[n]=\sum\times[k]h[k], k$ from 0 to ∞
d) $y[n]=\sum\times[k]h[n], k$ from -∞ to +∞

5) Who discovered the Fourier series?
a) Jean Baptiste de Fourier
b) Jean Baptiste Joseph Fourier
c) Fourier Joseph
d) Jean Fourier

6) The Fourier transform of a unit step function is given as _____

a) $F(j\omega) = 1/j\omega$ b) $F(j\omega) = j\omega$

c) $F(\omega) = j/\omega$ d) None

7) Dirichlet conditions for periodic signals are in each period _____

a) function $x(t)$ has only finite number of maxima & minima

b) function $x(t)$ has finite number of discontinuities

c) function $x(t)$ is absolutely integrable over one period

d) All of above

8) Find the Z-transform of $\delta(n+3)$.

a) z b) z2

c) 1 d) z3

9) ROC of $x(n)$ contains _____

a) poles b) zeros

c) no poles d) no zeros

10) If $x(t)$ is an odd signal then which of the following statement is true?

a) $x(t) = 0$ b) $x(t) = x(-t)$

c) $x(0) = 0$ d) None

11) Identify the non-periodic signal.

a) $x(t) = \cos 2(t)$ b) $x(t) = \cos 2\pi\, t\, u(t)$

c) $x(t) = \sin(2\,\pi/3)t$ d) None

12) If signal $f(t)$ has energy, E, the energy of signal $f(2t)$ is equal to _____

a) E b) $E/2$

c) $2E$ d) $4E$

13) The system $y[n] = x[-n]$ is _____

a) Time invariant b) Time variant

c) Both a and b d) none

14) The signal $x(n) = \cos 2n$ is _____

a) periodic with period π b) periodic with period 2

c) period with period 4 π d) Aperiodic

Seat No.		Set	S

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Signals and Systems (ENTPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Solve any four of the following. **16**

a) Write a list of signal classification and explain any two signals.
b) Sketch the signal $x(t) = r(t\ +1) - r(t) + r(t-1)$
c) Check whether the given system is linear or nonlinear and time variant or Invariant. $y(t) = x(n^2)$
d) Derive the equation of convolution integral and write its properties.
e) Perform the convolution between $x(t) = u(t)$ and $h(t) = e^{-t}\,u(t)$

Q.3 Solve any two of the following. **12**

a) Find the Convolution of the given sequences using multiplication method $x[n] = \{1,1,0,1,1\}$ and $h[n] = \{1,-2,-3,4\}$
b) Draw the direct form I and II of the following signals.
$4\frac{d^3y(t)}{dt^3} - 3\frac{dy(t)}{dt} + y(t) = x(t) + \frac{dx(t)}{dt}$
c) Check the system properties for the given function.
$Y(t) = x(t+10) + x^2(t)$

Section – II

Q.4 Solve any four of the following **16**

a) Explain types of Fourier series and Dirichlet's conditions.
b) For the signal $x(t) = \sin \omega o t$ find the Fourier series and draw its spectrum
c) State and prove Convolution property of Fourier series.
d) Obtain the Fourier Transform of $x(t) = te^{-t}\,u(t)$
e) State and prove time shift property of Fourier transform.

Q.5 Solve any two of the following. **12**

a) Define ROC and its properties of Z-Transform.
b) Determine Z-Transform of both sided sequence.
c) Determine Inverse Z-Transform of the following function for ROC $|Z| > 1$ and $|Z| < 0.5$
$X(Z) = \frac{1}{1-1.5Z^{-1}+0.5Z^{-2}}$

SLR-BD-205

Seat No.		Set	P

S. Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Control System (ENTPCC-05)

Day & Date: Wednesday 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

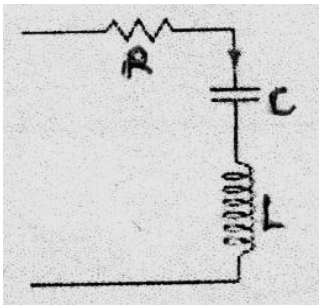
Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

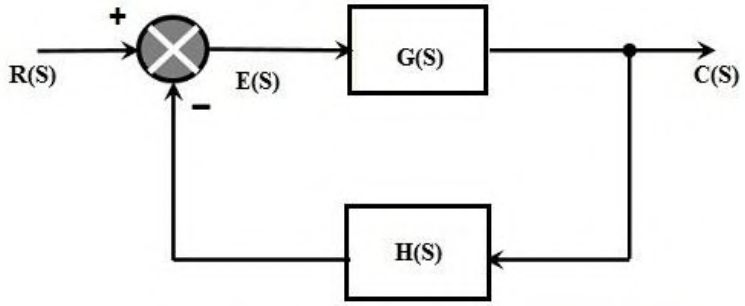
1) The output equation for given circuit is _____.



a) $Vo(S) = LsI(S) + \frac{1}{Cs}I(S)$ b) $Vo(S) = LsI(S) + \frac{1}{c}I(S)$

c) $Vo(S) = \frac{1}{Ls}I(S) + CsI(S)$ d) None of these

2) For Negative Feedback, the transfer function of closed loop control system as shown in Figure below is _____.



a) $T(S) = \frac{G(S)}{1+G(S)H(S)}$ b) $T(S) = \frac{G(S)}{1-G(S)H(S)}$

c) $T(S) = \frac{G(S)}{1+H(S)}$ d) None of these

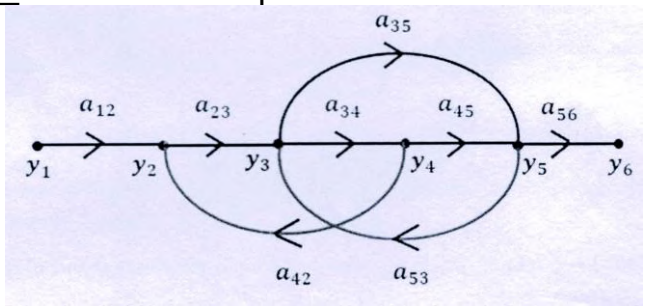
3) Transfer function is defined as _____.

a) ratio of Output to Input
b) ratio of Input to Output
c) ratio of Laplace transform of output to Laplace Transform of Input
d) ratio of Laplace transform of input to Laplace Transform of Output

4) Following is the example of closed loop system _____.

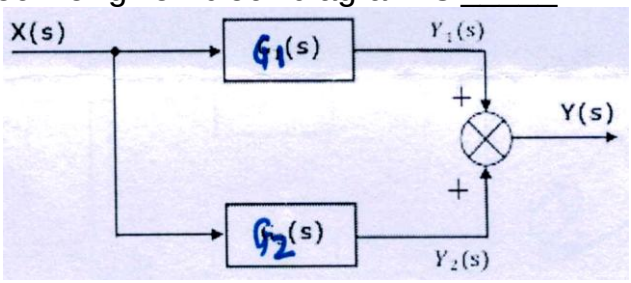
a) Electric Toaster
b) Washing Machine
c) Electric Light Switch
d) Missile Guidance system

5) The Signal Flow Graph shown below, has _____ Number of forward paths and _____ Number of Loops.



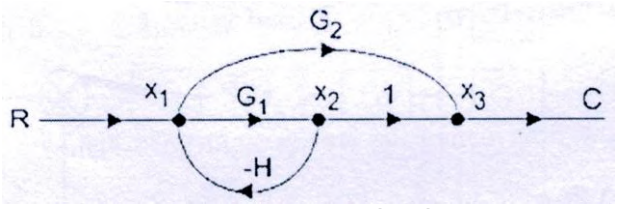
a) 2, 2
b) 2, 3
c) 3, 3
d) 3, 2

6) The Single block for given block diagram is _____.



a) $T(S) = G1(S).G2(S)$
b) $T(S) = G1(S) + G2(S)$
c) $T(S) = \frac{G1(S)}{G2(S)}$
d) None of these

7) Use Mason's Gain formula to calculate the transfer function of given figure:



a) $\mathrm{G1}/1 + \mathrm{G2H}$
b) $\frac{\mathrm{G1+G2}}{1+\mathrm{G1H}}$
c) $\mathrm{G2}/1 + \mathrm{G1H}$
d) None of these

8) The Type 1 system has _____ at the origin.

a) no pole
b) one pole
c) three poles
d) two poles

9) For Type 0 System, the Error Constants are position error = _____ Velocity error = _____ & Acceleration error = _____, where k is constant.

a) $1/(1+\mathrm{Kp}), \infty, \infty$ b) $0, 1/\mathrm{Kp}, \infty$

c) $\infty, 0, 0$ d) $\infty, \infty, 0$

10) The given system is _____.

$$T(S) = \frac{(S+10)(S+3)}{(S+20)(S+4)}$$

a) Type 2 System b) Type 0 System

c) Type 1 System d) None of these

11) Magnitude of Bode plot for a Pole is _____.

a) Line with a slope of -20dB/decade

b) Line with a slope of -6 dB/decade

c) Line with a slope of -40dB/decade

d) Straight line parallel to frequency axis

12) The Phase Angle for Asymptotic Bode at $\omega = \infty$ rad/sec, for given equation is _____.

$$G(S)H(S) = \frac{(S+1)}{(S+2)(S+5)}$$

a) $\theta = -90^0$ b) $\theta = 180^0$

c) $\theta = -270^0$ d) $\theta = 270^0$

13) If anybody wants to add Pole in the system, he/she requires to add _____ compensating network.

a) Lead -Lag Network b) Lag Network

c) Lead Network d) None of these

14) In Given Equation below, how many Poles are lies on RHS of S-Plane?

$$\Delta_{CL}(S) = s^5 + 15s^4 + 185s^3 + 725s^2 - 326s + 120 = 0$$

S^5:	1	185	-326
S^4:	15	725	120
S^3:	136.7	-334	
S^2:	761.7	120	
S^1:	-355.5		
S^0:	120		

a) 1 b) 3

c) 4 d) 2

Seat No.	

Set **P**

S. Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Control System (ENTPCC-05)

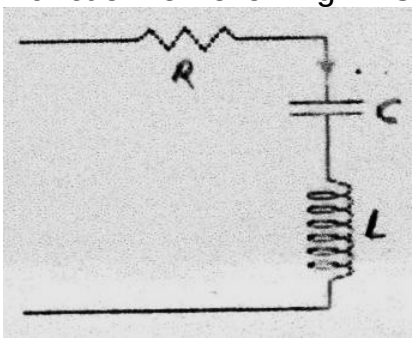
Day & Date: Wednesday 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

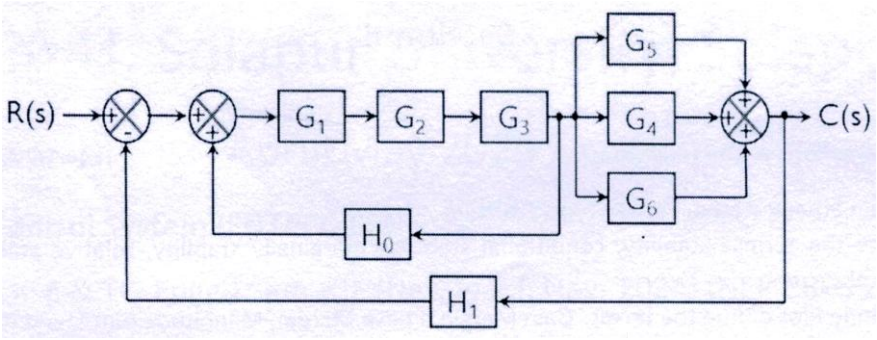
Section – I

Q.2 Attempt any four of the following questions. **16**

a) Calculate the Transfer function for following RLC circuit.



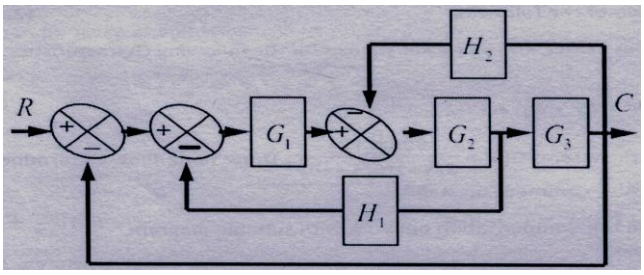
b) Explain the transfer function for closed loop control system.
c) Differentiate between Closed Loop and Open Loop system.
d) Explain Block Diagram reduction rules.
e) Define Signal Flow graph and Plot Signal flow graph for following system.



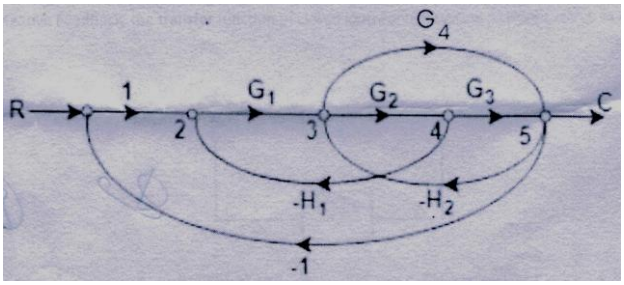
Q.3 Attempt any two of the following questions. **12**

a) Explain Missile guidance and launching system with the suitable diagram.

b) Reduce following block diagram to single block using block diagram reduction rules.



c) Calculate the transfer function for following signal flow graph using Mason's Gain formula.



Section – II

Q.4 Attempt any four of the following. **16**

a) Explain Steady state error for Type 2 system.

b) Define the terms - Stability, conditional stability, marginally stability, relative stability for the control system.

c) For Bode Plot define the terms - Gain Margin, Phase Margin, Magnitude plot, and Phase Plot.

d) Why Compensation is need in control system. Give the types of Compensating networks.

e) Test the stability of following characteristics equation using Routh - Hurwitz criterion.

$$S^6 + 2S^5 + 2S^4 + 3S^3 + 5S^2 + 6S + 1 = 0$$

Q.5 Attempt any two of the following. **12**

a) How many roots lies in RHS, LHS plane and jω axis for the following characteristics equation using Routh - Hurwitz criterion.

$$T(S) = S^5 + 2S^4 + 2S^3 + 4S^2 + S + 2$$

b) For unity feedback system, $G(S) = \frac{800(S+2)}{S(S+10)(S+40)}$ Draw Bode Plot, Determine Gain Margin, Phase Margin, ωgc, ωpc. Also comment on stability.

c) Derive and Explain Lag Compensation network with suitable diagram.

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Control System (ENTPCC-05)

Day & Date: Wednesday 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The Type 1 system has _____ at the origin.
a) no pole b) one pole
c) three poles d) two poles

2) For Type 0 System, the Error Constants are position error = _____
Velocity error = _____ & Acceleration error = _____, where k is constant.
a) $1/(1+\mathrm{Kp}), \infty, \infty$ b) $0, 1/\mathrm{Kp}, \infty$
c) $\infty, 0, 0$ d) $\infty, \infty, 0$

3) The given system is _____.

$$T(S) = \frac{(S+10)(S+3)}{(S+20)(S+4)}$$

a) Type 2 System b) Type 0 System
c) Type 1 System d) None of these

4) Magnitude of Bode plot for a Pole is _____.
a) Line with a slope of -20dB/decade
b) Line with a slope of -6 dB/decade
c) Line with a slope of -40dB/decade
d) Straight line parallel to frequency axis

5) The Phase Angle for Asymptotic Bode at $\omega = \infty$ rad/sec, for given equation is _____.

$$G(S)H(S) = \frac{(S+1)}{(S+2)(S+5)}$$

a) $\theta = -90^0$ b) $\theta = 180^0$
c) $\theta = -270^0$ d) $\theta = 270^0$

6) If anybody wants to add Pole in the system, he/she requires to add _____ compensating network.

a) Lead -Lag Network
b) Lag Network
c) Lead Network
d) None of these

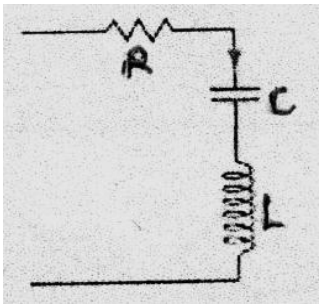
7) In Given Equation below, how many Poles are lies on RHS of S-Plane?

$$\Delta_{CL}(S) = s^5 + 15s^4 + 185s^3 + 725s^2 - 326s + 120 = 0$$

S^5:	1	185	-326
S^4:	15	725	120
S^3:	136.7	-334	
S^2:	761.7	120	
S^1:	-355.5		
S^0:	120		

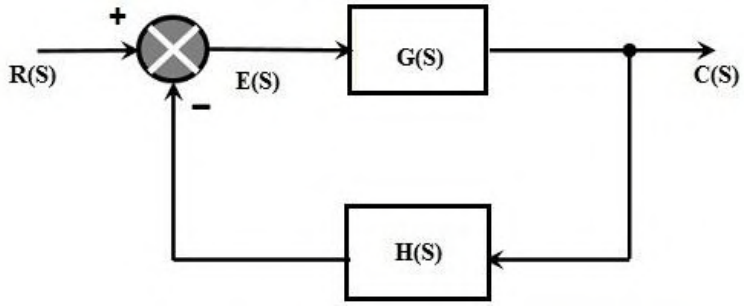
a) 1
b) 3
c) 4
d) 2

8) The output equation for given circuit is _____.



a) $Vo(S) = LsI(S) + \frac{1}{Cs}I(S)$
b) $Vo(S) = LsI(S) + \frac{1}{c}I(S)$
c) $Vo(S) = \frac{1}{Ls}I(S) + CsI(S)$
d) None of these

9) For Negative Feedback, the transfer function of closed loop control system as shown in Figure below is _____.



a) $T(S) = \frac{G(S)}{1+G(S)H(S)}$
b) $T(S) = \frac{G(S)}{1-G(S)H(S)}$
c) $T(S) = \frac{G(S)}{1+H(S)}$
d) None of these

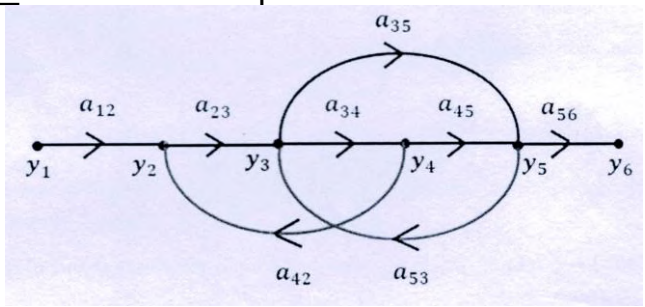
10) Transfer function is defined as _____.

a) ratio of Output to Input
b) ratio of Input to Output
c) ratio of Laplace transform of output to Laplace Transform of Input
d) ratio of Laplace transform of input to Laplace Transform of Output

11) Following is the example of closed loop system _____.

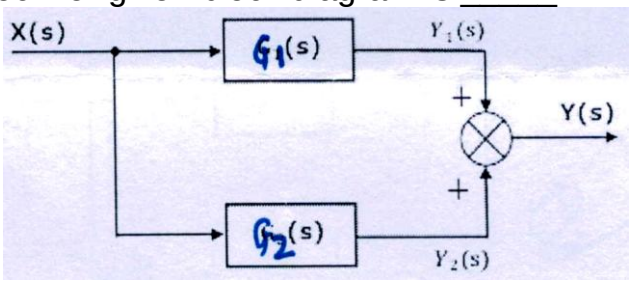
a) Electric Toaster
b) Washing Machine
c) Electric Light Switch
d) Missile Guidance system

12) The Signal Flow Graph shown below, has _____ Number of forward paths and _____ Number of Loops.



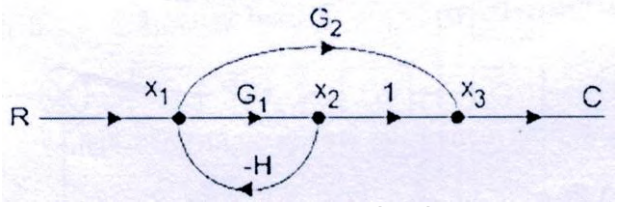
a) 2, 2
b) 2, 3
c) 3, 3
d) 3, 2

13) The Single block for given block diagram is _____.



a) $T(S) = G1(S).G2(S)$
b) $T(S) = G1(S) + G2(S)$
c) $T(S) = \frac{G1(S)}{G2(S)}$
d) None of these

14) Use Mason's Gain formula to calculate the transfer function of given figure:



a) $\mathrm{G1}/1 + \mathrm{G2H}$
b) $\frac{\mathrm{G1+G2}}{1+\mathrm{G1H}}$
c) $\mathrm{G2}/1 + \mathrm{G1H}$
d) None of these

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Control System (ENTPCC-05)

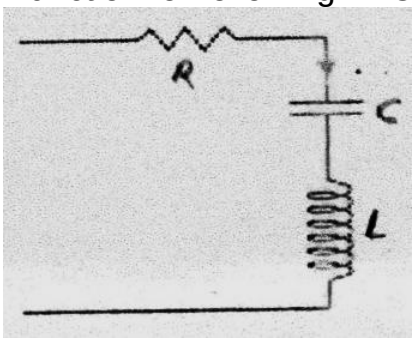
Day & Date: Wednesday 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

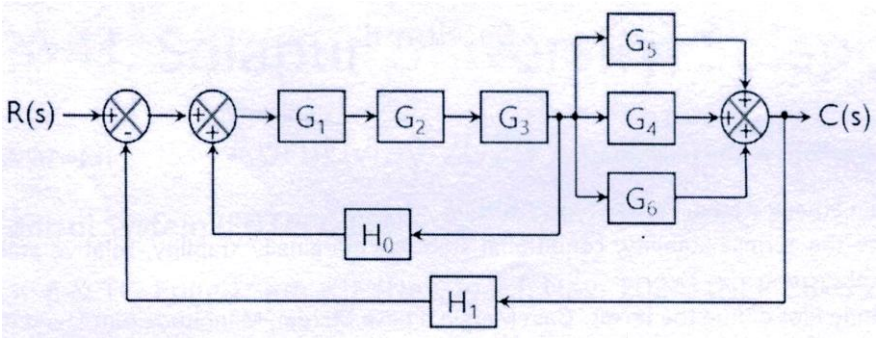
Section – I

Q.2 Attempt any four of the following questions. **16**

a) Calculate the Transfer function for following RLC circuit.



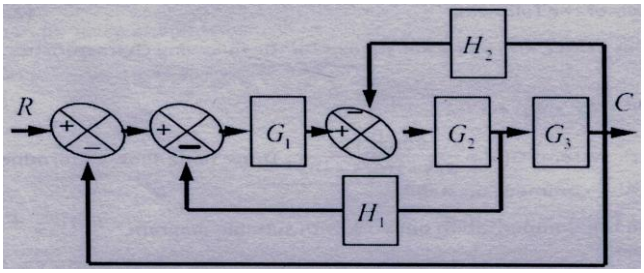
b) Explain the transfer function for closed loop control system.
c) Differentiate between Closed Loop and Open Loop system.
d) Explain Block Diagram reduction rules.
e) Define Signal Flow graph and Plot Signal flow graph for following system.



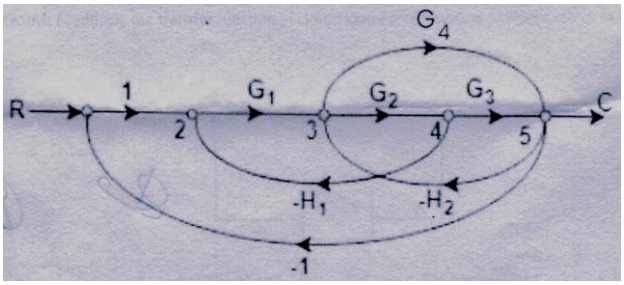
Q.3 Attempt any two of the following questions. **12**

a) Explain Missile guidance and launching system with the suitable diagram.

b) Reduce following block diagram to single block using block diagram reduction rules.



c) Calculate the transfer function for following signal flow graph using Mason's Gain formula.



Section – II

Q.4 Attempt any four of the following. **16**

a) Explain Steady state error for Type 2 system.

b) Define the terms - Stability, conditional stability, marginally stability, relative stability for the control system.

c) For Bode Plot define the terms - Gain Margin, Phase Margin, Magnitude plot, and Phase Plot.

d) Why Compensation is need in control system. Give the types of Compensating networks.

e) Test the stability of following characteristics equation using Routh - Hurwitz criterion.

$$S^6 + 2S^5 + 2S^4 + 3S^3 + 5S^2 + 6S + 1 = 0$$

Q.5 Attempt any two of the following. **12**

a) How many roots lies in RHS, LHS plane and jω axis for the following characteristics equation using Routh - Hurwitz criterion.

$$T(S) = S^5 + 2S^4 + 2S^3 + 4S^2 + S + 2$$

b) For unity feedback system, $G(S) = \frac{800(S+2)}{S(S+10)(S+40)}$ Draw Bode Plot, Determine Gain Margin, Phase Margin, ωgc, ωpc. Also comment on stability.

c) Derive and Explain Lag Compensation network with suitable diagram.

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Control System (ENTPCC-05)

Day & Date: Wednesday 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Magnitude of Bode plot for a Pole is _____.
a) Line with a slope of -20dB/decade
b) Line with a slope of -6 dB/decade
c) Line with a slope of -40dB/decade
d) Straight line parallel to frequency axis

2) The Phase Angle for Asymptotic Bode at $\omega = \infty$ rad/sec, for given equation is _____.

$$G(S)H(S) = \frac{(S+1)}{(S+2)(S+5)}$$

a) $\theta = -90^0$ b) $\theta = 180^0$
c) $\theta = -270^0$ d) $\theta = 270^0$

3) If anybody wants to add Pole in the system, he/she requires to add _____ compensating network.
a) Lead -Lag Network b) Lag Network
c) Lead Network d) None of these

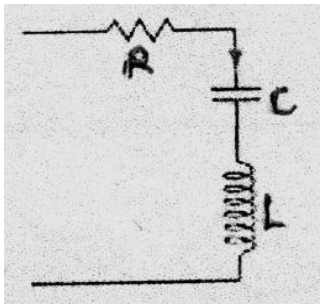
4) In Given Equation below, how many Poles are lies on RHS of S-Plane?

$$\Delta_{CL}(S) = s^5 + 15s^4 + 185s^3 + 725s^2 - 326s + 120 = 0$$

S^5:	1	185	-326
S^4:	15	725	120
S^3:	136.7	-334	
S^2:	761.7	120	
S^1:	-355.5		
S^0:	120		

a) 1 b) 3
c) 4 d) 2

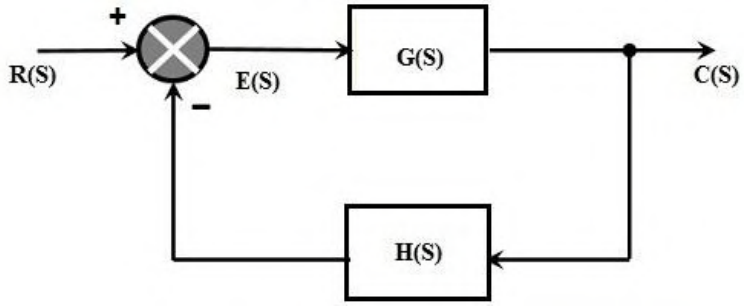
5) The output equation for given circuit is _____.



a) $Vo(S) = LsI(S) + \frac{1}{Cs}I(S)$ b) $Vo(S) = LsI(S) + \frac{1}{c}I(S)$

c) $Vo(S) = \frac{1}{Ls}I(S) + CsI(S)$ d) None of these

6) For Negative Feedback, the transfer function of closed loop control system as shown in Figure below is _____.



a) $T(S) = \frac{G(S)}{1+G(S)H(S)}$ b) $T(S) = \frac{G(S)}{1-G(S)H(S)}$

c) $T(S) = \frac{G(S)}{1+H(S)}$ d) None of these

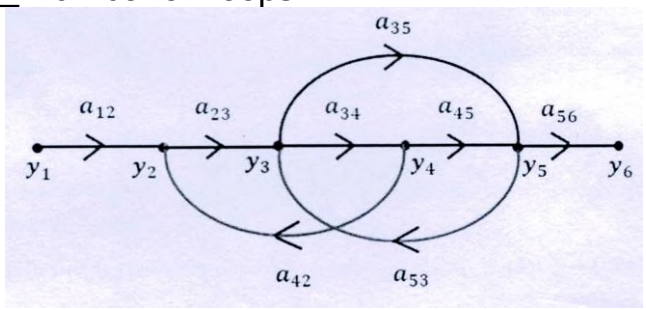
7) Transfer function is defined as _____.

a) ratio of Output to Input
b) ratio of Input to Output
c) ratio of Laplace transform of output to Laplace Transform of Input
d) ratio of Laplace transform of input to Laplace Transform of Output

8) Following is the example of closed loop system _____.

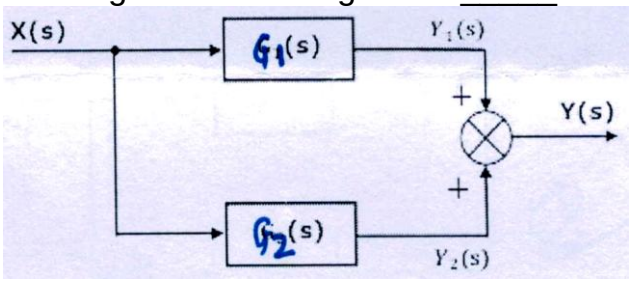
a) Electric Toaster
b) Washing Machine
c) Electric Light Switch
d) Missile Guidance system

9) The Signal Flow Graph shown below, has _____ Number of forward paths and _____ Number of Loops.



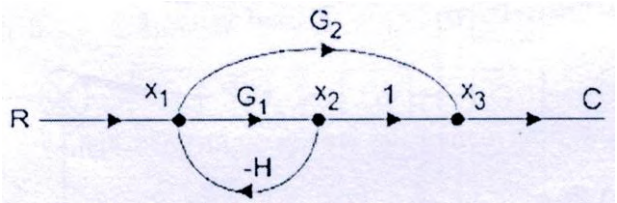
a) 2, 2
b) 2, 3
c) 3, 3
d) 3, 2

10) The Single block for given block diagram is _____.



a) $T(S) = G1(S).G2(S)$
b) $T(S) = G1(S) + G2(S)$
c) $T(S) = \frac{G1(S)}{G2(S)}$
d) None of these

11) Use Mason's Gain formula to calculate the transfer function of given figure:



a) $\mathrm{G1}/1 + \mathrm{G2H}$
b) $\frac{\mathrm{G1+G2}}{1+\mathrm{G1H}}$
c) $\mathrm{G2}/1 + \mathrm{G1H}$
d) None of these

12) The Type 1 system has _____ at the origin.

a) no pole
b) one pole
c) three poles
d) two poles

13) For Type 0 System, the Error Constants are position error = _____ Velocity error = _____ & Acceleration error = _____, where k is constant.

a) $1/(1 + \mathrm{Kp}), \infty, \infty$
b) $0, 1/\mathrm{Kp}, \infty$
c) $\infty, 0, 0$
d) $\infty, \infty, 0$

14) The given system is _____.

$$T(S) = \frac{(S+10)(S+3)}{(S+20)(S+4)}$$

a) Type 2 System
b) Type 0 System
c) Type 1 System
d) None of these

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Control System (ENTPCC-05)

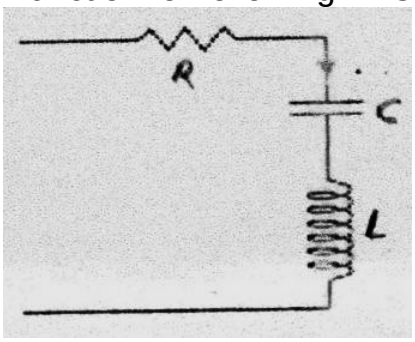
Day & Date: Wednesday 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

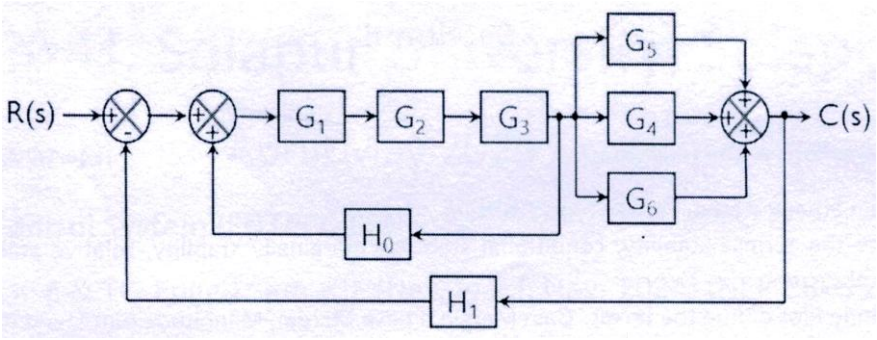
Section – I

Q.2 Attempt any four of the following questions. **16**

a) Calculate the Transfer function for following RLC circuit.



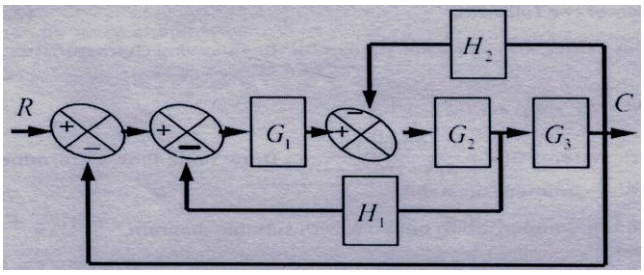
b) Explain the transfer function for closed loop control system.
c) Differentiate between Closed Loop and Open Loop system.
d) Explain Block Diagram reduction rules.
e) Define Signal Flow graph and Plot Signal flow graph for following system.



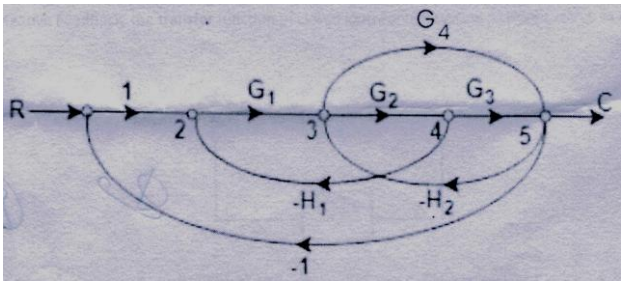
Q.3 Attempt any two of the following questions. **12**

a) Explain Missile guidance and launching system with the suitable diagram.

b) Reduce following block diagram to single block using block diagram reduction rules.



c) Calculate the transfer function for following signal flow graph using Mason's Gain formula.



Section – II

Q.4 Attempt any four of the following. **16**

a) Explain Steady state error for Type 2 system.

b) Define the terms - Stability, conditional stability, marginally stability, relative stability for the control system.

c) For Bode Plot define the terms - Gain Margin, Phase Margin, Magnitude plot, and Phase Plot.

d) Why Compensation is need in control system. Give the types of Compensating networks.

e) Test the stability of following characteristics equation using Routh - Hurwitz criterion.

$$S^6 + 2S^5 + 2S^4 + 3S^3 + 5S^2 + 6S + 1 = 0$$

Q.5 Attempt any two of the following. **12**

a) How many roots lies in RHS, LHS plane and jω axis for the following characteristics equation using Routh - Hurwitz criterion.

$$T(S) = S^5 + 2S^4 + 2S^3 + 4S^2 + S + 2$$

b) For unity feedback system, $G(S) = \frac{800(S+2)}{S(S+10)(S+40)}$ Draw Bode Plot, Determine Gain Margin, Phase Margin, ωgc, ωpc. Also comment on stability.

c) Derive and Explain Lag Compensation network with suitable diagram.

Seat No.		Set	S

S. Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Control System (ENTPCC-05)

Day & Date: Wednesday 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

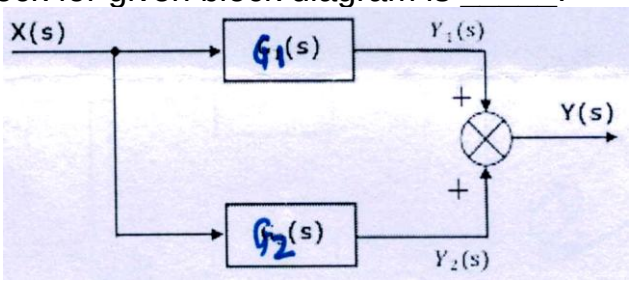
Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

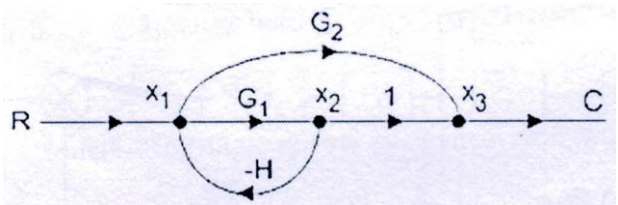
1) The Single block for given block diagram is _____.



a) $T(S) = G1(S).G2(S)$ b) $T(S) = G1(S) + G2(S)$

c) $T(S) = \frac{G1(S)}{G2(S)}$ d) None of these

2) Use Mason's Gain formula to calculate the transfer function of given figure:



a) $G1/1 + G2H$ b) $\frac{G1+G2}{1+G1H}$

c) $G2/1 + G1H$ d) None of these

3) The Type 1 system has _____ at the origin.

a) no pole b) one pole

c) three poles d) two poles

4) For Type 0 System, the Error Constants are position error = _____ Velocity error = _____ & Acceleration error = _____, where k is constant.

a) $1/(1+\mathrm{Kp}), \infty, \infty$ b) $0, 1/\mathrm{Kp}, \infty$

c) $\infty, 0, 0$ d) $\infty, \infty, 0$

5) The given system is _____.

$$T(S) = \frac{(S+10)(S+3)}{(S+20)(S+4)}$$

a) Type 2 System b) Type 0 System

c) Type 1 System d) None of these

6) Magnitude of Bode plot for a Pole is _____.

a) Line with a slope of -20dB/decade

b) Line with a slope of -6 dB/decade

c) Line with a slope of -40dB/decade

d) Straight line parallel to frequency axis

7) The Phase Angle for Asymptotic Bode at $\omega = \infty$ rad/sec, for given equation is _____.

$$G(S)H(S) = \frac{(S+1)}{(S+2)(S+5)}$$

a) $\theta = -90^0$ b) $\theta = 180^0$

c) $\theta = -270^0$ d) $\theta = 270^0$

8) If anybody wants to add Pole in the system, he/she requires to add _____ compensating network.

a) Lead -Lag Network b) Lag Network

c) Lead Network d) None of these

9) In Given Equation below, how many Poles are lies on RHS of S-Plane?

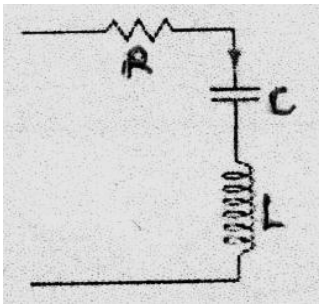
$$\Delta_{CL}(S) = s^5 + 15s^4 + 185s^3 + 725s^2 - 326s + 120 = 0$$

S^5:	1	185	-326
S^4:	15	725	120
S^3:	136.7	-334	
S^2:	761.7	120	
S^1:	-355.5		
S^0:	120		

a) 1 b) 3

c) 4 d) 2

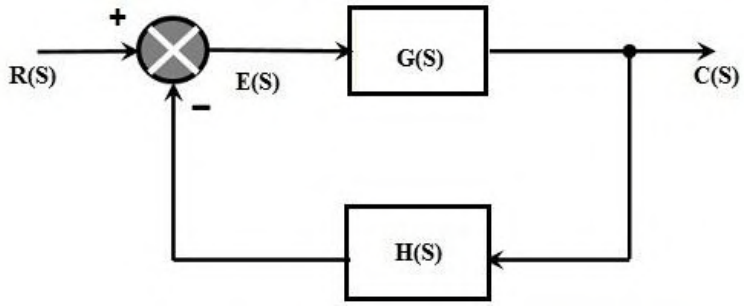
10) The output equation for given circuit is _____.



a) $Vo(S) = LsI(S) + \frac{1}{Cs}I(S)$ b) $Vo(S) = LsI(S) + \frac{1}{c}I(S)$

c) $Vo(S) = \frac{1}{Ls}I(S) + CsI(S)$ d) None of these

11) For Negative Feedback, the transfer function of closed loop control system as shown in Figure below is _____.



a) $T(S) = \frac{G(S)}{1+G(S)H(S)}$ b) $T(S) = \frac{G(S)}{1-G(S)H(S)}$

c) $T(S) = \frac{G(S)}{1+H(S)}$ d) None of these

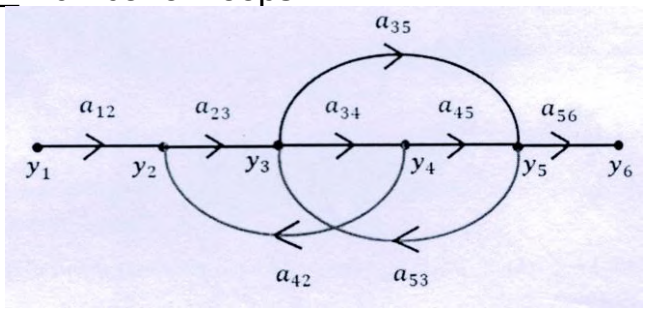
12) Transfer function is defined as _____.

a) ratio of Output to Input
b) ratio of Input to Output
c) ratio of Laplace transform of output to Laplace Transform of Input
d) ratio of Laplace transform of input to Laplace Transform of Output

13) Following is the example of closed loop system _____.

a) Electric Toaster b) Washing Machine
c) Electric Light Switch d) Missile Guidance system

14) The Signal Flow Graph shown below, has _____ Number of forward paths and _____ Number of Loops.



a) 2, 2
b) 2, 3
c) 3, 3
d) 3, 2

Seat No.	

Set **S**

S. Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Control System (ENTPCC-05)

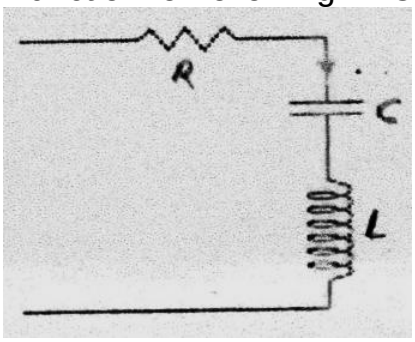
Day & Date: Wednesday 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

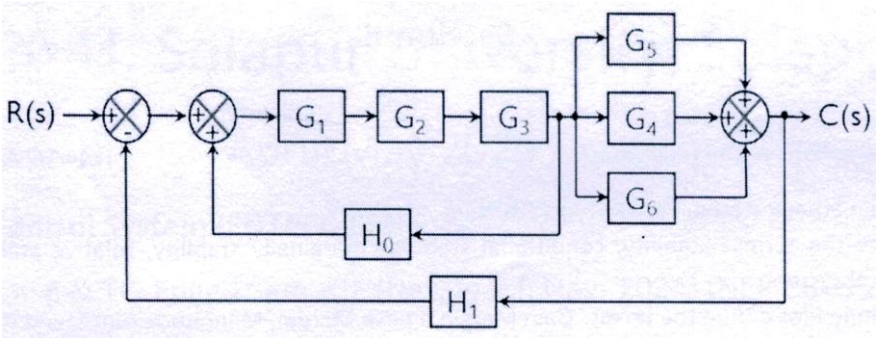
Section – I

Q.2 Attempt any four of the following questions. **16**

a) Calculate the Transfer function for following RLC circuit.



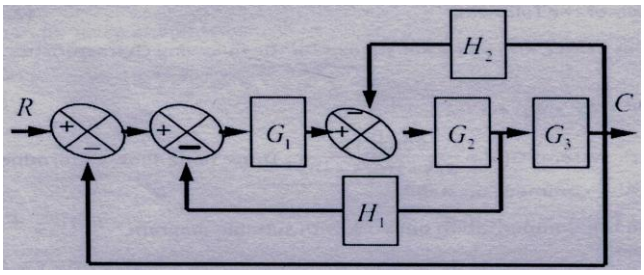
b) Explain the transfer function for closed loop control system.
c) Differentiate between Closed Loop and Open Loop system.
d) Explain Block Diagram reduction rules.
e) Define Signal Flow graph and Plot Signal flow graph for following system.



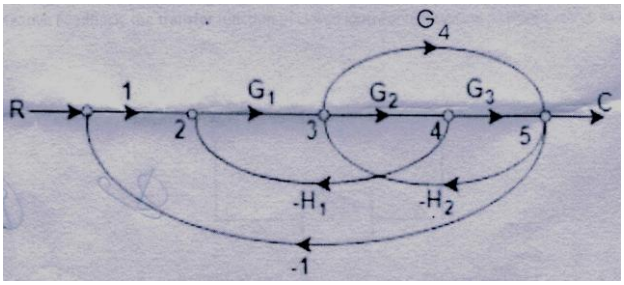
Q.3 Attempt any two of the following questions. **12**

a) Explain Missile guidance and launching system with the suitable diagram.

b) Reduce following block diagram to single block using block diagram reduction rules.



c) Calculate the transfer function for following signal flow graph using Mason's Gain formula.



Section – II

Q.4 Attempt any four of the following. **16**

a) Explain Steady state error for Type 2 system.

b) Define the terms - Stability, conditional stability, marginally stability, relative stability for the control system.

c) For Bode Plot define the terms - Gain Margin, Phase Margin, Magnitude plot, and Phase Plot.

d) Why Compensation is need in control system. Give the types of Compensating networks.

e) Test the stability of following characteristics equation using Routh - Hurwitz criterion.

$$S^6 + 2S^5 + 2S^4 + 3S^3 + 5S^2 + 6S + 1 = 0$$

Q.5 Attempt any two of the following. **12**

a) How many roots lies in RHS, LHS plane and jω axis for the following characteristics equation using Routh - Hurwitz criterion.

$$T(S) = S^5 + 2S^4 + 2S^3 + 4S^2 + S + 2$$

b) For unity feedback system, $G(S) = \frac{800(S+2)}{S(S+10)(S+40)}$ Draw Bode Plot, Determine Gain Margin, Phase Margin, ωgc, ωpc. Also comment on stability.

c) Derive and Explain Lag Compensation network with suitable diagram.

Seat No.	

Set P

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Analog Integrated Circuits (ENTPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable fata if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The maximum value of d Vo/dt is called _____
a) voltage ratio b) voltage rate
c) slew rate d) transient response

2) An Ideal Op-amp has _____ power supply rejection ration.
a) 0 b) Infinite
c) Negative d) Positive

3) What happens due to a mismatch between two input terminals in an op-amp?
a) Input offset voltage
b) Output offset voltage
c) Both the input and output offset voltage
d) None of the mentioned

4) A differential type amplifier in an Op-amp provides which of the following characteristics?
a) Rejection of CM signal b) High input type impedance
c) Low noise d) All the above

5) Find the type of amplifier that cannot be constructed in a differential configuration.
a) Summing amplifier b) Scaling amplifier
c) Averaging amplifier d) Subtractor

6) What is the use of the compensation capacitor in op-amp?
a) Improves the amplification of op-amp
b) Decreases the slew rate of op-amp
c) Increases the bandwidth of op-amp
d) Op-amp acts as all pass filter

7) In V-I converter with floating load where load is ____
a) Connected to ground b) Not connected to ground
c) Connected to input d) Load is zero

8) What are the features of an instrumentation amplifier?
a) Low noise b) High gain accuracy
c) Low thermal and time drift d) All of the mentioned

9) What should be the minimum time between the two zero-crossings if the output is 28 Vpp When sine wave is input, in case of IC 741, in open loop by considering the effect of slew rate?
a) 56 m sec b) 56 sec
c) 5.6 sec d) 56 msec

10) For the summing amplifier ratio of Rf/R should be _____
a) less than one b) greater than one
c) zero d) one

11) How are the square wave output generated in op-amp?
a) Op-amp is forced to operate in the positive saturation region
b) Op-amp is forced to operate in the negative saturation region
c) Op-amp is forced to operate between positive and negative saturation region
d) None of the mentioned

12) A _____ circuit converts irregular shapes into a square wave or pulse.
a) Schmitt Trigger b) Clamper
c) Peak Detector d) Window Detector

13) Active filters offer the following advantages over passive filter _____.
a) Flexibility in design b) Gain adjustment
c) Both a and b d) None of these

14) Which among the following can be used to detect the missing heart beat?
a) Monostable multivibrator b) Astable multivibrator
c) Schmitt trigger d) None of the mentioned

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Analog Integrated Circuits (ENTPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly

Section – I

Q.2 Attempt any four **16**

a) Explain the op-amp as an integrator with a waveform.
b) Explain the V to I converter with the grounded load.
c) What is slew rate? Explain its importance.
d) Design an Inverting amplifier using the op-amp 741 for a closed-loop gain of 7.
e) With a neat block diagram, explain the basic op-amp.

Q.3 Attempt any two **12**

a) Explain the following term :
i) Input offset voltag
ii) Input bias current
iii) CMRR
iv) SVRR
b) Derive the ICEQ and VCEQ for the DIBO differential amplifier.
c) Explain summing, scaling, and an averaging amplifier in an inverting configuration.

Section – II

Q.4 Attempt any four **16**

a) Draw and explain a triangular wave generator with a waveform.
b) Explain the block diagram of the PLL and give its Applications.
c) With a neat diagram, explain sample and hold circuit.
d) Explain Log amplifier.
e) Design a Second order low pass Butterworth filter with f_H= 1.5KHz.

Q.5 Attempt any two. **12**

a) Draw and explain the RC phase shift oscillator and derive the equation of frequency of oscillation.
b) Explain IC555 in Astable mode with an internal circuit diagram.
c) Give the types of precision rectifies and explain any one.

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Analog Integrated Circuits (ENTPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable fata if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) What are the features of an instrumentation amplifier?
a) Low noise b) High gain accuracy
c) Low thermal and time drift d) All of the mentioned

2) What should be the minimum time between the two zero-crossings if the output is 28 Vpp When sine wave is input, in case of IC 741, in open loop by considering the effect of slew rate?
a) 56 m sec b) 56 sec
c) 5.6 sec d) 56 msec

3) For the summing amplifier ratio of Rf/R should be _____
a) less than one b) greater than one
c) zero d) one

4) How are the square wave output generated in op-amp?
a) Op-amp is forced to operate in the positive saturation region
b) Op-amp is forced to operate in the negative saturation region
c) Op-amp is forced to operate between positive and negative saturation region
d) None of the mentioned

5) A _____ circuit converts irregular shapes into a square wave or pulse.
a) Schmitt Trigger b) Clamper
c) Peak Detector d) Window Detector

6) Active filters offer the following advantages over passive filter _____.
a) Flexibility in design b) Gain adjustment
c) Both a and b d) None of these

7) Which among the following can be used to detect the missing heart beat?

a) Monostable multivibrator b) Astable multivibrator
c) Schmitt trigger d) None of the mentioned

8) The maximum value of d Vo/dt is called _____

a) voltage ratio b) voltage rate
c) slew rate d) transient response

9) An Ideal Op-amp has _____ power supply rejection ration.

a) 0 b) Infinite
c) Negative d) Positive

10) What happens due to a mismatch between two input terminals in an op-amp?

a) Input offset voltage
b) Output offset voltage
c) Both the input and output offset voltage
d) None of the mentioned

11) A differential type amplifier in an Op-amp provides which of the following characteristics?

a) Rejection of CM signal b) High input type impedance
c) Low noise d) All the above

12) Find the type of amplifier that cannot be constructed in a differential configuration.

a) Summing amplifier b) Scaling amplifier
c) Averaging amplifier d) Subtractor

13) What is the use of the compensation capacitor in op-amp?

a) Improves the amplification of op-amp
b) Decreases the slew rate of op-amp
c) Increases the bandwidth of op-amp
d) Op-amp acts as all pass filter

14) In V-I converter with floating load where load is ____

a) Connected to ground b) Not connected to ground
c) Connected to input d) Load is zero

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Analog Integrated Circuits (ENTPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly

Section – I

Q.2 Attempt any four **16**

a) Explain the op-amp as an integrator with a waveform.
b) Explain the V to I converter with the grounded load.
c) What is slew rate? Explain its importance.
d) Design an Inverting amplifier using the op-amp 741 for a closed-loop gain of 7.
e) With a neat block diagram, explain the basic op-amp.

Q.3 Attempt any two **12**

a) Explain the following term :
i) Input offset voltag
ii) Input bias current
iii) CMRR
iv) SVRR
b) Derive the ICEQ and VCEQ for the DIBO differential amplifier.
c) Explain summing, scaling, and an averaging amplifier in an inverting configuration.

Section – II

Q.4 Attempt any four **16**

a) Draw and explain a triangular wave generator with a waveform.
b) Explain the block diagram of the PLL and give its Applications.
c) With a neat diagram, explain sample and hold circuit.
d) Explain Log amplifier.
e) Design a Second order low pass Butterworth filter with f_H= 1.5KHz.

Q.5 Attempt any two. **12**

a) Draw and explain the RC phase shift oscillator and derive the equation of frequency of oscillation.
b) Explain IC555 in Astable mode with an internal circuit diagram.
c) Give the types of precision rectifies and explain any one.

Seat No.	

Set R

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Analog Integrated Circuits (ENTPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable fata if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer: 14

1) How are the square wave output generated in op-amp?
a) Op-amp is forced to operate in the positive saturation region
b) Op-amp is forced to operate in the negative saturation region
c) Op-amp is forced to operate between positive and negative saturation region
d) None of the mentioned

2) A _____ circuit converts irregular shapes into a square wave or pulse.
a) Schmitt Trigger b) Clamper
c) Peak Detector d) Window Detector

3) Active filters offer the following advantages over passive filter _____.
a) Flexibility in design b) Gain adjustment
c) Both a and b d) None of these

4) Which among the following can be used to detect the missing heart beat?
a) Monostable multivibrator b) Astable multivibrator
c) Schmitt trigger d) None of the mentioned

5) The maximum value of d Vo/dt is called _____
a) voltage ratio b) voltage rate
c) slew rate d) transient response

6) An Ideal Op-amp has _____ power supply rejection ration.
a) 0 b) Infinite
c) Negative d) Positive

7) What happens due to a mismatch between two input terminals in an op-amp?
a) Input offset voltage
b) Output offset voltage
c) Both the input and output offset voltage
d) None of the mentioned

8) A differential type amplifier in an Op-amp provides which of the following characteristics?
a) Rejection of CM signal b) High input type impedance
c) Low noise d) All the above

9) Find the type of amplifier that cannot be constructed in a differential configuration.
a) Summing amplifier b) Scaling amplifier
c) Averaging amplifier d) Subtractor

10) What is the use of the compensation capacitor in op-amp?
a) Improves the amplification of op-amp
b) Decreases the slew rate of op-amp
c) Increases the bandwidth of op-amp
d) Op-amp acts as all pass filter

11) In V-I converter with floating load where load is ____
a) Connected to ground b) Not connected to ground
c) Connected to input d) Load is zero

12) What are the features of an instrumentation amplifier?
a) Low noise b) High gain accuracy
c) Low thermal and time drift d) All of the mentioned

13) What should be the minimum time between the two zero-crossings if the output is 28 Vpp When sine wave is input, in case of IC 741, in open loop by considering the effect of slew rate?
a) 56 m sec b) 56 sec
c) 5.6 sec d) 56 msec

14) For the summing amplifier ratio of Rf/R should be _____
a) less than one b) greater than one
c) zero d) one

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Analog Integrated Circuits (ENTPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly

Section – I

Q.2 Attempt any four **16**

a) Explain the op-amp as an integrator with a waveform.
b) Explain the V to I converter with the grounded load.
c) What is slew rate? Explain its importance.
d) Design an Inverting amplifier using the op-amp 741 for a closed-loop gain of 7.
e) With a neat block diagram, explain the basic op-amp.

Q.3 Attempt any two **12**

a) Explain the following term :
i) Input offset voltag
ii) Input bias current
iii) CMRR
iv) SVRR
b) Derive the ICEQ and VCEQ for the DIBO differential amplifier.
c) Explain summing, scaling, and an averaging amplifier in an inverting configuration.

Section – II

Q.4 Attempt any four **16**

a) Draw and explain a triangular wave generator with a waveform.
b) Explain the block diagram of the PLL and give its Applications.
c) With a neat diagram, explain sample and hold circuit.
d) Explain Log amplifier.
e) Design a Second order low pass Butterworth filter with f_H= 1.5KHz.

Q.5 Attempt any two. **12**

a) Draw and explain the RC phase shift oscillator and derive the equation of frequency of oscillation.
b) Explain IC555 in Astable mode with an internal circuit diagram.
c) Give the types of precision rectifies and explain any one.

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Analog Integrated Circuits (ENTPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable fata if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) What is the use of the compensation capacitor in op-amp?
a) Improves the amplification of op-amp
b) Decreases the slew rate of op-amp
c) Increases the bandwidth of op-amp
d) Op-amp acts as all pass filter

2) In V-I converter with floating load where load is ____
a) Connected to ground b) Not connected to ground
c) Connected to input d) Load is zero

3) What are the features of an instrumentation amplifier?
a) Low noise b) High gain accuracy
c) Low thermal and time drift d) All of the mentioned

4) What should be the minimum time between the two zero-crossings if the output is 28 Vpp When sine wave is input, in case of IC 741, in open loop by considering the effect of slew rate?
a) 56 m sec b) 56 sec
c) 5.6 sec d) 56 msec

5) For the summing amplifier ratio of Rf/R should be _____
a) less than one b) greater than one
c) zero d) one

6) How are the square wave output generated in op-amp?
a) Op-amp is forced to operate in the positive saturation region
b) Op-amp is forced to operate in the negative saturation region
c) Op-amp is forced to operate between positive and negative saturation region
d) None of the mentioned

7) A _____ circuit converts irregular shapes into a square wave or pulse.
a) Schmitt Trigger b) Clamper
c) Peak Detector d) Window Detector

8) Active filters offer the following advantages over passive filter _____.
a) Flexibility in design b) Gain adjustment
c) Both a and b d) None of these

9) Which among the following can be used to detect the missing heart beat?
a) Monostable multivibrator b) Astable multivibrator
c) Schmitt trigger d) None of the mentioned

10) The maximum value of d Vo/dt is called _____
a) voltage ratio b) voltage rate
c) slew rate d) transient response

11) An Ideal Op-amp has _____ power supply rejection ration.
a) 0 b) Infinite
c) Negative d) Positive

12) What happens due to a mismatch between two input terminals in an op-amp?
a) Input offset voltage
b) Output offset voltage
c) Both the input and output offset voltage
d) None of the mentioned

13) A differential type amplifier in an Op-amp provides which of the following characteristics?
a) Rejection of CM signal b) High input type impedance
c) Low noise d) All the above

14) Find the type of amplifier that cannot be constructed in a differential configuration.
a) Summing amplifier b) Scaling amplifier
c) Averaging amplifier d) Subtractor

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Analog Integrated Circuits (ENTPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume additional suitable data if necessary and state it clearly

Section – I

Q.2 Attempt any four **16**

a) Explain the op-amp as an integrator with a waveform.
b) Explain the V to I converter with the grounded load.
c) What is slew rate? Explain its importance.
d) Design an Inverting amplifier using the op-amp 741 for a closed-loop gain of 7.
e) With a neat block diagram, explain the basic op-amp.

Q.3 Attempt any two **12**

a) Explain the following term :
i) Input offset voltag
ii) Input bias current
iii) CMRR
iv) SVRR
b) Derive the ICEQ and VCEQ for the DIBO differential amplifier.
c) Explain summing, scaling, and an averaging amplifier in an inverting configuration.

Section – II

Q.4 Attempt any four **16**

a) Draw and explain a triangular wave generator with a waveform.
b) Explain the block diagram of the PLL and give its Applications.
c) With a neat diagram, explain sample and hold circuit.
d) Explain Log amplifier.
e) Design a Second order low pass Butterworth filter with f_H= 1.5KHz.

Q.5 Attempt any two. **12**

a) Draw and explain the RC phase shift oscillator and derive the equation of frequency of oscillation.
b) Explain IC555 in Astable mode with an internal circuit diagram.
c) Give the types of precision rectifies and explain any one.

SLR-BD-207

Seat No.	

Set P

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Innovation can be best described as: _____
a) A new idea only
b) The process of creating value through ideas
c) Invention
d) None of the above

2) Entrepreneurship is primarily related to: _____
a) Administration b) Risk-taking
c) Planning d) None of these

3) Which of the following is not an entrepreneurial competency?
a) Innovation b) Leadership
c) Laziness d) Decision making

4) An entrepreneur operates: _____
a) Outside the organization b) Within an existing company
c) As a freelancer d) None

5) "Push" type innovation comes from: _____
a) Market needs b) Customer demands
c) Internal ideas d) Suppliers

6) Agile management promotes: _____
a) Linear process b) Flexibility and iteration
c) Bureaucracy d) None

7) Blue Ocean strategy refers to: _____
a) Competing in existing markets
b) Creating new market space
c) Losing market share
d) None

8) Which of these is not a barrier to innovation?
a) Risk-taking culture b) Resistance to change
c) Lack of resources d) Poor leadership

9) The shifting composition of the economy refers to: _____
a) Stable industries b) Changing business models
c) Static job roles d) None

10) Lean start-up encourages: _____
a) High upfront investment b) Rapid prototyping
c) Formal structure d) None

11) Legal considerations for entrepreneurs include: _____
a) Taxation b) IP protection
c) Contracts d) All of these

12) One of the seven sources of innovation is: _____
a) Competitor's failure b) Demographics
c) Inflation d) GDP

13) Entrepreneurial opportunity recognition is: _____
a) Unimportant b) Intuition-based only
c) Structured process d) Not taught

14) Six Thinking Hats is a method for: _____
a) Innovation testing b) Decision-making
c) Funding d) Legal advice

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 All questions are compulsory.

a) Define innovation. Explain its relationship with entrepreneurship. **06**
b) Distinguish between Entrepreneur, Manager, and Intrapreneur. **04**

Q.3 Solve any three questions.

a) Explain classification of innovation. **06**
b) Describe the economic theories of entrepreneurship. **06**
c) Discuss need and importance of Entrepreneurship Development. **06**
d) Describe sources of innovation with examples. **06**
e) Explain Agile management and NUF test in innovation. **06**

Section – II

Q.4 All questions are compulsory.

a) Explain the purpose and process of innovation. **06**
b) What are the needs for continuous learning in innovation? **04**

Q.5 Solve any three questions.

a) Explain different types of innovative strategies. **06**
b) Describe Red Ocean vs Blue Ocean strategies. **06**
c) List barriers to innovation and explain with examples. **06**
d) Explain the entrepreneurial process and opportunity recognition. **06**
e) Write short note on Lean start-up methodology. **06**

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of these is not a barrier to innovation?
a) Risk-taking culture b) Resistance to change
c) Lack of resources d) Poor leadership

2) The shifting composition of the economy refers to: _____
a) Stable industries b) Changing business models
c) Static job roles d) None

3) Lean start-up encourages: _____
a) High upfront investment b) Rapid prototyping
c) Formal structure d) None

4) Legal considerations for entrepreneurs include: _____
a) Taxation b) IP protection
c) Contracts d) All of these

5) One of the seven sources of innovation is: _____
a) Competitor's failure b) Demographics
c) Inflation d) GDP

6) Entrepreneurial opportunity recognition is: _____
a) Unimportant b) Intuition-based only
c) Structured process d) Not taught

7) Six Thinking Hats is a method for: _____
a) Innovation testing b) Decision-making
c) Funding d) Legal advice

8) Innovation can be best described as: _____
   a) A new idea only
   b) The process of creating value through ideas
   c) Invention
   d) None of the above

9) Entrepreneurship is primarily related to: _____
   a) Administration
   b) Risk-taking
   c) Planning
   d) None of these

10) Which of the following is not an entrepreneurial competency?
   a) Innovation
   b) Leadership
   c) Laziness
   d) Decision making

11) An entrepreneur operates: _____
   a) Outside the organization
   b) Within an existing company
   c) As a freelancer
   d) None

12) "Push" type innovation comes from: _____
   a) Market needs
   b) Customer demands
   c) Internal ideas
   d) Suppliers

13) Agile management promotes: _____
   a) Linear process
   b) Flexibility and iteration
   c) Bureaucracy
   d) None

14) Blue Ocean strategy refers to: _____
   a) Competing in existing markets
   b) Creating new market space
   c) Losing market share
   d) None

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 All questions are compulsory.

a) Define innovation. Explain its relationship with entrepreneurship. **06**
b) Distinguish between Entrepreneur, Manager, and Intrapreneur. **04**

Q.3 Solve any three questions.

a) Explain classification of innovation. **06**
b) Describe the economic theories of entrepreneurship. **06**
c) Discuss need and importance of Entrepreneurship Development. **06**
d) Describe sources of innovation with examples. **06**
e) Explain Agile management and NUF test in innovation. **06**

Section – II

Q.4 All questions are compulsory.

a) Explain the purpose and process of innovation. **06**
b) What are the needs for continuous learning in innovation? **04**

Q.5 Solve any three questions.

a) Explain different types of innovative strategies. **06**
b) Describe Red Ocean vs Blue Ocean strategies. **06**
c) List barriers to innovation and explain with examples. **06**
d) Explain the entrepreneurial process and opportunity recognition. **06**
e) Write short note on Lean start-up methodology. **06**

Seat No.		Set	R

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Legal considerations for entrepreneurs include: _____
a) Taxation b) IP protection
c) Contracts d) All of these

2) One of the seven sources of innovation is: _____
a) Competitor's failure b) Demographics
c) Inflation d) GDP

3) Entrepreneurial opportunity recognition is: _____
a) Unimportant b) Intuition-based only
c) Structured process d) Not taught

4) Six Thinking Hats is a method for: _____
a) Innovation testing b) Decision-making
c) Funding d) Legal advice

5) Innovation can be best described as: _____
a) A new idea only
b) The process of creating value through ideas
c) Invention
d) None of the above

6) Entrepreneurship is primarily related to: _____
a) Administration b) Risk-taking
c) Planning d) None of these

7) Which of the following is not an entrepreneurial competency?
a) Innovation b) Leadership
c) Laziness d) Decision making

8) An entrepreneur operates: _____
a) Outside the organization
b) Within an existing company
c) As a freelancer
d) None

9) "Push" type innovation comes from: _____
a) Market needs
b) Customer demands
c) Internal ideas
d) Suppliers

10) Agile management promotes: _____
a) Linear process
b) Flexibility and iteration
c) Bureaucracy
d) None

11) Blue Ocean strategy refers to: _____
a) Competing in existing markets
b) Creating new market space
c) Losing market share
d) None

12) Which of these is not a barrier to innovation?
a) Risk-taking culture
b) Resistance to change
c) Lack of resources
d) Poor leadership

13) The shifting composition of the economy refers to: _____
a) Stable industries
b) Changing business models
c) Static job roles
d) None

14) Lean start-up encourages: _____
a) High upfront investment
b) Rapid prototyping
c) Formal structure
d) None

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 All questions are compulsory.

a) Define innovation. Explain its relationship with entrepreneurship. **06**
b) Distinguish between Entrepreneur, Manager, and Intrapreneur. **04**

Q.3 Solve any three questions.

a) Explain classification of innovation. **06**
b) Describe the economic theories of entrepreneurship. **06**
c) Discuss need and importance of Entrepreneurship Development. **06**
d) Describe sources of innovation with examples. **06**
e) Explain Agile management and NUF test in innovation. **06**

Section – II

Q.4 All questions are compulsory.

a) Explain the purpose and process of innovation. **06**
b) What are the needs for continuous learning in innovation? **04**

Q.5 Solve any three questions.

a) Explain different types of innovative strategies. **06**
b) Describe Red Ocean vs Blue Ocean strategies. **06**
c) List barriers to innovation and explain with examples. **06**
d) Explain the entrepreneurial process and opportunity recognition. **06**
e) Write short note on Lean start-up methodology. **06**

Seat No.		Set	S

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Agile management promotes: _____
a) Linear process b) Flexibility and iteration
c) Bureaucracy d) None

2) Blue Ocean strategy refers to: _____
a) Competing in existing markets
b) Creating new market space
c) Losing market share
d) None

3) Which of these is not a barrier to innovation?
a) Risk-taking culture b) Resistance to change
c) Lack of resources d) Poor leadership

4) The shifting composition of the economy refers to: _____
a) Stable industries b) Changing business models
c) Static job roles d) None

5) Lean start-up encourages: _____
a) High upfront investment b) Rapid prototyping
c) Formal structure d) None

6) Legal considerations for entrepreneurs include: _____
a) Taxation b) IP protection
c) Contracts d) All of these

7) One of the seven sources of innovation is: _____
a) Competitor's failure b) Demographics
c) Inflation d) GDP

8) Entrepreneurial opportunity recognition is: _____
a) Unimportant
b) Intuition-based only
c) Structured process
d) Not taught

9) Six Thinking Hats is a method for: _____
a) Innovation testing
b) Decision-making
c) Funding
d) Legal advice

10) Innovation can be best described as: _____
a) A new idea only
b) The process of creating value through ideas
c) Invention
d) None of the above

11) Entrepreneurship is primarily related to: _____
a) Administration
b) Risk-taking
c) Planning
d) None of these

12) Which of the following is not an entrepreneurial competency?
a) Innovation
b) Leadership
c) Laziness
d) Decision making

13) An entrepreneur operates: _____
a) Outside the organization
b) Within an existing company
c) As a freelancer
d) None

14) "Push" type innovation comes from: _____
a) Market needs
b) Customer demands
c) Internal ideas
d) Suppliers

SLR-BD-207

Seat No.	

Set S

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 All questions are compulsory.

a) Define innovation. Explain its relationship with entrepreneurship. **06**
b) Distinguish between Entrepreneur, Manager, and Intrapreneur. **04**

Q.3 Solve any three questions.

a) Explain classification of innovation. **06**
b) Describe the economic theories of entrepreneurship. **06**
c) Discuss need and importance of Entrepreneurship Development. **06**
d) Describe sources of innovation with examples. **06**
e) Explain Agile management and NUF test in innovation. **06**

Section – II

Q.4 All questions are compulsory.

a) Explain the purpose and process of innovation. **06**
b) What are the needs for continuous learning in innovation? **04**

Q.5 Solve any three questions.

a) Explain different types of innovative strategies. **06**
b) Describe Red Ocean vs Blue Ocean strategies. **06**
c) List barriers to innovation and explain with examples. **06**
d) Explain the entrepreneurial process and opportunity recognition. **06**
e) Write short note on Lean start-up methodology. **06**

SLR-BD-208

Seat No.		Set	P

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) The Occupational Health and Safety Management System (OHSMS) primarily aims to: _____
a) Increase industrial profits
b) Reduce energy consumption
c) Ensure worker safety and reduce health risks in workplaces
d) Promote environmental tourism

2) In-situ conservation refers to: _____
a) Conservation of species in zoos
b) Conservation using biotechnology
c) Conservation in gene banks
d) Conservation of species in their natural habitats

3) Carbon footprint is a measure of: _____
a) Land occupied by forests
b) Energy consumption in a home
c) Greenhouse gas emissions by an activity or person
d) Amount of carbon in plants

4) The main goal of sustainability is to: _____
a) Meet present needs without compromising future needs
b) Increase profit only
c) Eliminate economic development
d) Promote urbanization

5) Which of the following is an example of hazardous waste?
a) Expired medicines b) Plastic bottles
c) Food scraps d) Paper waste

6) Biodiversity hotspots in India include: _____
a) Eastern Ghats and Indo-Gangetic Plain
b) Western Ghats and the Himalayas
c) Thar Desert and Sundarbans only
d) Deccan Plateau and Indo-Gangetic Basin

7) The 3R concept stands for: _____
a) Reuse, Reduce, Rebuild
b) Reduce, Reuse, Recycle
c) Replace, Reuse, Restore
d) Recycle, Recover, Rebuild

8) The ISO 14000 Series deals with: _____
a) Energy-efficient building design
b) Environmental Management Systems
c) Industrial Safety Standards
d) Economic Performance Indicators

9) Which of the following is a non-conventional source of energy?
a) Coal
b) Natural Gas
c) Wind
d) Diesel

10) The main goal of a circular economy is to: _____
a) Increase fossil fuel usage
b) Promote single-use products
c) Minimize waste and resource use
d) Maximize profit only

11) The first step in preparing an Environmental Impact Assessment (EIA) report is: _____
a) Cost-benefit analysis
b) Monitoring
c) Screening
d) Public hearing

12) Which of the following is not a principle of Environmental Management?
a) Polluter pays
b) Sustainability
c) Preventive action
d) Maximum profit generation

13) Cost-Benefit Analysis (CBA) in environmental policies is used to: _____
a) Maximize pollution
b) Evaluate environmental legislation
c) Compare environmental costs with economic benefits
d) Promote industrialization

14) An ecosystem consists of: _____
a) Living organisms only
b) Non-living components only
c) Living organisms and their physical environment
d) Plants and animals only

SLR-BD-208

Seat No.		Set	P

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following **12**

a) Define the term "environment". Discuss the scope and importance of environmental studies. Why is there a need for public awareness?
b) Describe the causes and effects of air and water pollution. Suggest two preventive measures for each.
c) Define sustainability. Discuss any two major challenges in achieving sustainable development.

Q.3 Attempt Any Two **10**

a) What are hazardous wastes and e-wastes? How should they be managed?
b) What are carbon credits and carbon footprints? Explain with examples.
c) List any two Millennium Development Goals (MDGs). Mention one environmental protocol.

Q.4 Write short notes on any two of the following: **06**

a) Genetic diversity
b) India as a mega-diversity nation
c) In-situ and Ex-situ conservation

Section – II

Q.5 Write short notes on any two of the following: **10**

a) ISO 14000 Series
b) Sustainable Habitat - Green Buildings
c) Non-conventional energy sources

Q.6 Attempt the following **10**

a) Define Environmental Management. Discuss its nature, scope, and components.
b) Define the 3R concept and explain how it supports the zero waste approach.

Q.7 Attempt any two **08**

a) Define Environmental Management. Discuss its nature, scope, and components.

b) What is Environmental Policy Analysis? Distinguish between macro-level and micro-level analysis.

c) Outline the steps involved in the Environmental Impact Assessment (EIA) process.

Seat No.		Set	Q

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) The ISO 14000 Series deals with: _____
a) Energy-efficient building design
b) Environmental Management Systems
c) Industrial Safety Standards
d) Economic Performance Indicators

2) Which of the following is a non-conventional source of energy?
a) Coal b) Natural Gas
c) Wind d) Diesel

3) The main goal of a circular economy is to: _____
a) Increase fossil fuel usage
b) Promote single-use products
c) Minimize waste and resource use
d) Maximize profit only

4) The first step in preparing an Environmental Impact Assessment (EIA) report is: _____
a) Cost-benefit analysis b) Monitoring
c) Screening d) Public hearing

5) Which of the following is not a principle of Environmental Management?
a) Polluter pays b) Sustainability
c) Preventive action d) Maximum profit generation

6) Cost-Benefit Analysis (CBA) in environmental policies is used to: _____
a) Maximize pollution
b) Evaluate environmental legislation
c) Compare environmental costs with economic benefits
d) Promote industrialization

7) An ecosystem consists of: _____
a) Living organisms only
b) Non-living components only
c) Living organisms and their physical environment
d) Plants and animals only

8) The Occupational Health and Safety Management System (OHSMS) primarily aims to: _____
a) Increase industrial profits
b) Reduce energy consumption
c) Ensure worker safety and reduce health risks in workplaces
d) Promote environmental tourism

9) In-situ conservation refers to: _____
a) Conservation of species in zoos
b) Conservation using biotechnology
c) Conservation in gene banks
d) Conservation of species in their natural habitats

10) Carbon footprint is a measure of: _____
a) Land occupied by forests
b) Energy consumption in a home
c) Greenhouse gas emissions by an activity or person
d) Amount of carbon in plants

11) The main goal of sustainability is to: _____
a) Meet present needs without compromising future needs
b) Increase profit only
c) Eliminate economic development
d) Promote urbanization

12) Which of the following is an example of hazardous waste?
a) Expired medicines b) Plastic bottles
c) Food scraps d) Paper waste

13) Biodiversity hotspots in India include: _____
a) Eastern Ghats and Indo-Gangetic Plain
b) Western Ghats and the Himalayas
c) Thar Desert and Sundarbans only
d) Deccan Plateau and Indo-Gangetic Basin

14) The 3R concept stands for: _____
a) Reuse, Reduce, Rebuild b) Reduce, Reuse, Recycle
c) Replace, Reuse, Restore d) Recycle, Recover, Rebuild

SLR-BD-208

Seat No.		Set	Q

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following **12**

a) Define the term "environment". Discuss the scope and importance of environmental studies. Why is there a need for public awareness?
b) Describe the causes and effects of air and water pollution. Suggest two preventive measures for each.
c) Define sustainability. Discuss any two major challenges in achieving sustainable development.

Q.3 Attempt Any Two **10**

a) What are hazardous wastes and e-wastes? How should they be managed?
b) What are carbon credits and carbon footprints? Explain with examples.
c) List any two Millennium Development Goals (MDGs). Mention one environmental protocol.

Q.4 Write short notes on any two of the following: **06**

a) Genetic diversity
b) India as a mega-diversity nation
c) In-situ and Ex-situ conservation

Section – II

Q.5 Write short notes on any two of the following: **10**

a) ISO 14000 Series
b) Sustainable Habitat - Green Buildings
c) Non-conventional energy sources

Q.6 Attempt the following **10**

a) Define Environmental Management. Discuss its nature, scope, and components.
b) Define the 3R concept and explain how it supports the zero waste approach.

Q.7 Attempt any two **08**

a) Define Environmental Management. Discuss its nature, scope, and components.

b) What is Environmental Policy Analysis? Distinguish between macro-level and micro-level analysis.

c) Outline the steps involved in the Environmental Impact Assessment (EIA) process.

Seat No.		Set	R

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) The first step in preparing an Environmental Impact Assessment (EIA) report is: _____
a) Cost-benefit analysis b) Monitoring
c) Screening d) Public hearing

2) Which of the following is not a principle of Environmental Management?
a) Polluter pays b) Sustainability
c) Preventive action d) Maximum profit generation

3) Cost-Benefit Analysis (CBA) in environmental policies is used to: _____
a) Maximize pollution
b) Evaluate environmental legislation
c) Compare environmental costs with economic benefits
d) Promote industrialization

4) An ecosystem consists of: _____
a) Living organisms only
b) Non-living components only
c) Living organisms and their physical environment
d) Plants and animals only

5) The Occupational Health and Safety Management System (OHSMS) primarily aims to: _____
a) Increase industrial profits
b) Reduce energy consumption
c) Ensure worker safety and reduce health risks in workplaces
d) Promote environmental tourism

6) In-situ conservation refers to: _____
   a) Conservation of species in zoos
   b) Conservation using biotechnology
   c) Conservation in gene banks
   d) Conservation of species in their natural habitats

7) Carbon footprint is a measure of: _____
   a) Land occupied by forests
   b) Energy consumption in a home
   c) Greenhouse gas emissions by an activity or person
   d) Amount of carbon in plants

8) The main goal of sustainability is to: _____
   a) Meet present needs without compromising future needs
   b) Increase profit only
   c) Eliminate economic development
   d) Promote urbanization

9) Which of the following is an example of hazardous waste?
   a) Expired medicines b) Plastic bottles
   c) Food scraps d) Paper waste

10) Biodiversity hotspots in India include: _____
   a) Eastern Ghats and Indo-Gangetic Plain
   b) Western Ghats and the Himalayas
   c) Thar Desert and Sundarbans only
   d) Deccan Plateau and Indo-Gangetic Basin

11) The 3R concept stands for: _____
   a) Reuse, Reduce, Rebuild b) Reduce, Reuse, Recycle
   c) Replace, Reuse, Restore d) Recycle, Recover, Rebuild

12) The ISO 14000 Series deals with: _____
   a) Energy-efficient building design
   b) Environmental Management Systems
   c) Industrial Safety Standards
   d) Economic Performance Indicators

13) Which of the following is a non-conventional source of energy?
   a) Coal b) Natural Gas
   c) Wind d) Diesel

14) The main goal of a circular economy is to: _____
   a) Increase fossil fuel usage
   b) Promote single-use products
   c) Minimize waste and resource use
   d) Maximize profit only

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following **12**

a) Define the term "environment". Discuss the scope and importance of environmental studies. Why is there a need for public awareness?
b) Describe the causes and effects of air and water pollution. Suggest two preventive measures for each.
c) Define sustainability. Discuss any two major challenges in achieving sustainable development.

Q.3 Attempt Any Two **10**

a) What are hazardous wastes and e-wastes? How should they be managed?
b) What are carbon credits and carbon footprints? Explain with examples.
c) List any two Millennium Development Goals (MDGs). Mention one environmental protocol.

Q.4 Write short notes on any two of the following: **06**

a) Genetic diversity
b) India as a mega-diversity nation
c) In-situ and Ex-situ conservation

Section – II

Q.5 Write short notes on any two of the following: **10**

a) ISO 14000 Series
b) Sustainable Habitat - Green Buildings
c) Non-conventional energy sources

Q.6 Attempt the following **10**

a) Define Environmental Management. Discuss its nature, scope, and components.
b) Define the 3R concept and explain how it supports the zero waste approach.

Q.7 Attempt any two **08**

a) Define Environmental Management. Discuss its nature, scope, and components.

b) What is Environmental Policy Analysis? Distinguish between macro-level and micro-level analysis.

c) Outline the steps involved in the Environmental Impact Assessment (EIA) process.

Seat No.		Set	S

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Biodiversity hotspots in India include: _____
a) Eastern Ghats and Indo-Gangetic Plain
b) Western Ghats and the Himalayas
c) Thar Desert and Sundarbans only
d) Deccan Plateau and Indo-Gangetic Basin

2) The 3R concept stands for: _____
a) Reuse, Reduce, Rebuild b) Reduce, Reuse, Recycle
c) Replace, Reuse, Restore d) Recycle, Recover, Rebuild

3) The ISO 14000 Series deals with: _____
a) Energy-efficient building design
b) Environmental Management Systems
c) Industrial Safety Standards
d) Economic Performance Indicators

4) Which of the following is a non-conventional source of energy?
a) Coal b) Natural Gas
c) Wind d) Diesel

5) The main goal of a circular economy is to: _____
a) Increase fossil fuel usage
b) Promote single-use products
c) Minimize waste and resource use
d) Maximize profit only

6) The first step in preparing an Environmental Impact Assessment (EIA) report is: _____
a) Cost-benefit analysis b) Monitoring
c) Screening d) Public hearing

7) Which of the following is not a principle of Environmental Management?
a) Polluter pays
b) Sustainability
c) Preventive action
d) Maximum profit generation

8) Cost-Benefit Analysis (CBA) in environmental policies is used to: _____
a) Maximize pollution
b) Evaluate environmental legislation
c) Compare environmental costs with economic benefits
d) Promote industrialization

9) An ecosystem consists of: _____
a) Living organisms only
b) Non-living components only
c) Living organisms and their physical environment
d) Plants and animals only

10) The Occupational Health and Safety Management System (OHSMS) primarily aims to: _____
a) Increase industrial profits
b) Reduce energy consumption
c) Ensure worker safety and reduce health risks in workplaces
d) Promote environmental tourism

11) In-situ conservation refers to: _____
a) Conservation of species in zoos
b) Conservation using biotechnology
c) Conservation in gene banks
d) Conservation of species in their natural habitats

12) Carbon footprint is a measure of: _____
a) Land occupied by forests
b) Energy consumption in a home
c) Greenhouse gas emissions by an activity or person
d) Amount of carbon in plants

13) The main goal of sustainability is to: _____
a) Meet present needs without compromising future needs
b) Increase profit only
c) Eliminate economic development
d) Promote urbanization

14) Which of the following is an example of hazardous waste?
a) Expired medicines
b) Plastic bottles
c) Food scraps
d) Paper waste

SLR-BD-208

Seat No.		Set	S

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following **12**

a) Define the term "environment". Discuss the scope and importance of environmental studies. Why is there a need for public awareness?
b) Describe the causes and effects of air and water pollution. Suggest two preventive measures for each.
c) Define sustainability. Discuss any two major challenges in achieving sustainable development.

Q.3 Attempt Any Two **10**

a) What are hazardous wastes and e-wastes? How should they be managed?
b) What are carbon credits and carbon footprints? Explain with examples.
c) List any two Millennium Development Goals (MDGs). Mention one environmental protocol.

Q.4 Write short notes on any two of the following: **06**

a) Genetic diversity
b) India as a mega-diversity nation
c) In-situ and Ex-situ conservation

Section – II

Q.5 Write short notes on any two of the following: **10**

a) ISO 14000 Series
b) Sustainable Habitat - Green Buildings
c) Non-conventional energy sources

Q.6 Attempt the following **10**

a) Define Environmental Management. Discuss its nature, scope, and components.
b) Define the 3R concept and explain how it supports the zero waste approach.

Q.7 Attempt any two **08**

a) Define Environmental Management. Discuss its nature, scope, and components.

b) What is Environmental Policy Analysis? Distinguish between macro-level and micro-level analysis.

c) Outline the steps involved in the Environmental Impact Assessment (EIA) process.

SLR-BD-209

Seat No.		Set	P

S. Y. (B. Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which is the primary advantage of using solar energy power generation?
a) Low initial coast
b) Reduce environmental impact
c) Do not require large area
d) Simple storage method

2) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

3) Which of the following common application of solar energy?
a) Generating electricity
b) Heating water
c) Providing power for electronic device
d) All of the above

4) Passive solar energy refers to trapping the Suns energy _____.
a) Using mechanical devices
b) without using mechanical devices
c) Using chemical
d) Incineration

5) The process or digestion taking place in the presence of air is called as _____.
a) Aerobic digestion b) Anaerobic digestion
c) Hydrolysis d) None of these

6) Which type of renewable energy resources generate low power energy?

a) Biomass b) Solar
c) Wind d) All of the above

7) In wind turbine gear box is used to _____.

a) Step up the speed b) Reduce the speed
c) shut down d) None of these

8) Geothermal energy present _____ of the earth.

a) Rotation b) Exterior
c) North side d) Interior

9) Biogas is the gaseous fuel which is obtained from biomass by means of _____ fermentation.

a) Aerobic b) Anaerobic
c) Constant d) None of the above

10) _____ is produced by blending of vegetable oil.

a) CNG b) Methane gas
c) Biofuel d) Biodisel

11) Availability of Solar energy on the earth surface is _____MW.

a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

12) Energy is _____ of substance or a body to do work.

a) Obesity b) Power
c) Capacity d) None of the above

13) Wind energy used from _____ years ago.

a) 3000 b) 2000
c) 6000 d) 5000

14) The major source of the Geothermal energy is _____.

a) Water b) Hot water reservoir
c) Oil d) Gas

Seat No.	

Set **P**

S.Y. (B. Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Attempt any Four **16**

a) Explain advantages of biomass energy.
b) Explain in detail scope of renewable energy.
c) What is biomass energy and explain resources of biomass energy.
d) Write a note on applications of solar energy.
e) Explain function of biogas digester.
f) Write a note on aerobic and anaerobic digestion.

Q.3 Attempt any two. **12**

a) Explain Solar photovoltaic technology.
b) Explain Basic components of wind energy conversion system.
c) Explain in detail advantages and disadvantages of renewable energy.
d) Explain in detail advantage and disadvantage of Solar energy.

Section – II

Q.4 Attempt any Four. **16**

a) Write a note on wave energy.
b) Merits and demerits of hydropower energy.
c) Explain specifications of energy storage devices.
d) Main parts of hydropower station.
e) Importance of tidal energy.
f) Importance of energy storage devices

Q.5 Attempt any two. **12**

a) Write a note on potential of wave energy in India.
b) Explain different methods of energy storage.
c) Explain with neat diagram hydropower plant.
d) Explain in detail ocean thermal energy conversion (OTEC).

Seat No.	

Set **Q**

S. Y. (B. Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Geothermal energy present _____ of the earth.
a) Rotation b) Exterior
c) North side d) Interior

2) Biogas is the gaseous fuel which is obtained from biomass by means of _____ fermentation.
a) Aerobic b) Anaerobic
c) Constant d) None of the above

3) _____ is produced by blending of vegetable oil.
a) CNG b) Methane gas
c) Biofuel d) Biodisel

4) Availability of Solar energy on the earth surface is _____MW.
a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

5) Energy is _____ of substance or a body to do work.
a) Obesity b) Power
c) Capacity d) None of the above

6) Wind energy used from _____ years ago.
a) 3000 b) 2000
c) 6000 d) 5000

7) The major source of the Geothermal energy is _____.
a) Water b) Hot water reservoir
c) Oil d) Gas

8) Which is the primary advantage of using solar energy power generation?
a) Low initial coast
b) Reduce environmental impact
c) Do not require large area
d) Simple storage method

9) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

10) Which of the following common application of solar energy?
a) Generating electricity
b) Heating water
c) Providing power for electronic device
d) All of the above

11) Passive solar energy refers to trapping the Suns energy _____.
a) Using mechanical devices
b) without using mechanical devices
c) Using chemical
d) Incineration

12) The process or digestion taking place in the presence of air is called as _____.
a) Aerobic digestion b) Anaerobic digestion
c) Hydrolysis d) None of these

13) Which type of renewable energy resources generate low power energy?
a) Biomass b) Solar
c) Wind d) All of the above

14) In wind turbine gear box is used to _____.
a) Step up the speed b) Reduce the speed
c) shut down d) None of these

Seat No.	

Set **Q**

S.Y. (B. Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Attempt any Four **16**

a) Explain advantages of biomass energy.
b) Explain in detail scope of renewable energy.
c) What is biomass energy and explain resources of biomass energy.
d) Write a note on applications of solar energy.
e) Explain function of biogas digester.
f) Write a note on aerobic and anaerobic digestion.

Q.3 Attempt any two. **12**

a) Explain Solar photovoltaic technology.
b) Explain Basic components of wind energy conversion system.
c) Explain in detail advantages and disadvantages of renewable energy.
d) Explain in detail advantage and disadvantage of Solar energy.

Section – II

Q.4 Attempt any Four. **16**

a) Write a note on wave energy.
b) Merits and demerits of hydropower energy.
c) Explain specifications of energy storage devices.
d) Main parts of hydropower station.
e) Importance of tidal energy.
f) Importance of energy storage devices

Q.5 Attempt any two. **12**

a) Write a note on potential of wave energy in India.
b) Explain different methods of energy storage.
c) Explain with neat diagram hydropower plant.
d) Explain in detail ocean thermal energy conversion (OTEC).

Seat No.	

Set **R**

S. Y. (B. Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Availability of Solar energy on the earth surface is _____MW.
a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

2) Energy is _____ of substance or a body to do work.
a) Obesity b) Power
c) Capacity d) None of the above

3) Wind energy used from _____ years ago.
a) 3000 b) 2000
c) 6000 d) 5000

4) The major source of the Geothermal energy is _____.
a) Water b) Hot water reservoir
c) Oil d) Gas

5) Which is the primary advantage of using solar energy power generation?
a) Low initial coast
b) Reduce environmental impact
c) Do not require large area
d) Simple storage method

6) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

7) Which of the following common application of solar energy?
a) Generating electricity
b) Heating water
c) Providing power for electronic device
d) All of the above

8) Passive solar energy refers to trapping the Suns energy _____.
a) Using mechanical devices
b) without using mechanical devices
c) Using chemical
d) Incineration

9) The process or digestion taking place in the presence of air is called as _____.
a) Aerobic digestion
b) Anaerobic digestion
c) Hydrolysis
d) None of these

10) Which type of renewable energy resources generate low power energy?
a) Biomass
b) Solar
c) Wind
d) All of the above

11) In wind turbine gear box is used to _____.
a) Step up the speed
b) Reduce the speed
c) shut down
d) None of these

12) Geothermal energy present _____ of the earth.
a) Rotation
b) Exterior
c) North side
d) Interior

13) Biogas is the gaseous fuel which is obtained from biomass by means of _____ fermentation.
a) Aerobic
b) Anaerobic
c) Constant
d) None of the above

14) _____ is produced by blending of vegetable oil.
a) CNG
b) Methane gas
c) Biofuel
d) Biodisel

Seat No.	

Set **R**

S.Y. (B. Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Attempt any Four **16**

a) Explain advantages of biomass energy.
b) Explain in detail scope of renewable energy.
c) What is biomass energy and explain resources of biomass energy.
d) Write a note on applications of solar energy.
e) Explain function of biogas digester.
f) Write a note on aerobic and anaerobic digestion.

Q.3 Attempt any two. **12**

a) Explain Solar photovoltaic technology.
b) Explain Basic components of wind energy conversion system.
c) Explain in detail advantages and disadvantages of renewable energy.
d) Explain in detail advantage and disadvantage of Solar energy.

Section – II

Q.4 Attempt any Four. **16**

a) Write a note on wave energy.
b) Merits and demerits of hydropower energy.
c) Explain specifications of energy storage devices.
d) Main parts of hydropower station.
e) Importance of tidal energy.
f) Importance of energy storage devices

Q.5 Attempt any two. **12**

a) Write a note on potential of wave energy in India.
b) Explain different methods of energy storage.
c) Explain with neat diagram hydropower plant.
d) Explain in detail ocean thermal energy conversion (OTEC).

Seat No.	

Set **S**

S. Y. (B. Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which type of renewable energy resources generate low power energy?
a) Biomass b) Solar
c) Wind d) All of the above

2) In wind turbine gear box is used to _____.
a) Step up the speed b) Reduce the speed
c) shut down d) None of these

3) Geothermal energy present _____ of the earth.
a) Rotation b) Exterior
c) North side d) Interior

4) Biogas is the gaseous fuel which is obtained from biomass by means of _____ fermentation.
a) Aerobic b) Anaerobic
c) Constant d) None of the above

5) _____ is produced by blending of vegetable oil.
a) CNG b) Methane gas
c) Biofuel d) Biodisel

6) Availability of Solar energy on the earth surface is _____MW.
a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

7) Energy is _____ of substance or a body to do work.
a) Obesity b) Power
c) Capacity d) None of the above

8) Wind energy used from _____ years ago.
a) 3000 b) 2000
c) 6000 d) 5000

9) The major source of the Geothermal energy is _____.
a) Water b) Hot water reservoir
c) Oil d) Gas

10) Which is the primary advantage of using solar energy power generation?
a) Low initial coast
b) Reduce environmental impact
c) Do not require large area
d) Simple storage method

11) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

12) Which of the following common application of solar energy?
a) Generating electricity
b) Heating water
c) Providing power for electronic device
d) All of the above

13) Passive solar energy refers to trapping the Suns energy _____.
a) Using mechanical devices
b) without using mechanical devices
c) Using chemical
d) Incineration

14) The process or digestion taking place in the presence of air is called as _____.
a) Aerobic digestion b) Anaerobic digestion
c) Hydrolysis d) None of these

SLR-BD-209

Seat No.	

Set S

S.Y. (B. Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Attempt any Four **16**

a) Explain advantages of biomass energy.
b) Explain in detail scope of renewable energy.
c) What is biomass energy and explain resources of biomass energy.
d) Write a note on applications of solar energy.
e) Explain function of biogas digester.
f) Write a note on aerobic and anaerobic digestion.

Q.3 Attempt any two. **12**

a) Explain Solar photovoltaic technology.
b) Explain Basic components of wind energy conversion system.
c) Explain in detail advantages and disadvantages of renewable energy.
d) Explain in detail advantage and disadvantage of Solar energy.

Section – II

Q.4 Attempt any Four. **16**

a) Write a note on wave energy.
b) Merits and demerits of hydropower energy.
c) Explain specifications of energy storage devices.
d) Main parts of hydropower station.
e) Importance of tidal energy.
f) Importance of energy storage devices

Q.5 Attempt any two. **12**

a) Write a note on potential of wave energy in India.
b) Explain different methods of energy storage.
c) Explain with neat diagram hydropower plant.
d) Explain in detail ocean thermal energy conversion (OTEC).

SLR-BD-210

Seat No.	

Set P

S. Y. (B. Tech.) (Sem-II)(New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Draw neat diagrams whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) An instrument transformer is used to extend the range of _____.
a) induction instrument b) electrostatic instrument
c) moving coil instrument d) any of the above

2) The internal resistance of an ammeter should be _____.
a) Very small b) Medium
c) High d) Infinity

3) The smallest change which a sensor can detect is termed: _____
a) Accuracy b) Precision
c) Resolution d) Scale

4) Sensor effectiveness depends on _____ parameter.
a) Sensitivity b) Radiation
c) Restively d) All the above

5) The desirable static characteristics of a measuring system are _____
a) accuracy and drift
b) accuracy, sensitivity and reproducibility
c) drift and dead zone
d) static error

6) A _____ device prevents the oscillation of the moving system and enables the latter to reach its final position quickly.
a) Deflecting b) Controlling
c) Damping d) any of the above

7) _____ is an instrument which measures the insulation resistance of an electric circuit relative to earth and one another.
a) Tangent galvanometer
b) Megger
c) Current transformer
d) None of the above

8) Which of the following is a key characteristic of a sensor?
a) It can only measure temperature
b) It is an active component
c) It converts physical parameters into an electrical signal
d) Il requires no external power

9) Which of the following is a type of magnetic sensor?
a) Thermistor
b) Strain gauge
c) Hall effect sensor
d) LVDT

10) Typical conversion speed of ADC is _____
a) Less than 1 μs
b) Less than 100 μs
c) Less than 500 μs
d) Greater than 1000 μs

11) What is signal conditioning?
a) To analyze any signal
b) Conversion or modification is referred to as conditioning
c) Conversion from analog to digital is signal conditioning
d) Conversion from digital to analog is signal conditioning

12) Touch screen devices use which sensor?
a) Touch sensor
b) Temperature sensor
c) Humidity sensor
d) Pressure sensor

13) ENOB in ADC stand for _____
a) Effective number of bytes
b) Effective number of bits
c) Effective nibble baud
d) None of the mentioned

14) A simple bridge circuit consists of a network of _____
a) 3 resistance arms
b) 2 resistance arms
c) 4 resistance arms
d) 6 resistance arms

Seat No.	

Set **P**

S. Y. (B. Tech.) (Sem-II)(New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt any four of the following: **16**

a) Define standard & explain types of standards.
b) Define the following characteristics
1) Linearity 2) Accuracy 3) Repeatability 4) Sensitivity
c) Derive the expression for unknown capacitance with phasor diagram by using Schering Bridge.
d) Write difference between Current Transformer and Potential Transformer.
e) Explain working of digital storage oscilloscope with suitable block diagram.

Q.3 Attempt any two of the following: **12**

a) Illustrate and derive the torque equation for a Moving iron instrument with neat diagram.
b) Draw the equivalent circuit and phasor diagram of a CT. Derive the expressions for ratio and phase angle errors.
c) Explain digital ramp type and dual slope integrating type digital voltmeter.

Section – II

Q.4 Attempt any four of the following: **16**

a) Explain the principle of working of Hall effect sensor.
b) Explain different types of temperature sensor with details.
c) Discuss Classification of sensor and explain active and passive sensor.
d) State and explain the methods of data transmission.
e) State and Explain the Modes of Heat transfer.

Q.5 Attempt any two of the following: **12**

a) Stale the sensors used for Velocity and Acceleration application and explain any one of them.
b) Slate and explain the sensors used for occupancy and motion detector application.
c) Define the temperature and explain the thermal properties of material.

SLR-BD-210

Seat No.	

Set Q

S. Y. (B. Tech.) (Sem-II)(New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Draw neat diagrams whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which of the following is a key characteristic of a sensor?
a) It can only measure temperature
b) It is an active component
c) It converts physical parameters into an electrical signal
d) Il requires no external power

2) Which of the following is a type of magnetic sensor?
a) Thermistor b) Strain gauge
c) Hall effect sensor d) LVDT

3) Typical conversion speed of ADC is _____
a) Less than 1 μs b) Less than 100 μs
c) Less than 500 μs d) Greater than 1000 μs

4) What is signal conditioning?
a) To analyze any signal
b) Conversion or modification is referred to as conditioning
c) Conversion from analog to digital is signal conditioning
d) Conversion from digital to analog is signal conditioning

5) Touch screen devices use which sensor?
a) Touch sensor b) Temperature sensor
c) Humidity sensor d) Pressure sensor

6) ENOB in ADC stand for _____
a) Effective number of bytes b) Effective number of bits
c) Effective nibble baud d) None of the mentioned

7) A simple bridge circuit consists of a network of _____
a) 3 resistance arms b) 2 resistance arms
c) 4 resistance arms d) 6 resistance arms

8) An instrument transformer is used to extend the range of _____.
a) induction instrument b) electrostatic instrument
c) moving coil instrument d) any of the above

9) The internal resistance of an ammeter should be _____.
a) Very small b) Medium
c) High d) Infinity

10) The smallest change which a sensor can detect is termed: _____
a) Accuracy b) Precision
c) Resolution d) Scale

11) Sensor effectiveness depends on _____ parameter.
a) Sensitivity b) Radiation
c) Restively d) All the above

12) The desirable static characteristics of a measuring system are _____
a) accuracy and drift
b) accuracy, sensitivity and reproducibility
c) drift and dead zone
d) static error

13) A _____ device prevents the oscillation of the moving system and enables the latter to reach its final position quickly.
a) Deflecting b) Controlling
c) Damping d) any of the above

14) _____ is an instrument which measures the insulation resistance of an electric circuit relative to earth and one another.
a) Tangent galvanometer
b) Megger
c) Current transformer
d) None of the above

SLR-BD-210

Seat No.		Set	Q

S. Y. (B. Tech.) (Sem-II)(New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt any four of the following: 16

a) Define standard & explain types of standards.
b) Define the following characteristics
1) Linearity 2) Accuracy 3) Repeatability 4) Sensitivity
c) Derive the expression for unknown capacitance with phasor diagram by using Schering Bridge.
d) Write difference between Current Transformer and Potential Transformer.
e) Explain working of digital storage oscilloscope with suitable block diagram.

Q.3 Attempt any two of the following: 12

a) Illustrate and derive the torque equation for a Moving iron instrument with neat diagram.
b) Draw the equivalent circuit and phasor diagram of a CT. Derive the expressions for ratio and phase angle errors.
c) Explain digital ramp type and dual slope integrating type digital voltmeter.

Section – II

Q.4 Attempt any four of the following: 16

a) Explain the principle of working of Hall effect sensor.
b) Explain different types of temperature sensor with details.
c) Discuss Classification of sensor and explain active and passive sensor.
d) State and explain the methods of data transmission.
e) State and Explain the Modes of Heat transfer.

Q.5 Attempt any two of the following: 12

a) Stale the sensors used for Velocity and Acceleration application and explain any one of them.
b) Slate and explain the sensors used for occupancy and motion detector application.
c) Define the temperature and explain the thermal properties of material.

Seat No.	

Set R

S. Y. (B. Tech.) (Sem-II)(New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Draw neat diagrams whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. 14

1) What is signal conditioning?
a) To analyze any signal
b) Conversion or modification is referred to as conditioning
c) Conversion from analog to digital is signal conditioning
d) Conversion from digital to analog is signal conditioning

2) Touch screen devices use which sensor?
a) Touch sensor b) Temperature sensor
c) Humidity sensor d) Pressure sensor

3) ENOB in ADC stand for _____
a) Effective number of bytes b) Effective number of bits
c) Effective nibble baud d) None of the mentioned

4) A simple bridge circuit consists of a network of _____
a) 3 resistance arms b) 2 resistance arms
c) 4 resistance arms d) 6 resistance arms

5) An instrument transformer is used to extend the range of _____.
a) induction instrument b) electrostatic instrument
c) moving coil instrument d) any of the above

6) The internal resistance of an ammeter should be _____.
a) Very small b) Medium
c) High d) Infinity

7) The smallest change which a sensor can detect is termed: _____
a) Accuracy b) Precision
c) Resolution d) Scale

8) Sensor effectiveness depends on _____ parameter.
a) Sensitivity b) Radiation
c) Restively d) All the above

9) The desirable static characteristics of a measuring system are _____
a) accuracy and drift
b) accuracy, sensitivity and reproducibility
c) drift and dead zone
d) static error

10) A _____ device prevents the oscillation of the moving system and enables the latter to reach its final position quickly.
a) Deflecting b) Controlling
c) Damping d) any of the above

11) _____ is an instrument which measures the insulation resistance of an electric circuit relative to earth and one another.
a) Tangent galvanometer
b) Megger
c) Current transformer
d) None of the above

12) Which of the following is a key characteristic of a sensor?
a) It can only measure temperature
b) It is an active component
c) It converts physical parameters into an electrical signal
d) Il requires no external power

13) Which of the following is a type of magnetic sensor?
a) Thermistor b) Strain gauge
c) Hall effect sensor d) LVDT

14) Typical conversion speed of ADC is _____
a) Less than 1 μs b) Less than 100 μs
c) Less than 500 μs d) Greater than 1000 μs

Seat No.	

Set **R**

S. Y. (B. Tech.) (Sem-II)(New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt any four of the following: **16**

a) Define standard & explain types of standards.
b) Define the following characteristics
1) Linearity 2) Accuracy 3) Repeatability 4) Sensitivity
c) Derive the expression for unknown capacitance with phasor diagram by using Schering Bridge.
d) Write difference between Current Transformer and Potential Transformer.
e) Explain working of digital storage oscilloscope with suitable block diagram.

Q.3 Attempt any two of the following: **12**

a) Illustrate and derive the torque equation for a Moving iron instrument with neat diagram.
b) Draw the equivalent circuit and phasor diagram of a CT. Derive the expressions for ratio and phase angle errors.
c) Explain digital ramp type and dual slope integrating type digital voltmeter.

Section – II

Q.4 Attempt any four of the following: **16**

a) Explain the principle of working of Hall effect sensor.
b) Explain different types of temperature sensor with details.
c) Discuss Classification of sensor and explain active and passive sensor.
d) State and explain the methods of data transmission.
e) State and Explain the Modes of Heat transfer.

Q.5 Attempt any two of the following: **12**

a) Stale the sensors used for Velocity and Acceleration application and explain any one of them.
b) Slate and explain the sensors used for occupancy and motion detector application.
c) Define the temperature and explain the thermal properties of material.

Seat No.	

Set **S**

S. Y. (B. Tech.) (Sem-II)(New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Draw neat diagrams whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) A _____ device prevents the oscillation of the moving system and enables the latter to reach its final position quickly.
a) Deflecting b) Controlling
c) Damping d) any of the above

2) _____ is an instrument which measures the insulation resistance of an electric circuit relative to earth and one another.
a) Tangent galvanometer
b) Megger
c) Current transformer
d) None of the above

3) Which of the following is a key characteristic of a sensor?
a) It can only measure temperature
b) It is an active component
c) It converts physical parameters into an electrical signal
d) Il requires no external power

4) Which of the following is a type of magnetic sensor?
a) Thermistor b) Strain gauge
c) Hall effect sensor d) LVDT

5) Typical conversion speed of ADC is _____
a) Less than 1 μs b) Less than 100 μs
c) Less than 500 μs d) Greater than 1000 μs

6) What is signal conditioning?
a) To analyze any signal
b) Conversion or modification is referred to as conditioning
c) Conversion from analog to digital is signal conditioning
d) Conversion from digital to analog is signal conditioning

7) Touch screen devices use which sensor?
a) Touch sensor b) Temperature sensor
c) Humidity sensor d) Pressure sensor

8) ENOB in ADC stand for _____
a) Effective number of bytes b) Effective number of bits
c) Effective nibble baud d) None of the mentioned

9) A simple bridge circuit consists of a network of _____
a) 3 resistance arms b) 2 resistance arms
c) 4 resistance arms d) 6 resistance arms

10) An instrument transformer is used to extend the range of _____.
a) induction instrument b) electrostatic instrument
c) moving coil instrument d) any of the above

11) The internal resistance of an ammeter should be _____.
a) Very small b) Medium
c) High d) Infinity

12) The smallest change which a sensor can detect is termed: _____
a) Accuracy b) Precision
c) Resolution d) Scale

13) Sensor effectiveness depends on _____ parameter.
a) Sensitivity b) Radiation
c) Restively d) All the above

14) The desirable static characteristics of a measuring system are _____
a) accuracy and drift
b) accuracy, sensitivity and reproducibility
c) drift and dead zone
d) static error

SLR-BD-210

Seat No.		Set	S

S. Y. (B. Tech.) (Sem-II)(New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt any four of the following: 16

a) Define standard & explain types of standards.
b) Define the following characteristics
1) Linearity 2) Accuracy 3) Repeatability 4) Sensitivity
c) Derive the expression for unknown capacitance with phasor diagram by using Schering Bridge.
d) Write difference between Current Transformer and Potential Transformer.
e) Explain working of digital storage oscilloscope with suitable block diagram.

Q.3 Attempt any two of the following: 12

a) Illustrate and derive the torque equation for a Moving iron instrument with neat diagram.
b) Draw the equivalent circuit and phasor diagram of a CT. Derive the expressions for ratio and phase angle errors.
c) Explain digital ramp type and dual slope integrating type digital voltmeter.

Section – II

Q.4 Attempt any four of the following: 16

a) Explain the principle of working of Hall effect sensor.
b) Explain different types of temperature sensor with details.
c) Discuss Classification of sensor and explain active and passive sensor.
d) State and explain the methods of data transmission.
e) State and Explain the Modes of Heat transfer.

Q.5 Attempt any two of the following: 12

a) Stale the sensors used for Velocity and Acceleration application and explain any one of them.
b) Slate and explain the sensors used for occupancy and motion detector application.
c) Define the temperature and explain the thermal properties of material.

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Linear programming deals with the optimization of a function of variables is, known as _____
a) Subjective function b) Objective function
c) Combined Equation d) None of these

2) What is the condition of Balance Assignment Problem?
a) Σ Demand$=\Sigma$ Supply
b) No. of rows $>$ No. of column
c) No. of rows $<$ No. of column
d) No. of rows $=$ No. of columns

3) EOQ means: _____
a) Economic Offering Quantity b) Empty Order Quantity
c) Economic Order Quantity d) Economic Order Quality

4) In ABC analysis, high monitoring and control are required for: _____
a) A class items b) B class items
c) C class items d) All of these

5) Graphical method, simplex method, and transportation method are concerned with _____.
a) Break-even analysis b) Value analysis
c) Linear programming d) Queueing theory

6) The cost of keeping items in inventory is called _____
a) Set up cost b) Holding cost
c) Shortage cost d) None of these

7) Dual of the Dual is _____
a) Dual b) Primal
c) Zero d) Infinity

8) At the Break-Even Point _____
a) Profit > Loss
b) Profit < Loss
c) Profit = Loss
d) None of these

9) The PERT in project management means Program Evaluation and _____ Technique.
a) Resource
b) Reconciliation
c) Reconsideration
d) Review

10) _____ Stock is the lower limit of stock below which the stock should not be allowed to fall.
a) Maximum
b) Average
c) Safety
d) Standard

11) Optimization Means _____.
a) Maximization
b) Minimization
c) Minimization or Maximization
d) Mean of Minimization & Maximization

12) A feasible solution to LPP _____.
a) Must satisfy all the constraints simultaneously
b) Need not satisfy all the constraints
c) Must be a corner point of feasible region
d) Must optimize the objective function

13) In a project network, the critical path _____.
a) May be the shortest path
b) Is the longest path
c) May be the longest path
d) Is the shortest path

14) The inventory carrying costs are also called as _____.
a) Procurement costs
b) Set-up costs
c) Storage costs
d) None of the above

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt Any Three. **24**

a) Using Graphical method, Solve

Maximize $Z = 10X_1 + 8X_2$
Subject to, $2X_1 + X_2 \leq 40;$
$2X_1 + 3X_2 \leq 80;$
$0 \leq X_1; 0 \leq X_2$

b) Solve the following assignment model for minimum processing time.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Find the initial basic feasible solution by Least Cost Method.

	W1	W2	W3	W4	Supply
F1	48	60	56	58	140
F2	45	55	53	60	260
F3	50	65	60	62	360
F4	52	64	55	61	220
Demand	200	320	250	210	

d) What are the different Limitations & Applications of 'Operation Research'?

e) How do you solve unbalanced transportation problem? What are different methods to solve Transportation Model? Explain in details.

Q.3 Answer any one. **04**

a) What is LPP? What are different components of LPP?

b) How assignment model is useful in practical life?

Section – II

Q.4 Attempt Any Three. **24**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/- Find economic order quantity and number of orders to be placed per month?

b) Write a note various types inventory cost.

c) Draw network, find out CP & PD. Calculate All floats of each non-critical Activity.

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Immediate Predecessor	-	-	-	B	A	A	B	C,D	C,D	E	F,G,H	F,G,H	I	J,K
Time in Months	2	6	4	3	6	8	3	7	2	5	4	3	13	7

d) A small project consists of seven activities. The time estimates in weeks of different activities are given below. Find out probability of completing the project in 18 weeks.

Activity	Estimated Time		
	to	tm	tp
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

Probability Factor	Probability
0	50%
1	84.13%
2	97.72%
3	99.87%

e) Explain Sequencing Problem Technique. What are its Different Elements, also elaborate its assumptions.

Q.3 Attempt Any One. **04**

a) What is EOQ? What is its important?

b) Distinguish between CPM & PERT (At least 4 points)

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) At the Break-Even Point _____
a) Profit > Loss b) Profit < Loss
c) Profit = Loss d) None of these

2) The PERT in project management means Program Evaluation and _____ Technique.
a) Resource b) Reconciliation
c) Reconsideration d) Review

3) _____ Stock is the lower limit of stock below which the stock should not be allowed to fall.
a) Maximum b) Average
c) Safety d) Standard

4) Optimization Means _____.
a) Maximization
b) Minimization
c) Minimization or Maximization
d) Mean of Minimization & Maximization

5) A feasible solution to LPP _____.
a) Must satisfy all the constraints simultaneously
b) Need not satisfy all the constraints
c) Must be a corner point of feasible region
d) Must optimize the objective function

6) In a project network, the critical path _____.
a) May be the shortest path b) Is the longest path
c) May be the longest path d) Is the shortest path

7) The inventory carrying costs are also called as _____.
a) Procurement costs b) Set-up costs
c) Storage costs d) None of the above

8) Linear programming deals with the optimization of a function of variables is, known as _____
a) Subjective function b) Objective function
c) Combined Equation d) None of these

9) What is the condition of Balance Assignment Problem?
a) Σ Demand= Σ Supply
b) No. of rows > No. of column
c) No. of rows < No. of column
d) No. of rows = No. of columns

10) EOQ means: _____
a) Economic Offering Quantity b) Empty Order Quantity
c) Economic Order Quantity d) Economic Order Quality

11) In ABC analysis, high monitoring and control are required for: _____
a) A class items b) B class items
c) C class items d) All of these

12) Graphical method, simplex method, and transportation method are concerned with _____.
a) Break-even analysis b) Value analysis
c) Linear programming d) Queueing theory

13) The cost of keeping items in inventory is called _____
a) Set up cost b) Holding cost
c) Shortage cost d) None of these

14) Dual of the Dual is _____
a) Dual b) Primal
c) Zero d) Infinity

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt Any Three. **24**

a) Using Graphical method, Solve

Maximize $Z = 10X_1 + 8X_2$
Subject to, $2X_1 + X_2 \leq 40;$
$2X_1 + 3X_2 \leq 80;$
$0 \leq X_1; 0 \leq X_2$

b) Solve the following assignment model for minimum processing time.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Find the initial basic feasible solution by Least Cost Method.

	W1	W2	W3	W4	Supply
F1	48	60	56	58	140
F2	45	55	53	60	260
F3	50	65	60	62	360
F4	52	64	55	61	220
Demand	200	320	250	210	

d) What are the different Limitations & Applications of 'Operation Research'?

e) How do you solve unbalanced transportation problem? What are different methods to solve Transportation Model? Explain in details.

Q.3 Answer any one. **04**

a) What is LPP? What are different components of LPP?

b) How assignment model is useful in practical life?

Section – II

Q.4 Attempt Any Three. **24**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/- Find economic order quantity and number of orders to be placed per month?

b) Write a note various types inventory cost.

c) Draw network, find out CP & PD. Calculate All floats of each non-critical Activity.

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Immediate Predecessor	-	-	-	B	A	A	B	C,D	C,D	E	F,G,H	F,G,H	I	J,K
Time in Months	2	6	4	3	6	8	3	7	2	5	4	3	13	7

d) A small project consists of seven activities. The time estimates in weeks of different activities are given below. Find out probability of completing the project in 18 weeks.

Activity	Estimated Time		
	to	tm	tp
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

Probability Factor	Probability
0	50%
1	84.13%
2	97.72%
3	99.87%

e) Explain Sequencing Problem Technique. What are its Different Elements, also elaborate its assumptions.

Q.3 Attempt Any One. **04**

a) What is EOQ? What is its important?

b) Distinguish between CPM & PERT (At least 4 points)

Seat No.	

Set R

S. Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Optimization Means _____.
a) Maximization
b) Minimization
c) Minimization or Maximization
d) Mean of Minimization & Maximization

2) A feasible solution to LPP _____.
a) Must satisfy all the constraints simultaneously
b) Need not satisfy all the constraints
c) Must be a corner point of feasible region
d) Must optimize the objective function

3) In a project network, the critical path _____.
a) May be the shortest path b) Is the longest path
c) May be the longest path d) Is the shortest path

4) The inventory carrying costs are also called as _____.
a) Procurement costs b) Set-up costs
c) Storage costs d) None of the above

5) Linear programming deals with the optimization of a function of variables is, known as _____
a) Subjective function b) Objective function
c) Combined Equation d) None of these

6) What is the condition of Balance Assignment Problem?
a) Σ Demand$=\Sigma$ Supply
b) No. of rows $>$ No. of column
c) No. of rows $<$ No. of column
d) No. of rows $=$ No. of columns

7) EOQ means: _____

a) Economic Offering Quantity b) Empty Order Quantity
c) Economic Order Quantity d) Economic Order Quality

8) In ABC analysis, high monitoring and control are required for: _____

a) A class items b) B class items
c) C class items d) All of these

9) Graphical method, simplex method, and transportation method are concerned with _____.

a) Break-even analysis b) Value analysis
c) Linear programming d) Queueing theory

10) The cost of keeping items in inventory is called _____

a) Set up cost b) Holding cost
c) Shortage cost d) None of these

11) Dual of the Dual is _____

a) Dual b) Primal
c) Zero d) Infinity

12) At the Break-Even Point _____

a) Profit > Loss b) Profit < Loss
c) Profit = Loss d) None of these

13) The PERT in project management means Program Evaluation and _____ Technique.

a) Resource b) Reconciliation
c) Reconsideration d) Review

14) _____ Stock is the lower limit of stock below which the stock should not be allowed to fall.

a) Maximum b) Average
c) Safety d) Standard

Seat No.	

Set R

S. Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt Any Three. **24**

a) Using Graphical method, Solve

Maximize $Z = 10X_1 + 8X_2$
Subject to, $2X_1 + X_2 \leq 40;$
$2X_1 + 3X_2 \leq 80;$
$0 \leq X_1; 0 \leq X_2$

b) Solve the following assignment model for minimum processing time.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Find the initial basic feasible solution by Least Cost Method.

	W1	W2	W3	W4	Supply
F1	48	60	56	58	140
F2	45	55	53	60	260
F3	50	65	60	62	360
F4	52	64	55	61	220
Demand	200	320	250	210	

d) What are the different Limitations & Applications of 'Operation Research'?

e) How do you solve unbalanced transportation problem? What are different methods to solve Transportation Model? Explain in details.

Q.3 Answer any one. **04**

a) What is LPP? What are different components of LPP?

b) How assignment model is useful in practical life?

Section – II

Q.4 Attempt Any Three. **24**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/- Find economic order quantity and number of orders to be placed per month?

b) Write a note various types inventory cost.

c) Draw network, find out CP & PD. Calculate All floats of each non-critical Activity.

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Immediate Predecessor	-	-	-	B	A	A	B	C,D	C,D	E	F,G,H	F,G,H	I	J,K
Time in Months	2	6	4	3	6	8	3	7	2	5	4	3	13	7

d) A small project consists of seven activities. The time estimates in weeks of different activities are given below. Find out probability of completing the project in 18 weeks.

Activity	Estimated Time		
	to	tm	tp
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

Probability Factor	Probability
0	50%
1	84.13%
2	97.72%
3	99.87%

e) Explain Sequencing Problem Technique. What are its Different Elements, also elaborate its assumptions.

Q.3 Attempt Any One. **04**

a) What is EOQ? What is its important?

b) Distinguish between CPM & PERT (At least 4 points)

Seat No.		Set	S

S. Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) The cost of keeping items in inventory is called _____
a) Set up cost b) Holding cost
c) Shortage cost d) None of these

2) Dual of the Dual is _____
a) Dual b) Primal
c) Zero d) Infinity

3) At the Break-Even Point _____
a) Profit > Loss b) Profit < Loss
c) Profit = Loss d) None of these

4) The PERT in project management means Program Evaluation and _____ Technique.
a) Resource b) Reconciliation
c) Reconsideration d) Review

5) _____ Stock is the lower limit of stock below which the stock should not be allowed to fall.
a) Maximum b) Average
c) Safety d) Standard

6) Optimization Means _____.
a) Maximization
b) Minimization
c) Minimization or Maximization
d) Mean of Minimization & Maximization

7) A feasible solution to LPP _____.
a) Must satisfy all the constraints simultaneously
b) Need not satisfy all the constraints
c) Must be a corner point of feasible region
d) Must optimize the objective function

8) In a project network, the critical path _____.
a) May be the shortest path b) Is the longest path
c) May be the longest path d) Is the shortest path

9) The inventory carrying costs are also called as _____.
a) Procurement costs b) Set-up costs
c) Storage costs d) None of the above

10) Linear programming deals with the optimization of a function of variables is, known as _____
a) Subjective function b) Objective function
c) Combined Equation d) None of these

11) What is the condition of Balance Assignment Problem?
a) Σ Demand= Σ Supply
b) No. of rows > No. of column
c) No. of rows < No. of column
d) No. of rows = No. of columns

12) EOQ means: _____
a) Economic Offering Quantity b) Empty Order Quantity
c) Economic Order Quantity d) Economic Order Quality

13) In ABC analysis, high monitoring and control are required for: _____
a) A class items b) B class items
c) C class items d) All of these

14) Graphical method, simplex method, and transportation method are concerned with _____.
a) Break-even analysis b) Value analysis
c) Linear programming d) Queueing theory

Seat No.	

Set S

S. Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt Any Three. **24**

a) Using Graphical method, Solve

Maximize $Z = 10X_1 + 8X_2$
Subject to, $2X_1 + X_2 \leq 40;$
$2X_1 + 3X_2 \leq 80;$
$0 \leq X_1; 0 \leq X_2$

b) Solve the following assignment model for minimum processing time.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Find the initial basic feasible solution by Least Cost Method.

	W1	W2	W3	W4	Supply
F1	48	60	56	58	140
F2	45	55	53	60	260
F3	50	65	60	62	360
F4	52	64	55	61	220
Demand	200	320	250	210	

d) What are the different Limitations & Applications of 'Operation Research'?

e) How do you solve unbalanced transportation problem? What are different methods to solve Transportation Model? Explain in details.

Q.3 Answer any one. **04**

a) What is LPP? What are different components of LPP?

b) How assignment model is useful in practical life?

Section – II

Q.4 Attempt Any Three. **24**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/- Find economic order quantity and number of orders to be placed per month?

b) Write a note various types inventory cost.

c) Draw network, find out CP & PD. Calculate All floats of each non-critical Activity.

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Immediate Predecessor	-	-	-	B	A	A	B	C,D	C,D	E	F,G,H	F,G,H	I	J,K
Time in Months	2	6	4	3	6	8	3	7	2	5	4	3	13	7

d) A small project consists of seven activities. The time estimates in weeks of different activities are given below. Find out probability of completing the project in 18 weeks.

Activity	Estimated Time		
	to	tm	tp
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

Probability Factor	Probability
0	50%
1	84.13%
2	97.72%
3	99.87%

e) Explain Sequencing Problem Technique. What are its Different Elements, also elaborate its assumptions.

Q.3 Attempt Any One. **04**

a) What is EOQ? What is its important?

b) Distinguish between CPM & PERT (At least 4 points)

SLR-BD-212

Seat No.	

Set P

S.Y. (B.Tech.)(Sem-II)(New)(NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) A transcendental equation is an equation that involves _____.
a) Only algebraic terms
b) Only transcendental functions
c) Both algebraic and transcendental functions
d) Linear terms only

2) The interval in which a real root of the equation $x^3 - 2x - 5 = 0$ lies is _____.
a) $(1,2)$ b) $(0,1)$
c) $(2,3)$ d) $(3,4)$

3) The Gauss-Seidel method is used for solving _____.
a) Nonlinear equations
b) Systems of linear equations
c) Ordinary differential equations
d) Partial differential equations

4) Which of the following is a disadvantage of the Gauss-Jacobi method?
a) It converges faster than most direct methods
b) It requires a large number of iterations for a good approximation
c) It cannot be used for systems with more than two equations
d) It works only for symmetric systems

5) The use of Romberg's method is _____.
a) To solve simultaneous linear equation
b) To find root of linear equation
c) To evaluate definite integration
d) To find the Eigen values

6) The order of convergence of Newton-Raphson method is _____.

a) 1 b) 2

c) $\sqrt{2}$ d) 1.6

7) Power Method is used to find _____.

a) Negative Eigen Value b) Largest Eigen value

c) Positive Eigen Value d) None of these

8) To find the Numerically largest Eigen value using iterative Method we use the equation _____.

a) $A = \lambda X$ b) $AX = X$

c) $X = \lambda X$ d) $AX = \lambda X$

9) If $\frac{dy}{dx} = x - y$ and $y(0) = 1$ then by Picard's method the value of $y_1(1)$ is _____.

a) 0.905 b) 1.905

c) 2.905 d) none

10) Runge-Kutta method is self-starting method _____.

a) true d) false

c) we can't say d) none

11) If the data is equally spaced and interpolation is near the beginning of the data then _____ Interpolation formula is used.

a) Newton's backward difference

b) Newton's divided difference

c) Newton's forward difference

d) Lagrange's

12) The process of finding the value inside the interval (x_0, x_n) is called ___.

a) Interpolation b) Extrapolation

c) Iterative d) polynomial equation

13) Using Newton-Raphson method the first approximation to the root of the equation $x^4 - x - 10 = 0$ near to $x_0 = 2$ is _____.

a) 1.671 b) 2.271

c) 2.071 d) 1.871

14) To apply Simpson's one-third rule the number of sub-intervals must be _____.

a) Even b) Odd

c) Multiple of 3 d) Multiple of 6

Seat No.	

Set **P**

S.Y. (B.Tech.)(Sem-II)(New)(NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any three. **09**

a) Find the double root of the equation $x^3 - 5.4x^2 + 9.24x - 5.096 = 0$ given that it is nearer to 1.5.

b) Solve the system of equations by Jacobi's iterative method (perform 3 iterations) $27x + 6y - z = 85,\ 6x + 15y + 2z = 72,\ x + y + 54z = 110$

c) Find positive real root of the equation $x \sin x + \cos x = 0$ using Newton Raphson method correct to 3 decimal places.

d) Solve the system of equation by using Gauss-Elimination method. $x + 4y - z = -5, x + y - 6z = -12, -3x - y - z = 4$

e) Solve $\frac{dy}{dx} = -xy$ with $x_0 = 0\ ,\ y_0 = 1$ using Picard's method upto 3rd approximation.

Q.3 Answer any three. **09**

a) Solve $\frac{dy}{dx} = x + y$ with $x_0 = 0\ , y_0 = 1$ using Range kutta forth order method and find approximate value of y when $x = 0.2$

b) Solve $\frac{dy}{dx} = 1 + xy$ with $y(0) = 1$ using Picard's method take first approximation and find y for $x = 0.1$

c) Solve by Gauss Seidel Method, the equations $20x + y - 2z = 17, 3x + 20y - z = -18, 2x - 3y + 20z = 25$ Perform 3 iteration.

d) Find the value of $\sqrt{5}$ using newton's iterative formula. Perform 3 iteration.

e) Find the positive root of $f(x) = 2x^3 - 3x - 6$ by Newton's Raphson method perform 3 iteration.

Q.4 Answer any two. **10**

a) Perform 2-iteration by Newton's Raphson Method to Solve the non-linear equation $x = x^2 + y^2,\ y = x^2 - y^2$ Take initial approximation $x_0 = 0.8, y_0 = 0.4$

b) Solve the system of equation by LU decomposition Method $3x + 2y + 7z = 4,\quad 2x + 3y + z = 5,\quad 3x + 4y + z = 7$

c) Solve differential equation $\frac{dy}{dx} = 1 + xz,\ \frac{dz}{dx} = -xy$ for $x = 0.3$ using 4th order Runge-Kutta Method Initial Values are $x = 0,\ y = 0,\ z = 1$

Section – II

Q.5 Answer any Three. **09**

a) Evaluate the integral $\int_0^1 \frac{x^2}{1+x^3}\,dx$ using Simpson's $\frac{1}{3}$rd rule, Take $h = 0.25$

b) Determine the largest Eigen value and corresponding Eigen vector of the matrix $\begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$ by using power method perform three iteration.

c) Use Trapezoidal Rule to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as 0.5

d) Using Newton's divided difference formula, find the value of $f(2)$. Given the following table.

x	4	5	7	10	11	13
$f(x)$	48	100	294	900	1210	2028

e) Construct Newton's Forward interpolation polynomial for the following data:

x	4	6	8	10
y	1	3	8	16

Hence find the value of y for $x = 5$

Q.6 Answer any Three. **09**

a) Solve the integral $\int_0^{1/2} \frac{1}{\sqrt{1-x^2}}\,dx$ using Weddle's rule Taking $n = 6$

b) Solve $\int_3^5 \frac{4}{(2x^2)}\,dx$ Using Gauss Formula for $n = 2$ and $n = 3$.

c) Find all Eigen values and Eigen vectors of the following matrix by using Gauss Jacobi's Method. $\begin{bmatrix} 2 & 3 \\ 3 & 2 \end{bmatrix}$

d) Solve $\int_0^6 \frac{dx}{1+x^2}$ by using Simpsons 3/8th rule take $h = 1$

e) Using Newton's Backward formula, find the value of $f(2)$ if

x	1	1.4	1.8	2.2
$f(x)$	3.49	4.82	5.96	6.5

Q.7 Answer any two. **10**

a) Find the largest eigen value and the corresponding eigen vector of the matrix:

$\begin{bmatrix} 25 & 1 & 2 \\ 1 & 3 & 0 \\ 2 & 0 & -4 \end{bmatrix}$ by using power method

Take $[1 \quad 0 \quad 0]^r$ as initial eigen vector (perform 5 iterations)

b) Use Romberg's method to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as $0.5, 0.25, 0.125$

c) Given the Values

x	5	7	11	13	17
$f(x)$	150	392	1452	2366	5202

Evaluate $f(9)$,using Lagrange's Formula.

Seat No.	

Set **Q**

S.Y. (B.Tech.)(Sem-II)(New)(NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) To find the Numerically largest Eigen value using iterative Method we use the equation _____.
a) $A = \lambda X$ b) $AX = X$
c) $X = \lambda X$ d) $AX = \lambda X$

2) If $\frac{dy}{dx} = x - y$ and $y(0) = 1$ then by Picard's method the value of $y_1(1)$ is _____.
a) 0.905 b) 1.905
c) 2.905 d) none

3) Runge-Kutta method is self-starting method _____.
a) true d) false
c) we can't say d) none

4) If the data is equally spaced and interpolation is near the beginning of the data then _____ Interpolation formula is used.
a) Newton's backward difference
b) Newton's divided difference
c) Newton's forward difference
d) Lagrange's

5) The process of finding the value inside the interval (x_0, x_n) is called ___.
a) Interpolation b) Extrapolation
c) Iterative d) polynomial equation

6) Using Newton-Raphson method the first approximation to the root of the equation $x^4 - x - 10 = 0$ near to $x_0 = 2$ is _____.
a) 1.671 b) 2.271
c) 2.071 d) 1.871

7) To apply Simpson's one-third rule the number of sub-intervals must be _____.
a) Even b) Odd
c) Multiple of 3 d) Multiple of 6

8) A transcendental equation is an equation that involves _____.
a) Only algebraic terms
b) Only transcendental functions
c) Both algebraic and transcendental functions
d) Linear terms only

9) The interval in which a real root of the equation $x^3 - 2x - 5 = 0$ lies is _____.
a) $(1,2)$ b) $(0,1)$
c) $(2,3)$ d) $(3,4)$

10) The Gauss-Seidel method is used for solving _____.
a) Nonlinear equations
b) Systems of linear equations
c) Ordinary differential equations
d) Partial differential equations

11) Which of the following is a disadvantage of the Gauss-Jacobi method?
a) It converges faster than most direct methods
b) It requires a large number of iterations for a good approximation
c) It cannot be used for systems with more than two equations
d) It works only for symmetric systems

12) The use of Romberg's method is _____.
a) To solve simultaneous linear equation
b) To find root of linear equation
c) To evaluate definite integration
d) To find the Eigen values

13) The order of convergence of Newton-Raphson method is _____.
a) 1 b) 2
c) $\sqrt{2}$ d) 1.6

14) Power Method is used to find _____.
a) Negative Eigen Value b) Largest Eigen value
c) Positive Eigen Value d) None of these

Seat No.	

Set | Q

S.Y. (B.Tech.)(Sem-II)(New)(NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any three. **09**

a) Find the double root of the equation $x^3 - 5.4x^2 + 9.24x - 5.096 = 0$ given that it is nearer to 1.5.

b) Solve the system of equations by Jacobi's iterative method (perform 3 iterations) $27x + 6y - z = 85,\ 6x + 15y + 2z = 72,\ x + y + 54z = 110$

c) Find positive real root of the equation $x \sin x + \cos x = 0$ using Newton Raphson method correct to 3 decimal places.

d) Solve the system of equation by using Gauss-Elimination method. $x + 4y - z = -5, x + y - 6z = -12, -3x - y - z = 4$

e) Solve $\frac{dy}{dx} = -xy$ with $x_0 = 0\ ,\ y_0 = 1$ using Picard's method upto 3rd approximation.

Q.3 Answer any three. **09**

a) Solve $\frac{dy}{dx} = x + y$ with $x_0 = 0\ , y_0 = 1$ using Range kutta forth order method and find approximate value of y when $x = 0.2$

b) Solve $\frac{dy}{dx} = 1 + xy$ with $y(0) = 1$ using Picard's method take first approximation and find y for $x = 0.1$

c) Solve by Gauss Seidel Method, the equations $20x + y - 2z = 17, 3x + 20y - z = -18, 2x - 3y + 20z = 25$ Perform 3 iteration.

d) Find the value of $\sqrt{5}$ using newton's iterative formula. Perform 3 iteration.

e) Find the positive root of $f(x) = 2x^3 - 3x - 6$ by Newton's Raphson method perform 3 iteration.

Q.4 Answer any two. **10**

a) Perform 2-iteration by Newton's Raphson Method to Solve the non-linear equation $x = x^2 + y^2,\ y = x^2 - y^2$ Take initial approximation $x_0 = 0.8, y_0 = 0.4$

b) Solve the system of equation by LU decomposition Method $3x + 2y + 7z = 4,\quad 2x + 3y + z = 5,\quad 3x + 4y + z = 7$

c) Solve differential equation $\frac{dy}{dx} = 1 + xz,\ \frac{dz}{dx} = -xy$ for $x = 0.3$ using 4th order Runge-Kutta Method Initial Values are $x = 0,\ y = 0,\ z = 1$

Section – II

Q.5 Answer any Three. **09**

a) Evaluate the integral $\int_0^1 \frac{x^2}{1+x^3}\,dx$ using Simpson's $\frac{1}{3}$rd rule, Take $h = 0.25$

b) Determine the largest Eigen value and corresponding Eigen vector of the matrix $\begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$ by using power method perform three iteration.

c) Use Trapezoidal Rule to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as 0.5

d) Using Newton's divided difference formula, find the value of $f(2)$. Given the following table.

x	4	5	7	10	11	13
$f(x)$	48	100	294	900	1210	2028

e) Construct Newton's Forward interpolation polynomial for the following data:

x	4	6	8	10
y	1	3	8	16

Hence find the value of y for $x = 5$

Q.6 Answer any Three. **09**

a) Solve the integral $\int_0^{1/2} \frac{1}{\sqrt{1-x^2}}\,dx$ using Weddle's rule Taking $n = 6$

b) Solve $\int_3^5 \frac{4}{(2x^2)}\,dx$ Using Gauss Formula for $n = 2$ and $n = 3$.

c) Find all Eigen values and Eigen vectors of the following matrix by using Gauss Jacobi's Method. $\begin{bmatrix} 2 & 3 \\ 3 & 2 \end{bmatrix}$

d) Solve $\int_0^6 \frac{dx}{1+x^2}$ by using Simpsons 3/8th rule take $h = 1$

e) Using Newton's Backward formula, find the value of $f(2)$ if

x	1	1.4	1.8	2.2
$f(x)$	3.49	4.82	5.96	6.5

Q.7 Answer any two. **10**

a) Find the largest eigen value and the corresponding eigen vector of the matrix:

$\begin{bmatrix} 25 & 1 & 2 \\ 1 & 3 & 0 \\ 2 & 0 & -4 \end{bmatrix}$ by using power method

Take $[1 \quad 0 \quad 0]^r$ as initial eigen vector (perform 5 iterations)

b) Use Romberg's method to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as $0.5, 0.25, 0.125$

c) Given the Values

x	5	7	11	13	17
$f(x)$	150	392	1452	2366	5202

Evaluate $f(9)$,using Lagrange's Formula.

Seat No.	

Set R

S.Y. (B.Tech.)(Sem-II)(New)(NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) If the data is equally spaced and interpolation is near the beginning of the data then _____ Interpolation formula is used.
a) Newton's backward difference
b) Newton's divided difference
c) Newton's forward difference
d) Lagrange's

2) The process of finding the value inside the interval (x_0, x_n) is called ___.
a) Interpolation b) Extrapolation
c) Iterative d) polynomial equation

3) Using Newton-Raphson method the first approximation to the root of the equation $x^4 - x - 10 = 0$ near to $x_0 = 2$ is _____.
a) 1.671 b) 2.271
c) 2.071 d) 1.871

4) To apply Simpson's one-third rule the number of sub-intervals must be _____.
a) Even b) Odd
c) Multiple of 3 d) Multiple of 6

5) A transcendental equation is an equation that involves _____.
a) Only algebraic terms
b) Only transcendental functions
c) Both algebraic and transcendental functions
d) Linear terms only

6) The interval in which a real root of the equation $x^3 - 2x - 5 = 0$ lies is _____.

a) $(1,2)$ b) $(0,1)$
c) $(2,3)$ d) $(3,4)$

7) The Gauss-Seidel method is used for solving _____.

a) Nonlinear equations
b) Systems of linear equations
c) Ordinary differential equations
d) Partial differential equations

8) Which of the following is a disadvantage of the Gauss-Jacobi method?

a) It converges faster than most direct methods
b) It requires a large number of iterations for a good approximation
c) It cannot be used for systems with more than two equations
d) It works only for symmetric systems

9) The use of Romberg's method is _____.

a) To solve simultaneous linear equation
b) To find root of linear equation
c) To evaluate definite integration
d) To find the Eigen values

10) The order of convergence of Newton-Raphson method is _____.

a) 1 b) 2
c) $\sqrt{2}$ d) 1.6

11) Power Method is used to find _____.

a) Negative Eigen Value b) Largest Eigen value
c) Positive Eigen Value d) None of these

12) To find the Numerically largest Eigen value using iterative Method we use the equation _____.

a) $A = \lambda X$ b) $AX = X$
c) $X = \lambda X$ d) $AX = \lambda X$

13) If $\frac{dy}{dx} = x - y$ and $y(0) = 1$ then by Picard's method the value of $y_1(1)$ is _____.

a) 0.905 b) 1.905
c) 2.905 d) none

14) Runge-Kutta method is self-starting method _____.

a) true d) false
c) we can't say d) none

Seat No.	

Set **R**

S.Y. (B.Tech.)(Sem-II)(New)(NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any three. **09**

a) Find the double root of the equation $x^3 - 5.4x^2 + 9.24x - 5.096 = 0$ given that it is nearer to 1.5.

b) Solve the system of equations by Jacobi's iterative method (perform 3 iterations) $27x + 6y - z = 85,\ 6x + 15y + 2z = 72,\ x + y + 54z = 110$

c) Find positive real root of the equation $x \sin x + \cos x = 0$ using Newton Raphson method correct to 3 decimal places.

d) Solve the system of equation by using Gauss-Elimination method. $x + 4y - z = -5, x + y - 6z = -12, -3x - y - z = 4$

e) Solve $\frac{dy}{dx} = -xy$ with $x_0 = 0\ ,\ y_0 = 1$ using Picard's method upto 3rd approximation.

Q.3 Answer any three. **09**

a) Solve $\frac{dy}{dx} = x + y$ with $x_0 = 0\ , y_0 = 1$ using Range kutta forth order method and find approximate value of y when $x = 0.2$

b) Solve $\frac{dy}{dx} = 1 + xy$ with $y(0) = 1$ using Picard's method take first approximation and find y for $x = 0.1$

c) Solve by Gauss Seidel Method, the equations $20x + y - 2z = 17, 3x + 20y - z = -18, 2x - 3y + 20z = 25$ Perform 3 iteration.

d) Find the value of $\sqrt{5}$ using newton's iterative formula. Perform 3 iteration.

e) Find the positive root of $f(x) = 2x^3 - 3x - 6$ by Newton's Raphson method perform 3 iteration.

Q.4 Answer any two. **10**

a) Perform 2-iteration by Newton's Raphson Method to Solve the non-linear equation $x = x^2 + y^2,\ y = x^2 - y^2$ Take initial approximation $x_0 = 0.8, y_0 = 0.4$

b) Solve the system of equation by LU decomposition Method $3x + 2y + 7z = 4,\quad 2x + 3y + z = 5,\quad 3x + 4y + z = 7$

c) Solve differential equation $\frac{dy}{dx} = 1 + xz,\ \frac{dz}{dx} = -xy$ for $x = 0.3$ using 4th order Runge-Kutta Method Initial Values are $x = 0,\ y = 0,\ z = 1$

Section – II

Q.5 Answer any Three. **09**

a) Evaluate the integral $\int_0^1 \frac{x^2}{1+x^3}\,dx$ using Simpson's $\frac{1}{3}$rd rule, Take $h = 0.25$

b) Determine the largest Eigen value and corresponding Eigen vector of the matrix $\begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$ by using power method perform three iteration.

c) Use Trapezoidal Rule to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as 0.5

d) Using Newton's divided difference formula, find the value of $f(2)$. Given the following table.

x	4	5	7	10	11	13
$f(x)$	48	100	294	900	1210	2028

e) Construct Newton's Forward interpolation polynomial for the following data:

x	4	6	8	10
y	1	3	8	16

Hence find the value of y for $x = 5$

Q.6 Answer any Three. **09**

a) Solve the integral $\int_0^{1/2} \frac{1}{\sqrt{1-x^2}}\,dx$ using Weddle's rule Taking $n = 6$

b) Solve $\int_3^5 \frac{4}{(2x^2)}\,dx$ Using Gauss Formula for $n = 2$ and $n = 3$.

c) Find all Eigen values and Eigen vectors of the following matrix by using Gauss Jacobi's Method. $\begin{bmatrix} 2 & 3 \\ 3 & 2 \end{bmatrix}$

d) Solve $\int_0^6 \frac{dx}{1+x^2}$ by using Simpsons 3/8th rule take $h = 1$

e) Using Newton's Backward formula, find the value of $f(2)$ if

x	1	1.4	1.8	2.2
$f(x)$	3.49	4.82	5.96	6.5

Q.7 Answer any two. **10**

a) Find the largest eigen value and the corresponding eigen vector of the matrix:

$\begin{bmatrix} 25 & 1 & 2 \\ 1 & 3 & 0 \\ 2 & 0 & -4 \end{bmatrix}$ by using power method

Take $[1 \quad 0 \quad 0]^r$ as initial eigen vector (perform 5 iterations)

b) Use Romberg's method to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as $0.5, 0.25, 0.125$

c) Given the Values

x	5	7	11	13	17
$f(x)$	150	392	1452	2366	5202

Evaluate $f(9)$,using Lagrange's Formula.

Seat No.	

Set **S**

S.Y. (B.Tech.)(Sem-II)(New)(NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The order of convergence of Newton-Raphson method is _____.
a) 1 b) 2
c) $\sqrt{2}$ d) 1.6

2) Power Method is used to find _____.
a) Negative Eigen Value b) Largest Eigen value
c) Positive Eigen Value d) None of these

3) To find the Numerically largest Eigen value using iterative Method we use the equation _____.
a) $A = \lambda X$ b) $AX = X$
c) $X = \lambda X$ d) $AX = \lambda X$

4) If $\frac{dy}{dx} = x - y$ and $y(0) = 1$ then by Picard's method the value of $y_1(1)$ is _____.
a) 0.905 b) 1.905
c) 2.905 d) none

5) Runge-Kutta method is self-starting method _____.
a) true d) false
c) we can't say d) none

6) If the data is equally spaced and interpolation is near the beginning of the data then _____ Interpolation formula is used.
a) Newton's backward difference
b) Newton's divided difference
c) Newton's forward difference
d) Lagrange's

7) The process of finding the value inside the interval (x_0, x_n) is called ___.
a) Interpolation b) Extrapolation
c) Iterative d) polynomial equation

8) Using Newton-Raphson method the first approximation to the root of the equation $x^4 - x - 10 = 0$ near to $x_0 = 2$ is _____.
a) 1.671 b) 2.271
c) 2.071 d) 1.871

9) To apply Simpson's one-third rule the number of sub-intervals must be _____.
a) Even b) Odd
c) Multiple of 3 d) Multiple of 6

10) A transcendental equation is an equation that involves _____.
a) Only algebraic terms
b) Only transcendental functions
c) Both algebraic and transcendental functions
d) Linear terms only

11) The interval in which a real root of the equation $x^3 - 2x - 5 = 0$ lies is _____.
a) $(1,2)$ b) $(0,1)$
c) $(2,3)$ d) $(3,4)$

12) The Gauss-Seidel method is used for solving _____.
a) Nonlinear equations
b) Systems of linear equations
c) Ordinary differential equations
d) Partial differential equations

13) Which of the following is a disadvantage of the Gauss-Jacobi method?
a) It converges faster than most direct methods
b) It requires a large number of iterations for a good approximation
c) It cannot be used for systems with more than two equations
d) It works only for symmetric systems

14) The use of Romberg's method is _____.
a) To solve simultaneous linear equation
b) To find root of linear equation
c) To evaluate definite integration
d) To find the Eigen values

Seat No.		Set	S

S.Y. (B.Tech.)(Sem-II)(New)(NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any three. **09**

a) Find the double root of the equation $x^3 - 5.4x^2 + 9.24x - 5.096 = 0$ given that it is nearer to 1.5.

b) Solve the system of equations by Jacobi's iterative method (perform 3 iterations) $27x + 6y - z = 85,\ 6x + 15y + 2z = 72,\ x + y + 54z = 110$

c) Find positive real root of the equation $x \sin x + \cos x = 0$ using Newton Raphson method correct to 3 decimal places.

d) Solve the system of equation by using Gauss-Elimination method. $x + 4y - z = -5, x + y - 6z = -12, -3x - y - z = 4$

e) Solve $\frac{dy}{dx} = -xy$ with $x_0 = 0\ ,\ y_0 = 1$ using Picard's method upto 3rd approximation.

Q.3 Answer any three. **09**

a) Solve $\frac{dy}{dx} = x + y$ with $x_0 = 0\ , y_0 = 1$ using Range kutta forth order method and find approximate value of y when $x = 0.2$

b) Solve $\frac{dy}{dx} = 1 + xy$ with $y(0) = 1$ using Picard's method take first approximation and find y for $x = 0.1$

c) Solve by Gauss Seidel Method, the equations $20x + y - 2z = 17, 3x + 20y - z = -18, 2x - 3y + 20z = 25$ Perform 3 iteration.

d) Find the value of $\sqrt{5}$ using newton's iterative formula. Perform 3 iteration.

e) Find the positive root of $f(x) = 2x^3 - 3x - 6$ by Newton's Raphson method perform 3 iteration.

Q.4 Answer any two. **10**

a) Perform 2-iteration by Newton's Raphson Method to Solve the non-linear equation $x = x^2 + y^2,\ y = x^2 - y^2$ Take initial approximation $x_0 = 0.8, y_0 = 0.4$

b) Solve the system of equation by LU decomposition Method $3x + 2y + 7z = 4,\quad 2x + 3y + z = 5,\quad 3x + 4y + z = 7$

c) Solve differential equation $\frac{dy}{dx} = 1 + xz,\ \frac{dz}{dx} = -xy$ for $x = 0.3$ using 4th order Runge-Kutta Method Initial Values are $x = 0,\ y = 0,\ z = 1$

Section – II

Q.5 Answer any Three. **09**

a) Evaluate the integral $\int_0^1 \frac{x^2}{1+x^3}\,dx$ using Simpson's $\frac{1}{3}$rd rule, Take $h = 0.25$

b) Determine the largest Eigen value and corresponding Eigen vector of the matrix $\begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$ by using power method perform three iteration.

c) Use Trapezoidal Rule to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as 0.5

d) Using Newton's divided difference formula, find the value of $f(2)$. Given the following table.

x	4	5	7	10	11	13
$f(x)$	48	100	294	900	1210	2028

e) Construct Newton's Forward interpolation polynomial for the following data:

x	4	6	8	10
y	1	3	8	16

Hence find the value of y for $x = 5$

Q.6 Answer any Three. **09**

a) Solve the integral $\int_0^{1/2} \frac{1}{\sqrt{1-x^2}}\,dx$ using Weddle's rule Taking $n = 6$

b) Solve $\int_3^5 \frac{4}{(2x^2)}\,dx$ Using Gauss Formula for $n = 2$ and $n = 3$.

c) Find all Eigen values and Eigen vectors of the following matrix by using Gauss Jacobi's Method. $\begin{bmatrix} 2 & 3 \\ 3 & 2 \end{bmatrix}$

d) Solve $\int_0^6 \frac{dx}{1+x^2}$ by using Simpsons 3/8th rule take $h = 1$

e) Using Newton's Backward formula, find the value of $f(2)$ if

x	1	1.4	1.8	2.2
$f(x)$	3.49	4.82	5.96	6.5

Q.7 Answer any two. **10**

a) Find the largest eigen value and the corresponding eigen vector of the matrix:

$\begin{bmatrix} 25 & 1 & 2 \\ 1 & 3 & 0 \\ 2 & 0 & -4 \end{bmatrix}$ by using power method

Take $[1 \quad 0 \quad 0]^r$ as initial eigen vector (perform 5 iterations)

b) Use Romberg's method to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as $0.5, 0.25, 0.125$

c) Given the Values

x	5	7	11	13	17
$f(x)$	150	392	1452	2366	5202

Evaluate $f(9)$,using Lagrange's Formula.

SLR-BD-213

Seat No.		Set	P

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) In communication, _____ is the person who receives and decodes the message.
a) Sender b) Receiver
c) Driver d) Cleaner

2) Which among the following is not a manmade channel of communication?
a) Telephone b) Cell phone
c) Fax d) Air

3) Communication is the part of _____ skills.
a) Rough b) Soft
c) Hard d) Short

4) Which among the following are the barriers to communication?
a) Physical b) Mechanical
c) Psychological d) All of above

5) To overcome language barrier, which of the ways should not be followed?
a) Easy and understandable words should be used.
b) Jokes should be told to the audience.
c) The language of audience should be used.
d) Non-verbal ways should be used to the extent possible.

6) Which of the following is not among 7Cs?
a) Conciseness b) Completeness
c) Clarity d) Charity

7) Posters fall under _____ communication.
a) oral b) visual
c) written d) spoken

8) On the _____ it is possible to get immediate feedback.
a) letter b) e-mail
c) fax d) telephone

9) The response to a sender's message is called as _____.
a) Reply b) Feedback
c) Answer d) None of the above

10) _____ is the soul of communication.
a) Sender b) Receiver
c) Message d) Feedback

11) Which of these is not an element of non-verbal communication?
a) Personal appearance b) Posture
c) Eye contact d) Name of the speaker

12) Telephonic conversation is a form of: _____
a) verbal communication b) non-verbal communication
c) visual communication d) Written

13) To give a good presentation, full rehearsal is: _____
a) Optional b) Necessary
c) Useless d) Audience based

14) Which of the following is not an advantage of oral presentation?
a) Flexibility b) Scope for body language
c) Expensive d) Time-saving

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Three. **12**

a) Explain how communication is necessary for business.
b) What is feedback? Explain its necessity in communication.
c) Write short note on: Different channels of communication.
d) Explain language barriers to communication with the ways to overcome them.
e) Explain language as a tool of communication.

Q.3 Attempt Any Four. **16**

a) Explain seven C's of effective communication.
b) Explain various types of barriers to communication and the ways to overcome them.
c) What is oral communication? Explain its advantages.
d) Explain various steps in the process of communication.
e) What is written communication? Explain its benefits.

Section – II

Q.4 Attempt Any Three. **12**

a) Explain the difference between formal and informal communication.
b) Explain vertical communication with its types.
c) Explain farewell speech by the departing person, with an example
d) Explain the speech for vote of thanks, with an example.
e) Write short note on: Non- verbal aspects of presentation.

Q.5 Attempt Any Four. **16**

a) Explain the structure of a business letter with its various components.
b) Explain the steps in the process of presentation.
c) You had purchased some furniture items from a vendor. Afterwards you found that the furniture items are in a damaged condition. Write a letter of complaint and ask for replacement.
d) Explain four P's of effective presentations.
e) You are in need of some computer hardware parts. Prepare a letter placing order to the supplier. Specify the terms and conditions of purchase.

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) On the _____ it is possible to get immediate feedback.
a) letter b) e-mail
c) fax d) telephone

2) The response to a sender's message is called as _____.
a) Reply b) Feedback
c) Answer d) None of the above

3) _____ is the soul of communication.
a) Sender b) Receiver
c) Message d) Feedback

4) Which of these is not an element of non-verbal communication?
a) Personal appearance b) Posture
c) Eye contact d) Name of the speaker

5) Telephonic conversation is a form of: _____
a) verbal communication b) non-verbal communication
c) visual communication d) Written

6) To give a good presentation, full rehearsal is: _____
a) Optional b) Necessary
c) Useless d) Audience based

7) Which of the following is not an advantage of oral presentation?
a) Flexibility b) Scope for body language
c) Expensive d) Time-saving

8) In communication, _____ is the person who receives and decodes the message.
a) Sender b) Receiver
c) Driver d) Cleaner

9) Which among the following is not a manmade channel of communication?
a) Telephone b) Cell phone
c) Fax d) Air

10) Communication is the part of _____ skills.
a) Rough b) Soft
c) Hard d) Short

11) Which among the following are the barriers to communication?
a) Physical b) Mechanical
c) Psychological d) All of above

12) To overcome language barrier, which of the ways should not be followed?
a) Easy and understandable words should be used.
b) Jokes should be told to the audience.
c) The language of audience should be used.
d) Non-verbal ways should be used to the extent possible.

13) Which of the following is not among 7Cs?
a) Conciseness b) Completeness
c) Clarity d) Charity

14) Posters fall under _____ communication.
a) oral b) visual
c) written d) spoken

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Three. **12**

a) Explain how communication is necessary for business.
b) What is feedback? Explain its necessity in communication.
c) Write short note on: Different channels of communication.
d) Explain language barriers to communication with the ways to overcome them.
e) Explain language as a tool of communication.

Q.3 Attempt Any Four. **16**

a) Explain seven C's of effective communication.
b) Explain various types of barriers to communication and the ways to overcome them.
c) What is oral communication? Explain its advantages.
d) Explain various steps in the process of communication.
e) What is written communication? Explain its benefits.

Section – II

Q.4 Attempt Any Three. **12**

a) Explain the difference between formal and informal communication.
b) Explain vertical communication with its types.
c) Explain farewell speech by the departing person, with an example
d) Explain the speech for vote of thanks, with an example.
e) Write short note on: Non- verbal aspects of presentation.

Q.5 Attempt Any Four. **16**

a) Explain the structure of a business letter with its various components.
b) Explain the steps in the process of presentation.
c) You had purchased some furniture items from a vendor. Afterwards you found that the furniture items are in a damaged condition. Write a letter of complaint and ask for replacement.
d) Explain four P's of effective presentations.
e) You are in need of some computer hardware parts. Prepare a letter placing order to the supplier. Specify the terms and conditions of purchase.

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Which of these is not an element of non-verbal communication?
a) Personal appearance b) Posture
c) Eye contact d) Name of the speaker

2) Telephonic conversation is a form of: _____
a) verbal communication b) non-verbal communication
c) visual communication d) Written

3) To give a good presentation, full rehearsal is: _____
a) Optional b) Necessary
c) Useless d) Audience based

4) Which of the following is not an advantage of oral presentation?
a) Flexibility b) Scope for body language
c) Expensive d) Time-saving

5) In communication, _____ is the person who receives and decodes the message.
a) Sender b) Receiver
c) Driver d) Cleaner

6) Which among the following is not a manmade channel of communication?
a) Telephone b) Cell phone
c) Fax d) Air

7) Communication is the part of _____ skills.
a) Rough b) Soft
c) Hard d) Short

8) Which among the following are the barriers to communication?
a) Physical b) Mechanical
c) Psychological d) All of above

9) To overcome language barrier, which of the ways should not be followed?
a) Easy and understandable words should be used.
b) Jokes should be told to the audience.
c) The language of audience should be used.
d) Non-verbal ways should be used to the extent possible.

10) Which of the following is not among 7Cs?
a) Conciseness b) Completeness
c) Clarity d) Charity

11) Posters fall under _____ communication.
a) oral b) visual
c) written d) spoken

12) On the _____ it is possible to get immediate feedback.
a) letter b) e-mail
c) fax d) telephone

13) The response to a sender's message is called as _____.
a) Reply b) Feedback
c) Answer d) None of the above

14) _____ is the soul of communication.
a) Sender b) Receiver
c) Message d) Feedback

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Three. **12**

a) Explain how communication is necessary for business.
b) What is feedback? Explain its necessity in communication.
c) Write short note on: Different channels of communication.
d) Explain language barriers to communication with the ways to overcome them.
e) Explain language as a tool of communication.

Q.3 Attempt Any Four. **16**

a) Explain seven C's of effective communication.
b) Explain various types of barriers to communication and the ways to overcome them.
c) What is oral communication? Explain its advantages.
d) Explain various steps in the process of communication.
e) What is written communication? Explain its benefits.

Section – II

Q.4 Attempt Any Three. **12**

a) Explain the difference between formal and informal communication.
b) Explain vertical communication with its types.
c) Explain farewell speech by the departing person, with an example
d) Explain the speech for vote of thanks, with an example.
e) Write short note on: Non- verbal aspects of presentation.

Q.5 Attempt Any Four. **16**

a) Explain the structure of a business letter with its various components.
b) Explain the steps in the process of presentation.
c) You had purchased some furniture items from a vendor. Afterwards you found that the furniture items are in a damaged condition. Write a letter of complaint and ask for replacement.
d) Explain four P's of effective presentations.
e) You are in need of some computer hardware parts. Prepare a letter placing order to the supplier. Specify the terms and conditions of purchase.

Seat No.		Set	S

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) Which of the following is not among 7Cs?
a) Conciseness b) Completeness
c) Clarity d) Charity

2) Posters fall under _____ communication.
a) oral b) visual
c) written d) spoken

3) On the _____ it is possible to get immediate feedback.
a) letter b) e-mail
c) fax d) telephone

4) The response to a sender's message is called as _____.
a) Reply b) Feedback
c) Answer d) None of the above

5) _____ is the soul of communication.
a) Sender b) Receiver
c) Message d) Feedback

6) Which of these is not an element of non-verbal communication?
a) Personal appearance b) Posture
c) Eye contact d) Name of the speaker

7) Telephonic conversation is a form of: _____
a) verbal communication b) non-verbal communication
c) visual communication d) Written

8) To give a good presentation, full rehearsal is: _____
a) Optional b) Necessary
c) Useless d) Audience based

9) Which of the following is not an advantage of oral presentation?
a) Flexibility
b) Scope for body language
c) Expensive
d) Time-saving

10) In communication, _____ is the person who receives and decodes the message.
a) Sender
b) Receiver
c) Driver
d) Cleaner

11) Which among the following is not a manmade channel of communication?
a) Telephone
b) Cell phone
c) Fax
d) Air

12) Communication is the part of _____ skills.
a) Rough
b) Soft
c) Hard
d) Short

13) Which among the following are the barriers to communication?
a) Physical
b) Mechanical
c) Psychological
d) All of above

14) To overcome language barrier, which of the ways should not be followed?
a) Easy and understandable words should be used.
b) Jokes should be told to the audience.
c) The language of audience should be used.
d) Non-verbal ways should be used to the extent possible.

SLR-BD-213

Seat No.	

Set S

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Three. **12**

a) Explain how communication is necessary for business.
b) What is feedback? Explain its necessity in communication.
c) Write short note on: Different channels of communication.
d) Explain language barriers to communication with the ways to overcome them.
e) Explain language as a tool of communication.

Q.3 Attempt Any Four. **16**

a) Explain seven C's of effective communication.
b) Explain various types of barriers to communication and the ways to overcome them.
c) What is oral communication? Explain its advantages.
d) Explain various steps in the process of communication.
e) What is written communication? Explain its benefits.

Section – II

Q.4 Attempt Any Three. **12**

a) Explain the difference between formal and informal communication.
b) Explain vertical communication with its types.
c) Explain farewell speech by the departing person, with an example
d) Explain the speech for vote of thanks, with an example.
e) Write short note on: Non- verbal aspects of presentation.

Q.5 Attempt Any Four. **16**

a) Explain the structure of a business letter with its various components.
b) Explain the steps in the process of presentation.
c) You had purchased some furniture items from a vendor. Afterwards you found that the furniture items are in a damaged condition. Write a letter of complaint and ask for replacement.
d) Explain four P's of effective presentations.
e) You are in need of some computer hardware parts. Prepare a letter placing order to the supplier. Specify the terms and conditions of purchase.

SLR-BD-214

Seat No.	

Set P

S. Y. (B. Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The internal ROM memory of the 8051 is:
a) 4 KBytes b) 6 Kbytes
c) 128 bytes d) 256 bytes

2) This program code will be executed continuously:
```
LOOP: MOV A,#03h
      DEC A
      JNZ LOOP
```
a) TRUE b) FALSE
c) gives error d) loop execute 3 times

3) After reset the stack pointer in microcontroller, 8051 is initialized to ____.
a) 70 H b) FF H
c) 00 H d) 07 H

4) Vector address of timer /counter1 interrupt is _____ h.
a) 0003 b) 0013
c) 000B d) 001B

5) Program status word register of 8051 is ____.
a) only bit addressable
b) only byte addressable
c) Bit addressable as well as byte addressable
d) none of above

6) What is the address range of Register bank 0 in 8051?
a) 00h-07h b) 00h-FFh
c) 80h-7Fh d) 80h-FFh

7) The 8051 has _____ 16-bit counter/timers.
a) 1 b) 2
c) 3 d) 4

8) The contents of the accumulator after this operation
MOV A,#0CH
ANL A,#0CH
will be _____.
a) 00001100 b) 00001101
c) 11111111 d) 11000000

9) The 8051 can handle _____ interrupt sources.
a) 3 b) 4
c) 5 d) 6

10) MOV A, @R1 will _____
a) Copy R1 to Accumulator
b) Copy Accumulator to R1
c) Copy the contents of memory whose address is in R1 to Accumulator
d) Copy the accumulator to memory whose address is in R1

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

12) An alternate function of port pin P3.4 in the 8051 is: _____
a) Timer 0 b) Timer 1
c) Interrupt 0 d) Interrupt 1

13) The I/O ports that are used as address and data for external memory are: _____
a) Port 1 and 2 b) Port 1 and 3
c) Port 0 and 2 d) Port 0 and 3

14) Microcontrollers often have: _____
a) CPUs b) RAM
c) ROM d) All of the above

Seat No.	

Set **P**

S. Y. (B. Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any 4 **16**

a) State functional difference between Microprocessor & Microcontroller.
b) Explain various logical instructions related with 8051 with syntax and example.
c) Write ALP for delay 200ms; Use Timer 0 in Model.
d) Explain different features of 8051.
e) Explain following Pins if 8051 Microcontroller
1) ALE/PROG 2) RST
3) XTAL1 and XTAL2 4) PSEN

Q.3 Solve any 2 **12**

a) Compare the Von-Neumann and Harvard Architecture.
b) Explain different Addressing modes with example in 8051.
c) Write a short note on i) TMOD ii) SCON iii) SBUF

Section – II

Q.4 Solve any 4 **16**

a) Write a code for addition of 2 numbers stored in R1 and R2, and store the result in R3.
b) Write a code to generate a delay of 1 sec using Registers.
c) write a short note on Timers.
d) Explain the input / output ports in 8051.
e) write a program to interface Switch & LED with 8051 provided that when the switch is pressed, LED should be ON.

Q.5 Attempt any 2 **12**

a) Write a Program to interface the 4×4 matrix keypad as input and 7-segment display as output with 8051.
b) Draw and explain the External Memory Interfacing with 8051. Attach 8KB RAM externally. Also find the starting and end address.
c) Write an 8051C program to toggle all the bits of port 1 continuously with 1 min delay in between.

SLR-BD-214

Seat No.	

Set Q

S. Y. (B. Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The contents of the accumulator after this operation
MOV A,#0CH
ANL A,#0CH
will be _____.
a) 00001100 b) 00001101
c) 11111111 d) 11000000

2) The 8051 can handle _____ interrupt sources.
a) 3 b) 4
c) 5 d) 6

3) MOV A, @R1 will _____
a) Copy R1 to Accumulator
b) Copy Accumulator to R1
c) Copy the contents of memory whose address is in R1 to Accumulator
d) Copy the accumulator to memory whose address is in R1

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

5) An alternate function of port pin P3.4 in the 8051 is: _____
a) Timer 0 b) Timer 1
c) Interrupt 0 d) Interrupt 1

6) The I/O ports that are used as address and data for external memory are: _____
a) Port 1 and 2 b) Port 1 and 3
c) Port 0 and 2 d) Port 0 and 3

7) Microcontrollers often have: _____

a) CPUs b) RAM
c) ROM d) All of the above

8) The internal ROM memory of the 8051 is:

a) 4 KBytes b) 6 Kbytes
c) 128 bytes d) 256 bytes

9) This program code will be executed continuously:

```
LOOP: MOV A,#03h
      DEC A
      JNZ LOOP
```

a) TRUE b) FALSE
c) gives error d) loop execute 3 times

10) After reset the stack pointer in microcontroller, 8051 is initialized to ____.

a) 70 H b) FF H
c) 00 H d) 07 H

11) Vector address of timer /counter1 interrupt is _____ h.

a) 0003 b) 0013
c) 000B d) 001B

12) Program status word register of 8051 is ____.

a) only bit addressable
b) only byte addressable
c) Bit addressable as well as byte addressable
d) none of above

13) What is the address range of Register bank 0 in 8051?

a) 00h-07h b) 00h-FFh
c) 80h-7Fh d) 80h-FFh

14) The 8051 has _____ 16-bit counter/timers.

a) 1 b) 2
c) 3 d) 4

SLR-BD-214

Seat No.	

Set Q

S. Y. (B. Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any 4 **16**

a) State functional difference between Microprocessor & Microcontroller.
b) Explain various logical instructions related with 8051 with syntax and example.
c) Write ALP for delay 200ms; Use Timer 0 in Model.
d) Explain different features of 8051.
e) Explain following Pins if 8051 Microcontroller
1) ALE/PROG 2) RST
3) XTAL1 and XTAL2 4) PSEN

Q.3 Solve any 2 **12**

a) Compare the Von-Neumann and Harvard Architecture.
b) Explain different Addressing modes with example in 8051.
c) Write a short note on i) TMOD ii) SCON iii) SBUF

Section – II

Q.4 Solve any 4 **16**

a) Write a code for addition of 2 numbers stored in R1 and R2, and store the result in R3.
b) Write a code to generate a delay of 1 sec using Registers.
c) write a short note on Timers.
d) Explain the input / output ports in 8051.
e) write a program to interface Switch & LED with 8051 provided that when the switch is pressed, LED should be ON.

Q.5 Attempt any 2 **12**

a) Write a Program to interface the 4×4 matrix keypad as input and 7-segment display as output with 8051.
b) Draw and explain the External Memory Interfacing with 8051. Attach 8KB RAM externally. Also find the starting and end address.
c) Write an 8051C program to toggle all the bits of port 1 continuously with 1 min delay in between.

Seat No.	

Set **R**

S. Y. (B. Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

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

2) An alternate function of port pin P3.4 in the 8051 is: _____
a) Timer 0 b) Timer 1
c) Interrupt 0 d) Interrupt 1

3) The I/O ports that are used as address and data for external memory are: _____
a) Port 1 and 2 b) Port 1 and 3
c) Port 0 and 2 d) Port 0 and 3

4) Microcontrollers often have: _____
a) CPUs b) RAM
c) ROM d) All of the above

5) The internal ROM memory of the 8051 is:
a) 4 KBytes b) 6 Kbytes
c) 128 bytes d) 256 bytes

6) This program code will be executed continuously:

```
LOOP: MOV A,#03h
      DEC A
      JNZ LOOP
```

a) TRUE b) FALSE
c) gives error d) loop execute 3 times

7) After reset the stack pointer in microcontroller, 8051 is initialized to ____.
a) 70 H b) FF H
c) 00 H d) 07 H

8) Vector address of timer /counter1 interrupt is _____ h.
a) 0003 b) 0013
c) 000B d) 001B

9) Program status word register of 8051 is ____.
a) only bit addressable
b) only byte addressable
c) Bit addressable as well as byte addressable
d) none of above

10) What is the address range of Register bank 0 in 8051?
a) 00h-07h b) 00h-FFh
c) 80h-7Fh d) 80h-FFh

11) The 8051 has _____ 16-bit counter/timers.
a) 1 b) 2
c) 3 d) 4

12) The contents of the accumulator after this operation
MOV A,#0CH
ANL A,#0CH
will be _____.
a) 00001100 b) 00001101
c) 11111111 d) 11000000

13) The 8051 can handle _____ interrupt sources.
a) 3 b) 4
c) 5 d) 6

14) MOV A, @R1 will _____
a) Copy R1 to Accumulator
b) Copy Accumulator to R1
c) Copy the contents of memory whose address is in R1 to Accumulator
d) Copy the accumulator to memory whose address is in R1

Seat No.	

Set R

S. Y. (B. Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any 4 **16**

a) State functional difference between Microprocessor & Microcontroller.
b) Explain various logical instructions related with 8051 with syntax and example.
c) Write ALP for delay 200ms; Use Timer 0 in Model.
d) Explain different features of 8051.
e) Explain following Pins if 8051 Microcontroller
1) ALE/PROG 2) RST
3) XTAL1 and XTAL2 4) PSEN

Q.3 Solve any 2 **12**

a) Compare the Von-Neumann and Harvard Architecture.
b) Explain different Addressing modes with example in 8051.
c) Write a short note on i) TMOD ii) SCON iii) SBUF

Section – II

Q.4 Solve any 4 **16**

a) Write a code for addition of 2 numbers stored in R1 and R2, and store the result in R3.
b) Write a code to generate a delay of 1 sec using Registers.
c) write a short note on Timers.
d) Explain the input / output ports in 8051.
e) write a program to interface Switch & LED with 8051 provided that when the switch is pressed, LED should be ON.

Q.5 Attempt any 2 **12**

a) Write a Program to interface the 4×4 matrix keypad as input and 7-segment display as output with 8051.
b) Draw and explain the External Memory Interfacing with 8051. Attach 8KB RAM externally. Also find the starting and end address.
c) Write an 8051C program to toggle all the bits of port 1 continuously with 1 min delay in between.

SLR-BD-214

Seat No.		Set	S

S. Y. (B. Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the address range of Register bank 0 in 8051?
a) 00h-07h b) 00h-FFh
c) 80h-7Fh d) 80h-FFh

2) The 8051 has _____ 16-bit counter/timers.
a) 1 b) 2
c) 3 d) 4

3) The contents of the accumulator after this operation
MOV A,#0CH
ANL A,#0CH
will be _____.
a) 00001100 b) 00001101
c) 11111111 d) 11000000

4) The 8051 can handle _____ interrupt sources.
a) 3 b) 4
c) 5 d) 6

5) MOV A, @R1 will _____
a) Copy R1 to Accumulator
b) Copy Accumulator to R1
c) Copy the contents of memory whose address is in R1 to Accumulator
d) Copy the accumulator to memory whose address is in R1

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

7) An alternate function of port pin P3.4 in the 8051 is: _____

a) Timer 0 b) Timer 1
c) Interrupt 0 d) Interrupt 1

8) The I/O ports that are used as address and data for external memory are: _____

a) Port 1 and 2 b) Port 1 and 3
c) Port 0 and 2 d) Port 0 and 3

9) Microcontrollers often have: _____

a) CPUs b) RAM
c) ROM d) All of the above

10) The internal ROM memory of the 8051 is:

a) 4 KBytes b) 6 Kbytes
c) 128 bytes d) 256 bytes

11) This program code will be executed continuously:

```
LOOP: MOV A,#03h
      DEC A
      JNZ LOOP
```

a) TRUE b) FALSE
c) gives error d) loop execute 3 times

12) After reset the stack pointer in microcontroller, 8051 is initialized to ____.

a) 70 H b) FF H
c) 00 H d) 07 H

13) Vector address of timer /counter1 interrupt is _____ h.

a) 0003 b) 0013
c) 000B d) 001B

14) Program status word register of 8051 is ____.

a) only bit addressable
b) only byte addressable
c) Bit addressable as well as byte addressable
d) none of above

SLR-BD-214

Seat No.	

Set S

S. Y. (B. Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any 4 **16**

a) State functional difference between Microprocessor & Microcontroller.
b) Explain various logical instructions related with 8051 with syntax and example.
c) Write ALP for delay 200ms; Use Timer 0 in Model.
d) Explain different features of 8051.
e) Explain following Pins if 8051 Microcontroller
1) ALE/PROG 2) RST
3) XTAL1 and XTAL2 4) PSEN

Q.3 Solve any 2 **12**

a) Compare the Von-Neumann and Harvard Architecture.
b) Explain different Addressing modes with example in 8051.
c) Write a short note on i) TMOD ii) SCON iii) SBUF

Section – II

Q.4 Solve any 4 **16**

a) Write a code for addition of 2 numbers stored in R1 and R2, and store the result in R3.
b) Write a code to generate a delay of 1 sec using Registers.
c) write a short note on Timers.
d) Explain the input / output ports in 8051.
e) write a program to interface Switch & LED with 8051 provided that when the switch is pressed, LED should be ON.

Q.5 Attempt any 2 **12**

a) Write a Program to interface the 4×4 matrix keypad as input and 7-segment display as output with 8051.
b) Draw and explain the External Memory Interfacing with 8051. Attach 8KB RAM externally. Also find the starting and end address.
c) Write an 8051C program to toggle all the bits of port 1 continuously with 1 min delay in between.

SLR-BD-214

Seat No.	

Set P

S. Y. (B. Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The internal ROM memory of the 8051 is:
a) 4 KBytes b) 6 Kbytes
c) 128 bytes d) 256 bytes

2) This program code will be executed continuously:
```
LOOP: MOV A,#03h
      DEC A
      JNZ LOOP
```
a) TRUE b) FALSE
c) gives error d) loop execute 3 times

3) After reset the stack pointer in microcontroller, 8051 is initialized to ____.
a) 70 H b) FF H
c) 00 H d) 07 H

4) Vector address of timer /counter1 interrupt is _____ h.
a) 0003 b) 0013
c) 000B d) 001B

5) Program status word register of 8051 is ____.
a) only bit addressable
b) only byte addressable
c) Bit addressable as well as byte addressable
d) none of above

6) What is the address range of Register bank 0 in 8051?
a) 00h-07h b) 00h-FFh
c) 80h-7Fh d) 80h-FFh

7) The 8051 has _____ 16-bit counter/timers.
a) 1 b) 2
c) 3 d) 4

8) The contents of the accumulator after this operation
MOV A,#0CH
ANL A,#0CH
will be _____.
a) 00001100 b) 00001101
c) 11111111 d) 11000000

9) The 8051 can handle _____ interrupt sources.
a) 3 b) 4
c) 5 d) 6

10) MOV A, @R1 will _____
a) Copy R1 to Accumulator
b) Copy Accumulator to R1
c) Copy the contents of memory whose address is in R1 to Accumulator
d) Copy the accumulator to memory whose address is in R1

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

12) An alternate function of port pin P3.4 in the 8051 is: _____
a) Timer 0 b) Timer 1
c) Interrupt 0 d) Interrupt 1

13) The I/O ports that are used as address and data for external memory are: _____
a) Port 1 and 2 b) Port 1 and 3
c) Port 0 and 2 d) Port 0 and 3

14) Microcontrollers often have: _____
a) CPUs b) RAM
c) ROM d) All of the above

Seat No.	

Set **P**

S. Y. (B. Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any 4 **16**

a) State functional difference between Microprocessor & Microcontroller.
b) Explain various logical instructions related with 8051 with syntax and example.
c) Write ALP for delay 200ms; Use Timer 0 in Model.
d) Explain different features of 8051.
e) Explain following Pins if 8051 Microcontroller
1) ALE/PROG 2) RST
3) XTAL1 and XTAL2 4) PSEN

Q.3 Solve any 2 **12**

a) Compare the Von-Neumann and Harvard Architecture.
b) Explain different Addressing modes with example in 8051.
c) Write a short note on i) TMOD ii) SCON iii) SBUF

Section – II

Q.4 Solve any 4 **16**

a) Write a code for addition of 2 numbers stored in R1 and R2, and store the result in R3.
b) Write a code to generate a delay of 1 sec using Registers.
c) write a short note on Timers.
d) Explain the input / output ports in 8051.
e) write a program to interface Switch & LED with 8051 provided that when the switch is pressed, LED should be ON.

Q.5 Attempt any 2 **12**

a) Write a Program to interface the 4×4 matrix keypad as input and 7-segment display as output with 8051.
b) Draw and explain the External Memory Interfacing with 8051. Attach 8KB RAM externally. Also find the starting and end address.
c) Write an 8051C program to toggle all the bits of port 1 continuously with 1 min delay in between.

SLR-BD-214

Seat No.	

Set Q

S. Y. (B. Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The contents of the accumulator after this operation
MOV A,#0CH
ANL A,#0CH
will be _____.
a) 00001100 b) 00001101
c) 11111111 d) 11000000

2) The 8051 can handle _____ interrupt sources.
a) 3 b) 4
c) 5 d) 6

3) MOV A, @R1 will _____
a) Copy R1 to Accumulator
b) Copy Accumulator to R1
c) Copy the contents of memory whose address is in R1 to Accumulator
d) Copy the accumulator to memory whose address is in R1

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

5) An alternate function of port pin P3.4 in the 8051 is: _____
a) Timer 0 b) Timer 1
c) Interrupt 0 d) Interrupt 1

6) The I/O ports that are used as address and data for external memory are: _____
a) Port 1 and 2 b) Port 1 and 3
c) Port 0 and 2 d) Port 0 and 3

7) Microcontrollers often have: _____

a) CPUs b) RAM
c) ROM d) All of the above

8) The internal ROM memory of the 8051 is:

a) 4 KBytes b) 6 Kbytes
c) 128 bytes d) 256 bytes

9) This program code will be executed continuously:

```
LOOP: MOV A,#03h
      DEC A
      JNZ LOOP
```

a) TRUE b) FALSE
c) gives error d) loop execute 3 times

10) After reset the stack pointer in microcontroller, 8051 is initialized to ____.

a) 70 H b) FF H
c) 00 H d) 07 H

11) Vector address of timer /counter1 interrupt is _____ h.

a) 0003 b) 0013
c) 000B d) 001B

12) Program status word register of 8051 is ____.

a) only bit addressable
b) only byte addressable
c) Bit addressable as well as byte addressable
d) none of above

13) What is the address range of Register bank 0 in 8051?

a) 00h-07h b) 00h-FFh
c) 80h-7Fh d) 80h-FFh

14) The 8051 has _____ 16-bit counter/timers.

a) 1 b) 2
c) 3 d) 4

SLR-BD-214

Seat No.	

Set Q

S. Y. (B. Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any 4 **16**

a) State functional difference between Microprocessor & Microcontroller.
b) Explain various logical instructions related with 8051 with syntax and example.
c) Write ALP for delay 200ms; Use Timer 0 in Model.
d) Explain different features of 8051.
e) Explain following Pins if 8051 Microcontroller
1) ALE/PROG 2) RST
3) XTAL1 and XTAL2 4) PSEN

Q.3 Solve any 2 **12**

a) Compare the Von-Neumann and Harvard Architecture.
b) Explain different Addressing modes with example in 8051.
c) Write a short note on i) TMOD ii) SCON iii) SBUF

Section – II

Q.4 Solve any 4 **16**

a) Write a code for addition of 2 numbers stored in R1 and R2, and store the result in R3.
b) Write a code to generate a delay of 1 sec using Registers.
c) write a short note on Timers.
d) Explain the input / output ports in 8051.
e) write a program to interface Switch & LED with 8051 provided that when the switch is pressed, LED should be ON.

Q.5 Attempt any 2 **12**

a) Write a Program to interface the 4×4 matrix keypad as input and 7-segment display as output with 8051.
b) Draw and explain the External Memory Interfacing with 8051. Attach 8KB RAM externally. Also find the starting and end address.
c) Write an 8051C program to toggle all the bits of port 1 continuously with 1 min delay in between.

SLR-BD-214

Seat No.	

Set R

S. Y. (B. Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

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

2) An alternate function of port pin P3.4 in the 8051 is: _____
a) Timer 0 b) Timer 1
c) Interrupt 0 d) Interrupt 1

3) The I/O ports that are used as address and data for external memory are: _____
a) Port 1 and 2 b) Port 1 and 3
c) Port 0 and 2 d) Port 0 and 3

4) Microcontrollers often have: _____
a) CPUs b) RAM
c) ROM d) All of the above

5) The internal ROM memory of the 8051 is:
a) 4 KBytes b) 6 Kbytes
c) 128 bytes d) 256 bytes

6) This program code will be executed continuously:

```
LOOP: MOV A,#03h
      DEC A
      JNZ LOOP
```

a) TRUE b) FALSE
c) gives error d) loop execute 3 times

7) After reset the stack pointer in microcontroller, 8051 is initialized to ____.
a) 70 H b) FF H
c) 00 H d) 07 H

8) Vector address of timer /counter1 interrupt is _____ h.
a) 0003 b) 0013
c) 000B d) 001B

9) Program status word register of 8051 is ____.
a) only bit addressable
b) only byte addressable
c) Bit addressable as well as byte addressable
d) none of above

10) What is the address range of Register bank 0 in 8051?
a) 00h-07h b) 00h-FFh
c) 80h-7Fh d) 80h-FFh

11) The 8051 has _____ 16-bit counter/timers.
a) 1 b) 2
c) 3 d) 4

12) The contents of the accumulator after this operation
MOV A,#0CH
ANL A,#0CH
will be _____.
a) 00001100 b) 00001101
c) 11111111 d) 11000000

13) The 8051 can handle _____ interrupt sources.
a) 3 b) 4
c) 5 d) 6

14) MOV A, @R1 will _____
a) Copy R1 to Accumulator
b) Copy Accumulator to R1
c) Copy the contents of memory whose address is in R1 to Accumulator
d) Copy the accumulator to memory whose address is in R1

Seat No.	

Set **R**

S. Y. (B. Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any 4 **16**

a) State functional difference between Microprocessor & Microcontroller.
b) Explain various logical instructions related with 8051 with syntax and example.
c) Write ALP for delay 200ms; Use Timer 0 in Model.
d) Explain different features of 8051.
e) Explain following Pins if 8051 Microcontroller
1) ALE/PROG 2) RST
3) XTAL1 and XTAL2 4) PSEN

Q.3 Solve any 2 **12**

a) Compare the Von-Neumann and Harvard Architecture.
b) Explain different Addressing modes with example in 8051.
c) Write a short note on i) TMOD ii) SCON iii) SBUF

Section – II

Q.4 Solve any 4 **16**

a) Write a code for addition of 2 numbers stored in R1 and R2, and store the result in R3.
b) Write a code to generate a delay of 1 sec using Registers.
c) write a short note on Timers.
d) Explain the input / output ports in 8051.
e) write a program to interface Switch & LED with 8051 provided that when the switch is pressed, LED should be ON.

Q.5 Attempt any 2 **12**

a) Write a Program to interface the 4×4 matrix keypad as input and 7-segment display as output with 8051.
b) Draw and explain the External Memory Interfacing with 8051. Attach 8KB RAM externally. Also find the starting and end address.
c) Write an 8051C program to toggle all the bits of port 1 continuously with 1 min delay in between.

Seat No.	

Set **S**

S. Y. (B. Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the address range of Register bank 0 in 8051?
a) 00h-07h b) 00h-FFh
c) 80h-7Fh d) 80h-FFh

2) The 8051 has _____ 16-bit counter/timers.
a) 1 b) 2
c) 3 d) 4

3) The contents of the accumulator after this operation
MOV A,#0CH
ANL A,#0CH
will be _____.
a) 00001100 b) 00001101
c) 11111111 d) 11000000

4) The 8051 can handle _____ interrupt sources.
a) 3 b) 4
c) 5 d) 6

5) MOV A, @R1 will _____
a) Copy R1 to Accumulator
b) Copy Accumulator to R1
c) Copy the contents of memory whose address is in R1 to Accumulator
d) Copy the accumulator to memory whose address is in R1

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

7) An alternate function of port pin P3.4 in the 8051 is: _____

a) Timer 0 b) Timer 1
c) Interrupt 0 d) Interrupt 1

8) The I/O ports that are used as address and data for external memory are: _____

a) Port 1 and 2 b) Port 1 and 3
c) Port 0 and 2 d) Port 0 and 3

9) Microcontrollers often have: _____

a) CPUs b) RAM
c) ROM d) All of the above

10) The internal ROM memory of the 8051 is:

a) 4 KBytes b) 6 Kbytes
c) 128 bytes d) 256 bytes

11) This program code will be executed continuously:

```
LOOP: MOV A,#03h
      DEC A
      JNZ LOOP
```

a) TRUE b) FALSE
c) gives error d) loop execute 3 times

12) After reset the stack pointer in microcontroller, 8051 is initialized to ____.

a) 70 H b) FF H
c) 00 H d) 07 H

13) Vector address of timer /counter1 interrupt is _____ h.

a) 0003 b) 0013
c) 000B d) 001B

14) Program status word register of 8051 is ____.

a) only bit addressable
b) only byte addressable
c) Bit addressable as well as byte addressable
d) none of above

SLR-BD-214

Seat No.	

Set S

S. Y. (B. Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any 4 **16**

a) State functional difference between Microprocessor & Microcontroller.
b) Explain various logical instructions related with 8051 with syntax and example.
c) Write ALP for delay 200ms; Use Timer 0 in Model.
d) Explain different features of 8051.
e) Explain following Pins if 8051 Microcontroller
1) ALE/PROG 2) RST
3) XTAL1 and XTAL2 4) PSEN

Q.3 Solve any 2 **12**

a) Compare the Von-Neumann and Harvard Architecture.
b) Explain different Addressing modes with example in 8051.
c) Write a short note on i) TMOD ii) SCON iii) SBUF

Section – II

Q.4 Solve any 4 **16**

a) Write a code for addition of 2 numbers stored in R1 and R2, and store the result in R3.
b) Write a code to generate a delay of 1 sec using Registers.
c) write a short note on Timers.
d) Explain the input / output ports in 8051.
e) write a program to interface Switch & LED with 8051 provided that when the switch is pressed, LED should be ON.

Q.5 Attempt any 2 **12**

a) Write a Program to interface the 4×4 matrix keypad as input and 7-segment display as output with 8051.
b) Draw and explain the External Memory Interfacing with 8051. Attach 8KB RAM externally. Also find the starting and end address.
c) Write an 8051C program to toggle all the bits of port 1 continuously with 1 min delay in between.

SLR-BD-214

Seat No.	

Set P

S.Y. (B. Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The internal ROM memory of the 8051 is:
a) 4 KBytes b) 6 Kbytes
c) 128 bytes d) 256 bytes

2) This program code will be executed continuously:
```
LOOP: MOV A,#03h
      DEC A
      JNZ LOOP
```
a) TRUE b) FALSE
c) gives error d) loop execute 3 times

3) After reset the stack pointer in microcontroller, 8051 is initialized to ____.
a) 70 H b) FF H
c) 00 H d) 07 H

4) Vector address of timer /counter1 interrupt is _____ h.
a) 0003 b) 0013
c) 000B d) 001B

5) Program status word register of 8051 is ____.
a) only bit addressable
b) only byte addressable
c) Bit addressable as well as byte addressable
d) none of above

6) What is the address range of Register bank 0 in 8051?
a) 00h-07h b) 00h-FFh
c) 80h-7Fh d) 80h-FFh

7) The 8051 has _____ 16-bit counter/timers.
a) 1 b) 2
c) 3 d) 4

8) The contents of the accumulator after this operation
MOV A,#0CH
ANL A,#0CH
will be _____.
a) 00001100 b) 00001101
c) 11111111 d) 11000000

9) The 8051 can handle _____ interrupt sources.
a) 3 b) 4
c) 5 d) 6

10) MOV A, @R1 will _____
a) Copy R1 to Accumulator
b) Copy Accumulator to R1
c) Copy the contents of memory whose address is in R1 to Accumulator
d) Copy the accumulator to memory whose address is in R1

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

12) An alternate function of port pin P3.4 in the 8051 is: _____
a) Timer 0 b) Timer 1
c) Interrupt 0 d) Interrupt 1

13) The I/O ports that are used as address and data for external memory are: _____
a) Port 1 and 2 b) Port 1 and 3
c) Port 0 and 2 d) Port 0 and 3

14) Microcontrollers often have: _____
a) CPUs b) RAM
c) ROM d) All of the above

Seat No.	

Set P

S.Y. (B. Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any 4 **16**

a) State functional difference between Microprocessor & Microcontroller.
b) Explain various logical instructions related with 8051 with syntax and example.
c) Write ALP for delay 200ms; Use Timer 0 in Model.
d) Explain different features of 8051.
e) Explain following Pins if 8051 Microcontroller
1) ALE/PROG 2) RST
3) XTAL1 and XTAL2 4) PSEN

Q.3 Solve any 2 **12**

a) Compare the Von-Neumann and Harvard Architecture.
b) Explain different Addressing modes with example in 8051.
c) Write a short note on i) TMOD ii) SCON iii) SBUF

Section – II

Q.4 Solve any 4 **16**

a) Write a code for addition of 2 numbers stored in R1 and R2, and store the result in R3.
b) Write a code to generate a delay of 1 sec using Registers.
c) write a short note on Timers.
d) Explain the input / output ports in 8051.
e) write a program to interface Switch & LED with 8051 provided that when the switch is pressed, LED should be ON.

Q.5 Attempt any 2 **12**

a) Write a Program to interface the 4×4 matrix keypad as input and 7-segment display as output with 8051.
b) Draw and explain the External Memory Interfacing with 8051. Attach 8KB RAM externally. Also find the starting and end address.
c) Write an 8051C program to toggle all the bits of port 1 continuously with 1 min delay in between.

SLR-BD-214

Seat No.	

Set Q

S.Y. (B. Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The contents of the accumulator after this operation
MOV A,#0CH
ANL A,#0CH
will be _____.
a) 00001100 b) 00001101
c) 11111111 d) 11000000

2) The 8051 can handle _____ interrupt sources.
a) 3 b) 4
c) 5 d) 6

3) MOV A, @R1 will _____
a) Copy R1 to Accumulator
b) Copy Accumulator to R1
c) Copy the contents of memory whose address is in R1 to Accumulator
d) Copy the accumulator to memory whose address is in R1

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

5) An alternate function of port pin P3.4 in the 8051 is: _____
a) Timer 0 b) Timer 1
c) Interrupt 0 d) Interrupt 1

6) The I/O ports that are used as address and data for external memory are: _____
a) Port 1 and 2 b) Port 1 and 3
c) Port 0 and 2 d) Port 0 and 3

7) Microcontrollers often have: _____

a) CPUs b) RAM
c) ROM d) All of the above

8) The internal ROM memory of the 8051 is:

a) 4 KBytes b) 6 Kbytes
c) 128 bytes d) 256 bytes

9) This program code will be executed continuously:

```
LOOP: MOV A,#03h
      DEC A
      JNZ LOOP
```

a) TRUE b) FALSE
c) gives error d) loop execute 3 times

10) After reset the stack pointer in microcontroller, 8051 is initialized to ____.

a) 70 H b) FF H
c) 00 H d) 07 H

11) Vector address of timer /counter1 interrupt is _____ h.

a) 0003 b) 0013
c) 000B d) 001B

12) Program status word register of 8051 is ____.

a) only bit addressable
b) only byte addressable
c) Bit addressable as well as byte addressable
d) none of above

13) What is the address range of Register bank 0 in 8051?

a) 00h-07h b) 00h-FFh
c) 80h-7Fh d) 80h-FFh

14) The 8051 has _____ 16-bit counter/timers.

a) 1 b) 2
c) 3 d) 4

Seat No.	

Set **Q**

S.Y. (B. Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any 4 **16**

a) State functional difference between Microprocessor & Microcontroller.
b) Explain various logical instructions related with 8051 with syntax and example.
c) Write ALP for delay 200ms; Use Timer 0 in Model.
d) Explain different features of 8051.
e) Explain following Pins if 8051 Microcontroller
1) ALE/PROG 2) RST
3) XTAL1 and XTAL2 4) PSEN

Q.3 Solve any 2 **12**

a) Compare the Von-Neumann and Harvard Architecture.
b) Explain different Addressing modes with example in 8051.
c) Write a short note on i) TMOD ii) SCON iii) SBUF

Section – II

Q.4 Solve any 4 **16**

a) Write a code for addition of 2 numbers stored in R1 and R2, and store the result in R3.
b) Write a code to generate a delay of 1 sec using Registers.
c) write a short note on Timers.
d) Explain the input / output ports in 8051.
e) write a program to interface Switch & LED with 8051 provided that when the switch is pressed, LED should be ON.

Q.5 Attempt any 2 **12**

a) Write a Program to interface the 4×4 matrix keypad as input and 7-segment display as output with 8051.
b) Draw and explain the External Memory Interfacing with 8051. Attach 8KB RAM externally. Also find the starting and end address.
c) Write an 8051C program to toggle all the bits of port 1 continuously with 1 min delay in between.

Seat No.	

Set **R**

S.Y. (B. Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

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

2) An alternate function of port pin P3.4 in the 8051 is: _____
a) Timer 0 b) Timer 1
c) Interrupt 0 d) Interrupt 1

3) The I/O ports that are used as address and data for external memory are: _____
a) Port 1 and 2 b) Port 1 and 3
c) Port 0 and 2 d) Port 0 and 3

4) Microcontrollers often have: _____
a) CPUs b) RAM
c) ROM d) All of the above

5) The internal ROM memory of the 8051 is:
a) 4 KBytes b) 6 Kbytes
c) 128 bytes d) 256 bytes

6) This program code will be executed continuously:

```
LOOP: MOV A,#03h
      DEC A
      JNZ LOOP
```

a) TRUE b) FALSE
c) gives error d) loop execute 3 times

7) After reset the stack pointer in microcontroller, 8051 is initialized to ____.
a) 70 H b) FF H
c) 00 H d) 07 H

8) Vector address of timer /counter1 interrupt is _____ h.
a) 0003 b) 0013
c) 000B d) 001B

9) Program status word register of 8051 is ____.
a) only bit addressable
b) only byte addressable
c) Bit addressable as well as byte addressable
d) none of above

10) What is the address range of Register bank 0 in 8051?
a) 00h-07h b) 00h-FFh
c) 80h-7Fh d) 80h-FFh

11) The 8051 has _____ 16-bit counter/timers.
a) 1 b) 2
c) 3 d) 4

12) The contents of the accumulator after this operation
MOV A,#0CH
ANL A,#0CH
will be _____.
a) 00001100 b) 00001101
c) 11111111 d) 11000000

13) The 8051 can handle _____ interrupt sources.
a) 3 b) 4
c) 5 d) 6

14) MOV A, @R1 will _____
a) Copy R1 to Accumulator
b) Copy Accumulator to R1
c) Copy the contents of memory whose address is in R1 to Accumulator
d) Copy the accumulator to memory whose address is in R1

Seat No.	

Set R

S.Y. (B. Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any 4 **16**

a) State functional difference between Microprocessor & Microcontroller.
b) Explain various logical instructions related with 8051 with syntax and example.
c) Write ALP for delay 200ms; Use Timer 0 in Model.
d) Explain different features of 8051.
e) Explain following Pins if 8051 Microcontroller
1) ALE/PROG 2) RST
3) XTAL1 and XTAL2 4) PSEN

Q.3 Solve any 2 **12**

a) Compare the Von-Neumann and Harvard Architecture.
b) Explain different Addressing modes with example in 8051.
c) Write a short note on i) TMOD ii) SCON iii) SBUF

Section – II

Q.4 Solve any 4 **16**

a) Write a code for addition of 2 numbers stored in R1 and R2, and store the result in R3.
b) Write a code to generate a delay of 1 sec using Registers.
c) write a short note on Timers.
d) Explain the input / output ports in 8051.
e) write a program to interface Switch & LED with 8051 provided that when the switch is pressed, LED should be ON.

Q.5 Attempt any 2 **12**

a) Write a Program to interface the 4×4 matrix keypad as input and 7-segment display as output with 8051.
b) Draw and explain the External Memory Interfacing with 8051. Attach 8KB RAM externally. Also find the starting and end address.
c) Write an 8051C program to toggle all the bits of port 1 continuously with 1 min delay in between.

SLR-BD-214

Seat No.		Set	S

S.Y. (B. Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the address range of Register bank 0 in 8051?
a) 00h-07h b) 00h-FFh
c) 80h-7Fh d) 80h-FFh

2) The 8051 has _____ 16-bit counter/timers.
a) 1 b) 2
c) 3 d) 4

3) The contents of the accumulator after this operation
MOV A,#0CH
ANL A,#0CH
will be _____.
a) 00001100 b) 00001101
c) 11111111 d) 11000000

4) The 8051 can handle _____ interrupt sources.
a) 3 b) 4
c) 5 d) 6

5) MOV A, @R1 will _____
a) Copy R1 to Accumulator
b) Copy Accumulator to R1
c) Copy the contents of memory whose address is in R1 to Accumulator
d) Copy the accumulator to memory whose address is in R1

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

7) An alternate function of port pin P3.4 in the 8051 is: _____

a) Timer 0 b) Timer 1
c) Interrupt 0 d) Interrupt 1

8) The I/O ports that are used as address and data for external memory are: _____

a) Port 1 and 2 b) Port 1 and 3
c) Port 0 and 2 d) Port 0 and 3

9) Microcontrollers often have: _____

a) CPUs b) RAM
c) ROM d) All of the above

10) The internal ROM memory of the 8051 is:

a) 4 KBytes b) 6 Kbytes
c) 128 bytes d) 256 bytes

11) This program code will be executed continuously:

```
LOOP: MOV A,#03h
      DEC A
      JNZ LOOP
```

a) TRUE b) FALSE
c) gives error d) loop execute 3 times

12) After reset the stack pointer in microcontroller, 8051 is initialized to ____.

a) 70 H b) FF H
c) 00 H d) 07 H

13) Vector address of timer /counter1 interrupt is _____ h.

a) 0003 b) 0013
c) 000B d) 001B

14) Program status word register of 8051 is ____.

a) only bit addressable
b) only byte addressable
c) Bit addressable as well as byte addressable
d) none of above

SLR-BD-214

Seat No.	

Set S

S.Y. (B. Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any 4 **16**

a) State functional difference between Microprocessor & Microcontroller.
b) Explain various logical instructions related with 8051 with syntax and example.
c) Write ALP for delay 200ms; Use Timer 0 in Model.
d) Explain different features of 8051.
e) Explain following Pins if 8051 Microcontroller
1) ALE/PROG 2) RST
3) XTAL1 and XTAL2 4) PSEN

Q.3 Solve any 2 **12**

a) Compare the Von-Neumann and Harvard Architecture.
b) Explain different Addressing modes with example in 8051.
c) Write a short note on i) TMOD ii) SCON iii) SBUF

Section – II

Q.4 Solve any 4 **16**

a) Write a code for addition of 2 numbers stored in R1 and R2, and store the result in R3.
b) Write a code to generate a delay of 1 sec using Registers.
c) write a short note on Timers.
d) Explain the input / output ports in 8051.
e) write a program to interface Switch & LED with 8051 provided that when the switch is pressed, LED should be ON.

Q.5 Attempt any 2 **12**

a) Write a Program to interface the 4×4 matrix keypad as input and 7-segment display as output with 8051.
b) Draw and explain the External Memory Interfacing with 8051. Attach 8KB RAM externally. Also find the starting and end address.
c) Write an 8051C program to toggle all the bits of port 1 continuously with 1 min delay in between.

SLR-BD-214

Seat No.	

Set P

S.Y. (B. Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The internal ROM memory of the 8051 is:
a) 4 KBytes b) 6 Kbytes
c) 128 bytes d) 256 bytes

2) This program code will be executed continuously:
```
LOOP: MOV A,#03h
      DEC A
      JNZ LOOP
```
a) TRUE b) FALSE
c) gives error d) loop execute 3 times

3) After reset the stack pointer in microcontroller, 8051 is initialized to ____.
a) 70 H b) FF H
c) 00 H d) 07 H

4) Vector address of timer /counter1 interrupt is _____ h.
a) 0003 b) 0013
c) 000B d) 001B

5) Program status word register of 8051 is ____.
a) only bit addressable
b) only byte addressable
c) Bit addressable as well as byte addressable
d) none of above

6) What is the address range of Register bank 0 in 8051?
a) 00h-07h b) 00h-FFh
c) 80h-7Fh d) 80h-FFh

7) The 8051 has _____ 16-bit counter/timers.
a) 1 b) 2
c) 3 d) 4

8) The contents of the accumulator after this operation
MOV A,#0CH
ANL A,#0CH
will be _____.
a) 00001100 b) 00001101
c) 11111111 d) 11000000

9) The 8051 can handle _____ interrupt sources.
a) 3 b) 4
c) 5 d) 6

10) MOV A, @R1 will _____
a) Copy R1 to Accumulator
b) Copy Accumulator to R1
c) Copy the contents of memory whose address is in R1 to Accumulator
d) Copy the accumulator to memory whose address is in R1

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

12) An alternate function of port pin P3.4 in the 8051 is: _____
a) Timer 0 b) Timer 1
c) Interrupt 0 d) Interrupt 1

13) The I/O ports that are used as address and data for external memory are: _____
a) Port 1 and 2 b) Port 1 and 3
c) Port 0 and 2 d) Port 0 and 3

14) Microcontrollers often have: _____
a) CPUs b) RAM
c) ROM d) All of the above

Seat No.	

Set **P**

S.Y. (B. Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any 4 **16**

a) State functional difference between Microprocessor & Microcontroller.
b) Explain various logical instructions related with 8051 with syntax and example.
c) Write ALP for delay 200ms; Use Timer 0 in Model.
d) Explain different features of 8051.
e) Explain following Pins if 8051 Microcontroller
1) ALE/PROG 2) RST
3) XTAL1 and XTAL2 4) PSEN

Q.3 Solve any 2 **12**

a) Compare the Von-Neumann and Harvard Architecture.
b) Explain different Addressing modes with example in 8051.
c) Write a short note on i) TMOD ii) SCON iii) SBUF

Section – II

Q.4 Solve any 4 **16**

a) Write a code for addition of 2 numbers stored in R1 and R2, and store the result in R3.
b) Write a code to generate a delay of 1 sec using Registers.
c) write a short note on Timers.
d) Explain the input / output ports in 8051.
e) write a program to interface Switch & LED with 8051 provided that when the switch is pressed, LED should be ON.

Q.5 Attempt any 2 **12**

a) Write a Program to interface the 4×4 matrix keypad as input and 7-segment display as output with 8051.
b) Draw and explain the External Memory Interfacing with 8051. Attach 8KB RAM externally. Also find the starting and end address.
c) Write an 8051C program to toggle all the bits of port 1 continuously with 1 min delay in between.

SLR-BD-214

Seat No.	

Set Q

S.Y. (B. Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The contents of the accumulator after this operation
MOV A,#0CH
ANL A,#0CH
will be _____.
a) 00001100 b) 00001101
c) 11111111 d) 11000000

2) The 8051 can handle _____ interrupt sources.
a) 3 b) 4
c) 5 d) 6

3) MOV A, @R1 will _____
a) Copy R1 to Accumulator
b) Copy Accumulator to R1
c) Copy the contents of memory whose address is in R1 to Accumulator
d) Copy the accumulator to memory whose address is in R1

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

5) An alternate function of port pin P3.4 in the 8051 is: _____
a) Timer 0 b) Timer 1
c) Interrupt 0 d) Interrupt 1

6) The I/O ports that are used as address and data for external memory are: _____
a) Port 1 and 2 b) Port 1 and 3
c) Port 0 and 2 d) Port 0 and 3

7) Microcontrollers often have: _____

a) CPUs b) RAM
c) ROM d) All of the above

8) The internal ROM memory of the 8051 is:

a) 4 KBytes b) 6 Kbytes
c) 128 bytes d) 256 bytes

9) This program code will be executed continuously:

```
LOOP: MOV A,#03h
      DEC A
      JNZ LOOP
```

a) TRUE b) FALSE
c) gives error d) loop execute 3 times

10) After reset the stack pointer in microcontroller, 8051 is initialized to ____.

a) 70 H b) FF H
c) 00 H d) 07 H

11) Vector address of timer /counter1 interrupt is _____ h.

a) 0003 b) 0013
c) 000B d) 001B

12) Program status word register of 8051 is ____.

a) only bit addressable
b) only byte addressable
c) Bit addressable as well as byte addressable
d) none of above

13) What is the address range of Register bank 0 in 8051?

a) 00h-07h b) 00h-FFh
c) 80h-7Fh d) 80h-FFh

14) The 8051 has _____ 16-bit counter/timers.

a) 1 b) 2
c) 3 d) 4

Seat No.	

Set **Q**

S.Y. (B. Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any 4 **16**

a) State functional difference between Microprocessor & Microcontroller.
b) Explain various logical instructions related with 8051 with syntax and example.
c) Write ALP for delay 200ms; Use Timer 0 in Model.
d) Explain different features of 8051.
e) Explain following Pins if 8051 Microcontroller
1) ALE/PROG 2) RST
3) XTAL1 and XTAL2 4) PSEN

Q.3 Solve any 2 **12**

a) Compare the Von-Neumann and Harvard Architecture.
b) Explain different Addressing modes with example in 8051.
c) Write a short note on i) TMOD ii) SCON iii) SBUF

Section – II

Q.4 Solve any 4 **16**

a) Write a code for addition of 2 numbers stored in R1 and R2, and store the result in R3.
b) Write a code to generate a delay of 1 sec using Registers.
c) write a short note on Timers.
d) Explain the input / output ports in 8051.
e) write a program to interface Switch & LED with 8051 provided that when the switch is pressed, LED should be ON.

Q.5 Attempt any 2 **12**

a) Write a Program to interface the 4×4 matrix keypad as input and 7-segment display as output with 8051.
b) Draw and explain the External Memory Interfacing with 8051. Attach 8KB RAM externally. Also find the starting and end address.
c) Write an 8051C program to toggle all the bits of port 1 continuously with 1 min delay in between.

Seat No.	

Set **R**

S.Y. (B. Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

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

2) An alternate function of port pin P3.4 in the 8051 is: _____
a) Timer 0 b) Timer 1
c) Interrupt 0 d) Interrupt 1

3) The I/O ports that are used as address and data for external memory are: _____
a) Port 1 and 2 b) Port 1 and 3
c) Port 0 and 2 d) Port 0 and 3

4) Microcontrollers often have: _____
a) CPUs b) RAM
c) ROM d) All of the above

5) The internal ROM memory of the 8051 is:
a) 4 KBytes b) 6 Kbytes
c) 128 bytes d) 256 bytes

6) This program code will be executed continuously:

```
LOOP: MOV A,#03h
      DEC A
      JNZ LOOP
```

a) TRUE b) FALSE
c) gives error d) loop execute 3 times

7) After reset the stack pointer in microcontroller, 8051 is initialized to ____.
a) 70 H b) FF H
c) 00 H d) 07 H

8) Vector address of timer /counter1 interrupt is _____ h.
a) 0003 b) 0013
c) 000B d) 001B

9) Program status word register of 8051 is ____.
a) only bit addressable
b) only byte addressable
c) Bit addressable as well as byte addressable
d) none of above

10) What is the address range of Register bank 0 in 8051?
a) 00h-07h b) 00h-FFh
c) 80h-7Fh d) 80h-FFh

11) The 8051 has _____ 16-bit counter/timers.
a) 1 b) 2
c) 3 d) 4

12) The contents of the accumulator after this operation
MOV A,#0CH
ANL A,#0CH
will be _____.
a) 00001100 b) 00001101
c) 11111111 d) 11000000

13) The 8051 can handle _____ interrupt sources.
a) 3 b) 4
c) 5 d) 6

14) MOV A, @R1 will _____
a) Copy R1 to Accumulator
b) Copy Accumulator to R1
c) Copy the contents of memory whose address is in R1 to Accumulator
d) Copy the accumulator to memory whose address is in R1

Seat No.	

Set **R**

S.Y. (B. Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any 4 **16**

a) State functional difference between Microprocessor & Microcontroller.
b) Explain various logical instructions related with 8051 with syntax and example.
c) Write ALP for delay 200ms; Use Timer 0 in Model.
d) Explain different features of 8051.
e) Explain following Pins if 8051 Microcontroller
1) ALE/PROG 2) RST
3) XTAL1 and XTAL2 4) PSEN

Q.3 Solve any 2 **12**

a) Compare the Von-Neumann and Harvard Architecture.
b) Explain different Addressing modes with example in 8051.
c) Write a short note on i) TMOD ii) SCON iii) SBUF

Section – II

Q.4 Solve any 4 **16**

a) Write a code for addition of 2 numbers stored in R1 and R2, and store the result in R3.
b) Write a code to generate a delay of 1 sec using Registers.
c) write a short note on Timers.
d) Explain the input / output ports in 8051.
e) write a program to interface Switch & LED with 8051 provided that when the switch is pressed, LED should be ON.

Q.5 Attempt any 2 **12**

a) Write a Program to interface the 4×4 matrix keypad as input and 7-segment display as output with 8051.
b) Draw and explain the External Memory Interfacing with 8051. Attach 8KB RAM externally. Also find the starting and end address.
c) Write an 8051C program to toggle all the bits of port 1 continuously with 1 min delay in between.

Seat No.	

Set **S**

S.Y. (B. Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the address range of Register bank 0 in 8051?
a) 00h-07h b) 00h-FFh
c) 80h-7Fh d) 80h-FFh

2) The 8051 has _____ 16-bit counter/timers.
a) 1 b) 2
c) 3 d) 4

3) The contents of the accumulator after this operation
MOV A,#0CH
ANL A,#0CH
will be _____.
a) 00001100 b) 00001101
c) 11111111 d) 11000000

4) The 8051 can handle _____ interrupt sources.
a) 3 b) 4
c) 5 d) 6

5) MOV A, @R1 will _____
a) Copy R1 to Accumulator
b) Copy Accumulator to R1
c) Copy the contents of memory whose address is in R1 to Accumulator
d) Copy the accumulator to memory whose address is in R1

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

7) An alternate function of port pin P3.4 in the 8051 is: _____

a) Timer 0 b) Timer 1
c) Interrupt 0 d) Interrupt 1

8) The I/O ports that are used as address and data for external memory are: _____

a) Port 1 and 2 b) Port 1 and 3
c) Port 0 and 2 d) Port 0 and 3

9) Microcontrollers often have: _____

a) CPUs b) RAM
c) ROM d) All of the above

10) The internal ROM memory of the 8051 is:

a) 4 KBytes b) 6 Kbytes
c) 128 bytes d) 256 bytes

11) This program code will be executed continuously:

```
LOOP: MOV A,#03h
      DEC A
      JNZ LOOP
```

a) TRUE b) FALSE
c) gives error d) loop execute 3 times

12) After reset the stack pointer in microcontroller, 8051 is initialized to ____.

a) 70 H b) FF H
c) 00 H d) 07 H

13) Vector address of timer /counter1 interrupt is _____ h.

a) 0003 b) 0013
c) 000B d) 001B

14) Program status word register of 8051 is ____.

a) only bit addressable
b) only byte addressable
c) Bit addressable as well as byte addressable
d) none of above

Seat No.	

Set **S**

S.Y. (B. Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any 4 **16**

a) State functional difference between Microprocessor & Microcontroller.
b) Explain various logical instructions related with 8051 with syntax and example.
c) Write ALP for delay 200ms; Use Timer 0 in Model.
d) Explain different features of 8051.
e) Explain following Pins if 8051 Microcontroller
1) ALE/PROG 2) RST
3) XTAL1 and XTAL2 4) PSEN

Q.3 Solve any 2 **12**

a) Compare the Von-Neumann and Harvard Architecture.
b) Explain different Addressing modes with example in 8051.
c) Write a short note on i) TMOD ii) SCON iii) SBUF

Section – II

Q.4 Solve any 4 **16**

a) Write a code for addition of 2 numbers stored in R1 and R2, and store the result in R3.
b) Write a code to generate a delay of 1 sec using Registers.
c) write a short note on Timers.
d) Explain the input / output ports in 8051.
e) write a program to interface Switch & LED with 8051 provided that when the switch is pressed, LED should be ON.

Q.5 Attempt any 2 **12**

a) Write a Program to interface the 4×4 matrix keypad as input and 7-segment display as output with 8051.
b) Draw and explain the External Memory Interfacing with 8051. Attach 8KB RAM externally. Also find the starting and end address.
c) Write an 8051C program to toggle all the bits of port 1 continuously with 1 min delay in between.

SLR-BD-214

Seat No.	

Set P

S. Y. (B. Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The internal ROM memory of the 8051 is:
a) 4 KBytes b) 6 Kbytes
c) 128 bytes d) 256 bytes

2) This program code will be executed continuously:
```
LOOP: MOV A,#03h
      DEC A
      JNZ LOOP
```
a) TRUE b) FALSE
c) gives error d) loop execute 3 times

3) After reset the stack pointer in microcontroller, 8051 is initialized to ____.
a) 70 H b) FF H
c) 00 H d) 07 H

4) Vector address of timer /counter1 interrupt is _____ h.
a) 0003 b) 0013
c) 000B d) 001B

5) Program status word register of 8051 is ____.
a) only bit addressable
b) only byte addressable
c) Bit addressable as well as byte addressable
d) none of above

6) What is the address range of Register bank 0 in 8051?
a) 00h-07h b) 00h-FFh
c) 80h-7Fh d) 80h-FFh

7) The 8051 has _____ 16-bit counter/timers.
a) 1 b) 2
c) 3 d) 4

8) The contents of the accumulator after this operation
MOV A,#0CH
ANL A,#0CH
will be _____.
a) 00001100 b) 00001101
c) 11111111 d) 11000000

9) The 8051 can handle _____ interrupt sources.
a) 3 b) 4
c) 5 d) 6

10) MOV A, @R1 will _____
a) Copy R1 to Accumulator
b) Copy Accumulator to R1
c) Copy the contents of memory whose address is in R1 to Accumulator
d) Copy the accumulator to memory whose address is in R1

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

12) An alternate function of port pin P3.4 in the 8051 is: _____
a) Timer 0 b) Timer 1
c) Interrupt 0 d) Interrupt 1

13) The I/O ports that are used as address and data for external memory are: _____
a) Port 1 and 2 b) Port 1 and 3
c) Port 0 and 2 d) Port 0 and 3

14) Microcontrollers often have: _____
a) CPUs b) RAM
c) ROM d) All of the above

Seat No.	

Set P

S. Y. (B. Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any 4 **16**

a) State functional difference between Microprocessor & Microcontroller.
b) Explain various logical instructions related with 8051 with syntax and example.
c) Write ALP for delay 200ms; Use Timer 0 in Model.
d) Explain different features of 8051.
e) Explain following Pins if 8051 Microcontroller
1) ALE/PROG 2) RST
3) XTAL1 and XTAL2 4) PSEN

Q.3 Solve any 2 **12**

a) Compare the Von-Neumann and Harvard Architecture.
b) Explain different Addressing modes with example in 8051.
c) Write a short note on i) TMOD ii) SCON iii) SBUF

Section – II

Q.4 Solve any 4 **16**

a) Write a code for addition of 2 numbers stored in R1 and R2, and store the result in R3.
b) Write a code to generate a delay of 1 sec using Registers.
c) write a short note on Timers.
d) Explain the input / output ports in 8051.
e) write a program to interface Switch & LED with 8051 provided that when the switch is pressed, LED should be ON.

Q.5 Attempt any 2 **12**

a) Write a Program to interface the 4×4 matrix keypad as input and 7-segment display as output with 8051.
b) Draw and explain the External Memory Interfacing with 8051. Attach 8KB RAM externally. Also find the starting and end address.
c) Write an 8051C program to toggle all the bits of port 1 continuously with 1 min delay in between.

SLR-BD-214

Seat No.	

Set Q

S. Y. (B. Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) The contents of the accumulator after this operation
MOV A,#0CH
ANL A,#0CH
will be _____.
a) 00001100 b) 00001101
c) 11111111 d) 11000000

2) The 8051 can handle _____ interrupt sources.
a) 3 b) 4
c) 5 d) 6

3) MOV A, @R1 will _____
a) Copy R1 to Accumulator
b) Copy Accumulator to R1
c) Copy the contents of memory whose address is in R1 to Accumulator
d) Copy the accumulator to memory whose address is in R1

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

5) An alternate function of port pin P3.4 in the 8051 is: _____
a) Timer 0 b) Timer 1
c) Interrupt 0 d) Interrupt 1

6) The I/O ports that are used as address and data for external memory are: _____
a) Port 1 and 2 b) Port 1 and 3
c) Port 0 and 2 d) Port 0 and 3

7) Microcontrollers often have: _____

a) CPUs b) RAM
c) ROM d) All of the above

8) The internal ROM memory of the 8051 is:

a) 4 KBytes b) 6 Kbytes
c) 128 bytes d) 256 bytes

9) This program code will be executed continuously:

```
LOOP: MOV A,#03h
      DEC A
      JNZ LOOP
```

a) TRUE b) FALSE
c) gives error d) loop execute 3 times

10) After reset the stack pointer in microcontroller, 8051 is initialized to ____.

a) 70 H b) FF H
c) 00 H d) 07 H

11) Vector address of timer /counter1 interrupt is _____ h.

a) 0003 b) 0013
c) 000B d) 001B

12) Program status word register of 8051 is ____.

a) only bit addressable
b) only byte addressable
c) Bit addressable as well as byte addressable
d) none of above

13) What is the address range of Register bank 0 in 8051?

a) 00h-07h b) 00h-FFh
c) 80h-7Fh d) 80h-FFh

14) The 8051 has _____ 16-bit counter/timers.

a) 1 b) 2
c) 3 d) 4

Seat No.	

Set **Q**

S. Y. (B. Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any 4 **16**

a) State functional difference between Microprocessor & Microcontroller.
b) Explain various logical instructions related with 8051 with syntax and example.
c) Write ALP for delay 200ms; Use Timer 0 in Model.
d) Explain different features of 8051.
e) Explain following Pins if 8051 Microcontroller
1) ALE/PROG 2) RST
3) XTAL1 and XTAL2 4) PSEN

Q.3 Solve any 2 **12**

a) Compare the Von-Neumann and Harvard Architecture.
b) Explain different Addressing modes with example in 8051.
c) Write a short note on i) TMOD ii) SCON iii) SBUF

Section – II

Q.4 Solve any 4 **16**

a) Write a code for addition of 2 numbers stored in R1 and R2, and store the result in R3.
b) Write a code to generate a delay of 1 sec using Registers.
c) write a short note on Timers.
d) Explain the input / output ports in 8051.
e) write a program to interface Switch & LED with 8051 provided that when the switch is pressed, LED should be ON.

Q.5 Attempt any 2 **12**

a) Write a Program to interface the 4×4 matrix keypad as input and 7-segment display as output with 8051.
b) Draw and explain the External Memory Interfacing with 8051. Attach 8KB RAM externally. Also find the starting and end address.
c) Write an 8051C program to toggle all the bits of port 1 continuously with 1 min delay in between.

Seat No.	

Set **R**

S. Y. (B. Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

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

2) An alternate function of port pin P3.4 in the 8051 is: _____
a) Timer 0 b) Timer 1
c) Interrupt 0 d) Interrupt 1

3) The I/O ports that are used as address and data for external memory are: _____
a) Port 1 and 2 b) Port 1 and 3
c) Port 0 and 2 d) Port 0 and 3

4) Microcontrollers often have: _____
a) CPUs b) RAM
c) ROM d) All of the above

5) The internal ROM memory of the 8051 is:
a) 4 KBytes b) 6 Kbytes
c) 128 bytes d) 256 bytes

6) This program code will be executed continuously:

```
LOOP: MOV A,#03h
      DEC A
      JNZ LOOP
```

a) TRUE b) FALSE
c) gives error d) loop execute 3 times

7) After reset the stack pointer in microcontroller, 8051 is initialized to ____.
a) 70 H b) FF H
c) 00 H d) 07 H

8) Vector address of timer /counter1 interrupt is _____ h.
a) 0003 b) 0013
c) 000B d) 001B

9) Program status word register of 8051 is ____.
a) only bit addressable
b) only byte addressable
c) Bit addressable as well as byte addressable
d) none of above

10) What is the address range of Register bank 0 in 8051?
a) 00h-07h b) 00h-FFh
c) 80h-7Fh d) 80h-FFh

11) The 8051 has _____ 16-bit counter/timers.
a) 1 b) 2
c) 3 d) 4

12) The contents of the accumulator after this operation
MOV A,#0CH
ANL A,#0CH
will be _____.
a) 00001100 b) 00001101
c) 11111111 d) 11000000

13) The 8051 can handle _____ interrupt sources.
a) 3 b) 4
c) 5 d) 6

14) MOV A, @R1 will _____
a) Copy R1 to Accumulator
b) Copy Accumulator to R1
c) Copy the contents of memory whose address is in R1 to Accumulator
d) Copy the accumulator to memory whose address is in R1

Seat No.	

Set **R**

S. Y. (B. Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any 4 **16**

a) State functional difference between Microprocessor & Microcontroller.
b) Explain various logical instructions related with 8051 with syntax and example.
c) Write ALP for delay 200ms; Use Timer 0 in Model.
d) Explain different features of 8051.
e) Explain following Pins if 8051 Microcontroller
1) ALE/PROG 2) RST
3) XTAL1 and XTAL2 4) PSEN

Q.3 Solve any 2 **12**

a) Compare the Von-Neumann and Harvard Architecture.
b) Explain different Addressing modes with example in 8051.
c) Write a short note on i) TMOD ii) SCON iii) SBUF

Section – II

Q.4 Solve any 4 **16**

a) Write a code for addition of 2 numbers stored in R1 and R2, and store the result in R3.
b) Write a code to generate a delay of 1 sec using Registers.
c) write a short note on Timers.
d) Explain the input / output ports in 8051.
e) write a program to interface Switch & LED with 8051 provided that when the switch is pressed, LED should be ON.

Q.5 Attempt any 2 **12**

a) Write a Program to interface the 4×4 matrix keypad as input and 7-segment display as output with 8051.
b) Draw and explain the External Memory Interfacing with 8051. Attach 8KB RAM externally. Also find the starting and end address.
c) Write an 8051C program to toggle all the bits of port 1 continuously with 1 min delay in between.

SLR-BD-214

Seat No.		Set	S

S. Y. (B. Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the address range of Register bank 0 in 8051?
a) 00h-07h b) 00h-FFh
c) 80h-7Fh d) 80h-FFh

2) The 8051 has _____ 16-bit counter/timers.
a) 1 b) 2
c) 3 d) 4

3) The contents of the accumulator after this operation
MOV A,#0CH
ANL A,#0CH
will be _____.
a) 00001100 b) 00001101
c) 11111111 d) 11000000

4) The 8051 can handle _____ interrupt sources.
a) 3 b) 4
c) 5 d) 6

5) MOV A, @R1 will _____
a) Copy R1 to Accumulator
b) Copy Accumulator to R1
c) Copy the contents of memory whose address is in R1 to Accumulator
d) Copy the accumulator to memory whose address is in R1

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

7) An alternate function of port pin P3.4 in the 8051 is: _____

a) Timer 0 b) Timer 1
c) Interrupt 0 d) Interrupt 1

8) The I/O ports that are used as address and data for external memory are: _____

a) Port 1 and 2 b) Port 1 and 3
c) Port 0 and 2 d) Port 0 and 3

9) Microcontrollers often have: _____

a) CPUs b) RAM
c) ROM d) All of the above

10) The internal ROM memory of the 8051 is:

a) 4 KBytes b) 6 Kbytes
c) 128 bytes d) 256 bytes

11) This program code will be executed continuously:

```
LOOP: MOV A,#03h
      DEC A
      JNZ LOOP
```

a) TRUE b) FALSE
c) gives error d) loop execute 3 times

12) After reset the stack pointer in microcontroller, 8051 is initialized to ____.

a) 70 H b) FF H
c) 00 H d) 07 H

13) Vector address of timer /counter1 interrupt is _____ h.

a) 0003 b) 0013
c) 000B d) 001B

14) Program status word register of 8051 is ____.

a) only bit addressable
b) only byte addressable
c) Bit addressable as well as byte addressable
d) none of above

Seat No.	

Set **S**

S. Y. (B. Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Microcontroller (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any 4 **16**

a) State functional difference between Microprocessor & Microcontroller.
b) Explain various logical instructions related with 8051 with syntax and example.
c) Write ALP for delay 200ms; Use Timer 0 in Model.
d) Explain different features of 8051.
e) Explain following Pins if 8051 Microcontroller
1) ALE/PROG 2) RST
3) XTAL1 and XTAL2 4) PSEN

Q.3 Solve any 2 **12**

a) Compare the Von-Neumann and Harvard Architecture.
b) Explain different Addressing modes with example in 8051.
c) Write a short note on i) TMOD ii) SCON iii) SBUF

Section – II

Q.4 Solve any 4 **16**

a) Write a code for addition of 2 numbers stored in R1 and R2, and store the result in R3.
b) Write a code to generate a delay of 1 sec using Registers.
c) write a short note on Timers.
d) Explain the input / output ports in 8051.
e) write a program to interface Switch & LED with 8051 provided that when the switch is pressed, LED should be ON.

Q.5 Attempt any 2 **12**

a) Write a Program to interface the 4×4 matrix keypad as input and 7-segment display as output with 8051.
b) Draw and explain the External Memory Interfacing with 8051. Attach 8KB RAM externally. Also find the starting and end address.
c) Write an 8051C program to toggle all the bits of port 1 continuously with 1 min delay in between.

Seat No.	

Set **P**

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which IoT characteristic ensures that devices can work with different platforms?
a) Reliability b) Scalability
c) Interoperability d) Maintainability

2) The IOT application layer is responsible for: ____
a) Collecting data from devices
b) Providing interfaces to the user
c) Transmitting data between devices
d) Authenticating users

3) What is the main purpose of the gateway in IOT?
a) Secure device communication
b) Transmit data to the cloud
c) Provide power to devices
d) Collect user input

4) The Gyro sensor measures: ____
a) Angular velocity b) Pressure
c) Force d) Temperature

5) A relay is necessary when using actuators because ____
a) To isolate high-power actuators from low-power circuits
b) To provide more precise control
c) To amplify the actuator's signal
d) To reduce the actuator's power consumption

6) What could happen if a sensor is supplied with voltage above or below its required range?

a) It will always work efficiently
b) It will generate more power
c) It will automatically adjust its voltage
c) It may fail or produce incorrect readings

7) Which component in a servo motor provides position feedback?

a) Gearbox b) Output shaft
c) Control circuit d) Potentiometer

8) Why is BLE ideal for wearable IoT devices?

a) High-speed data transmission
b) Long-range communication
c) Low power consumption
d) High memory usage

9) Which topology is best for a home automation system with a central controller?

a) Star topology b) Ring topology
c) Mesh topology d) Point-to-point topology

10) Which problem is likely in ring topology if a node fails?

a) Increased power consumption
b) Network breakdown
c) Reduced speed
d) More memory usage

11) The _____ message in CoAP ensures reliable communication by requiring an acknowledgment.

a) NON b) RST
c) ACK d) CON

12) You are designing a home automation system for elderly care. Which feature would you prioritize?

a) Gaming support b) Automated Irrigation
c) Fall detection and alerts d) Music control

13) Which thing helps detect available parking slots in a smart parking system?

a) Microphone b) Servo motor
c) Ultrasonic sensor d) Thermistor

14) What is the impact of sensor failure in an irrigation system?

a) Overwatering or under watering
b) Accurate irrigation
c) Increased crop yield
d) Beller energy usage

SLR-BD-215

Seat No.	

Set P

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any FOUR Questions **16**

a) Describe the main components of an loT system with neat sketch.

b) Draw the layered architecture of the Internet of Things (loT) and explain the function of each layer in brief.

c) Explain Need of ADC Chip while using Analog Sensors.

d) Describe the key voltage considerations when designing a sensor-based IoT system. Give examples of common voltage ranges used.

e) Compare Sharp IR Distance Sensor with ultrasonic sensors (any 4 Points).

Q.3 Attempt any TWO **12**

a) What is role of Actuator in IoT. Give examples of commonly used actuators in IoT. Explain working of any one in detail.

b) What is a PIR Sensor? Why it is called Passive? Describe how Motion Detected using a PIR sensor with neat sketch.

c) Define IoT. List and Explain Design challenges & security challenges related to IoT.

Section – II

Q.4 Attempt Any FOUR Questions **16**

a) Describe the architecture of a Li-Fi system with a neat diagram.

b) Explain the MQTT architecture with the roles of Publisher, Subscriber, and Broker.

c) List the various sensors and actuators used in smart home automation system and justify their selection.

d) Discuss the advantages, disadvantages and applications of CoAP for constrained IoT devices.

e) What is Presence in XMPP? How does it help in IoT and messaging applications?

Q.5 Attempt any TWO **12**

a) Explain the role of the central node (hub/ switch /gateway) in Star Topology. Compare Star Topology with Ring and Mesh Topologies.

b) Farmers are struggling with improper watering of crops due to irregular rainfall, leading to low crop yield.

Develop an IoT-based Smart Agriculture system focusing on soil moisture monitoring and automated irrigation. State challenges in system design.

c) A city faces frequent traffic jams due to drivers wasting time finding parking slots in crowded areas.

Propose a Smart Parking IoT solution to efficiently guide drivers to available parking spots. Draw the system architecture and explain working.

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Why is BLE ideal for wearable IoT devices?
a) High-speed data transmission
b) Long-range communication
c) Low power consumption
d) High memory usage

2) Which topology is best for a home automation system with a central controller?
a) Star topology b) Ring topology
c) Mesh topology d) Point-to-point topology

3) Which problem is likely in ring topology if a node fails?
a) Increased power consumption
b) Network breakdown
c) Reduced speed
d) More memory usage

4) The _____ message in CoAP ensures reliable communication by requiring an acknowledgment.
a) NON b) RST
c) ACK d) CON

5) You are designing a home automation system for elderly care. Which feature would you prioritize?
a) Gaming support b) Automated Irrigation
c) Fall detection and alerts d) Music control

6) Which thing helps detect available parking slots in a smart parking system?
a) Microphone b) Servo motor
c) Ultrasonic sensor d) Thermistor

7) What is the impact of sensor failure in an irrigation system?
a) Overwatering or under watering
b) Accurate irrigation
c) Increased crop yield
d) Beller energy usage

8) Which IoT characteristic ensures that devices can work with different platforms?
a) Reliability
b) Scalability
c) Interoperability
d) Maintainability

9) The IOT application layer is responsible for: ____
a) Collecting data from devices
b) Providing interfaces to the user
c) Transmitting data between devices
d) Authenticating users

10) What is the main purpose of the gateway in IOT?
a) Secure device communication
b) Transmit data to the cloud
c) Provide power to devices
d) Collect user input

11) The Gyro sensor measures: ____
a) Angular velocity
b) Pressure
c) Force
d) Temperature

12) A relay is necessary when using actuators because ____
a) To isolate high-power actuators from low-power circuits
b) To provide more precise control
c) To amplify the actuator's signal
d) To reduce the actuator's power consumption

13) What could happen if a sensor is supplied with voltage above or below its required range?
a) It will always work efficiently
b) It will generate more power
c) It will automatically adjust its voltage
c) It may fail or produce incorrect readings

14) Which component in a servo motor provides position feedback?
a) Gearbox
b) Output shaft
c) Control circuit
d) Potentiometer

SLR-BD-215

Seat No.	

Set Q

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any FOUR Questions **16**

a) Describe the main components of an loT system with neat sketch.

b) Draw the layered architecture of the Internet of Things (loT) and explain the function of each layer in brief.

c) Explain Need of ADC Chip while using Analog Sensors.

d) Describe the key voltage considerations when designing a sensor-based IoT system. Give examples of common voltage ranges used.

e) Compare Sharp IR Distance Sensor with ultrasonic sensors (any 4 Points).

Q.3 Attempt any TWO **12**

a) What is role of Actuator in IoT. Give examples of commonly used actuators in IoT. Explain working of any one in detail.

b) What is a PIR Sensor? Why it is called Passive? Describe how Motion Detected using a PIR sensor with neat sketch.

c) Define IoT. List and Explain Design challenges & security challenges related to IoT.

Section – II

Q.4 Attempt Any FOUR Questions **16**

a) Describe the architecture of a Li-Fi system with a neat diagram.

b) Explain the MQTT architecture with the roles of Publisher, Subscriber, and Broker.

c) List the various sensors and actuators used in smart home automation system and justify their selection.

d) Discuss the advantages, disadvantages and applications of CoAP for constrained IoT devices.

e) What is Presence in XMPP? How does it help in IoT and messaging applications?

Q.5 Attempt any TWO **12**

a) Explain the role of the central node (hub/ switch /gateway) in Star Topology. Compare Star Topology with Ring and Mesh Topologies.

b) Farmers are struggling with improper watering of crops due to irregular rainfall, leading to low crop yield.

Develop an IoT-based Smart Agriculture system focusing on soil moisture monitoring and automated irrigation. State challenges in system design.

c) A city faces frequent traffic jams due to drivers wasting time finding parking slots in crowded areas.

Propose a Smart Parking IoT solution to efficiently guide drivers to available parking spots. Draw the system architecture and explain working.

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The _____ message in CoAP ensures reliable communication by requiring an acknowledgment.
a) NON b) RST
c) ACK d) CON

2) You are designing a home automation system for elderly care. Which feature would you prioritize?
a) Gaming support b) Automated Irrigation
c) Fall detection and alerts d) Music control

3) Which thing helps detect available parking slots in a smart parking system?
a) Microphone b) Servo motor
c) Ultrasonic sensor d) Thermistor

4) What is the impact of sensor failure in an irrigation system?
a) Overwatering or under watering
b) Accurate irrigation
c) Increased crop yield
d) Beller energy usage

5) Which IoT characteristic ensures that devices can work with different platforms?
a) Reliability b) Scalability
c) Interoperability d) Maintainability

6) The IOT application layer is responsible for: ____
a) Collecting data from devices
b) Providing interfaces to the user
c) Transmitting data between devices
d) Authenticating users

7) What is the main purpose of the gateway in IOT?
a) Secure device communication
b) Transmit data to the cloud
c) Provide power to devices
d) Collect user input

8) The Gyro sensor measures: ____
a) Angular velocity
b) Pressure
c) Force
d) Temperature

9) A relay is necessary when using actuators because ____
a) To isolate high-power actuators from low-power circuits
b) To provide more precise control
c) To amplify the actuator's signal
d) To reduce the actuator's power consumption

10) What could happen if a sensor is supplied with voltage above or below its required range?
a) It will always work efficiently
b) It will generate more power
c) It will automatically adjust its voltage
c) It may fail or produce incorrect readings

11) Which component in a servo motor provides position feedback?
a) Gearbox
b) Output shaft
c) Control circuit
d) Potentiometer

12) Why is BLE ideal for wearable IoT devices?
a) High-speed data transmission
b) Long-range communication
c) Low power consumption
d) High memory usage

13) Which topology is best for a home automation system with a central controller?
a) Star topology
b) Ring topology
c) Mesh topology
d) Point-to-point topology

14) Which problem is likely in ring topology if a node fails?
a) Increased power consumption
b) Network breakdown
c) Reduced speed
d) More memory usage

SLR-BD-215

Seat No.	

Set R

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any FOUR Questions **16**

a) Describe the main components of an loT system with neat sketch.

b) Draw the layered architecture of the Internet of Things (loT) and explain the function of each layer in brief.

c) Explain Need of ADC Chip while using Analog Sensors.

d) Describe the key voltage considerations when designing a sensor-based IoT system. Give examples of common voltage ranges used.

e) Compare Sharp IR Distance Sensor with ultrasonic sensors (any 4 Points).

Q.3 Attempt any TWO **12**

a) What is role of Actuator in IoT. Give examples of commonly used actuators in IoT. Explain working of any one in detail.

b) What is a PIR Sensor? Why it is called Passive? Describe how Motion Detected using a PIR sensor with neat sketch.

c) Define IoT. List and Explain Design challenges & security challenges related to IoT.

Section – II

Q.4 Attempt Any FOUR Questions **16**

a) Describe the architecture of a Li-Fi system with a neat diagram.

b) Explain the MQTT architecture with the roles of Publisher, Subscriber, and Broker.

c) List the various sensors and actuators used in smart home automation system and justify their selection.

d) Discuss the advantages, disadvantages and applications of CoAP for constrained IoT devices.

e) What is Presence in XMPP? How does it help in IoT and messaging applications?

Q.5 Attempt any TWO **12**

a) Explain the role of the central node (hub/ switch /gateway) in Star Topology. Compare Star Topology with Ring and Mesh Topologies.

b) Farmers are struggling with improper watering of crops due to irregular rainfall, leading to low crop yield.

Develop an IoT-based Smart Agriculture system focusing on soil moisture monitoring and automated irrigation. State challenges in system design.

c) A city faces frequent traffic jams due to drivers wasting time finding parking slots in crowded areas.

Propose a Smart Parking IoT solution to efficiently guide drivers to available parking spots. Draw the system architecture and explain working.

Seat No.	

Set **S**

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What could happen if a sensor is supplied with voltage above or below its required range?
a) It will always work efficiently
b) It will generate more power
c) It will automatically adjust its voltage
c) It may fail or produce incorrect readings

2) Which component in a servo motor provides position feedback?
a) Gearbox b) Output shaft
c) Control circuit d) Potentiometer

3) Why is BLE ideal for wearable IoT devices?
a) High-speed data transmission
b) Long-range communication
c) Low power consumption
d) High memory usage

4) Which topology is best for a home automation system with a central controller?
a) Star topology b) Ring topology
c) Mesh topology d) Point-to-point topology

5) Which problem is likely in ring topology if a node fails?
a) Increased power consumption
b) Network breakdown
c) Reduced speed
d) More memory usage

6) The _____ message in CoAP ensures reliable communication by requiring an acknowledgment.

a) NON b) RST
c) ACK d) CON

7) You are designing a home automation system for elderly care. Which feature would you prioritize?

a) Gaming support b) Automated Irrigation
c) Fall detection and alerts d) Music control

8) Which thing helps detect available parking slots in a smart parking system?

a) Microphone b) Servo motor
c) Ultrasonic sensor d) Thermistor

9) What is the impact of sensor failure in an irrigation system?

a) Overwatering or under watering
b) Accurate irrigation
c) Increased crop yield
d) Beller energy usage

10) Which IoT characteristic ensures that devices can work with different platforms?

a) Reliability b) Scalability
c) Interoperability d) Maintainability

11) The IOT application layer is responsible for: ____

a) Collecting data from devices
b) Providing interfaces to the user
c) Transmitting data between devices
d) Authenticating users

12) What is the main purpose of the gateway in IOT?

a) Secure device communication
b) Transmit data to the cloud
c) Provide power to devices
d) Collect user input

13) The Gyro sensor measures: ____

a) Angular velocity b) Pressure
c) Force d) Temperature

14) A relay is necessary when using actuators because ____

a) To isolate high-power actuators from low-power circuits
b) To provide more precise control
c) To amplify the actuator's signal
d) To reduce the actuator's power consumption

SLR-BD-215

Seat No.		Set	S

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any FOUR Questions **16**

a) Describe the main components of an loT system with neat sketch.

b) Draw the layered architecture of the Internet of Things (loT) and explain the function of each layer in brief.

c) Explain Need of ADC Chip while using Analog Sensors.

d) Describe the key voltage considerations when designing a sensor-based IoT system. Give examples of common voltage ranges used.

e) Compare Sharp IR Distance Sensor with ultrasonic sensors (any 4 Points).

Q.3 Attempt any TWO **12**

a) What is role of Actuator in IoT. Give examples of commonly used actuators in IoT. Explain working of any one in detail.

b) What is a PIR Sensor? Why it is called Passive? Describe how Motion Detected using a PIR sensor with neat sketch.

c) Define IoT. List and Explain Design challenges & security challenges related to IoT.

Section – II

Q.4 Attempt Any FOUR Questions **16**

a) Describe the architecture of a Li-Fi system with a neat diagram.

b) Explain the MQTT architecture with the roles of Publisher, Subscriber, and Broker.

c) List the various sensors and actuators used in smart home automation system and justify their selection.

d) Discuss the advantages, disadvantages and applications of CoAP for constrained IoT devices.

e) What is Presence in XMPP? How does it help in IoT and messaging applications?

Q.5 Attempt any TWO **12**

a) Explain the role of the central node (hub/ switch /gateway) in Star Topology. Compare Star Topology with Ring and Mesh Topologies.

b) Farmers are struggling with improper watering of crops due to irregular rainfall, leading to low crop yield.

Develop an IoT-based Smart Agriculture system focusing on soil moisture monitoring and automated irrigation. State challenges in system design.

c) A city faces frequent traffic jams due to drivers wasting time finding parking slots in crowded areas.

Propose a Smart Parking IoT solution to efficiently guide drivers to available parking spots. Draw the system architecture and explain working.

Seat No.	

Set P

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which IoT characteristic ensures that devices can work with different platforms?
a) Reliability b) Scalability
c) Interoperability d) Maintainability

2) The IOT application layer is responsible for: ____
a) Collecting data from devices
b) Providing interfaces to the user
c) Transmitting data between devices
d) Authenticating users

3) What is the main purpose of the gateway in IOT?
a) Secure device communication
b) Transmit data to the cloud
c) Provide power to devices
d) Collect user input

4) The Gyro sensor measures: ____
a) Angular velocity b) Pressure
c) Force d) Temperature

5) A relay is necessary when using actuators because ____
a) To isolate high-power actuators from low-power circuits
b) To provide more precise control
c) To amplify the actuator's signal
d) To reduce the actuator's power consumption

6) What could happen if a sensor is supplied with voltage above or below its required range?

a) It will always work efficiently
b) It will generate more power
c) It will automatically adjust its voltage
c) It may fail or produce incorrect readings

7) Which component in a servo motor provides position feedback?

a) Gearbox b) Output shaft
c) Control circuit d) Potentiometer

8) Why is BLE ideal for wearable IoT devices?

a) High-speed data transmission
b) Long-range communication
c) Low power consumption
d) High memory usage

9) Which topology is best for a home automation system with a central controller?

a) Star topology b) Ring topology
c) Mesh topology d) Point-to-point topology

10) Which problem is likely in ring topology if a node fails?

a) Increased power consumption
b) Network breakdown
c) Reduced speed
d) More memory usage

11) The _____ message in CoAP ensures reliable communication by requiring an acknowledgment.

a) NON b) RST
c) ACK d) CON

12) You are designing a home automation system for elderly care. Which feature would you prioritize?

a) Gaming support b) Automated Irrigation
c) Fall detection and alerts d) Music control

13) Which thing helps detect available parking slots in a smart parking system?

a) Microphone b) Servo motor
c) Ultrasonic sensor d) Thermistor

14) What is the impact of sensor failure in an irrigation system?

a) Overwatering or under watering
b) Accurate irrigation
c) Increased crop yield
d) Beller energy usage

SLR-BD-215

Seat No.	

Set P

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any FOUR Questions **16**

a) Describe the main components of an loT system with neat sketch.

b) Draw the layered architecture of the Internet of Things (loT) and explain the function of each layer in brief.

c) Explain Need of ADC Chip while using Analog Sensors.

d) Describe the key voltage considerations when designing a sensor-based IoT system. Give examples of common voltage ranges used.

e) Compare Sharp IR Distance Sensor with ultrasonic sensors (any 4 Points).

Q.3 Attempt any TWO **12**

a) What is role of Actuator in IoT. Give examples of commonly used actuators in IoT. Explain working of any one in detail.

b) What is a PIR Sensor? Why it is called Passive? Describe how Motion Detected using a PIR sensor with neat sketch.

c) Define IoT. List and Explain Design challenges & security challenges related to IoT.

Section – II

Q.4 Attempt Any FOUR Questions **16**

a) Describe the architecture of a Li-Fi system with a neat diagram.

b) Explain the MQTT architecture with the roles of Publisher, Subscriber, and Broker.

c) List the various sensors and actuators used in smart home automation system and justify their selection.

d) Discuss the advantages, disadvantages and applications of CoAP for constrained IoT devices.

e) What is Presence in XMPP? How does it help in IoT and messaging applications?

Q.5 Attempt any TWO **12**

a) Explain the role of the central node (hub/ switch /gateway) in Star Topology. Compare Star Topology with Ring and Mesh Topologies.

b) Farmers are struggling with improper watering of crops due to irregular rainfall, leading to low crop yield.

Develop an IoT-based Smart Agriculture system focusing on soil moisture monitoring and automated irrigation. State challenges in system design.

c) A city faces frequent traffic jams due to drivers wasting time finding parking slots in crowded areas.

Propose a Smart Parking IoT solution to efficiently guide drivers to available parking spots. Draw the system architecture and explain working.

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Why is BLE ideal for wearable IoT devices?
a) High-speed data transmission
b) Long-range communication
c) Low power consumption
d) High memory usage

2) Which topology is best for a home automation system with a central controller?
a) Star topology b) Ring topology
c) Mesh topology d) Point-to-point topology

3) Which problem is likely in ring topology if a node fails?
a) Increased power consumption
b) Network breakdown
c) Reduced speed
d) More memory usage

4) The _____ message in CoAP ensures reliable communication by requiring an acknowledgment.
a) NON b) RST
c) ACK d) CON

5) You are designing a home automation system for elderly care. Which feature would you prioritize?
a) Gaming support b) Automated Irrigation
c) Fall detection and alerts d) Music control

6) Which thing helps detect available parking slots in a smart parking system?
a) Microphone b) Servo motor
c) Ultrasonic sensor d) Thermistor

7) What is the impact of sensor failure in an irrigation system?
a) Overwatering or under watering
b) Accurate irrigation
c) Increased crop yield
d) Beller energy usage

8) Which IoT characteristic ensures that devices can work with different platforms?
a) Reliability
b) Scalability
c) Interoperability
d) Maintainability

9) The IOT application layer is responsible for: ____
a) Collecting data from devices
b) Providing interfaces to the user
c) Transmitting data between devices
d) Authenticating users

10) What is the main purpose of the gateway in IOT?
a) Secure device communication
b) Transmit data to the cloud
c) Provide power to devices
d) Collect user input

11) The Gyro sensor measures: ____
a) Angular velocity
b) Pressure
c) Force
d) Temperature

12) A relay is necessary when using actuators because ____
a) To isolate high-power actuators from low-power circuits
b) To provide more precise control
c) To amplify the actuator's signal
d) To reduce the actuator's power consumption

13) What could happen if a sensor is supplied with voltage above or below its required range?
a) It will always work efficiently
b) It will generate more power
c) It will automatically adjust its voltage
c) It may fail or produce incorrect readings

14) Which component in a servo motor provides position feedback?
a) Gearbox
b) Output shaft
c) Control circuit
d) Potentiometer

SLR-BD-215

Seat No.	

Set Q

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any FOUR Questions **16**

a) Describe the main components of an loT system with neat sketch.

b) Draw the layered architecture of the Internet of Things (loT) and explain the function of each layer in brief.

c) Explain Need of ADC Chip while using Analog Sensors.

d) Describe the key voltage considerations when designing a sensor-based IoT system. Give examples of common voltage ranges used.

e) Compare Sharp IR Distance Sensor with ultrasonic sensors (any 4 Points).

Q.3 Attempt any TWO **12**

a) What is role of Actuator in IoT. Give examples of commonly used actuators in IoT. Explain working of any one in detail.

b) What is a PIR Sensor? Why it is called Passive? Describe how Motion Detected using a PIR sensor with neat sketch.

c) Define IoT. List and Explain Design challenges & security challenges related to IoT.

Section – II

Q.4 Attempt Any FOUR Questions **16**

a) Describe the architecture of a Li-Fi system with a neat diagram.

b) Explain the MQTT architecture with the roles of Publisher, Subscriber, and Broker.

c) List the various sensors and actuators used in smart home automation system and justify their selection.

d) Discuss the advantages, disadvantages and applications of CoAP for constrained IoT devices.

e) What is Presence in XMPP? How does it help in IoT and messaging applications?

Q.5 Attempt any TWO **12**

a) Explain the role of the central node (hub/ switch /gateway) in Star Topology. Compare Star Topology with Ring and Mesh Topologies.

b) Farmers are struggling with improper watering of crops due to irregular rainfall, leading to low crop yield.

Develop an IoT-based Smart Agriculture system focusing on soil moisture monitoring and automated irrigation. State challenges in system design.

c) A city faces frequent traffic jams due to drivers wasting time finding parking slots in crowded areas.

Propose a Smart Parking IoT solution to efficiently guide drivers to available parking spots. Draw the system architecture and explain working.

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The _____ message in CoAP ensures reliable communication by requiring an acknowledgment.
a) NON b) RST
c) ACK d) CON

2) You are designing a home automation system for elderly care. Which feature would you prioritize?
a) Gaming support b) Automated Irrigation
c) Fall detection and alerts d) Music control

3) Which thing helps detect available parking slots in a smart parking system?
a) Microphone b) Servo motor
c) Ultrasonic sensor d) Thermistor

4) What is the impact of sensor failure in an irrigation system?
a) Overwatering or under watering
b) Accurate irrigation
c) Increased crop yield
d) Beller energy usage

5) Which IoT characteristic ensures that devices can work with different platforms?
a) Reliability b) Scalability
c) Interoperability d) Maintainability

6) The IOT application layer is responsible for: ____
a) Collecting data from devices
b) Providing interfaces to the user
c) Transmitting data between devices
d) Authenticating users

7) What is the main purpose of the gateway in IOT?
a) Secure device communication
b) Transmit data to the cloud
c) Provide power to devices
d) Collect user input

8) The Gyro sensor measures: ____
a) Angular velocity
b) Pressure
c) Force
d) Temperature

9) A relay is necessary when using actuators because ____
a) To isolate high-power actuators from low-power circuits
b) To provide more precise control
c) To amplify the actuator's signal
d) To reduce the actuator's power consumption

10) What could happen if a sensor is supplied with voltage above or below its required range?
a) It will always work efficiently
b) It will generate more power
c) It will automatically adjust its voltage
c) It may fail or produce incorrect readings

11) Which component in a servo motor provides position feedback?
a) Gearbox
b) Output shaft
c) Control circuit
d) Potentiometer

12) Why is BLE ideal for wearable IoT devices?
a) High-speed data transmission
b) Long-range communication
c) Low power consumption
d) High memory usage

13) Which topology is best for a home automation system with a central controller?
a) Star topology
b) Ring topology
c) Mesh topology
d) Point-to-point topology

14) Which problem is likely in ring topology if a node fails?
a) Increased power consumption
b) Network breakdown
c) Reduced speed
d) More memory usage

SLR-BD-215

Seat No.	

Set R

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any FOUR Questions **16**

a) Describe the main components of an loT system with neat sketch.

b) Draw the layered architecture of the Internet of Things (loT) and explain the function of each layer in brief.

c) Explain Need of ADC Chip while using Analog Sensors.

d) Describe the key voltage considerations when designing a sensor-based IoT system. Give examples of common voltage ranges used.

e) Compare Sharp IR Distance Sensor with ultrasonic sensors (any 4 Points).

Q.3 Attempt any TWO **12**

a) What is role of Actuator in IoT. Give examples of commonly used actuators in IoT. Explain working of any one in detail.

b) What is a PIR Sensor? Why it is called Passive? Describe how Motion Detected using a PIR sensor with neat sketch.

c) Define IoT. List and Explain Design challenges & security challenges related to IoT.

Section – II

Q.4 Attempt Any FOUR Questions **16**

a) Describe the architecture of a Li-Fi system with a neat diagram.

b) Explain the MQTT architecture with the roles of Publisher, Subscriber, and Broker.

c) List the various sensors and actuators used in smart home automation system and justify their selection.

d) Discuss the advantages, disadvantages and applications of CoAP for constrained IoT devices.

e) What is Presence in XMPP? How does it help in IoT and messaging applications?

Q.5 Attempt any TWO **12**

a) Explain the role of the central node (hub/ switch /gateway) in Star Topology. Compare Star Topology with Ring and Mesh Topologies.

b) Farmers are struggling with improper watering of crops due to irregular rainfall, leading to low crop yield.

Develop an IoT-based Smart Agriculture system focusing on soil moisture monitoring and automated irrigation. State challenges in system design.

c) A city faces frequent traffic jams due to drivers wasting time finding parking slots in crowded areas.

Propose a Smart Parking IoT solution to efficiently guide drivers to available parking spots. Draw the system architecture and explain working.

Seat No.	

Set **S**

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What could happen if a sensor is supplied with voltage above or below its required range?
a) It will always work efficiently
b) It will generate more power
c) It will automatically adjust its voltage
c) It may fail or produce incorrect readings

2) Which component in a servo motor provides position feedback?
a) Gearbox b) Output shaft
c) Control circuit d) Potentiometer

3) Why is BLE ideal for wearable IoT devices?
a) High-speed data transmission
b) Long-range communication
c) Low power consumption
d) High memory usage

4) Which topology is best for a home automation system with a central controller?
a) Star topology b) Ring topology
c) Mesh topology d) Point-to-point topology

5) Which problem is likely in ring topology if a node fails?
a) Increased power consumption
b) Network breakdown
c) Reduced speed
d) More memory usage

6) The _____ message in CoAP ensures reliable communication by requiring an acknowledgment.

a) NON b) RST
c) ACK d) CON

7) You are designing a home automation system for elderly care. Which feature would you prioritize?

a) Gaming support b) Automated Irrigation
c) Fall detection and alerts d) Music control

8) Which thing helps detect available parking slots in a smart parking system?

a) Microphone b) Servo motor
c) Ultrasonic sensor d) Thermistor

9) What is the impact of sensor failure in an irrigation system?

a) Overwatering or under watering
b) Accurate irrigation
c) Increased crop yield
d) Beller energy usage

10) Which IoT characteristic ensures that devices can work with different platforms?

a) Reliability b) Scalability
c) Interoperability d) Maintainability

11) The IOT application layer is responsible for: ____

a) Collecting data from devices
b) Providing interfaces to the user
c) Transmitting data between devices
d) Authenticating users

12) What is the main purpose of the gateway in IOT?

a) Secure device communication
b) Transmit data to the cloud
c) Provide power to devices
d) Collect user input

13) The Gyro sensor measures: ____

a) Angular velocity b) Pressure
c) Force d) Temperature

14) A relay is necessary when using actuators because ____

a) To isolate high-power actuators from low-power circuits
b) To provide more precise control
c) To amplify the actuator's signal
d) To reduce the actuator's power consumption

SLR-BD-215

Seat No.	

Set S

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any FOUR Questions **16**

a) Describe the main components of an loT system with neat sketch.

b) Draw the layered architecture of the Internet of Things (loT) and explain the function of each layer in brief.

c) Explain Need of ADC Chip while using Analog Sensors.

d) Describe the key voltage considerations when designing a sensor-based IoT system. Give examples of common voltage ranges used.

e) Compare Sharp IR Distance Sensor with ultrasonic sensors (any 4 Points).

Q.3 Attempt any TWO **12**

a) What is role of Actuator in IoT. Give examples of commonly used actuators in IoT. Explain working of any one in detail.

b) What is a PIR Sensor? Why it is called Passive? Describe how Motion Detected using a PIR sensor with neat sketch.

c) Define IoT. List and Explain Design challenges & security challenges related to IoT.

Section – II

Q.4 Attempt Any FOUR Questions **16**

a) Describe the architecture of a Li-Fi system with a neat diagram.

b) Explain the MQTT architecture with the roles of Publisher, Subscriber, and Broker.

c) List the various sensors and actuators used in smart home automation system and justify their selection.

d) Discuss the advantages, disadvantages and applications of CoAP for constrained IoT devices.

e) What is Presence in XMPP? How does it help in IoT and messaging applications?

Q.5 Attempt any TWO **12**

a) Explain the role of the central node (hub/ switch /gateway) in Star Topology. Compare Star Topology with Ring and Mesh Topologies.

b) Farmers are struggling with improper watering of crops due to irregular rainfall, leading to low crop yield.

Develop an IoT-based Smart Agriculture system focusing on soil moisture monitoring and automated irrigation. State challenges in system design.

c) A city faces frequent traffic jams due to drivers wasting time finding parking slots in crowded areas.

Propose a Smart Parking IoT solution to efficiently guide drivers to available parking spots. Draw the system architecture and explain working.

SLR-BD-215

Seat No.	

Set P

S. Y. (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which IoT characteristic ensures that devices can work with different platforms?
a) Reliability b) Scalability
c) Interoperability d) Maintainability

2) The IOT application layer is responsible for: ____
a) Collecting data from devices
b) Providing interfaces to the user
c) Transmitting data between devices
d) Authenticating users

3) What is the main purpose of the gateway in IOT?
a) Secure device communication
b) Transmit data to the cloud
c) Provide power to devices
d) Collect user input

4) The Gyro sensor measures: ____
a) Angular velocity b) Pressure
c) Force d) Temperature

5) A relay is necessary when using actuators because ____
a) To isolate high-power actuators from low-power circuits
b) To provide more precise control
c) To amplify the actuator's signal
d) To reduce the actuator's power consumption

6) What could happen if a sensor is supplied with voltage above or below its required range?

a) It will always work efficiently
b) It will generate more power
c) It will automatically adjust its voltage
c) It may fail or produce incorrect readings

7) Which component in a servo motor provides position feedback?

a) Gearbox b) Output shaft
c) Control circuit d) Potentiometer

8) Why is BLE ideal for wearable IoT devices?

a) High-speed data transmission
b) Long-range communication
c) Low power consumption
d) High memory usage

9) Which topology is best for a home automation system with a central controller?

a) Star topology b) Ring topology
c) Mesh topology d) Point-to-point topology

10) Which problem is likely in ring topology if a node fails?

a) Increased power consumption
b) Network breakdown
c) Reduced speed
d) More memory usage

11) The _____ message in CoAP ensures reliable communication by requiring an acknowledgment.

a) NON b) RST
c) ACK d) CON

12) You are designing a home automation system for elderly care. Which feature would you prioritize?

a) Gaming support b) Automated Irrigation
c) Fall detection and alerts d) Music control

13) Which thing helps detect available parking slots in a smart parking system?

a) Microphone b) Servo motor
c) Ultrasonic sensor d) Thermistor

14) What is the impact of sensor failure in an irrigation system?

a) Overwatering or under watering
b) Accurate irrigation
c) Increased crop yield
d) Beller energy usage

Seat No.	

Set **P**

S. Y. (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any FOUR Questions **16**

a) Describe the main components of an loT system with neat sketch.

b) Draw the layered architecture of the Internet of Things (loT) and explain the function of each layer in brief.

c) Explain Need of ADC Chip while using Analog Sensors.

d) Describe the key voltage considerations when designing a sensor-based IoT system. Give examples of common voltage ranges used.

e) Compare Sharp IR Distance Sensor with ultrasonic sensors (any 4 Points).

Q.3 Attempt any TWO **12**

a) What is role of Actuator in IoT. Give examples of commonly used actuators in IoT. Explain working of any one in detail.

b) What is a PIR Sensor? Why it is called Passive? Describe how Motion Detected using a PIR sensor with neat sketch.

c) Define IoT. List and Explain Design challenges & security challenges related to IoT.

Section – II

Q.4 Attempt Any FOUR Questions **16**

a) Describe the architecture of a Li-Fi system with a neat diagram.

b) Explain the MQTT architecture with the roles of Publisher, Subscriber, and Broker.

c) List the various sensors and actuators used in smart home automation system and justify their selection.

d) Discuss the advantages, disadvantages and applications of CoAP for constrained IoT devices.

e) What is Presence in XMPP? How does it help in IoT and messaging applications?

Q.5 Attempt any TWO **12**

a) Explain the role of the central node (hub/ switch /gateway) in Star Topology. Compare Star Topology with Ring and Mesh Topologies.

b) Farmers are struggling with improper watering of crops due to irregular rainfall, leading to low crop yield.

Develop an IoT-based Smart Agriculture system focusing on soil moisture monitoring and automated irrigation. State challenges in system design.

c) A city faces frequent traffic jams due to drivers wasting time finding parking slots in crowded areas.

Propose a Smart Parking IoT solution to efficiently guide drivers to available parking spots. Draw the system architecture and explain working.

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Why is BLE ideal for wearable IoT devices?
a) High-speed data transmission
b) Long-range communication
c) Low power consumption
d) High memory usage

2) Which topology is best for a home automation system with a central controller?
a) Star topology b) Ring topology
c) Mesh topology d) Point-to-point topology

3) Which problem is likely in ring topology if a node fails?
a) Increased power consumption
b) Network breakdown
c) Reduced speed
d) More memory usage

4) The _____ message in CoAP ensures reliable communication by requiring an acknowledgment.
a) NON b) RST
c) ACK d) CON

5) You are designing a home automation system for elderly care. Which feature would you prioritize?
a) Gaming support b) Automated Irrigation
c) Fall detection and alerts d) Music control

6) Which thing helps detect available parking slots in a smart parking system?
a) Microphone b) Servo motor
c) Ultrasonic sensor d) Thermistor

7) What is the impact of sensor failure in an irrigation system?
a) Overwatering or under watering
b) Accurate irrigation
c) Increased crop yield
d) Beller energy usage

8) Which IoT characteristic ensures that devices can work with different platforms?
a) Reliability
b) Scalability
c) Interoperability
d) Maintainability

9) The IOT application layer is responsible for: ____
a) Collecting data from devices
b) Providing interfaces to the user
c) Transmitting data between devices
d) Authenticating users

10) What is the main purpose of the gateway in IOT?
a) Secure device communication
b) Transmit data to the cloud
c) Provide power to devices
d) Collect user input

11) The Gyro sensor measures: ____
a) Angular velocity
b) Pressure
c) Force
d) Temperature

12) A relay is necessary when using actuators because ____
a) To isolate high-power actuators from low-power circuits
b) To provide more precise control
c) To amplify the actuator's signal
d) To reduce the actuator's power consumption

13) What could happen if a sensor is supplied with voltage above or below its required range?
a) It will always work efficiently
b) It will generate more power
c) It will automatically adjust its voltage
c) It may fail or produce incorrect readings

14) Which component in a servo motor provides position feedback?
a) Gearbox
b) Output shaft
c) Control circuit
d) Potentiometer

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any FOUR Questions **16**

a) Describe the main components of an loT system with neat sketch.

b) Draw the layered architecture of the Internet of Things (loT) and explain the function of each layer in brief.

c) Explain Need of ADC Chip while using Analog Sensors.

d) Describe the key voltage considerations when designing a sensor-based IoT system. Give examples of common voltage ranges used.

e) Compare Sharp IR Distance Sensor with ultrasonic sensors (any 4 Points).

Q.3 Attempt any TWO **12**

a) What is role of Actuator in IoT. Give examples of commonly used actuators in IoT. Explain working of any one in detail.

b) What is a PIR Sensor? Why it is called Passive? Describe how Motion Detected using a PIR sensor with neat sketch.

c) Define IoT. List and Explain Design challenges & security challenges related to IoT.

Section – II

Q.4 Attempt Any FOUR Questions **16**

a) Describe the architecture of a Li-Fi system with a neat diagram.

b) Explain the MQTT architecture with the roles of Publisher, Subscriber, and Broker.

c) List the various sensors and actuators used in smart home automation system and justify their selection.

d) Discuss the advantages, disadvantages and applications of CoAP for constrained IoT devices.

e) What is Presence in XMPP? How does it help in IoT and messaging applications?

Q.5 Attempt any TWO **12**

a) Explain the role of the central node (hub/ switch /gateway) in Star Topology. Compare Star Topology with Ring and Mesh Topologies.

b) Farmers are struggling with improper watering of crops due to irregular rainfall, leading to low crop yield.

Develop an IoT-based Smart Agriculture system focusing on soil moisture monitoring and automated irrigation. State challenges in system design.

c) A city faces frequent traffic jams due to drivers wasting time finding parking slots in crowded areas.

Propose a Smart Parking IoT solution to efficiently guide drivers to available parking spots. Draw the system architecture and explain working.

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The _____ message in CoAP ensures reliable communication by requiring an acknowledgment.
a) NON b) RST
c) ACK d) CON

2) You are designing a home automation system for elderly care. Which feature would you prioritize?
a) Gaming support b) Automated Irrigation
c) Fall detection and alerts d) Music control

3) Which thing helps detect available parking slots in a smart parking system?
a) Microphone b) Servo motor
c) Ultrasonic sensor d) Thermistor

4) What is the impact of sensor failure in an irrigation system?
a) Overwatering or under watering
b) Accurate irrigation
c) Increased crop yield
d) Beller energy usage

5) Which IoT characteristic ensures that devices can work with different platforms?
a) Reliability b) Scalability
c) Interoperability d) Maintainability

6) The IOT application layer is responsible for: ____
a) Collecting data from devices
b) Providing interfaces to the user
c) Transmitting data between devices
d) Authenticating users

7) What is the main purpose of the gateway in IOT?
a) Secure device communication
b) Transmit data to the cloud
c) Provide power to devices
d) Collect user input

8) The Gyro sensor measures: ____
a) Angular velocity
b) Pressure
c) Force
d) Temperature

9) A relay is necessary when using actuators because ____
a) To isolate high-power actuators from low-power circuits
b) To provide more precise control
c) To amplify the actuator's signal
d) To reduce the actuator's power consumption

10) What could happen if a sensor is supplied with voltage above or below its required range?
a) It will always work efficiently
b) It will generate more power
c) It will automatically adjust its voltage
c) It may fail or produce incorrect readings

11) Which component in a servo motor provides position feedback?
a) Gearbox
b) Output shaft
c) Control circuit
d) Potentiometer

12) Why is BLE ideal for wearable IoT devices?
a) High-speed data transmission
b) Long-range communication
c) Low power consumption
d) High memory usage

13) Which topology is best for a home automation system with a central controller?
a) Star topology
b) Ring topology
c) Mesh topology
d) Point-to-point topology

14) Which problem is likely in ring topology if a node fails?
a) Increased power consumption
b) Network breakdown
c) Reduced speed
d) More memory usage

SLR-BD-215

Seat No.	

Set R

S. Y. (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any FOUR Questions **16**

a) Describe the main components of an loT system with neat sketch.

b) Draw the layered architecture of the Internet of Things (loT) and explain the function of each layer in brief.

c) Explain Need of ADC Chip while using Analog Sensors.

d) Describe the key voltage considerations when designing a sensor-based IoT system. Give examples of common voltage ranges used.

e) Compare Sharp IR Distance Sensor with ultrasonic sensors (any 4 Points).

Q.3 Attempt any TWO **12**

a) What is role of Actuator in IoT. Give examples of commonly used actuators in IoT. Explain working of any one in detail.

b) What is a PIR Sensor? Why it is called Passive? Describe how Motion Detected using a PIR sensor with neat sketch.

c) Define IoT. List and Explain Design challenges & security challenges related to IoT.

Section – II

Q.4 Attempt Any FOUR Questions **16**

a) Describe the architecture of a Li-Fi system with a neat diagram.

b) Explain the MQTT architecture with the roles of Publisher, Subscriber, and Broker.

c) List the various sensors and actuators used in smart home automation system and justify their selection.

d) Discuss the advantages, disadvantages and applications of CoAP for constrained IoT devices.

e) What is Presence in XMPP? How does it help in IoT and messaging applications?

Q.5 Attempt any TWO **12**

a) Explain the role of the central node (hub/ switch /gateway) in Star Topology. Compare Star Topology with Ring and Mesh Topologies.

b) Farmers are struggling with improper watering of crops due to irregular rainfall, leading to low crop yield.

Develop an IoT-based Smart Agriculture system focusing on soil moisture monitoring and automated irrigation. State challenges in system design.

c) A city faces frequent traffic jams due to drivers wasting time finding parking slots in crowded areas.

Propose a Smart Parking IoT solution to efficiently guide drivers to available parking spots. Draw the system architecture and explain working.

Seat No.	

Set **S**

S. Y. (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What could happen if a sensor is supplied with voltage above or below its required range?
a) It will always work efficiently
b) It will generate more power
c) It will automatically adjust its voltage
c) It may fail or produce incorrect readings

2) Which component in a servo motor provides position feedback?
a) Gearbox b) Output shaft
c) Control circuit d) Potentiometer

3) Why is BLE ideal for wearable IoT devices?
a) High-speed data transmission
b) Long-range communication
c) Low power consumption
d) High memory usage

4) Which topology is best for a home automation system with a central controller?
a) Star topology b) Ring topology
c) Mesh topology d) Point-to-point topology

5) Which problem is likely in ring topology if a node fails?
a) Increased power consumption
b) Network breakdown
c) Reduced speed
d) More memory usage

6) The _____ message in CoAP ensures reliable communication by requiring an acknowledgment.

a) NON b) RST
c) ACK d) CON

7) You are designing a home automation system for elderly care. Which feature would you prioritize?

a) Gaming support b) Automated Irrigation
c) Fall detection and alerts d) Music control

8) Which thing helps detect available parking slots in a smart parking system?

a) Microphone b) Servo motor
c) Ultrasonic sensor d) Thermistor

9) What is the impact of sensor failure in an irrigation system?

a) Overwatering or under watering
b) Accurate irrigation
c) Increased crop yield
d) Beller energy usage

10) Which IoT characteristic ensures that devices can work with different platforms?

a) Reliability b) Scalability
c) Interoperability d) Maintainability

11) The IOT application layer is responsible for: ____

a) Collecting data from devices
b) Providing interfaces to the user
c) Transmitting data between devices
d) Authenticating users

12) What is the main purpose of the gateway in IOT?

a) Secure device communication
b) Transmit data to the cloud
c) Provide power to devices
d) Collect user input

13) The Gyro sensor measures: ____

a) Angular velocity b) Pressure
c) Force d) Temperature

14) A relay is necessary when using actuators because ____

a) To isolate high-power actuators from low-power circuits
b) To provide more precise control
c) To amplify the actuator's signal
d) To reduce the actuator's power consumption

SLR-BD-215

Seat No.		Set	S

S. Y. (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any FOUR Questions **16**

a) Describe the main components of an loT system with neat sketch.

b) Draw the layered architecture of the Internet of Things (loT) and explain the function of each layer in brief.

c) Explain Need of ADC Chip while using Analog Sensors.

d) Describe the key voltage considerations when designing a sensor-based IoT system. Give examples of common voltage ranges used.

e) Compare Sharp IR Distance Sensor with ultrasonic sensors (any 4 Points).

Q.3 Attempt any TWO **12**

a) What is role of Actuator in IoT. Give examples of commonly used actuators in IoT. Explain working of any one in detail.

b) What is a PIR Sensor? Why it is called Passive? Describe how Motion Detected using a PIR sensor with neat sketch.

c) Define IoT. List and Explain Design challenges & security challenges related to IoT.

Section – II

Q.4 Attempt Any FOUR Questions **16**

a) Describe the architecture of a Li-Fi system with a neat diagram.

b) Explain the MQTT architecture with the roles of Publisher, Subscriber, and Broker.

c) List the various sensors and actuators used in smart home automation system and justify their selection.

d) Discuss the advantages, disadvantages and applications of CoAP for constrained IoT devices.

e) What is Presence in XMPP? How does it help in IoT and messaging applications?

Q.5 Attempt any TWO **12**

a) Explain the role of the central node (hub/ switch /gateway) in Star Topology. Compare Star Topology with Ring and Mesh Topologies.

b) Farmers are struggling with improper watering of crops due to irregular rainfall, leading to low crop yield.

Develop an IoT-based Smart Agriculture system focusing on soil moisture monitoring and automated irrigation. State challenges in system design.

c) A city faces frequent traffic jams due to drivers wasting time finding parking slots in crowded areas.

Propose a Smart Parking IoT solution to efficiently guide drivers to available parking spots. Draw the system architecture and explain working.

Seat No.	

Set **P**

S. Y. (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which IoT characteristic ensures that devices can work with different platforms?
a) Reliability b) Scalability
c) Interoperability d) Maintainability

2) The IOT application layer is responsible for: ____
a) Collecting data from devices
b) Providing interfaces to the user
c) Transmitting data between devices
d) Authenticating users

3) What is the main purpose of the gateway in IOT?
a) Secure device communication
b) Transmit data to the cloud
c) Provide power to devices
d) Collect user input

4) The Gyro sensor measures: ____
a) Angular velocity b) Pressure
c) Force d) Temperature

5) A relay is necessary when using actuators because ____
a) To isolate high-power actuators from low-power circuits
b) To provide more precise control
c) To amplify the actuator's signal
d) To reduce the actuator's power consumption

6) What could happen if a sensor is supplied with voltage above or below its required range?

a) It will always work efficiently
b) It will generate more power
c) It will automatically adjust its voltage
c) It may fail or produce incorrect readings

7) Which component in a servo motor provides position feedback?

a) Gearbox b) Output shaft
c) Control circuit d) Potentiometer

8) Why is BLE ideal for wearable IoT devices?

a) High-speed data transmission
b) Long-range communication
c) Low power consumption
d) High memory usage

9) Which topology is best for a home automation system with a central controller?

a) Star topology b) Ring topology
c) Mesh topology d) Point-to-point topology

10) Which problem is likely in ring topology if a node fails?

a) Increased power consumption
b) Network breakdown
c) Reduced speed
d) More memory usage

11) The _____ message in CoAP ensures reliable communication by requiring an acknowledgment.

a) NON b) RST
c) ACK d) CON

12) You are designing a home automation system for elderly care. Which feature would you prioritize?

a) Gaming support b) Automated Irrigation
c) Fall detection and alerts d) Music control

13) Which thing helps detect available parking slots in a smart parking system?

a) Microphone b) Servo motor
c) Ultrasonic sensor d) Thermistor

14) What is the impact of sensor failure in an irrigation system?

a) Overwatering or under watering
b) Accurate irrigation
c) Increased crop yield
d) Beller energy usage

Seat No.	

Set **P**

S. Y. (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any FOUR Questions **16**

a) Describe the main components of an loT system with neat sketch.

b) Draw the layered architecture of the Internet of Things (loT) and explain the function of each layer in brief.

c) Explain Need of ADC Chip while using Analog Sensors.

d) Describe the key voltage considerations when designing a sensor-based IoT system. Give examples of common voltage ranges used.

e) Compare Sharp IR Distance Sensor with ultrasonic sensors (any 4 Points).

Q.3 Attempt any TWO **12**

a) What is role of Actuator in IoT. Give examples of commonly used actuators in IoT. Explain working of any one in detail.

b) What is a PIR Sensor? Why it is called Passive? Describe how Motion Detected using a PIR sensor with neat sketch.

c) Define IoT. List and Explain Design challenges & security challenges related to IoT.

Section – II

Q.4 Attempt Any FOUR Questions **16**

a) Describe the architecture of a Li-Fi system with a neat diagram.

b) Explain the MQTT architecture with the roles of Publisher, Subscriber, and Broker.

c) List the various sensors and actuators used in smart home automation system and justify their selection.

d) Discuss the advantages, disadvantages and applications of CoAP for constrained IoT devices.

e) What is Presence in XMPP? How does it help in IoT and messaging applications?

Q.5 Attempt any TWO **12**

a) Explain the role of the central node (hub/ switch /gateway) in Star Topology. Compare Star Topology with Ring and Mesh Topologies.

b) Farmers are struggling with improper watering of crops due to irregular rainfall, leading to low crop yield.

Develop an IoT-based Smart Agriculture system focusing on soil moisture monitoring and automated irrigation. State challenges in system design.

c) A city faces frequent traffic jams due to drivers wasting time finding parking slots in crowded areas.

Propose a Smart Parking IoT solution to efficiently guide drivers to available parking spots. Draw the system architecture and explain working.

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Why is BLE ideal for wearable IoT devices?
a) High-speed data transmission
b) Long-range communication
c) Low power consumption
d) High memory usage

2) Which topology is best for a home automation system with a central controller?
a) Star topology b) Ring topology
c) Mesh topology d) Point-to-point topology

3) Which problem is likely in ring topology if a node fails?
a) Increased power consumption
b) Network breakdown
c) Reduced speed
d) More memory usage

4) The _____ message in CoAP ensures reliable communication by requiring an acknowledgment.
a) NON b) RST
c) ACK d) CON

5) You are designing a home automation system for elderly care. Which feature would you prioritize?
a) Gaming support b) Automated Irrigation
c) Fall detection and alerts d) Music control

6) Which thing helps detect available parking slots in a smart parking system?
a) Microphone b) Servo motor
c) Ultrasonic sensor d) Thermistor

7) What is the impact of sensor failure in an irrigation system?
a) Overwatering or under watering
b) Accurate irrigation
c) Increased crop yield
d) Beller energy usage

8) Which IoT characteristic ensures that devices can work with different platforms?
a) Reliability
b) Scalability
c) Interoperability
d) Maintainability

9) The IOT application layer is responsible for: ____
a) Collecting data from devices
b) Providing interfaces to the user
c) Transmitting data between devices
d) Authenticating users

10) What is the main purpose of the gateway in IOT?
a) Secure device communication
b) Transmit data to the cloud
c) Provide power to devices
d) Collect user input

11) The Gyro sensor measures: ____
a) Angular velocity
b) Pressure
c) Force
d) Temperature

12) A relay is necessary when using actuators because ____
a) To isolate high-power actuators from low-power circuits
b) To provide more precise control
c) To amplify the actuator's signal
d) To reduce the actuator's power consumption

13) What could happen if a sensor is supplied with voltage above or below its required range?
a) It will always work efficiently
b) It will generate more power
c) It will automatically adjust its voltage
c) It may fail or produce incorrect readings

14) Which component in a servo motor provides position feedback?
a) Gearbox
b) Output shaft
c) Control circuit
d) Potentiometer

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any FOUR Questions **16**

a) Describe the main components of an loT system with neat sketch.

b) Draw the layered architecture of the Internet of Things (loT) and explain the function of each layer in brief.

c) Explain Need of ADC Chip while using Analog Sensors.

d) Describe the key voltage considerations when designing a sensor-based IoT system. Give examples of common voltage ranges used.

e) Compare Sharp IR Distance Sensor with ultrasonic sensors (any 4 Points).

Q.3 Attempt any TWO **12**

a) What is role of Actuator in IoT. Give examples of commonly used actuators in IoT. Explain working of any one in detail.

b) What is a PIR Sensor? Why it is called Passive? Describe how Motion Detected using a PIR sensor with neat sketch.

c) Define IoT. List and Explain Design challenges & security challenges related to IoT.

Section – II

Q.4 Attempt Any FOUR Questions **16**

a) Describe the architecture of a Li-Fi system with a neat diagram.

b) Explain the MQTT architecture with the roles of Publisher, Subscriber, and Broker.

c) List the various sensors and actuators used in smart home automation system and justify their selection.

d) Discuss the advantages, disadvantages and applications of CoAP for constrained IoT devices.

e) What is Presence in XMPP? How does it help in IoT and messaging applications?

Q.5 Attempt any TWO **12**

a) Explain the role of the central node (hub/ switch /gateway) in Star Topology. Compare Star Topology with Ring and Mesh Topologies.

b) Farmers are struggling with improper watering of crops due to irregular rainfall, leading to low crop yield.

Develop an IoT-based Smart Agriculture system focusing on soil moisture monitoring and automated irrigation. State challenges in system design.

c) A city faces frequent traffic jams due to drivers wasting time finding parking slots in crowded areas.

Propose a Smart Parking IoT solution to efficiently guide drivers to available parking spots. Draw the system architecture and explain working.

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The _____ message in CoAP ensures reliable communication by requiring an acknowledgment.
a) NON b) RST
c) ACK d) CON

2) You are designing a home automation system for elderly care. Which feature would you prioritize?
a) Gaming support b) Automated Irrigation
c) Fall detection and alerts d) Music control

3) Which thing helps detect available parking slots in a smart parking system?
a) Microphone b) Servo motor
c) Ultrasonic sensor d) Thermistor

4) What is the impact of sensor failure in an irrigation system?
a) Overwatering or under watering
b) Accurate irrigation
c) Increased crop yield
d) Beller energy usage

5) Which IoT characteristic ensures that devices can work with different platforms?
a) Reliability b) Scalability
c) Interoperability d) Maintainability

6) The IOT application layer is responsible for: ____
a) Collecting data from devices
b) Providing interfaces to the user
c) Transmitting data between devices
d) Authenticating users

7) What is the main purpose of the gateway in IOT?
a) Secure device communication
b) Transmit data to the cloud
c) Provide power to devices
d) Collect user input

8) The Gyro sensor measures: ____
a) Angular velocity
b) Pressure
c) Force
d) Temperature

9) A relay is necessary when using actuators because ____
a) To isolate high-power actuators from low-power circuits
b) To provide more precise control
c) To amplify the actuator's signal
d) To reduce the actuator's power consumption

10) What could happen if a sensor is supplied with voltage above or below its required range?
a) It will always work efficiently
b) It will generate more power
c) It will automatically adjust its voltage
c) It may fail or produce incorrect readings

11) Which component in a servo motor provides position feedback?
a) Gearbox
b) Output shaft
c) Control circuit
d) Potentiometer

12) Why is BLE ideal for wearable IoT devices?
a) High-speed data transmission
b) Long-range communication
c) Low power consumption
d) High memory usage

13) Which topology is best for a home automation system with a central controller?
a) Star topology
b) Ring topology
c) Mesh topology
d) Point-to-point topology

14) Which problem is likely in ring topology if a node fails?
a) Increased power consumption
b) Network breakdown
c) Reduced speed
d) More memory usage

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any FOUR Questions **16**

a) Describe the main components of an loT system with neat sketch.

b) Draw the layered architecture of the Internet of Things (loT) and explain the function of each layer in brief.

c) Explain Need of ADC Chip while using Analog Sensors.

d) Describe the key voltage considerations when designing a sensor-based IoT system. Give examples of common voltage ranges used.

e) Compare Sharp IR Distance Sensor with ultrasonic sensors (any 4 Points).

Q.3 Attempt any TWO **12**

a) What is role of Actuator in IoT. Give examples of commonly used actuators in IoT. Explain working of any one in detail.

b) What is a PIR Sensor? Why it is called Passive? Describe how Motion Detected using a PIR sensor with neat sketch.

c) Define IoT. List and Explain Design challenges & security challenges related to IoT.

Section – II

Q.4 Attempt Any FOUR Questions **16**

a) Describe the architecture of a Li-Fi system with a neat diagram.

b) Explain the MQTT architecture with the roles of Publisher, Subscriber, and Broker.

c) List the various sensors and actuators used in smart home automation system and justify their selection.

d) Discuss the advantages, disadvantages and applications of CoAP for constrained IoT devices.

e) What is Presence in XMPP? How does it help in IoT and messaging applications?

Q.5 Attempt any TWO **12**

a) Explain the role of the central node (hub/ switch /gateway) in Star Topology. Compare Star Topology with Ring and Mesh Topologies.

b) Farmers are struggling with improper watering of crops due to irregular rainfall, leading to low crop yield.

Develop an IoT-based Smart Agriculture system focusing on soil moisture monitoring and automated irrigation. State challenges in system design.

c) A city faces frequent traffic jams due to drivers wasting time finding parking slots in crowded areas.

Propose a Smart Parking IoT solution to efficiently guide drivers to available parking spots. Draw the system architecture and explain working.

Seat No.	

Set **S**

S. Y. (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What could happen if a sensor is supplied with voltage above or below its required range?
a) It will always work efficiently
b) It will generate more power
c) It will automatically adjust its voltage
c) It may fail or produce incorrect readings

2) Which component in a servo motor provides position feedback?
a) Gearbox b) Output shaft
c) Control circuit d) Potentiometer

3) Why is BLE ideal for wearable IoT devices?
a) High-speed data transmission
b) Long-range communication
c) Low power consumption
d) High memory usage

4) Which topology is best for a home automation system with a central controller?
a) Star topology b) Ring topology
c) Mesh topology d) Point-to-point topology

5) Which problem is likely in ring topology if a node fails?
a) Increased power consumption
b) Network breakdown
c) Reduced speed
d) More memory usage

6) The _____ message in CoAP ensures reliable communication by requiring an acknowledgment.

a) NON b) RST
c) ACK d) CON

7) You are designing a home automation system for elderly care. Which feature would you prioritize?

a) Gaming support b) Automated Irrigation
c) Fall detection and alerts d) Music control

8) Which thing helps detect available parking slots in a smart parking system?

a) Microphone b) Servo motor
c) Ultrasonic sensor d) Thermistor

9) What is the impact of sensor failure in an irrigation system?

a) Overwatering or under watering
b) Accurate irrigation
c) Increased crop yield
d) Beller energy usage

10) Which IoT characteristic ensures that devices can work with different platforms?

a) Reliability b) Scalability
c) Interoperability d) Maintainability

11) The IOT application layer is responsible for: ____

a) Collecting data from devices
b) Providing interfaces to the user
c) Transmitting data between devices
d) Authenticating users

12) What is the main purpose of the gateway in IOT?

a) Secure device communication
b) Transmit data to the cloud
c) Provide power to devices
d) Collect user input

13) The Gyro sensor measures: ____

a) Angular velocity b) Pressure
c) Force d) Temperature

14) A relay is necessary when using actuators because ____

a) To isolate high-power actuators from low-power circuits
b) To provide more precise control
c) To amplify the actuator's signal
d) To reduce the actuator's power consumption

SLR-BD-215

Seat No.		Set	S

S. Y. (B. Tech) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any FOUR Questions **16**

a) Describe the main components of an loT system with neat sketch.

b) Draw the layered architecture of the Internet of Things (loT) and explain the function of each layer in brief.

c) Explain Need of ADC Chip while using Analog Sensors.

d) Describe the key voltage considerations when designing a sensor-based IoT system. Give examples of common voltage ranges used.

e) Compare Sharp IR Distance Sensor with ultrasonic sensors (any 4 Points).

Q.3 Attempt any TWO **12**

a) What is role of Actuator in IoT. Give examples of commonly used actuators in IoT. Explain working of any one in detail.

b) What is a PIR Sensor? Why it is called Passive? Describe how Motion Detected using a PIR sensor with neat sketch.

c) Define IoT. List and Explain Design challenges & security challenges related to IoT.

Section – II

Q.4 Attempt Any FOUR Questions **16**

a) Describe the architecture of a Li-Fi system with a neat diagram.

b) Explain the MQTT architecture with the roles of Publisher, Subscriber, and Broker.

c) List the various sensors and actuators used in smart home automation system and justify their selection.

d) Discuss the advantages, disadvantages and applications of CoAP for constrained IoT devices.

e) What is Presence in XMPP? How does it help in IoT and messaging applications?

Q.5 Attempt any TWO **12**

a) Explain the role of the central node (hub/ switch /gateway) in Star Topology. Compare Star Topology with Ring and Mesh Topologies.

b) Farmers are struggling with improper watering of crops due to irregular rainfall, leading to low crop yield.

Develop an IoT-based Smart Agriculture system focusing on soil moisture monitoring and automated irrigation. State challenges in system design.

c) A city faces frequent traffic jams due to drivers wasting time finding parking slots in crowded areas.

Propose a Smart Parking IoT solution to efficiently guide drivers to available parking spots. Draw the system architecture and explain working.

SLR-BD-215

Seat No.	

Set P

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which IoT characteristic ensures that devices can work with different platforms?
a) Reliability b) Scalability
c) Interoperability d) Maintainability

2) The IOT application layer is responsible for: ____
a) Collecting data from devices
b) Providing interfaces to the user
c) Transmitting data between devices
d) Authenticating users

3) What is the main purpose of the gateway in IOT?
a) Secure device communication
b) Transmit data to the cloud
c) Provide power to devices
d) Collect user input

4) The Gyro sensor measures: ____
a) Angular velocity b) Pressure
c) Force d) Temperature

5) A relay is necessary when using actuators because ____
a) To isolate high-power actuators from low-power circuits
b) To provide more precise control
c) To amplify the actuator's signal
d) To reduce the actuator's power consumption

6) What could happen if a sensor is supplied with voltage above or below its required range?

a) It will always work efficiently
b) It will generate more power
c) It will automatically adjust its voltage
c) It may fail or produce incorrect readings

7) Which component in a servo motor provides position feedback?

a) Gearbox b) Output shaft
c) Control circuit d) Potentiometer

8) Why is BLE ideal for wearable IoT devices?

a) High-speed data transmission
b) Long-range communication
c) Low power consumption
d) High memory usage

9) Which topology is best for a home automation system with a central controller?

a) Star topology b) Ring topology
c) Mesh topology d) Point-to-point topology

10) Which problem is likely in ring topology if a node fails?

a) Increased power consumption
b) Network breakdown
c) Reduced speed
d) More memory usage

11) The _____ message in CoAP ensures reliable communication by requiring an acknowledgment.

a) NON b) RST
c) ACK d) CON

12) You are designing a home automation system for elderly care. Which feature would you prioritize?

a) Gaming support b) Automated Irrigation
c) Fall detection and alerts d) Music control

13) Which thing helps detect available parking slots in a smart parking system?

a) Microphone b) Servo motor
c) Ultrasonic sensor d) Thermistor

14) What is the impact of sensor failure in an irrigation system?

a) Overwatering or under watering
b) Accurate irrigation
c) Increased crop yield
d) Beller energy usage

Seat No.	

Set **P**

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any FOUR Questions **16**

a) Describe the main components of an loT system with neat sketch.

b) Draw the layered architecture of the Internet of Things (loT) and explain the function of each layer in brief.

c) Explain Need of ADC Chip while using Analog Sensors.

d) Describe the key voltage considerations when designing a sensor-based IoT system. Give examples of common voltage ranges used.

e) Compare Sharp IR Distance Sensor with ultrasonic sensors (any 4 Points).

Q.3 Attempt any TWO **12**

a) What is role of Actuator in IoT. Give examples of commonly used actuators in IoT. Explain working of any one in detail.

b) What is a PIR Sensor? Why it is called Passive? Describe how Motion Detected using a PIR sensor with neat sketch.

c) Define IoT. List and Explain Design challenges & security challenges related to IoT.

Section – II

Q.4 Attempt Any FOUR Questions **16**

a) Describe the architecture of a Li-Fi system with a neat diagram.

b) Explain the MQTT architecture with the roles of Publisher, Subscriber, and Broker.

c) List the various sensors and actuators used in smart home automation system and justify their selection.

d) Discuss the advantages, disadvantages and applications of CoAP for constrained IoT devices.

e) What is Presence in XMPP? How does it help in IoT and messaging applications?

Q.5 Attempt any TWO **12**

a) Explain the role of the central node (hub/ switch /gateway) in Star Topology. Compare Star Topology with Ring and Mesh Topologies.

b) Farmers are struggling with improper watering of crops due to irregular rainfall, leading to low crop yield.

Develop an IoT-based Smart Agriculture system focusing on soil moisture monitoring and automated irrigation. State challenges in system design.

c) A city faces frequent traffic jams due to drivers wasting time finding parking slots in crowded areas.

Propose a Smart Parking IoT solution to efficiently guide drivers to available parking spots. Draw the system architecture and explain working.

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Why is BLE ideal for wearable IoT devices?
a) High-speed data transmission
b) Long-range communication
c) Low power consumption
d) High memory usage

2) Which topology is best for a home automation system with a central controller?
a) Star topology b) Ring topology
c) Mesh topology d) Point-to-point topology

3) Which problem is likely in ring topology if a node fails?
a) Increased power consumption
b) Network breakdown
c) Reduced speed
d) More memory usage

4) The _____ message in CoAP ensures reliable communication by requiring an acknowledgment.
a) NON b) RST
c) ACK d) CON

5) You are designing a home automation system for elderly care. Which feature would you prioritize?
a) Gaming support b) Automated Irrigation
c) Fall detection and alerts d) Music control

6) Which thing helps detect available parking slots in a smart parking system?
a) Microphone b) Servo motor
c) Ultrasonic sensor d) Thermistor

7) What is the impact of sensor failure in an irrigation system?
a) Overwatering or under watering
b) Accurate irrigation
c) Increased crop yield
d) Beller energy usage

8) Which IoT characteristic ensures that devices can work with different platforms?
a) Reliability
b) Scalability
c) Interoperability
d) Maintainability

9) The IOT application layer is responsible for: ____
a) Collecting data from devices
b) Providing interfaces to the user
c) Transmitting data between devices
d) Authenticating users

10) What is the main purpose of the gateway in IOT?
a) Secure device communication
b) Transmit data to the cloud
c) Provide power to devices
d) Collect user input

11) The Gyro sensor measures: ____
a) Angular velocity
b) Pressure
c) Force
d) Temperature

12) A relay is necessary when using actuators because ____
a) To isolate high-power actuators from low-power circuits
b) To provide more precise control
c) To amplify the actuator's signal
d) To reduce the actuator's power consumption

13) What could happen if a sensor is supplied with voltage above or below its required range?
a) It will always work efficiently
b) It will generate more power
c) It will automatically adjust its voltage
c) It may fail or produce incorrect readings

14) Which component in a servo motor provides position feedback?
a) Gearbox
b) Output shaft
c) Control circuit
d) Potentiometer

SLR-BD-215

Seat No.	

Set Q

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any FOUR Questions **16**

a) Describe the main components of an loT system with neat sketch.

b) Draw the layered architecture of the Internet of Things (loT) and explain the function of each layer in brief.

c) Explain Need of ADC Chip while using Analog Sensors.

d) Describe the key voltage considerations when designing a sensor-based IoT system. Give examples of common voltage ranges used.

e) Compare Sharp IR Distance Sensor with ultrasonic sensors (any 4 Points).

Q.3 Attempt any TWO **12**

a) What is role of Actuator in IoT. Give examples of commonly used actuators in IoT. Explain working of any one in detail.

b) What is a PIR Sensor? Why it is called Passive? Describe how Motion Detected using a PIR sensor with neat sketch.

c) Define IoT. List and Explain Design challenges & security challenges related to IoT.

Section – II

Q.4 Attempt Any FOUR Questions **16**

a) Describe the architecture of a Li-Fi system with a neat diagram.

b) Explain the MQTT architecture with the roles of Publisher, Subscriber, and Broker.

c) List the various sensors and actuators used in smart home automation system and justify their selection.

d) Discuss the advantages, disadvantages and applications of CoAP for constrained IoT devices.

e) What is Presence in XMPP? How does it help in IoT and messaging applications?

Q.5 Attempt any TWO **12**

a) Explain the role of the central node (hub/ switch /gateway) in Star Topology. Compare Star Topology with Ring and Mesh Topologies.

b) Farmers are struggling with improper watering of crops due to irregular rainfall, leading to low crop yield.

Develop an IoT-based Smart Agriculture system focusing on soil moisture monitoring and automated irrigation. State challenges in system design.

c) A city faces frequent traffic jams due to drivers wasting time finding parking slots in crowded areas.

Propose a Smart Parking IoT solution to efficiently guide drivers to available parking spots. Draw the system architecture and explain working.

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The _____ message in CoAP ensures reliable communication by requiring an acknowledgment.
a) NON b) RST
c) ACK d) CON

2) You are designing a home automation system for elderly care. Which feature would you prioritize?
a) Gaming support b) Automated Irrigation
c) Fall detection and alerts d) Music control

3) Which thing helps detect available parking slots in a smart parking system?
a) Microphone b) Servo motor
c) Ultrasonic sensor d) Thermistor

4) What is the impact of sensor failure in an irrigation system?
a) Overwatering or under watering
b) Accurate irrigation
c) Increased crop yield
d) Beller energy usage

5) Which IoT characteristic ensures that devices can work with different platforms?
a) Reliability b) Scalability
c) Interoperability d) Maintainability

6) The IOT application layer is responsible for: ____
a) Collecting data from devices
b) Providing interfaces to the user
c) Transmitting data between devices
d) Authenticating users

7) What is the main purpose of the gateway in IOT?
a) Secure device communication
b) Transmit data to the cloud
c) Provide power to devices
d) Collect user input

8) The Gyro sensor measures: ____
a) Angular velocity
b) Pressure
c) Force
d) Temperature

9) A relay is necessary when using actuators because ____
a) To isolate high-power actuators from low-power circuits
b) To provide more precise control
c) To amplify the actuator's signal
d) To reduce the actuator's power consumption

10) What could happen if a sensor is supplied with voltage above or below its required range?
a) It will always work efficiently
b) It will generate more power
c) It will automatically adjust its voltage
c) It may fail or produce incorrect readings

11) Which component in a servo motor provides position feedback?
a) Gearbox
b) Output shaft
c) Control circuit
d) Potentiometer

12) Why is BLE ideal for wearable IoT devices?
a) High-speed data transmission
b) Long-range communication
c) Low power consumption
d) High memory usage

13) Which topology is best for a home automation system with a central controller?
a) Star topology
b) Ring topology
c) Mesh topology
d) Point-to-point topology

14) Which problem is likely in ring topology if a node fails?
a) Increased power consumption
b) Network breakdown
c) Reduced speed
d) More memory usage

SLR-BD-215

Seat No.	

Set R

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any FOUR Questions **16**

a) Describe the main components of an loT system with neat sketch.

b) Draw the layered architecture of the Internet of Things (loT) and explain the function of each layer in brief.

c) Explain Need of ADC Chip while using Analog Sensors.

d) Describe the key voltage considerations when designing a sensor-based IoT system. Give examples of common voltage ranges used.

e) Compare Sharp IR Distance Sensor with ultrasonic sensors (any 4 Points).

Q.3 Attempt any TWO **12**

a) What is role of Actuator in IoT. Give examples of commonly used actuators in IoT. Explain working of any one in detail.

b) What is a PIR Sensor? Why it is called Passive? Describe how Motion Detected using a PIR sensor with neat sketch.

c) Define IoT. List and Explain Design challenges & security challenges related to IoT.

Section – II

Q.4 Attempt Any FOUR Questions **16**

a) Describe the architecture of a Li-Fi system with a neat diagram.

b) Explain the MQTT architecture with the roles of Publisher, Subscriber, and Broker.

c) List the various sensors and actuators used in smart home automation system and justify their selection.

d) Discuss the advantages, disadvantages and applications of CoAP for constrained IoT devices.

e) What is Presence in XMPP? How does it help in IoT and messaging applications?

Q.5 Attempt any TWO **12**

a) Explain the role of the central node (hub/ switch /gateway) in Star Topology. Compare Star Topology with Ring and Mesh Topologies.

b) Farmers are struggling with improper watering of crops due to irregular rainfall, leading to low crop yield.

Develop an IoT-based Smart Agriculture system focusing on soil moisture monitoring and automated irrigation. State challenges in system design.

c) A city faces frequent traffic jams due to drivers wasting time finding parking slots in crowded areas.

Propose a Smart Parking IoT solution to efficiently guide drivers to available parking spots. Draw the system architecture and explain working.

Seat No.	

Set **S**

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What could happen if a sensor is supplied with voltage above or below its required range?
a) It will always work efficiently
b) It will generate more power
c) It will automatically adjust its voltage
c) It may fail or produce incorrect readings

2) Which component in a servo motor provides position feedback?
a) Gearbox b) Output shaft
c) Control circuit d) Potentiometer

3) Why is BLE ideal for wearable IoT devices?
a) High-speed data transmission
b) Long-range communication
c) Low power consumption
d) High memory usage

4) Which topology is best for a home automation system with a central controller?
a) Star topology b) Ring topology
c) Mesh topology d) Point-to-point topology

5) Which problem is likely in ring topology if a node fails?
a) Increased power consumption
b) Network breakdown
c) Reduced speed
d) More memory usage

6) The _____ message in CoAP ensures reliable communication by requiring an acknowledgment.

a) NON b) RST
c) ACK d) CON

7) You are designing a home automation system for elderly care. Which feature would you prioritize?

a) Gaming support b) Automated Irrigation
c) Fall detection and alerts d) Music control

8) Which thing helps detect available parking slots in a smart parking system?

a) Microphone b) Servo motor
c) Ultrasonic sensor d) Thermistor

9) What is the impact of sensor failure in an irrigation system?

a) Overwatering or under watering
b) Accurate irrigation
c) Increased crop yield
d) Beller energy usage

10) Which IoT characteristic ensures that devices can work with different platforms?

a) Reliability b) Scalability
c) Interoperability d) Maintainability

11) The IOT application layer is responsible for: ____

a) Collecting data from devices
b) Providing interfaces to the user
c) Transmitting data between devices
d) Authenticating users

12) What is the main purpose of the gateway in IOT?

a) Secure device communication
b) Transmit data to the cloud
c) Provide power to devices
d) Collect user input

13) The Gyro sensor measures: ____

a) Angular velocity b) Pressure
c) Force d) Temperature

14) A relay is necessary when using actuators because ____

a) To isolate high-power actuators from low-power circuits
b) To provide more precise control
c) To amplify the actuator's signal
d) To reduce the actuator's power consumption

SLR-BD-215

Seat No.		Set	S

S. Y. (B. Tech) (Sem-II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Fundamentals of IOT (ENTMDN-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any FOUR Questions **16**

a) Describe the main components of an loT system with neat sketch.

b) Draw the layered architecture of the Internet of Things (loT) and explain the function of each layer in brief.

c) Explain Need of ADC Chip while using Analog Sensors.

d) Describe the key voltage considerations when designing a sensor-based IoT system. Give examples of common voltage ranges used.

e) Compare Sharp IR Distance Sensor with ultrasonic sensors (any 4 Points).

Q.3 Attempt any TWO **12**

a) What is role of Actuator in IoT. Give examples of commonly used actuators in IoT. Explain working of any one in detail.

b) What is a PIR Sensor? Why it is called Passive? Describe how Motion Detected using a PIR sensor with neat sketch.

c) Define IoT. List and Explain Design challenges & security challenges related to IoT.

Section – II

Q.4 Attempt Any FOUR Questions **16**

a) Describe the architecture of a Li-Fi system with a neat diagram.

b) Explain the MQTT architecture with the roles of Publisher, Subscriber, and Broker.

c) List the various sensors and actuators used in smart home automation system and justify their selection.

d) Discuss the advantages, disadvantages and applications of CoAP for constrained IoT devices.

e) What is Presence in XMPP? How does it help in IoT and messaging applications?

Q.5 Attempt any TWO **12**

a) Explain the role of the central node (hub/ switch /gateway) in Star Topology. Compare Star Topology with Ring and Mesh Topologies.

b) Farmers are struggling with improper watering of crops due to irregular rainfall, leading to low crop yield.

Develop an IoT-based Smart Agriculture system focusing on soil moisture monitoring and automated irrigation. State challenges in system design.

c) A city faces frequent traffic jams due to drivers wasting time finding parking slots in crowded areas.

Propose a Smart Parking IoT solution to efficiently guide drivers to available parking spots. Draw the system architecture and explain working.

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Artificial Intelligence (ENTHON-02A)

Day & Date: Monday 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer **14**

1) The correct ways to solve a problem of state-space search are?
a) Forward from the initial state b) Backward from the goal
c) Both a and b d) None of the above

2) Which of these is the best learning model suitable for an observable environment?
a) Supervised b) Unsupervised
c) Both a & b d) None of the above

3) A* algorithm is based on _____
a) Breadth-First-Search b) Depth-First-Search
c) Best-First-Search d) Hill climbing

4) Which is not a property of representation of knowledge?
a) Representational Verification b) Representational Adequacy
c) Inferential Adequacy d) Inferential Efficiency

5) Which of the following search technique has AND/OR graph theory?
a) Greedy Best First Search b) A*
c) AO* d) None of these

6) Propositional Logic has _____ output.
a) Either True or False b) Both True and False
c) Quantitative Value d) None

7) How an AI agent does interact with its environment?
a) Using sensors and perceivers b) Using only sensors
c) Using only perceivers d) None of the above

8) Which AI technique enables the computers to understand the associations and relationships between objects and events?

a) Heuristic Processing
b) Cognitive Science
c) Relative Symbolism
d) Pattern Matching

9) In state-space, the set of actions for a given problem is expressed by the _____.

a) Intermediate States
b) Successor function that takes current action and returns next state
c) Initial States
d) None of the above

10) Which statement is valid for the Heuristic function?

a) The heuristic function is used to solve mathematical problems.
b) The heuristic function takes parameters of type string and returns an integer value.
c) The heuristic function does not have any return type.
d) The heuristic function calculates the cost of an optimal path between the pair of states.

11) The Bayesian Network gives _____

a) A complete description of the problem
b) Partial Description of the domain
c) A complete description of the domain
d) None of the above

12) The best AI agent is one which _____

a) Needs user inputs for solving any problem
b) Can solve a problem on its own without any human intervention
c) Need a similar exemplary problem in its knowledge base
d) All of the above

13) The search algorithm which is similar to the minimax search, but removes the branches that don't affect the final output is known as_____.

a) Depth-first search
b) Breadth-first search
c) Alpha-beta pruning
d) None of the above

14) The probabilistic reasoning depends upon _____.

a) Estimation
b) Observations
c) Likelihood
d) All of the above

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Artificial Intelligence (ENTHON-02A)

Day & Date: Monday 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any four: **16**

a) Explain the minimax algorithm with example.
b) Explain any four applications of Al.
c) Explain any two types Al agents with diagram.
d) Explain AO* Algorithm with example.
e) What is constraint Satisfaction Problems? Explain with map colouring example.

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

a) Explain FOL (First Order Logic) in detail.
b) Write short note on knowledge representation and reasoning.
c) Write a note BFS and DFS with example.

Section – II

Q.4 Solve any four: **16**

a) Explain in brief Utility Theory of Decision making in Al.
b) Explain few sample applications of representing and reasoning with uncertain knowledge.
c) Explain in brief sequential decision problems in decision making of Al.
d) Explain in brief the scalability issues in learning and Knowledge acquisition.
e) Explain in brief the streaming scenario in learning and Knowledge acquisition.

Q.5 Solve any two: **12**

a) Explain Elementary Game Theory with few sample applications.
b) Explain Bayesian networks with few sample applications.
c) Describe alpha beta pruning algorithm with example.

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Artificial Intelligence (ENTHON-02A)

Day & Date: Monday 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer **14**

1) Which AI technique enables the computers to understand the associations and relationships between objects and events?
a) Heuristic Processing b) Cognitive Science
c) Relative Symbolism d) Pattern Matching

2) In state-space, the set of actions for a given problem is expressed by the _____.
a) Intermediate States
b) Successor function that takes current action and returns next state
c) Initial States
d) None of the above

3) Which statement is valid for the Heuristic function?
a) The heuristic function is used to solve mathematical problems.
b) The heuristic function takes parameters of type string and returns an integer value.
c) The heuristic function does not have any return type.
d) The heuristic function calculates the cost of an optimal path between the pair of states.

4) The Bayesian Network gives _____
a) A complete description of the problem
b) Partial Description of the domain
c) A complete description of the domain
d) None of the above

5) The best AI agent is one which _____
a) Needs user inputs for solving any problem
b) Can solve a problem on its own without any human intervention
c) Need a similar exemplary problem in its knowledge base
d) All of the above

6) The search algorithm which is similar to the minimax search, but removes the branches that don't affect the final output is known as_____.

a) Depth-first search b) Breadth-first search
c) Alpha-beta pruning d) None of the above

7) The probabilistic reasoning depends upon _____.

a) Estimation b) Observations
c) Likelihood d) All of the above

8) The correct ways to solve a problem of state-space search are?

a) Forward from the initial state b) Backward from the goal
c) Both a and b d) None of the above

9) Which of these is the best learning model suitable for an observable environment?

a) Supervised b) Unsupervised
c) Both a & b d) None of the above

10) A* algorithm is based on _____

a) Breadth-First-Search b) Depth-First-Search
c) Best-First-Search d) Hill climbing

11) Which is not a property of representation of knowledge?

a) Representational Verification b) Representational Adequacy
c) Inferential Adequacy d) Inferential Efficiency

12) Which of the following search technique has AND/OR graph theory?

a) Greedy Best First Search b) A*
c) AO* d) None of these

13) Propositional Logic has _____ output.

a) Either True or False b) Both True and False
c) Quantitative Value d) None

14) How an AI agent does interact with its environment?

a) Using sensors and perceivers b) Using only sensors
c) Using only perceivers d) None of the above

SLR-BD-216

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Artificial Intelligence (ENTHON-02A)

Day & Date: Monday 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any four: **16**

a) Explain the minimax algorithm with example.
b) Explain any four applications of Al.
c) Explain any two types Al agents with diagram.
d) Explain AO* Algorithm with example.
e) What is constraint Satisfaction Problems? Explain with map colouring example.

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

a) Explain FOL (First Order Logic) in detail.
b) Write short note on knowledge representation and reasoning.
c) Write a note BFS and DFS with example.

Section – II

Q.4 Solve any four: **16**

a) Explain in brief Utility Theory of Decision making in Al.
b) Explain few sample applications of representing and reasoning with uncertain knowledge.
c) Explain in brief sequential decision problems in decision making of Al.
d) Explain in brief the scalability issues in learning and Knowledge acquisition.
e) Explain in brief the streaming scenario in learning and Knowledge acquisition.

Q.5 Solve any two: **12**

a) Explain Elementary Game Theory with few sample applications.
b) Explain Bayesian networks with few sample applications.
c) Describe alpha beta pruning algorithm with example.

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Artificial Intelligence (ENTHON-02A)

Day & Date: Monday 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer **14**

1) The Bayesian Network gives _____
a) A complete description of the problem
b) Partial Description of the domain
c) A complete description of the domain
d) None of the above

2) The best AI agent is one which _____
a) Needs user inputs for solving any problem
b) Can solve a problem on its own without any human intervention
c) Need a similar exemplary problem in its knowledge base
d) All of the above

3) The search algorithm which is similar to the minimax search, but removes the branches that don't affect the final output is known as_____.
a) Depth-first search b) Breadth-first search
c) Alpha-beta pruning d) None of the above

4) The probabilistic reasoning depends upon _____.
a) Estimation b) Observations
c) Likelihood d) All of the above

5) The correct ways to solve a problem of state-space search are?
a) Forward from the initial state b) Backward from the goal
c) Both a and b d) None of the above

6) Which of these is the best learning model suitable for an observable environment?
a) Supervised b) Unsupervised
c) Both a & b d) None of the above

7) A* algorithm is based on _____
a) Breadth-First-Search b) Depth-First-Search
c) Best-First-Search d) Hill climbing

8) Which is not a property of representation of knowledge?
a) Representational Verification b) Representational Adequacy
c) Inferential Adequacy d) Inferential Efficiency

9) Which of the following search technique has AND/OR graph theory?
a) Greedy Best First Search b) A*
c) AO* d) None of these

10) Propositional Logic has _____ output.
a) Either True or False b) Both True and False
c) Quantitative Value d) None

11) How an AI agent does interact with its environment?
a) Using sensors and perceivers b) Using only sensors
c) Using only perceivers d) None of the above

12) Which AI technique enables the computers to understand the associations and relationships between objects and events?
a) Heuristic Processing b) Cognitive Science
c) Relative Symbolism d) Pattern Matching

13) In state-space, the set of actions for a given problem is expressed by the _____.
a) Intermediate States
b) Successor function that takes current action and returns next state
c) Initial States
d) None of the above

14) Which statement is valid for the Heuristic function?
a) The heuristic function is used to solve mathematical problems.
b) The heuristic function takes parameters of type string and returns an integer value.
c) The heuristic function does not have any return type.
d) The heuristic function calculates the cost of an optimal path between the pair of states.

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Artificial Intelligence (ENTHON-02A)

Day & Date: Monday 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any four: **16**

a) Explain the minimax algorithm with example.
b) Explain any four applications of Al.
c) Explain any two types Al agents with diagram.
d) Explain AO* Algorithm with example.
e) What is constraint Satisfaction Problems? Explain with map colouring example.

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

a) Explain FOL (First Order Logic) in detail.
b) Write short note on knowledge representation and reasoning.
c) Write a note BFS and DFS with example.

Section – II

Q.4 Solve any four: **16**

a) Explain in brief Utility Theory of Decision making in Al.
b) Explain few sample applications of representing and reasoning with uncertain knowledge.
c) Explain in brief sequential decision problems in decision making of Al.
d) Explain in brief the scalability issues in learning and Knowledge acquisition.
e) Explain in brief the streaming scenario in learning and Knowledge acquisition.

Q.5 Solve any two: **12**

a) Explain Elementary Game Theory with few sample applications.
b) Explain Bayesian networks with few sample applications.
c) Describe alpha beta pruning algorithm with example.

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Artificial Intelligence (ENTHON-02A)

Day & Date: Monday 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer **14**

1) Propositional Logic has _____ output.
a) Either True or False b) Both True and False
c) Quantitative Value d) None

2) How an AI agent does interact with its environment?
a) Using sensors and perceivers b) Using only sensors
c) Using only perceivers d) None of the above

3) Which AI technique enables the computers to understand the associations and relationships between objects and events?
a) Heuristic Processing b) Cognitive Science
c) Relative Symbolism d) Pattern Matching

4) In state-space, the set of actions for a given problem is expressed by the _____.
a) Intermediate States
b) Successor function that takes current action and returns next state
c) Initial States
d) None of the above

5) Which statement is valid for the Heuristic function?
a) The heuristic function is used to solve mathematical problems.
b) The heuristic function takes parameters of type string and returns an integer value.
c) The heuristic function does not have any return type.
d) The heuristic function calculates the cost of an optimal path between the pair of states.

6) The Bayesian Network gives _____
a) A complete description of the problem
b) Partial Description of the domain
c) A complete description of the domain
d) None of the above

7) The best AI agent is one which _____
a) Needs user inputs for solving any problem
b) Can solve a problem on its own without any human intervention
c) Need a similar exemplary problem in its knowledge base
d) All of the above

8) The search algorithm which is similar to the minimax search, but removes the branches that don't affect the final output is known as_____.
a) Depth-first search b) Breadth-first search
c) Alpha-beta pruning d) None of the above

9) The probabilistic reasoning depends upon _____.
a) Estimation b) Observations
c) Likelihood d) All of the above

10) The correct ways to solve a problem of state-space search are?
a) Forward from the initial state b) Backward from the goal
c) Both a and b d) None of the above

11) Which of these is the best learning model suitable for an observable environment?
a) Supervised b) Unsupervised
c) Both a & b d) None of the above

12) A* algorithm is based on _____
a) Breadth-First-Search b) Depth-First-Search
c) Best-First-Search d) Hill climbing

13) Which is not a property of representation of knowledge?
a) Representational Verification b) Representational Adequacy
c) Inferential Adequacy d) Inferential Efficiency

14) Which of the following search technique has AND/OR graph theory?
a) Greedy Best First Search b) A*
c) AO* d) None of these

SLR-BD-216

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Artificial Intelligence (ENTHON-02A)

Day & Date: Monday 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Solve any four: **16**

a) Explain the minimax algorithm with example.
b) Explain any four applications of Al.
c) Explain any two types Al agents with diagram.
d) Explain AO* Algorithm with example.
e) What is constraint Satisfaction Problems? Explain with map colouring example.

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

a) Explain FOL (First Order Logic) in detail.
b) Write short note on knowledge representation and reasoning.
c) Write a note BFS and DFS with example.

Section – II

Q.4 Solve any four: **16**

a) Explain in brief Utility Theory of Decision making in Al.
b) Explain few sample applications of representing and reasoning with uncertain knowledge.
c) Explain in brief sequential decision problems in decision making of Al.
d) Explain in brief the scalability issues in learning and Knowledge acquisition.
e) Explain in brief the streaming scenario in learning and Knowledge acquisition.

Q.5 Solve any two: **12**

a) Explain Elementary Game Theory with few sample applications.
b) Explain Bayesian networks with few sample applications.
c) Describe alpha beta pruning algorithm with example.

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Data Communication and Signaling in Railway (ENTHON-02D)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer **14**

1) The World Wide Web (WWW) was invented by _____.
a) Steve Jobs b) Tim Berners Lee
c) Ray Tom liners d) All of these

2) The purpose of using flux in soldering is to _____
a) Increase fluidity of solder metal
b) Feel up gaps left in a bad joint
c) Carbon steel
d) Prevent oxides forming

3) State the reason for thermal shutdown of IC regulator?
a) Spikes in temperature b) Decrease in temperature
c) Fluctuation in temperature d) Increase in temperature

4) On which of the following effects of electric current a fuse operates?
a) Photoelectric effect b) Electrostatic effect
c) Heating effect d) Magnetic effect

5) The bridge rectifier is an alternative for _____
a) Full wave rectifier b) Peak rectifier
c) Half wave rectifier d) None of the mentioned

6) Which of these is not a guided medium?
a) Fiber optical cable b) Coaxial cable
c) Wireless LAN d) Copper wire

7) Which transmission media provides the highest transmission speed in a network?
a) Coaxial cable b) twisted pair cable
c) optical fiber d) electrical cable

8) Which of these are web browsers?
a) Google Chrome
b) Internet Explorer
c) Brave
d) All of these

9) The purpose of using flux in soldering is to _____
a) Increase fluidity of solder metal
b) Feel up gaps left in a bad joint
c) Carbon steel
d) Prevent oxides forming

10) State the reason for the thermal shutdown of IC regulator.
a) Spikes in temperature
b) Decrease in temperature
c) Fluctuation in temperature
d) Increase in temperature

11) On which of the following effects of electric current a fuse operates?
a) Photoelectric effect
b) Electrostatic effect
c) Heating effect
d) Magnetic effect

12) A soldering iron 'bit' is made of _____
a) Brass
b) Tin
c) Steel
d) Copper

13) What is the max data transfer rate for optical fiber cable?
a) 10 Mbps
b) 100 Mbps
c) 1000 Mbps
d) 10000 Mbps

14) Fiber optics possess the following properties _____.
a) Immune electromagnetic interference
b) Very less signal attenuation
c) Very hard to tap
d) All of the mentioned

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Data Communication and Signaling in Railway (ENTHON-02D)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any FOUR **16**

a) What do you mean by Rectifiers? Give classification.
b) Draw and Explain Block diagram of DC Regulated Power supply.
c) Write a note on WWW (World Wide Web).
d) Explain Soldering & Desoldering techniques.
e) Explain & compare Internet & Intranet.

Q.3 Attempt any TWO **12**

a) Give Classification of Transmission media. Compare wired transmission media and Wireless transmission media.
b) Explain the necessity of Fuses & classification of Fuses.
c) Write a short note on IC Regulators.

Section – II

Q.4 Attempt any FOUR **16**

a) Give & explain the classification of Railway signals according to functions.
b) Write a short note on FTP (File Transfer Protocol).
c) Explain different networking devices.
d) Explain Equipment used in Railnet.
e) What are the special signals used in Railway signaling.

Q.5 Attempt any TWO **12**

a) Explain the client Server communication model.
b) Write a note on DHCP (Dynamic Host Configuration Protocol).
c) Explain in detail Domain Name System (DNS).

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Data Communication and Signaling in Railway (ENTHON-02D)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer **14**

1) Which of these are web browsers?
a) Google Chrome b) Internet Explorer
c) Brave d) All of these

2) The purpose of using flux in soldering is to _____
a) Increase fluidity of solder metal
b) Feel up gaps left in a bad joint
c) Carbon steel
d) Prevent oxides forming

3) State the reason for the thermal shutdown of IC regulator.
a) Spikes in temperature b) Decrease in temperature
c) Fluctuation in temperature d) Increase in temperature

4) On which of the following effects of electric current a fuse operates?
a) Photoelectric effect b) Electrostatic effect
c) Heating effect d) Magnetic effect

5) A soldering iron 'bit' is made of _____
a) Brass b) Tin
c) Steel d) Copper

6) What is the max data transfer rate for optical fiber cable?
a) 10 Mbps b) 100 Mbps
c) 1000 Mbps d) 10000 Mbps

7) Fiber optics possess the following properties _____.
a) Immune electromagnetic interference
b) Very less signal attenuation
c) Very hard to tap
d) All of the mentioned

8) The World Wide Web (WWW) was invented by _____.
a) Steve Jobs b) Tim Berners Lee
c) Ray Tom liners d) All of these

9) The purpose of using flux in soldering is to _____
a) Increase fluidity of solder metal
b) Feel up gaps left in a bad joint
c) Carbon steel
d) Prevent oxides forming

10) State the reason for thermal shutdown of IC regulator?
a) Spikes in temperature b) Decrease in temperature
c) Fluctuation in temperature d) Increase in temperature

11) On which of the following effects of electric current a fuse operates?
a) Photoelectric effect b) Electrostatic effect
c) Heating effect d) Magnetic effect

12) The bridge rectifier is an alternative for _____
a) Full wave rectifier b) Peak rectifier
c) Half wave rectifier d) None of the mentioned

13) Which of these is not a guided medium?
a) Fiber optical cable b) Coaxial cable
c) Wireless LAN d) Copper wire

14) Which transmission media provides the highest transmission speed in a network?
a) Coaxial cable b) twisted pair cable
c) optical fiber d) electrical cable

SLR-BD-219

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Data Communication and Signaling in Railway (ENTHON-02D)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any FOUR **16**

a) What do you mean by Rectifiers? Give classification.
b) Draw and Explain Block diagram of DC Regulated Power supply.
c) Write a note on WWW (World Wide Web).
d) Explain Soldering & Desoldering techniques.
e) Explain & compare Internet & Intranet.

Q.3 Attempt any TWO **12**

a) Give Classification of Transmission media. Compare wired transmission media and Wireless transmission media.
b) Explain the necessity of Fuses & classification of Fuses.
c) Write a short note on IC Regulators.

Section – II

Q.4 Attempt any FOUR **16**

a) Give & explain the classification of Railway signals according to functions.
b) Write a short note on FTP (File Transfer Protocol).
c) Explain different networking devices.
d) Explain Equipment used in Railnet.
e) What are the special signals used in Railway signaling.

Q.5 Attempt any TWO **12**

a) Explain the client Server communication model.
b) Write a note on DHCP (Dynamic Host Configuration Protocol).
c) Explain in detail Domain Name System (DNS).

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Data Communication and Signaling in Railway (ENTHON-02D)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer **14**

1) On which of the following effects of electric current a fuse operates?
a) Photoelectric effect b) Electrostatic effect
c) Heating effect d) Magnetic effect

2) A soldering iron 'bit' is made of _____
a) Brass b) Tin
c) Steel d) Copper

3) What is the max data transfer rate for optical fiber cable?
a) 10 Mbps b) 100 Mbps
c) 1000 Mbps d) 10000 Mbps

4) Fiber optics possess the following properties _____.
a) Immune electromagnetic interference
b) Very less signal attenuation
c) Very hard to tap
d) All of the mentioned

5) The World Wide Web (WWW) was invented by _____.
a) Steve Jobs b) Tim Berners Lee
c) Ray Tom liners d) All of these

6) The purpose of using flux in soldering is to _____
a) Increase fluidity of solder metal
b) Feel up gaps left in a bad joint
c) Carbon steel
d) Prevent oxides forming

7) State the reason for thermal shutdown of IC regulator?
a) Spikes in temperature b) Decrease in temperature
c) Fluctuation in temperature d) Increase in temperature

8) On which of the following effects of electric current a fuse operates?
a) Photoelectric effect b) Electrostatic effect
c) Heating effect d) Magnetic effect

9) The bridge rectifier is an alternative for _____
a) Full wave rectifier b) Peak rectifier
c) Half wave rectifier d) None of the mentioned

10) Which of these is not a guided medium?
a) Fiber optical cable b) Coaxial cable
c) Wireless LAN d) Copper wire

11) Which transmission media provides the highest transmission speed in a network?
a) Coaxial cable b) twisted pair cable
c) optical fiber d) electrical cable

12) Which of these are web browsers?
a) Google Chrome b) Internet Explorer
c) Brave d) All of these

13) The purpose of using flux in soldering is to _____
a) Increase fluidity of solder metal
b) Feel up gaps left in a bad joint
c) Carbon steel
d) Prevent oxides forming

14) State the reason for the thermal shutdown of IC regulator.
a) Spikes in temperature b) Decrease in temperature
c) Fluctuation in temperature d) Increase in temperature

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Data Communication and Signaling in Railway (ENTHON-02D)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any FOUR **16**

a) What do you mean by Rectifiers? Give classification.
b) Draw and Explain Block diagram of DC Regulated Power supply.
c) Write a note on WWW (World Wide Web).
d) Explain Soldering & Desoldering techniques.
e) Explain & compare Internet & Intranet.

Q.3 Attempt any TWO **12**

a) Give Classification of Transmission media. Compare wired transmission media and Wireless transmission media.
b) Explain the necessity of Fuses & classification of Fuses.
c) Write a short note on IC Regulators.

Section – II

Q.4 Attempt any FOUR **16**

a) Give & explain the classification of Railway signals according to functions.
b) Write a short note on FTP (File Transfer Protocol).
c) Explain different networking devices.
d) Explain Equipment used in Railnet.
e) What are the special signals used in Railway signaling.

Q.5 Attempt any TWO **12**

a) Explain the client Server communication model.
b) Write a note on DHCP (Dynamic Host Configuration Protocol).
c) Explain in detail Domain Name System (DNS).

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Data Communication and Signaling in Railway (ENTHON-02D)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer **14**

1) Which of these is not a guided medium?
a) Fiber optical cable b) Coaxial cable
c) Wireless LAN d) Copper wire

2) Which transmission media provides the highest transmission speed in a network?
a) Coaxial cable b) twisted pair cable
c) optical fiber d) electrical cable

3) Which of these are web browsers?
a) Google Chrome b) Internet Explorer
c) Brave d) All of these

4) The purpose of using flux in soldering is to _____
a) Increase fluidity of solder metal
b) Feel up gaps left in a bad joint
c) Carbon steel
d) Prevent oxides forming

5) State the reason for the thermal shutdown of IC regulator.
a) Spikes in temperature b) Decrease in temperature
c) Fluctuation in temperature d) Increase in temperature

6) On which of the following effects of electric current a fuse operates?
a) Photoelectric effect b) Electrostatic effect
c) Heating effect d) Magnetic effect

7) A soldering iron 'bit' is made of _____
a) Brass b) Tin
c) Steel d) Copper

8) What is the max data transfer rate for optical fiber cable?
a) 10 Mbps b) 100 Mbps
c) 1000 Mbps d) 10000 Mbps

9) Fiber optics possess the following properties _____.
a) Immune electromagnetic interference
b) Very less signal attenuation
c) Very hard to tap
d) All of the mentioned

10) The World Wide Web (WWW) was invented by _____.
a) Steve Jobs b) Tim Berners Lee
c) Ray Tom liners d) All of these

11) The purpose of using flux in soldering is to _____
a) Increase fluidity of solder metal
b) Feel up gaps left in a bad joint
c) Carbon steel
d) Prevent oxides forming

12) State the reason for thermal shutdown of IC regulator?
a) Spikes in temperature b) Decrease in temperature
c) Fluctuation in temperature d) Increase in temperature

13) On which of the following effects of electric current a fuse operates?
a) Photoelectric effect b) Electrostatic effect
c) Heating effect d) Magnetic effect

14) The bridge rectifier is an alternative for _____
a) Full wave rectifier b) Peak rectifier
c) Half wave rectifier d) None of the mentioned

SLR-BD-219

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Data Communication and Signaling in Railway (ENTHON-02D)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any FOUR **16**

a) What do you mean by Rectifiers? Give classification.
b) Draw and Explain Block diagram of DC Regulated Power supply.
c) Write a note on WWW (World Wide Web).
d) Explain Soldering & Desoldering techniques.
e) Explain & compare Internet & Intranet.

Q.3 Attempt any TWO **12**

a) Give Classification of Transmission media. Compare wired transmission media and Wireless transmission media.
b) Explain the necessity of Fuses & classification of Fuses.
c) Write a short note on IC Regulators.

Section – II

Q.4 Attempt any FOUR **16**

a) Give & explain the classification of Railway signals according to functions.
b) Write a short note on FTP (File Transfer Protocol).
c) Explain different networking devices.
d) Explain Equipment used in Railnet.
e) What are the special signals used in Railway signaling.

Q.5 Attempt any TWO **12**

a) Explain the client Server communication model.
b) Write a note on DHCP (Dynamic Host Configuration Protocol).
c) Explain in detail Domain Name System (DNS).

Seat No.		Set	P

S.Y. (B.Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Control System (BTN06401)

Day & Date: Monday 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) In an open loop control system _____
a) Output is independent of control input
b) Output is dependent on control input
c) Only system parameters have effect on the control output
d) None of the above

2) A control system in which the control action is somehow dependent on the output is known as _____
a) Closed loop system b) Semiclosed loop system
c) Open system d) None of the above

3) Signal flow graph is a _____
a) semilog graph
b) log-log graph
c) Topological representation of a set of differential equation
d) A special type of graph for analysis of modern control system

4) The overall transfer function from block diagram reduction for cascaded blocks is _____
a) Sum of individual gain
b) Product of individual gain
c) Difference of individual gain
d) Divsion of individual gain

5) Root locus is used to calculate _____
a) Marginal stability b) Absolute stability
c) Conditional stability d) Relative stability

6) Standard test signals in control system are _____
a) Impulse signal b) Ramp signal
c) Unit step signal d) All of the mentioned

7) While increasing the value of gain K, the system becomes _____
a) Less stable b) More stable
c) Unstable d) Absolute stable

8) Roots on the imaginary axis makes the system _____
a) Stable b) Unstable
c) Marginally stable d) Linear

9) The overall transfer function of two blocks in parallel are _____
a) Sum of individual gain b) Product of individual gain
c) Difference of individual gain d) Division of individual gain

10) The main objective of drawing root locus plot is _____
a) To obtain a clear picture about the open loop poles and zeroes of the system
b) To obtain a clear picture about the transient response of feedback system for various values of open loop gain K
c) To determine sufficient condition for the value of 'K' that will make the feedback system unstable
d) Both b and c

11) A node having only outgoing branches _____
a) Input node b) Output node
c) Incoming node d) Outgoing node

12) Scientist Bode have contribution in _____
a) Asymptotic plots b) Polar plots
c) Root locus technique d) Constant M and n circle

13) For a stable closed loop system, the gain at phase crossover frequency should always be _____
a) < 20 dB b) < 6 dB
c) > 6 dB d) > 0 dB

14) Routh Hurwitz criterion gives _____
a) Number of roots in the right half of the s-plane
b) Value of the roots
c) Number of roots in the left half of the s-plane
d) Number of roots in the top half of the s-plane

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Control System (BTN06401)

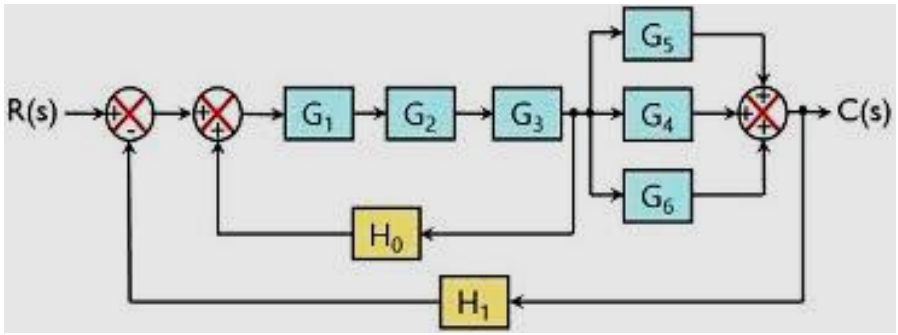
Day & Date: Monday 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any four of the following **16**

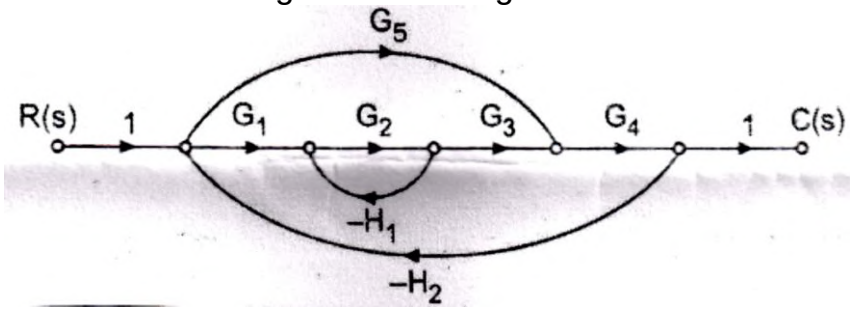
a) Reduce the following block diagram using block diagram reduction rules.



b) What is type of system explains TYPE 0 and TYPE 1 system.
c) Examine stability if $S^5 + S^4 + 2S^3 + 2S^2 + 3S + 15 = 0$
d) Define Transfer Function? Derive transfer function.
e) Explain Liquid level Control system.

Q.3 Attempt any two of the following **12**

a) Find Transfer function of given SFG diagram.



b) Explain working principle of Stepper motor with diagram.
c) Determine Kp, Kv, Ka, Steady State Error with open loop transfer function as:
$G(s)H(s) = \frac{10(s+2)(s+3)}{s(s+1)(s+4)(s+5)}$, and $r(t) = 3 + t + t^2$

Section – II

Q.4 Attempt any four of the following **16**

a) Explain the terms 1) Gain Margin, 2) Phase Margin

b) Explain Lead Compensator.

c) For Root Locus, explain Angle condition and Magnitude condition

d) How to find the Breakaway point and the angle of Departure for Root Locus Technique.

e) Draw the root locus of the control system having open loop transfer function,

$$G(s)H(s) = \frac{20}{s(s+1)(s+3)}$$

Q.5 Attempt any two of the following **12**

a) Construct the Bode Plot for Transfer Function $G(s) = \frac{20}{s(1+0.1s)}$

b) A feedback system has open loop transfer function

$$G(s)H(s) = \frac{K(1+S)}{s(s^2+5S-6)}$$

Determine,

i) Range of K for stability,

ii) Marginal value of K,

iii) Location of roots for marginal value of K.

c) Explain two special cases of Routh's criterion.

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Control System (BTN06401)

Day & Date: Monday 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) Roots on the imaginary axis makes the system _____
a) Stable b) Unstable
c) Marginally stable d) Linear

2) The overall transfer function of two blocks in parallel are _____
a) Sum of individual gain b) Product of individual gain
c) Difference of individual gain d) Division of individual gain

3) The main objective of drawing root locus plot is _____
a) To obtain a clear picture about the open loop poles and zeroes of the system
b) To obtain a clear picture about the transient response of feedback system for various values of open loop gain K
c) To determine sufficient condition for the value of 'K' that will make the feedback system unstable
d) Both b and c

4) A node having only outgoing branches _____
a) Input node b) Output node
c) Incoming node d) Outgoing node

5) Scientist Bode have contribution in _____
a) Asymptotic plots b) Polar plots
c) Root locus technique d) Constant M and n circle

6) For a stable closed loop system, the gain at phase crossover frequency should always be _____
a) < 20 dB b) < 6 dB
c) > 6 dB d) > 0 dB

7) Routh Hurwitz criterion gives _____
a) Number of roots in the right half of the s-plane
b) Value of the roots
c) Number of roots in the left half of the s-plane
d) Number of roots in the top half of the s-plane

8) In an open loop control system _____
a) Output is independent of control input
b) Output is dependent on control input
c) Only system parameters have effect on the control output
d) None of the above

9) A control system in which the control action is somehow dependent on the output is known as _____
a) Closed loop system
b) Semiclosed loop system
c) Open system
d) None of the above

10) Signal flow graph is a _____
a) semilog graph
b) log-log graph
c) Topological representation of a set of differential equation
d) A special type of graph for analysis of modern control system

11) The overall transfer function from block diagram reduction for cascaded blocks is _____
a) Sum of individual gain
b) Product of individual gain
c) Difference of individual gain
d) Divsion of individual gain

12) Root locus is used to calculate _____
a) Marginal stability
b) Absolute stability
c) Conditional stability
d) Relative stability

13) Standard test signals in control system are _____
a) Impulse signal
b) Ramp signal
c) Unit step signal
d) All of the mentioned

14) While increasing the value of gain K, the system becomes _____
a) Less stable
b) More stable
c) Unstable
d) Absolute stable

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Control System (BTN06401)

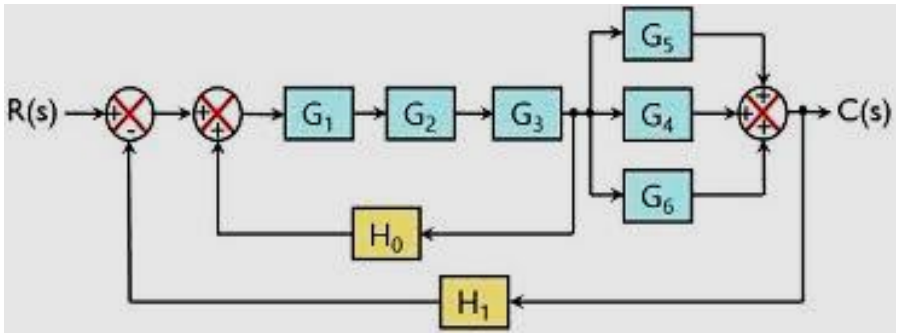
Day & Date: Monday 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any four of the following **16**

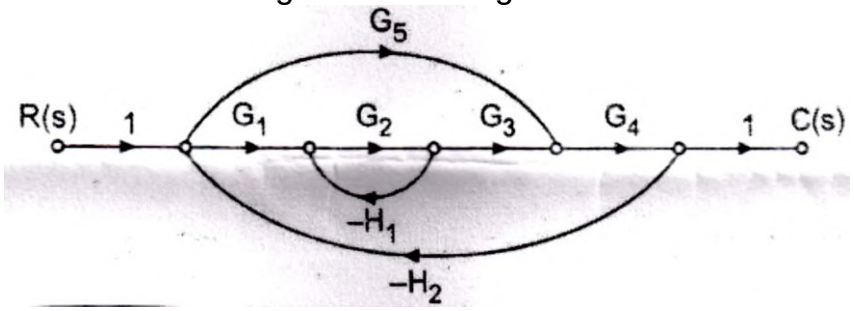
a) Reduce the following block diagram using block diagram reduction rules.



b) What is type of system explains TYPE 0 and TYPE 1 system.
c) Examine stability if $S^5 + S^4 + 2S^3 + 2S^2 + 3S + 15 = 0$
d) Define Transfer Function? Derive transfer function.
e) Explain Liquid level Control system.

Q.3 Attempt any two of the following **12**

a) Find Transfer function of given SFG diagram.



b) Explain working principle of Stepper motor with diagram.
c) Determine Kp, Kv, Ka, Steady State Error with open loop transfer function as:
$G(s)H(s) = \frac{10(s+2)(s+3)}{s(s+1)(s+4)(s+5)}$, and $r(t) = 3 + t + t^2$

Section – II

Q.4 Attempt any four of the following **16**

a) Explain the terms 1) Gain Margin, 2) Phase Margin

b) Explain Lead Compensator.

c) For Root Locus, explain Angle condition and Magnitude condition

d) How to find the Breakaway point and the angle of Departure for Root Locus Technique.

e) Draw the root locus of the control system having open loop transfer function,

$$G(s)H(s) = \frac{20}{s(s+1)(s+3)}$$

Q.5 Attempt any two of the following **12**

a) Construct the Bode Plot for Transfer Function $G(s) = \frac{20}{s(1+0.1s)}$

b) A feedback system has open loop transfer function

$$G(s)H(s) = \frac{K(1+S)}{s(s^2+5S-6)}$$

Determine,

i) Range of K for stability,

ii) Marginal value of K,

iii) Location of roots for marginal value of K.

c) Explain two special cases of Routh's criterion.

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Control System (BTN06401)

Day & Date: Monday 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) A node having only outgoing branches _____
a) Input node b) Output node
c) Incoming node d) Outgoing node

2) Scientist Bode have contribution in _____
a) Asymptotic plots b) Polar plots
c) Root locus technique d) Constant M and n circle

3) For a stable closed loop system, the gain at phase crossover frequency should always be _____
a) < 20 dB b) < 6 dB
c) > 6 dB d) > 0 dB

4) Routh Hurwitz criterion gives _____
a) Number of roots in the right half of the s-plane
b) Value of the roots
c) Number of roots in the left half of the s-plane
d) Number of roots in the top half of the s-plane

5) In an open loop control system _____
a) Output is independent of control input
b) Output is dependent on control input
c) Only system parameters have effect on the control output
d) None of the above

6) A control system in which the control action is somehow dependent on the output is known as _____
a) Closed loop system b) Semiclosed loop system
c) Open system d) None of the above

7) Signal flow graph is a _____
a) semilog graph
b) log-log graph
c) Topological representation of a set of differential equation
d) A special type of graph for analysis of modern control system

8) The overall transfer function from block diagram reduction for cascaded blocks is _____
a) Sum of individual gain
b) Product of individual gain
c) Difference of individual gain
d) Divsion of individual gain

9) Root locus is used to calculate _____
a) Marginal stability b) Absolute stability
c) Conditional stability d) Relative stability

10) Standard test signals in control system are _____
a) Impulse signal b) Ramp signal
c) Unit step signal d) All of the mentioned

11) While increasing the value of gain K, the system becomes _____
a) Less stable b) More stable
c) Unstable d) Absolute stable

12) Roots on the imaginary axis makes the system _____
a) Stable b) Unstable
c) Marginally stable d) Linear

13) The overall transfer function of two blocks in parallel are _____
a) Sum of individual gain b) Product of individual gain
c) Difference of individual gain d) Division of individual gain

14) The main objective of drawing root locus plot is _____
a) To obtain a clear picture about the open loop poles and zeroes of the system
b) To obtain a clear picture about the transient response of feedback system for various values of open loop gain K
c) To determine sufficient condition for the value of ‘K’ that will make the feedback system unstable
d) Both b and c

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Control System (BTN06401)

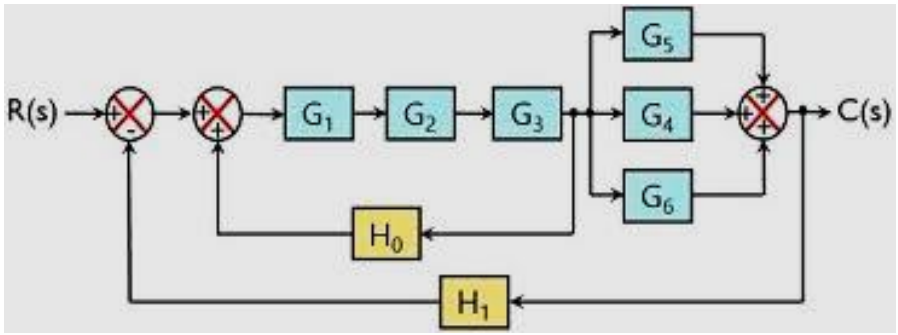
Day & Date: Monday 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any four of the following **16**

a) Reduce the following block diagram using block diagram reduction rules.



b) What is type of system explains TYPE 0 and TYPE 1 system.

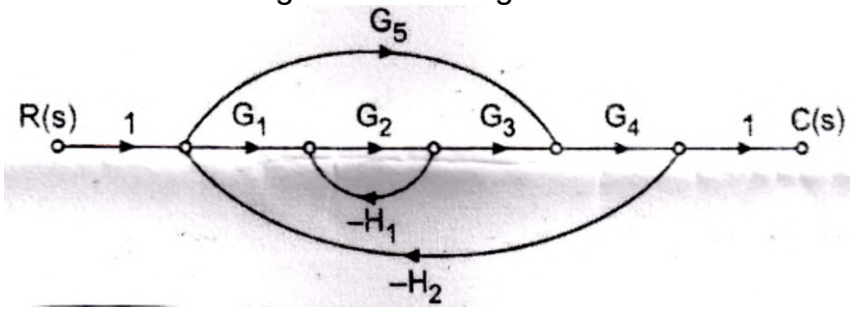
c) Examine stability if $S^5 + S^4 + 2S^3 + 2S^2 + 3S + 15 = 0$

d) Define Transfer Function? Derive transfer function.

e) Explain Liquid level Control system.

Q.3 Attempt any two of the following **12**

a) Find Transfer function of given SFG diagram.



b) Explain working principle of Stepper motor with diagram.

c) Determine Kp, Kv, Ka, Steady State Error with open loop transfer function as:

$G(s)H(s) = \frac{10(s+2)(s+3)}{s(s+1)(s+4)(s+5)}$, and $r(t) = 3 + t + t^2$

Section – II

Q.4 Attempt any four of the following **16**

a) Explain the terms 1) Gain Margin, 2) Phase Margin

b) Explain Lead Compensator.

c) For Root Locus, explain Angle condition and Magnitude condition

d) How to find the Breakaway point and the angle of Departure for Root Locus Technique.

e) Draw the root locus of the control system having open loop transfer function,

$$G(s)H(s) = \frac{20}{s(s+1)(s+3)}$$

Q.5 Attempt any two of the following **12**

a) Construct the Bode Plot for Transfer Function $G(s) = \frac{20}{s(1+0.1s)}$

b) A feedback system has open loop transfer function

$$G(s)H(s) = \frac{K(1+S)}{s(s^2+5S-6)}$$

Determine,

i) Range of K for stability,

ii) Marginal value of K,

iii) Location of roots for marginal value of K.

c) Explain two special cases of Routh's criterion.

Seat No.		Set	S

S.Y. (B.Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Control System (BTN06401)

Day & Date: Monday 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) Standard test signals in control system are _____
a) Impulse signal b) Ramp signal
c) Unit step signal d) All of the mentioned

2) While increasing the value of gain K, the system becomes _____
a) Less stable b) More stable
c) Unstable d) Absolute stable

3) Roots on the imaginary axis makes the system _____
a) Stable b) Unstable
c) Marginally stable d) Linear

4) The overall transfer function of two blocks in parallel are _____
a) Sum of individual gain b) Product of individual gain
c) Difference of individual gain d) Division of individual gain

5) The main objective of drawing root locus plot is _____
a) To obtain a clear picture about the open loop poles and zeroes of the system
b) To obtain a clear picture about the transient response of feedback system for various values of open loop gain K
c) To determine sufficient condition for the value of 'K' that will make the feedback system unstable
d) Both b and c

6) A node having only outgoing branches _____
a) Input node b) Output node
c) Incoming node d) Outgoing node

7) Scientist Bode have contribution in _____
a) Asymptotic plots b) Polar plots
c) Root locus technique d) Constant M and n circle

8) For a stable closed loop system, the gain at phase crossover frequency should always be _____
a) < 20 dB b) < 6 dB
c) > 6 dB d) > 0 dB

9) Routh Hurwitz criterion gives _____
a) Number of roots in the right half of the s-plane
b) Value of the roots
c) Number of roots in the left half of the s-plane
d) Number of roots in the top half of the s-plane

10) In an open loop control system _____
a) Output is independent of control input
b) Output is dependent on control input
c) Only system parameters have effect on the control output
d) None of the above

11) A control system in which the control action is somehow dependent on the output is known as _____
a) Closed loop system b) Semiclosed loop system
c) Open system d) None of the above

12) Signal flow graph is a _____
a) semilog graph
b) log-log graph
c) Topological representation of a set of differential equation
d) A special type of graph for analysis of modern control system

13) The overall transfer function from block diagram reduction for cascaded blocks is _____
a) Sum of individual gain
b) Product of individual gain
c) Difference of individual gain
d) Divsion of individual gain

14) Root locus is used to calculate _____
a) Marginal stability b) Absolute stability
c) Conditional stability d) Relative stability

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Control System (BTN06401)

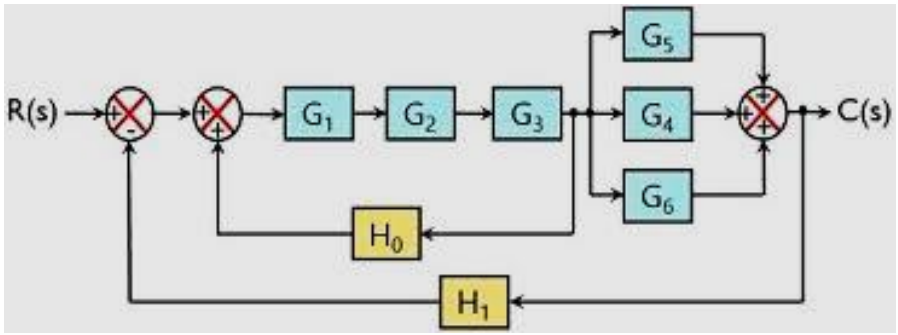
Day & Date: Monday 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any four of the following **16**

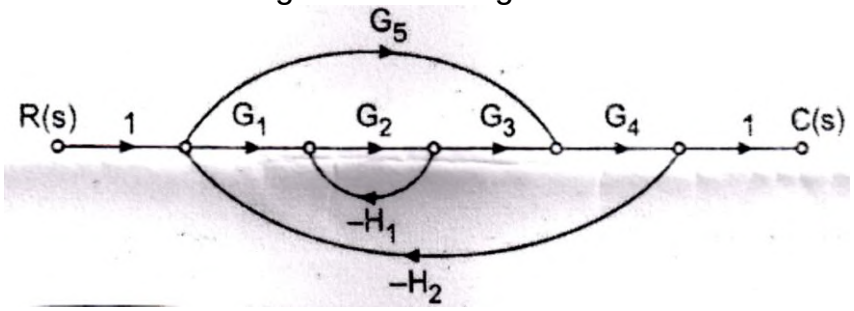
a) Reduce the following block diagram using block diagram reduction rules.



b) What is type of system explains TYPE 0 and TYPE 1 system.
c) Examine stability if $S^5 + S^4 + 2S^3 + 2S^2 + 3S + 15 = 0$
d) Define Transfer Function? Derive transfer function.
e) Explain Liquid level Control system.

Q.3 Attempt any two of the following **12**

a) Find Transfer function of given SFG diagram.



b) Explain working principle of Stepper motor with diagram.
c) Determine Kp, Kv, Ka, Steady State Error with open loop transfer function as:
$G(s)H(s) = \frac{10(s+2)(s+3)}{s(s+1)(s+4)(s+5)}$, and $r(t) = 3 + t + t^2$

Section – II

Q.4 Attempt any four of the following **16**

a) Explain the terms 1) Gain Margin, 2) Phase Margin

b) Explain Lead Compensator.

c) For Root Locus, explain Angle condition and Magnitude condition

d) How to find the Breakaway point and the angle of Departure for Root Locus Technique.

e) Draw the root locus of the control system having open loop transfer function,

$$G(s)H(s) = \frac{20}{s(s+1)(s+3)}$$

Q.5 Attempt any two of the following **12**

a) Construct the Bode Plot for Transfer Function $G(s) = \frac{20}{s(1+0.1s)}$

b) A feedback system has open loop transfer function

$$G(s)H(s) = \frac{K(1+S)}{s(s^2+5S-6)}$$

Determine,

i) Range of K for stability,

ii) Marginal value of K,

iii) Location of roots for marginal value of K.

c) Explain two special cases of Routh's criterion.

SLR-BD-221

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Analog Integrated Circuits (BTN06402)

Day & Date: Wednesday, 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each Question carries one mark.
2) Don't forget to mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Draw neat diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Tick the correct option. **14**

1) In ideal Differential Amplifier, if same signal is given to both inputs, and then output will be ____
a) Same as input b) Double the input
c) Not equal to zero d) Zero

2) What should be maximum bandwidth for a gain of 20 in case of IC 741?
a) 1 MHz b) 100 KHz
c) 50 KHz d) 1 KHz

3) The type of feedback used in closed loop non-inverting amplifier is _____.
a) Voltage series b) Current series
c) Current shunt d) Voltage shunt

4) How to improve CMRR value _____.
a) Increase common mode gain
b) Decrease common mode gain
c) Increase Differential mode gain
d) Decrease differential mode gain

5) Voltage Follower is special case of _____ amplifier.
a) Non-inverting b) Inverting
c) Differential d) Scaling

6) Zero crossing detectors is special case of _____.
a) Basic comparator b) Peak detector
c) Schmitt trigger d) Window detector

7) Which is not the ideal characteristic of an op-amp?
a) Input Resistance → 0
b) Output impedance → 0
c) Bandwidth → ∞
d) Open loop voltage gain → ∞

8) For radio frequency oscillator components used are _____.
a) Crystal
b) LC
c) RC
d) Both (a & b)

9) A duty cycle is less than _____ in saw tooth wave generator.
a) 90%
b) 66.66%
c) 50%
d) 20%

10) To introduce a delay of 10 ms using IC555 with R = 10Kohm the capacitance value required is _____.
a) 1 μF
b) 4.54mF
c) 0.45 μF
d) 0.1 μF

11) Vref for LM317 is _____.
a) 1.25mV
b) 1.25V
c) 12.5V
d) None of these

12) Find the output voltage of an ideal op-amp. If V1 and V2 are the two input voltages _____.
a) VO = V1-V2
b) VO = A x (V1-V2)
c) VO = A x (V1+V2)
d) VO = V1 x V2

13) For first order active filter gain roll off rate in stop band is _____.
a) 40 dB/decade
b) 20 dB/decade
c) 90 dB/decade
d) 60 dB/decade

14) For Wien bridge Oscillator frequency of oscillation is _____.
a) 0.159 / RC
b) 1.59 / RC
c) 0.065 / RC
d) 6.5 / RC

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Analog Integrated Circuits (BTN06402)

Day & Date: Wednesday, 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams wherever necessary.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) What is op-amp? Explain with neat diagram basic building blocks of op-amp.

b) Derive equation for ideal voltage gain of non-inverting amplifier using virtual ground concept.

c) Define the following electrical parameters of IC 741 with practical & ideal values:
a) Input Offset Current
b) Total output offset voltage
c) CMRR
d) PSRR

d) Explain differentiator and its frequency response.

e) Explain the concept of grounded load V-I converter.

Q.3 Attempt the following. (Any Two) **12**

a) Derive expressions for differential voltage gain, R_{in} and R_{out} for DIBO differential amplifier using AC equivalent circuit.

b) Determine the slew rate of a frequency compensated OP-AMP at room temperature, which has a unity cross-over frequency of 5MHz (Assume $V_m = 1$)

c) Draw and Explain Summing and Scaling amplifier using non Inverting mode of amplifiers.

Section – II

Q.5 Answer the following questions. (Any Four) **16**

a) Explain with neat diagram operation of OP-AMP as Comparator.

b) Draw and Explain Zero crossing Detector in detail.

c) Write design procedure for a first order low pass filter.

d) Explain the concept of Phase Shift Oscillator with neat diagrams.

e) What is voltage regulator? Explain the concept of fixed voltage regulators.

Q.6 Answer the following questions. (Any Two) **12**

a) Draw and Explain Positive and negative clippers.

b) Design a second order low-pass filter for a cut-off frequency of 1 kHz with a pass band gain of 1.586
(Assume $C_2 = C_3 = 0.005\ \mu F$ and $R_1 = 33k\Omega$)

c) Explain the operation of Astable Multivibrator using IC 555. Obtain the expression for,
(1) One Cycle Period and Output Frequency
(2) T_{on}
(3) T_{off}

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Analog Integrated Circuits (BTN06402)

Day & Date: Wednesday, 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each Question carries one mark.
2) Don't forget to mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Draw neat diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Tick the correct option. **14**

1) For radio frequency oscillator components used are _____.
a) Crystal b) LC
c) RC d) Both (a & b)

2) A duty cycle is less than _____ in saw tooth wave generator.
a) 90% b) 66.66%
c) 50% d) 20%

3) To introduce a delay of 10 ms using IC555 with R = 10Kohm the capacitance value required is _____.
a) 1 μF b) 4.54mF
c) 0.45 μF d) 0.1 μF

4) Vref for LM317 is _____.
a) 1.25mV b) 1.25V
c) 12.5V d) None of these

5) Find the output voltage of an ideal op-amp. If V1 and V2 are the two input voltages _____.
a) VO = V1-V2 b) VO = A x (V1-V2)
c) VO = A x (V1+V2) d) VO = V1 x V2

6) For first order active filter gain roll off rate in stop band is _____.
a) 40 dB/decade b) 20 dB/decade
c) 90 dB/decade d) 60 dB/decade

7) For Wien bridge Oscillator frequency of oscillation is _____.
a) 0.159 / RC b) 1.59 / RC
c) 0.065 / RC d) 6.5 / RC

8) In ideal Differential Amplifier, if same signal is given to both inputs, and then output will be ____

a) Same as input
b) Double the input
c) Not equal to zero
d) Zero

9) What should be maximum bandwidth for a gain of 20 in case of IC 741?

a) 1 MHz
b) 100 KHz
c) 50 KHz
d) 1 KHz

10) The type of feedback used in closed loop non-inverting amplifier is _____.

a) Voltage series
b) Current series
c) Current shunt
d) Voltage shunt

11) How to improve CMRR value _____.

a) Increase common mode gain
b) Decrease common mode gain
c) Increase Differential mode gain
d) Decrease differential mode gain

12) Voltage Follower is special case of _____ amplifier.

a) Non-inverting
b) Inverting
c) Differential
d) Scaling

13) Zero crossing detectors is special case of _____.

a) Basic comparator
b) Peak detector
c) Schmitt trigger
d) Window detector

14) Which is not the ideal characteristic of an op-amp?

a) Input Resistance $\rightarrow 0$
b) Output impedance $\rightarrow 0$
c) Bandwidth $\rightarrow \infty$
d) Open loop voltage gain $\rightarrow \infty$

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Analog Integrated Circuits (BTN06402)

Day & Date: Wednesday, 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams wherever necessary.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) What is op-amp? Explain with neat diagram basic building blocks of op-amp.

b) Derive equation for ideal voltage gain of non-inverting amplifier using virtual ground concept.

c) Define the following electrical parameters of IC 741 with practical & ideal values:
a) Input Offset Current
b) Total output offset voltage
c) CMRR
d) PSRR

d) Explain differentiator and its frequency response.

e) Explain the concept of grounded load V-I converter.

Q.3 Attempt the following. (Any Two) **12**

a) Derive expressions for differential voltage gain, R_{in} and R_{out} for DIBO differential amplifier using AC equivalent circuit.

b) Determine the slew rate of a frequency compensated OP-AMP at room temperature, which has a unity cross-over frequency of 5MHz (Assume $V_m = 1$)

c) Draw and Explain Summing and Scaling amplifier using non Inverting mode of amplifiers.

Section – II

Q.5 Answer the following questions. (Any Four) **16**

a) Explain with neat diagram operation of OP-AMP as Comparator.

b) Draw and Explain Zero crossing Detector in detail.

c) Write design procedure for a first order low pass filter.

d) Explain the concept of Phase Shift Oscillator with neat diagrams.

e) What is voltage regulator? Explain the concept of fixed voltage regulators.

Q.6 Answer the following questions. (Any Two) **12**

a) Draw and Explain Positive and negative clippers.

b) Design a second order low-pass filter for a cut-off frequency of 1 kHz with a pass band gain of 1.586
(Assume $C_2 = C_3 = 0.005\ \mu F$ and $R_1 = 33k\Omega$)

c) Explain the operation of Astable Multivibrator using IC 555. Obtain the expression for,
(1) One Cycle Period and Output Frequency
(2) T_{on}
(3) T_{off}

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Analog Integrated Circuits (BTN06402)

Day & Date: Wednesday, 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each Question carries one mark.
2) Don't forget to mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Draw neat diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Tick the correct option. **14**

1) Vref for LM317 is _____.
a) 1.25mV b) 1.25V
c) 12.5V d) None of these

2) Find the output voltage of an ideal op-amp. If V1 and V2 are the two input voltages _____.
a) VO = V1-V2 b) VO = A x (V1-V2)
c) VO = A x (V1+V2) d) VO = V1 x V2

3) For first order active filter gain roll off rate in stop band is _____.
a) 40 dB/decade b) 20 dB/decade
c) 90 dB/decade d) 60 dB/decade

4) For Wien bridge Oscillator frequency of oscillation is _____.
a) 0.159 / RC b) 1.59 / RC
c) 0.065 / RC d) 6.5 / RC

5) In ideal Differential Amplifier, if same signal is given to both inputs, and then output will be ____
a) Same as input b) Double the input
c) Not equal to zero d) Zero

6) What should be maximum bandwidth for a gain of 20 in case of IC 741?
a) 1 MHz b) 100 KHz
c) 50 KHz d) 1 KHz

7) The type of feedback used in closed loop non-inverting amplifier is _____.

a) Voltage series
b) Current series
c) Current shunt
d) Voltage shunt

8) How to improve CMRR value _____.

a) Increase common mode gain
b) Decrease common mode gain
c) Increase Differential mode gain
d) Decrease differential mode gain

9) Voltage Follower is special case of _____ amplifier.

a) Non-inverting
b) Inverting
c) Differential
d) Scaling

10) Zero crossing detectors is special case of _____.

a) Basic comparator
b) Peak detector
c) Schmitt trigger
d) Window detector

11) Which is not the ideal characteristic of an op-amp?

a) Input Resistance $\rightarrow 0$
b) Output impedance $\rightarrow 0$
c) Bandwidth $\rightarrow \infty$
d) Open loop voltage gain $\rightarrow \infty$

12) For radio frequency oscillator components used are _____.

a) Crystal
b) LC
c) RC
d) Both (a & b)

13) A duty cycle is less than _____ in saw tooth wave generator.

a) 90%
b) 66.66%
c) 50%
d) 20%

14) To introduce a delay of 10 ms using IC555 with R = 10Kohm the capacitance value required is _____.

a) 1 μF
b) 4.54mF
c) 0.45 μF
d) 0.1 μF

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Analog Integrated Circuits (BTN06402)

Day & Date: Wednesday, 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams wherever necessary.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) What is op-amp? Explain with neat diagram basic building blocks of op-amp.

b) Derive equation for ideal voltage gain of non-inverting amplifier using virtual ground concept.

c) Define the following electrical parameters of IC 741 with practical & ideal values:
a) Input Offset Current
b) Total output offset voltage
c) CMRR
d) PSRR

d) Explain differentiator and its frequency response.

e) Explain the concept of grounded load V-I converter.

Q.3 Attempt the following. (Any Two) **12**

a) Derive expressions for differential voltage gain, R_{in} and R_{out} for DIBO differential amplifier using AC equivalent circuit.

b) Determine the slew rate of a frequency compensated OP-AMP at room temperature, which has a unity cross-over frequency of 5MHz (Assume $V_m = 1$)

c) Draw and Explain Summing and Scaling amplifier using non Inverting mode of amplifiers.

Section – II

Q.5 Answer the following questions. (Any Four) **16**

a) Explain with neat diagram operation of OP-AMP as Comparator.

b) Draw and Explain Zero crossing Detector in detail.

c) Write design procedure for a first order low pass filter.

d) Explain the concept of Phase Shift Oscillator with neat diagrams.

e) What is voltage regulator? Explain the concept of fixed voltage regulators.

Q.6 Answer the following questions. (Any Two) **12**

a) Draw and Explain Positive and negative clippers.

b) Design a second order low-pass filter for a cut-off frequency of 1 kHz with a pass band gain of 1.586
(Assume $C_2 = C_3 = 0.005\ \mu F$ and $R_1 = 33k\Omega$)

c) Explain the operation of Astable Multivibrator using IC 555. Obtain the expression for,
(1) One Cycle Period and Output Frequency
(2) T_{on}
(3) T_{off}

SLR-BD-221

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Analog Integrated Circuits (BTN06402)

Day & Date: Wednesday, 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 20 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each Question carries one mark.
2) Don't forget to mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Draw neat diagram wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Tick the correct option. **14**

1) Zero crossing detectors is special case of _____.
a) Basic comparator b) Peak detector
c) Schmitt trigger d) Window detector

2) Which is not the ideal characteristic of an op-amp?
a) Input Resistance → 0
b) Output impedance → 0
c) Bandwidth → ∞
d) Open loop voltage gain → ∞

3) For radio frequency oscillator components used are _____.
a) Crystal b) LC
c) RC d) Both (a & b)

4) A duty cycle is less than _____ in saw tooth wave generator.
a) 90% b) 66.66%
c) 50% d) 20%

5) To introduce a delay of 10 ms using IC555 with R = 10Kohm the capacitance value required is _____.
a) 1 μF b) 4.54mF
c) 0.45 μF d) 0.1 μF

6) Vref for LM317 is _____.
a) 1.25mV b) 1.25V
c) 12.5V d) None of these

7) Find the output voltage of an ideal op-amp. If V1 and V2 are the two input voltages _____.

a) VO = V1-V2 b) VO = A x (V1-V2)
c) VO = A x (V1+V2) d) VO = V1 x V2

8) For first order active filter gain roll off rate in stop band is _____.

a) 40 dB/decade b) 20 dB/decade
c) 90 dB/decade d) 60 dB/decade

9) For Wien bridge Oscillator frequency of oscillation is _____.

a) 0.159 / RC b) 1.59 / RC
c) 0.065 / RC d) 6.5 / RC

10) In ideal Differential Amplifier, if same signal is given to both inputs, and then output will be ____

a) Same as input b) Double the input
c) Not equal to zero d) Zero

11) What should be maximum bandwidth for a gain of 20 in case of IC 741?

a) 1 MHz b) 100 KHz
c) 50 KHz d) 1 KHz

12) The type of feedback used in closed loop non-inverting amplifier is _____.

a) Voltage series b) Current series
c) Current shunt d) Voltage shunt

13) How to improve CMRR value _____.

a) Increase common mode gain
b) Decrease common mode gain
c) Increase Differential mode gain
d) Decrease differential mode gain

14) Voltage Follower is special case of _____ amplifier.

a) Non-inverting b) Inverting
c) Differential d) Scaling

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Analog Integrated Circuits (BTN06402)

Day & Date: Wednesday, 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams wherever necessary.

Section – I

Q.2 Attempt the following. (Any Four) **16**

a) What is op-amp? Explain with neat diagram basic building blocks of op-amp.

b) Derive equation for ideal voltage gain of non-inverting amplifier using virtual ground concept.

c) Define the following electrical parameters of IC 741 with practical & ideal values:
a) Input Offset Current
b) Total output offset voltage
c) CMRR
d) PSRR

d) Explain differentiator and its frequency response.

e) Explain the concept of grounded load V-I converter.

Q.3 Attempt the following. (Any Two) **12**

a) Derive expressions for differential voltage gain, R_{in} and R_{out} for DIBO differential amplifier using AC equivalent circuit.

b) Determine the slew rate of a frequency compensated OP-AMP at room temperature, which has a unity cross-over frequency of 5MHz (Assume $V_m = 1$)

c) Draw and Explain Summing and Scaling amplifier using non Inverting mode of amplifiers.

Section – II

Q.5 Answer the following questions. (Any Four) **16**

a) Explain with neat diagram operation of OP-AMP as Comparator.

b) Draw and Explain Zero crossing Detector in detail.

c) Write design procedure for a first order low pass filter.

d) Explain the concept of Phase Shift Oscillator with neat diagrams.

e) What is voltage regulator? Explain the concept of fixed voltage regulators.

Q.6 Answer the following questions. (Any Two) **12**

a) Draw and Explain Positive and negative clippers.

b) Design a second order low-pass filter for a cut-off frequency of 1 kHz with a pass band gain of 1.586
(Assume $C_2 = C_3 = 0.005\ \mu F$ and $R_1 = 33k\Omega$)

c) Explain the operation of Astable Multivibrator using IC 555. Obtain the expression for,
(1) One Cycle Period and Output Frequency
(2) T_{on}
(3) T_{off}

Seat No.	

Set P

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Principles of Digital Communication (BTN06403)

Day & Date: Friday, 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.
5) Use non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Average information per message is called _____.
a) Mutual information b) Joint information
c) Uncertainty d) Entropy

2) Information content in the universally true event is _____.
a) Infinite Constant b) Zero
c) Positive d) Negative Constant

3) In _____ encoding, we use three levels: positive, zero and negative.
a) Unipolar b) Bipolar
c) Polar d) None of the above

4) In PCM quantization noise depends on _____.
a) Sampling rate b) Number of quantization levels
c) Signal power d) None of the above

5) The minimum distance in two symbols in case of BPSK is _____.
a) $\sqrt{\mathrm{Eb}}$ b) $2\sqrt{\mathrm{Eb}}$
c) Eb d) None of these

6) Coherent detection at the receiver side requires _____.
a) Phase Synchronization b) Timing Synchronization
c) Both a) & b) d) Amplitude Synchronization

7) In QAM, both identities are varied _____.
a) Amplitude and phase b) Bit rate and phase
c) Frequency and phase d) Baud rate and phase

8) The error probability of QPSK is, _____.
a) Better than BPSK b) Inferior to BPSK
c) Same as BPSK d) None of the above

9) Minimum shift keying is similar to _____.
a) Continuous phase frequency shift keying
b) BPSK
c) BFSK
d) QPSK

10) A correlation receiver consists of _____.
a) Multiplier and integrator b) An integrator only
c) Multiplier only d) Adder and integrator

11) Equalizer is used for _____.
a) Frame synchronization b) Symbol synchronization
c) Carrier synchronization d) Minimizing ISI

12) The order of _____ matrix is (n- k) x n.
a) Generator matrix b) Parity check matrix
c) Transpose of H d) none of above

13) Code rate is the ratio of _____.
a) k/n b) n/k
c) q/k d) none of above

14) The weight of the code 1010100 is _____.
a) 2 b) 3
c) 4 d) 5

Seat No.	

Set **P**

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Principles of Digital Communication (BTN06403)

Day & Date: Friday, 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt the following (Any Four). **16**

a) Explain concept of amount of information. Why logarithmic function is used to represent information.

b) A black & white TV picture consists of 525 lines of picture information. Assume that, each line consists of 525 picture elements & that each element can have 256 brightness levels. Pictures are repeated at the rate of 30 per second. Calculate the average rate of information conveyed by a TV set to a receiver.

c) Explain the distortions in Delta modulation. Give its remedy.

d) Write notes on Inter Symbol Interference.

e) Give advantages, disadvantages & applications of DPSK

Q.3 Attempt the following (Any Two). **12**

a) Find the mutual information for the channel shown below in figure 1.

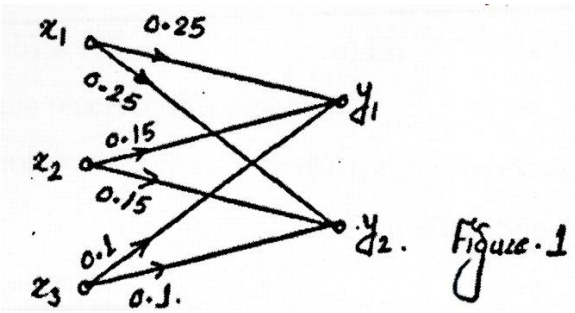


Figure. 1

b) Explain with neat schematic PCM transmitter & receiver.

c) With the help of a neat block schematic explain the FSK modulator & demodulator.

Section – II

Q.4 Attempt the following (Any Four). **16**

a) Explain matched filter.

b) Write a note on M-ary orthogonal signals.

c) Write any one method of frame synchronization.

d) For the (6,3) block code the parity check matrix is given as

$$H = \begin{bmatrix} 1 & 0 & 1 & 1 & 0 & 0 \\ 0 & 1 & 1 & 0 & 1 & 0 \\ 1 & 1 & 0 & 0 & 0 & 1 \end{bmatrix}$$

If received vector is 100101, find whether it is erroneous.

e) Explain any one carrier recovery technique.

Q.5 Attempt the following (Any Two). **12**

a) For (7,4) block code the generator matrix is given by,

$$G = \begin{bmatrix} 1 & 0 & 0 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 0 & 1 & 1 & 1 \\ 0 & 0 & 1 & 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 & 0 & 1 & 1 \end{bmatrix}$$

1) Find parity check matrix.
2) Find all the code vectors of this code
3) Comment on error detection and correction capability of this code.

b) Explain the working of M-ary FSK transmitter.

c) Explain in detail integrator and dump receiver.

Seat No.	

Set Q

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Principles of Digital Communication (BTN06403)

Day & Date: Friday, 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.
5) Use non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) The error probability of QPSK is, _____.
a) Better than BPSK b) Inferior to BPSK
c) Same as BPSK d) None of the above

2) Minimum shift keying is similar to _____.
a) Continuous phase frequency shift keying
b) BPSK
c) BFSK
d) QPSK

3) A correlation receiver consists of _____.
a) Multiplier and integrator b) An integrator only
c) Multiplier only d) Adder and integrator

4) Equalizer is used for _____.
a) Frame synchronization b) Symbol synchronization
c) Carrier synchronization d) Minimizing ISI

5) The order of _____ matrix is (n- k) x n.
a) Generator matrix b) Parity check matrix
c) Transpose of H d) none of above

6) Code rate is the ratio of _____.
a) k/n b) n/k
c) q/k d) none of above

7) The weight of the code 1010100 is _____.
a) 2 b) 3
c) 4 d) 5

8) Average information per message is called _____.
a) Mutual information b) Joint information
c) Uncertainty d) Entropy

9) Information content in the universally true event is _____.
a) Infinite Constant b) Zero
c) Positive d) Negative Constant

10) In _____ encoding, we use three levels: positive, zero and negative.
a) Unipolar b) Bipolar
c) Polar d) None of the above

11) In PCM quantization noise depends on _____.
a) Sampling rate b) Number of quantization levels
c) Signal power d) None of the above

12) The minimum distance in two symbols in case of BPSK is _____.
a) $\sqrt{\mathrm{Eb}}$ b) $2\sqrt{\mathrm{Eb}}$
c) Eb d) None of these

13) Coherent detection at the receiver side requires _____.
a) Phase Synchronization b) Timing Synchronization
c) Both a) & b) d) Amplitude Synchronization

14) In QAM, both identities are varied _____.
a) Amplitude and phase b) Bit rate and phase
c) Frequency and phase d) Baud rate and phase

Seat No.	

Set **Q**

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Principles of Digital Communication (BTN06403)

Day & Date: Friday, 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt the following (Any Four). **16**

a) Explain concept of amount of information. Why logarithmic function is used to represent information.

b) A black & white TV picture consists of 525 lines of picture information. Assume that, each line consists of 525 picture elements & that each element can have 256 brightness levels. Pictures are repeated at the rate of 30 per second. Calculate the average rate of information conveyed by a TV set to a receiver.

c) Explain the distortions in Delta modulation. Give its remedy.

d) Write notes on Inter Symbol Interference.

e) Give advantages, disadvantages & applications of DPSK

Q.3 Attempt the following (Any Two). **12**

a) Find the mutual information for the channel shown below in figure 1.

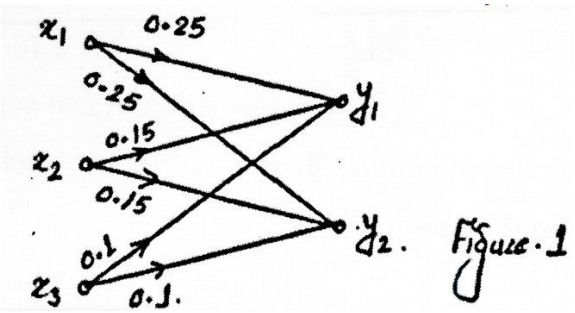


Figure 1

b) Explain with neat schematic PCM transmitter & receiver.

c) With the help of a neat block schematic explain the FSK modulator & demodulator.

Section – II

Q.4 Attempt the following (Any Four). **16**

a) Explain matched filter.

b) Write a note on M-ary orthogonal signals.

c) Write any one method of frame synchronization.

d) For the (6,3) block code the parity check matrix is given as

$$H = \begin{bmatrix} 1 & 0 & 1 & 1 & 0 & 0 \\ 0 & 1 & 1 & 0 & 1 & 0 \\ 1 & 1 & 0 & 0 & 0 & 1 \end{bmatrix}$$

If received vector is 100101, find whether it is erroneous.

e) Explain any one carrier recovery technique.

Q.5 Attempt the following (Any Two). **12**

a) For (7,4) block code the generator matrix is given by,

$$G = \begin{bmatrix} 1 & 0 & 0 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 0 & 1 & 1 & 1 \\ 0 & 0 & 1 & 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 & 0 & 1 & 1 \end{bmatrix}$$

1) Find parity check matrix.
2) Find all the code vectors of this code
3) Comment on error detection and correction capability of this code.

b) Explain the working of M-ary FSK transmitter.

c) Explain in detail integrator and dump receiver.

Seat No.	

Set **R**

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Principles of Digital Communication (BTN06403)

Day & Date: Friday, 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.
5) Use non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Equalizer is used for _____.
a) Frame synchronization b) Symbol synchronization
c) Carrier synchronization d) Minimizing ISI

2) The order of _____ matrix is (n- k) x n.
a) Generator matrix b) Parity check matrix
c) Transpose of H d) none of above

3) Code rate is the ratio of _____.
a) k/n b) n/k
c) q/k d) none of above

4) The weight of the code 1010100 is _____.
a) 2 b) 3
c) 4 d) 5

5) Average information per message is called _____.
a) Mutual information b) Joint information
c) Uncertainty d) Entropy

6) Information content in the universally true event is _____.
a) Infinite Constant b) Zero
c) Positive d) Negative Constant

7) In _____ encoding, we use three levels: positive, zero and negative.
a) Unipolar b) Bipolar
c) Polar d) None of the above

8) In PCM quantization noise depends on _____.
a) Sampling rate b) Number of quantization levels
c) Signal power d) None of the above

9) The minimum distance in two symbols in case of BPSK is _____.
a) $\sqrt{\mathrm{Eb}}$ b) $2\sqrt{\mathrm{Eb}}$
c) Eb d) None of these

10) Coherent detection at the receiver side requires _____.
a) Phase Synchronization b) Timing Synchronization
c) Both a) & b) d) Amplitude Synchronization

11) In QAM, both identities are varied _____.
a) Amplitude and phase b) Bit rate and phase
c) Frequency and phase d) Baud rate and phase

12) The error probability of QPSK is, _____.
a) Better than BPSK b) Inferior to BPSK
c) Same as BPSK d) None of the above

13) Minimum shift keying is similar to _____.
a) Continuous phase frequency shift keying
b) BPSK
c) BFSK
d) QPSK

14) A correlation receiver consists of _____.
a) Multiplier and integrator b) An integrator only
c) Multiplier only d) Adder and integrator

Seat No.	

Set **R**

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Principles of Digital Communication (BTN06403)

Day & Date: Friday, 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt the following (Any Four). **16**

a) Explain concept of amount of information. Why logarithmic function is used to represent information.

b) A black & white TV picture consists of 525 lines of picture information. Assume that, each line consists of 525 picture elements & that each element can have 256 brightness levels. Pictures are repeated at the rate of 30 per second. Calculate the average rate of information conveyed by a TV set to a receiver.

c) Explain the distortions in Delta modulation. Give its remedy.

d) Write notes on Inter Symbol Interference.

e) Give advantages, disadvantages & applications of DPSK

Q.3 Attempt the following (Any Two). **12**

a) Find the mutual information for the channel shown below in figure 1.

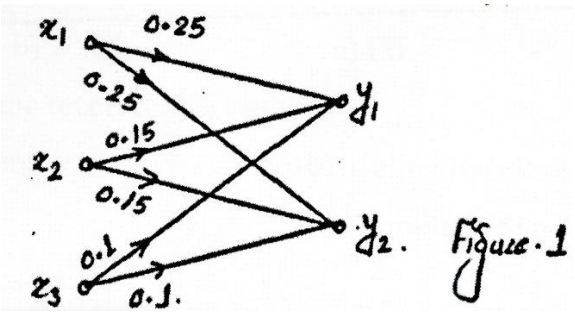


Figure 1

b) Explain with neat schematic PCM transmitter & receiver.

c) With the help of a neat block schematic explain the FSK modulator & demodulator.

Section – II

Q.4 Attempt the following (Any Four). **16**

a) Explain matched filter.

b) Write a note on M-ary orthogonal signals.

c) Write any one method of frame synchronization.

d) For the (6,3) block code the parity check matrix is given as

$$H = \begin{bmatrix} 1 & 0 & 1 & 1 & 0 & 0 \\ 0 & 1 & 1 & 0 & 1 & 0 \\ 1 & 1 & 0 & 0 & 0 & 1 \end{bmatrix}$$

If received vector is 100101, find whether it is erroneous.

e) Explain any one carrier recovery technique.

Q.5 Attempt the following (Any Two). **12**

a) For (7,4) block code the generator matrix is given by,

$$G = \begin{bmatrix} 1 & 0 & 0 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 0 & 1 & 1 & 1 \\ 0 & 0 & 1 & 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 & 0 & 1 & 1 \end{bmatrix}$$

1) Find parity check matrix.
2) Find all the code vectors of this code
3) Comment on error detection and correction capability of this code.

b) Explain the working of M-ary FSK transmitter.

c) Explain in detail integrator and dump receiver.

Seat No.		Set	S

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Principles of Digital Communication (BTN06403)

Day & Date: Friday, 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.
5) Use non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Coherent detection at the receiver side requires _____.
a) Phase Synchronization b) Timing Synchronization
c) Both a) & b) d) Amplitude Synchronization

2) In QAM, both identities are varied _____.
a) Amplitude and phase b) Bit rate and phase
c) Frequency and phase d) Baud rate and phase

3) The error probability of QPSK is, _____.
a) Better than BPSK b) Inferior to BPSK
c) Same as BPSK d) None of the above

4) Minimum shift keying is similar to _____.
a) Continuous phase frequency shift keying
b) BPSK
c) BFSK
d) QPSK

5) A correlation receiver consists of _____.
a) Multiplier and integrator b) An integrator only
c) Multiplier only d) Adder and integrator

6) Equalizer is used for _____.
a) Frame synchronization b) Symbol synchronization
c) Carrier synchronization d) Minimizing ISI

7) The order of _____ matrix is (n- k) x n.
a) Generator matrix b) Parity check matrix
c) Transpose of H d) none of above

8) Code rate is the ratio of _____.
a) k/n b) n/k
c) q/k d) none of above

9) The weight of the code 1010100 is _____.
a) 2 b) 3
c) 4 d) 5

10) Average information per message is called _____.
a) Mutual information b) Joint information
c) Uncertainty d) Entropy

11) Information content in the universally true event is _____.
a) Infinite Constant b) Zero
c) Positive d) Negative Constant

12) In _____ encoding, we use three levels: positive, zero and negative.
a) Unipolar b) Bipolar
c) Polar d) None of the above

13) In PCM quantization noise depends on _____.
a) Sampling rate b) Number of quantization levels
c) Signal power d) None of the above

14) The minimum distance in two symbols in case of BPSK is _____.
a) $\sqrt{\mathrm{Eb}}$ b) $2\sqrt{\mathrm{Eb}}$
c) Eb d) None of these

Seat No.		Set	S

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Principles of Digital Communication (BTN06403)

Day & Date: Friday, 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt the following (Any Four). **16**

a) Explain concept of amount of information. Why logarithmic function is used to represent information.

b) A black & white TV picture consists of 525 lines of picture information. Assume that, each line consists of 525 picture elements & that each element can have 256 brightness levels. Pictures are repeated at the rate of 30 per second. Calculate the average rate of information conveyed by a TV set to a receiver.

c) Explain the distortions in Delta modulation. Give its remedy.

d) Write notes on Inter Symbol Interference.

e) Give advantages, disadvantages & applications of DPSK

Q.3 Attempt the following (Any Two). **12**

a) Find the mutual information for the channel shown below in figure 1.

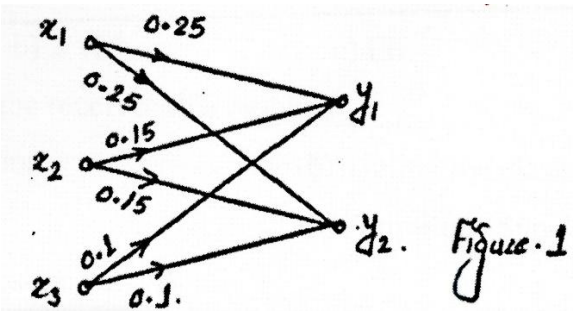


Figure 1

b) Explain with neat schematic PCM transmitter & receiver.

c) With the help of a neat block schematic explain the FSK modulator & demodulator.

Section – II

Q.4 Attempt the following (Any Four). **16**

a) Explain matched filter.

b) Write a note on M-ary orthogonal signals.

c) Write any one method of frame synchronization.

d) For the (6,3) block code the parity check matrix is given as

$$H = \begin{bmatrix} 1 & 0 & 1 & 1 & 0 & 0 \\ 0 & 1 & 1 & 0 & 1 & 0 \\ 1 & 1 & 0 & 0 & 0 & 1 \end{bmatrix}$$

If received vector is 100101, find whether it is erroneous.

e) Explain any one carrier recovery technique.

Q.5 Attempt the following (Any Two). **12**

a) For (7,4) block code the generator matrix is given by,

$$G = \begin{bmatrix} 1 & 0 & 0 & 0 & 1 & 0 & 1 \\ 0 & 1 & 0 & 0 & 1 & 1 & 1 \\ 0 & 0 & 1 & 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 & 0 & 1 & 1 \end{bmatrix}$$

1) Find parity check matrix.
2) Find all the code vectors of this code
3) Comment on error detection and correction capability of this code.

b) Explain the working of M-ary FSK transmitter.

c) Explain in detail integrator and dump receiver.

Seat No.	

Set P

S. Y (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Signals and Systems (BTN06404)

Day & Date: Tuesday, 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Which one of the following systems is causal?
a) $y(t) = x(t) + x(t-3) + x(t^2)$
b) $y(n) = x(n+2)$
c) $y(t) = x(t-1) + x(t-2)$
d) $y(n) = x(2^n)$

2) Which one of the following is an example of a bounded signal?
a) $e^t \cos wt$ b) $e^t \sin w(-t)$
c) $e^{-t} \cos wt$ d) $e^t \cos w(-t)$

3) Determine the odd component of the signal: $x(t) = \cos t + \sin t$.
a) $\sin t$ b) $2 \sin t$
c) $\cos t$ d) $2 \cos t$

4) For an energy signal _____.
a) $E = 0$ b) $P = \infty$
c) $E = \infty$ d) $P = 0$

5) Which of the following is true for complex-valued function?
a) $X(-t) = x^*(t)$ b) $X(-t) = x(t)$
c) $X(-t) = -x(t)$ d) $X(-t) = x^*(-t)$

6) The step function $u(t)$ is integral of _____ with respect to time t.
a) Ramp function b) Impulse function
c) Sinusoidal function d) Exponential function

7) What is a convolution sum?

a) $\sum x[k]h[n-k], k$ from $-\infty$ to $+\infty$

b) $\sum x[k]^{*}\sum h[n-k], k$ from $-\infty$ to $+\infty$

c) $\sum x[k] + \sum h[n-k], k$ from $-\infty$ to $+\infty$

d) $\sum\sum x[k]h[n-k], k$ from $-\infty$ to $+\infty$

8) The z-transform of $\delta[n-k] > 0$ is _____.

a) $Z^{k}, Z > 0$ b) $Z^{-k}, Z > 0$

c) $Z^{k}, Z \neq 0$ d) $Z^{-k}, Z \neq 0$

9) The z-transform of $x[n] = \{2,4,5,7,0,1\}$(5 as the reference variable) is _____.

a) $2z^{2} + 4z + 5 + 7z + z^{2}, z \neq \infty$

b) $2z^{-2} + 4z^{-1} + 5 + 7z + z^{3}, z \neq \infty$

c) $2z^{-2} + 4z^{-1} + 5 + 7z + z^{3}, 0 < |z| < \infty$

d) $2z^{2} + 4z + 5 + 7z^{-1} + z^{3}, 0 < |z| < \infty$

10) Find the Fourier transform of the unit step function.

a) $\pi\delta(\omega) + 1/\omega$ b) $\pi\delta(\omega) + 1/j\omega$

c) $\pi\delta(\omega) - 1/j\omega$ d) $\delta(\omega) + 1/j\omega$

11) The Fourier transform of the signal sgn (t) is _____.

a) $-2/j\omega$ b) $4/j\omega$

c) $2/j\omega$ d) $1/j\omega + 1$

12) The Fourier transform of a continuous time aperiodic signal is _____.

a) Continuous and aperiodic b) Discrete and aperiodic

c) Continuous and periodic d) Discrete and periodic

13) Which of the following is me process of 'aliasing'?

a) Peaks overlapping b) Phase overlapping

c) Amplitude overlapping d) Spectral overlapping

14) Sampling a signal is equivalent to multiplying it with _____.

a) A sync function b) A train of impulse

c) A train of sync functions d) A rectangular window

Seat No.	

Set **P**

S. Y (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Signals and Systems (BTN06404)

Day & Date: Tuesday, 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any FOUR. **16**

a) Sketch the following signal: $X(t) = u(-t+1)$

b) Find Even and Odd components of following signals.
$X(t) = \cos t + \sin t + \cos t \sin t$

c) Determine the energy and power of the following signal. $X(t) = t.u(t)$

d) Explain in detail properties of convolution.

e) Realize the transfer function of the system given in direct form-I
$H(s) = \dfrac{s+1}{S^2+3s+5}$

Q.3 Answer any two. **12**

a) List properties of system and explain in detail.

b) Find the convolution integral of given signals
$x_1(t) = e^{-at}u(t) \quad x_2(t) = e^{-bt}u(t)$

c) Find the convolution of the sequences.
$x_1(n) = \{1, -1, 2, 3, \} \quad x_2(n) = \{1, -2, 3, -1\}$

Section – II

Q.4 Answer any FOUR. **16**

a) State and explain sampling theorem in detail.

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

c) Find z- transform of $y(n) = \sum_{k=-\infty}^{n} x(k)$

d) Explain Properties of ROC of $X(z)$

e) Determine Nyquist rate and Nyquist sampling interval of $\sin c^2\,(200\pi t)$

Q.5 Answer any TWO. **12**

a) Find the Fourier transform of $x(t) = e^{at}u(-t)$

b) Find the z-transform of $x(n) = (1/2)^n u(-n)$ and also find ROC.

c) Find the Fourier series coefficients for the continuous time periodic signal.
$X(t) = 1.5 \quad \text{for } 0 \le t < 1$
$= -1.5 \quad \text{for } 1 \le t < 2$
With fundamental frequency $\Omega_0 = \pi$.

SLR-BD-223

Seat No.	

Set Q

S. Y (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Signals and Systems (BTN06404)

Day & Date: Tuesday, 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) The z-transform of $\delta[n-k]>0$ is _____.
a) $Z^k, Z>0$ b) $Z^{-k}, Z>0$
c) $Z^k, Z\neq 0$ d) $Z^{-k}, Z\neq 0$

2) The z-transform of $x[n]=\{2,4,5,7,0,1\}$(5 as the reference variable) is _____.
a) $2z^2+4z+5+7z+z^2, z\neq\infty$
b) $2z^{-2}+4z^{-1}+5+7z+z^3, z\neq\infty$
c) $2z^{-2}+4z^{-1}+5+7z+z^3, 0<|z|<\infty$
d) $2z^2+4z+5+7z^{-1}+z^3, 0<|z|<\infty$

3) Find the Fourier transform of the unit step function.
a) $\pi\delta(\omega)+1/\omega$ b) $\pi\delta(\omega)+1/j\omega$
c) $\pi\delta(\omega)-1/j\omega$ d) $\delta(\omega)+1/j\omega$

4) The Fourier transform of the signal sgn (t) is _____.
a) $-2/j\omega$ b) $4/j\omega$
c) $2/j\omega$ d) $1/j\omega+1$

5) The Fourier transform of a continuous time aperiodic signal is _____.
a) Continuous and aperiodic b) Discrete and aperiodic
c) Continuous and periodic d) Discrete and periodic

6) Which of the following is me process of 'aliasing'?
a) Peaks overlapping b) Phase overlapping
c) Amplitude overlapping d) Spectral overlapping

7) Sampling a signal is equivalent to multiplying it with _____.
a) A sync function
b) A train of impulse
c) A train of sync functions
d) A rectangular window

8) Which one of the following systems is causal?
a) $y(t) = x(t) + x(t-3) + x(t^2)$
b) $y(n) = x(n+2)$
c) $y(t) = x(t-1) + x(t-2)$
d) $y(n) = x(2^n)$

9) Which one of the following is an example of a bounded signal?
a) $e^t \cos wt$
b) $e^t \sin w(-t)$
c) $e^{-t} \cos wt$
d) $e^t \cos w(-t)$

10) Determine the odd component of the signal: $x(t) = \cos t + \sin t$.
a) $\sin t$
b) $2 \sin t$
c) $\cos t$
d) $2 \cos t$

11) For an energy signal _____.
a) $E = 0$
b) $P = \infty$
c) $E = \infty$
d) $P = 0$

12) Which of the following is true for complex-valued function?
a) $X(-t) = x^*(t)$
b) $X(-t) = x(t)$
c) $X(-t) = -x(t)$
d) $X(-t) = x^*(-t)$

13) The step function $u(t)$ is integral of _____ with respect to time t.
a) Ramp function
b) Impulse function
c) Sinusoidal function
d) Exponential function

14) What is a convolution sum?
a) $\sum x[k]h[n-k], k$ from $-\infty$ to $+\infty$
b) $\sum x[k]^* \sum h[n-k], k$ from $-\infty$ to $+\infty$
c) $\sum x[k] + \sum h[n-k], k$ from $-\infty$ to $+\infty$
d) $\sum\sum x[k]h[n-k], k$ from $-\infty$ to $+\infty$

Seat No.	

Set **Q**

S. Y (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Signals and Systems (BTN06404)

Day & Date: Tuesday, 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any FOUR. **16**

a) Sketch the following signal: $X(t) = u(-t+1)$

b) Find Even and Odd components of following signals.
$X(t) = \cos t + \sin t + \cos t \sin t$

c) Determine the energy and power of the following signal. $X(t) = t.u(t)$

d) Explain in detail properties of convolution.

e) Realize the transfer function of the system given in direct form-I
$H(s) = \dfrac{s+1}{S^2+3s+5}$

Q.3 Answer any two. **12**

a) List properties of system and explain in detail.

b) Find the convolution integral of given signals
$x_1(t) = e^{-at}u(t) \quad x_2(t) = e^{-bt}u(t)$

c) Find the convolution of the sequences.
$x_1(n) = \{1, -1, 2, 3, \} \quad x_2(n) = \{1, -2, 3, -1\}$

Section – II

Q.4 Answer any FOUR. **16**

a) State and explain sampling theorem in detail.

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

c) Find z- transform of $y(n) = \sum_{k=-\infty}^{n} x(k)$

d) Explain Properties of ROC of $X(z)$

e) Determine Nyquist rate and Nyquist sampling interval of $\sin c^2\,(200\pi t)$

Q.5 Answer any TWO. **12**

a) Find the Fourier transform of $x(t) = e^{at}u(-t)$

b) Find the z-transform of $x(n) = (1/2)^n u(-n)$ and also find ROC.

c) Find the Fourier series coefficients for the continuous time periodic signal.
$X(t) = 1.5 \quad \text{for } 0 \le t < 1$
$= -1.5 \quad \text{for } 1 \le t < 2$
With fundamental frequency $\Omega_0 = \pi$.

Seat No.	

Set **R**

S. Y (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Signals and Systems (BTN06404)

Day & Date: Tuesday, 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) The Fourier transform of the signal sgn (t) is _____.
a) $-2/j\omega$ b) $4/j\omega$
c) $2/j\omega$ d) $1/j\omega + 1$

2) The Fourier transform of a continuous time aperiodic signal is _____.
a) Continuous and aperiodic b) Discrete and aperiodic
c) Continuous and periodic d) Discrete and periodic

3) Which of the following is me process of 'aliasing'?
a) Peaks overlapping b) Phase overlapping
c) Amplitude overlapping d) Spectral overlapping

4) Sampling a signal is equivalent to multiplying it with _____.
a) A sync function b) A train of impulse
c) A train of sync functions d) A rectangular window

5) Which one of the following systems is causal?
a) $y(t) = x(t) + x(t-3) + x(t^2)$
b) $y(n) = x(n+2)$
c) $y(t) = x(t-1) + x(t-2)$
d) $y(n) = x(2^n)$

6) Which one of the following is an example of a bounded signal?
a) $e^t \cos wt$ b) $e^t \sin w(-t)$
c) $e^{-t} \cos wt$ d) $e^t \cos w(-t)$

7) Determine the odd component of the signal: $x(t) = \cos t + \sin t$.
a) $\sin t$ b) $2 \sin t$
c) $\cos t$ d) $2 \cos t$

8) For an energy signal _____.

a) $E = 0$ b) $P = \infty$

c) $E = \infty$ d) $P = 0$

9) Which of the following is true for complex-valued function?

a) $X(-t) = x^*(t)$ b) $X(-t) = x(t)$

c) $X(-t) = -x(t)$ d) $X(-t) = x^*(-t)$

10) The step function $u(t)$ is integral of _____ with respect to time t.

a) Ramp function b) Impulse function

c) Sinusoidal function d) Exponential function

11) What is a convolution sum?

a) $\sum x[k]h[n-k], k$ from $-\infty$ to $+\infty$

b) $\sum x[k]^* \sum h[n-k], k$ from $-\infty$ to $+\infty$

c) $\sum x[k] + \sum h[n-k], k$ from $-\infty$ to $+\infty$

d) $\sum\sum x[k]h[n-k], k$ from $-\infty$ to $+\infty$

12) The z-transform of $\delta[n-k] > 0$ is _____.

a) $Z^k, Z > 0$ b) $Z^{-k}, Z > 0$

c) $Z^k, Z \neq 0$ d) $Z^{-k}, Z \neq 0$

13) The z-transform of $x[n] = \{2,4,5,7,0,1\}$(5 as the reference variable) is _____.

a) $2z^2 + 4z + 5 + 7z + z^2, z \neq \infty$

b) $2z^{-2} + 4z^{-1} + 5 + 7z + z^3, z \neq \infty$

c) $2z^{-2} + 4z^{-1} + 5 + 7z + z^3, 0 < |z| < \infty$

d) $2z^2 + 4z + 5 + 7z^{-1} + z^3, 0 < |z| < \infty$

14) Find the Fourier transform of the unit step function.

a) $\pi\delta(\omega) + 1/\omega$ b) $\pi\delta(\omega) + 1/j\omega$

c) $\pi\delta(\omega) - 1/j\omega$ d) $\delta(\omega) + 1/j\omega$

Seat No.	

Set **R**

S. Y (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Signals and Systems (BTN06404)

Day & Date: Tuesday, 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any FOUR. **16**

a) Sketch the following signal: $X(t) = u(-t+1)$

b) Find Even and Odd components of following signals.
$X(t) = \cos t + \sin t + \cos t \sin t$

c) Determine the energy and power of the following signal. $X(t) = t.u(t)$

d) Explain in detail properties of convolution.

e) Realize the transfer function of the system given in direct form-I
$H(s) = \dfrac{s+1}{S^2+3s+5}$

Q.3 Answer any two. **12**

a) List properties of system and explain in detail.

b) Find the convolution integral of given signals
$x_1(t) = e^{-at}u(t) \quad x_2(t) = e^{-bt}u(t)$

c) Find the convolution of the sequences.
$x_1(n) = \{1, -1, 2, 3, \} \quad x_2(n) = \{1, -2, 3, -1\}$

Section – II

Q.4 Answer any FOUR. **16**

a) State and explain sampling theorem in detail.

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

c) Find z- transform of $y(n) = \sum_{k=-\infty}^{n} x(k)$

d) Explain Properties of ROC of $X(z)$

e) Determine Nyquist rate and Nyquist sampling interval of $\sin c^2\,(200\pi t)$

Q.5 Answer any TWO. **12**

a) Find the Fourier transform of $x(t) = e^{at}u(-t)$

b) Find the z-transform of $x(n) = (1/2)^n u(-n)$ and also find ROC.

c) Find the Fourier series coefficients for the continuous time periodic signal.
$X(t) = 1.5 \quad \text{for } 0 \le t < 1$
$= -1.5 \quad \text{for } 1 \le t < 2$
With fundamental frequency $\Omega_0 = \pi$.

Seat No.	

Set **S**

S. Y (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Signals and Systems (BTN06404)

Day & Date: Tuesday, 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) The step function $u(t)$ is integral of _____ with respect to time t.
a) Ramp function b) Impulse function
c) Sinusoidal function d) Exponential function

2) What is a convolution sum?
a) $\sum x[k]h[n-k], k$ from $-\infty$ to $+\infty$
b) $\sum x[k]^{*}\sum h[n-k], k$ from $-\infty$ to $+\infty$
c) $\sum x[k]+\sum h[n-k], k$ from $-\infty$ to $+\infty$
d) $\sum\sum x[k]h[n-k], k$ from $-\infty$ to $+\infty$

3) The z-transform of $\delta[n-k]>0$ is _____.
a) $Z^{k}, Z>0$ b) $Z^{-k}, Z>0$
c) $Z^{k}, Z\neq 0$ d) $Z^{-k}, Z\neq 0$

4) The z-transform of $x[n]=\{2,4,5,7,0,1\}$(5 as the reference variable) is _____.
a) $2z^{2}+4z+5+7z+z^{2}, z\neq\infty$
b) $2z^{-2}+4z^{-1}+5+7z+z^{3}, z\neq\infty$
c) $2z^{-2}+4z^{-1}+5+7z+z^{3}, 0<|z|<\infty$
d) $2z^{2}+4z+5+7z^{-1}+z^{3}, 0<|z|<\infty$

5) Find the Fourier transform of the unit step function.
a) $\pi\delta(\omega)+1/\omega$ b) $\pi\delta(\omega)+1/j\omega$
c) $\pi\delta(\omega)-1/j\omega$ d) $\delta(\omega)+1/j\omega$

6) The Fourier transform of the signal sgn (t) is _____.
a) $-2/j\omega$ b) $4/j\omega$
c) $2/j\omega$ d) $1/j\omega+1$

7) The Fourier transform of a continuous time aperiodic signal is _____.
a) Continuous and aperiodic b) Discrete and aperiodic
c) Continuous and periodic d) Discrete and periodic

8) Which of the following is me process of 'aliasing'?
a) Peaks overlapping b) Phase overlapping
c) Amplitude overlapping d) Spectral overlapping

9) Sampling a signal is equivalent to multiplying it with _____.
a) A sync function b) A train of impulse
c) A train of sync functions d) A rectangular window

10) Which one of the following systems is causal?
a) $y(t) = x(t) + x(t-3) + x(t^2)$
b) $y(n) = x(n+2)$
c) $y(t) = x(t-1) + x(t-2)$
d) $y(n) = x(2^n)$

11) Which one of the following is an example of a bounded signal?
a) $e^t \cos wt$ b) $e^t \sin w(-t)$
c) $e^{-t} \cos wt$ d) $e^t \cos w(-t)$

12) Determine the odd component of the signal: $x(t) = \cos t + \sin t$.
a) $\sin t$ b) $2 \sin t$
c) $\cos t$ d) $2 \cos t$

13) For an energy signal _____.
a) $E = 0$ b) $P = \infty$
c) $E = \infty$ d) $P = 0$

14) Which of the following is true for complex-valued function?
a) $X(-t) = x^*(t)$ b) $X(-t) = x(t)$
c) $X(-t) = -x(t)$ d) $X(-t) = x^*(-t)$

SLR-BD-223

Seat No.		Set	S

S. Y (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Signals and Systems (BTN06404)

Day & Date: Tuesday, 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any FOUR. **16**

a) Sketch the following signal: $X(t) = u(-t+1)$

b) Find Even and Odd components of following signals.
$X(t) = \cos t + \sin t + \cos t \sin t$

c) Determine the energy and power of the following signal. $X(t) = t.u(t)$

d) Explain in detail properties of convolution.

e) Realize the transfer function of the system given in direct form-I
$H(s) = \dfrac{s+1}{S^2+3s+5}$

Q.3 Answer any two. **12**

a) List properties of system and explain in detail.

b) Find the convolution integral of given signals
$x_1(t) = e^{-at}u(t) \quad x_2(t) = e^{-bt}u(t)$

c) Find the convolution of the sequences.
$x_1(n) = \{1, -1, 2, 3, \} \;\; x_2(n) = \{1, -2, 3, -1\}$

Section – II

Q.4 Answer any FOUR. **16**

a) State and explain sampling theorem in detail.

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

c) Find z- transform of $y(n) = \sum_{k=-\infty}^{n} x(k)$

d) Explain Properties of ROC of $X(z)$

e) Determine Nyquist rate and Nyquist sampling interval of $\sin c^2\,(200\pi t)$

Q.5 Answer any TWO. **12**

a) Find the Fourier transform of $x(t) = e^{at}u(-t)$

b) Find the z-transform of $x(n) = (1/2)^n u(-n)$ and also find ROC.

c) Find the Fourier series coefficients for the continuous time periodic signal.
$X(t) = 1.5 \quad \text{for } 0 \le t < 1$
$= -1.5 \quad \text{for } 1 \le t < 2$
With fundamental frequency $\Omega_0 = \pi$.

SLR-BD-224

Seat No.	

Set P

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Data Structures (BTN06405)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) In ____, search start at the beginning of the list and check every element in the list.
a) Linear search b) Binary search
c) Hash search d) Binary Tree search

2) State True or False:
i) Binary search is used for searching in a sorted array.
ii) The time complexity of binary search is O(logn).
a) True, False b) False, True
c) False, False d) True, True

3) What is the asymptotic notation for Average-case?
a) Big O b) Omega
c) Theta d) None of the above

4) Inserting an item into the stack when stack is not full is called _____ operation and deletion of item form the stack, when stack is not empty is called ____.
a) push, pop b) pop, push
c) insert, delete d) delete, insert

5) Which of the following data structure is linear type?
a) Graph b) Trees
c) Binary tree d) Stack

6) Overflow condition of queue is ____.
a) rear==max-1 b) top==max-1
c) front==max-l d) Both a) & b)

7) ____ is a pile in which items are added at one end and removed from the other.

a) Stack b) Queue
c) List d) None of the above

8) A binary tree in which all its levels except the last, have maximum numbers of nodes, and all the nodes in the last level have only one child it will be its left child. Name the tree.

a) Threaded tree b) Complete binary tree
c) M-way search tree d) Full binary tree

9) A ____ is a data structure that organizes data similar to a line in the supermarket, where the first one in line is the first one out.

a) Queue linked list b) Stacks linked list
c) Both of them d) Neither of them

10) In the ____ traversal we process all of a vertex's descendants before we move to an adjacent vertex.

a) Depth First b) Breadth first
c) With First d) Depth Limited

11) State True or False:

i) Network is a graph that has weights or costs associated with it.
ii) An undirected graph which contains no cycles is called a forest.
iii) A graph is said to be complete if there is no edge between every pair of vertices.

a) True, False, True b) True, True, False
c) True, True, True d) False, True, True

12) Which of the following is not the internal sort?

a) Insertion sort b) Bubble sort
c) Merge sort d) Heap sort

13) A graph is said to be ____ if the vertices can be split into two sets V1 and V2 such there are no edges between two vertices of V1 or two vertices of V2.

a) Partite b) Bipartite
c) Rooted d) Bisects

14) Which of the following statement is true?

i) Using singly linked lists and circular list, it is not possible to traverse the list backwards.
ii) To find the predecessor, it is required to traverse the list from the first node in case of singly linked list.

a) i-only b) ii-only
c) Both i and ii d) None of both

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Data Structures (BTN06405)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.
3) Assume additional data if required and mention it clearly.

Section – I

Q.2 Solve the following: (Any Four) **16**

a) Explain Algorithm Analysis & Algorithm complexity in detail.
b) Write a C program to find the Fibonacci series of first 10 numbers with recursive function.
c) What are the Applications of stack?
d) Write C program to implement a linear queue.
e) Write note on double ended queue DEQUE.

Q.3 Solve the following: (Any Two) **12**

a) Which are the Different Basic Terminologies in data structures?
b) Define different operations in Stack.
c) Write a C program for circular queue.

Section – II

Q.4 Solve the following: (Any Four) **16**

a) Explain the representation of a polynomial using linked list.
b) What are various applications of tree?
c) Draw binary search tree for following input. 42 23 74 11 65 54
d) Explain adjacency matrix of graph with an example.
e) Explain bubble sort method for sorting array of 10 elements.
Array: [29, 10, 14, 37, 13, 40, 15, 22, 8, 19]

Q.5 Solve the following: (Any Two) **12**

a) Write a program to implement singly linked list using functions insert, delete and display.
b) The following sequence gives preorder & inorder traversal of binary tree
Preorder: ABCDEGFHIJ Inorder: BCAEGDHFIJ
c) What is hashing? Explain properties of good hash function? Explain modulus hash function.

SLR-BD-224

Seat No.	

Set Q

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Data Structures (BTN06405)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) A binary tree in which all its levels except the last, have maximum numbers of nodes, and all the nodes in the last level have only one child it will be its left child. Name the tree.
a) Threaded tree b) Complete binary tree
c) M-way search tree d) Full binary tree

2) A ____ is a data structure that organizes data similar to a line in the supermarket, where the first one in line is the first one out.
a) Queue linked list b) Stacks linked list
c) Both of them d) Neither of them

3) In the ____ traversal we process all of a vertex's descendants before we move to an adjacent vertex.
a) Depth First b) Breadth first
c) With First d) Depth Limited

4) State True or False:
i) Network is a graph that has weights or costs associated with it.
ii) An undirected graph which contains no cycles is called a forest.
iii) A graph is said to be complete if there is no edge between every pair of vertices.
a) True, False, True b) True, True, False
c) True, True, True d) False, True, True

5) Which of the following is not the internal sort?
a) Insertion sort b) Bubble sort
c) Merge sort d) Heap sort

6) A graph is said to be ____ if the vertices can be split into two sets V1 and V2 such there are no edges between two vertices of V1 or two vertices of V2.

a) Partite b) Bipartite
c) Rooted d) Bisects

7) Which of the following statement is true?

i) Using singly linked lists and circular list, it is not possible to traverse the list backwards.
ii) To find the predecessor, it is required to traverse the list from the first node in case of singly linked list.

a) i-only b) ii-only
c) Both i and ii d) None of both

8) In ____, search start at the beginning of the list and check every element in the list.

a) Linear search b) Binary search
c) Hash search d) Binary Tree search

9) State True or False:

i) Binary search is used for searching in a sorted array.
ii) The time complexity of binary search is O(logn).

a) True, False b) False, True
c) False, False d) True, True

10) What is the asymptotic notation for Average-case?

a) Big O b) Omega
c) Theta d) None of the above

11) Inserting an item into the stack when stack is not full is called _____ operation and deletion of item form the stack, when stack is not empty is called ____.

a) push, pop b) pop, push
c) insert, delete d) delete, insert

12) Which of the following data structure is linear type?

a) Graph b) Trees
c) Binary tree d) Stack

13) Overflow condition of queue is ____.

a) rear==max-1 b) top==max-1
c) front==max-l d) Both a) & b)

14) ____ is a pile in which items are added at one end and removed from the other.

a) Stack b) Queue
c) List d) None of the above

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Data Structures (BTN06405)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.
3) Assume additional data if required and mention it clearly.

Section – I

Q.2 Solve the following: (Any Four) **16**

a) Explain Algorithm Analysis & Algorithm complexity in detail.
b) Write a C program to find the Fibonacci series of first 10 numbers with recursive function.
c) What are the Applications of stack?
d) Write C program to implement a linear queue.
e) Write note on double ended queue DEQUE.

Q.3 Solve the following: (Any Two) **12**

a) Which are the Different Basic Terminologies in data structures?
b) Define different operations in Stack.
c) Write a C program for circular queue.

Section – II

Q.4 Solve the following: (Any Four) **16**

a) Explain the representation of a polynomial using linked list.
b) What are various applications of tree?
c) Draw binary search tree for following input. 42 23 74 11 65 54
d) Explain adjacency matrix of graph with an example.
e) Explain bubble sort method for sorting array of 10 elements.
Array: [29, 10, 14, 37, 13, 40, 15, 22, 8, 19]

Q.5 Solve the following: (Any Two) **12**

a) Write a program to implement singly linked list using functions insert, delete and display.
b) The following sequence gives preorder & inorder traversal of binary tree
Preorder: ABCDEGFHIJ Inorder: BCAEGDHFIJ
c) What is hashing? Explain properties of good hash function? Explain modulus hash function.

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Data Structures (BTN06405)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) State True or False:
i) Network is a graph that has weights or costs associated with it.
ii) An undirected graph which contains no cycles is called a forest.
iii) A graph is said to be complete if there is no edge between every pair of vertices.
a) True, False, True b) True, True, False
c) True, True, True d) False, True, True

2) Which of the following is not the internal sort?
a) Insertion sort b) Bubble sort
c) Merge sort d) Heap sort

3) A graph is said to be ____ if the vertices can be split into two sets V1 and V2 such there are no edges between two vertices of V1 or two vertices of V2.
a) Partite b) Bipartite
c) Rooted d) Bisects

4) Which of the following statement is true?
i) Using singly linked lists and circular list, it is not possible to traverse the list backwards.
ii) To find the predecessor, it is required to traverse the list from the first node in case of singly linked list.
a) i-only b) ii-only
c) Both i and ii d) None of both

5) In ____, search start at the beginning of the list and check every element in the list.
a) Linear search b) Binary search
c) Hash search d) Binary Tree search

6) State True or False:

i) Binary search is used for searching in a sorted array.
ii) The time complexity of binary search is O(logn).

a) True, False b) False, True
c) False, False d) True, True

7) What is the asymptotic notation for Average-case?

a) Big O b) Omega
c) Theta d) None of the above

8) Inserting an item into the stack when stack is not full is called _____ operation and deletion of item form the stack, when stack is not empty is called ____.

a) push, pop b) pop, push
c) insert, delete d) delete, insert

9) Which of the following data structure is linear type?

a) Graph b) Trees
c) Binary tree d) Stack

10) Overflow condition of queue is ____.

a) rear==max-1 b) top==max-1
c) front==max-l d) Both a) & b)

11) ____ is a pile in which items are added at one end and removed from the other.

a) Stack b) Queue
c) List d) None of the above

12) A binary tree in which all its levels except the last, have maximum numbers of nodes, and all the nodes in the last level have only one child it will be its left child. Name the tree.

a) Threaded tree b) Complete binary tree
c) M-way search tree d) Full binary tree

13) A ____ is a data structure that organizes data similar to a line in the supermarket, where the first one in line is the first one out.

a) Queue linked list b) Stacks linked list
c) Both of them d) Neither of them

14) In the ____ traversal we process all of a vertex's descendants before we move to an adjacent vertex.

a) Depth First b) Breadth first
c) With First d) Depth Limited

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Data Structures (BTN06405)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.
3) Assume additional data if required and mention it clearly.

Section – I

Q.2 Solve the following: (Any Four) **16**

a) Explain Algorithm Analysis & Algorithm complexity in detail.
b) Write a C program to find the Fibonacci series of first 10 numbers with recursive function.
c) What are the Applications of stack?
d) Write C program to implement a linear queue.
e) Write note on double ended queue DEQUE.

Q.3 Solve the following: (Any Two) **12**

a) Which are the Different Basic Terminologies in data structures?
b) Define different operations in Stack.
c) Write a C program for circular queue.

Section – II

Q.4 Solve the following: (Any Four) **16**

a) Explain the representation of a polynomial using linked list.
b) What are various applications of tree?
c) Draw binary search tree for following input. 42 23 74 11 65 54
d) Explain adjacency matrix of graph with an example.
e) Explain bubble sort method for sorting array of 10 elements.
Array: [29, 10, 14, 37, 13, 40, 15, 22, 8, 19]

Q.5 Solve the following: (Any Two) **12**

a) Write a program to implement singly linked list using functions insert, delete and display.
b) The following sequence gives preorder & inorder traversal of binary tree
Preorder: ABCDEGFHIJ Inorder: BCAEGDHFIJ
c) What is hashing? Explain properties of good hash function? Explain modulus hash function.

Seat No.		Set	S

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Data Structures (BTN06405)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Overflow condition of queue is ____.
a) rear==max-1 b) top==max-1
c) front==max-l d) Both a) & b)

2) ____ is a pile in which items are added at one end and removed from the other.
a) Stack b) Queue
c) List d) None of the above

3) A binary tree in which all its levels except the last, have maximum numbers of nodes, and all the nodes in the last level have only one child it will be its left child. Name the tree.
a) Threaded tree b) Complete binary tree
c) M-way search tree d) Full binary tree

4) A ____ is a data structure that organizes data similar to a line in the supermarket, where the first one in line is the first one out.
a) Queue linked list b) Stacks linked list
c) Both of them d) Neither of them

5) In the ____ traversal we process all of a vertex's descendants before we move to an adjacent vertex.
a) Depth First b) Breadth first
c) With First d) Depth Limited

6) State True or False:

i) Network is a graph that has weights or costs associated with it.
ii) An undirected graph which contains no cycles is called a forest.
iii) A graph is said to be complete if there is no edge between every pair of vertices.

a) True, False, True
b) True, True, False
c) True, True, True
d) False, True, True

7) Which of the following is not the internal sort?

a) Insertion sort
b) Bubble sort
c) Merge sort
d) Heap sort

8) A graph is said to be ____ if the vertices can be split into two sets V1 and V2 such there are no edges between two vertices of V1 or two vertices of V2.

a) Partite
b) Bipartite
c) Rooted
d) Bisects

9) Which of the following statement is true?

i) Using singly linked lists and circular list, it is not possible to traverse the list backwards.
ii) To find the predecessor, it is required to traverse the list from the first node in case of singly linked list.

a) i-only
b) ii-only
c) Both i and ii
d) None of both

10) In ____, search start at the beginning of the list and check every element in the list.

a) Linear search
b) Binary search
c) Hash search
d) Binary Tree search

11) State True or False:

i) Binary search is used for searching in a sorted array.
ii) The time complexity of binary search is O(logn).

a) True, False
b) False, True
c) False, False
d) True, True

12) What is the asymptotic notation for Average-case?

a) Big O
b) Omega
c) Theta
d) None of the above

13) Inserting an item into the stack when stack is not full is called _____ operation and deletion of item form the stack, when stack is not empty is called ____.

a) push, pop
b) pop, push
c) insert, delete
d) delete, insert

14) Which of the following data structure is linear type?

a) Graph b) Trees

c) Binary tree d) Stack

SLR-BD-224

Seat No.	

Set S

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Data Structures (BTN06405)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.
3) Assume additional data if required and mention it clearly.

Section – I

Q.2 Solve the following: (Any Four) **16**

a) Explain Algorithm Analysis & Algorithm complexity in detail.
b) Write a C program to find the Fibonacci series of first 10 numbers with recursive function.
c) What are the Applications of stack?
d) Write C program to implement a linear queue.
e) Write note on double ended queue DEQUE.

Q.3 Solve the following: (Any Two) **12**

a) Which are the Different Basic Terminologies in data structures?
b) Define different operations in Stack.
c) Write a C program for circular queue.

Section – II

Q.4 Solve the following: (Any Four) **16**

a) Explain the representation of a polynomial using linked list.
b) What are various applications of tree?
c) Draw binary search tree for following input. 42 23 74 11 65 54
d) Explain adjacency matrix of graph with an example.
e) Explain bubble sort method for sorting array of 10 elements.
Array: [29, 10, 14, 37, 13, 40, 15, 22, 8, 19]

Q.5 Solve the following: (Any Two) **12**

a) Write a program to implement singly linked list using functions insert, delete and display.
b) The following sequence gives preorder & inorder traversal of binary tree
Preorder: ABCDEGFHIJ Inorder: BCAEGDHFIJ
c) What is hashing? Explain properties of good hash function? Explain modulus hash function.

Seat No.	

Set **P**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Computational Statistics (BTN04407)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Rank of a (m x n) matrix is determined by the number of linearly ____ rows present in the matrix.
a) Dependent b) Independent
c) Both d) None

2) What is the probability of getting a number less than 6 on dice?
a) 1 b) 1/3
c) ½ d) 0

3) In square matrix, sum of principal diagonal elements is given as ____.
a) Trace b) Rank
c) Eigen Value d) None

4) A die is thrown once. What is the probability that the score is a factor of 3?
a) 3/6 b) ½
c) 1/3 d) 1

5) The matrix which follows the conditions m=n is called?
a) Square matrix b) Rectangular matrix
c) Scalar matrix d) Diagonal matrix

6) ____ shows difference between actual Y and predicted Y value found using regression equation.
a) Slope b) Residual
c) Outlier d) None

7) How many outcomes are possible when drawing a card from deck of cards?
a) 1 b) 13
c) 52 d) 26

8) PCA reduce dimensionality of the data using feature extraction.
a) True b) False

9) What is Machine learning?
a) The autonomous acquisition of knowledge through the use of computer programs
b) The autonomous acquisition of knowledge through the use of manual programs
c) The selective acquisition of knowledge through the use of computer programs
d) The selective acquisition of knowledge through the use of manual programs

10) In the regression equation Y = 21+3X, the slope is ____.
a) 21 b) +3
c) -21 d) -3

11) Identify the type of learning in which labelled training data is used.
a) Semi supervised b) Supervised learning
c) Reinforcement learning d) Unsupervised learning

12) Linear regression is example of ____ learning.
a) Supervised b) Unsupervised
c) Reinforcement d) None of above

13) For orthogonal variable, correlation value is ____.
a) 0 b) 1
c) -1 d) None

14) Overfitting has high ____.
a) Bias b) Variance
c) Both d) None

Seat No.	

Set **P**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Computational Statistics (BTN04407)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION - I

Q.2 Solve the following: (Any Four) **16**

a) A die is rolled twice and two numbers are obtained, let X be the outcome of first role and Y be the outcome of the second roll. Given that X+Y=5, what is the probability of X=4 or Y=4?

b) Describe problem formulation.

c) Solve following using Substitute method.
2x-3y=-2 4x+y=24

d) A fair coin is tossed three times. What is probability of obtaining one Head and two Tails?

e) Describe Gaussian distribution.

Q.3 Solve the following: (Any Two) **12**

a) A doctor is aware of that disease Meningitis causes a patient to have stiff neck & it occurs 80% of the time. He also is aware of some more facts
(a) The known probability that patient has Meningitis disease is 1/30000.
(b) The known probability that a patient has stiff neck is 2%.
Find the probability that patients with stiff neck will have Meningitis.

b) The trace of square matrix of order 2*2 is 3 and trace of A3 is -18. Find determinant of matrix A.

c) Consider two bags, an orange bag and black bag. There are 4 candies in orange bag and 5 candies in black bag. There are also 2 chocolates in orange bag and 3 chocolates in black bag. A sweet is to be chosen randomly from any of the bags. What is probability that chosen sweet is chocolate from black bag?

SECTION - II

Q.4 Solve the following: (Any Four) **16**

a) Explain common term related to PCA.

b) Explain curse of dimensionality.

c) Write a note on machine learning.

d) Differentiate between Supervised, Unsupervised and Reinforcement Learning.

e) Differentiate between Training data and Testing data.

Q.5 Attempt the following: (Any Two) **12**

a) Explain overfitting and underfitting in detail with an example.

b) Explain key steps of PCA in Practice.

c) Explain various issues in machine learning.

Seat No.	

Set **Q**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Computational Statistics (BTN04407)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) PCA reduce dimensionality of the data using feature extraction.
a) True b) False

2) What is Machine learning?
a) The autonomous acquisition of knowledge through the use of computer programs
b) The autonomous acquisition of knowledge through the use of manual programs
c) The selective acquisition of knowledge through the use of computer programs
d) The selective acquisition of knowledge through the use of manual programs

3) In the regression equation Y = 21+3X, the slope is ____.
a) 21 b) +3
c) -21 d) -3

4) Identify the type of learning in which labelled training data is used.
a) Semi supervised b) Supervised learning
c) Reinforcement learning d) Unsupervised learning

5) Linear regression is example of ____ learning.
a) Supervised b) Unsupervised
c) Reinforcement d) None of above

6) For orthogonal variable, correlation value is ____.
a) 0 b) 1
c) -1 d) None

7) Overfitting has high ____.

a) Bias b) Variance
c) Both d) None

8) Rank of a (m x n) matrix is determined by the number of linearly ____ rows present in the matrix.

a) Dependent b) Independent
c) Both d) None

9) What is the probability of getting a number less than 6 on dice?

a) 1 b) 1/3
c) ½ d) 0

10) In square matrix, sum of principal diagonal elements is given as ____.

a) Trace b) Rank
c) Eigen Value d) None

11) A die is thrown once. What is the probability that the score is a factor of 3?

a) 3/6 b) ½
c) 1/3 d) 1

12) The matrix which follows the conditions m=n is called?

a) Square matrix b) Rectangular matrix
c) Scalar matrix d) Diagonal matrix

13) ____ shows difference between actual Y and predicted Y value found using regression equation.

a) Slope b) Residual
c) Outlier d) None

14) How many outcomes are possible when drawing a card from deck of cards?

a) 1 b) 13
c) 52 d) 26

Seat No.	

Set **Q**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Computational Statistics (BTN04407)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION - I

Q.2 Solve the following: (Any Four) **16**

a) A die is rolled twice and two numbers are obtained, let X be the outcome of first role and Y be the outcome of the second roll. Given that X+Y=5, what is the probability of X=4 or Y=4?

b) Describe problem formulation.

c) Solve following using Substitute method.
2x-3y=-2 4x+y=24

d) A fair coin is tossed three times. What is probability of obtaining one Head and two Tails?

e) Describe Gaussian distribution.

Q.3 Solve the following: (Any Two) **12**

a) A doctor is aware of that disease Meningitis causes a patient to have stiff neck & it occurs 80% of the time. He also is aware of some more facts
(a) The known probability that patient has Meningitis disease is 1/30000.
(b) The known probability that a patient has stiff neck is 2%.
Find the probability that patients with stiff neck will have Meningitis.

b) The trace of square matrix of order 2*2 is 3 and trace of A3 is -18. Find determinant of matrix A.

c) Consider two bags, an orange bag and black bag. There are 4 candies in orange bag and 5 candies in black bag. There are also 2 chocolates in orange bag and 3 chocolates in black bag. A sweet is to be chosen randomly from any of the bags. What is probability that chosen sweet is chocolate from black bag?

SECTION - II

Q.4 Solve the following: (Any Four) **16**

a) Explain common term related to PCA.

b) Explain curse of dimensionality.

c) Write a note on machine learning.

d) Differentiate between Supervised, Unsupervised and Reinforcement Learning.

e) Differentiate between Training data and Testing data.

Q.5 Attempt the following: (Any Two) **12**

a) Explain overfitting and underfitting in detail with an example.

b) Explain key steps of PCA in Practice.

c) Explain various issues in machine learning.

Seat No.	

Set **R**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Computational Statistics (BTN04407)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Identify the type of learning in which labelled training data is used.
a) Semi supervised b) Supervised learning
c) Reinforcement learning d) Unsupervised learning

2) Linear regression is example of ____ learning.
a) Supervised b) Unsupervised
c) Reinforcement d) None of above

3) For orthogonal variable, correlation value is ____.
a) 0 b) 1
c) -1 d) None

4) Overfitting has high ____.
a) Bias b) Variance
c) Both d) None

5) Rank of a (m x n) matrix is determined by the number of linearly ____ rows present in the matrix.
a) Dependent b) Independent
c) Both d) None

6) What is the probability of getting a number less than 6 on dice?
a) 1 b) 1/3
c) ½ d) 0

7) In square matrix, sum of principal diagonal elements is given as ____.
a) Trace b) Rank
c) Eigen Value d) None

8) A die is thrown once. What is the probability that the score is a factor of 3?

a) 3/6 b) ½

c) 1/3 d) 1

9) The matrix which follows the conditions m=n is called?

a) Square matrix b) Rectangular matrix

c) Scalar matrix d) Diagonal matrix

10) ____ shows difference between actual Y and predicted Y value found using regression equation.

a) Slope b) Residual

c) Outlier d) None

11) How many outcomes are possible when drawing a card from deck of cards?

a) 1 b) 13

c) 52 d) 26

12) PCA reduce dimensionality of the data using feature extraction.

a) True b) False

13) What is Machine learning?

a) The autonomous acquisition of knowledge through the use of computer programs

b) The autonomous acquisition of knowledge through the use of manual programs

c) The selective acquisition of knowledge through the use of computer programs

d) The selective acquisition of knowledge through the use of manual programs

14) In the regression equation Y = 21+3X, the slope is ____.

a) 21 b) +3

c) -21 d) -3

Seat No.	

Set **R**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Computational Statistics (BTN04407)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION - I

Q.2 Solve the following: (Any Four) **16**

a) A die is rolled twice and two numbers are obtained, let X be the outcome of first role and Y be the outcome of the second roll. Given that X+Y=5, what is the probability of X=4 or Y=4?

b) Describe problem formulation.

c) Solve following using Substitute method.
2x-3y=-2 4x+y=24

d) A fair coin is tossed three times. What is probability of obtaining one Head and two Tails?

e) Describe Gaussian distribution.

Q.3 Solve the following: (Any Two) **12**

a) A doctor is aware of that disease Meningitis causes a patient to have stiff neck & it occurs 80% of the time. He also is aware of some more facts
(a) The known probability that patient has Meningitis disease is 1/30000.
(b) The known probability that a patient has stiff neck is 2%.
Find the probability that patients with stiff neck will have Meningitis.

b) The trace of square matrix of order 2*2 is 3 and trace of A3 is -18. Find determinant of matrix A.

c) Consider two bags, an orange bag and black bag. There are 4 candies in orange bag and 5 candies in black bag. There are also 2 chocolates in orange bag and 3 chocolates in black bag. A sweet is to be chosen randomly from any of the bags. What is probability that chosen sweet is chocolate from black bag?

SECTION - II

Q.4 Solve the following: (Any Four) **16**

a) Explain common term related to PCA.

b) Explain curse of dimensionality.

c) Write a note on machine learning.

d) Differentiate between Supervised, Unsupervised and Reinforcement Learning.

e) Differentiate between Training data and Testing data.

Q.5 Attempt the following: (Any Two) **12**

a) Explain overfitting and underfitting in detail with an example.

b) Explain key steps of PCA in Practice.

c) Explain various issues in machine learning.

Seat No.	

Set S

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Computational Statistics (BTN04407)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) ____ shows difference between actual Y and predicted Y value found using regression equation.
a) Slope b) Residual
c) Outlier d) None

2) How many outcomes are possible when drawing a card from deck of cards?
a) 1 b) 13
c) 52 d) 26

3) PCA reduce dimensionality of the data using feature extraction.
a) True b) False

4) What is Machine learning?
a) The autonomous acquisition of knowledge through the use of computer programs
b) The autonomous acquisition of knowledge through the use of manual programs
c) The selective acquisition of knowledge through the use of computer programs
d) The selective acquisition of knowledge through the use of manual programs

5) In the regression equation Y = 21+3X, the slope is ____.
a) 21 b) +3
c) -21 d) -3

6) Identify the type of learning in which labelled training data is used.
a) Semi supervised b) Supervised learning
c) Reinforcement learning d) Unsupervised learning

7) Linear regression is example of ____ learning.
a) Supervised b) Unsupervised
c) Reinforcement d) None of above

8) For orthogonal variable, correlation value is ____.
a) 0 b) 1
c) -1 d) None

9) Overfitting has high ____.
a) Bias b) Variance
c) Both d) None

10) Rank of a (m x n) matrix is determined by the number of linearly ____ rows present in the matrix.
a) Dependent b) Independent
c) Both d) None

11) What is the probability of getting a number less than 6 on dice?
a) 1 b) 1/3
c) ½ d) 0

12) In square matrix, sum of principal diagonal elements is given as ____.
a) Trace b) Rank
c) Eigen Value d) None

13) A die is thrown once. What is the probability that the score is a factor of 3?
a) 3/6 b) ½
c) 1/3 d) 1

14) The matrix which follows the conditions m=n is called?
a) Square matrix b) Rectangular matrix
c) Scalar matrix d) Diagonal matrix

Seat No.	

Set **S**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Computational Statistics (BTN04407)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION - I

Q.2 Solve the following: (Any Four) **16**

a) A die is rolled twice and two numbers are obtained, let X be the outcome of first role and Y be the outcome of the second roll. Given that X+Y=5, what is the probability of X=4 or Y=4?

b) Describe problem formulation.

c) Solve following using Substitute method.
2x-3y=-2 4x+y=24

d) A fair coin is tossed three times. What is probability of obtaining one Head and two Tails?

e) Describe Gaussian distribution.

Q.3 Solve the following: (Any Two) **12**

a) A doctor is aware of that disease Meningitis causes a patient to have stiff neck & it occurs 80% of the time. He also is aware of some more facts
(a) The known probability that patient has Meningitis disease is 1/30000.
(b) The known probability that a patient has stiff neck is 2%.
Find the probability that patients with stiff neck will have Meningitis.

b) The trace of square matrix of order 2*2 is 3 and trace of A3 is -18. Find determinant of matrix A.

c) Consider two bags, an orange bag and black bag. There are 4 candies in orange bag and 5 candies in black bag. There are also 2 chocolates in orange bag and 3 chocolates in black bag. A sweet is to be chosen randomly from any of the bags. What is probability that chosen sweet is chocolate from black bag?

SECTION - II

Q.4 Solve the following: (Any Four) **16**

a) Explain common term related to PCA.

b) Explain curse of dimensionality.

c) Write a note on machine learning.

d) Differentiate between Supervised, Unsupervised and Reinforcement Learning.

e) Differentiate between Training data and Testing data.

Q.5 Attempt the following: (Any Two) **12**

a) Explain overfitting and underfitting in detail with an example.

b) Explain key steps of PCA in Practice.

c) Explain various issues in machine learning.

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Database Management Systems (BTN04408)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) DDL stands for ____.
a) Data declaration language
b) Declaration data language
c) Document declaration language
d) Data definition language

2) _____ operation can be visualized as a horizontal partition of the relation into two set of tuples.
a) JOIN b) PARTITION
c) SELECT d) PROJECT

3) 'AS' clause is used in SQL for ____.
a) selection b) rename
c) join d) projection

4) What key links records from one database table to a record or records in another database table?
a) Primary key b) Principal Key
c) Foreign key d) Link key

5) Which of the following contains information about the structure of a database?
a) Database management system
b) Data dictionary
c) Data repository
d) Data warehouse

6) The language which has recently become the defacto standard for interfacing application programs with relational database system is _____.
a) Oracle b) SQL
c) DBase d) 4GL

7) By normalizing relations or sets of relations, one minimizes ____.
a) Data b) Fields
c) Redundancy d) Database

8) Which of the following is a type of Normal Form?
a) ACNF b) BCNF
c) CCNF d) DCNF

9) Domain constraints, functional dependency and referential integrity are special forms of ____.
a) Foreign key b) Primary key
c) Assertion d) Referential constraint

10) The database administrator who authorizes all the new users, modifies the database, and takes grants privilege is ____.
a) Super user b) Administrator
c) Operator of operating system d) All

11) If we wish to grant a privilege and to allow the recipient to pass the privilege on to other users, we append the ____ clause to the appropriate grant command.
a) With grant b) Grant user
c) Grant pass privilege d) With grant option

12) Which of the following is the syntax for views where v is view name?
a) Create view v as “query name”;
b) Create “query expression” as view;
c) Create view v as “query expression”;
d) Create view “query expression”;

13) Key value pairs are usually seen in ____.
a) Hash tables b) Heaps
c) Both Hash tables and Heaps d) Skip list

14) A system is in a ____ state if there exists a set of transactions such that every transaction in the set is waiting for another transaction in the set.
a) Idle b) Waiting
c) Deadlock d) Ready

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Database Management Systems (BTN04408)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section - I

Q.2 Solve the following: (Any Four) **16**

a) What is DBMS? And which are the application database system?
b) Which are the constraints in DBMS explain with example.
c) Explain Relational Query languages.
d) What are the different design issues in ER model?
e) Explain view in SQL with example.

Q.3 Solve the following: (Any Two) **12**

a) Which are the types of Database Languages? Explain with its commands.
b) Explain Basic SQL clauses.
c) Explain Extended Relational Algebra operation with example.

Section - II

Q.4 Attempt the following: (Any Four) **16**

a) Write a short note on Nested subqueries with example.
b) Explain Atomic Domains.
c) Explain ordered indices in detail.
d) Explain the transaction states with neat diagram.
e) What is functional dependency? Give example.

Q.5 Attempt the following: (Any Two) **12**

a) List the different Aggregate operations in SQL? Explain any 3 Aggregate operations with queries.
b) Differentiate between B+ tree and B tree index files.
c) Explain Time stamp ordering protocol with example.

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Database Management Systems (BTN04408)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is a type of Normal Form?
a) ACNF b) BCNF
c) CCNF d) DCNF

2) Domain constraints, functional dependency and referential integrity are special forms of ____.
a) Foreign key b) Primary key
c) Assertion d) Referential constraint

3) The database administrator who authorizes all the new users, modifies the database, and takes grants privilege is ____.
a) Super user b) Administrator
c) Operator of operating system d) All

4) If we wish to grant a privilege and to allow the recipient to pass the privilege on to other users, we append the ____ clause to the appropriate grant command.
a) With grant b) Grant user
c) Grant pass privilege d) With grant option

5) Which of the following is the syntax for views where v is view name?
a) Create view v as "query name";
b) Create "query expression" as view;
c) Create view v as "query expression";
d) Create view "query expression";

6) Key value pairs are usually seen in ____.
a) Hash tables b) Heaps
c) Both Hash tables and Heaps d) Skip list

7) A system is in a ____ state if there exists a set of transactions such that every transaction in the set is waiting for another transaction in the set.

a) Idle
b) Waiting
c) Deadlock
d) Ready

8) DDL stands for ____.

a) Data declaration language
b) Declaration data language
c) Document declaration language
d) Data definition language

9) _____ operation can be visualized as a horizontal partition of the relation into two set of tuples.

a) JOIN
b) PARTITION
c) SELECT
d) PROJECT

10) 'AS' clause is used in SQL for ____.

a) selection
b) rename
c) join
d) projection

11) What key links records from one database table to a record or records in another database table?

a) Primary key
b) Principal Key
c) Foreign key
d) Link key

12) Which of the following contains information about the structure of a database?

a) Database management system
b) Data dictionary
c) Data repository
d) Data warehouse

13) The language which has recently become the defacto standard for interfacing application programs with relational database system is _____.

a) Oracle
b) SQL
c) DBase
d) 4GL

14) By normalizing relations or sets of relations, one minimizes ____.

a) Data
b) Fields
c) Redundancy
d) Database

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Database Management Systems (BTN04408)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section - I

Q.2 Solve the following: (Any Four) **16**

a) What is DBMS? And which are the application database system?
b) Which are the constraints in DBMS explain with example.
c) Explain Relational Query languages.
d) What are the different design issues in ER model?
e) Explain view in SQL with example.

Q.3 Solve the following: (Any Two) **12**

a) Which are the types of Database Languages? Explain with its commands.
b) Explain Basic SQL clauses.
c) Explain Extended Relational Algebra operation with example.

Section - II

Q.4 Attempt the following: (Any Four) **16**

a) Write a short note on Nested subqueries with example.
b) Explain Atomic Domains.
c) Explain ordered indices in detail.
d) Explain the transaction states with neat diagram.
e) What is functional dependency? Give example.

Q.5 Attempt the following: (Any Two) **12**

a) List the different Aggregate operations in SQL? Explain any 3 Aggregate operations with queries.
b) Differentiate between B+ tree and B tree index files.
c) Explain Time stamp ordering protocol with example.

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Database Management Systems (BTN04408)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) If we wish to grant a privilege and to allow the recipient to pass the privilege on to other users, we append the ____ clause to the appropriate grant command.
a) With grant b) Grant user
c) Grant pass privilege d) With grant option

2) Which of the following is the syntax for views where v is view name?
a) Create view v as "query name";
b) Create "query expression" as view;
c) Create view v as "query expression";
d) Create view "query expression";

3) Key value pairs are usually seen in ____.
a) Hash tables b) Heaps
c) Both Hash tables and Heaps d) Skip list

4) A system is in a ____ state if there exists a set of transactions such that every transaction in the set is waiting for another transaction in the set.
a) Idle b) Waiting
c) Deadlock d) Ready

5) DDL stands for ____.
a) Data declaration language
b) Declaration data language
c) Document declaration language
d) Data definition language

6) _____ operation can be visualized as a horizontal partition of the relation into two set of tuples.
a) JOIN b) PARTITION
c) SELECT d) PROJECT

7) 'AS' clause is used in SQL for ____.

a) selection b) rename
c) join d) projection

8) What key links records from one database table to a record or records in another database table?

a) Primary key b) Principal Key
c) Foreign key d) Link key

9) Which of the following contains information about the structure of a database?

a) Database management system
b) Data dictionary
c) Data repository
d) Data warehouse

10) The language which has recently become the defacto standard for interfacing application programs with relational database system is _____.

a) Oracle b) SQL
c) DBase d) 4GL

11) By normalizing relations or sets of relations, one minimizes ____.

a) Data b) Fields
c) Redundancy d) Database

12) Which of the following is a type of Normal Form?

a) ACNF b) BCNF
c) CCNF d) DCNF

13) Domain constraints, functional dependency and referential integrity are special forms of ____.

a) Foreign key b) Primary key
c) Assertion d) Referential constraint

14) The database administrator who authorizes all the new users, modifies the database, and takes grants privilege is ____.

a) Super user b) Administrator
c) Operator of operating system d) All

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Database Management Systems (BTN04408)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section - I

Q.2 Solve the following: (Any Four) **16**

a) What is DBMS? And which are the application database system?
b) Which are the constraints in DBMS explain with example.
c) Explain Relational Query languages.
d) What are the different design issues in ER model?
e) Explain view in SQL with example.

Q.3 Solve the following: (Any Two) **12**

a) Which are the types of Database Languages? Explain with its commands.
b) Explain Basic SQL clauses.
c) Explain Extended Relational Algebra operation with example.

Section - II

Q.4 Attempt the following: (Any Four) **16**

a) Write a short note on Nested subqueries with example.
b) Explain Atomic Domains.
c) Explain ordered indices in detail.
d) Explain the transaction states with neat diagram.
e) What is functional dependency? Give example.

Q.5 Attempt the following: (Any Two) **12**

a) List the different Aggregate operations in SQL? Explain any 3 Aggregate operations with queries.
b) Differentiate between B+ tree and B tree index files.
c) Explain Time stamp ordering protocol with example.

Seat No.	

Set **S**

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Database Management Systems (BTN04408)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if required.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The language which has recently become the defacto standard for interfacing application programs with relational database system is _____.
a) Oracle b) SQL
c) DBase d) 4GL

2) By normalizing relations or sets of relations, one minimizes ____.
a) Data b) Fields
c) Redundancy d) Database

3) Which of the following is a type of Normal Form?
a) ACNF b) BCNF
c) CCNF d) DCNF

4) Domain constraints, functional dependency and referential integrity are special forms of ____.
a) Foreign key b) Primary key
c) Assertion d) Referential constraint

5) The database administrator who authorizes all the new users, modifies the database, and takes grants privilege is ____.
a) Super user b) Administrator
c) Operator of operating system d) All

6) If we wish to grant a privilege and to allow the recipient to pass the privilege on to other users, we append the ____ clause to the appropriate grant command.
a) With grant b) Grant user
c) Grant pass privilege d) With grant option

7) Which of the following is the syntax for views where v is view name?
   a) Create view v as “query name”;
   b) Create “query expression” as view;
   c) Create view v as “query expression”;
   d) Create view “query expression”;

8) Key value pairs are usually seen in ____.
   a) Hash tables
   b) Heaps
   c) Both Hash tables and Heaps
   d) Skip list

9) A system is in a ____ state if there exists a set of transactions such that every transaction in the set is waiting for another transaction in the set.
   a) Idle
   b) Waiting
   c) Deadlock
   d) Ready

10) DDL stands for ____.
   a) Data declaration language
   b) Declaration data language
   c) Document declaration language
   d) Data definition language

11) _____ operation can be visualized as a horizontal partition of the relation into two set of tuples.
   a) JOIN
   b) PARTITION
   c) SELECT
   d) PROJECT

12) ‘AS’ clause is used in SQL for ____.
   a) selection
   b) rename
   c) join
   d) projection

13) What key links records from one database table to a record or records in another database table?
   a) Primary key
   b) Principal Key
   c) Foreign key
   d) Link key

14) Which of the following contains information about the structure of a database?
   a) Database management system
   b) Data dictionary
   c) Data repository
   d) Data warehouse

Seat No.	

Set **S**

S.Y. (B. Tech) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Database Management Systems (BTN04408)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section - I

Q.2 Solve the following: (Any Four) **16**

a) What is DBMS? And which are the application database system?
b) Which are the constraints in DBMS explain with example.
c) Explain Relational Query languages.
d) What are the different design issues in ER model?
e) Explain view in SQL with example.

Q.3 Solve the following: (Any Two) **12**

a) Which are the types of Database Languages? Explain with its commands.
b) Explain Basic SQL clauses.
c) Explain Extended Relational Algebra operation with example.

Section - II

Q.4 Attempt the following: (Any Four) **16**

a) Write a short note on Nested subqueries with example.
b) Explain Atomic Domains.
c) Explain ordered indices in detail.
d) Explain the transaction states with neat diagram.
e) What is functional dependency? Give example.

Q.5 Attempt the following: (Any Two) **12**

a) List the different Aggregate operations in SQL? Explain any 3 Aggregate operations with queries.
b) Differentiate between B+ tree and B tree index files.
c) Explain Time stamp ordering protocol with example.

Seat No.	

Set **P**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Fundamentals of IOT(BTN04409)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) How does IoT contribute to the development of smart cities?
a) By promoting online gaming
b) By enhancing communication systems
c) By improving urban infrastructure and management
d) By increasing social media usage

2) What is the role of communication systems in IoT?
a) Real-time processing b) Data storage in the cloud
c) Interconnecting devices d) Embedded system development

3) What are the challenges associated with developing embedded systems for IoT?
a) Increased power consumption
b) Real-time requirements, resource constraints
c) Limited communication options
d) Lack of sensor integration

4) Which of the following is an example of a real-time operating system (RTOS) used in embedded systems for IoT?
a) Windows b) Linux
c) FreeRTOS d) MacOS

5) What is the role of communication protocols in embedded systems for IoT?
a) Managing communication between devices
b) Providing data storage in the cloud
c) Simplifying the development process
d) Designing user interfaces for IoT applications

6) What is the purpose of calibration in sensor applications?
a) Adjusting sensor readings to match a reference standard
b) Enhancing sensor sensitivity
c) Increasing sensor power consumption
d) Improving sensor communication

7) Which environmental factor can affect sensor readings?
a) Cloud cover
b) Traffic congestion
c) Operating temperature
d) Social media activity

8) Which environmental factor can affect the performance of moisture sensors?
a) Temperature
b) Traffic congestion
c) Social media activity
d) Cloud cover

9) In which domain are position sensors commonly used?
a) Healthcare
b) Manufacturing
c) Entertainment
d) Social networking

10) What is the primary application of humidity sensors in IoT?
a) Monitoring temperature
b) Detecting human presence
c) Assessing air quality
d) Measuring humidity levels

11) Which communication technology is commonly used for IoT applications in smart agriculture?
a) Wi-Fi
b) LoRa (Long Range)
c) Bluetooth Low Energy (BLE)
d) Cellular

12) What is the primary advantage of using LoRa technology in IoT applications?
a) Short communication range
b) High data transfer speed
c) Long communication range
d) Low power consumption

13) Which of the following is NOT a valid Linux command for shell access in Raspberry Pi?
a) Is
b) mv
c) cd
d) run

14) Which tool is commonly used for remote access to a Raspberry Pi from a Windows machine?
a) Terminal
b) PuTTY
c) SSH
d) Remote Desktop

Seat No.	

Set P

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Fundamentals of IOT(BTN04409)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section - I

Q.2 Solve the following: (Any Four) **16**

a) Describe the key components of an IoT system, including embedded systems, communication systems, and the cloud.
b) Explain the role of cloud computing in supporting IoT applications. How does cloud computing enhance the capabilities of IoT devices?
c) Compare various embedded platforms commonly used in IoT.
d) Discuss the key characteristics that differentiate embedded systems from general-purpose computing systems.
e) Explain the units of measurement commonly used in sensor technology.

Q.3 Solve the following: (Any Two) **12**

a) Explain the concept of edge computing in the context of IoT. How does edge computing address die challenges of data processing and latency in IoT systems? Provide examples of edge computing in IoT applications.
b) Examine the role of sensors and actuators in embedded systems for IoT. Provide examples of sensors and actuators commonly used in IoT applications and explain how they contribute to the overall functionality of embedded systems.
c) Examine the concept of noise in sensor signals. Discuss the types of noise that can affect sensor measurements and explain how noise can be minimized or eliminated in sensor systems.

Section - II

Q.4 Solve the following: (Any Four) **16**

a) Discuss the significance of humidity and moisture sensors in IoT.
b) Discuss how light sensors are used for tasks such as ambient light adjustment, security, and in consumer electronics.
c) Discuss the challenges and considerations in implementing sensor applications in real-world scenarios.
d) Compare Bluetooth Low Energy, Wi-Fi, and RFID technologies.
e) Identify two significant challenges in developing IoT solutions with Raspberry Pi and discuss potential future advancements in this field.

Q.5 Attempt the following: (Any Two) **12**

a) Discuss the techniques and protocols used for interfacing LED, switches, and LCD with Raspberry Pi.

b) Examine the integration of communication technologies in industrial IoT applications. Discuss how BLE, Wi-Fi, and RFID are employed to enable communication between machines and support automation in industrial settings.

c) Discuss the role of temperature sensors in various IoT applications. Discuss examples of temperature-sensitive applications in industries such as healthcare, food storage, and climate control.

Seat No.	

Set **Q**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Fundamentals of IOT(BTN04409)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Which environmental factor can affect the performance of moisture sensors?
a) Temperature b) Traffic congestion
c) Social media activity d) Cloud cover

2) In which domain are position sensors commonly used?
a) Healthcare b) Manufacturing
c) Entertainment d) Social networking

3) What is the primary application of humidity sensors in IoT?
a) Monitoring temperature b) Detecting human presence
c) Assessing air quality d) Measuring humidity levels

4) Which communication technology is commonly used for IoT applications in smart agriculture?
a) Wi-Fi b) LoRa (Long Range)
c) Bluetooth Low Energy (BLE) d) Cellular

5) What is the primary advantage of using LoRa technology in IoT applications?
a) Short communication range b) High data transfer speed
c) Long communication range d) Low power consumption

6) Which of the following is NOT a valid Linux command for shell access in Raspberry Pi?
a) Is b) mv
c) cd d) run

7) Which tool is commonly used for remote access to a Raspberry Pi from a Windows machine?
a) Terminal b) PuTTY
c) SSH d) Remote Desktop

8) How does IoT contribute to the development of smart cities?
   a) By promoting online gaming
   b) By enhancing communication systems
   c) By improving urban infrastructure and management
   d) By increasing social media usage

9) What is the role of communication systems in IoT?
   a) Real-time processing
   b) Data storage in the cloud
   c) Interconnecting devices
   d) Embedded system development

10) What are the challenges associated with developing embedded systems for IoT?
   a) Increased power consumption
   b) Real-time requirements, resource constraints
   c) Limited communication options
   d) Lack of sensor integration

11) Which of the following is an example of a real-time operating system (RTOS) used in embedded systems for IoT?
   a) Windows
   b) Linux
   c) FreeRTOS
   d) MacOS

12) What is the role of communication protocols in embedded systems for IoT?
   a) Managing communication between devices
   b) Providing data storage in the cloud
   c) Simplifying the development process
   d) Designing user interfaces for IoT applications

13) What is the purpose of calibration in sensor applications?
   a) Adjusting sensor readings to match a reference standard
   b) Enhancing sensor sensitivity
   c) Increasing sensor power consumption
   d) Improving sensor communication

14) Which environmental factor can affect sensor readings?
   a) Cloud cover
   b) Traffic congestion
   c) Operating temperature
   d) Social media activity

Seat No.	

Set Q

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Fundamentals of IOT(BTN04409)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section - I

Q.2 Solve the following: (Any Four) **16**

a) Describe the key components of an IoT system, including embedded systems, communication systems, and the cloud.
b) Explain the role of cloud computing in supporting IoT applications. How does cloud computing enhance the capabilities of IoT devices?
c) Compare various embedded platforms commonly used in IoT.
d) Discuss the key characteristics that differentiate embedded systems from general-purpose computing systems.
e) Explain the units of measurement commonly used in sensor technology.

Q.3 Solve the following: (Any Two) **12**

a) Explain the concept of edge computing in the context of IoT. How does edge computing address die challenges of data processing and latency in IoT systems? Provide examples of edge computing in IoT applications.
b) Examine the role of sensors and actuators in embedded systems for IoT. Provide examples of sensors and actuators commonly used in IoT applications and explain how they contribute to the overall functionality of embedded systems.
c) Examine the concept of noise in sensor signals. Discuss the types of noise that can affect sensor measurements and explain how noise can be minimized or eliminated in sensor systems.

Section - II

Q.4 Solve the following: (Any Four) **16**

a) Discuss the significance of humidity and moisture sensors in IoT.
b) Discuss how light sensors are used for tasks such as ambient light adjustment, security, and in consumer electronics.
c) Discuss the challenges and considerations in implementing sensor applications in real-world scenarios.
d) Compare Bluetooth Low Energy, Wi-Fi, and RFID technologies.
e) Identify two significant challenges in developing IoT solutions with Raspberry Pi and discuss potential future advancements in this field.

Q.5 Attempt the following: (Any Two) **12**

a) Discuss the techniques and protocols used for interfacing LED, switches, and LCD with Raspberry Pi.

b) Examine the integration of communication technologies in industrial IoT applications. Discuss how BLE, Wi-Fi, and RFID are employed to enable communication between machines and support automation in industrial settings.

c) Discuss the role of temperature sensors in various IoT applications. Discuss examples of temperature-sensitive applications in industries such as healthcare, food storage, and climate control.

Seat No.	

Set **R**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Fundamentals of IOT(BTN04409)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Which communication technology is commonly used for IoT applications in smart agriculture?
a) Wi-Fi b) LoRa (Long Range)
c) Bluetooth Low Energy (BLE) d) Cellular

2) What is the primary advantage of using LoRa technology in IoT applications?
a) Short communication range b) High data transfer speed
c) Long communication range d) Low power consumption

3) Which of the following is NOT a valid Linux command for shell access in Raspberry Pi?
a) Is b) mv
c) cd d) run

4) Which tool is commonly used for remote access to a Raspberry Pi from a Windows machine?
a) Terminal b) PuTTY
c) SSH d) Remote Desktop

5) How does IoT contribute to the development of smart cities?
a) By promoting online gaming
b) By enhancing communication systems
c) By improving urban infrastructure and management
d) By increasing social media usage

6) What is the role of communication systems in IoT?
a) Real-time processing b) Data storage in the cloud
c) Interconnecting devices d) Embedded system development

7) What are the challenges associated with developing embedded systems for IoT?
   a) Increased power consumption
   b) Real-time requirements, resource constraints
   c) Limited communication options
   d) Lack of sensor integration

8) Which of the following is an example of a real-time operating system (RTOS) used in embedded systems for IoT?
   a) Windows
   b) Linux
   c) FreeRTOS
   d) MacOS

9) What is the role of communication protocols in embedded systems for IoT?
   a) Managing communication between devices
   b) Providing data storage in the cloud
   c) Simplifying the development process
   d) Designing user interfaces for IoT applications

10) What is the purpose of calibration in sensor applications?
   a) Adjusting sensor readings to match a reference standard
   b) Enhancing sensor sensitivity
   c) Increasing sensor power consumption
   d) Improving sensor communication

11) Which environmental factor can affect sensor readings?
   a) Cloud cover
   b) Traffic congestion
   c) Operating temperature
   d) Social media activity

12) Which environmental factor can affect the performance of moisture sensors?
   a) Temperature
   b) Traffic congestion
   c) Social media activity
   d) Cloud cover

13) In which domain are position sensors commonly used?
   a) Healthcare
   b) Manufacturing
   c) Entertainment
   d) Social networking

14) What is the primary application of humidity sensors in IoT?
   a) Monitoring temperature
   b) Detecting human presence
   c) Assessing air quality
   d) Measuring humidity levels

Seat No.	

Set R

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Fundamentals of IOT(BTN04409)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section - I

Q.2 Solve the following: (Any Four) **16**

a) Describe the key components of an IoT system, including embedded systems, communication systems, and the cloud.
b) Explain the role of cloud computing in supporting IoT applications. How does cloud computing enhance the capabilities of IoT devices?
c) Compare various embedded platforms commonly used in IoT.
d) Discuss the key characteristics that differentiate embedded systems from general-purpose computing systems.
e) Explain the units of measurement commonly used in sensor technology.

Q.3 Solve the following: (Any Two) **12**

a) Explain the concept of edge computing in the context of IoT. How does edge computing address die challenges of data processing and latency in IoT systems? Provide examples of edge computing in IoT applications.
b) Examine the role of sensors and actuators in embedded systems for IoT. Provide examples of sensors and actuators commonly used in IoT applications and explain how they contribute to the overall functionality of embedded systems.
c) Examine the concept of noise in sensor signals. Discuss the types of noise that can affect sensor measurements and explain how noise can be minimized or eliminated in sensor systems.

Section - II

Q.4 Solve the following: (Any Four) **16**

a) Discuss the significance of humidity and moisture sensors in IoT.
b) Discuss how light sensors are used for tasks such as ambient light adjustment, security, and in consumer electronics.
c) Discuss the challenges and considerations in implementing sensor applications in real-world scenarios.
d) Compare Bluetooth Low Energy, Wi-Fi, and RFID technologies.
e) Identify two significant challenges in developing IoT solutions with Raspberry Pi and discuss potential future advancements in this field.

Q.5 Attempt the following: (Any Two) **12**

a) Discuss the techniques and protocols used for interfacing LED, switches, and LCD with Raspberry Pi.

b) Examine the integration of communication technologies in industrial IoT applications. Discuss how BLE, Wi-Fi, and RFID are employed to enable communication between machines and support automation in industrial settings.

c) Discuss the role of temperature sensors in various IoT applications. Discuss examples of temperature-sensitive applications in industries such as healthcare, food storage, and climate control.

Seat No.	

Set | S

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Fundamentals of IOT(BTN04409)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) What is the purpose of calibration in sensor applications?
a) Adjusting sensor readings to match a reference standard
b) Enhancing sensor sensitivity
c) Increasing sensor power consumption
d) Improving sensor communication

2) Which environmental factor can affect sensor readings?
a) Cloud cover b) Traffic congestion
c) Operating temperature d) Social media activity

3) Which environmental factor can affect the performance of moisture sensors?
a) Temperature b) Traffic congestion
c) Social media activity d) Cloud cover

4) In which domain are position sensors commonly used?
a) Healthcare b) Manufacturing
c) Entertainment d) Social networking

5) What is the primary application of humidity sensors in IoT?
a) Monitoring temperature b) Detecting human presence
c) Assessing air quality d) Measuring humidity levels

6) Which communication technology is commonly used for IoT applications in smart agriculture?
a) Wi-Fi b) LoRa (Long Range)
c) Bluetooth Low Energy (BLE) d) Cellular

7) What is the primary advantage of using LoRa technology in IoT applications?
a) Short communication range b) High data transfer speed
c) Long communication range d) Low power consumption

8) Which of the following is NOT a valid Linux command for shell access in Raspberry Pi?

a) ls
b) mv
c) cd
d) run

9) Which tool is commonly used for remote access to a Raspberry Pi from a Windows machine?

a) Terminal
b) PuTTY
c) SSH
d) Remote Desktop

10) How does IoT contribute to the development of smart cities?

a) By promoting online gaming
b) By enhancing communication systems
c) By improving urban infrastructure and management
d) By increasing social media usage

11) What is the role of communication systems in IoT?

a) Real-time processing
b) Data storage in the cloud
c) Interconnecting devices
d) Embedded system development

12) What are the challenges associated with developing embedded systems for IoT?

a) Increased power consumption
b) Real-time requirements, resource constraints
c) Limited communication options
d) Lack of sensor integration

13) Which of the following is an example of a real-time operating system (RTOS) used in embedded systems for IoT?

a) Windows
b) Linux
c) FreeRTOS
d) MacOS

14) What is the role of communication protocols in embedded systems for IoT?

a) Managing communication between devices
b) Providing data storage in the cloud
c) Simplifying the development process
d) Designing user interfaces for IoT applications

Seat No.	

Set **S**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Fundamentals of IOT(BTN04409)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section - I

Q.2 Solve the following: (Any Four) **16**

a) Describe the key components of an IoT system, including embedded systems, communication systems, and the cloud.
b) Explain the role of cloud computing in supporting IoT applications. How does cloud computing enhance the capabilities of IoT devices?
c) Compare various embedded platforms commonly used in IoT.
d) Discuss the key characteristics that differentiate embedded systems from general-purpose computing systems.
e) Explain the units of measurement commonly used in sensor technology.

Q.3 Solve the following: (Any Two) **12**

a) Explain the concept of edge computing in the context of IoT. How does edge computing address die challenges of data processing and latency in IoT systems? Provide examples of edge computing in IoT applications.
b) Examine the role of sensors and actuators in embedded systems for IoT. Provide examples of sensors and actuators commonly used in IoT applications and explain how they contribute to the overall functionality of embedded systems.
c) Examine the concept of noise in sensor signals. Discuss the types of noise that can affect sensor measurements and explain how noise can be minimized or eliminated in sensor systems.

Section - II

Q.4 Solve the following: (Any Four) **16**

a) Discuss the significance of humidity and moisture sensors in IoT.
b) Discuss how light sensors are used for tasks such as ambient light adjustment, security, and in consumer electronics.
c) Discuss the challenges and considerations in implementing sensor applications in real-world scenarios.
d) Compare Bluetooth Low Energy, Wi-Fi, and RFID technologies.
e) Identify two significant challenges in developing IoT solutions with Raspberry Pi and discuss potential future advancements in this field.

Q.5 Attempt the following: (Any Two) **12**

a) Discuss the techniques and protocols used for interfacing LED, switches, and LCD with Raspberry Pi.

b) Examine the integration of communication technologies in industrial IoT applications. Discuss how BLE, Wi-Fi, and RFID are employed to enable communication between machines and support automation in industrial settings.

c) Discuss the role of temperature sensors in various IoT applications. Discuss examples of temperature-sensitive applications in industries such as healthcare, food storage, and climate control.

SLR-BD-228

Seat No.		Set	P

S.Y. (B.Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Cryptography (BTN04410)

Day & Date: Monday 09-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) The figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) An attempt to gain unauthorized access to a system is called: _____
a) Passive Attack b) Active Attack
c) Intrusion d) Masquerading

2) Which of the following is a cryptographic security mechanism?
a) Firewalls b) Encryption
c) Access Control d) Intrusion Detection Systems

3) In the symmetric cipher model, the plaintext refers to: _____
a) The encrypted message
b) The original, readable message before encryption
c) The key used for decryption
d) The hashing algorithm

4) Ina transposition cipher, encryption is performed by: _____
a) Replacing each character with another
b) Rearranging the order of characters in the plaintext
c) Swapping letters based on a predefined key
d) Adding extra characters to the text

5) In a Feistel cipher structure, encryption and decryption: _____
a) Use different functions
b) Require different keys
c) Use the same structure with key scheduling
d) Are based only on permutation

6) The Feistel structure in DES means: _____
a) Encryption and decryption use different algorithms
b) The algorithm is reversible
c) It requires asymmetric key pairs
d) It is immune to brute-force attacks

7) Avalanche effect in cryptography means: _____
a) A minor change in plaintext produces major changes in ciphertext
b) A small key change results in minor output differences
c) The cipher resists linear cryptanalysis
d) A key can be reused multiple times

8) The most widely used public-key cryptosystem is: _____
a) AES b) RSA
c) DES d) Blowfish

9) Public-key cryptography is not commonly used for: _____
a) Key exchange
b) Digital signatures
c) Encrypting large amounts of data directly
d) Authenticating websites

10) A good cryptographic hash function should be: _____
a) Reversible
b) Computationally expensive to compute
c) Deterministic and fast to compute
d) Dependent on a secret key

11) The term collision in hash functions refers to: _____
a) Two different inputs producing the same hash output
b) The hash function being too slow
c) The key being compromised
d) Data being lost during hashing

12) The verification of a digital signature is performed using: _____
a) A private key b) A public key
c) A symmetric key d) A shared secret key

13) Which authentication protocol relies on symmetric encryption?
a) RSA b) Kerberos
c) Diffie-Hellman d) Digital signatures

14) The main goal of Personal Identity Verification is to: _____
a) Store user passwords securely
b) Authenticate individuals using strong identity proofing
c) Encrypt user emails
d) Provide network security

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Cryptography (BTN04410)

Day & Date: Monday 09-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any FOUR questions. **16**

a) Explain the difference between data integrity and system integrity.
b) What is a transposition cipher? How is it different from a substitution cipher?
c) Explain the concept of payload and cover media in steganography.
d) Demonstrate the XOR operation in DES using a small example.
e) Describe how the initial cipher key is expanded to create round keys.

Q.3 Attempt any TWO questions. **12**

a) Describe the role of specific security mechanisms as defined in the OSI Security Architecture.
b) How does the Playfair cipher work? Illustrate with encryption of a sample plaintext.
c) Describe the AES structure and the steps involved in one round of AES.

Section – II

Q.4 Attempt any FOUR questions. **16**

a) Define the encryption and decryption functions in RSA.
b) What is the limitation of using simple XOR-based hash functions?
c) List two requirements of a good MAC.
d) What is a challenge-response mechanism? How does it work with symmetric keys?
e) What is the goal of a Personal Identity Verification (PIV) system?

Q.5 Attempt any TWO questions. **12**

a) Describe the Diffie-Hellman key exchange algorithm in detail with an example.
b) Compare SHA-1 and SHA-2 in terms of structure and security.
c) Discuss the use of Public Key Infrastructure (PKI) in remote authentication systems.

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Cryptography (BTN04410)

Day & Date: Monday 09-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) The figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The most widely used public-key cryptosystem is: _____
a) AES b) RSA
c) DES d) Blowfish

2) Public-key cryptography is not commonly used for: _____
a) Key exchange
b) Digital signatures
c) Encrypting large amounts of data directly
d) Authenticating websites

3) A good cryptographic hash function should be: _____
a) Reversible
b) Computationally expensive to compute
c) Deterministic and fast to compute
d) Dependent on a secret key

4) The term collision in hash functions refers to: _____
a) Two different inputs producing the same hash output
b) The hash function being too slow
c) The key being compromised
d) Data being lost during hashing

5) The verification of a digital signature is performed using: _____
a) A private key b) A public key
c) A symmetric key d) A shared secret key

6) Which authentication protocol relies on symmetric encryption?
a) RSA b) Kerberos
c) Diffie-Hellman d) Digital signatures

7) The main goal of Personal Identity Verification is to: _____
a) Store user passwords securely
b) Authenticate individuals using strong identity proofing
c) Encrypt user emails
d) Provide network security

8) An attempt to gain unauthorized access to a system is called: _____
a) Passive Attack b) Active Attack
c) Intrusion d) Masquerading

9) Which of the following is a cryptographic security mechanism?
a) Firewalls b) Encryption
c) Access Control d) Intrusion Detection Systems

10) In the symmetric cipher model, the plaintext refers to: _____
a) The encrypted message
b) The original, readable message before encryption
c) The key used for decryption
d) The hashing algorithm

11) Ina transposition cipher, encryption is performed by: _____
a) Replacing each character with another
b) Rearranging the order of characters in the plaintext
c) Swapping letters based on a predefined key
d) Adding extra characters to the text

12) In a Feistel cipher structure, encryption and decryption: _____
a) Use different functions
b) Require different keys
c) Use the same structure with key scheduling
d) Are based only on permutation

13) The Feistel structure in DES means: _____
a) Encryption and decryption use different algorithms
b) The algorithm is reversible
c) It requires asymmetric key pairs
d) It is immune to brute-force attacks

14) Avalanche effect in cryptography means: _____
a) A minor change in plaintext produces major changes in ciphertext
b) A small key change results in minor output differences
c) The cipher resists linear cryptanalysis
d) A key can be reused multiple times

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Cryptography (BTN04410)

Day & Date: Monday 09-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any FOUR questions. **16**

a) Explain the difference between data integrity and system integrity.
b) What is a transposition cipher? How is it different from a substitution cipher?
c) Explain the concept of payload and cover media in steganography.
d) Demonstrate the XOR operation in DES using a small example.
e) Describe how the initial cipher key is expanded to create round keys.

Q.3 Attempt any TWO questions. **12**

a) Describe the role of specific security mechanisms as defined in the OSI Security Architecture.
b) How does the Playfair cipher work? Illustrate with encryption of a sample plaintext.
c) Describe the AES structure and the steps involved in one round of AES.

Section – II

Q.4 Attempt any FOUR questions. **16**

a) Define the encryption and decryption functions in RSA.
b) What is the limitation of using simple XOR-based hash functions?
c) List two requirements of a good MAC.
d) What is a challenge-response mechanism? How does it work with symmetric keys?
e) What is the goal of a Personal Identity Verification (PIV) system?

Q.5 Attempt any TWO questions. **12**

a) Describe the Diffie-Hellman key exchange algorithm in detail with an example.
b) Compare SHA-1 and SHA-2 in terms of structure and security.
c) Discuss the use of Public Key Infrastructure (PKI) in remote authentication systems.

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Cryptography (BTN04410)

Day & Date: Monday 09-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) The figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The term collision in hash functions refers to: _____
a) Two different inputs producing the same hash output
b) The hash function being too slow
c) The key being compromised
d) Data being lost during hashing

2) The verification of a digital signature is performed using: _____
a) A private key b) A public key
c) A symmetric key d) A shared secret key

3) Which authentication protocol relies on symmetric encryption?
a) RSA b) Kerberos
c) Diffie-Hellman d) Digital signatures

4) The main goal of Personal Identity Verification is to: _____
a) Store user passwords securely
b) Authenticate individuals using strong identity proofing
c) Encrypt user emails
d) Provide network security

5) An attempt to gain unauthorized access to a system is called: _____
a) Passive Attack b) Active Attack
c) Intrusion d) Masquerading

6) Which of the following is a cryptographic security mechanism?
a) Firewalls b) Encryption
c) Access Control d) Intrusion Detection Systems

7) In the symmetric cipher model, the plaintext refers to: _____
a) The encrypted message
b) The original, readable message before encryption
c) The key used for decryption
d) The hashing algorithm

8) Ina transposition cipher, encryption is performed by: _____
a) Replacing each character with another
b) Rearranging the order of characters in the plaintext
c) Swapping letters based on a predefined key
d) Adding extra characters to the text

9) In a Feistel cipher structure, encryption and decryption: _____
a) Use different functions
b) Require different keys
c) Use the same structure with key scheduling
d) Are based only on permutation

10) The Feistel structure in DES means: _____
a) Encryption and decryption use different algorithms
b) The algorithm is reversible
c) It requires asymmetric key pairs
d) It is immune to brute-force attacks

11) Avalanche effect in cryptography means: _____
a) A minor change in plaintext produces major changes in ciphertext
b) A small key change results in minor output differences
c) The cipher resists linear cryptanalysis
d) A key can be reused multiple times

12) The most widely used public-key cryptosystem is: _____
a) AES b) RSA
c) DES d) Blowfish

13) Public-key cryptography is not commonly used for: _____
a) Key exchange
b) Digital signatures
c) Encrypting large amounts of data directly
d) Authenticating websites

14) A good cryptographic hash function should be: _____
a) Reversible
b) Computationally expensive to compute
c) Deterministic and fast to compute
d) Dependent on a secret key

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Cryptography (BTN04410)

Day & Date: Monday 09-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any FOUR questions. **16**

a) Explain the difference between data integrity and system integrity.
b) What is a transposition cipher? How is it different from a substitution cipher?
c) Explain the concept of payload and cover media in steganography.
d) Demonstrate the XOR operation in DES using a small example.
e) Describe how the initial cipher key is expanded to create round keys.

Q.3 Attempt any TWO questions. **12**

a) Describe the role of specific security mechanisms as defined in the OSI Security Architecture.
b) How does the Playfair cipher work? Illustrate with encryption of a sample plaintext.
c) Describe the AES structure and the steps involved in one round of AES.

Section – II

Q.4 Attempt any FOUR questions. **16**

a) Define the encryption and decryption functions in RSA.
b) What is the limitation of using simple XOR-based hash functions?
c) List two requirements of a good MAC.
d) What is a challenge-response mechanism? How does it work with symmetric keys?
e) What is the goal of a Personal Identity Verification (PIV) system?

Q.5 Attempt any TWO questions. **12**

a) Describe the Diffie-Hellman key exchange algorithm in detail with an example.
b) Compare SHA-1 and SHA-2 in terms of structure and security.
c) Discuss the use of Public Key Infrastructure (PKI) in remote authentication systems.

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Cryptography (BTN04410)

Day & Date: Monday 09-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) The figures to the right indicate full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The Feistel structure in DES means: _____
a) Encryption and decryption use different algorithms
b) The algorithm is reversible
c) It requires asymmetric key pairs
d) It is immune to brute-force attacks

2) Avalanche effect in cryptography means: _____
a) A minor change in plaintext produces major changes in ciphertext
b) A small key change results in minor output differences
c) The cipher resists linear cryptanalysis
d) A key can be reused multiple times

3) The most widely used public-key cryptosystem is: _____
a) AES b) RSA
c) DES d) Blowfish

4) Public-key cryptography is not commonly used for: _____
a) Key exchange
b) Digital signatures
c) Encrypting large amounts of data directly
d) Authenticating websites

5) A good cryptographic hash function should be: _____
a) Reversible
b) Computationally expensive to compute
c) Deterministic and fast to compute
d) Dependent on a secret key

6) The term collision in hash functions refers to: _____
a) Two different inputs producing the same hash output
b) The hash function being too slow
c) The key being compromised
d) Data being lost during hashing

7) The verification of a digital signature is performed using: _____
a) A private key
b) A public key
c) A symmetric key
d) A shared secret key

8) Which authentication protocol relies on symmetric encryption?
a) RSA
b) Kerberos
c) Diffie-Hellman
d) Digital signatures

9) The main goal of Personal Identity Verification is to: _____
a) Store user passwords securely
b) Authenticate individuals using strong identity proofing
c) Encrypt user emails
d) Provide network security

10) An attempt to gain unauthorized access to a system is called: _____
a) Passive Attack
b) Active Attack
c) Intrusion
d) Masquerading

11) Which of the following is a cryptographic security mechanism?
a) Firewalls
b) Encryption
c) Access Control
d) Intrusion Detection Systems

12) In the symmetric cipher model, the plaintext refers to: _____
a) The encrypted message
b) The original, readable message before encryption
c) The key used for decryption
d) The hashing algorithm

13) Ina transposition cipher, encryption is performed by: _____
a) Replacing each character with another
b) Rearranging the order of characters in the plaintext
c) Swapping letters based on a predefined key
d) Adding extra characters to the text

14) In a Feistel cipher structure, encryption and decryption: _____
a) Use different functions
b) Require different keys
c) Use the same structure with key scheduling
d) Are based only on permutation

SLR-BD-228

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Cryptography (BTN04410)

Day & Date: Monday 09-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any FOUR questions. **16**

a) Explain the difference between data integrity and system integrity.
b) What is a transposition cipher? How is it different from a substitution cipher?
c) Explain the concept of payload and cover media in steganography.
d) Demonstrate the XOR operation in DES using a small example.
e) Describe how the initial cipher key is expanded to create round keys.

Q.3 Attempt any TWO questions. **12**

a) Describe the role of specific security mechanisms as defined in the OSI Security Architecture.
b) How does the Playfair cipher work? Illustrate with encryption of a sample plaintext.
c) Describe the AES structure and the steps involved in one round of AES.

Section – II

Q.4 Attempt any FOUR questions. **16**

a) Define the encryption and decryption functions in RSA.
b) What is the limitation of using simple XOR-based hash functions?
c) List two requirements of a good MAC.
d) What is a challenge-response mechanism? How does it work with symmetric keys?
e) What is the goal of a Personal Identity Verification (PIV) system?

Q.5 Attempt any TWO questions. **12**

a) Describe the Diffie-Hellman key exchange algorithm in detail with an example.
b) Compare SHA-1 and SHA-2 in terms of structure and security.
c) Discuss the use of Public Key Infrastructure (PKI) in remote authentication systems.

Seat No.	

Set **P**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Railway Engineering: A Beginner's Perspective (BTN04411)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The entire electrified mainline rail network in India uses ____.
a) 30 kV AC b) 25 kV AC
c) 230 kV AC d) 240 kV AC

2) Who deals with safety matters of rail travel & train operations?
a) Railway Boards
b) Control Office Applications (COA)
c) Commission of Railway Safety (CRS)
d) Center Railway Information System (CRIS)

3) A railway reservation system is a piece of software that helps railway operators handle ____.
a) Scheduling b) Reservation
c) Pricing d) All of given

4) Which of the following is not the types of Rails?
a) B.H.Rail b) D.H.Rail
c) R.H.Rail d) F.F.Rail

5) In Indian Railway mostly which type of Gauges of Track has been adopted ____.
a) Broad b) Medium
c) Narrow d) Small

6) What is the characteristic/Advantage of the Electric Locomotive?
a) Independence of running costs
b) Reduced environmental pollution
c) Reduced power loss
d) All of the Above

7) India's first metro was commissioned was ____.

a) Metro railway, Kochi
b) Metro railway, Mumbai
c) Metro railway, Kolkata
d) Metro railway, Delhi

8) Which of the following is an advantage of railway transport?

a) Railways are the cheapest mode of transport compared with other modes of transports
b) Railways help a country's industrialization process by easily transporting coal and raw materials at a lower rate
c) Railways make it easier to travel long distances and carry bulky goods that are not easily carried by motor vehicles
d) All of the mentioned

9) In Indian Railway how many Gauges of Track has been adopted ____.

a) 1
b) 2
c) 3
d) 4

10) Indian Railways propose to install large format display screens under ____ the project.

a) Railway Board
b) Railway Display Network ("RDN")
c) Railway Ministry
d) Railway Department

11) The currently under construction bullet train project route in India is ____.

a) Mumbai-Ahmedabad
b) Mumbai-Kolkata
c) Delhi-Ahmedabad
d) Delhi-Bengaluru

12) Which is not part of Railway track layer?

a) Ballast
b) Fishplate
c) Switch
d) Subgrade

13) Electronic Interlocking (EI): employs computer-based systems and electronic equipment NOT to control ____.

a) Signals
b) Points
c) level-crossing gates
d) Bogies

14) Which of following is not the advantage of maglev trains?

a) Higher top speeds
b) Superior acceleration and deceleration
c) Higher noise
d) Lower

Seat No.	

Set **P**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Railway Engineering: A Beginner's Perspective (BTN04411)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION - I

Q.2 Solve the following: (Any Four) **16**

a) Give important features of Indian Railways.
b) What are sleepers? Explain its types.
c) Define Terminologies:
i) Ballast
ii) Pantograph
iii) Fishplate
iv) Fasteners
d) Describe Track Layers in details.
e) Which are different Facets of the Railways/Rail types.

Q.3 Solve the following: (Any Two) **12**

a) What are Bogies and Coaches? Explain.
b) Which is the overhead equipment? Explain.
c) Write a note on Power supply system & technology in Railways.

SECTION - II

Q.4 Solve the following: (Any Four) **16**

a) What is mean by Relays? Give its types.
b) Write note on Indian Railways Electrification.
c) Which Display System is used in Railways? Explain.
d) Write short note on Clean Energy in Indian Railways.
e) Write note on Bullet Trains and Metro in India.

Q.5 Solve the following: (Any Two) **12**

a) What is the Maglev Train concept in Railways? Explain.
b) Write note on Trends in International Railways.
c) Explain the concept of Bio Toilets in Indian Railway.

Seat No.		Set	Q

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Railway Engineering: A Beginner's Perspective (BTN04411)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is an advantage of railway transport?
a) Railways are the cheapest mode of transport compared with other modes of transports
b) Railways help a country's industrialization process by easily transporting coal and raw materials at a lower rate
c) Railways make it easier to travel long distances and carry bulky goods that are not easily carried by motor vehicles
d) All of the mentioned

2) In Indian Railway how many Gauges of Track has been adopted ____.
a) 1 b) 2
c) 3 d) 4

3) Indian Railways propose to install large format display screens under ____ the project.
a) Railway Board b) Railway Display Network ("RDN")
c) Railway Ministry d) Railway Department

4) The currently under construction bullet train project route in India is ____.
a) Mumbai-Ahmedabad b) Mumbai-Kolkata
c) Delhi-Ahmedabad d) Delhi-Bengaluru

5) Which is not part of Railway track layer?
a) Ballast b) Fishplate
c) Switch d) Subgrade

6) Electronic Interlocking (El): employs computer-based systems and electronic equipment NOT to control ____.
a) Signals b) Points
c) level-crossing gates d) Bogies

7) Which of following is not the advantage of maglev trains?
a) Higher top speeds b) Superior acceleration and deceleration
c) Higher noise d) Lower

8) The entire electrified mainline rail network in India uses ____.
a) 30 kV AC b) 25 kV AC
c) 230 kV AC d) 240 kV AC

9) Who deals with safety matters of rail travel & train operations?
a) Railway Boards
b) Control Office Applications (COA)
c) Commission of Railway Safety (CRS)
d) Center Railway Information System (CRIS)

10) A railway reservation system is a piece of software that helps railway operators handle ____.
a) Scheduling b) Reservation
c) Pricing d) All of given

11) Which of the following is not the types of Rails?
a) B.H.Rail b) D.H.Rail
c) R.H.Rail d) F.F.Rail

12) In Indian Railway mostly which type of Gauges of Track has been adopted ____.
a) Broad b) Medium
c) Narrow d) Small

13) What is the characteristic/Advantage of the Electric Locomotive?
a) Independence of running costs
b) Reduced environmental pollution
c) Reduced power loss
d) All of the Above

14) India's first metro was commissioned was ____.
a) Metro railway, Kochi b) Metro railway, Mumbai
c) Metro railway, Kolkata d) Metro railway, Delhi

Seat No.	

Set **Q**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Railway Engineering: A Beginner's Perspective (BTN04411)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION - I

Q.2 Solve the following: (Any Four) **16**

a) Give important features of Indian Railways.
b) What are sleepers? Explain its types.
c) Define Terminologies:
i) Ballast
ii) Pantograph
iii) Fishplate
iv) Fasteners
d) Describe Track Layers in details.
e) Which are different Facets of the Railways/Rail types.

Q.3 Solve the following: (Any Two) **12**

a) What are Bogies and Coaches? Explain.
b) Which is the overhead equipment? Explain.
c) Write a note on Power supply system & technology in Railways.

SECTION - II

Q.4 Solve the following: (Any Four) **16**

a) What is mean by Relays? Give its types.
b) Write note on Indian Railways Electrification.
c) Which Display System is used in Railways? Explain.
d) Write short note on Clean Energy in Indian Railways.
e) Write note on Bullet Trains and Metro in India.

Q.5 Solve the following: (Any Two) **12**

a) What is the Maglev Train concept in Railways? Explain.
b) Write note on Trends in International Railways.
c) Explain the concept of Bio Toilets in Indian Railway.

Seat No.	

Set **R**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Railway Engineering: A Beginner's Perspective (BTN04411)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The currently under construction bullet train project route in India is ____.
a) Mumbai-Ahmedabad b) Mumbai-Kolkata
c) Delhi-Ahmedabad d) Delhi-Bengaluru

2) Which is not part of Railway track layer?
a) Ballast b) Fishplate
c) Switch d) Subgrade

3) Electronic Interlocking (El): employs computer-based systems and electronic equipment NOT to control ____.
a) Signals b) Points
c) level-crossing gates d) Bogies

4) Which of following is not the advantage of maglev trains?
a) Higher top speeds b) Superior acceleration and deceleration
c) Higher noise d) Lower

5) The entire electrified mainline rail network in India uses ____.
a) 30 kV AC b) 25 kV AC
c) 230 kV AC d) 240 kV AC

6) Who deals with safety matters of rail travel & train operations?
a) Railway Boards
b) Control Office Applications (COA)
c) Commission of Railway Safety (CRS)
d) Center Railway Information System (CRIS)

7) A railway reservation system is a piece of software that helps railway operators handle ____.
a) Scheduling b) Reservation
c) Pricing d) All of given

8) Which of the following is not the types of Rails?

a) B.H.Rail b) D.H.Rail
c) R.H.Rail d) F.F.Rail

9) In Indian Railway mostly which type of Gauges of Track has been adopted ____.

a) Broad b) Medium
c) Narrow d) Small

10) What is the characteristic/Advantage of the Electric Locomotive?

a) Independence of running costs
b) Reduced environmental pollution
c) Reduced power loss
d) All of the Above

11) India's first metro was commissioned was ____.

a) Metro railway, Kochi b) Metro railway, Mumbai
c) Metro railway, Kolkata d) Metro railway, Delhi

12) Which of the following is an advantage of railway transport?

a) Railways are the cheapest mode of transport compared with other modes of transports
b) Railways help a country’s industrialization process by easily transporting coal and raw materials at a lower rate
c) Railways make it easier to travel long distances and carry bulky goods that are not easily carried by motor vehicles
d) All of the mentioned

13) In Indian Railway how many Gauges of Track has been adopted ____.

a) 1 b) 2
c) 3 d) 4

14) Indian Railways propose to install large format display screens under ____ the project.

a) Railway Board b) Railway Display Network (“RDN")
c) Railway Ministry d) Railway Department

Seat No.	

Set **R**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Railway Engineering: A Beginner's Perspective (BTN04411)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION - I

Q.2 Solve the following: (Any Four) **16**

a) Give important features of Indian Railways.
b) What are sleepers? Explain its types.
c) Define Terminologies:
i) Ballast
ii) Pantograph
iii) Fishplate
iv) Fasteners
d) Describe Track Layers in details.
e) Which are different Facets of the Railways/Rail types.

Q.3 Solve the following: (Any Two) **12**

a) What are Bogies and Coaches? Explain.
b) Which is the overhead equipment? Explain.
c) Write a note on Power supply system & technology in Railways.

SECTION - II

Q.4 Solve the following: (Any Four) **16**

a) What is mean by Relays? Give its types.
b) Write note on Indian Railways Electrification.
c) Which Display System is used in Railways? Explain.
d) Write short note on Clean Energy in Indian Railways.
e) Write note on Bullet Trains and Metro in India.

Q.5 Solve the following: (Any Two) **12**

a) What is the Maglev Train concept in Railways? Explain.
b) Write note on Trends in International Railways.
c) Explain the concept of Bio Toilets in Indian Railway.

Seat No.		Set	S

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Railway Engineering: A Beginner's Perspective (BTN04411)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the characteristic/Advantage of the Electric Locomotive?
a) Independence of running costs
b) Reduced environmental pollution
c) Reduced power loss
d) All of the Above

2) India's first metro was commissioned was ____.
a) Metro railway, Kochi b) Metro railway, Mumbai
c) Metro railway, Kolkata d) Metro railway, Delhi

3) Which of the following is an advantage of railway transport?
a) Railways are the cheapest mode of transport compared with other modes of transports
b) Railways help a country's industrialization process by easily transporting coal and raw materials at a lower rate
c) Railways make it easier to travel long distances and carry bulky goods that are not easily carried by motor vehicles
d) All of the mentioned

4) In Indian Railway how many Gauges of Track has been adopted ____.
a) 1 b) 2
c) 3 d) 4

5) Indian Railways propose to install large format display screens under ____ the project.
a) Railway Board b) Railway Display Network ("RDN")
c) Railway Ministry d) Railway Department

6) The currently under construction bullet train project route in India is ____.
a) Mumbai-Ahmedabad b) Mumbai-Kolkata
c) Delhi-Ahmedabad d) Delhi-Bengaluru

7) Which is not part of Railway track layer?
a) Ballast b) Fishplate
c) Switch d) Subgrade

8) Electronic Interlocking (El): employs computer-based systems and electronic equipment NOT to control ____.
a) Signals b) Points
c) level-crossing gates d) Bogies

9) Which of following is not the advantage of maglev trains?
a) Higher top speeds b) Superior acceleration and deceleration
c) Higher noise d) Lower

10) The entire electrified mainline rail network in India uses ____.
a) 30 kV AC b) 25 kV AC
c) 230 kV AC d) 240 kV AC

11) Who deals with safety matters of rail travel & train operations?
a) Railway Boards
b) Control Office Applications (COA)
c) Commission of Railway Safety (CRS)
d) Center Railway Information System (CRIS)

12) A railway reservation system is a piece of software that helps railway operators handle ____.
a) Scheduling b) Reservation
c) Pricing d) All of given

13) Which of the following is not the types of Rails?
a) B.H.Rail b) D.H.Rail
c) R.H.Rail d) F.F.Rail

14) In Indian Railway mostly which type of Gauges of Track has been adopted ____.
a) Broad b) Medium
c) Narrow d) Small

Seat No.	

Set **S**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Railway Engineering: A Beginner's Perspective (BTN04411)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION - I

Q.2 Solve the following: (Any Four) **16**

a) Give important features of Indian Railways.
b) What are sleepers? Explain its types.
c) Define Terminologies:
i) Ballast
ii) Pantograph
iii) Fishplate
iv) Fasteners
d) Describe Track Layers in details.
e) Which are different Facets of the Railways/Rail types.

Q.3 Solve the following: (Any Two) **12**

a) What are Bogies and Coaches? Explain.
b) Which is the overhead equipment? Explain.
c) Write a note on Power supply system & technology in Railways.

SECTION - II

Q.4 Solve the following: (Any Four) **16**

a) What is mean by Relays? Give its types.
b) Write note on Indian Railways Electrification.
c) Which Display System is used in Railways? Explain.
d) Write short note on Clean Energy in Indian Railways.
e) Write note on Bullet Trains and Metro in India.

Q.5 Solve the following: (Any Two) **12**

a) What is the Maglev Train concept in Railways? Explain.
b) Write note on Trends in International Railways.
c) Explain the concept of Bio Toilets in Indian Railway.

SLR-BD-243

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Power Plant Engineering and Elements of Power System (EEPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Assume suitable data if necessary and state it clearly.
4) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Multiple Choice Questions. **14**

1) Which of the following enters the super heater of a boiler?
a) Cold Water b) Hot Water
c) Wet Steam d) Superheated Steam

2) Control rods are made of _____.
a) Cesium b) Cadmium
c) Tin d) Gallium

3) Silencer is usually incorporated in _____.
a) Cooling System b) Air intake
c) Fuel Supply System d) Exhaust System

4) The lubrication cost in a diesel power plant is _____.
a) High b) Low
c) Moderate d) Very low

5) In a three-unit insulator string, voltage across the lowest unit is 17.5 KV and string efficiency is 84.28%. The total voltage across the string will be equal to _____.
a) 8.285 KV b) 44.25 KV
c) 88.25 KV d) 442.5 KV

6) String efficiency is given by _____.
a) (Voltage across the string)/ (number of discs on the string)*(Voltage across disc nearest to the conductor)
b) (Voltage across the string)* (number of discs on the string) / (Voltage across disc nearest to the conductor)
c) (Voltage across disc nearest to the conductor) * (number of discs on the string) / (Voltage across the string)
d) (Voltage across disc nearest to the conductor) / (number of discs on the string)*(Voltage across the string)

7) The generating voltage & frequency in India is about?
a) 11 KV and 60HZ
b) 11KV and 50HZ
c) 220KV and 60HZ
d) 220KV and 50HZ

8) Which of these systems uses the 3 phase 4 wire system?
a) Primary distribution
b) Secondary distribution
c) Primary transmission
d) Secondary transmission

9) Suspension type insulators are used for voltage beyond _____.
a) 230V
b) 440V
c) 11KV
d) 33KV

10) Which type of insulator is used where there is a dead end of the line or there is a corner for a high voltage line?
a) Pin type insulator
b) Shackle insulator
c) Strain insulator
d) Stay insulator

11) Generally grounding is provided for _____.
a) for the safety of the equipment
b) for the safety of the operating personnel
c) Both a & b
d) None of these

12) Underground substation is preferred when _____.
a) Enough land is not available
b) Price of land is high
c) Population density is high
d) All of above

13) For the same conductor length, same amount of power, same losses and same maximum voltage to earth, which system requires minimum conductor area?
a) Single phase AC
b) 3 phase AC
c) 2 wire AC
d) 3 wire DC

14) Spillway belongs to which structure: _____.
a) Hydroelectric power plant
b) Steam power station
c) Nuclear power Station
d) Wind Turbine

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Power Plant Engineering and Elements of Power System (EEPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Attempt any Four. **16**

a) Define the following terms: Load Curve, Load duration curve, Connected load, Maximum demand.
b) Explain the merits & demerits of Gas Power Plant.
c) Draw the layout of the wind power plan & explain the operation of main components.
d) Write the site selection factors of diesel power plants.
e) What are the merits and limitations of green energy?
f) Write a note on economic load sharing.

Q.3 Attempt any Two. **12**

a) With neat diagram explain the classification of nuclear reactors.
b) The maximum demand of a Thermal Power Plant of 60 MW capacity is 50 MW at annual load factor of 50%. The load having maximum demands of 25 MW, 20 MW, 8 MW & 5 MW are connected to the power station.
Calculate the energy generated, diversity factor and plant capacity factor.
c) What are the desirable characteristics of tariff?

Section – II

Q.4 Attempt any Four. **16**

a) Explain the advantages of high voltage transmission.
b) Explain Kelvin's Law.
c) Explain equipment used in substations with their symbols.
d) Derive an expression for 3 phase 3 wire for the overhead system.
e) Explain various conductor materials.
f) What are different methods to improve string efficiency?

Q.5 Attempt any Two. **12**

a) In a 33 KV overhead line, there are three units in the string of insulators. If the capacitance between each insulator pin and earth is 11% of self-capacitance of each insulator, find
   i) the distribution of voltage over 3 insulators
   ii) String efficiency

b) Explain - resistance grounding, reactance grounding & solid grounding.

c) Make comparisons between AC and DC transmission systems.

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Power Plant Engineering and Elements of Power System (EEPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Assume suitable data if necessary and state it clearly.
4) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Multiple Choice Questions. **14**

1) Which of these systems uses the 3 phase 4 wire system?
a) Primary distribution b) Secondary distribution
c) Primary transmission d) Secondary transmission

2) Suspension type insulators are used for voltage beyond _____.
a) 230V b) 440V
c) 11KV d) 33KV

3) Which type of insulator is used where there is a dead end of the line or there is a corner for a high voltage line?
a) Pin type insulator b) Shackle insulator
c) Strain insulator d) Stay insulator

4) Generally grounding is provided for _____.
a) for the safety of the equipment
b) for the safety of the operating personnel
c) Both a & b
d) None of these

5) Underground substation is preferred when _____.
a) Enough land is not available b) Price of land is high
c) Population density is high d) All of above

6) For the same conductor length, same amount of power, same losses and same maximum voltage to earth, which system requires minimum conductor area?
a) Single phase AC b) 3 phase AC
c) 2 wire AC d) 3 wire DC

7) Spillway belongs to which structure: _____.
a) Hydroelectric power plant b) Steam power station
c) Nuclear power Station d) Wind Turbine

8) Which of the following enters the super heater of a boiler?
a) Cold Water b) Hot Water
c) Wet Steam d) Superheated Steam

9) Control rods are made of _____.
a) Cesium b) Cadmium
c) Tin d) Gallium

10) Silencer is usually incorporated in _____.
a) Cooling System b) Air intake
c) Fuel Supply System d) Exhaust System

11) The lubrication cost in a diesel power plant is _____.
a) High b) Low
c) Moderate d) Very low

12) In a three-unit insulator string, voltage across the lowest unit is 17.5 KV and string efficiency is 84.28%. The total voltage across the string will be equal to _____.
a) 8.285 KV b) 44.25 KV
c) 88.25 KV d) 442.5 KV

13) String efficiency is given by _____.
a) (Voltage across the string)/ (number of discs on the string)*(Voltage across disc nearest to the conductor)
b) (Voltage across the string)* (number of discs on the string) / (Voltage across disc nearest to the conductor)
c) (Voltage across disc nearest to the conductor) * (number of discs on the string) / (Voltage across the string)
d) (Voltage across disc nearest to the conductor) / (number of discs on the string)*(Voltage across the string)

14) The generating voltage & frequency in India is about?
a) 11 KV and 60HZ b) 11KV and 50HZ
c) 220KV and 60HZ d) 220KV and 50HZ

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Power Plant Engineering and Elements of Power System (EEPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Attempt any Four. **16**

a) Define the following terms: Load Curve, Load duration curve, Connected load, Maximum demand.
b) Explain the merits & demerits of Gas Power Plant.
c) Draw the layout of the wind power plan & explain the operation of main components.
d) Write the site selection factors of diesel power plants.
e) What are the merits and limitations of green energy?
f) Write a note on economic load sharing.

Q.3 Attempt any Two. **12**

a) With neat diagram explain the classification of nuclear reactors.
b) The maximum demand of a Thermal Power Plant of 60 MW capacity is 50 MW at annual load factor of 50%. The load having maximum demands of 25 MW, 20 MW, 8 MW & 5 MW are connected to the power station.
Calculate the energy generated, diversity factor and plant capacity factor.
c) What are the desirable characteristics of tariff?

Section – II

Q.4 Attempt any Four. **16**

a) Explain the advantages of high voltage transmission.
b) Explain Kelvin's Law.
c) Explain equipment used in substations with their symbols.
d) Derive an expression for 3 phase 3 wire for the overhead system.
e) Explain various conductor materials.
f) What are different methods to improve string efficiency?

Q.5 Attempt any Two. **12**

a) In a 33 KV overhead line, there are three units in the string of insulators. If the capacitance between each insulator pin and earth is 11% of self-capacitance of each insulator, find
   i) the distribution of voltage over 3 insulators
   ii) String efficiency

b) Explain - resistance grounding, reactance grounding & solid grounding.

c) Make comparisons between AC and DC transmission systems.

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Power Plant Engineering and Elements of Power System (EEPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Assume suitable data if necessary and state it clearly.
4) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Multiple Choice Questions. **14**

1) Generally grounding is provided for _____.
a) for the safety of the equipment
b) for the safety of the operating personnel
c) Both a & b
d) None of these

2) Underground substation is preferred when _____.
a) Enough land is not available b) Price of land is high
c) Population density is high d) All of above

3) For the same conductor length, same amount of power, same losses and same maximum voltage to earth, which system requires minimum conductor area?
a) Single phase AC b) 3 phase AC
c) 2 wire AC d) 3 wire DC

4) Spillway belongs to which structure: _____.
a) Hydroelectric power plant b) Steam power station
c) Nuclear power Station d) Wind Turbine

5) Which of the following enters the super heater of a boiler?
a) Cold Water b) Hot Water
c) Wet Steam d) Superheated Steam

6) Control rods are made of _____.
a) Cesium b) Cadmium
c) Tin d) Gallium

7) Silencer is usually incorporated in _____.
a) Cooling System b) Air intake
c) Fuel Supply System d) Exhaust System

8) The lubrication cost in a diesel power plant is _____.
a) High b) Low
c) Moderate d) Very low

9) In a three-unit insulator string, voltage across the lowest unit is 17.5 KV and string efficiency is 84.28%. The total voltage across the string will be equal to _____.
a) 8.285 KV b) 44.25 KV
c) 88.25 KV d) 442.5 KV

10) String efficiency is given by _____.
a) (Voltage across the string)/ (number of discs on the string)*(Voltage across disc nearest to the conductor)
b) (Voltage across the string)* (number of discs on the string) / (Voltage across disc nearest to the conductor)
c) (Voltage across disc nearest to the conductor) * (number of discs on the string) / (Voltage across the string)
d) (Voltage across disc nearest to the conductor) / (number of discs on the string)*(Voltage across the string)

11) The generating voltage & frequency in India is about?
a) 11 KV and 60HZ b) 11KV and 50HZ
c) 220KV and 60HZ d) 220KV and 50HZ

12) Which of these systems uses the 3 phase 4 wire system?
a) Primary distribution b) Secondary distribution
c) Primary transmission d) Secondary transmission

13) Suspension type insulators are used for voltage beyond _____.
a) 230V b) 440V
c) 11KV d) 33KV

14) Which type of insulator is used where there is a dead end of the line or there is a corner for a high voltage line?
a) Pin type insulator b) Shackle insulator
c) Strain insulator d) Stay insulator

SLR-BD-243

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Power Plant Engineering and Elements of Power System (EEPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Attempt any Four. **16**

a) Define the following terms: Load Curve, Load duration curve, Connected load, Maximum demand.
b) Explain the merits & demerits of Gas Power Plant.
c) Draw the layout of the wind power plan & explain the operation of main components.
d) Write the site selection factors of diesel power plants.
e) What are the merits and limitations of green energy?
f) Write a note on economic load sharing.

Q.3 Attempt any Two. **12**

a) With neat diagram explain the classification of nuclear reactors.
b) The maximum demand of a Thermal Power Plant of 60 MW capacity is 50 MW at annual load factor of 50%. The load having maximum demands of 25 MW, 20 MW, 8 MW & 5 MW are connected to the power station.
Calculate the energy generated, diversity factor and plant capacity factor.
c) What are the desirable characteristics of tariff?

Section – II

Q.4 Attempt any Four. **16**

a) Explain the advantages of high voltage transmission.
b) Explain Kelvin's Law.
c) Explain equipment used in substations with their symbols.
d) Derive an expression for 3 phase 3 wire for the overhead system.
e) Explain various conductor materials.
f) What are different methods to improve string efficiency?

Q.5 Attempt any Two. **12**

a) In a 33 KV overhead line, there are three units in the string of insulators. If the capacitance between each insulator pin and earth is 11% of self-capacitance of each insulator, find
   i) the distribution of voltage over 3 insulators
   ii) String efficiency

b) Explain - resistance grounding, reactance grounding & solid grounding.

c) Make comparisons between AC and DC transmission systems.

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Power Plant Engineering and Elements of Power System (EEPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Assume suitable data if necessary and state it clearly.
4) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Multiple Choice Questions. **14**

1) String efficiency is given by _____.
a) (Voltage across the string)/ (number of discs on the string)*(Voltage across disc nearest to the conductor)
b) (Voltage across the string)* (number of discs on the string) / (Voltage across disc nearest to the conductor)
c) (Voltage across disc nearest to the conductor) * (number of discs on the string) / (Voltage across the string)
d) (Voltage across disc nearest to the conductor) / (number of discs on the string)*(Voltage across the string)

2) The generating voltage & frequency in India is about?
a) 11 KV and 60HZ b) 11KV and 50HZ
c) 220KV and 60HZ d) 220KV and 50HZ

3) Which of these systems uses the 3 phase 4 wire system?
a) Primary distribution b) Secondary distribution
c) Primary transmission d) Secondary transmission

4) Suspension type insulators are used for voltage beyond _____.
a) 230V b) 440V
c) 11KV d) 33KV

5) Which type of insulator is used where there is a dead end of the line or there is a corner for a high voltage line?
a) Pin type insulator b) Shackle insulator
c) Strain insulator d) Stay insulator

6) Generally grounding is provided for _____.
a) for the safety of the equipment
b) for the safety of the operating personnel
c) Both a & b
d) None of these

7) Underground substation is preferred when _____.
a) Enough land is not available b) Price of land is high
c) Population density is high d) All of above

8) For the same conductor length, same amount of power, same losses and same maximum voltage to earth, which system requires minimum conductor area?
a) Single phase AC b) 3 phase AC
c) 2 wire AC d) 3 wire DC

9) Spillway belongs to which structure: _____.
a) Hydroelectric power plant b) Steam power station
c) Nuclear power Station d) Wind Turbine

10) Which of the following enters the super heater of a boiler?
a) Cold Water b) Hot Water
c) Wet Steam d) Superheated Steam

11) Control rods are made of _____.
a) Cesium b) Cadmium
c) Tin d) Gallium

12) Silencer is usually incorporated in _____.
a) Cooling System b) Air intake
c) Fuel Supply System d) Exhaust System

13) The lubrication cost in a diesel power plant is _____.
a) High b) Low
c) Moderate d) Very low

14) In a three-unit insulator string, voltage across the lowest unit is 17.5 KV and string efficiency is 84.28%. The total voltage across the string will be equal to _____.
a) 8.285 KV b) 44.25 KV
c) 88.25 KV d) 442.5 KV

SLR-BD-243

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Power Plant Engineering and Elements of Power System (EEPCC-02)

Day & Date: Monday 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Attempt any Four. **16**

a) Define the following terms: Load Curve, Load duration curve, Connected load, Maximum demand.
b) Explain the merits & demerits of Gas Power Plant.
c) Draw the layout of the wind power plan & explain the operation of main components.
d) Write the site selection factors of diesel power plants.
e) What are the merits and limitations of green energy?
f) Write a note on economic load sharing.

Q.3 Attempt any Two. **12**

a) With neat diagram explain the classification of nuclear reactors.
b) The maximum demand of a Thermal Power Plant of 60 MW capacity is 50 MW at annual load factor of 50%. The load having maximum demands of 25 MW, 20 MW, 8 MW & 5 MW are connected to the power station.
Calculate the energy generated, diversity factor and plant capacity factor.
c) What are the desirable characteristics of tariff?

Section – II

Q.4 Attempt any Four. **16**

a) Explain the advantages of high voltage transmission.
b) Explain Kelvin's Law.
c) Explain equipment used in substations with their symbols.
d) Derive an expression for 3 phase 3 wire for the overhead system.
e) Explain various conductor materials.
f) What are different methods to improve string efficiency?

Q.5 Attempt any Two. **12**

a) In a 33 KV overhead line, there are three units in the string of insulators. If the capacitance between each insulator pin and earth is 11% of self-capacitance of each insulator, find
   i) the distribution of voltage over 3 insulators
   ii) String efficiency

b) Explain - resistance grounding, reactance grounding & solid grounding.

c) Make comparisons between AC and DC transmission systems.

SLR-BD-244

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
DC Machines and Transformer (EEPCC-03)

Day & Date: Tuesday 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) In a clockwise rotating loaded d.c. generator, brushes have to be shifted _____.
a) clockwise b) counterclockwise
c) either (a) or (b) d) neither (a) nor (b)

2) Iron losses in a D.C. machine are independent of variations in _____.
a) speed b) load
c) voltage d) speed and voltage

3) What will happen if the back e.m.f. in the d.c. motor absent?
a) Motor will run faster than rated value
b) Motor will burn
c) Armature drop will be reduced substantially
d) None of the above

4) A laboratory group was working with a set of 3-hp shunt DC motor. But there was a mistake that it was fused with a 0.3A fuse instead 3A fuse. Then it was started _____.
a) a flash occurred instantly b) it ran for 3s and fuse was blown
c) it ran normal d) none of the mentioned

5) Hopkinson's test on D.C. machines is conducted at _____.
a) no-load b) part load
c) full-load d) overload

6) While performing Swinburne's test, the iron losses are assumed to be _____.
a) Constant b) Absent
c) Variable d) None of these

7) To perform field test on d.c. machines two motors are required. The motors used are _____.
a) Series motors
b) One will be series motor and other will be shunt motors
c) Shunt motors
d) None of these

8) BLDC motor is analogous to _____.
a) Permanent magnet synchronous motor
b) DC motor
c) Rotating Transformer
d) Single-phase Induction motor

9) The voltage transformation ratio of a transformer is defined as ratio of _____.
a) primary turns to secondary turns
b) secondary current to primary current
c) secondary induced emf to primary induced emf
d) secondary terminal voltage to primary applied voltage

10) Which of the following loss in a transformer is zero even at full load?
a) Core loss b) Friction loss
c) Eddy current loss d) Hysteresis loss

11) Why OC test is performed on LV side?
a) Simple construction
b) Less voltage is required and parameters can be transformed to HV side
c) It'll not give losses ig conducted on HV side
d) HV side does not have connections for voltage

12) When a V - V system is converted into a $\Delta - \Delta$ system, increase in capacity of the system is _____ percent.
a) 86.6 b) 66.7
c) 73.2 d) 50

13) Transformers operating in parallel mode of operation will share the load depending upon their _____.
a) leakage reactance b) per unit impedance
c) efficiencies d) ratings

14) An autotransformer having a transformation ratio of 0.8 supplies a load of 3 kW. The power transferred conductively from primary to secondary is _____ kW.
a) 0.6 b) 2.4
c) 1.5 d) 0.27

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
DC Machines and Transformer (EEPCC-03)

Day & Date: Tuesday 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions (if necessary and state them clearly).
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt the following (Any Four). **16**

a) Derive the torque equation of DC machine.

b) A six-pole lap-connected 230 V shunt motor has 410 armature conductors. It takes 41 A on full load. The flux per pole is 0.05 weber. The armature and field resistances are 0.1 ohm and 230 ohms respectively. Contact drop per brush = 1 V. Determines the speed of the motor at full load.

c) With a neat sketch explain the Hopkinson's test for dc motor.

d) A 4 pole, long shunt lap -wound generator supplies 25 KW at a terminal voltage of 500 V. The armature resistance is 0.03 Ω, series field resistance is 0.04 Ω, and shunt field resistance is 200Ω. The brush drop may be taken as 1.0 V. Determine the e.m.f. generated. Calculate also the No. of conductors if speed is 1200 rpm. and flux per pole is 0.02 weber. Neglect armature reaction.

e) With help of neat diagram explain speed control methods of dc series motor.

f) A 200 V, 2000 rpm, 10 A separately excited DC motor has an armature resistance of 2 Ω. Rated DC voltage is applied to the armature and field winding of the motor. If the armature draws 5 A from the source, calculate the torque developed by the motor.

Q.3 Attempt the following (Any Two). **12**

a) A 100KW, 500V DC shunt generator was runs as motor on no load at rates voltage and speed. The total current taken was 9.5 A including the shunt field current of 2.5 A. The resistance of armature circuit is 0.1 Ω . Calculate the efficiency of generator at
1) full load
2) half the full load

b) A 440 V, 4-pole, lap-connected shunt motor has a no-load input current of 15 A and a shunt field current of 10 A. At full load, it takes a current of 150 A. If armature resistance = 0.1 ohms, flux per pole on no-load = 0.05 weber, number of armature conductors = 750, and contact drop per brush = 1 V, calculate:

i) No-load speed
ii) Full-load speed
iii) Speed regulation. Armature reaction weakens the field by 1.5% on full load.

OR

b) With a neat circuit diagram explain Swinburne's test and how the efficiency of the generator and motor are computed with this test. Write the advantages of this test.

Section – II

Q.4 Attempt the following (Any Four). **16**

a) With a neat sketch explain the constructions and working of a Variable Reluctance stepper motor.

b) Explain with phasor diagram a practical transformer on load condition.

c) single-phase 200 kVA, 3300/240 volt, 50 Hz. Transformer carries 80 turns on its secondary. What will be its

i) primary and secondary current on full load;
ii) the maximum value of flux;
iii) the number of primary turns.

d) With a neat sketch explain $\Delta - Y$ connection of a $3 - \phi$ transformer.

e) A single phase transformer with a ratio 5:1 has primary resistance of 0.4 ohm and reactance of 1.2 ohm and the secondary resistance of 0.01 and reactance of 0.04 ohm. Determine the percentage regulation when delivering 125 A at 600 V at 0.8 p.f. lagging.

f) Derive the condition for maximum efficiency of a transformer.

Q.5 Attempt the following (Any Two). **12**

a) Derive an expression for saving in conductor material in an autotransformer over two-winding transformers of equal rating. State the advantages and disadvantages of autotransformer over two-winding transformers.

b) Two single phase transformers are connected in parallel. Both of them are having equal turns and an impedance of (0.5 + j3) ohm and (0.6 + j10) ohm with respect to the secondary. Determine how they will share a total load of 100 kW at power factor 0.8 lagging.

c) Explain how Open circuit and Short circuit tests are conducted on single phase transformer to calculate equivalent circuit parameters and efficiency.

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
DC Machines and Transformer (EEPCC-03)

Day & Date: Tuesday 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) BLDC motor is analogous to _____.
a) Permanent magnet synchronous motor
b) DC motor
c) Rotating Transformer
d) Single-phase Induction motor

2) The voltage transformation ratio of a transformer is defined as ratio of _____.
a) primary turns to secondary turns
b) secondary current to primary current
c) secondary induced emf to primary induced emf
d) secondary terminal voltage to primary applied voltage

3) Which of the following loss in a transformer is zero even at full load?
a) Core loss b) Friction loss
c) Eddy current loss d) Hysteresis loss

4) Why OC test is performed on LV side?
a) Simple construction
b) Less voltage is required and parameters can be transformed to HV side
c) It'll not give losses ig conducted on HV side
d) HV side does not have connections for voltage

5) When a V - V system is converted into a Δ – Δ system, increase in capacity of the system is _____ percent.
a) 86.6 b) 66.7
c) 73.2 d) 50

6) Transformers operating in parallel mode of operation will share the load depending upon their _____.

a) leakage reactance b) per unit impedance
c) efficiencies d) ratings

7) An autotransformer having a transformation ratio of 0.8 supplies a load of 3 kW. The power transferred conductively from primary to secondary is _____ kW.

a) 0.6 b) 2.4
c) 1.5 d) 0.27

8) In a clockwise rotating loaded d.c. generator, brushes have to be shifted _____.

a) clockwise b) counterclockwise
c) either (a) or (b) d) neither (a) nor (b)

9) Iron losses in a D.C. machine are independent of variations in _____.

a) speed b) load
c) voltage d) speed and voltage

10) What will happen if the back e.m.f. in the d.c. motor absent?

a) Motor will run faster than rated value
b) Motor will burn
c) Armature drop will be reduced substantially
d) None of the above

11) A laboratory group was working with a set of 3-hp shunt DC motor. But there was a mistake that it was fused with a 0.3A fuse instead 3A fuse. Then it was started _____.

a) a flash occurred instantly b) it ran for 3s and fuse was blown
c) it ran normal d) none of the mentioned

12) Hopkinson's test on D.C. machines is conducted at _____.

a) no-load b) part load
c) full-load d) overload

13) While performing Swinburne's test, the iron losses are assumed to be _____.

a) Constant b) Absent
c) Variable d) None of these

14) To perform field test on d.c. machines two motors are required. The motors used are _____.

a) Series motors
b) One will be series motor and other will be shunt motors
c) Shunt motors
d) None of these

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
DC Machines and Transformer (EEPCC-03)

Day & Date: Tuesday 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions (if necessary and state them clearly).
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt the following (Any Four). **16**

a) Derive the torque equation of DC machine.

b) A six-pole lap-connected 230 V shunt motor has 410 armature conductors. It takes 41 A on full load. The flux per pole is 0.05 weber. The armature and field resistances are 0.1 ohm and 230 ohms respectively. Contact drop per brush = 1 V. Determines the speed of the motor at full load.

c) With a neat sketch explain the Hopkinson's test for dc motor.

d) A 4 pole, long shunt lap -wound generator supplies 25 KW at a terminal voltage of 500 V. The armature resistance is 0.03 Ω, series field resistance is 0.04 Ω, and shunt field resistance is 200Ω. The brush drop may be taken as 1.0 V. Determine the e.m.f. generated. Calculate also the No. of conductors if speed is 1200 rpm. and flux per pole is 0.02 weber. Neglect armature reaction.

e) With help of neat diagram explain speed control methods of dc series motor.

f) A 200 V, 2000 rpm, 10 A separately excited DC motor has an armature resistance of 2 Ω. Rated DC voltage is applied to the armature and field winding of the motor. If the armature draws 5 A from the source, calculate the torque developed by the motor.

Q.3 Attempt the following (Any Two). **12**

a) A 100KW, 500V DC shunt generator was runs as motor on no load at rates voltage and speed. The total current taken was 9.5 A including the shunt field current of 2.5 A. The resistance of armature circuit is 0.1 Ω . Calculate the efficiency of generator at
1) full load
2) half the full load

b) A 440 V, 4-pole, lap-connected shunt motor has a no-load input current of 15 A and a shunt field current of 10 A. At full load, it takes a current of 150 A. If armature resistance = 0.1 ohms, flux per pole on no-load = 0.05 weber, number of armature conductors = 750, and contact drop per brush = 1 V, calculate:

i) No-load speed
ii) Full-load speed
iii) Speed regulation. Armature reaction weakens the field by 1.5% on full load.

OR

b) With a neat circuit diagram explain Swinburne's test and how the efficiency of the generator and motor are computed with this test. Write the advantages of this test.

Section – II

Q.4 Attempt the following (Any Four). **16**

a) With a neat sketch explain the constructions and working of a Variable Reluctance stepper motor.

b) Explain with phasor diagram a practical transformer on load condition.

c) single-phase 200 kVA, 3300/240 volt, 50 Hz. Transformer carries 80 turns on its secondary. What will be its

i) primary and secondary current on full load;
ii) the maximum value of flux;
iii) the number of primary turns.

d) With a neat sketch explain $\Delta - Y$ connection of a $3 - \phi$ transformer.

e) A single phase transformer with a ratio 5:1 has primary resistance of 0.4 ohm and reactance of 1.2 ohm and the secondary resistance of 0.01 and reactance of 0.04 ohm. Determine the percentage regulation when delivering 125 A at 600 V at 0.8 p.f. lagging.

f) Derive the condition for maximum efficiency of a transformer.

Q.5 Attempt the following (Any Two). **12**

a) Derive an expression for saving in conductor material in an autotransformer over two-winding transformers of equal rating. State the advantages and disadvantages of autotransformer over two-winding transformers.

b) Two single phase transformers are connected in parallel. Both of them are having equal turns and an impedance of (0.5 + j3) ohm and (0.6 + j10) ohm with respect to the secondary. Determine how they will share a total load of 100 kW at power factor 0.8 lagging.

c) Explain how Open circuit and Short circuit tests are conducted on single phase transformer to calculate equivalent circuit parameters and efficiency.

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
DC Machines and Transformer (EEPCC-03)

Day & Date: Tuesday 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Why OC test is performed on LV side?
a) Simple construction
b) Less voltage is required and parameters can be transformed to HV side
c) It'll not give losses ig conducted on HV side
d) HV side does not have connections for voltage

2) When a V - V system is converted into a Δ – Δ system, increase in capacity of the system is _____ percent.
a) 86.6 b) 66.7
c) 73.2 d) 50

3) Transformers operating in parallel mode of operation will share the load depending upon their _____.
a) leakage reactance b) per unit impedance
c) efficiencies d) ratings

4) An autotransformer having a transformation ratio of 0.8 supplies a load of 3 kW. The power transferred conductively from primary to secondary is _____ kW.
a) 0.6 b) 2.4
c) 1.5 d) 0.27

5) In a clockwise rotating loaded d.c. generator, brushes have to be shifted _____.
a) clockwise b) counterclockwise
c) either (a) or (b) d) neither (a) nor (b)

6) Iron losses in a D.C. machine are independent of variations in _____.
a) speed b) load
c) voltage d) speed and voltage

7) What will happen if the back e.m.f. in the d.c. motor absent?
a) Motor will run faster than rated value
b) Motor will burn
c) Armature drop will be reduced substantially
d) None of the above

8) A laboratory group was working with a set of 3-hp shunt DC motor. But there was a mistake that it was fused with a 0.3A fuse instead 3A fuse. Then it was started _____.
a) a flash occurred instantly b) it ran for 3s and fuse was blown
c) it ran normal d) none of the mentioned

9) Hopkinson's test on D.C. machines is conducted at _____.
a) no-load b) part load
c) full-load d) overload

10) While performing Swinburne's test, the iron losses are assumed to be _____.
a) Constant b) Absent
c) Variable d) None of these

11) To perform field test on d.c. machines two motors are required. The motors used are _____.
a) Series motors
b) One will be series motor and other will be shunt motors
c) Shunt motors
d) None of these

12) BLDC motor is analogous to _____.
a) Permanent magnet synchronous motor
b) DC motor
c) Rotating Transformer
d) Single-phase Induction motor

13) The voltage transformation ratio of a transformer is defined as ratio of _____.
a) primary turns to secondary turns
b) secondary current to primary current
c) secondary induced emf to primary induced emf
d) secondary terminal voltage to primary applied voltage

14) Which of the following loss in a transformer is zero even at full load?
a) Core loss b) Friction loss
c) Eddy current loss d) Hysteresis loss

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
DC Machines and Transformer (EEPCC-03)

Day & Date: Tuesday 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions (if necessary and state them clearly).
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt the following (Any Four). **16**

a) Derive the torque equation of DC machine.

b) A six-pole lap-connected 230 V shunt motor has 410 armature conductors. It takes 41 A on full load. The flux per pole is 0.05 weber. The armature and field resistances are 0.1 ohm and 230 ohms respectively. Contact drop per brush = 1 V. Determines the speed of the motor at full load.

c) With a neat sketch explain the Hopkinson's test for dc motor.

d) A 4 pole, long shunt lap -wound generator supplies 25 KW at a terminal voltage of 500 V. The armature resistance is 0.03 Ω, series field resistance is 0.04 Ω, and shunt field resistance is 200Ω. The brush drop may be taken as 1.0 V. Determine the e.m.f. generated. Calculate also the No. of conductors if speed is 1200 rpm. and flux per pole is 0.02 weber. Neglect armature reaction.

e) With help of neat diagram explain speed control methods of dc series motor.

f) A 200 V, 2000 rpm, 10 A separately excited DC motor has an armature resistance of 2 Ω. Rated DC voltage is applied to the armature and field winding of the motor. If the armature draws 5 A from the source, calculate the torque developed by the motor.

Q.3 Attempt the following (Any Two). **12**

a) A 100KW, 500V DC shunt generator was runs as motor on no load at rates voltage and speed. The total current taken was 9.5 A including the shunt field current of 2.5 A. The resistance of armature circuit is 0.1 Ω . Calculate the efficiency of generator at
1) full load
2) half the full load

b) A 440 V, 4-pole, lap-connected shunt motor has a no-load input current of 15 A and a shunt field current of 10 A. At full load, it takes a current of 150 A. If armature resistance = 0.1 ohms, flux per pole on no-load = 0.05 weber, number of armature conductors = 750, and contact drop per brush = 1 V, calculate:

i) No-load speed
ii) Full-load speed
iii) Speed regulation. Armature reaction weakens the field by 1.5% on full load.

OR

b) With a neat circuit diagram explain Swinburne's test and how the efficiency of the generator and motor are computed with this test. Write the advantages of this test.

Section – II

Q.4 Attempt the following (Any Four). **16**

a) With a neat sketch explain the constructions and working of a Variable Reluctance stepper motor.

b) Explain with phasor diagram a practical transformer on load condition.

c) single-phase 200 kVA, 3300/240 volt, 50 Hz. Transformer carries 80 turns on its secondary. What will be its

i) primary and secondary current on full load;
ii) the maximum value of flux;
iii) the number of primary turns.

d) With a neat sketch explain $\Delta - Y$ connection of a $3 - \phi$ transformer.

e) A single phase transformer with a ratio 5:1 has primary resistance of 0.4 ohm and reactance of 1.2 ohm and the secondary resistance of 0.01 and reactance of 0.04 ohm. Determine the percentage regulation when delivering 125 A at 600 V at 0.8 p.f. lagging.

f) Derive the condition for maximum efficiency of a transformer.

Q.5 Attempt the following (Any Two). **12**

a) Derive an expression for saving in conductor material in an autotransformer over two-winding transformers of equal rating. State the advantages and disadvantages of autotransformer over two-winding transformers.

b) Two single phase transformers are connected in parallel. Both of them are having equal turns and an impedance of (0.5 + j3) ohm and (0.6 + j10) ohm with respect to the secondary. Determine how they will share a total load of 100 kW at power factor 0.8 lagging.

c) Explain how Open circuit and Short circuit tests are conducted on single phase transformer to calculate equivalent circuit parameters and efficiency.

Seat No.	

Set **S**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
DC Machines and Transformer (EEPCC-03)

Day & Date: Tuesday 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions (if necessary and state them clearly).

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) While performing Swinburne's test, the iron losses are assumed to be _____.
a) Constant b) Absent
c) Variable d) None of these

2) To perform field test on d.c. machines two motors are required. The motors used are _____.
a) Series motors
b) One will be series motor and other will be shunt motors
c) Shunt motors
d) None of these

3) BLDC motor is analogous to _____.
a) Permanent magnet synchronous motor
b) DC motor
c) Rotating Transformer
d) Single-phase Induction motor

4) The voltage transformation ratio of a transformer is defined as ratio of _____.
a) primary turns to secondary turns
b) secondary current to primary current
c) secondary induced emf to primary induced emf
d) secondary terminal voltage to primary applied voltage

5) Which of the following loss in a transformer is zero even at full load?
a) Core loss b) Friction loss
c) Eddy current loss d) Hysteresis loss

6) Why OC test is performed on LV side?
a) Simple construction
b) Less voltage is required and parameters can be transformed to HV side
c) It'll not give losses ig conducted on HV side
d) HV side does not have connections for voltage

7) When a V - V system is converted into a Δ – Δ system, increase in capacity of the system is _____ percent.
a) 86.6 b) 66.7
c) 73.2 d) 50

8) Transformers operating in parallel mode of operation will share the load depending upon their _____.
a) leakage reactance b) per unit impedance
c) efficiencies d) ratings

9) An autotransformer having a transformation ratio of 0.8 supplies a load of 3 kW. The power transferred conductively from primary to secondary is _____ kW.
a) 0.6 b) 2.4
c) 1.5 d) 0.27

10) In a clockwise rotating loaded d.c. generator, brushes have to be shifted _____.
a) clockwise b) counterclockwise
c) either (a) or (b) d) neither (a) nor (b)

11) Iron losses in a D.C. machine are independent of variations in _____.
a) speed b) load
c) voltage d) speed and voltage

12) What will happen if the back e.m.f. in the d.c. motor absent?
a) Motor will run faster than rated value
b) Motor will burn
c) Armature drop will be reduced substantially
d) None of the above

13) A laboratory group was working with a set of 3-hp shunt DC motor. But there was a mistake that it was fused with a 0.3A fuse instead 3A fuse. Then it was started _____.
a) a flash occurred instantly b) it ran for 3s and fuse was blown
c) it ran normal d) none of the mentioned

14) Hopkinson's test on D.C. machines is conducted at _____.
a) no-load b) part load
c) full-load d) overload

Seat No.	

Set **S**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
DC Machines and Transformer (EEPCC-03)

Day & Date: Tuesday 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions (if necessary and state them clearly).
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt the following (Any Four). **16**

a) Derive the torque equation of DC machine.

b) A six-pole lap-connected 230 V shunt motor has 410 armature conductors. It takes 41 A on full load. The flux per pole is 0.05 weber. The armature and field resistances are 0.1 ohm and 230 ohms respectively. Contact drop per brush = 1 V. Determines the speed of the motor at full load.

c) With a neat sketch explain the Hopkinson's test for dc motor.

d) A 4 pole, long shunt lap -wound generator supplies 25 KW at a terminal voltage of 500 V. The armature resistance is 0.03 Ω, series field resistance is 0.04 Ω, and shunt field resistance is 200Ω. The brush drop may be taken as 1.0 V. Determine the e.m.f. generated. Calculate also the No. of conductors if speed is 1200 rpm. and flux per pole is 0.02 weber. Neglect armature reaction.

e) With help of neat diagram explain speed control methods of dc series motor.

f) A 200 V, 2000 rpm, 10 A separately excited DC motor has an armature resistance of 2 Ω. Rated DC voltage is applied to the armature and field winding of the motor. If the armature draws 5 A from the source, calculate the torque developed by the motor.

Q.3 Attempt the following (Any Two). **12**

a) A 100KW, 500V DC shunt generator was runs as motor on no load at rates voltage and speed. The total current taken was 9.5 A including the shunt field current of 2.5 A. The resistance of armature circuit is 0.1 Ω . Calculate the efficiency of generator at
1) full load
2) half the full load

b) A 440 V, 4-pole, lap-connected shunt motor has a no-load input current of 15 A and a shunt field current of 10 A. At full load, it takes a current of 150 A. If armature resistance = 0.1 ohms, flux per pole on no-load = 0.05 weber, number of armature conductors = 750, and contact drop per brush = 1 V, calculate:

i) No-load speed
ii) Full-load speed
iii) Speed regulation. Armature reaction weakens the field by 1.5% on full load.

OR

b) With a neat circuit diagram explain Swinburne's test and how the efficiency of the generator and motor are computed with this test. Write the advantages of this test.

Section – II

Q.4 Attempt the following (Any Four). **16**

a) With a neat sketch explain the constructions and working of a Variable Reluctance stepper motor.

b) Explain with phasor diagram a practical transformer on load condition.

c) single-phase 200 kVA, 3300/240 volt, 50 Hz. Transformer carries 80 turns on its secondary. What will be its

i) primary and secondary current on full load;
ii) the maximum value of flux;
iii) the number of primary turns.

d) With a neat sketch explain $\Delta - Y$ connection of a $3 - \phi$ transformer.

e) A single phase transformer with a ratio 5:1 has primary resistance of 0.4 ohm and reactance of 1.2 ohm and the secondary resistance of 0.01 and reactance of 0.04 ohm. Determine the percentage regulation when delivering 125 A at 600 V at 0.8 p.f. lagging.

f) Derive the condition for maximum efficiency of a transformer.

Q.5 Attempt the following (Any Two). **12**

a) Derive an expression for saving in conductor material in an autotransformer over two-winding transformers of equal rating. State the advantages and disadvantages of autotransformer over two-winding transformers.

b) Two single phase transformers are connected in parallel. Both of them are having equal turns and an impedance of (0.5 + j3) ohm and (0.6 + j10) ohm with respect to the secondary. Determine how they will share a total load of 100 kW at power factor 0.8 lagging.

c) Explain how Open circuit and Short circuit tests are conducted on single phase transformer to calculate equivalent circuit parameters and efficiency.

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) If a linear differential equation with constant coefficients and r.h.s. equal to zero has a real root m_1 repeated Two times, then the corresponding part of the integral is _____.

a) $(c_1 + c_2)e^{m_1 X}$ b) $(c_1 + c_2 x)e^{m_1 X}$

c) $(c_1 x + c_2 x^2)e^{m_1 X}$ d) $(c_1 + c_2 x^3)e^{m_1 X}$

2) $\frac{1}{D-a}X$ is equal to _____.

a) $\int Xe^{ax}dx$ b) $e^{ax}\int X.e^{-ax}dx$

c) $\int Xe^{-ax}dx$ d) $e^{-ax}\int Xe^{-ax}dx$

3) $\frac{1}{D+1}(\log x + \frac{1}{x})$ is equal to _____.

a) e^x b) 1

c) x d) $\log x$

4) The solution of $q = e^{-p}$ is _____.

a) $z = ax + by + c$ b) $z = a^x + b^y + c$

c) $z = ax + y^{-b} + c$ d) $z = ax + e^{-a}y + c$

5) The solution of the equation $pq = p + q$ is _____.

a) $z = ax + (a+1)y + c$

b) $z = (a+1)x + a(a-1)y + c$

c) $z = (a-1)x + a(a+1)y + c$

d) $z(a-1) = a(a-1)x + ay + c$

6) If μ_1', μ_2', μ_3', μ_4' are the first four moments of the distribution about certain number then fourth moment μ_4 of the distribution about the arithmetic mean is given by _____.

a) $\mu_4' + 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^4 + 3(\mu_1')^4$

b) $\mu_4' - 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^2 - 3(\mu_1')^4$

c) $\mu_4' + 4\mu_3'\mu_1' - 6\mu_2'(\mu_1')^4 - 3(\mu_1')^4$

d) $\mu_4' + 2\mu_3'\mu_1' + 6\mu_2'(\mu_1')^4 - 3(\mu_1')^4$

7) Coefficient of kurtosis β_2 is given by _____.

a) $\frac{\mu_4}{\mu_3}$ b) $\frac{\mu_4}{\mu_2^2}$

c) $\frac{\mu_3}{\mu_2^2}$ d) $\frac{\mu_4}{\mu_2^3}$

8) If value of x for normal distribution is 35, mean of normal distribution is 65 and standard deviation is 25 then standardized random variable is ___.

a) -1.5 b) -1.7

c) -1.2 d) -4

9) A continuous random variable has the following probability density function $f(x) = kx(1-x), 0 \le x \le 1$ then $k =$ _____.

a) 6 b) 2

c) 3 d) 5

10) The area under the standard normal curve from $z = -\infty$ to $z = 0$ is ___.

a) 1 b) ½

c) 3/2 d) 0

11) If X, Y denotes the deviations from their means and if $\sum X^2 = 40, \sum Y^2 = 100, \sum XY = 50,$ then $r =$ _____.

a) 0.63 b) 0.82

c) 0.91 d) 0.79

12) The line of regression of x and y is given by _____.

a) $x - \bar{x} = b_{xy}(y - \bar{y})$ b) $x - \bar{y} = b_{xy}(x - \bar{x})$

c) $x - \bar{x} = b_{xx}(y - \bar{y})$ d) $x - \bar{x} = b_{yx}(y - \bar{y})$

13) The following mistakes per page were found in a book.

No. of mistakes:	0	1	2	3	4
Pages:	211	90	19	5	0

Then χ^2 is _____.

a) 0.59 b) 0.069

c) 0.81 d) 0.79

14) The 't-statistic' is defined as _____.

a) $\frac{\bar{x}-\mu}{\sigma/\sqrt{n}}$ b) $\frac{\bar{x}-\mu}{s/\sqrt{n}}$

c) $\frac{\bar{x}-\mu}{\sigma/n}$ d) $\frac{\bar{x}-\mu}{s/n}$

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **09**

a) Find the Arithmetic mean, Median and standard deviation for the following frequency distribution.

x	5	9	12	15	20	24	30	35	42	49
f	3	6	8	8	9	10	8	7	6	2

b) Solve $(D^2 - 4D + 4)y = 8.x^2e^{2x}\sin 2x$

c) Solve $(D^2 + D + 1)y = \sin 2x$

d) Calculate Mode for the following frequency distribution.

C.I.	00-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency (f)	4	7	8	12	25	18	10

e) Solve $p^2q^3 = x^2y^3$

Q.3 Attempt any Three. **09**

a) Solve: $(2D + 1)^2y = 4e^{-x/2}$

b) Solve: $p + q = pqz$

c) Find Q_1, Q_2, Q_3 from the following data.
5,7,12,14,15,22,25,30,36,42,53

d) Solve $x(y - z)p + y(z - x)q = z(x - y)$

e) Solve $(D^3 - 3D + 2)y = x$

Q.4 Attempt any Two **10**

a) The first four moments of a distribution about the value 5 are 2,20,40 and 50. from the given information obtain the first four central moments, coefficient of skewness and kurtosis.

b) Solve the following differential equation by the method of separation of variables.
$\frac{\partial z}{\partial x} - 2\frac{\partial z}{\partial y} = z$ given that $z(x, 0) = 3e^{-5x}$

c) Solve: $(D^2 - D - 2)y = 2\log x + \frac{1}{x} + \frac{1}{x^2}$

Section – II

Q.5 Attempt any three of the following. **09**

a) Find the value of k if each of the following functions is a probability density function.

$$f(x) = \begin{cases} kx^2(1-x^3), & 0 \le x \le 1 \\ 0, & \text{otherwise} \end{cases}$$

b) The mean life time of 100 fluorescent light bulbs produced by a Company is computed to be 1570 Hrs. with S.D. of 120 Hrs. If μ is the mean lifetime of all the bulbs produced by the Company, Test the Hypothesis $\mu = 1600$ Hrs. Against the alternative Hypothesis $\mu \neq 1600$ Hrs. using 5% level of Significance.
(Given Expected value at 5% LOS is 1.96)

c) Calculate the coefficient of correlation between height of father and height of son from the following data.

Height of father	64	65	66	67	68	69	70
Height of son	66	67	65	68	70	68	71

d) Two independent random sample have the following data,
$\overline{x_1} = 110, \sigma_1 = 25, n_1 = 16$
$\overline{x_2} = 120, \sigma_2 = 30, n_2 = 9$
If σ_1 and σ_2 are the S. D. of the populations. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance. (The table value of t at $\alpha = 0.05$ for $v = 23$ degrees of freedom is 2.069)

e) If in a lot of 500 solenoids 25 are defective, find the probability that there will be 0, 1, 2 defective solenoids in a random sample of 20 solenoids.

Q.6 Attempt any three of the following. **09**

a) If two independent random samples of sizes 15 and 8 have respectively the following mean and population standard deviations, $\overline{x_1} = 980, \overline{x_2} = 1012; \sigma_1 = 75, \sigma_2 = 80$. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance.
(Given Expected value at 5% LOS with 21 DF is 2.080)

b) The number of telephone calls received by an operator in a ten-minute interval follows a Poisson distribution with mean 1. What is the probability of receiving (i) no call, (ii) less than four calls, in the interval? What is the most likely number of calls?

c) Calculate the equations of the lines of regression. Given
Mean of $x = 50.07$, S.D. of $x = 5.26$
Mean of $y = 9.98$, S.D. of $y = 2.59$
$r = 0.898$

d) In an intelligence test administered to 1000 children the mean score was, 42 with s.d. 24. Find the number of children (i) scoring more than 60 and (ii) between 20 and 40 assuming the distribution to be normal.
(Given: For S.N.V. z area from z = 0 to z = 0.75 is 0.2734, that between z = 0 and z = 0.9167 is 0.3202 and that between z = 0 to z = 0.08333 is 0.0332.)

e) Fit a Straight line $y = a + bx$ to the following data.

x	0	1	2	3	4	5
y	1	2	3	4.5	6	7.5

Q.7 Attempt any Two. **10**

a) Fit a Poisson's distribution to the following data :

X	0	1	2	3	4	Total
f	112	63	20	4	1	200

b) Obtain a second-degree curve to the following data.

Year	1965	1966	1967	1968	1969	1970	1971	1972
Profit (in Corers Rs.)	125	140	165	195	200	215	220	230

Also estimate the profit in 1973.

c) Ten school boys were given a test in Statistics and their scores were recorded. They were given a month's special coaching and a second test was given to them in the same subject at the end of the coaching period. Test if the marks given below give evidence to the fact that the students are benefitted by coaching.
Marks in test I: 70, 68, 56, 75, 80, 90, 68, 75, 56, 58
Marks in Test II: 68, 70, 52, 73, 75, 78, 80, 92, 54, 55
(Given that value of t_α at 5 % LOS for v = 9 degrees of freedom is 1.86 for one tailed test)

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) If value of x for normal distribution is 35, mean of normal distribution is 65 and standard deviation is 25 then standardized random variable is ___.
a) -1.5 b) -1.7
c) -1.2 d) -4

2) A continuous random variable has the following probability density function $f(x) = kx(1-x), 0 \leq x \leq 1$ then $k =$ _____.
a) 6 b) 2
c) 3 d) 5

3) The area under the standard normal curve from $z = -\infty$ to $z = 0$ is ___.
a) 1 b) ½
c) 3/2 d) 0

4) If X, Y denotes the deviations from their means and if $\sum X^2 = 40, \sum Y^2 = 100, \sum XY = 50,$ then $r =$ _____.
a) 0.63 b) 0.82
c) 0.91 d) 0.79

5) The line of regression of x and y is given by _____.
a) $x - \bar{x} = b_{xy}(y - \bar{y})$ b) $x - \bar{y} = b_{xy}(x - \bar{x})$
c) $x - \bar{x} = b_{xx}(y - \bar{y})$ d) $x - \bar{x} = b_{yx}(y - \bar{y})$

6) The following mistakes per page were found in a book.

No. of mistakes:	0	1	2	3	4
Pages:	211	90	19	5	0

Then χ^2 is _____.
a) 0.59 b) 0.069
c) 0.81 d) 0.79

7) The 't-statistic' is defined as _____.

a) $\frac{\bar{x}-\mu}{\sigma/\sqrt{n}}$ b) $\frac{\bar{x}-\mu}{s/\sqrt{n}}$

c) $\frac{\bar{x}-\mu}{\sigma/n}$ d) $\frac{\bar{x}-\mu}{s/n}$

8) If a linear differential equation with constant coefficients and r.h.s. equal to zero has a real root m_1 repeated Two times, then the corresponding part of the integral is _____.

a) $(c_1 + c_2)e^{m_1 X}$ b) $(c_1 + c_2 x)e^{m_1 X}$

c) $(c_1 x + c_2 x^2)e^{m_1 X}$ d) $(c_1 + c_2 x^3)e^{m_1 X}$

9) $\frac{1}{D-a}X$ is equal to _____.

a) $\int Xe^{ax}dx$ b) $e^{ax}\int X.e^{-ax}dx$

c) $\int Xe^{-ax}dx$ d) $e^{-ax}\int Xe^{-ax}dx$

10) $\frac{1}{D+1}(\log x + \frac{1}{x})$ is equal to _____.

a) e^x b) 1

c) x d) $\log x$

11) The solution of $q = e^{-p}$ is _____.

a) $z = ax + by + c$ b) $z = a^x + b^y + c$

c) $z = ax + y^{-b} + c$ d) $z = ax + e^{-a}y + c$

12) The solution of the equation $pq = p + q$ is _____.

a) $z = ax + (a+1)y + c$

b) $z = (a+1)x + a(a-1)y + c$

c) $z = (a-1)x + a(a+1)y + c$

d) $z(a-1) = a(a-1)x + ay + c$

13) If μ_1', μ_2', μ_3', μ_4' are the first four moments of the distribution about certain number then fourth moment μ_4 of the distribution about the arithmetic mean is given by _____.

a) $\mu_4' + 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^4 + 3(\mu_1')^4$

b) $\mu_4' - 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^2 - 3(\mu_1')^4$

c) $\mu_4' + 4\mu_3'\mu_1' - 6\mu_2'(\mu_1')^4 - 3(\mu_1')^4$

d) $\mu_4' + 2\mu_3'\mu_1' + 6\mu_2'(\mu_1')^4 - 3(\mu_1')^4$

14) Coefficient of kurtosis β_2 is given by _____.

a) $\frac{\mu_4}{\mu_3}$ b) $\frac{\mu_4}{\mu_2^2}$

c) $\frac{\mu_3}{\mu_2^2}$ d) $\frac{\mu_4}{\mu_2^3}$

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **09**

a) Find the Arithmetic mean, Median and standard deviation for the following frequency distribution.

x	5	9	12	15	20	24	30	35	42	49
f	3	6	8	8	9	10	8	7	6	2

b) Solve $(D^2 - 4D + 4)y = 8.x^2e^{2x}\sin 2x$

c) Solve $(D^2 + D + 1)y = \sin 2x$

d) Calculate Mode for the following frequency distribution.

C.I.	00-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency (f)	4	7	8	12	25	18	10

e) Solve $p^2q^3 = x^2y^3$

Q.3 Attempt any Three. **09**

a) Solve: $(2D + 1)^2y = 4e^{-x/2}$

b) Solve: $p + q = pqz$

c) Find Q_1, Q_2, Q_3 from the following data.
5,7,12,14,15,22,25,30,36,42,53

d) Solve $x(y - z)p + y(z - x)q = z(x - y)$

e) Solve $(D^3 - 3D + 2)y = x$

Q.4 Attempt any Two **10**

a) The first four moments of a distribution about the value 5 are 2,20,40 and 50. from the given information obtain the first four central moments, coefficient of skewness and kurtosis.

b) Solve the following differential equation by the method of separation of variables.
$\frac{\partial z}{\partial x} - 2\frac{\partial z}{\partial y} = z$ given that $z(x, 0) = 3e^{-5x}$

c) Solve: $(D^2 - D - 2)y = 2\log x + \frac{1}{x} + \frac{1}{x^2}$

Section – II

Q.5 Attempt any three of the following. **09**

a) Find the value of k if each of the following functions is a probability density function.

$$f(x) = \begin{cases} kx^2(1-x^3), & 0 \le x \le 1 \\ 0, & \text{otherwise} \end{cases}$$

b) The mean life time of 100 fluorescent light bulbs produced by a Company is computed to be 1570 Hrs. with S.D. of 120 Hrs. If μ is the mean lifetime of all the bulbs produced by the Company, Test the Hypothesis $\mu = 1600$ Hrs. Against the alternative Hypothesis $\mu \neq 1600$ Hrs. using 5% level of Significance.
(Given Expected value at 5% LOS is 1.96)

c) Calculate the coefficient of correlation between height of father and height of son from the following data.

Height of father	64	65	66	67	68	69	70
Height of son	66	67	65	68	70	68	71

d) Two independent random sample have the following data,
$\overline{x_1} = 110, \sigma_1 = 25, n_1 = 16$
$\overline{x_2} = 120, \sigma_2 = 30, n_2 = 9$
If σ_1 and σ_2 are the S. D. of the populations. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance. (The table value of t at $\alpha = 0.05$ for $v = 23$ degrees of freedom is 2.069)

e) If in a lot of 500 solenoids 25 are defective, find the probability that there will be 0, 1, 2 defective solenoids in a random sample of 20 solenoids.

Q.6 Attempt any three of the following. **09**

a) If two independent random samples of sizes 15 and 8 have respectively the following mean and population standard deviations, $\overline{x_1} = 980, \overline{x_2} = 1012; \sigma_1 = 75, \sigma_2 = 80$. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance.
(Given Expected value at 5% LOS with 21 DF is 2.080)

b) The number of telephone calls received by an operator in a ten-minute interval follows a Poisson distribution with mean 1. What is the probability of receiving (i) no call, (ii) less than four calls, in the interval? What is the most likely number of calls?

c) Calculate the equations of the lines of regression. Given
Mean of $x = 50.07$, S.D. of $x = 5.26$
Mean of $y = 9.98$, S.D. of $y = 2.59$
$r = 0.898$

d) In an intelligence test administered to 1000 children the mean score was, 42 with s.d. 24. Find the number of children (i) scoring more than 60 and (ii) between 20 and 40 assuming the distribution to be normal.
(Given: For S.N.V. z area from z = 0 to z = 0.75 is 0.2734, that between z = 0 and z = 0.9167 is 0.3202 and that between z = 0 to z = 0.08333 is 0.0332.)

e) Fit a Straight line $y = a + bx$ to the following data.

x	0	1	2	3	4	5
y	1	2	3	4.5	6	7.5

Q.7 Attempt any Two. **10**

a) Fit a Poisson's distribution to the following data :

X	0	1	2	3	4	Total
f	112	63	20	4	1	200

b) Obtain a second-degree curve to the following data.

Year	1965	1966	1967	1968	1969	1970	1971	1972
Profit (in Corers Rs.)	125	140	165	195	200	215	220	230

Also estimate the profit in 1973.

c) Ten school boys were given a test in Statistics and their scores were recorded. They were given a month's special coaching and a second test was given to them in the same subject at the end of the coaching period. Test if the marks given below give evidence to the fact that the students are benefitted by coaching.
Marks in test I: 70, 68, 56, 75, 80, 90, 68, 75, 56, 58
Marks in Test II: 68, 70, 52, 73, 75, 78, 80, 92, 54, 55
(Given that value of t_α at 5 % LOS for v = 9 degrees of freedom is 1.86 for one tailed test)

Seat No.		Set	R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) If X, Y denotes the deviations from their means and if $\sum X^2 = 40, \sum Y^2 = 100, \sum XY = 50,$ then $r =$ _____.
a) 0.63 b) 0.82
c) 0.91 d) 0.79

2) The line of regression of x and y is given by _____.
a) $x - \bar{x} = b_{xy}(y - \bar{y})$ b) $x - \bar{y} = b_{xy}(x - \bar{x})$
c) $x - \bar{x} = b_{xx}(y - \bar{y})$ d) $x - \bar{x} = b_{yx}(y - \bar{y})$

3) The following mistakes per page were found in a book.

No. of mistakes:	0	1	2	3	4
Pages:	211	90	19	5	0

Then χ^2 is _____.
a) 0.59 b) 0.069
c) 0.81 d) 0.79

4) The 't-statistic' is defined as _____.
a) $\frac{\bar{x}-\mu}{\sigma/\sqrt{n}}$ b) $\frac{\bar{x}-\mu}{s/\sqrt{n}}$
c) $\frac{\bar{x}-\mu}{\sigma/n}$ d) $\frac{\bar{x}-\mu}{s/n}$

5) If a linear differential equation with constant coefficients and r.h.s. equal to zero has a real root m_1 repeated Two times, then the corresponding part of the integral is _____.
a) $(c_1 + c_2)e^{m_1 X}$ b) $(c_1 + c_2 x)e^{m_1 X}$
c) $(c_1 x + c_2 x^2)e^{m_1 X}$ d) $(c_1 + c_2 x^3)e^{m_1 X}$

6) $\frac{1}{D-a}X$ is equal to _____.

a) $\int Xe^{ax}dx$ b) $e^{ax}\int X.e^{-ax}dx$

c) $\int Xe^{-ax}dx$ d) $e^{-ax}\int Xe^{-ax}dx$

7) $\frac{1}{D+1}(\log x+\frac{1}{x})$ is equal to _____.

a) e^x b) 1

c) x d) $\log x$

8) The solution of $q=e^{-p}$ is _____.

a) $z=ax+by+c$ b) $z=a^x+b^y+c$

c) $z=ax+y^{-b}+c$ d) $z=ax+e^{-a}y+c$

9) The solution of the equation $pq=p+q$ is _____.

a) $z=ax+(a+1)y+c$

b) $z=(a+1)x+a(a-1)y+c$

c) $z=(a-1)x+a(a+1)y+c$

d) $z(a-1)=a(a-1)x+ay+c$

10) If μ_1', μ_2', μ_3', μ_4' are the first four moments of the distribution about certain number then fourth moment μ_4 of the distribution about the arithmetic mean is given by _____.

a) $\mu_4'+4\mu_3'\mu_1'+6\mu_2'(\mu_1')^4+3(\mu_1')^4$

b) $\mu_4'-4\mu_3'\mu_1'+6\mu_2'(\mu_1')^2-3(\mu_1')^4$

c) $\mu_4'+4\mu_3'\mu_1'-6\mu_2'(\mu_1')^4-3(\mu_1')^4$

d) $\mu_4'+2\mu_3'\mu_1'+6\mu_2'(\mu_1')^4-3(\mu_1')^4$

11) Coefficient of kurtosis β_2 is given by _____.

a) $\frac{\mu_4}{\mu_3}$ b) $\frac{\mu_4}{\mu_2^2}$

c) $\frac{\mu_3}{\mu_2^2}$ d) $\frac{\mu_4}{\mu_2^3}$

12) If value of x for normal distribution is 35, mean of normal distribution is 65 and standard deviation is 25 then standardized random variable is ___.

a) -1.5 b) -1.7

c) -1.2 d) -4

13) A continuous random variable has the following probability density function $f(x)=kx(1-x),0\le x\le 1$ then $k=$ _____.

a) 6 b) 2

c) 3 d) 5

14) The area under the standard normal curve from $z = -\infty$ to $z = 0$ is ___.

a) 1 b) ½

c) 3/2 d) 0

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **09**

a) Find the Arithmetic mean, Median and standard deviation for the following frequency distribution.

x	5	9	12	15	20	24	30	35	42	49
f	3	6	8	8	9	10	8	7	6	2

b) Solve $(D^2 - 4D + 4)y = 8.x^2e^{2x}\sin 2x$

c) Solve $(D^2 + D + 1)y = \sin 2x$

d) Calculate Mode for the following frequency distribution.

C.I.	00-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency (f)	4	7	8	12	25	18	10

e) Solve $p^2q^3 = x^2y^3$

Q.3 Attempt any Three. **09**

a) Solve: $(2D + 1)^2y = 4e^{-x/2}$

b) Solve: $p + q = pqz$

c) Find Q_1, Q_2, Q_3 from the following data.
5,7,12,14,15,22,25,30,36,42,53

d) Solve $x(y - z)p + y(z - x)q = z(x - y)$

e) Solve $(D^3 - 3D + 2)y = x$

Q.4 Attempt any Two **10**

a) The first four moments of a distribution about the value 5 are 2,20,40 and 50. from the given information obtain the first four central moments, coefficient of skewness and kurtosis.

b) Solve the following differential equation by the method of separation of variables.
$\frac{\partial z}{\partial x} - 2\frac{\partial z}{\partial y} = z$ given that $z(x, 0) = 3e^{-5x}$

c) Solve: $(D^2 - D - 2)y = 2\log x + \frac{1}{x} + \frac{1}{x^2}$

Section – II

Q.5 Attempt any three of the following. **09**

a) Find the value of k if each of the following functions is a probability density function.

$$f(x) = \begin{cases} kx^2(1-x^3), & 0 \le x \le 1 \\ 0, & \text{otherwise} \end{cases}$$

b) The mean life time of 100 fluorescent light bulbs produced by a Company is computed to be 1570 Hrs. with S.D. of 120 Hrs. If μ is the mean lifetime of all the bulbs produced by the Company, Test the Hypothesis $\mu = 1600$ Hrs. Against the alternative Hypothesis $\mu \neq 1600$ Hrs. using 5% level of Significance.
(Given Expected value at 5% LOS is 1.96)

c) Calculate the coefficient of correlation between height of father and height of son from the following data.

Height of father	64	65	66	67	68	69	70
Height of son	66	67	65	68	70	68	71

d) Two independent random sample have the following data,
$\overline{x_1} = 110, \sigma_1 = 25, n_1 = 16$
$\overline{x_2} = 120, \sigma_2 = 30, n_2 = 9$
If σ_1 and σ_2 are the S. D. of the populations. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance. (The table value of t at $\alpha = 0.05$ for $v = 23$ degrees of freedom is 2.069)

e) If in a lot of 500 solenoids 25 are defective, find the probability that there will be 0, 1, 2 defective solenoids in a random sample of 20 solenoids.

Q.6 Attempt any three of the following. **09**

a) If two independent random samples of sizes 15 and 8 have respectively the following mean and population standard deviations, $\overline{x_1} = 980, \overline{x_2} = 1012; \sigma_1 = 75, \sigma_2 = 80$. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance.
(Given Expected value at 5% LOS with 21 DF is 2.080)

b) The number of telephone calls received by an operator in a ten-minute interval follows a Poisson distribution with mean 1. What is the probability of receiving (i) no call, (ii) less than four calls, in the interval? What is the most likely number of calls?

c) Calculate the equations of the lines of regression. Given
Mean of $x = 50.07$, S.D. of $x = 5.26$
Mean of $y = 9.98$, S.D. of $y = 2.59$
$r = 0.898$

d) In an intelligence test administered to 1000 children the mean score was, 42 with s.d. 24. Find the number of children (i) scoring more than 60 and (ii) between 20 and 40 assuming the distribution to be normal.
(Given: For S.N.V. z area from z = 0 to z = 0.75 is 0.2734, that between z = 0 and z = 0.9167 is 0.3202 and that between z = 0 to z = 0.08333 is 0.0332.)

e) Fit a Straight line $y = a + bx$ to the following data.

x	0	1	2	3	4	5
y	1	2	3	4.5	6	7.5

Q.7 Attempt any Two. **10**

a) Fit a Poisson's distribution to the following data :

X	0	1	2	3	4	Total
f	112	63	20	4	1	200

b) Obtain a second-degree curve to the following data.

Year	1965	1966	1967	1968	1969	1970	1971	1972
Profit (in Corers Rs.)	125	140	165	195	200	215	220	230

Also estimate the profit in 1973.

c) Ten school boys were given a test in Statistics and their scores were recorded. They were given a month's special coaching and a second test was given to them in the same subject at the end of the coaching period. Test if the marks given below give evidence to the fact that the students are benefitted by coaching.
Marks in test I: 70, 68, 56, 75, 80, 90, 68, 75, 56, 58
Marks in Test II: 68, 70, 52, 73, 75, 78, 80, 92, 54, 55
(Given that value of t_α at 5 % LOS for v = 9 degrees of freedom is 1.86 for one tailed test)

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) If $\mu_1', \mu_2', \mu_3', \mu_4'$ are the first four moments of the distribution about certain number then fourth moment μ_4 of the distribution about the arithmetic mean is given by _____.

a) $\mu_4' + 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^4 + 3(\mu_1')^4$

b) $\mu_4' - 4\mu_3'\mu_1' + 6\mu_2'(\mu_1')^2 - 3(\mu_1')^4$

c) $\mu_4' + 4\mu_3'\mu_1' - 6\mu_2'(\mu_1')^4 - 3(\mu_1')^4$

d) $\mu_4' + 2\mu_3'\mu_1' + 6\mu_2'(\mu_1')^4 - 3(\mu_1')^4$

2) Coefficient of kurtosis β_2 is given by _____.

a) $\frac{\mu_4}{\mu_3}$ b) $\frac{\mu_4}{\mu_2^2}$

c) $\frac{\mu_3}{\mu_2^2}$ d) $\frac{\mu_4}{\mu_2^3}$

3) If value of x for normal distribution is 35, mean of normal distribution is 65 and standard deviation is 25 then standardized random variable is ___.

a) -1.5 b) -1.7
c) -1.2 d) -4

4) A continuous random variable has the following probability density function $f(x) = kx(1-x), 0 \leq x \leq 1$ then $k =$ _____.

a) 6 b) 2
c) 3 d) 5

5) The area under the standard normal curve from $z = -\infty$ to $z = 0$ is ___.

a) 1 b) ½
c) 3/2 d) 0

6) If X, Y denotes the deviations from their means and if $\sum X^2 = 40, \sum Y^2 = 100, \sum XY = 50,$ then $r =$ _____.

a) 0.63 b) 0.82
c) 0.91 d) 0.79

7) The line of regression of x and y is given by _____.

a) $x - \bar{x} = b_{xy}(y - \bar{y})$ b) $x - \bar{y} = b_{xy}(x - \bar{x})$
c) $x - \bar{x} = b_{xx}(y - \bar{y})$ d) $x - \bar{x} = b_{yx}(y - \bar{y})$

8) The following mistakes per page were found in a book.

No. of mistakes:	0	1	2	3	4
Pages:	211	90	19	5	0

Then χ^2 is _____.

a) 0.59 b) 0.069
c) 0.81 d) 0.79

9) The 't-statistic' is defined as _____.

a) $\frac{\bar{x}-\mu}{\sigma/\sqrt{n}}$ b) $\frac{\bar{x}-\mu}{s/\sqrt{n}}$
c) $\frac{\bar{x}-\mu}{\sigma/n}$ d) $\frac{\bar{x}-\mu}{s/n}$

10) If a linear differential equation with constant coefficients and r.h.s. equal to zero has a real root m_1 repeated Two times, then the corresponding part of the integral is _____.

a) $(c_1 + c_2)e^{m_1 X}$ b) $(c_1 + c_2 x)e^{m_1 X}$
c) $(c_1 x + c_2 x^2)e^{m_1 X}$ d) $(c_1 + c_2 x^3)e^{m_1 X}$

11) $\frac{1}{D-a}X$ is equal to _____.

a) $\int Xe^{ax}dx$ b) $e^{ax}\int X.e^{-ax}dx$
c) $\int Xe^{-ax}dx$ d) $e^{-ax}\int Xe^{-ax}dx$

12) $\frac{1}{D+1}(\log x + \frac{1}{x})$ is equal to _____.

a) e^x b) 1
c) x d) $\log x$

13) The solution of $q = e^{-p}$ is _____.

a) $z = ax + by + c$ b) $z = a^x + b^y + c$
c) $z = ax + y^{-b} + c$ d) $z = ax + e^{-a}y + c$

14) The solution of the equation $pq = p + q$ is _____.

a) $z = ax + (a+1)y + c$
b) $z = (a+1)x + a(a-1)y + c$
c) $z = (a-1)x + a(a+1)y + c$

d) $z(a-1) = a(a-1)x + ay + c$

SLR-BD-245

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Advanced Mathematics and Statistics (OE-01A)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **09**

a) Find the Arithmetic mean, Median and standard deviation for the following frequency distribution.

x	5	9	12	15	20	24	30	35	42	49
f	3	6	8	8	9	10	8	7	6	2

b) Solve $(D^2 - 4D + 4)y = 8.x^2e^{2x}\sin 2x$

c) Solve $(D^2 + D + 1)y = \sin 2x$

d) Calculate Mode for the following frequency distribution.

C.I.	00-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency (f)	4	7	8	12	25	18	10

e) Solve $p^2q^3 = x^2y^3$

Q.3 Attempt any Three. **09**

a) Solve: $(2D+1)^2y = 4e^{-x/2}$

b) Solve: $p + q = pqz$

c) Find Q_1, Q_2, Q_3 from the following data.
5,7,12,14,15,22,25,30,36,42,53

d) Solve $x(y-z)p + y(z-x)q = z(x-y)$

e) Solve $(D^3 - 3D + 2)y = x$

Q.4 Attempt any Two **10**

a) The first four moments of a distribution about the value 5 are 2,20,40 and 50. from the given information obtain the first four central moments, coefficient of skewness and kurtosis.

b) Solve the following differential equation by the method of separation of variables.
$\frac{\partial z}{\partial x} - 2\frac{\partial z}{\partial y} = z$ given that $z(x,0) = 3e^{-5x}$

c) Solve: $(D^2 - D - 2)y = 2\log x + \frac{1}{x} + \frac{1}{x^2}$

Section – II

Q.5 Attempt any three of the following. **09**

a) Find the value of k if each of the following functions is a probability density function.

$$f(x) = \begin{cases} kx^2(1-x^3), & 0 \le x \le 1 \\ 0, & \text{otherwise} \end{cases}$$

b) The mean life time of 100 fluorescent light bulbs produced by a Company is computed to be 1570 Hrs. with S.D. of 120 Hrs. If μ is the mean lifetime of all the bulbs produced by the Company, Test the Hypothesis $\mu = 1600$ Hrs. Against the alternative Hypothesis $\mu \neq 1600$ Hrs. using 5% level of Significance.
(Given Expected value at 5% LOS is 1.96)

c) Calculate the coefficient of correlation between height of father and height of son from the following data.

Height of father	64	65	66	67	68	69	70
Height of son	66	67	65	68	70	68	71

d) Two independent random sample have the following data,
$\overline{x_1} = 110, \sigma_1 = 25, n_1 = 16$
$\overline{x_2} = 120, \sigma_2 = 30, n_2 = 9$
If σ_1 and σ_2 are the S. D. of the populations. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance. (The table value of t at $\alpha = 0.05$ for $v = 23$ degrees of freedom is 2.069)

e) If in a lot of 500 solenoids 25 are defective, find the probability that there will be 0, 1, 2 defective solenoids in a random sample of 20 solenoids.

Q.6 Attempt any three of the following. **09**

a) If two independent random samples of sizes 15 and 8 have respectively the following mean and population standard deviations, $\overline{x_1} = 980, \overline{x_2} = 1012; \sigma_1 = 75, \sigma_2 = 80$. Test the hypothesis that $\mu_1 = \mu_2$ at 5% level of significance.
(Given Expected value at 5% LOS with 21 DF is 2.080)

b) The number of telephone calls received by an operator in a ten-minute interval follows a Poisson distribution with mean 1. What is the probability of receiving (i) no call, (ii) less than four calls, in the interval? What is the most likely number of calls?

c) Calculate the equations of the lines of regression. Given
Mean of $x = 50.07$, S.D. of $x = 5.26$
Mean of $y = 9.98$, S.D. of $y = 2.59$
$r = 0.898$

d) In an intelligence test administered to 1000 children the mean score was, 42 with s.d. 24. Find the number of children (i) scoring more than 60 and (ii) between 20 and 40 assuming the distribution to be normal.
(Given: For S.N.V. z area from z = 0 to z = 0.75 is 0.2734, that between z = 0 and z = 0.9167 is 0.3202 and that between z = 0 to z = 0.08333 is 0.0332.)

e) Fit a Straight line $y = a + bx$ to the following data.

x	0	1	2	3	4	5
y	1	2	3	4.5	6	7.5

Q.7 Attempt any Two. **10**

a) Fit a Poisson's distribution to the following data :

X	0	1	2	3	4	Total
f	112	63	20	4	1	200

b) Obtain a second-degree curve to the following data.

Year	1965	1966	1967	1968	1969	1970	1971	1972
Profit (in Corers Rs.)	125	140	165	195	200	215	220	230

Also estimate the profit in 1973.

c) Ten school boys were given a test in Statistics and their scores were recorded. They were given a month's special coaching and a second test was given to them in the same subject at the end of the coaching period. Test if the marks given below give evidence to the fact that the students are benefitted by coaching.
Marks in test I: 70, 68, 56, 75, 80, 90, 68, 75, 56, 58
Marks in Test II: 68, 70, 52, 73, 75, 78, 80, 92, 54, 55
(Given that value of t_α at 5 % LOS for v = 9 degrees of freedom is 1.86 for one tailed test)

Seat No.		Set	P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which dimension of e-commerce enables commerce beyond the boundaries of the country?
a) Richness b) Interactivity
c) Global Reach d) Ubiquity

2) Which of the following describes the definition of electronic commerce?
a) Doing business
b) Sale and purchase of goods
c) Doing business electronically
d) All of the above mentioned

3) Which e-commerce model involves the sale of goods or services from businesses to the general public?
a) Business to Government b) Business to Consumer
c) Business to Business d) Consumer to Business

4) All of the following are major B2C business models except _____.
a) content provider b) industry consortium
c) transaction broker d) service provider

5) Which of the following advantage of E-commerce?
a) Ability to operate 24/7
b) Inability to personalize the shopping
c) Higher operational cost
d) Limited reach CO1 I

6) Which e-commerce transaction provides the benefits of eliminating the requirement of a middleman?

a) Business to Business
b) Business to Government
c) Consumer to Business
d) Business to Consumer

7) After completing an E-Commerce transaction, the seller and buyer should be provided an opportunity to _____ their transaction experience.

a) undo
b) regret
c) provide rating for
d) forget

8) Which of the following is a common digital marketing strategy used in E-commerce?

a) Search Engine Optimization (SEO)
b) Traditional print advertising
c) Cold-calling potential customers
d) Distributing flyers in local neighborhoods

9) Digital Cash has following characteristic _____.

a) Anonymity
b) Security
c) Confidentiality
d) All above

10) Which component of E-commerce ensures secure online transactions and customer data protection?

a) Payment gateways
b) Shopping carts
c) Product catalogs
d) Data warehouses

11) Which type of attack is a method of defeating a cryptographic scheme of trying a large number of possibilities?

a) Teardrop attack
b) Brute force attack
c) Phlashing
d) Smurf attack

12) What is the another name called PDoS?

a) Brute force attack
b) Non technical attack
c) Phlashing
d) Smurf attack

13) What does the term “data security” refer to in E-commerce?

a) The use of cookies to track customer behavior
b) The protection of customer data from unauthorized access and breaches
c) The analysis of customer browsing history for personalized recommendations
d) The process of categorizing customer data for marketing purposes

14) Which of the following is a characteristic of E-commerce marketplaces?

a) They only allow B2C transactions
b) They sell physical products exclusively
c) They are limited to a specific geographical area
d) Multiple sellers can list their products to reach a broader audience

SLR-BD-246

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve any four of the following. **16**

a) What is electronic commerce? Explain its applications?
b) Describe the web 2.0 in detail.
c) What do you mean by Supply Chain Execution Framework?
d) Discuss in brief virtual auction. Explain the differences between virtual auction and reverse auction.
e) Give the types of E payment methods. Explain in detail the EPS?

Q.3 Solve any two of the following. **12**

a) Define Electronic Data Interchange. What are the components of Electronic Data Interchange?
b) Explain in detail Business to consumer e-Commerce model.
c) What are the key technologies for B2B E-commerce? Explain architectural models of B2B E-commerce.

Section – II

Q.4 Solve any four of the following. **16**

a) What is the purpose of using social media in E-commerce marketing?
b) Explain technical malware attack method related to different services.
c) Explain E-Commerce micro payments in detail.
d) Explain SEO in detail.
e) Explain web advertising types in detail.

Q.5 Solve any two of the following. **12**

a) Define digital cash or e-cash. Explain with example how an online banking system works.
b) What are the different strategies to increase the sale?
c) What are the security challenges and protection measure available to any e business?

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is a common digital marketing strategy used in E-commerce?
a) Search Engine Optimization (SEO)
b) Traditional print advertising
c) Cold-calling potential customers
d) Distributing flyers in local neighborhoods

2) Digital Cash has following characteristic _____.
a) Anonymity b) Security
c) Confidentiality d) All above

3) Which component of E-commerce ensures secure online transactions and customer data protection?
a) Payment gateways b) Shopping carts
c) Product catalogs d) Data warehouses

4) Which type of attack is a method of defeating a cryptographic scheme of trying a large number of possibilities?
a) Teardrop attack b) Brute force attack
c) Phlashing d) Smurf attack

5) What is the another name called PDoS?
a) Brute force attack b) Non technical attack
c) Phlashing d) Smurf attack

6) What does the term “data security” refer to in E-commerce?
a) The use of cookies to track customer behavior
b) The protection of customer data from unauthorized access and breaches
c) The analysis of customer browsing history for personalized recommendations
d) The process of categorizing customer data for marketing purposes

7) Which of the following is a characteristic of E-commerce marketplaces?
a) They only allow B2C transactions
b) They sell physical products exclusively
c) They are limited to a specific geographical area
d) Multiple sellers can list their products to reach a broader audience

8) Which dimension of e-commerce enables commerce beyond the boundaries of the country?
a) Richness b) Interactivity
c) Global Reach d) Ubiquity

9) Which of the following describes the definition of electronic commerce?
a) Doing business
b) Sale and purchase of goods
c) Doing business electronically
d) All of the above mentioned

10) Which e-commerce model involves the sale of goods or services from businesses to the general public?
a) Business to Government b) Business to Consumer
c) Business to Business d) Consumer to Business

11) All of the following are major B2C business models except _____.
a) content provider b) industry consortium
c) transaction broker d) service provider

12) Which of the following advantage of E-commerce?
a) Ability to operate 24/7
b) Inability to personalize the shopping
c) Higher operational cost
d) Limited reach CO1 I

13) Which e-commerce transaction provides the benefits of eliminating the requirement of a middleman?
a) Business to Business b) Business to Government
c) Consumer to Business d) Business to Consumer

14) After completing an E-Commerce transaction, the seller and buyer should be provided an opportunity to _____ their transaction experience.
a) undo b) regret
c) provide rating for d) forget

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve any four of the following. **16**

a) What is electronic commerce? Explain its applications?
b) Describe the web 2.0 in detail.
c) What do you mean by Supply Chain Execution Framework?
d) Discuss in brief virtual auction. Explain the differences between virtual auction and reverse auction.
e) Give the types of E payment methods. Explain in detail the EPS?

Q.3 Solve any two of the following. **12**

a) Define Electronic Data Interchange. What are the components of Electronic Data Interchange?
b) Explain in detail Business to consumer e-Commerce model.
c) What are the key technologies for B2B E-commerce? Explain architectural models of B2B E-commerce.

Section – II

Q.4 Solve any four of the following. **16**

a) What is the purpose of using social media in E-commerce marketing?
b) Explain technical malware attack method related to different services.
c) Explain E-Commerce micro payments in detail.
d) Explain SEO in detail.
e) Explain web advertising types in detail.

Q.5 Solve any two of the following. **12**

a) Define digital cash or e-cash. Explain with example how an online banking system works.
b) What are the different strategies to increase the sale?
c) What are the security challenges and protection measure available to any e business?

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Which type of attack is a method of defeating a cryptographic scheme of trying a large number of possibilities?
a) Teardrop attack b) Brute force attack
c) Phlashing d) Smurf attack

2) What is the another name called PDoS?
a) Brute force attack b) Non technical attack
c) Phlashing d) Smurf attack

3) What does the term "data security" refer to in E-commerce?
a) The use of cookies to track customer behavior
b) The protection of customer data from unauthorized access and breaches
c) The analysis of customer browsing history for personalized recommendations
d) The process of categorizing customer data for marketing purposes

4) Which of the following is a characteristic of E-commerce marketplaces?
a) They only allow B2C transactions
b) They sell physical products exclusively
c) They are limited to a specific geographical area
d) Multiple sellers can list their products to reach a broader audience

5) Which dimension of e-commerce enables commerce beyond the boundaries of the country?
a) Richness b) Interactivity
c) Global Reach d) Ubiquity

6) Which of the following describes the definition of electronic commerce?
a) Doing business
b) Sale and purchase of goods
c) Doing business electronically
d) All of the above mentioned

7) Which e-commerce model involves the sale of goods or services from businesses to the general public?
a) Business to Government b) Business to Consumer
c) Business to Business d) Consumer to Business

8) All of the following are major B2C business models except _____.
a) content provider b) industry consortium
c) transaction broker d) service provider

9) Which of the following advantage of E-commerce?
a) Ability to operate 24/7
b) Inability to personalize the shopping
c) Higher operational cost
d) Limited reach CO1 I

10) Which e-commerce transaction provides the benefits of eliminating the requirement of a middleman?
a) Business to Business b) Business to Government
c) Consumer to Business d) Business to Consumer

11) After completing an E-Commerce transaction, the seller and buyer should be provided an opportunity to _____ their transaction experience.
a) undo b) regret
c) provide rating for d) forget

12) Which of the following is a common digital marketing strategy used in E-commerce?
a) Search Engine Optimization (SEO)
b) Traditional print advertising
c) Cold-calling potential customers
d) Distributing flyers in local neighborhoods

13) Digital Cash has following characteristic _____.
a) Anonymity b) Security
c) Confidentiality d) All above

14) Which component of E-commerce ensures secure online transactions and customer data protection?
a) Payment gateways b) Shopping carts
c) Product catalogs d) Data warehouses

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve any four of the following. **16**

a) What is electronic commerce? Explain its applications?
b) Describe the web 2.0 in detail.
c) What do you mean by Supply Chain Execution Framework?
d) Discuss in brief virtual auction. Explain the differences between virtual auction and reverse auction.
e) Give the types of E payment methods. Explain in detail the EPS?

Q.3 Solve any two of the following. **12**

a) Define Electronic Data Interchange. What are the components of Electronic Data Interchange?
b) Explain in detail Business to consumer e-Commerce model.
c) What are the key technologies for B2B E-commerce? Explain architectural models of B2B E-commerce.

Section – II

Q.4 Solve any four of the following. **16**

a) What is the purpose of using social media in E-commerce marketing?
b) Explain technical malware attack method related to different services.
c) Explain E-Commerce micro payments in detail.
d) Explain SEO in detail.
e) Explain web advertising types in detail.

Q.5 Solve any two of the following. **12**

a) Define digital cash or e-cash. Explain with example how an online banking system works.
b) What are the different strategies to increase the sale?
c) What are the security challenges and protection measure available to any e business?

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which e-commerce transaction provides the benefits of eliminating the requirement of a middleman?
a) Business to Business b) Business to Government
c) Consumer to Business d) Business to Consumer

2) After completing an E-Commerce transaction, the seller and buyer should be provided an opportunity to _____ their transaction experience.
a) undo b) regret
c) provide rating for d) forget

3) Which of the following is a common digital marketing strategy used in E-commerce?
a) Search Engine Optimization (SEO)
b) Traditional print advertising
c) Cold-calling potential customers
d) Distributing flyers in local neighborhoods

4) Digital Cash has following characteristic _____.
a) Anonymity b) Security
c) Confidentiality d) All above

5) Which component of E-commerce ensures secure online transactions and customer data protection?
a) Payment gateways b) Shopping carts
c) Product catalogs d) Data warehouses

6) Which type of attack is a method of defeating a cryptographic scheme of trying a large number of possibilities?
a) Teardrop attack b) Brute force attack
c) Phlashing d) Smurf attack

7) What is the another name called PDoS?
a) Brute force attack b) Non technical attack
c) Phlashing d) Smurf attack

8) What does the term “data security” refer to in E-commerce?
a) The use of cookies to track customer behavior
b) The protection of customer data from unauthorized access and breaches
c) The analysis of customer browsing history for personalized recommendations
d) The process of categorizing customer data for marketing purposes

9) Which of the following is a characteristic of E-commerce marketplaces?
a) They only allow B2C transactions
b) They sell physical products exclusively
c) They are limited to a specific geographical area
d) Multiple sellers can list their products to reach a broader audience

10) Which dimension of e-commerce enables commerce beyond the boundaries of the country?
a) Richness b) Interactivity
c) Global Reach d) Ubiquity

11) Which of the following describes the definition of electronic commerce?
a) Doing business
b) Sale and purchase of goods
c) Doing business electronically
d) All of the above mentioned

12) Which e-commerce model involves the sale of goods or services from businesses to the general public?
a) Business to Government b) Business to Consumer
c) Business to Business d) Consumer to Business

13) All of the following are major B2C business models except _____.
a) content provider b) industry consortium
c) transaction broker d) service provider

14) Which of the following advantage of E-commerce?
a) Ability to operate 24/7
b) Inability to personalize the shopping
c) Higher operational cost
d) Limited reach CO1 I

SLR-BD-246

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Digital Marketing and E- Commerce (OE-01B)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Solve any four of the following. **16**

a) What is electronic commerce? Explain its applications?
b) Describe the web 2.0 in detail.
c) What do you mean by Supply Chain Execution Framework?
d) Discuss in brief virtual auction. Explain the differences between virtual auction and reverse auction.
e) Give the types of E payment methods. Explain in detail the EPS?

Q.3 Solve any two of the following. **12**

a) Define Electronic Data Interchange. What are the components of Electronic Data Interchange?
b) Explain in detail Business to consumer e-Commerce model.
c) What are the key technologies for B2B E-commerce? Explain architectural models of B2B E-commerce.

Section – II

Q.4 Solve any four of the following. **16**

a) What is the purpose of using social media in E-commerce marketing?
b) Explain technical malware attack method related to different services.
c) Explain E-Commerce micro payments in detail.
d) Explain SEO in detail.
e) Explain web advertising types in detail.

Q.5 Solve any two of the following. **12**

a) Define digital cash or e-cash. Explain with example how an online banking system works.
b) What are the different strategies to increase the sale?
c) What are the security challenges and protection measure available to any e business?

SLR-BD-247

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The main focus of the humanities is: _____.
a) Scientific experiments
b) Human culture and expression
c) Market trends and economies
d) Medical advancements

2) Which of the following does not come under the humanities?
a) Philosophy b) Literature
c) Physics d) Art History

3) The main focus of social sciences is on:
a) The physical and natural world
b) Human society and social relationships
c) Ancient artifacts
d) Chemical compositions

4) The study of language structure and its evolution is called: _____.
a) Sociology b) Linguistics
c) Psychology d) Anthropology

5) Identify the key person in philosophy _____.
a) Isaac Newton b) Leonardo da Vinci
c) Aristotle d) Charles Darwin

6) The archaeology focuses on: _____.
a) Economic theories
b) The study of celestial bodies
c) Material remains of past societies
d) Genetic research

7) Which of the following disciplines deals with political systems and governance?
a) Economics b) Political Science
c) Sociology d) Cultural Studies

8) Sociology mainly focuses on: _____.
a) Artistic techniques
b) Social behaviour and societal structures
c) Social economics
d) Historical events

9) Which discipline studies the production, distribution, and consumption of goods and services?
a) Sociology b) Political Science
c) Economics d) History

10) In which ancient civilization did the term "democracy" originate?
a) Ancient Egypt b) Ancient Greece
c) Ancient Rome d) Mesopotamia

11) Identify the primary focus of ethics in philosophy _____.
a) Logic and reasoning b) Moral principles and conduct
c) Aesthetics and beauty d) Scientific discovery

12) Feminism primarily addresses issues related to: _____.
a) Economic inequality
b) Gender equality and women's rights
c) Political ideologies
d) Technological advancements

13) What is the fundamental problem of economics?
a) Production of goods b) Scarcity of resources
c) Inflation d) Trade barriers

14) Dr. Sigmund Freud is best known for his contributions to: _____.
a) Political science b) Psychoanalysis
c) Economic theory d) Structural linguistics

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **12**

a) Explain the interdisciplinary nature of disciplines under humanities and social sciences.
b) Write a short note on: Scope of humanities.
c) Explain how perceptual processes shape human behaviour.
d) Write a short note on: Different aspects of perception.
e) Write a short note on: Major philosophical movements and their impact.

Q.3 Attempt any Two. **16**

a) Explain the advantages and disadvantages of democracy.
b) Explain major theories of psychology.
c) Explain how different psychological aspects affect social communication.

Section – II

Q.4 Attempt any Three. **12**

a) Write a short note on: Social Institutions.
b) Explain different elements of culture and society.
c) Write a short note on: Contributions of ancient civilizations to modern society.
d) How did industrial revolution contribute to technical advancements?
e) Write a short note on: Ethics in Engineering.

Q.5 Attempt any Two. **16**

a) What is industrialization? Explain the social and economic consequences of industrialization.
b) Describe different economic theories and thinkers.
c) Explain the technological innovations in 18^{th} & 19^{th} century.

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Sociology mainly focuses on: _____.
a) Artistic techniques
b) Social behaviour and societal structures
c) Social economics
d) Historical events

2) Which discipline studies the production, distribution, and consumption of goods and services?
a) Sociology b) Political Science
c) Economics d) History

3) In which ancient civilization did the term "democracy" originate?
a) Ancient Egypt b) Ancient Greece
c) Ancient Rome d) Mesopotamia

4) Identify the primary focus of ethics in philosophy _____.
a) Logic and reasoning b) Moral principles and conduct
c) Aesthetics and beauty d) Scientific discovery

5) Feminism primarily addresses issues related to: _____.
a) Economic inequality
b) Gender equality and women's rights
c) Political ideologies
d) Technological advancements

6) What is the fundamental problem of economics?
a) Production of goods b) Scarcity of resources
c) Inflation d) Trade barriers

7) Dr. Sigmund Freud is best known for his contributions to: _____.
a) Political science b) Psychoanalysis
c) Economic theory d) Structural linguistics

8) The main focus of the humanities is: _____.
a) Scientific experiments
b) Human culture and expression
c) Market trends and economies
d) Medical advancements

9) Which of the following does not come under the humanities?
a) Philosophy b) Literature
c) Physics d) Art History

10) The main focus of social sciences is on:
a) The physical and natural world
b) Human society and social relationships
c) Ancient artifacts
d) Chemical compositions

11) The study of language structure and its evolution is called: _____.
a) Sociology b) Linguistics
c) Psychology d) Anthropology

12) Identify the key person in philosophy _____.
a) Isaac Newton b) Leonardo da Vinci
c) Aristotle d) Charles Darwin

13) The archaeology focuses on: _____.
a) Economic theories
b) The study of celestial bodies
c) Material remains of past societies
d) Genetic research

14) Which of the following disciplines deals with political systems and governance?
a) Economics b) Political Science
c) Sociology d) Cultural Studies

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **12**

a) Explain the interdisciplinary nature of disciplines under humanities and social sciences.
b) Write a short note on: Scope of humanities.
c) Explain how perceptual processes shape human behaviour.
d) Write a short note on: Different aspects of perception.
e) Write a short note on: Major philosophical movements and their impact.

Q.3 Attempt any Two. **16**

a) Explain the advantages and disadvantages of democracy.
b) Explain major theories of psychology.
c) Explain how different psychological aspects affect social communication.

Section – II

Q.4 Attempt any Three. **12**

a) Write a short note on: Social Institutions.
b) Explain different elements of culture and society.
c) Write a short note on: Contributions of ancient civilizations to modern society.
d) How did industrial revolution contribute to technical advancements?
e) Write a short note on: Ethics in Engineering.

Q.5 Attempt any Two. **16**

a) What is industrialization? Explain the social and economic consequences of industrialization.
b) Describe different economic theories and thinkers.
c) Explain the technological innovations in 18^{th} & 19^{th} century.

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Identify the primary focus of ethics in philosophy _____.
a) Logic and reasoning b) Moral principles and conduct
c) Aesthetics and beauty d) Scientific discovery

2) Feminism primarily addresses issues related to: _____.
a) Economic inequality
b) Gender equality and women's rights
c) Political ideologies
d) Technological advancements

3) What is the fundamental problem of economics?
a) Production of goods b) Scarcity of resources
c) Inflation d) Trade barriers

4) Dr. Sigmund Freud is best known for his contributions to: _____.
a) Political science b) Psychoanalysis
c) Economic theory d) Structural linguistics

5) The main focus of the humanities is: _____.
a) Scientific experiments
b) Human culture and expression
c) Market trends and economies
d) Medical advancements

6) Which of the following does not come under the humanities?
a) Philosophy b) Literature
c) Physics d) Art History

7) The main focus of social sciences is on:
a) The physical and natural world
b) Human society and social relationships
c) Ancient artifacts
d) Chemical compositions

8) The study of language structure and its evolution is called: _____.
a) Sociology b) Linguistics
c) Psychology d) Anthropology

9) Identify the key person in philosophy _____.
a) Isaac Newton b) Leonardo da Vinci
c) Aristotle d) Charles Darwin

10) The archaeology focuses on: _____.
a) Economic theories
b) The study of celestial bodies
c) Material remains of past societies
d) Genetic research

11) Which of the following disciplines deals with political systems and governance?
a) Economics b) Political Science
c) Sociology d) Cultural Studies

12) Sociology mainly focuses on: _____.
a) Artistic techniques
b) Social behaviour and societal structures
c) Social economics
d) Historical events

13) Which discipline studies the production, distribution, and consumption of goods and services?
a) Sociology b) Political Science
c) Economics d) History

14) In which ancient civilization did the term "democracy" originate?
a) Ancient Egypt b) Ancient Greece
c) Ancient Rome d) Mesopotamia

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **12**

a) Explain the interdisciplinary nature of disciplines under humanities and social sciences.
b) Write a short note on: Scope of humanities.
c) Explain how perceptual processes shape human behaviour.
d) Write a short note on: Different aspects of perception.
e) Write a short note on: Major philosophical movements and their impact.

Q.3 Attempt any Two. **16**

a) Explain the advantages and disadvantages of democracy.
b) Explain major theories of psychology.
c) Explain how different psychological aspects affect social communication.

Section – II

Q.4 Attempt any Three. **12**

a) Write a short note on: Social Institutions.
b) Explain different elements of culture and society.
c) Write a short note on: Contributions of ancient civilizations to modern society.
d) How did industrial revolution contribute to technical advancements?
e) Write a short note on: Ethics in Engineering.

Q.5 Attempt any Two. **16**

a) What is industrialization? Explain the social and economic consequences of industrialization.
b) Describe different economic theories and thinkers.
c) Explain the technological innovations in 18^{th} & 19^{th} century.

Seat No.	

Set **S**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The archaeology focuses on: _____.

a) Economic theories
b) The study of celestial bodies
c) Material remains of past societies
d) Genetic research

2) Which of the following disciplines deals with political systems and governance?

a) Economics b) Political Science
c) Sociology d) Cultural Studies

3) Sociology mainly focuses on: _____.

a) Artistic techniques
b) Social behaviour and societal structures
c) Social economics
d) Historical events

4) Which discipline studies the production, distribution, and consumption of goods and services?

a) Sociology b) Political Science
c) Economics d) History

5) In which ancient civilization did the term "democracy" originate?

a) Ancient Egypt b) Ancient Greece
c) Ancient Rome d) Mesopotamia

6) Identify the primary focus of ethics in philosophy _____.

a) Logic and reasoning b) Moral principles and conduct
c) Aesthetics and beauty d) Scientific discovery

7) Feminism primarily addresses issues related to: _____.
a) Economic inequality
b) Gender equality and women's rights
c) Political ideologies
d) Technological advancements

8) What is the fundamental problem of economics?
a) Production of goods
b) Scarcity of resources
c) Inflation
d) Trade barriers

9) Dr. Sigmund Freud is best known for his contributions to: _____.
a) Political science
b) Psychoanalysis
c) Economic theory
d) Structural linguistics

10) The main focus of the humanities is: _____.
a) Scientific experiments
b) Human culture and expression
c) Market trends and economies
d) Medical advancements

11) Which of the following does not come under the humanities?
a) Philosophy
b) Literature
c) Physics
d) Art History

12) The main focus of social sciences is on:
a) The physical and natural world
b) Human society and social relationships
c) Ancient artifacts
d) Chemical compositions

13) The study of language structure and its evolution is called: _____.
a) Sociology
b) Linguistics
c) Psychology
d) Anthropology

14) Identify the key person in philosophy _____.
a) Isaac Newton
b) Leonardo da Vinci
c) Aristotle
d) Charles Darwin

SLR-BD-247

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Humanities and Social Sciences (OE-01C)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Three. **12**

a) Explain the interdisciplinary nature of disciplines under humanities and social sciences.
b) Write a short note on: Scope of humanities.
c) Explain how perceptual processes shape human behaviour.
d) Write a short note on: Different aspects of perception.
e) Write a short note on: Major philosophical movements and their impact.

Q.3 Attempt any Two. **16**

a) Explain the advantages and disadvantages of democracy.
b) Explain major theories of psychology.
c) Explain how different psychological aspects affect social communication.

Section – II

Q.4 Attempt any Three. **12**

a) Write a short note on: Social Institutions.
b) Explain different elements of culture and society.
c) Write a short note on: Contributions of ancient civilizations to modern society.
d) How did industrial revolution contribute to technical advancements?
e) Write a short note on: Ethics in Engineering.

Q.5 Attempt any Two. **16**

a) What is industrialization? Explain the social and economic consequences of industrialization.
b) Describe different economic theories and thinkers.
c) Explain the technological innovations in 18^{th} & 19^{th} century.

SLR-BD-248

Seat No.	

Set P

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ is defined as "the discipline dealing with what is good & bad & with moral duty & obligation".
a) Rule b) Organisation culture
c) Protocol d) Ethics

2) _____ involves establishing the amount of work to be done & the time when each element of the work will start.
a) Planning b) Routing
c) Scheduling d) Organizing

3) In _____ concept product enjoys the supreme importance.
a) Selling b) Marketing
c) Manufacturing d) Business

4) _____ are the greatest importance at the supervisory level.
a) Supervisory skills b) Human relation skills
c) Technical skills d) Planning skills

5) The responsibilities of the operations manager include _____.
a) Planning , organizing , staffing , procuring , and reviewing
b) Forecasting , designing , planning , organizing , and controlling
c) Forecasting , designing , operating , procuring , and reviewing
d) Planning , organizing , staffing , leading , and controlling
e) Designing & operating

6) Self-esteem, status affiliation with others, affection those come under _____ needs.
a) Basic b) Primary
c) Third level of d) Secondary

7) _____ is ability of individual or group to induce or influence the beliefs or action of other person or group.

a) Power b) Authority
c) Post d) Leadership

8) The basic objective of quality control in any organization is to _____.

a) Quality development, quality maintenance and quality improvement activities in organization
b) Achieve optimum cost
c) Achieve customer's satisfaction
d) Achieve all the above

9) Cost associated with defective products being shipped to the customers are called as _____.

a) Cost of internal failure b) Total cost of failure
c) Rejection cost d) Cost of external failure

10) For identification of vital few for the given data, the tool used is _____.

a) Cause-Effect diagram b) Scatter diagram
c) Pareto Analysis d) Check Sheet

11) Total quality management (TQM) mainly aims for _____.

a) Control for quality b) Usefulness of product
c) Customer satisfaction d) Cost control

12) The statistician who invented the control chart for use in industrial quality control was: _____.

a) Deming b) Taguchi
c) Pareto d) Shewhart
e) None of the above

13) The method of accepting or rejecting the lot is known as _____.

a) Lot sampling b) Acceptance sampling
c) Batch sampling d) Quality control

14) In double sampling plan, second sample is taken when the number of defectives _____.

a) > C1 but < C2 b) > C1
c) > C1 and C2 d) < C2

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2	**a)**	Explain the Social responsibilities and ethics in management.	**07**
	b)	Explain decision making process with types of decision.	**07**
Q.3	**a)**	What is planning process? Explain steps in planning.	**07**
	b)	What is leadership? Explain any four styles.	**07**
Q.4	**a)**	Explain communication and Various types of communications.	**07**
	b)	What is motivation? Explain Maslow's theory of motivation.	**07**

Section – II

Q.5	**a)**	Define quality and state the Steps in quality control.	**07**
	b)	Explain Benchmarking with advantages and disadvantages.	**07**
Q.6	**a)**	Explain Deming Wheel with suitable example.	**07**
	b)	Explain the following as applied to quality control: 1) Appraisal costs 2) Prevention costs 3) Failure costs 4) Optimum costs	**07**

Q.7 **a)** In a manufacturing process the number of defectives found in the inspection of 20 lots of 100 samples is given below. **07**

1) Determine the control limit of P chart and state whether the process is in control or not.
2) Determine the new value of mean fraction defective if some points are out of control. Compute the corresponding control limits and state whether the process is still in control or not.

Lot No.	No. of defectives	Lot No.	No. of Defectives
1	5	11	7
2	4	12	6
3	3	13	3
4	5	14	5
5	4	15	4
6	6	16	2
7	9	17	8
8	15	18	7
9	11	19	6
10	6	20	4

b) Differentiate between single sampling plan & double sampling plan. **07**

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The basic objective of quality control in any organization is to _____.
a) Quality development, quality maintenance and quality improvement activities in organization
b) Achieve optimum cost
c) Achieve customer's satisfaction
d) Achieve all the above

2) Cost associated with defective products being shipped to the customers are called as _____.
a) Cost of internal failure b) Total cost of failure
c) Rejection cost d) Cost of external failure

3) For identification of vital few for the given data, the tool used is _____.
a) Cause-Effect diagram b) Scatter diagram
c) Pareto Analysis d) Check Sheet

4) Total quality management (TQM) mainly aims for _____.
a) Control for quality b) Usefulness of product
c) Customer satisfaction d) Cost control

5) The statistician who invented the control chart for use in industrial quality control was: _____.
a) Deming b) Taguchi
c) Pareto d) Shewhart
e) None of the above

6) The method of accepting or rejecting the lot is known as _____.
a) Lot sampling b) Acceptance sampling
c) Batch sampling d) Quality control

7) In double sampling plan, second sample is taken when the number of defectives _____.

a) > C1 but < C2 b) > C1
c) > C1 and C2 d) < C2

8) _____ is defined as “the discipline dealing with what is good & bad & with moral duty & obligation”.

a) Rule b) Organisation culture
c) Protocol d) Ethics

9) _____ involves establishing the amount of work to be done & the time when each element of the work will start.

a) Planning b) Routing
c) Scheduling d) Organizing

10) In _____ concept product enjoys the supreme importance.

a) Selling b) Marketing
c) Manufacturing d) Business

11) _____ are the greatest importance at the supervisory level.

a) Supervisory skills b) Human relation skills
c) Technical skills d) Planning skills

12) The responsibilities of the operations manager include _____.

a) Planning , organizing , staffing , procuring , and reviewing
b) Forecasting , designing , planning , organizing , and controlling
c) Forecasting , designing , operating , procuring , and reviewing
d) Planning , organizing , staffing , leading , and controlling
e) Designing & operating

13) Self-esteem, status affiliation with others, affection those come under _____ needs.

a) Basic b) Primary
c) Third level of d) Secondary

14) _____ is ability of individual or group to induce or influence the beliefs or action of other person or group.

a) Power b) Authority
c) Post d) Leadership

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2	**a)**	Explain the Social responsibilities and ethics in management.	**07**
	b)	Explain decision making process with types of decision.	**07**
Q.3	**a)**	What is planning process? Explain steps in planning.	**07**
	b)	What is leadership? Explain any four styles.	**07**
Q.4	**a)**	Explain communication and Various types of communications.	**07**
	b)	What is motivation? Explain Maslow's theory of motivation.	**07**

Section – II

Q.5	**a)**	Define quality and state the Steps in quality control.	**07**
	b)	Explain Benchmarking with advantages and disadvantages.	**07**
Q.6	**a)**	Explain Deming Wheel with suitable example.	**07**
	b)	Explain the following as applied to quality control: 1) Appraisal costs 2) Prevention costs 3) Failure costs 4) Optimum costs	**07**

Q.7 **a)** In a manufacturing process the number of defectives found in the inspection of 20 lots of 100 samples is given below. **07**

1) Determine the control limit of P chart and state whether the process is in control or not.
2) Determine the new value of mean fraction defective if some points are out of control. Compute the corresponding control limits and state whether the process is still in control or not.

Lot No.	No. of defectives	Lot No.	No. of Defectives
1	5	11	7
2	4	12	6
3	3	13	3
4	5	14	5
5	4	15	4
6	6	16	2
7	9	17	8
8	15	18	7
9	11	19	6
10	6	20	4

b) Differentiate between single sampling plan & double sampling plan. **07**

Seat No.		Set	R

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Total quality management (TQM) mainly aims for _____.
a) Control for quality b) Usefulness of product
c) Customer satisfaction d) Cost control

2) The statistician who invented the control chart for use in industrial quality control was: _____.
a) Deming b) Taguchi
c) Pareto d) Shewhart
e) None of the above

3) The method of accepting or rejecting the lot is known as _____.
a) Lot sampling b) Acceptance sampling
c) Batch sampling d) Quality control

4) In double sampling plan, second sample is taken when the number of defectives _____.
a) > C1 but < C2 b) > C1
c) > C1 and C2 d) < C2

5) _____ is defined as "the discipline dealing with what is good & bad & with moral duty & obligation".
a) Rule b) Organisation culture
c) Protocol d) Ethics

6) _____ involves establishing the amount of work to be done & the time when each element of the work will start.
a) Planning b) Routing
c) Scheduling d) Organizing

7) In _____ concept product enjoys the supreme importance.
a) Selling b) Marketing
c) Manufacturing d) Business

8) _____ are the greatest importance at the supervisory level.
a) Supervisory skills b) Human relation skills
c) Technical skills d) Planning skills

9) The responsibilities of the operations manager include _____.
a) Planning , organizing , staffing , procuring , and reviewing
b) Forecasting , designing , planning , organizing , and controlling
c) Forecasting , designing , operating , procuring , and reviewing
d) Planning , organizing , staffing , leading , and controlling
e) Designing & operating

10) Self-esteem, status affiliation with others, affection those come under _____ needs.
a) Basic b) Primary
c) Third level of d) Secondary

11) _____ is ability of individual or group to induce or influence the beliefs or action of other person or group.
a) Power b) Authority
c) Post d) Leadership

12) The basic objective of quality control in any organization is to _____.
a) Quality development, quality maintenance and quality improvement activities in organization
b) Achieve optimum cost
c) Achieve customer's satisfaction
d) Achieve all the above

13) Cost associated with defective products being shipped to the customers are called as _____.
a) Cost of internal failure b) Total cost of failure
c) Rejection cost d) Cost of external failure

14) For identification of vital few for the given data, the tool used is _____.
a) Cause-Effect diagram b) Scatter diagram
c) Pareto Analysis d) Check Sheet

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2	**a)**	Explain the Social responsibilities and ethics in management.	**07**
	b)	Explain decision making process with types of decision.	**07**
Q.3	**a)**	What is planning process? Explain steps in planning.	**07**
	b)	What is leadership? Explain any four styles.	**07**
Q.4	**a)**	Explain communication and Various types of communications.	**07**
	b)	What is motivation? Explain Maslow's theory of motivation.	**07**

Section – II

Q.5	**a)**	Define quality and state the Steps in quality control.	**07**
	b)	Explain Benchmarking with advantages and disadvantages.	**07**
Q.6	**a)**	Explain Deming Wheel with suitable example.	**07**
	b)	Explain the following as applied to quality control: 1) Appraisal costs 2) Prevention costs 3) Failure costs 4) Optimum costs	**07**

Q.7 **a)** In a manufacturing process the number of defectives found in the inspection of 20 lots of 100 samples is given below. **07**

1) Determine the control limit of P chart and state whether the process is in control or not.
2) Determine the new value of mean fraction defective if some points are out of control. Compute the corresponding control limits and state whether the process is still in control or not.

Lot No.	No. of defectives	Lot No.	No. of Defectives
1	5	11	7
2	4	12	6
3	3	13	3
4	5	14	5
5	4	15	4
6	6	16	2
7	9	17	8
8	15	18	7
9	11	19	6
10	6	20	4

b) Differentiate between single sampling plan & double sampling plan. **07**

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary and mention it clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Self-esteem, status affiliation with others, affection those come under _____ needs.
a) Basic b) Primary
c) Third level of d) Secondary

2) _____ is ability of individual or group to induce or influence the beliefs or action of other person or group.
a) Power b) Authority
c) Post d) Leadership

3) The basic objective of quality control in any organization is to _____.
a) Quality development, quality maintenance and quality improvement activities in organization
b) Achieve optimum cost
c) Achieve customer's satisfaction
d) Achieve all the above

4) Cost associated with defective products being shipped to the customers are called as _____.
a) Cost of internal failure b) Total cost of failure
c) Rejection cost d) Cost of external failure

5) For identification of vital few for the given data, the tool used is _____.
a) Cause-Effect diagram b) Scatter diagram
c) Pareto Analysis d) Check Sheet

6) Total quality management (TQM) mainly aims for _____.
a) Control for quality b) Usefulness of product
c) Customer satisfaction d) Cost control

7) The statistician who invented the control chart for use in industrial quality control was: _____.

a) Deming b) Taguchi
c) Pareto d) Shewhart
e) None of the above

8) The method of accepting or rejecting the lot is known as _____.

a) Lot sampling b) Acceptance sampling
c) Batch sampling d) Quality control

9) In double sampling plan, second sample is taken when the number of defectives _____.

a) > C1 but < C2 b) > C1
c) > C1 and C2 d) < C2

10) _____ is defined as “the discipline dealing with what is good & bad & with moral duty & obligation”.

a) Rule b) Organisation culture
c) Protocol d) Ethics

11) _____ involves establishing the amount of work to be done & the time when each element of the work will start.

a) Planning b) Routing
c) Scheduling d) Organizing

12) In _____ concept product enjoys the supreme importance.

a) Selling b) Marketing
c) Manufacturing d) Business

13) _____ are the greatest importance at the supervisory level.

a) Supervisory skills b) Human relation skills
c) Technical skills d) Planning skills

14) The responsibilities of the operations manager include _____.

a) Planning , organizing , staffing , procuring , and reviewing
b) Forecasting , designing , planning , organizing , and controlling
c) Forecasting , designing , operating , procuring , and reviewing
d) Planning , organizing , staffing , leading , and controlling
e) Designing & operating

SLR-BD-18

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Industrial and Quality Management (OE-01D)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two questions from each section.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2	**a)**	Explain the Social responsibilities and ethics in management.	**07**
	b)	Explain decision making process with types of decision.	**07**
Q.3	**a)**	What is planning process? Explain steps in planning.	**07**
	b)	What is leadership? Explain any four styles.	**07**
Q.4	**a)**	Explain communication and Various types of communications.	**07**
	b)	What is motivation? Explain Maslow's theory of motivation.	**07**

Section – II

Q.5	**a)**	Define quality and state the Steps in quality control.	**07**
	b)	Explain Benchmarking with advantages and disadvantages.	**07**
Q.6	**a)**	Explain Deming Wheel with suitable example.	**07**
	b)	Explain the following as applied to quality control: 1) Appraisal costs 2) Prevention costs 3) Failure costs 4) Optimum costs	**07**

Q.7 **a)** In a manufacturing process the number of defectives found in the inspection of 20 lots of 100 samples is given below. **07**

1) Determine the control limit of P chart and state whether the process is in control or not.
2) Determine the new value of mean fraction defective if some points are out of control. Compute the corresponding control limits and state whether the process is still in control or not.

Lot No.	No. of defectives	Lot No.	No. of Defectives
1	5	11	7
2	4	12	6
3	3	13	3
4	5	14	5
5	4	15	4
6	6	16	2
7	9	17	8
8	15	18	7
9	11	19	6
10	6	20	4

b) Differentiate between single sampling plan & double sampling plan. **07**

SLR-BD-249

Seat No.		Set	P

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Laplace transform of $\int_0^t u^3 du =$_____.

a) $\frac{3}{s^5}$ b) $\frac{6}{s^5}$

c) $\frac{1}{s^5}$ d) $\frac{6}{s^4}$

2) If $L\{f(t)\} = \emptyset(s)$, then $L\{f(at)\} =$ _____.

a) $\emptyset\left(\frac{s}{a}\right)$ b) $\frac{1}{s}\emptyset\left(\frac{s}{a}\right)$

c) $\emptyset'\left(\frac{s}{a}\right)$ d) $\frac{1}{a}\emptyset\left(\frac{s}{a}\right)$

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

a) $\frac{1}{3}\sin 3t$ b) $\frac{1}{3}\cos 3t$

c) $\frac{1}{3}\cosh 3t$ d) $\frac{1}{3}\sinh 3t$

4) For $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 3y = 3e^{2x}$, the particular integral is _____.

a) $\frac{1}{15}e^{2x}$ b) $3e^{2x}$

c) $\frac{1}{5}e^{2x}$ d) $C_1e^{-x} + C_2e^{-2x}$

5) The general solution of the equation $(D^3 - 7D - 6)y = 0$ is _____.

a) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{-3x}$

b) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{3x}$

c) $y = c_1e^{-x} + c_2e^{-2x} + c_3e^{-3x}$

d) None of these

6) $z\{k\} =$_____ for $|z| > 1$

a) $\frac{z}{z-1}$ b) $\frac{1}{(z-1)^2}$

c) $\frac{z}{(z-1)^2}$ d) $\frac{z}{(z+1)^2}$

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

a) $f\left(\frac{a}{z}\right)$ b) $f\left(\frac{z}{a}\right)$

c) $\frac{1}{a}f\left(\frac{z}{a}\right)$ d) None

8) $Z\left\{\frac{1}{k!}\right\} =?$ for $k \geq 0$

a) e^z b) $e^{\frac{1}{z}}$

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

9) The Fourier sine transform of $f(x)$ is given by _____.

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

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

10) From the result $\int_{-\infty}^{\infty} \frac{\cos sx.\sin sk}{s} ds = \begin{cases} \pi & , \ |x| < k \\ 0 & , \ |x| > k \end{cases}$ we can deduce that $\int_0^{\infty} \frac{\sin sk}{s}\, ds =$ _____.

a) 0 b) 1

c) π d) $\frac{\pi}{2}$

11) The first real positive root of $x^3 = 6x - 4$ by Newton Raphson method near $x_0 = 1$ is _____.

a) 0.6667 b) 0.6

c) 0.4 d) 0.3

12) How many steps does the fourth-order Runge-Kutta method use?

a) Two steps b) Five steps

c) Four steps d) Three steps

13) In the interval $(0, a)$ the constant term in the Fourier series of $f(x) = \frac{a}{2} - x$ is _____.

a) 0 b) 1

c) $\frac{a^2}{2\pi}$ d) $\frac{a^2}{4\pi}$

14) Fourier series of $f(x) = x\ in(-\pi, \pi)$ will contain ____

a) No sine term b) No cosine term

c) Both cosine and sine term d) None of these

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any three **09**

a) Solve : $(D^2 + 4D + 5)y = -2\cos hx + 2^x$

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

c) Find Z-transform of $x_k = 2^k \cos(3k + 2)\,, k \geq 0$

d) Find Z-transform of $x_k = k^2 e^{-ak}, k \geq 0$

e) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{1}{s(s^2+4)}\right]$

Q.3 Attempt any three of the following. **09**

a) Evaluate by using Laplace transform $\int_0^\infty \left(\frac{e^{-t}-e^{-3t}}{t}\right) dt$

b) Find the inverse Z-transform of $f(k) = \begin{cases} 4^k, & k < 0 \\ 3^k, & k \geq 0 \end{cases}$

c) Find $Z\{e^{-3k}\sin 2k\}, k \geq 0$

d) Solve $(D^2 - 1)y = (1 + e^{-x})^2$

e) Find Laplace Transform of $\{t\cos 2t\}$

Q.4 Attempt any two **10**

a) Find the inverse Z-transform of $\frac{1}{(z-a)^2}$ if

1) $|z| < a$,
2) $|z| > a$,

b) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$

c) Solve $(D^2 - 6D + 13)y = e^{x\log 2} + 8e^{3x}\sin 4x$

Section – II

Q.5 Attempt any three **09**

a) Evaluate $\int_0^5 \frac{1}{4x+5} dx$ using $n = 5$ by Trapezoidal rule.

b) Evaluate $I = \int_0^2 e^{-x} dx$ by using the Simpson's 1/3rd rule given h= 0.5

c) Obtain half range cosine series $f(x) = x$ in $0 < x < 1$

d) Find the Fourier series expansion of $f(x) = x^2$ in $(-\pi, \pi)$

e) Find the Fourier transform of $f(x) = \begin{cases} \frac{1}{2\epsilon}, & |x| \leq \epsilon \\ 0, & |x| > \epsilon \end{cases}$

Q.6 Attempt any three **09**

a) Find f(x) if its Fourier sine transform e^{-as}

b) Find the Fourier cosine transform of

$f(x)$, if $f(x) = \begin{cases} 1, & 0 \leq x < 1 \\ 0, & x \geq 1 \end{cases}$

c) Find the Fourier series expansion of $f(x) = x$ in $(-\pi, \pi)$

d) Solve by Newton Raphson method $x^4 - x = 10$ correct to four decimal places. (perform two iterations only)

e) Find $\int_0^6 \frac{1}{1+x^2} dx\ n = 6$ using Simpson's 3/8th rule.

Q.7 Attempt any two. **10**

a) Find $\int_1^8 \frac{1}{1+x} dx\ h = 1$ by using Trapezoidal rule and Simpson's 1/3rd rule.

b) Find Fourier transform of

$f(x) = 1\ |x| < k$

$= 0\ |x| > k$ and

Hence evaluate i) $\int_{-\infty}^{\infty} \frac{\sin sk . \cos sk}{s} ds$ ii) $\int_{-\infty}^{\infty} \frac{sin\ ks}{s} ds$

c) Find the Fourier series expansion of the function $f(x) = e^{-\alpha x}$ in $(0, 2\pi)$

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) $Z\left\{\frac{1}{k!}\right\} = ?$ for $k \geq 0$

a) e^z b) $e^{\frac{1}{z}}$

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

2) The Fourier sine transform of $f(x)$ is given by _____.

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

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

3) From the result $\int_{-\infty}^{\infty}\frac{\cos sx.\sin sk}{s}ds = \begin{cases}\pi & , \ |x| < k \\ 0 & , \ |x| > k\end{cases}$ we can deduce that $\int_0^{\infty}\frac{\sin sk}{s}\, ds =$ _____.

a) 0 b) 1

c) π d) $\frac{\pi}{2}$

4) The first real positive root of $x^3 = 6x - 4$ by Newton Raphson method near $x_0 = 1$ is _____.

a) 0.6667 b) 0.6

c) 0.4 d) 0.3

5) How many steps does the fourth-order Runge-Kutta method use?

a) Two steps b) Five steps

c) Four steps d) Three steps

6) In the interval $(0, a)$ the constant term in the Fourier series of $f(x) = \frac{a}{2} - x$ is _____.

a) 0 b) 1

c) $\frac{a^2}{2\pi}$ d) $\frac{a^2}{4\pi}$

7) Fourier series of $f(x) = x\ in(-\pi, \pi)$ will contain _____

a) No sine term b) No cosine term

c) Both cosine and sine term d) None of these

8) Laplace transform of $\int_0^t u^3 du =$_____.

a) $\frac{3}{s^5}$ b) $\frac{6}{s^5}$

c) $\frac{1}{s^5}$ d) $\frac{6}{s^4}$

9) If $L\{f(t)\} = \emptyset(s)$, then $L\{f(at)\} =$ _____.

a) $\emptyset\left(\frac{s}{a}\right)$ b) $\frac{1}{s}\emptyset\left(\frac{s}{a}\right)$

c) $\emptyset'\left(\frac{s}{a}\right)$ d) $\frac{1}{a}\emptyset\left(\frac{s}{a}\right)$

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

a) $\frac{1}{3}\sin 3t$ b) $\frac{1}{3}\cos 3t$

c) $\frac{1}{3}\cosh 3t$ d) $\frac{1}{3}\sinh 3t$

11) For $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 3y = 3e^{2x}$, the particular integral is _____.

a) $\frac{1}{15}e^{2x}$ b) $3e^{2x}$

c) $\frac{1}{5}e^{2x}$ d) $C_1e^{-x} + C_2e^{-2x}$

12) The general solution of the equation $(D^3 - 7D - 6)y = 0$ is _____.

a) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{-3x}$

b) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{3x}$

c) $y = c_1e^{-x} + c_2e^{-2x} + c_3e^{-3x}$

d) None of these

13) $z\{k\} =$_____ for $|z| > 1$

a) $\frac{z}{z-1}$ b) $\frac{1}{(z-1)^2}$

c) $\frac{z}{(z-1)^2}$ d) $\frac{z}{(z+1)^2}$

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

a) $f\left(\frac{a}{z}\right)$ b) $f\left(\frac{z}{a}\right)$

c) $\frac{1}{a} f\left(\frac{z}{a}\right)$ d) None

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any three **09**

a) Solve : $(D^2 + 4D + 5)y = -2\cos hx + 2^x$

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

c) Find Z-transform of $x_k = 2^k \cos(3k + 2)\,, k \geq 0$

d) Find Z-transform of $x_k = k^2 e^{-ak}, k \geq 0$

e) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{1}{s(s^2+4)}\right]$

Q.3 Attempt any three of the following. **09**

a) Evaluate by using Laplace transform $\int_0^\infty \left(\frac{e^{-t}-e^{-3t}}{t}\right) dt$

b) Find the inverse Z-transform of $f(k) = \begin{cases} 4^k, & k < 0 \\ 3^k, & k \geq 0 \end{cases}$

c) Find $Z\{e^{-3k}\sin 2k\}, k \geq 0$

d) Solve $(D^2 - 1)y = (1 + e^{-x})^2$

e) Find Laplace Transform of $\{t\cos 2t\}$

Q.4 Attempt any two **10**

a) Find the inverse Z-transform of $\frac{1}{(z-a)^2}$ if

1) $|z| < a$,
2) $|z| > a$,

b) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$

c) Solve $(D^2 - 6D + 13)y = e^{x\log 2} + 8e^{3x}\sin 4x$

Section – II

Q.5 Attempt any three **09**

a) Evaluate $\int_0^5 \frac{1}{4x+5} dx$ using $n = 5$ by Trapezoidal rule.

b) Evaluate $I = \int_0^2 e^{-x} dx$ by using the Simpson's 1/3rd rule given h= 0.5

c) Obtain half range cosine series $f(x) = x$ in $0 < x < 1$

d) Find the Fourier series expansion of $f(x) = x^2$ in $(-\pi, \pi)$

e) Find the Fourier transform of $f(x) = \begin{cases} \frac{1}{2\epsilon}, & |x| \leq \epsilon \\ 0, & |x| > \epsilon \end{cases}$

Q.6 Attempt any three **09**

a) Find f(x) if its Fourier sine transform e^{-as}

b) Find the Fourier cosine transform of

$f(x)$, if $f(x) = \begin{cases} 1, & 0 \leq x < 1 \\ 0, & x \geq 1 \end{cases}$

c) Find the Fourier series expansion of $f(x) = x$ in $(-\pi, \pi)$

d) Solve by Newton Raphson method $x^4 - x = 10$ correct to four decimal places. (perform two iterations only)

e) Find $\int_0^6 \frac{1}{1+x^2} dx\ n = 6$ using Simpson's 3/8th rule.

Q.7 Attempt any two. **10**

a) Find $\int_1^8 \frac{1}{1+x} dx\ h = 1$ by using Trapezoidal rule and Simpson's 1/3rd rule.

b) Find Fourier transform of

$f(x) = 1\ |x| < k$

$= 0\ |x| > k$ and

Hence evaluate i) $\int_{-\infty}^{\infty} \frac{\sin sk . \cos sk}{s} ds$ ii) $\int_{-\infty}^{\infty} \frac{sin\ ks}{s} ds$

c) Find the Fourier series expansion of the function $f(x) = e^{-\alpha x}$ in $(0, 2\pi)$

Seat No.	

Set R

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The first real positive root of $x^3 = 6x - 4$ by Newton Raphson method near $x_0 = 1$ is _____.

a) 0.6667 b) 0.6
c) 0.4 d) 0.3

2) How many steps does the fourth-order Runge-Kutta method use?

a) Two steps b) Five steps
c) Four steps d) Three steps

3) In the interval $(0, a)$ the constant term in the Fourier series of $f(x) = \frac{a}{2} - x$ is _____.

a) 0 b) 1
c) $\frac{a^2}{2\pi}$ d) $\frac{a^2}{4\pi}$

4) Fourier series of $f(x) = x\ in(-\pi, \pi)$ will contain ____

a) No sine term b) No cosine term
c) Both cosine and sine term d) None of these

5) Laplace transform of $\int_0^t u^3 du$ =_____.

a) $\frac{3}{s^5}$ b) $\frac{6}{s^5}$
c) $\frac{1}{s^5}$ d) $\frac{6}{s^4}$

6) If $L\{f(t)\} = \emptyset(s)$, then $L\{f(at)\} =$ _____.

a) $\emptyset\left(\frac{s}{a}\right)$ b) $\frac{1}{s}\emptyset\left(\frac{s}{a}\right)$

c) $\emptyset'\left(\frac{s}{a}\right)$ d) $\frac{1}{a}\emptyset\left(\frac{s}{a}\right)$

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

a) $\frac{1}{3}\sin 3t$ b) $\frac{1}{3}\cos 3t$

c) $\frac{1}{3}\cosh 3t$ d) $\frac{1}{3}\sinh 3t$

8) For $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 3y = 3e^{2x}$, the particular integral is _____.

a) $\frac{1}{15}e^{2x}$ b) $3e^{2x}$

c) $\frac{1}{5}e^{2x}$ d) $C_1e^{-x} + C_2e^{-2x}$

9) The general solution of the equation $(D^3 - 7D - 6)y = 0$ is _____.

a) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{-3x}$

b) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{3x}$

c) $y = c_1e^{-x} + c_2e^{-2x} + c_3e^{-3x}$

d) None of these

10) $z\{k\} =$_____ for $|z| > 1$

a) $\frac{z}{z-1}$ b) $\frac{1}{(z-1)^2}$

c) $\frac{z}{(z-1)^2}$ d) $\frac{z}{(z+1)^2}$

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

a) $f\left(\frac{a}{z}\right)$ b) $f\left(\frac{z}{a}\right)$

c) $\frac{1}{a}f\left(\frac{z}{a}\right)$ d) None

12) $Z\left\{\frac{1}{k!}\right\} =$? for $k \geq 0$

a) e^z b) $e^{\frac{1}{z}}$

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

13) The Fourier sine transform of $f(x)$ is given by _____.

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

b) $\int_{-\infty}^{\infty} f(x)\cos sx\ dx$

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

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

14) From the result $\int_{-\infty}^{\infty}\frac{\cos sx.\sin sk}{s}ds = \begin{cases}\pi & , \ |x| < k \\ 0 & , \ |x| > k\end{cases}$ we can deduce that $\int_{0}^{\infty}\frac{\sin sk}{s}\ ds =$ _____.

a) 0

b) 1

c) π

d) $\frac{\pi}{2}$

Seat No.	

Set R

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any three **09**

a) Solve : $(D^2 + 4D + 5)y = -2\cos hx + 2^x$

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

c) Find Z-transform of $x_k = 2^k \cos(3k + 2)\,, k \geq 0$

d) Find Z-transform of $x_k = k^2 e^{-ak}, k \geq 0$

e) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{1}{s(s^2+4)}\right]$

Q.3 Attempt any three of the following. **09**

a) Evaluate by using Laplace transform $\int_0^\infty \left(\frac{e^{-t}-e^{-3t}}{t}\right) dt$

b) Find the inverse Z-transform of $f(k) = \begin{cases} 4^k, & k < 0 \\ 3^k, & k \geq 0 \end{cases}$

c) Find $Z\{e^{-3k}\sin 2k\}, k \geq 0$

d) Solve $(D^2 - 1)y = (1 + e^{-x})^2$

e) Find Laplace Transform of $\{t\cos 2t\}$

Q.4 Attempt any two **10**

a) Find the inverse Z-transform of $\frac{1}{(z-a)^2}$ if

1) $|z| < a$,
2) $|z| > a$,

b) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$

c) Solve $(D^2 - 6D + 13)y = e^{x\log 2} + 8e^{3x}\sin 4x$

Section – II

Q.5 Attempt any three **09**

a) Evaluate $\int_0^5 \frac{1}{4x+5} dx$ using $n = 5$ by Trapezoidal rule.

b) Evaluate $I = \int_0^2 e^{-x} dx$ by using the Simpson's 1/3rd rule given h= 0.5

c) Obtain half range cosine series $f(x) = x$ in $0 < x < 1$

d) Find the Fourier series expansion of $f(x) = x^2$ in $(-\pi, \pi)$

e) Find the Fourier transform of $f(x) = \begin{cases} \frac{1}{2\epsilon}, & |x| \leq \epsilon \\ 0, & |x| > \epsilon \end{cases}$

Q.6 Attempt any three **09**

a) Find f(x) if its Fourier sine transform e^{-as}

b) Find the Fourier cosine transform of

$f(x)$, if $f(x) = \begin{cases} 1, & 0 \leq x < 1 \\ 0, & x \geq 1 \end{cases}$

c) Find the Fourier series expansion of $f(x) = x$ in $(-\pi, \pi)$

d) Solve by Newton Raphson method $x^4 - x = 10$ correct to four decimal places. (perform two iterations only)

e) Find $\int_0^6 \frac{1}{1+x^2} dx\ n = 6$ using Simpson's 3/8th rule.

Q.7 Attempt any two. **10**

a) Find $\int_1^8 \frac{1}{1+x} dx\ h = 1$ by using Trapezoidal rule and Simpson's 1/3rd rule.

b) Find Fourier transform of

$f(x) = 1\ |x| < k$

$= 0\ |x| > k$ and

Hence evaluate i) $\int_{-\infty}^{\infty} \frac{\sin sk . \cos sk}{s} ds$ ii) $\int_{-\infty}^{\infty} \frac{sin\ ks}{s} ds$

c) Find the Fourier series expansion of the function $f(x) = e^{-\alpha x}$ in $(0, 2\pi)$

Seat No.		Set	S

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) $z\{k\} =$_____ for $|z| > 1$

a) $\frac{z}{z-1}$ b) $\frac{1}{(z-1)^2}$

c) $\frac{z}{(z-1)^2}$ d) $\frac{z}{(z+1)^2}$

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

a) $f\left(\frac{a}{z}\right)$ b) $f\left(\frac{z}{a}\right)$

c) $\frac{1}{a} f\left(\frac{z}{a}\right)$ d) None

3) $Z\left\{\frac{1}{k!}\right\} =?$ for $k \geq 0$

a) e^z b) $e^{\frac{1}{z}}$

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

4) The Fourier sine transform of $f(x)$ is given by _____.

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

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

5) From the result $\int_{-\infty}^{\infty} \frac{\cos sx.\sin sk}{s} ds = \begin{cases} \pi & , \ |x| < k \\ 0 & , \ |x| > k \end{cases}$ we can deduce that $\int_0^{\infty} \frac{\sin sk}{s} \, ds =$ _____.

a) 0 b) 1

c) π d) $\frac{\pi}{2}$

6) The first real positive root of $x^3 = 6x - 4$ by Newton Raphson method near $x_0 = 1$ is _____.

a) 0.6667 b) 0.6

c) 0.4 d) 0.3

7) How many steps does the fourth-order Runge-Kutta method use?

a) Two steps b) Five steps

c) Four steps d) Three steps

8) In the interval $(0, a)$ the constant term in the Fourier series of $f(x) = \frac{a}{2} - x$ is _____.

a) 0 b) 1

c) $\frac{a^2}{2\pi}$ d) $\frac{a^2}{4\pi}$

9) Fourier series of $f(x) = x \ in(-\pi, \pi)$ will contain ____

a) No sine term b) No cosine term

c) Both cosine and sine term d) None of these

10) Laplace transform of $\int_0^t u^3 du =$_____.

a) $\frac{3}{s^5}$ b) $\frac{6}{s^5}$

c) $\frac{1}{s^5}$ d) $\frac{6}{s^4}$

11) If $L\{f(t)\} = \emptyset(s)$, then $L\{f(at)\} =$ _____.

a) $\emptyset\left(\frac{s}{a}\right)$ b) $\frac{1}{s}\emptyset\left(\frac{s}{a}\right)$

c) $\emptyset'\left(\frac{s}{a}\right)$ d) $\frac{1}{a}\emptyset\left(\frac{s}{a}\right)$

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

a) $\frac{1}{3}\sin 3t$ b) $\frac{1}{3}\cos 3t$

c) $\frac{1}{3}\cosh 3t$ d) $\frac{1}{3}\sinh 3t$

13) For $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 3y = 3e^{2x}$, the particular integral is _____.

a) $\frac{1}{15}e^{2x}$ b) $3e^{2x}$

c) $\frac{1}{5}e^{2x}$ d) $C_1e^{-x} + C_2e^{-2x}$

14) The general solution of the equation $(D^3 - 7D - 6)y = 0$ is _____.

a) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{-3x}$

b) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{3x}$

c) $y = c_1e^{-x} + c_2e^{-2x} + c_3e^{-3x}$

d) None of these

Seat No.	

Set **S**

S.Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Mathematics for Software and Hardware (OE-01E)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any three **09**

a) Solve : $(D^2 + 4D + 5)y = -2\cos hx + 2^x$

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

c) Find Z-transform of $x_k = 2^k \cos(3k + 2)\,, k \geq 0$

d) Find Z-transform of $x_k = k^2 e^{-ak}, k \geq 0$

e) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{1}{s(s^2+4)}\right]$

Q.3 Attempt any three of the following. **09**

a) Evaluate by using Laplace transform $\int_0^\infty \left(\frac{e^{-t}-e^{-3t}}{t}\right) dt$

b) Find the inverse Z-transform of $f(k) = \begin{cases} 4^k, & k < 0 \\ 3^k, & k \geq 0 \end{cases}$

c) Find $Z\{e^{-3k}\sin 2k\}, k \geq 0$

d) Solve $(D^2 - 1)y = (1 + e^{-x})^2$

e) Find Laplace Transform of $\{t\cos 2t\}$

Q.4 Attempt any two **10**

a) Find the inverse Z-transform of $\frac{1}{(z-a)^2}$ if

1) $|z| < a$,
2) $|z| > a$,

b) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$

c) Solve $(D^2 - 6D + 13)y = e^{x\log 2} + 8e^{3x}\sin 4x$

Section – II

Q.5 Attempt any three **09**

a) Evaluate $\int_0^5 \frac{1}{4x+5} dx$ using $n = 5$ by Trapezoidal rule.

b) Evaluate $I = \int_0^2 e^{-x} dx$ by using the Simpson's 1/3rd rule given h= 0.5

c) Obtain half range cosine series $f(x) = x$ in $0 < x < 1$

d) Find the Fourier series expansion of $f(x) = x^2$ in $(-\pi, \pi)$

e) Find the Fourier transform of $f(x) = \begin{cases} \frac{1}{2\epsilon}, & |x| \leq \epsilon \\ 0, & |x| > \epsilon \end{cases}$

Q.6 Attempt any three **09**

a) Find f(x) if its Fourier sine transform e^{-as}

b) Find the Fourier cosine transform of

$f(x)$, if $f(x) = \begin{cases} 1, & 0 \leq x < 1 \\ 0, & x \geq 1 \end{cases}$

c) Find the Fourier series expansion of $f(x) = x$ in $(-\pi, \pi)$

d) Solve by Newton Raphson method $x^4 - x = 10$ correct to four decimal places. (perform two iterations only)

e) Find $\int_0^6 \frac{1}{1+x^2} dx \; n = 6$ using Simpson's 3/8th rule.

Q.7 Attempt any two. **10**

a) Find $\int_1^8 \frac{1}{1+x} dx \; h = 1$ by using Trapezoidal rule and Simpson's 1/3rd rule.

b) Find Fourier transform of

$f(x) = 1 \; |x| < k$

$= 0 \; |x| > k$ and

Hence evaluate i) $\int_{-\infty}^{\infty} \frac{\sin sk . \cos sk}{s} ds$ ii) $\int_{-\infty}^{\infty} \frac{\sin ks}{s} ds$

c) Find the Fourier series expansion of the function $f(x) = e^{-\alpha x}$ in $(0, 2\pi)$

SLR-BD-250

Seat No.		Set	P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is feedback in communication?
a) The process of encoding a message.
b) The process of transmitting the message.
c) The response or reaction to a message.
d) The process of decoding a message.

2) In the process of communication 'Encoding' means _____.
a) Using symbol to express an idea
b) Deciphering the message
c) Creating noise in the communication
d) Interpreting the meaning of message

3) Empathy refers to: _____.
a) Capacity to understand or feel what another person feels
b) Having better understanding of partner's emotions
c) The higher the likelihood of self harm
d) Getting what one wants out of the relationship

4) Repots, suggestions, appeals grievances etc. are examples of: _____.
a) Down ward communication
b) Upward communication
c) Horizontal communication
d) Informal communication

5) Informal communication is commonly known as: _____.
a) Down ward communication b) Upward communication
c) Horizontal communication d) Grapevine

6) _____ is not a communication barrier?
a) Language b) Culture
c) Habits d) Physical

7) Which of the following is NOT a component of communication?
a) Sender b) Message
c) Receiver d) Translator

8) Emotional Intelligence primarily refers to the ability to: _____.
a) Understand and manage one's own emotions and the emotions of others
b) Solve mathematical problems
c) Memorize large amounts of information
d) Make logical decisions without emotions

9) Time management can help reduce stress by: _____
a) Creating unnecessary pressure
b) Organizing tasks and prioritizing effectively
c) Avoiding responsibilities altogether
d) Increasing the workload

10) The term “self-regulation” in Emotional Intelligence means: _____.
a) Hiding your emotions from others
b) Controlling impulsive behaviours and adapting to changing circumstances
c) Ignoring your emotional responses
d) Following strict rules without considering emotions

11) What is the primary purpose of a job interview?
a) To test the candidate's academic knowledge
b) To compare the candidate's qualifications with others
c) To discuss salary expectations only
d) To assess the candidate’s suitability for the job role

12) What kind of information will you collect before going to an interview?
a) About the job you are applying for
b) About the company
c) About the work culture
d) All of the above

13) Which of the following is an effective stress management technique?
a) Procrastination
b) Deep breathing and relaxation exercises
c) Avoiding physical activity
d) Excessive multitasking

14) Which of the following is an important step to prepare for an interview?
a) Memorizing answers word for word
b) Arriving late to showcase confidence
c) Avoiding practice to appear natural
d) Researching the company and role

SLR-BD-250

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Two. **12**

a) Define human communication and explain importance of communication.
b) Explain in brief:
1) Personal Barrier
2) Social Barrier
c) Enlighten in a brief strategy to improve emotional intelligence.

Q.3 Attempt any Four. **16**

a) Explain importance of emotional intelligence.
b) State advantages and disadvantages of informal communication.
c) Describe different modes of communication.
d) Highlight role of social awareness as key factor of emotional intelligence.
e) Explain relationship management as key factor of emotional intelligence.

Section – II

Q.4 Attempt any Two. **12**

a) What is interview? Explain various steps in the process of interview.
b) Explain importance of time management.
c) Explain the four P's of effective presentation.

Q.5 Attempt any Four. **16**

a) Explain importance of stress management.
b) Explain various types of interviews.
c) Describe various strategies for effective time management.
d) Explain various strategies of stress management.
e) Write short note on: Non- verbal aspects of presentation.

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Emotional Intelligence primarily refers to the ability to: _____.
a) Understand and manage one's own emotions and the emotions of others
b) Solve mathematical problems
c) Memorize large amounts of information
d) Make logical decisions without emotions

2) Time management can help reduce stress by: _____
a) Creating unnecessary pressure
b) Organizing tasks and prioritizing effectively
c) Avoiding responsibilities altogether
d) Increasing the workload

3) The term "self-regulation" in Emotional Intelligence means: _____.
a) Hiding your emotions from others
b) Controlling impulsive behaviours and adapting to changing circumstances
c) Ignoring your emotional responses
d) Following strict rules without considering emotions

4) What is the primary purpose of a job interview?
a) To test the candidate's academic knowledge
b) To compare the candidate's qualifications with others
c) To discuss salary expectations only
d) To assess the candidate's suitability for the job role

5) What kind of information will you collect before going to an interview?
a) About the job you are applying for
b) About the company
c) About the work culture
d) All of the above

6) Which of the following is an effective stress management technique?
a) Procrastination
b) Deep breathing and relaxation exercises
c) Avoiding physical activity
d) Excessive multitasking

7) Which of the following is an important step to prepare for an interview?
a) Memorizing answers word for word
b) Arriving late to showcase confidence
c) Avoiding practice to appear natural
d) Researching the company and role

8) What is feedback in communication?
a) The process of encoding a message.
b) The process of transmitting the message.
c) The response or reaction to a message.
d) The process of decoding a message.

9) In the process of communication 'Encoding' means _____.
a) Using symbol to express an idea
b) Deciphering the message
c) Creating noise in the communication
d) Interpreting the meaning of message

10) Empathy refers to: _____.
a) Capacity to understand or feel what another person feels
b) Having better understanding of partner's emotions
c) The higher the likelihood of self harm
d) Getting what one wants out of the relationship

11) Repots, suggestions, appeals grievances etc. are examples of: _____.
a) Down ward communication
b) Upward communication
c) Horizontal communication
d) Informal communication

12) Informal communication is commonly known as: _____.
a) Down ward communication b) Upward communication
c) Horizontal communication d) Grapevine

13) _____ is not a communication barrier?
a) Language b) Culture
c) Habits d) Physical

14) Which of the following is NOT a component of communication?
a) Sender b) Message
c) Receiver d) Translator

SLR-BD-250

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Two. **12**

a) Define human communication and explain importance of communication.
b) Explain in brief:
1) Personal Barrier
2) Social Barrier
c) Enlighten in a brief strategy to improve emotional intelligence.

Q.3 Attempt any Four. **16**

a) Explain importance of emotional intelligence.
b) State advantages and disadvantages of informal communication.
c) Describe different modes of communication.
d) Highlight role of social awareness as key factor of emotional intelligence.
e) Explain relationship management as key factor of emotional intelligence.

Section – II

Q.4 Attempt any Two. **12**

a) What is interview? Explain various steps in the process of interview.
b) Explain importance of time management.
c) Explain the four P's of effective presentation.

Q.5 Attempt any Four. **16**

a) Explain importance of stress management.
b) Explain various types of interviews.
c) Describe various strategies for effective time management.
d) Explain various strategies of stress management.
e) Write short note on: Non- verbal aspects of presentation.

SLR-BD-250

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the primary purpose of a job interview?
a) To test the candidate's academic knowledge
b) To compare the candidate's qualifications with others
c) To discuss salary expectations only
d) To assess the candidate's suitability for the job role

2) What kind of information will you collect before going to an interview?
a) About the job you are applying for
b) About the company
c) About the work culture
d) All of the above

3) Which of the following is an effective stress management technique?
a) Procrastination
b) Deep breathing and relaxation exercises
c) Avoiding physical activity
d) Excessive multitasking

4) Which of the following is an important step to prepare for an interview?
a) Memorizing answers word for word
b) Arriving late to showcase confidence
c) Avoiding practice to appear natural
d) Researching the company and role

5) What is feedback in communication?
a) The process of encoding a message.
b) The process of transmitting the message.
c) The response or reaction to a message.
d) The process of decoding a message.

6) In the process of communication 'Encoding' means _____.
a) Using symbol to express an idea
b) Deciphering the message
c) Creating noise in the communication
d) Interpreting the meaning of message

7) Empathy refers to: _____.
a) Capacity to understand or feel what another person feels
b) Having better understanding of partner's emotions
c) The higher the likelihood of self harm
d) Getting what one wants out of the relationship

8) Repots, suggestions, appeals grievances etc. are examples of: _____.
a) Down ward communication
b) Upward communication
c) Horizontal communication
d) Informal communication

9) Informal communication is commonly known as: _____.
a) Down ward communication b) Upward communication
c) Horizontal communication d) Grapevine

10) _____ is not a communication barrier?
a) Language b) Culture
c) Habits d) Physical

11) Which of the following is NOT a component of communication?
a) Sender b) Message
c) Receiver d) Translator

12) Emotional Intelligence primarily refers to the ability to: _____.
a) Understand and manage one's own emotions and the emotions of others
b) Solve mathematical problems
c) Memorize large amounts of information
d) Make logical decisions without emotions

13) Time management can help reduce stress by: _____
a) Creating unnecessary pressure
b) Organizing tasks and prioritizing effectively
c) Avoiding responsibilities altogether
d) Increasing the workload

14) The term "self-regulation" in Emotional Intelligence means: _____.
a) Hiding your emotions from others
b) Controlling impulsive behaviours and adapting to changing circumstances
c) Ignoring your emotional responses
d) Following strict rules without considering emotions

SLR-BD-250

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Two. **12**

a) Define human communication and explain importance of communication.
b) Explain in brief:
1) Personal Barrier
2) Social Barrier
c) Enlighten in a brief strategy to improve emotional intelligence.

Q.3 Attempt any Four. **16**

a) Explain importance of emotional intelligence.
b) State advantages and disadvantages of informal communication.
c) Describe different modes of communication.
d) Highlight role of social awareness as key factor of emotional intelligence.
e) Explain relationship management as key factor of emotional intelligence.

Section – II

Q.4 Attempt any Two. **12**

a) What is interview? Explain various steps in the process of interview.
b) Explain importance of time management.
c) Explain the four P's of effective presentation.

Q.5 Attempt any Four. **16**

a) Explain importance of stress management.
b) Explain various types of interviews.
c) Describe various strategies for effective time management.
d) Explain various strategies of stress management.
e) Write short note on: Non- verbal aspects of presentation.

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ is not a communication barrier?
a) Language b) Culture
c) Habits d) Physical

2) Which of the following is NOT a component of communication?
a) Sender b) Message
c) Receiver d) Translator

3) Emotional Intelligence primarily refers to the ability to: _____.
a) Understand and manage one's own emotions and the emotions of others
b) Solve mathematical problems
c) Memorize large amounts of information
d) Make logical decisions without emotions

4) Time management can help reduce stress by: _____
a) Creating unnecessary pressure
b) Organizing tasks and prioritizing effectively
c) Avoiding responsibilities altogether
d) Increasing the workload

5) The term "self-regulation" in Emotional Intelligence means: _____.
a) Hiding your emotions from others
b) Controlling impulsive behaviours and adapting to changing circumstances
c) Ignoring your emotional responses
d) Following strict rules without considering emotions

6) What is the primary purpose of a job interview?
a) To test the candidate's academic knowledge
b) To compare the candidate's qualifications with others
c) To discuss salary expectations only
d) To assess the candidate's suitability for the job role

7) What kind of information will you collect before going to an interview?
a) About the job you are applying for
b) About the company
c) About the work culture
d) All of the above

8) Which of the following is an effective stress management technique?
a) Procrastination
b) Deep breathing and relaxation exercises
c) Avoiding physical activity
d) Excessive multitasking

9) Which of the following is an important step to prepare for an interview?
a) Memorizing answers word for word
b) Arriving late to showcase confidence
c) Avoiding practice to appear natural
d) Researching the company and role

10) What is feedback in communication?
a) The process of encoding a message.
b) The process of transmitting the message.
c) The response or reaction to a message.
d) The process of decoding a message.

11) In the process of communication 'Encoding' means _____.
a) Using symbol to express an idea
b) Deciphering the message
c) Creating noise in the communication
d) Interpreting the meaning of message

12) Empathy refers to: _____.
a) Capacity to understand or feel what another person feels
b) Having better understanding of partner's emotions
c) The higher the likelihood of self harm
d) Getting what one wants out of the relationship

13) Repots, suggestions, appeals grievances etc. are examples of: _____.
a) Down ward communication
b) Upward communication
c) Horizontal communication
d) Informal communication

14) Informal communication is commonly known as: _____.
a) Down ward communication b) Upward communication
c) Horizontal communication d) Grapevine

SLR-BD-250

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Soft Skills and Personality Development (OE-01F)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Two. **12**

a) Define human communication and explain importance of communication.
b) Explain in brief:
1) Personal Barrier
2) Social Barrier
c) Enlighten in a brief strategy to improve emotional intelligence.

Q.3 Attempt any Four. **16**

a) Explain importance of emotional intelligence.
b) State advantages and disadvantages of informal communication.
c) Describe different modes of communication.
d) Highlight role of social awareness as key factor of emotional intelligence.
e) Explain relationship management as key factor of emotional intelligence.

Section – II

Q.4 Attempt any Two. **12**

a) What is interview? Explain various steps in the process of interview.
b) Explain importance of time management.
c) Explain the four P's of effective presentation.

Q.5 Attempt any Four. **16**

a) Explain importance of stress management.
b) Explain various types of interviews.
c) Describe various strategies for effective time management.
d) Explain various strategies of stress management.
e) Write short note on: Non- verbal aspects of presentation.

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the primary focus of Design Thinking?
a) Maximizing shareholder
b) Developing innovative and user-centered solutions
c) Streamlining manufacturing processes
d) Enhancing employee productivity

2) Which of the following correctly lists the first three phases of the Design Thinking process?
a) Empathize, Ideate, Prototype
b) Define, Ideate, Test
c) Empathize, Define, Ideate
d) Prototype, Test, Implement

3) In the context of Design Thinking, what is "brainstorming" used for?
a) Generating a wide range of ideas
b) Testing final products
c) Developing financial models
d) Identifying user pain points

4) What does a "customer journey map" help to visualize?
a) The financial cost of product development
b) The steps a customer goes through while interacting with a product or service
c) The design specifications of a product
d) The competitive landscape of a market

5) Which tool in Design Thinking helps in understanding the target user's needs and behaviors?
a) Prototype b) Persona
c) SWOT analysis d) Business model canvas

6) What is the final phase in the Design Thinking process?
a) Test b) Implement
c) Prototype d) Ideate

7) Which of the following is NOT an objective of design thinking?
a) To create user-friendly products
b) To streamline manufacturing processes
c) To encourage iterative prototyping
d) To enhance collaboration among teams

8) Which of the following is a benefit of using design thinking?
a) Reduces product variety b) Increases customer satisfaction
c) Limits team collaboration d) Eliminates risk in decision-making

9) What role does technology play in innovation management?
a) It complicates processes
b) It is irrelevant to innovation
c) It serves as a tool for enhancing efficiency and creativity
d) It replaces human input

10) Which leadership style involves making decisions based on input from team members?
a) Autocratic b) Laissez-faire
c) Democratic d) Transactional

11) What does "Product Solution Fit" refer to?
a) The alignment of the product with customer needs and problems
b) The product's price in relation to competitors
c) The marketing strategy for the product
d) The technical specifications of the product

12) Which of the following best defines "Product Market Fit"?
a) The degree to which a product meets the demands of a specific market
b) The number of products available in the market
c) The financial performance of a product
d) The product's popularity on social media

13) What is the primary goal of service design?
a) To reduce costs
b) To enhance customer experience
c) To standardize services
d) To simplify service offerings

14) Which of the following is a key principle of service design?
a) Focus on profitability over customer satisfaction
b) User-centered design
c) Minimal feedback from users
d) Rigid service processes

Seat No.	

Set **P**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Describe each phase of the Design Thinking process in detail, explaining how they contribute to the overall methodology. **06**

b) Provide a comprehensive definition of Design Thinking, including its essential characteristics and principles. **04**

Q.3 **Attempt any three.** **18**

a) Discuss the role of creativity and innovation in organizations and their impact on business performance.

b) What is the importance of empathy in Design Thinking?

c) Define leadership and explain its different types. How can effective leadership influence the success of an organization? Provide examples.

d) Explain the utilization of cognitive technology in decision-making processes.

e) Explain exemplary practices of effective leadership with relevant case studies.

Section – II

Q.4 **a)** Explain exemplary practices of effective leadership with relevant case studies. **06**

b) What is product solution fit, and how does it differ from product market fit? **04**

Q.5 **Attempt any three.** **18**

a) Define the development lifecycle and explain its significance in product development.

b) What are the benefits of implementing service design in organizations?

c) How can organizations effectively design a service to meet customer needs?

d) How does Intellectual Property (IP) play a role in product development and design thinking?

e) Explain any two successful case studies demonstrating design thinking in various engineering sectors.

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is a benefit of using design thinking?
a) Reduces product variety b) Increases customer satisfaction
c) Limits team collaboration d) Eliminates risk in decision-making

2) What role does technology play in innovation management?
a) It complicates processes
b) It is irrelevant to innovation
c) It serves as a tool for enhancing efficiency and creativity
d) It replaces human input

3) Which leadership style involves making decisions based on input from team members?
a) Autocratic b) Laissez-faire
c) Democratic d) Transactional

4) What does "Product Solution Fit" refer to?
a) The alignment of the product with customer needs and problems
b) The product's price in relation to competitors
c) The marketing strategy for the product
d) The technical specifications of the product

5) Which of the following best defines "Product Market Fit"?
a) The degree to which a product meets the demands of a specific market
b) The number of products available in the market
c) The financial performance of a product
d) The product's popularity on social media

6) What is the primary goal of service design?
a) To reduce costs
b) To enhance customer experience
c) To standardize services
d) To simplify service offerings

7) Which of the following is a key principle of service design?
a) Focus on profitability over customer satisfaction
b) User-centered design
c) Minimal feedback from users
d) Rigid service processes

8) What is the primary focus of Design Thinking?
a) Maximizing shareholder
b) Developing innovative and user-centered solutions
c) Streamlining manufacturing processes
d) Enhancing employee productivity

9) Which of the following correctly lists the first three phases of the Design Thinking process?
a) Empathize, Ideate, Prototype
b) Define, Ideate, Test
c) Empathize, Define, Ideate
d) Prototype, Test, Implement

10) In the context of Design Thinking, what is "brainstorming" used for?
a) Generating a wide range of ideas
b) Testing final products
c) Developing financial models
d) Identifying user pain points

11) What does a "customer journey map" help to visualize?
a) The financial cost of product development
b) The steps a customer goes through while interacting with a product or service
c) The design specifications of a product
d) The competitive landscape of a market

12) Which tool in Design Thinking helps in understanding the target user's needs and behaviors?
a) Prototype
b) Persona
c) SWOT analysis
d) Business model canvas

13) What is the final phase in the Design Thinking process?
a) Test
b) Implement
c) Prototype
d) Ideate

14) Which of the following is NOT an objective of design thinking?

a) To create user-friendly products
b) To streamline manufacturing processes
c) To encourage iterative prototyping
d) To enhance collaboration among teams

SLR-BD-251

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Describe each phase of the Design Thinking process in detail, explaining how they contribute to the overall methodology. **06**

b) Provide a comprehensive definition of Design Thinking, including its essential characteristics and principles. **04**

Q.3 **Attempt any three.** **18**

a) Discuss the role of creativity and innovation in organizations and their impact on business performance.

b) What is the importance of empathy in Design Thinking?

c) Define leadership and explain its different types. How can effective leadership influence the success of an organization? Provide examples.

d) Explain the utilization of cognitive technology in decision-making processes.

e) Explain exemplary practices of effective leadership with relevant case studies.

Section – II

Q.4 **a)** Explain exemplary practices of effective leadership with relevant case studies. **06**

b) What is product solution fit, and how does it differ from product market fit? **04**

Q.5 **Attempt any three.** **18**

a) Define the development lifecycle and explain its significance in product development.

b) What are the benefits of implementing service design in organizations?

c) How can organizations effectively design a service to meet customer needs?

d) How does Intellectual Property (IP) play a role in product development and design thinking?

e) Explain any two successful case studies demonstrating design thinking in various engineering sectors.

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) What does "Product Solution Fit" refer to?
a) The alignment of the product with customer needs and problems
b) The product's price in relation to competitors
c) The marketing strategy for the product
d) The technical specifications of the product

2) Which of the following best defines "Product Market Fit"?
a) The degree to which a product meets the demands of a specific market
b) The number of products available in the market
c) The financial performance of a product
d) The product's popularity on social media

3) What is the primary goal of service design?
a) To reduce costs
b) To enhance customer experience
c) To standardize services
d) To simplify service offerings

4) Which of the following is a key principle of service design?
a) Focus on profitability over customer satisfaction
b) User-centered design
c) Minimal feedback from users
d) Rigid service processes

5) What is the primary focus of Design Thinking?
a) Maximizing shareholder
b) Developing innovative and user-centered solutions
c) Streamlining manufacturing processes
d) Enhancing employee productivity

6) Which of the following correctly lists the first three phases of the Design Thinking process?
a) Empathize, Ideate, Prototype
b) Define, Ideate, Test
c) Empathize, Define, Ideate
d) Prototype, Test, Implement

7) In the context of Design Thinking, what is "brainstorming" used for?
a) Generating a wide range of ideas
b) Testing final products
c) Developing financial models
d) Identifying user pain points

8) What does a "customer journey map" help to visualize?
a) The financial cost of product development
b) The steps a customer goes through while interacting with a product or service
c) The design specifications of a product
d) The competitive landscape of a market

9) Which tool in Design Thinking helps in understanding the target user's needs and behaviors?
a) Prototype b) Persona
c) SWOT analysis d) Business model canvas

10) What is the final phase in the Design Thinking process?
a) Test b) Implement
c) Prototype d) Ideate

11) Which of the following is NOT an objective of design thinking?
a) To create user-friendly products
b) To streamline manufacturing processes
c) To encourage iterative prototyping
d) To enhance collaboration among teams

12) Which of the following is a benefit of using design thinking?
a) Reduces product variety b) Increases customer satisfaction
c) Limits team collaboration d) Eliminates risk in decision-making

13) What role does technology play in innovation management?
a) It complicates processes
b) It is irrelevant to innovation
c) It serves as a tool for enhancing efficiency and creativity
d) It replaces human input

14) Which leadership style involves making decisions based on input from team members?
a) Autocratic b) Laissez-faire
c) Democratic d) Transactional

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Describe each phase of the Design Thinking process in detail, explaining how they contribute to the overall methodology. **06**

b) Provide a comprehensive definition of Design Thinking, including its essential characteristics and principles. **04**

Q.3 **Attempt any three.** **18**

a) Discuss the role of creativity and innovation in organizations and their impact on business performance.

b) What is the importance of empathy in Design Thinking?

c) Define leadership and explain its different types. How can effective leadership influence the success of an organization? Provide examples.

d) Explain the utilization of cognitive technology in decision-making processes.

e) Explain exemplary practices of effective leadership with relevant case studies.

Section – II

Q.4 **a)** Explain exemplary practices of effective leadership with relevant case studies. **06**

b) What is product solution fit, and how does it differ from product market fit? **04**

Q.5 **Attempt any three.** **18**

a) Define the development lifecycle and explain its significance in product development.

b) What are the benefits of implementing service design in organizations?

c) How can organizations effectively design a service to meet customer needs?

d) How does Intellectual Property (IP) play a role in product development and design thinking?

e) Explain any two successful case studies demonstrating design thinking in various engineering sectors.

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no. 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the final phase in the Design Thinking process?
a) Test b) Implement
c) Prototype d) Ideate

2) Which of the following is NOT an objective of design thinking?
a) To create user-friendly products
b) To streamline manufacturing processes
c) To encourage iterative prototyping
d) To enhance collaboration among teams

3) Which of the following is a benefit of using design thinking?
a) Reduces product variety b) Increases customer satisfaction
c) Limits team collaboration d) Eliminates risk in decision-making

4) What role does technology play in innovation management?
a) It complicates processes
b) It is irrelevant to innovation
c) It serves as a tool for enhancing efficiency and creativity
d) It replaces human input

5) Which leadership style involves making decisions based on input from team members?
a) Autocratic b) Laissez-faire
c) Democratic d) Transactional

6) What does "Product Solution Fit" refer to?
a) The alignment of the product with customer needs and problems
b) The product's price in relation to competitors
c) The marketing strategy for the product
d) The technical specifications of the product

7) Which of the following best defines "Product Market Fit"?
a) The degree to which a product meets the demands of a specific market
b) The number of products available in the market
c) The financial performance of a product
d) The product's popularity on social media

8) What is the primary goal of service design?
a) To reduce costs
b) To enhance customer experience
c) To standardize services
d) To simplify service offerings

9) Which of the following is a key principle of service design?
a) Focus on profitability over customer satisfaction
b) User-centered design
c) Minimal feedback from users
d) Rigid service processes

10) What is the primary focus of Design Thinking?
a) Maximizing shareholder
b) Developing innovative and user-centered solutions
c) Streamlining manufacturing processes
d) Enhancing employee productivity

11) Which of the following correctly lists the first three phases of the Design Thinking process?
a) Empathize, Ideate, Prototype
b) Define, Ideate, Test
c) Empathize, Define, Ideate
d) Prototype, Test, Implement

12) In the context of Design Thinking, what is "brainstorming" used for?
a) Generating a wide range of ideas
b) Testing final products
c) Developing financial models
d) Identifying user pain points

13) What does a "customer journey map" help to visualize?
a) The financial cost of product development
b) The steps a customer goes through while interacting with a product or service
c) The design specifications of a product
d) The competitive landscape of a market

14) Which tool in Design Thinking helps in understanding the target user's needs and behaviors?
a) Prototype
b) Persona
c) SWOT analysis
d) Business model canvas

SLR-BD-251

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Design Thinking: Business Innovation Framework (CIVMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 **a)** Describe each phase of the Design Thinking process in detail, explaining how they contribute to the overall methodology. **06**

b) Provide a comprehensive definition of Design Thinking, including its essential characteristics and principles. **04**

Q.3 **Attempt any three.** **18**

a) Discuss the role of creativity and innovation in organizations and their impact on business performance.

b) What is the importance of empathy in Design Thinking?

c) Define leadership and explain its different types. How can effective leadership influence the success of an organization? Provide examples.

d) Explain the utilization of cognitive technology in decision-making processes.

e) Explain exemplary practices of effective leadership with relevant case studies.

Section – II

Q.4 **a)** Explain exemplary practices of effective leadership with relevant case studies. **06**

b) What is product solution fit, and how does it differ from product market fit? **04**

Q.5 **Attempt any three.** **18**

a) Define the development lifecycle and explain its significance in product development.

b) What are the benefits of implementing service design in organizations?

c) How can organizations effectively design a service to meet customer needs?

d) How does Intellectual Property (IP) play a role in product development and design thinking?

e) Explain any two successful case studies demonstrating design thinking in various engineering sectors.

SLR-BD-252

Seat No.	

Set P

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options. 14

1) What does GIS integrate spatial data with?
a) Other data resources b) Only tabular data
c) Only hard copy maps d) Only digital maps

2) What is the purpose of GIS software?
a) Data management and analysis
b) Creating physical maps
c) Collecting data only
d) Storing non-spatial data

3) Which of the following is a key function of an information system?
a) Data storage only
b) Data collection and processing
c) Document shredding
d) Manual calculations

4) Statistical data in GIS is primarily used for _____.
a) Data visualization b) Data analysis and interpretation
c) Data storage d) Data collection

5) Satellite data is most commonly used in GIS for _____.
a) Remote sensing b) Data entry
c) Statistical analysis d) Map digitization

6) A zone with a width created around a spatial feature is called as ____.
a) dissolve b) buffer
c) relation d) overlay

7) Network databases is to support relationships of _____.
a) many to many b) one to many
c) none of above d) all of above

8) The sensitivity of a sensor to detect slight differences in energy (brightness) is _____.
a) Spectral resolution b) Spatial resolution
c) Temporal resolution d) Radiometric resolution

9) Descriptive information provides qualitative data about the characteristics and conditions of Earth's surface features _____.
a) qualitative b) quantitative
c) both d) none

10) The instruments which provide electromagnetic radiation of specified wave length or a band of wave lengths to illuminate the earth surface, are called _____.
a) scanner b) passive sensors
c) active sensors d) none of these

11) Canal site selection using GIS is primarily concerned with _____.
a) Mapping the soil composition along the canal route
b) Studying land use in the surrounding areas
c) Identifying areas with the most water flow potential
d) Both a and c

12) What is the primary application of GIS in map revision?
a) To create new maps from scratch
b) To update and modify existing maps with current data
c) To design and print physical maps
d) To analyze spatial data for new projects

13) Which phase of GIS project planning involves the most detailed work on defining technical requirements and hardware/software needs?
a) feasibility study
b) planning and requirements analysis
c) design phase
d) testing phase

14) Which of the following is an example of a GIS design project task?
a) data model development
b) stakeholder consultation
c) site analysis and requirement definition
d) all of these

SLR-BD-252

Seat No.	

Set P

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch whenever necessary.

Section - I

Q.2 Attempt any four from the following. **16**
a) Describe commercial & open source GIS softwares.
b) Describe in detail data organisation method-layered based approach.
c) Describe field data & its collection methods.
d) Discuss advantages & disadvantages of aerial photographs.
e) Describe in detail run-length encoding.
f) Describe in detail about data analysis.

Q.3 Attempt any two from the following. **12**
a) Describe in detail digitizers, its process, advantages & disadvantages.
b) Describe the organisation of data in GIS.
c) Explain various data models used in DBMS in detail.

Section - II

Q.4 Attempt any four from the following. **16**
a) Explain in detail passive & active remote sensing with sketch.
b) Describe in detail metric information.
c) Describe application of GIS in dam site selection.
d) Describe application of GIS in soil erosion.
e) Explain in detail phases of planning & implementation.
f) Describe characteristics of advanced GIS projects.

Q.5 Attempt any two from the following. **12**
a) Describe need of integration of remote sensing & GIS in detail.
b) Describe key application of GIS in map revision.
c) Describe benefits of GIS implementation plan.

Seat No.	

Set **Q**

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options. **14**

1) The sensitivity of a sensor to detect slight differences in energy (brightness) is _____.
a) Spectral resolution b) Spatial resolution
c) Temporal resolution d) Radiometric resolution

2) Descriptive information provides qualitative data about the characteristics and conditions of Earth's surface features _____.
a) qualitative b) quantitative
c) both d) none

3) The instruments which provide electromagnetic radiation of specified wave length or a band of wave lengths to illuminate the earth surface, are called _____.
a) scanner b) passive sensors
c) active sensors d) none of these

4) Canal site selection using GIS is primarily concerned with _____.
a) Mapping the soil composition along the canal route
b) Studying land use in the surrounding areas
c) Identifying areas with the most water flow potential
d) Both a and c

5) What is the primary application of GIS in map revision?
a) To create new maps from scratch
b) To update and modify existing maps with current data
c) To design and print physical maps
d) To analyze spatial data for new projects

6) Which phase of GIS project planning involves the most detailed work on defining technical requirements and hardware/software needs?
a) feasibility study
b) planning and requirements analysis
c) design phase
d) testing phase

7) Which of the following is an example of a GIS design project task?
a) data model development
b) stakeholder consultation
c) site analysis and requirement definition
d) all of these

8) What does GIS integrate spatial data with?
a) Other data resources
b) Only tabular data
c) Only hard copy maps
d) Only digital maps

9) What is the purpose of GIS software?
a) Data management and analysis
b) Creating physical maps
c) Collecting data only
d) Storing non-spatial data

10) Which of the following is a key function of an information system?
a) Data storage only
b) Data collection and processing
c) Document shredding
d) Manual calculations

11) Statistical data in GIS is primarily used for _____.
a) Data visualization
b) Data analysis and interpretation
c) Data storage
d) Data collection

12) Satellite data is most commonly used in GIS for _____.
a) Remote sensing
b) Data entry
c) Statistical analysis
d) Map digitization

13) A zone with a width created around a spatial feature is called as ____.
a) dissolve
b) buffer
c) relation
d) overlay

14) Network databases is to support relationships of _____.
a) many to many
b) one to many
c) none of above
d) all of above

Seat No.	

Set **Q**

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch whenever necessary.

Section - I

Q.2 Attempt any four from the following. **16**

a) Describe commercial & open source GIS softwares.
b) Describe in detail data organisation method-layered based approach.
c) Describe field data & its collection methods.
d) Discuss advantages & disadvantages of aerial photographs.
e) Describe in detail run-length encoding.
f) Describe in detail about data analysis.

Q.3 Attempt any two from the following. **12**

a) Describe in detail digitizers, its process, advantages & disadvantages.
b) Describe the organisation of data in GIS.
c) Explain various data models used in DBMS in detail.

Section - II

Q.4 Attempt any four from the following. **16**

a) Explain in detail passive & active remote sensing with sketch.
b) Describe in detail metric information.
c) Describe application of GIS in dam site selection.
d) Describe application of GIS in soil erosion.
e) Explain in detail phases of planning & implementation.
f) Describe characteristics of advanced GIS projects.

Q.5 Attempt any two from the following. **12**

a) Describe need of integration of remote sensing & GIS in detail.
b) Describe key application of GIS in map revision.
c) Describe benefits of GIS implementation plan.

Seat No.	

Set **R**

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options. 14

1) Canal site selection using GIS is primarily concerned with _____.
a) Mapping the soil composition along the canal route
b) Studying land use in the surrounding areas
c) Identifying areas with the most water flow potential
d) Both a and c

2) What is the primary application of GIS in map revision?
a) To create new maps from scratch
b) To update and modify existing maps with current data
c) To design and print physical maps
d) To analyze spatial data for new projects

3) Which phase of GIS project planning involves the most detailed work on defining technical requirements and hardware/software needs?
a) feasibility study
b) planning and requirements analysis
c) design phase
d) testing phase

4) Which of the following is an example of a GIS design project task?
a) data model development
b) stakeholder consultation
c) site analysis and requirement definition
d) all of these

5) What does GIS integrate spatial data with?
a) Other data resources b) Only tabular data
c) Only hard copy maps d) Only digital maps

6) What is the purpose of GIS software?
a) Data management and analysis
b) Creating physical maps
c) Collecting data only
d) Storing non-spatial data

7) Which of the following is a key function of an information system?
a) Data storage only
b) Data collection and processing
c) Document shredding
d) Manual calculations

8) Statistical data in GIS is primarily used for _____.
a) Data visualization b) Data analysis and interpretation
c) Data storage d) Data collection

9) Satellite data is most commonly used in GIS for _____.
a) Remote sensing b) Data entry
c) Statistical analysis d) Map digitization

10) A zone with a width created around a spatial feature is called as ____.
a) dissolve b) buffer
c) relation d) overlay ___

11) Network databases is to support relationships of _____.
a) many to many b) one to many
c) none of above d) all of above

12) The sensitivity of a sensor to detect slight differences in energy (brightness) is _____.
a) Spectral resolution b) Spatial resolution
c) Temporal resolution d) Radiometric resolution

13) Descriptive information provides qualitative data about the characteristics and conditions of Earth's surface features _____.
a) qualitative b) quantitative
c) both d) none

14) The instruments which provide electromagnetic radiation of specified wave length or a band of wave lengths to illuminate the earth surface, are called _____.
a) scanner b) passive sensors
c) active sensors d) none of these

Seat No.	

Set **R**

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch whenever necessary.

Section - I

Q.2 Attempt any four from the following. **16**

a) Describe commercial & open source GIS softwares.
b) Describe in detail data organisation method-layered based approach.
c) Describe field data & its collection methods.
d) Discuss advantages & disadvantages of aerial photographs.
e) Describe in detail run-length encoding.
f) Describe in detail about data analysis.

Q.3 Attempt any two from the following. **12**

a) Describe in detail digitizers, its process, advantages & disadvantages.
b) Describe the organisation of data in GIS.
c) Explain various data models used in DBMS in detail.

Section - II

Q.4 Attempt any four from the following. **16**

a) Explain in detail passive & active remote sensing with sketch.
b) Describe in detail metric information.
c) Describe application of GIS in dam site selection.
d) Describe application of GIS in soil erosion.
e) Explain in detail phases of planning & implementation.
f) Describe characteristics of advanced GIS projects.

Q.5 Attempt any two from the following. **12**

a) Describe need of integration of remote sensing & GIS in detail.
b) Describe key application of GIS in map revision.
c) Describe benefits of GIS implementation plan.

Seat No.		Set	S

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given options. 14

1) A zone with a width created around a spatial feature is called as ____.
a) dissolve b) buffer
c) relation d) overlay

2) Network databases is to support relationships of _____.
a) many to many b) one to many
c) none of above d) all of above

3) The sensitivity of a sensor to detect slight differences in energy (brightness) is _____.
a) Spectral resolution b) Spatial resolution
c) Temporal resolution d) Radiometric resolution

4) Descriptive information provides qualitative data about the characteristics and conditions of Earth's surface features _____.
a) qualitative b) quantitative
c) both d) none

5) The instruments which provide electromagnetic radiation of specified wave length or a band of wave lengths to illuminate the earth surface, are called _____.
a) scanner b) passive sensors
c) active sensors d) none of these

6) Canal site selection using GIS is primarily concerned with _____.
a) Mapping the soil composition along the canal route
b) Studying land use in the surrounding areas
c) Identifying areas with the most water flow potential
d) Both a and c

7) What is the primary application of GIS in map revision?
a) To create new maps from scratch
b) To update and modify existing maps with current data
c) To design and print physical maps
d) To analyze spatial data for new projects

8) Which phase of GIS project planning involves the most detailed work on defining technical requirements and hardware/software needs?
a) feasibility study
b) planning and requirements analysis
c) design phase
d) testing phase

9) Which of the following is an example of a GIS design project task?
a) data model development
b) stakeholder consultation
c) site analysis and requirement definition
d) all of these

10) What does GIS integrate spatial data with?
a) Other data resources
b) Only tabular data
c) Only hard copy maps
d) Only digital maps

11) What is the purpose of GIS software?
a) Data management and analysis
b) Creating physical maps
c) Collecting data only
d) Storing non-spatial data

12) Which of the following is a key function of an information system?
a) Data storage only
b) Data collection and processing
c) Document shredding
d) Manual calculations

13) Statistical data in GIS is primarily used for _____.
a) Data visualization
b) Data analysis and interpretation
c) Data storage
d) Data collection

14) Satellite data is most commonly used in GIS for _____.
a) Remote sensing
b) Data entry
c) Statistical analysis
d) Map digitization

SLR-BD-252

Seat No.		Set	S

S. Y (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Introduction to Geographic Information System (CIVMDM-01B)

Day & Date: Thursday, 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat sketch whenever necessary.

Section - I

Q.2 Attempt any four from the following. **16**
a) Describe commercial & open source GIS softwares.
b) Describe in detail data organisation method-layered based approach.
c) Describe field data & its collection methods.
d) Discuss advantages & disadvantages of aerial photographs.
e) Describe in detail run-length encoding.
f) Describe in detail about data analysis.

Q.3 Attempt any two from the following. **12**
a) Describe in detail digitizers, its process, advantages & disadvantages.
b) Describe the organisation of data in GIS.
c) Explain various data models used in DBMS in detail.

Section - II

Q.4 Attempt any four from the following. **16**
a) Explain in detail passive & active remote sensing with sketch.
b) Describe in detail metric information.
c) Describe application of GIS in dam site selection.
d) Describe application of GIS in soil erosion.
e) Explain in detail phases of planning & implementation.
f) Describe characteristics of advanced GIS projects.

Q.5 Attempt any two from the following. **12**
a) Describe need of integration of remote sensing & GIS in detail.
b) Describe key application of GIS in map revision.
c) Describe benefits of GIS implementation plan.

SLR-BD-253

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is not a primary classification of engineering materials?
a) Metals b) Ceramics
c) Gases d) Polymers

2) Which property is most associated with metals?
a) High electrical conductivity b) High brittleness
c) Low melting point d) Low density

3) The Gibbs phase rule is given by:
a) $P + F = C - 1$ b) $P + F = C + 1$
c) $F = C - P + 2$ d) $F = C + P - 2$

4) Non-ferrous metals are primarily used for their:
a) High strength
b) High corrosion resistance and low density
c) Magnetic properties
d) Low melting point

5) In the eutectic transformation, liquid transforms into:
a) One solid phase b) Two solid phases
c) One liquid and one solid phase d) Three solid phases

6) Which of the following is a characteristic of brass alloy?
a) Primarily composed of copper and tin
b) Primarily composed of copper and zinc
c) Primarily composed, of copper and aluminum
d) Primarily composed of copper ana nickel

7) Bronze alloys are primarily composed of copper and:
a) Zinc b) Aluminum
c) Nickel d) Tin

8) Which of the following is an example of a thermoplastic polymer?
a) Bakelite b) Epoxy resin
c) Polystyrene d) Rubber

9) The ability of a polymer to return to its original shape after deformation is known as:
a) Ductility b) Elasticity
c) Malleability d) Toughness

10) Which of the following properties is enhanced by vulcanization of rubber?
a) High flexibility
b) Increased strength and resistance to wear
c) Decreased thermal stability
d) Decreased electrical resistance

11) Which of the following is NOT a characteristic of ceramic materials?
a) High melting points b) High electrical conductivity
c) Brittle nature d) Good wear resistance

12) Advanced ceramics are typically characterized by:
a) High ductility
b) Low strength
c) High thermal and electrical conductivity
d) High performance at high temperatures

13) Composite materials are widely used in the aerospace industry because they:
a) Are cost-effective and easily available
b) Provide high strength-to-weight ratio
c) Have low thermal resistance
d) Are magnetic in nature

14) Nanomaterials are commonly used in which of the following fields?
a) Drug delivery systems
b) Large-scale structural applications
c) Agricultural machinery
d) Waste disposal

SLR-BD-253

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two full questions from each section.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

SECTION – I

Q.2	**a)**	What are engineering materials, and how are they classified?	**07**
	b)	What is a phase diagram? Explain the different types of phase diagrams.	**07**
Q.3	**a)**	Discuss the phases present in the Fe-Fe_3C diagram at different compositions of carbon.	**07**
	b)	Discuss the composition and properties of plain carbon steels.	**07**
Q.4	**a)**	Discuss the composition and properties of brass and bronze.	**07**
	b)	Explain the properties and applications of Al-Cu alloys.	**07**

SECTION – II

Q.5	**a)**	Discuss the differences between thermoplastic and thermosetting polymers.	**07**
	b)	Explain how vulcanization is used to modify the physical properties of natural rubber.	**07**
Q.6	**a)**	What are ceramics, and what makes them different from metals and polymers?	**07**
	b)	Discuss the role of ceramics in the aerospace industry.	**07**
Q.7	**a)**	Explain the classification of composite materials.	**07**
	b)	Explain the role of nanomaterials in electronics and semiconductors.	**07**

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is an example of a thermoplastic polymer?
a) Bakelite b) Epoxy resin
c) Polystyrene d) Rubber

2) The ability of a polymer to return to its original shape after deformation is known as:
a) Ductility b) Elasticity
c) Malleability d) Toughness

3) Which of the following properties is enhanced by vulcanization of rubber?
a) High flexibility
b) Increased strength and resistance to wear
c) Decreased thermal stability
d) Decreased electrical resistance

4) Which of the following is NOT a characteristic of ceramic materials?
a) High melting points b) High electrical conductivity
c) Brittle nature d) Good wear resistance

5) Advanced ceramics are typically characterized by:
a) High ductility
b) Low strength
c) High thermal and electrical conductivity
d) High performance at high temperatures

6) Composite materials are widely used in the aerospace industry because they:
a) Are cost-effective and easily available
b) Provide high strength-to-weight ratio
c) Have low thermal resistance
d) Are magnetic in nature

7) Nanomaterials are commonly used in which of the following fields?
a) Drug delivery systems
b) Large-scale structural applications
c) Agricultural machinery
d) Waste disposal

8) Which of the following is not a primary classification of engineering materials?
a) Metals
b) Ceramics
c) Gases
d) Polymers

9) Which property is most associated with metals?
a) High electrical conductivity
b) High brittleness
c) Low melting point
d) Low density

10) The Gibbs phase rule is given by:
a) $\mathrm{P} + \mathrm{F} = \mathrm{C} - 1$
b) $\mathrm{P} + \mathrm{F} = \mathrm{C} + 1$
c) $\mathrm{F} = \mathrm{C} - \mathrm{P} + 2$
d) $\mathrm{F} = \mathrm{C} + \mathrm{P} - 2$

11) Non-ferrous metals are primarily used for their:
a) High strength
b) High corrosion resistance and low density
c) Magnetic properties
d) Low melting point

12) In the eutectic transformation, liquid transforms into:
a) One solid phase
b) Two solid phases
c) One liquid and one solid phase
d) Three solid phases

13) Which of the following is a characteristic of brass alloy?
a) Primarily composed of copper and tin
b) Primarily composed of copper and zinc
c) Primarily composed, of copper and aluminum
d) Primarily composed of copper ana nickel

14) Bronze alloys are primarily composed of copper and:
a) Zinc
b) Aluminum
c) Nickel
d) Tin

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two full questions from each section.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

SECTION – I

Q.2	**a)**	What are engineering materials, and how are they classified?	**07**
	b)	What is a phase diagram? Explain the different types of phase diagrams.	**07**
Q.3	**a)**	Discuss the phases present in the Fe-Fe_3C diagram at different compositions of carbon.	**07**
	b)	Discuss the composition and properties of plain carbon steels.	**07**
Q.4	**a)**	Discuss the composition and properties of brass and bronze.	**07**
	b)	Explain the properties and applications of Al-Cu alloys.	**07**

SECTION – II

Q.5	**a)**	Discuss the differences between thermoplastic and thermosetting polymers.	**07**
	b)	Explain how vulcanization is used to modify the physical properties of natural rubber.	**07**
Q.6	**a)**	What are ceramics, and what makes them different from metals and polymers?	**07**
	b)	Discuss the role of ceramics in the aerospace industry.	**07**
Q.7	**a)**	Explain the classification of composite materials.	**07**
	b)	Explain the role of nanomaterials in electronics and semiconductors.	**07**

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is NOT a characteristic of ceramic materials?
a) High melting points b) High electrical conductivity
c) Brittle nature d) Good wear resistance

2) Advanced ceramics are typically characterized by:
a) High ductility
b) Low strength
c) High thermal and electrical conductivity
d) High performance at high temperatures

3) Composite materials are widely used in the aerospace industry because they:
a) Are cost-effective and easily available
b) Provide high strength-to-weight ratio
c) Have low thermal resistance
d) Are magnetic in nature

4) Nanomaterials are commonly used in which of the following fields?
a) Drug delivery systems
b) Large-scale structural applications
c) Agricultural machinery
d) Waste disposal

5) Which of the following is not a primary classification of engineering materials?
a) Metals b) Ceramics
c) Gases d) Polymers

6) Which property is most associated with metals?
a) High electrical conductivity b) High brittleness
c) Low melting point d) Low density

7) The Gibbs phase rule is given by:
a) $P + F = C - 1$ b) $P + F = C + 1$
c) $F = C - P + 2$ d) $F = C + P - 2$

8) Non-ferrous metals are primarily used for their:
a) High strength
b) High corrosion resistance and low density
c) Magnetic properties
d) Low melting point

9) In the eutectic transformation, liquid transforms into:
a) One solid phase b) Two solid phases
c) One liquid and one solid phase d) Three solid phases

10) Which of the following is a characteristic of brass alloy?
a) Primarily composed of copper and tin
b) Primarily composed of copper and zinc
c) Primarily composed, of copper and aluminum
d) Primarily composed of copper ana nickel

11) Bronze alloys are primarily composed of copper and:
a) Zinc b) Aluminum
c) Nickel d) Tin

12) Which of the following is an example of a thermoplastic polymer?
a) Bakelite b) Epoxy resin
c) Polystyrene d) Rubber

13) The ability of a polymer to return to its original shape after deformation is known as:
a) Ductility b) Elasticity
c) Malleability d) Toughness

14) Which of the following properties is enhanced by vulcanization of rubber?
a) High flexibility
b) Increased strength and resistance to wear
c) Decreased thermal stability
d) Decreased electrical resistance

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two full questions from each section.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

SECTION – I

Q.2	**a)**	What are engineering materials, and how are they classified?	**07**
	b)	What is a phase diagram? Explain the different types of phase diagrams.	**07**
Q.3	**a)**	Discuss the phases present in the Fe-Fe_3C diagram at different compositions of carbon.	**07**
	b)	Discuss the composition and properties of plain carbon steels.	**07**
Q.4	**a)**	Discuss the composition and properties of brass and bronze.	**07**
	b)	Explain the properties and applications of Al-Cu alloys.	**07**

SECTION – II

Q.5	**a)**	Discuss the differences between thermoplastic and thermosetting polymers.	**07**
	b)	Explain how vulcanization is used to modify the physical properties of natural rubber.	**07**
Q.6	**a)**	What are ceramics, and what makes them different from metals and polymers?	**07**
	b)	Discuss the role of ceramics in the aerospace industry.	**07**
Q.7	**a)**	Explain the classification of composite materials.	**07**
	b)	Explain the role of nanomaterials in electronics and semiconductors.	**07**

Seat No.		Set	S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of the following is a characteristic of brass alloy?
a) Primarily composed of copper and tin
b) Primarily composed of copper and zinc
c) Primarily composed, of copper and aluminum
d) Primarily composed of copper ana nickel

2) Bronze alloys are primarily composed of copper and:
a) Zinc b) Aluminum
c) Nickel d) Tin

3) Which of the following is an example of a thermoplastic polymer?
a) Bakelite b) Epoxy resin
c) Polystyrene d) Rubber

4) The ability of a polymer to return to its original shape after deformation is known as:
a) Ductility b) Elasticity
c) Malleability d) Toughness

5) Which of the following properties is enhanced by vulcanization of rubber?
a) High flexibility
b) Increased strength and resistance to wear
c) Decreased thermal stability
d) Decreased electrical resistance

6) Which of the following is NOT a characteristic of ceramic materials?
a) High melting points b) High electrical conductivity
c) Brittle nature d) Good wear resistance

7) Advanced ceramics are typically characterized by:
a) High ductility
b) Low strength
c) High thermal and electrical conductivity
d) High performance at high temperatures

8) Composite materials are widely used in the aerospace industry because they:
a) Are cost-effective and easily available
b) Provide high strength-to-weight ratio
c) Have low thermal resistance
d) Are magnetic in nature

9) Nanomaterials are commonly used in which of the following fields?
a) Drug delivery systems
b) Large-scale structural applications
c) Agricultural machinery
d) Waste disposal

10) Which of the following is not a primary classification of engineering materials?
a) Metals
b) Ceramics
c) Gases
d) Polymers

11) Which property is most associated with metals?
a) High electrical conductivity
b) High brittleness
c) Low melting point
d) Low density

12) The Gibbs phase rule is given by:
a) $\mathrm{P} + \mathrm{F} = \mathrm{C} - 1$
b) $\mathrm{P} + \mathrm{F} = \mathrm{C} + 1$
c) $\mathrm{F} = \mathrm{C} - \mathrm{P} + 2$
d) $\mathrm{F} = \mathrm{C} + \mathrm{P} - 2$

13) Non-ferrous metals are primarily used for their:
a) High strength
b) High corrosion resistance and low density
c) Magnetic properties
d) Low melting point

14) In the eutectic transformation, liquid transforms into:
a) One solid phase
b) Two solid phases
c) One liquid and one solid phase
d) Three solid phases

SLR-BD-253

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Fundamentals of Material science and Engineering (MECHMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) Attempt any two full questions from each section.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

SECTION – I

Q.2	**a)**	What are engineering materials, and how are they classified?	**07**
	b)	What is a phase diagram? Explain the different types of phase diagrams.	**07**
Q.3	**a)**	Discuss the phases present in the Fe-Fe_3C diagram at different compositions of carbon.	**07**
	b)	Discuss the composition and properties of plain carbon steels.	**07**
Q.4	**a)**	Discuss the composition and properties of brass and bronze.	**07**
	b)	Explain the properties and applications of Al-Cu alloys.	**07**

SECTION – II

Q.5	**a)**	Discuss the differences between thermoplastic and thermosetting polymers.	**07**
	b)	Explain how vulcanization is used to modify the physical properties of natural rubber.	**07**
Q.6	**a)**	What are ceramics, and what makes them different from metals and polymers?	**07**
	b)	Discuss the role of ceramics in the aerospace industry.	**07**
Q.7	**a)**	Explain the classification of composite materials.	**07**
	b)	Explain the role of nanomaterials in electronics and semiconductors.	**07**

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the primary purpose of management?
a) To maximize profits
b) To achieve organizational goals efficiently
c) To manage resources effectively
d) To implement policies

2) Which approach emphasizes the interdependence of various organizational functions?
a) Classical Approach b) Systems Approach
c) Behavioral Approach d) Contingency Approach

3) What is NOT a function of managers?
a) Planning b) Organizing
c) Playing d) Controlling

4) Which of the following is a responsibility of managers regarding social responsibility?
a) Maximizing shareholder wealth
b) Ensuring employee satisfaction
c) Contributing to community welfare
d) Minimizing costs

5) What is the first step in the planning process?
a) Developing alternatives b) Setting objectives
c) Implementing plans d) Evaluating results

6) Which type of plan is designed to cover a short period?
a) Strategic Plan b) Tactical Plan
c) Operational Plan d) Contingency Plan

7) Which of the following is a part of the staffing function?
a) Budgeting b) Training
c) Planning d) Controlling

8) Which theory focuses on the hierarchy of needs to motivate employees?
a) Herzberg's Two-Factor Theory
b) McGregor's Theory X and Y
c) Maslow's Hierarchy of Needs
d) Adams' Equity Theory

9) What is the main purpose of controlling in management?
a) To set goals
b) To ensure that organizational activities are aligned with plans
c) To improve employee morale
d) To increase production

10) What type of costs includes costs associated with preventing defects?
a) Internal failure costs b) External failure costs
c) Appraisal costs d) Prevention costs

11) Which quality guru is known for his work in the field of quality improvement through statistical methods?
a) Philip Crosby b) W. Edwards Deming
c) Joseph Juran d) Kaoru Ishikawa

12) Which chart is used to monitor the mean of a process over time?
a) R-chart b) P-chart
c) C-chart d) X-bar chart

13) Acceptance sampling is primarily concerned with:
a) Evaluating the entire production process
b) Inspecting all items produced
c) Testing a sample to infer about the quality of the entire lot
d) Conducting customer satisfaction surveys

14) What is the primary goal of employee involvement in TQM?
a) To increase profits
b) To enhance product quality through teamwork and engagement
c) To reduce the number of employees
d) To focus solely on production output

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section – I, Q. No. 3 is compulsory and attempt any two questions from the remaining questions.
1) In Section – II, Q. No. 6 is compulsory and attempt any two questions from the remaining questions.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.
4) Draw neat-labelled diagrams wherever necessary.
5) Use of log table and calculators is allowed.

Section – I

Q.2 **a)** What are managerial skills and managerial roles? **05**
b) Explain the Social responsibilities and ethics in management. **04**

Q.3 **a)** What is planning? Explain advantages and disadvantages of planning? **05**
b) What are the types of organizations? Explain Problems with organizational level. **05**

Q.4 **a)** Define Leadership. Explain four extreme styles. **05**
b) Discuss types of communication by taking suitable example. **04**

Q.5 **Write short note on any three.** **09**
a) Channel of distribution
b) Functions of Managers
c) Methods of Departmentation
d) Explain Maslow's theory
e) Decision making

Section – II

Q.6 **a)** Define productivity. How does material management impact the productivity of a manufacturing unit? **05**
b) Explain how the production process is planned and controlled in batch production systems. **05**

Q.7	**a)**	Describe the importance of supplier partnerships in Total Quality Management. What are the key aspects that define a successful supplier partnership?	**05**
	b)	Explain the concept of employee involvement in TQM. How does fostering employee participation contribute to improved quality and productivity?	**04**
Q.8	**a)**	Explain the importance of Training and Development in enhancing employee performance. How can training programs be aligned with organizational goals?	**05**
	b)	What are the objectives of Human Resource Management (HRM)? Discuss how HRM helps in managing employee relations and improving organizational efficiency.	**04**

Q.9 Write short note on any three. **09**

- **a)** Material Requirement Planning (MRP)
- **b)** Batch Production
- **c)** Factors to improve productivity
- **d)** Functions of Production Planning and Control (PPC)
- **e)** Mass Production - Advantages and Disadvantages

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Which theory focuses on the hierarchy of needs to motivate employees?
a) Herzberg's Two-Factor Theory
b) McGregor's Theory X and Y
c) Maslow's Hierarchy of Needs
d) Adams' Equity Theory

2) What is the main purpose of controlling in management?
a) To set goals
b) To ensure that organizational activities are aligned with plans
c) To improve employee morale
d) To increase production

3) What type of costs includes costs associated with preventing defects?
a) Internal failure costs b) External failure costs
c) Appraisal costs d) Prevention costs

4) Which quality guru is known for his work in the field of quality improvement through statistical methods?
a) Philip Crosby b) W. Edwards Deming
c) Joseph Juran d) Kaoru Ishikawa

5) Which chart is used to monitor the mean of a process over time?
a) R-chart b) P-chart
c) C-chart d) X-bar chart

6) Acceptance sampling is primarily concerned with:
a) Evaluating the entire production process
b) Inspecting all items produced
c) Testing a sample to infer about the quality of the entire lot
d) Conducting customer satisfaction surveys

7) What is the primary goal of employee involvement in TQM?
a) To increase profits
b) To enhance product quality through teamwork and engagement
c) To reduce the number of employees
d) To focus solely on production output

8) What is the primary purpose of management?
a) To maximize profits
b) To achieve organizational goals efficiently
c) To manage resources effectively
d) To implement policies

9) Which approach emphasizes the interdependence of various organizational functions?
a) Classical Approach b) Systems Approach
c) Behavioral Approach d) Contingency Approach

10) What is NOT a function of managers?
a) Planning b) Organizing
c) Playing d) Controlling

11) Which of the following is a responsibility of managers regarding social responsibility?
a) Maximizing shareholder wealth
b) Ensuring employee satisfaction
c) Contributing to community welfare
d) Minimizing costs

12) What is the first step in the planning process?
a) Developing alternatives b) Setting objectives
c) Implementing plans d) Evaluating results

13) Which type of plan is designed to cover a short period?
a) Strategic Plan b) Tactical Plan
c) Operational Plan d) Contingency Plan

14) Which of the following is a part of the staffing function?
a) Budgeting b) Training
c) Planning d) Controlling

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section – I, Q. No. 3 is compulsory and attempt any two questions from the remaining questions.
1) In Section – II, Q. No. 6 is compulsory and attempt any two questions from the remaining questions.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.
4) Draw neat-labelled diagrams wherever necessary.
5) Use of log table and calculators is allowed.

Section – I

Q.2 **a)** What are managerial skills and managerial roles? **05**
b) Explain the Social responsibilities and ethics in management. **04**

Q.3 **a)** What is planning? Explain advantages and disadvantages of planning? **05**
b) What are the types of organizations? Explain Problems with organizational level. **05**

Q.4 **a)** Define Leadership. Explain four extreme styles. **05**
b) Discuss types of communication by taking suitable example. **04**

Q.5 **Write short note on any three.** **09**
a) Channel of distribution
b) Functions of Managers
c) Methods of Departmentation
d) Explain Maslow's theory
e) Decision making

Section – II

Q.6 **a)** Define productivity. How does material management impact the productivity of a manufacturing unit? **05**
b) Explain how the production process is planned and controlled in batch production systems. **05**

Q.7	**a)**	Describe the importance of supplier partnerships in Total Quality Management. What are the key aspects that define a successful supplier partnership?	**05**
	b)	Explain the concept of employee involvement in TQM. How does fostering employee participation contribute to improved quality and productivity?	**04**
Q.8	**a)**	Explain the importance of Training and Development in enhancing employee performance. How can training programs be aligned with organizational goals?	**05**
	b)	What are the objectives of Human Resource Management (HRM)? Discuss how HRM helps in managing employee relations and improving organizational efficiency.	**04**

Q.9 Write short note on any three. **09**

- **a)** Material Requirement Planning (MRP)
- **b)** Batch Production
- **c)** Factors to improve productivity
- **d)** Functions of Production Planning and Control (PPC)
- **e)** Mass Production - Advantages and Disadvantages

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which quality guru is known for his work in the field of quality improvement through statistical methods?
a) Philip Crosby b) W. Edwards Deming
c) Joseph Juran d) Kaoru Ishikawa

2) Which chart is used to monitor the mean of a process over time?
a) R-chart b) P-chart
c) C-chart d) X-bar chart

3) Acceptance sampling is primarily concerned with:
a) Evaluating the entire production process
b) Inspecting all items produced
c) Testing a sample to infer about the quality of the entire lot
d) Conducting customer satisfaction surveys

4) What is the primary goal of employee involvement in TQM?
a) To increase profits
b) To enhance product quality through teamwork and engagement
c) To reduce the number of employees
d) To focus solely on production output

5) What is the primary purpose of management?
a) To maximize profits
b) To achieve organizational goals efficiently
c) To manage resources effectively
d) To implement policies

6) Which approach emphasizes the interdependence of various organizational functions?

a) Classical Approach b) Systems Approach
c) Behavioral Approach d) Contingency Approach

7) What is NOT a function of managers?

a) Planning b) Organizing
c) Playing d) Controlling

8) Which of the following is a responsibility of managers regarding social responsibility?

a) Maximizing shareholder wealth
b) Ensuring employee satisfaction
c) Contributing to community welfare
d) Minimizing costs

9) What is the first step in the planning process?

a) Developing alternatives b) Setting objectives
c) Implementing plans d) Evaluating results

10) Which type of plan is designed to cover a short period?

a) Strategic Plan b) Tactical Plan
c) Operational Plan d) Contingency Plan

11) Which of the following is a part of the staffing function?

a) Budgeting b) Training
c) Planning d) Controlling

12) Which theory focuses on the hierarchy of needs to motivate employees?

a) Herzberg's Two-Factor Theory
b) McGregor's Theory X and Y
c) Maslow's Hierarchy of Needs
d) Adams' Equity Theory

13) What is the main purpose of controlling in management?

a) To set goals
b) To ensure that organizational activities are aligned with plans
c) To improve employee morale
d) To increase production

14) What type of costs includes costs associated with preventing defects?

a) Internal failure costs b) External failure costs
c) Appraisal costs d) Prevention costs

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section – I, Q. No. 3 is compulsory and attempt any two questions from the remaining questions.
1) In Section – II, Q. No. 6 is compulsory and attempt any two questions from the remaining questions.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.
4) Draw neat-labelled diagrams wherever necessary.
5) Use of log table and calculators is allowed.

Section – I

Q.2 **a)** What are managerial skills and managerial roles? **05**
b) Explain the Social responsibilities and ethics in management. **04**

Q.3 **a)** What is planning? Explain advantages and disadvantages of planning? **05**
b) What are the types of organizations? Explain Problems with organizational level. **05**

Q.4 **a)** Define Leadership. Explain four extreme styles. **05**
b) Discuss types of communication by taking suitable example. **04**

Q.5 **Write short note on any three.** **09**
a) Channel of distribution
b) Functions of Managers
c) Methods of Departmentation
d) Explain Maslow's theory
e) Decision making

Section – II

Q.6 **a)** Define productivity. How does material management impact the productivity of a manufacturing unit? **05**
b) Explain how the production process is planned and controlled in batch production systems. **05**

Q.7	**a)**	Describe the importance of supplier partnerships in Total Quality Management. What are the key aspects that define a successful supplier partnership?	**05**
	b)	Explain the concept of employee involvement in TQM. How does fostering employee participation contribute to improved quality and productivity?	**04**
Q.8	**a)**	Explain the importance of Training and Development in enhancing employee performance. How can training programs be aligned with organizational goals?	**05**
	b)	What are the objectives of Human Resource Management (HRM)? Discuss how HRM helps in managing employee relations and improving organizational efficiency.	**04**

Q.9 Write short note on any three. **09**

- **a)** Material Requirement Planning (MRP)
- **b)** Batch Production
- **c)** Factors to improve productivity
- **d)** Functions of Production Planning and Control (PPC)
- **e)** Mass Production - Advantages and Disadvantages

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which type of plan is designed to cover a short period?
a) Strategic Plan b) Tactical Plan
c) Operational Plan d) Contingency Plan

2) Which of the following is a part of the staffing function?
a) Budgeting b) Training
c) Planning d) Controlling

3) Which theory focuses on the hierarchy of needs to motivate employees?
a) Herzberg's Two-Factor Theory
b) McGregor's Theory X and Y
c) Maslow's Hierarchy of Needs
d) Adams' Equity Theory

4) What is the main purpose of controlling in management?
a) To set goals
b) To ensure that organizational activities are aligned with plans
c) To improve employee morale
d) To increase production

5) What type of costs includes costs associated with preventing defects?
a) Internal failure costs b) External failure costs
c) Appraisal costs d) Prevention costs

6) Which quality guru is known for his work in the field of quality improvement through statistical methods?
a) Philip Crosby b) W. Edwards Deming
c) Joseph Juran d) Kaoru Ishikawa

7) Which chart is used to monitor the mean of a process over time?
a) R-chart b) P-chart
c) C-chart d) X-bar chart

8) Acceptance sampling is primarily concerned with:
a) Evaluating the entire production process
b) Inspecting all items produced
c) Testing a sample to infer about the quality of the entire lot
d) Conducting customer satisfaction surveys

9) What is the primary goal of employee involvement in TQM?
a) To increase profits
b) To enhance product quality through teamwork and engagement
c) To reduce the number of employees
d) To focus solely on production output

10) What is the primary purpose of management?
a) To maximize profits
b) To achieve organizational goals efficiently
c) To manage resources effectively
d) To implement policies

11) Which approach emphasizes the interdependence of various organizational functions?
a) Classical Approach b) Systems Approach
c) Behavioral Approach d) Contingency Approach

12) What is NOT a function of managers?
a) Planning b) Organizing
c) Playing d) Controlling

13) Which of the following is a responsibility of managers regarding social responsibility?
a) Maximizing shareholder wealth
b) Ensuring employee satisfaction
c) Contributing to community welfare
d) Minimizing costs

14) What is the first step in the planning process?
a) Developing alternatives b) Setting objectives
c) Implementing plans d) Evaluating results

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Industrial Management (MECHMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) In Section – I, Q. No. 3 is compulsory and attempt any two questions from the remaining questions.
1) In Section – II, Q. No. 6 is compulsory and attempt any two questions from the remaining questions.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.
4) Draw neat-labelled diagrams wherever necessary.
5) Use of log table and calculators is allowed.

Section – I

Q.2 **a)** What are managerial skills and managerial roles? **05**
b) Explain the Social responsibilities and ethics in management. **04**

Q.3 **a)** What is planning? Explain advantages and disadvantages of planning? **05**
b) What are the types of organizations? Explain Problems with organizational level. **05**

Q.4 **a)** Define Leadership. Explain four extreme styles. **05**
b) Discuss types of communication by taking suitable example. **04**

Q.5 **Write short note on any three.** **09**
a) Channel of distribution
b) Functions of Managers
c) Methods of Departmentation
d) Explain Maslow's theory
e) Decision making

Section – II

Q.6 **a)** Define productivity. How does material management impact the productivity of a manufacturing unit? **05**
b) Explain how the production process is planned and controlled in batch production systems. **05**

Q.7	**a)**	Describe the importance of supplier partnerships in Total Quality Management. What are the key aspects that define a successful supplier partnership?	**05**
	b)	Explain the concept of employee involvement in TQM. How does fostering employee participation contribute to improved quality and productivity?	**04**
Q.8	**a)**	Explain the importance of Training and Development in enhancing employee performance. How can training programs be aligned with organizational goals?	**05**
	b)	What are the objectives of Human Resource Management (HRM)? Discuss how HRM helps in managing employee relations and improving organizational efficiency.	**04**

Q.9 Write short note on any three. **09**

- **a)** Material Requirement Planning (MRP)
- **b)** Batch Production
- **c)** Factors to improve productivity
- **d)** Functions of Production Planning and Control (PPC)
- **e)** Mass Production - Advantages and Disadvantages

Seat No.		Set	P

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The terms in SOP are called _____.
a) max terms b) min terms
c) mid terms d) sum terms

2) The number of cells in a K-map with n- variables.
a) 2n b) n^2
c) 2^n d) n

3) The logical sum of two or more logical product terms is called _____.
a) SOP b) POS
c) OR operation d) NAND operation

4) A Karnaugh map (K-map) is an abstract form of _____ diagram organized as a matrix of squares.
a) Venn Diagram b) Cycle Diagram
c) Block diagram d) Triangular Diagram

5) If A and B are the inputs of a half adder, the sum is given by _____.
a) A AND B b) A OR B
c) A XOR B d) A EX-NOR B

6) Let A and B is the input of a Subtractor, then the output will be _____.
a) A XOR B b) A AND B
c) A OR B d) A EX-NOR B

7) What is a multiplexer?
a) It is a type of decoder which decodes several inputs and gives one output
b) A multiplexer is a device which converts many signals into one
c) It takes one input and results into many output
d) It is a type of encoder which decodes several inputs and gives one output

8) A basic S-R flip-flop can be constructed by cross-coupling of which basic logic gates?
a) AND or OR gates
b) XOR or XNOR gates
c) NOR or NAND gates
d) AND or NOR gates

9) In S-R flip-flop, if Q = 0 the output is said to be _____.
a) Set
b) Reset
c) Previous state
d) Current state

10) A D-Flip flop is said to be transparent, when _____.
a) the output is Low
b) the output is High
c) the output follows clock
d) the output follows input

11) How many stable state/states present in flip-flop?
a) 1
b) 0
c) 2
d) 4

12) How many natural states will there be in a 4-bit ripple counter?
a) 4
b) 8
c) 16
d) 32

13) How many flip-flops are required to construct a decade counter?
a) 4
b) 8
c) 5
d) 10

14) A 4-bit counter has a maximum modulus of _____.
a) 3
b) 6
c) 8
d) 16

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) Explain Standard representation of logic function.
b) Express Boolean function $F = xy + x'z$ as a product of Max-terms.
c) Explain Half Adder with logic diagram.
d) Explain 1:4 De-Multiplexer with truth Table and logic diagram.
e) Explain stepwise procedure for K-map solution.

Q.3 Attempt any two. **12**

a) Explain Binary to Gray conversion in details.
b) Explain Full Adder with suitable diagram
c) Solve using K Map -

$$F\ (A, B, C, D)\ = \sum (0, 2, 5, 7, 8, 10, 13, 15)$$

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic SR Flip-flop using logic gates.
b) Explain D-Flip-Flop with suitable diagram.
c) Differentiate between Synchronous and Asynchronous sequential circuit.
d) Explain PISO shift register.
e) Explain Race-Round condition. How this condition will overcome?

Q.5 Attempt any two. **12**

a) Design MOD-10 Counter.
b) Explain JK Flip flop with suitable diagram, and truth table.
c) Explain 4-bit UP/DOWN counter with suitable diagram.

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) A basic S-R flip-flop can be constructed by cross-coupling of which basic logic gates?
a) AND or OR gates b) XOR or XNOR gates
c) NOR or NAND gates d) AND or NOR gates

2) In S-R flip-flop, if Q = 0 the output is said to be _____.
a) Set b) Reset
c) Previous state d) Current state

3) A D-Flip flop is said to be transparent, when _____.
a) the output is Low b) the output is High
c) the output follows clock d) the output follows input

4) How many stable state/states present in flip-flop?
a) 1 b) 0
c) 2 d) 4

5) How many natural states will there be in a 4-bit ripple counter?
a) 4 b) 8
c) 16 d) 32

6) How many flip-flops are required to construct a decade counter?
a) 4 b) 8
c) 5 d) 10

7) A 4-bit counter has a maximum modulus of _____.
a) 3 b) 6
c) 8 d) 16

8) The terms in SOP are called _____.

a) max terms b) min terms
c) mid terms d) sum terms

9) The number of cells in a K-map with n- variables.

a) 2n b) n^2
c) 2^n d) n

10) The logical sum of two or more logical product terms is called _____.

a) SOP b) POS
c) OR operation d) NAND operation

11) A Karnaugh map (K-map) is an abstract form of _____ diagram organized as a matrix of squares.

a) Venn Diagram b) Cycle Diagram
c) Block diagram d) Triangular Diagram

12) If A and B are the inputs of a half adder, the sum is given by _____.

a) A AND B b) A OR B
c) A XOR B d) A EX-NOR B

13) Let A and B is the input of a Subtractor, then the output will be _____.

a) A XOR B b) A AND B
c) A OR B d) A EX-NOR B

14) What is a multiplexer?

a) It is a type of decoder which decodes several inputs and gives one output
b) A multiplexer is a device which converts many signals into one
c) It takes one input and results into many output
d) It is a type of encoder which decodes several inputs and gives one output

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) Explain Standard representation of logic function.
b) Express Boolean function $F = xy + x'z$ as a product of Max-terms.
c) Explain Half Adder with logic diagram.
d) Explain 1:4 De-Multiplexer with truth Table and logic diagram.
e) Explain stepwise procedure for K-map solution.

Q.3 Attempt any two. **12**

a) Explain Binary to Gray conversion in details.
b) Explain Full Adder with suitable diagram
c) Solve using K Map -

$$F\ (A, B, C, D)\ = \sum (0, 2, 5, 7, 8, 10, 13, 15)$$

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic SR Flip-flop using logic gates.
b) Explain D-Flip-Flop with suitable diagram.
c) Differentiate between Synchronous and Asynchronous sequential circuit.
d) Explain PISO shift register.
e) Explain Race-Round condition. How this condition will overcome?

Q.5 Attempt any two. **12**

a) Design MOD-10 Counter.
b) Explain JK Flip flop with suitable diagram, and truth table.
c) Explain 4-bit UP/DOWN counter with suitable diagram.

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) How many stable state/states present in flip-flop?
a) 1 b) 0
c) 2 d) 4

2) How many natural states will there be in a 4-bit ripple counter?
a) 4 b) 8
c) 16 d) 32

3) How many flip-flops are required to construct a decade counter?
a) 4 b) 8
c) 5 d) 10

4) A 4-bit counter has a maximum modulus of _____.
a) 3 b) 6
c) 8 d) 16

5) The terms in SOP are called _____.
a) max terms b) min terms
c) mid terms d) sum terms

6) The number of cells in a K-map with n- variables.
a) 2n b) n^2
c) 2^n d) n

7) The logical sum of two or more logical product terms is called _____.
a) SOP b) POS
c) OR operation d) NAND operation

8) A Karnaugh map (K-map) is an abstract form of _____ diagram organized as a matrix of squares.

a) Venn Diagram b) Cycle Diagram
c) Block diagram d) Triangular Diagram

9) If A and B are the inputs of a half adder, the sum is given by _____.

a) A AND B b) A OR B
c) A XOR B d) A EX-NOR B

10) Let A and B is the input of a Subtractor, then the output will be _____.

a) A XOR B b) A AND B
c) A OR B d) A EX-NOR B

11) What is a multiplexer?

a) It is a type of decoder which decodes several inputs and gives one output
b) A multiplexer is a device which converts many signals into one
c) It takes one input and results into many output
d) It is a type of encoder which decodes several inputs and gives one output

12) A basic S-R flip-flop can be constructed by cross-coupling of which basic logic gates?

a) AND or OR gates b) XOR or XNOR gates
c) NOR or NAND gates d) AND or NOR gates

13) In S-R flip-flop, if Q = 0 the output is said to be _____.

a) Set b) Reset
c) Previous state d) Current state

14) A D-Flip flop is said to be transparent, when _____.

a) the output is Low b) the output is High
c) the output follows clock d) the output follows input

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) Explain Standard representation of logic function.
b) Express Boolean function $F = xy + x'z$ as a product of Max-terms.
c) Explain Half Adder with logic diagram.
d) Explain 1:4 De-Multiplexer with truth Table and logic diagram.
e) Explain stepwise procedure for K-map solution.

Q.3 Attempt any two. **12**

a) Explain Binary to Gray conversion in details.
b) Explain Full Adder with suitable diagram
c) Solve using K Map -

$$F\ (A, B, C, D)\ = \sum (0, 2, 5, 7, 8, 10, 13, 15)$$

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic SR Flip-flop using logic gates.
b) Explain D-Flip-Flop with suitable diagram.
c) Differentiate between Synchronous and Asynchronous sequential circuit.
d) Explain PISO shift register.
e) Explain Race-Round condition. How this condition will overcome?

Q.5 Attempt any two. **12**

a) Design MOD-10 Counter.
b) Explain JK Flip flop with suitable diagram, and truth table.
c) Explain 4-bit UP/DOWN counter with suitable diagram.

Seat No.		Set	S

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) Let A and B is the input of a Subtractor, then the output will be _____.
a) A XOR B b) A AND B
c) A OR B d) A EX-NOR B

2) What is a multiplexer?
a) It is a type of decoder which decodes several inputs and gives one output
b) A multiplexer is a device which converts many signals into one
c) It takes one input and results into many output
d) It is a type of encoder which decodes several inputs and gives one output

3) A basic S-R flip-flop can be constructed by cross-coupling of which basic logic gates?
a) AND or OR gates b) XOR or XNOR gates
c) NOR or NAND gates d) AND or NOR gates

4) In S-R flip-flop, if Q = 0 the output is said to be _____.
a) Set b) Reset
c) Previous state d) Current state

5) A D-Flip flop is said to be transparent, when _____.
a) the output is Low b) the output is High
c) the output follows clock d) the output follows input

6) How many stable state/states present in flip-flop?
a) 1 b) 0
c) 2 d) 4

7) How many natural states will there be in a 4-bit ripple counter?
a) 4 b) 8
c) 16 d) 32

8) How many flip-flops are required to construct a decade counter?
a) 4 b) 8
c) 5 d) 10

9) A 4-bit counter has a maximum modulus of _____.
a) 3 b) 6
c) 8 d) 16

10) The terms in SOP are called _____.
a) max terms b) min terms
c) mid terms d) sum terms

11) The number of cells in a K-map with n- variables.
a) 2n b) n^2
c) 2^n d) n

12) The logical sum of two or more logical product terms is called _____.
a) SOP b) POS
c) OR operation d) NAND operation

13) A Karnaugh map (K-map) is an abstract form of _____ diagram organized as a matrix of squares.
a) Venn Diagram b) Cycle Diagram
c) Block diagram d) Triangular Diagram

14) If A and B are the inputs of a half adder, the sum is given by _____.
a) A AND B b) A OR B
c) A XOR B d) A EX-NOR B

SLR-BD-255

Seat No.	

Set S

S.Y. (B. Tech) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Digital Techniques (ENTMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) Explain Standard representation of logic function.
b) Express Boolean function $F = xy + x'z$ as a product of Max-terms.
c) Explain Half Adder with logic diagram.
d) Explain 1:4 De-Multiplexer with truth Table and logic diagram.
e) Explain stepwise procedure for K-map solution.

Q.3 Attempt any two. **12**

a) Explain Binary to Gray conversion in details.
b) Explain Full Adder with suitable diagram
c) Solve using K Map -

$$F\ (A, B, C, D)\ = \sum (0, 2, 5, 7, 8, 10, 13, 15)$$

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic SR Flip-flop using logic gates.
b) Explain D-Flip-Flop with suitable diagram.
c) Differentiate between Synchronous and Asynchronous sequential circuit.
d) Explain PISO shift register.
e) Explain Race-Round condition. How this condition will overcome?

Q.5 Attempt any two. **12**

a) Design MOD-10 Counter.
b) Explain JK Flip flop with suitable diagram, and truth table.
c) Explain 4-bit UP/DOWN counter with suitable diagram.

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Thermocouple generate output voltage according to _____.
a) Circuit parameters b) Humidity
c) Temperature d) Voltage

2) Sensor is a type of transducer.
a) True b) False

3) Which factor affects the least while selection of sensor?
a) Size b) Accuracy
c) Colour d) Durability

4) Which sensor should one prefer for accurate measurement of distance upto 1 meter?
a) Ultrasonic sensor b) Infrared sensor
c) PIR sensor d) Photoresistor sensor

5) IR sensors can't work in dark environment.
a) True b) False

6) Which sensor should be used for calculating humidity?
a) DHT11 b) LM335Z/NOPB
c) HC-SR04 d) MPX10DP

7) What is the primary purpose of a strain gauge?
a) Measure temperature
b) Measure pressure
c) Measure deformation or strain
d) Measure voltage

8) What is a Wheatstone bridge used for in the context of strain gauges?
a) To amplify the signal
b) To convert mechanical strain to a voltage output
c) To filter noise from the signal
d) To measure temperature

9) Signal conditioning is carried out in _____.
a) Transducer housing b) Processor
c) Network interface d) None of the mentioned

10) What principle does a thermocouple operate on?
a) Seebeck effect b) Peltier effect
c) Joule heating d) Hall effect

11) Which material is most commonly used in RTDs for temperature sensing?
a) Copper b) Aluminum
c) Platinum d) Nickel

12) What is the typical temperature range for standard RTDs?
a) -200 to 500 °C b) -50 to 200 °C
c) 0 to 100 °C d) -100 to 1000 °C

13) What type of electrode is commonly used in a pHsensor?
a) Reference electrode b) Glass electrode
c) Metal electrode d) Carbon electrode

14) What is the output of atypical pHsensor?
a) Voltage b) Resistance
c) Current d) Frequency

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any Four. **16**

a) Define Motion Transducer. Explain different types of motion sensor with example.
b) Write a short note on sensor selection.
c) Define Sensor & Transducer. How do they differ from each other?
d) What is Calibration? With the help of block diagram explain procedure of calibration.
e) Explain concept of strain gauge & light intensity.
f) Describe concept of motion transducer in detail.

Q.3 Attempt any two. **12**

a) Discuss the classification of sensor based on Measurand. Provide the example of each type and their application.
b) State the working principle of LDR. Explain the construction & working of it. Also state advantages, disadvantages & application of it.
c) Write a note on:-
1) Temperature sensing
2) Light Intensity
3) Strain gauge
4) Magnetic field Sensor

Section – II

Q.4 Attempt any Four. **16**

a) With the help of neat sketch explain concept of LVDT.
b) Illustrate concept of ultrasonic sensor & Chemical sensor in detail
c) With the help of explain RTD.
d) With the help of neat sketch explain concept of RVDT.
e) Describe the concept of motion transducer.

Q.5 Attempt any two. **12**

a) With the help of neat sketch explain concept of AC Tachometer & DC Tachometer.

b) Define following concepts:

1) Humidity Sensor
2) Vibration Sensor
3) Gas Sensor

c) With the help of neat sketch explain Thermocouple & Thermistor.

Seat No.	

Set Q

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) What is a Wheatstone bridge used for in the context of strain gauges?
a) To amplify the signal
b) To convert mechanical strain to a voltage output
c) To filter noise from the signal
d) To measure temperature

2) Signal conditioning is carried out in _____.
a) Transducer housing b) Processor
c) Network interface d) None of the mentioned

3) What principle does a thermocouple operate on?
a) Seebeck effect b) Peltier effect
c) Joule heating d) Hall effect

4) Which material is most commonly used in RTDs for temperature sensing?
a) Copper b) Aluminum
c) Platinum d) Nickel

5) What is the typical temperature range for standard RTDs?
a) -200 to 500 °C b) -50 to 200 °C
c) 0 to 100 °C d) -100 to 1000 °C

6) What type of electrode is commonly used in a pHsensor?
a) Reference electrode b) Glass electrode
c) Metal electrode d) Carbon electrode

7) What is the output of atypical pHsensor?
a) Voltage b) Resistance
c) Current d) Frequency

8) Thermocouple generate output voltage according to _____.
a) Circuit parameters b) Humidity
c) Temperature d) Voltage

9) Sensor is a type of transducer.
a) True b) False

10) Which factor affects the least while selection of sensor?
a) Size b) Accuracy
c) Colour d) Durability

11) Which sensor should one prefer for accurate measurement of distance upto 1 meter?
a) Ultrasonic sensor b) Infrared sensor
c) PIR sensor d) Photoresistor sensor

12) IR sensors can't work in dark environment.
a) True b) False

13) Which sensor should be used for calculating humidity?
a) DHT11 b) LM335Z/NOPB
c) HC-SR04 d) MPX10DP

14) What is the primary purpose of a strain gauge?
a) Measure temperature
b) Measure pressure
c) Measure deformation or strain
d) Measure voltage

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any Four. **16**

a) Define Motion Transducer. Explain different types of motion sensor with example.
b) Write a short note on sensor selection.
c) Define Sensor & Transducer. How do they differ from each other?
d) What is Calibration? With the help of block diagram explain procedure of calibration.
e) Explain concept of strain gauge & light intensity.
f) Describe concept of motion transducer in detail.

Q.3 Attempt any two. **12**

a) Discuss the classification of sensor based on Measurand. Provide the example of each type and their application.
b) State the working principle of LDR. Explain the construction & working of it. Also state advantages, disadvantages & application of it.
c) Write a note on:-
1) Temperature sensing
2) Light Intensity
3) Strain gauge
4) Magnetic field Sensor

Section – II

Q.4 Attempt any Four. **16**

a) With the help of neat sketch explain concept of LVDT.
b) Illustrate concept of ultrasonic sensor & Chemical sensor in detail
c) With the help of explain RTD.
d) With the help of neat sketch explain concept of RVDT.
e) Describe the concept of motion transducer.

Q.5 Attempt any two. **12**

a) With the help of neat sketch explain concept of AC Tachometer & DC Tachometer.

b) Define following concepts:

1) Humidity Sensor
2) Vibration Sensor
3) Gas Sensor

c) With the help of neat sketch explain Thermocouple & Thermistor.

Seat No.	

Set R

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which material is most commonly used in RTDs for temperature sensing?
a) Copper b) Aluminum
c) Platinum d) Nickel

2) What is the typical temperature range for standard RTDs?
a) -200 to 500 °C b) -50 to 200 °C
c) 0 to 100 °C d) -100 to 1000 °C

3) What type of electrode is commonly used in a pHsensor?
a) Reference electrode b) Glass electrode
c) Metal electrode d) Carbon electrode

4) What is the output of atypical pHsensor?
a) Voltage b) Resistance
c) Current d) Frequency

5) Thermocouple generate output voltage according to _____.
a) Circuit parameters b) Humidity
c) Temperature d) Voltage

6) Sensor is a type of transducer.
a) True b) False

7) Which factor affects the least while selection of sensor?
a) Size b) Accuracy
c) Colour d) Durability

8) Which sensor should one prefer for accurate measurement of distance upto 1 meter?

a) Ultrasonic sensor
b) Infrared sensor
c) PIR sensor
d) Photoresistor sensor

9) IR sensors can't work in dark environment.

a) True
b) False

10) Which sensor should be used for calculating humidity?

a) DHT11
b) LM335Z/NOPB
c) HC-SR04
d) MPX10DP

11) What is the primary purpose of a strain gauge?

a) Measure temperature
b) Measure pressure
c) Measure deformation or strain
d) Measure voltage

12) What is a Wheatstone bridge used for in the context of strain gauges?

a) To amplify the signal
b) To convert mechanical strain to a voltage output
c) To filter noise from the signal
d) To measure temperature

13) Signal conditioning is carried out in _____.

a) Transducer housing
b) Processor
c) Network interface
d) None of the mentioned

14) What principle does a thermocouple operate on?

a) Seebeck effect
b) Peltier effect
c) Joule heating
d) Hall effect

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any Four. **16**

a) Define Motion Transducer. Explain different types of motion sensor with example.
b) Write a short note on sensor selection.
c) Define Sensor & Transducer. How do they differ from each other?
d) What is Calibration? With the help of block diagram explain procedure of calibration.
e) Explain concept of strain gauge & light intensity.
f) Describe concept of motion transducer in detail.

Q.3 Attempt any two. **12**

a) Discuss the classification of sensor based on Measurand. Provide the example of each type and their application.
b) State the working principle of LDR. Explain the construction & working of it. Also state advantages, disadvantages & application of it.
c) Write a note on:-
1) Temperature sensing
2) Light Intensity
3) Strain gauge
4) Magnetic field Sensor

Section – II

Q.4 Attempt any Four. **16**

a) With the help of neat sketch explain concept of LVDT.
b) Illustrate concept of ultrasonic sensor & Chemical sensor in detail
c) With the help of explain RTD.
d) With the help of neat sketch explain concept of RVDT.
e) Describe the concept of motion transducer.

Q.5 Attempt any two. **12**

a) With the help of neat sketch explain concept of AC Tachometer & DC Tachometer.

b) Define following concepts:

1) Humidity Sensor
2) Vibration Sensor
3) Gas Sensor

c) With the help of neat sketch explain Thermocouple & Thermistor.

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which sensor should be used for calculating humidity?
a) DHT11 b) LM335Z/NOPB
c) HC-SR04 d) MPX10DP

2) What is the primary purpose of a strain gauge?
a) Measure temperature
b) Measure pressure
c) Measure deformation or strain
d) Measure voltage

3) What is a Wheatstone bridge used for in the context of strain gauges?
a) To amplify the signal
b) To convert mechanical strain to a voltage output
c) To filter noise from the signal
d) To measure temperature

4) Signal conditioning is carried out in _____.
a) Transducer housing b) Processor
c) Network interface d) None of the mentioned

5) What principle does a thermocouple operate on?
a) Seebeck effect b) Peltier effect
c) Joule heating d) Hall effect

6) Which material is most commonly used in RTDs for temperature sensing?
a) Copper b) Aluminum
c) Platinum d) Nickel

7) What is the typical temperature range for standard RTDs?
a) -200 to 500 °C b) -50 to 200 °C
c) 0 to 100 °C d) -100 to 1000 °C

8) What type of electrode is commonly used in a pHsensor?
a) Reference electrode b) Glass electrode
c) Metal electrode d) Carbon electrode

9) What is the output of atypical pHsensor?
a) Voltage b) Resistance
c) Current d) Frequency

10) Thermocouple generate output voltage according to _____.
a) Circuit parameters b) Humidity
c) Temperature d) Voltage

11) Sensor is a type of transducer.
a) True b) False

12) Which factor affects the least while selection of sensor?
a) Size b) Accuracy
c) Colour d) Durability

13) Which sensor should one prefer for accurate measurement of distance upto 1 meter?
a) Ultrasonic sensor b) Infrared sensor
c) PIR sensor d) Photoresistor sensor

14) IR sensors can't work in dark environment.
a) True b) False

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Sensor Technology (ENTMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt any Four. **16**

a) Define Motion Transducer. Explain different types of motion sensor with example.
b) Write a short note on sensor selection.
c) Define Sensor & Transducer. How do they differ from each other?
d) What is Calibration? With the help of block diagram explain procedure of calibration.
e) Explain concept of strain gauge & light intensity.
f) Describe concept of motion transducer in detail.

Q.3 Attempt any two. **12**

a) Discuss the classification of sensor based on Measurand. Provide the example of each type and their application.
b) State the working principle of LDR. Explain the construction & working of it. Also state advantages, disadvantages & application of it.
c) Write a note on:-
1) Temperature sensing
2) Light Intensity
3) Strain gauge
4) Magnetic field Sensor

Section – II

Q.4 Attempt any Four. **16**

a) With the help of neat sketch explain concept of LVDT.
b) Illustrate concept of ultrasonic sensor & Chemical sensor in detail
c) With the help of explain RTD.
d) With the help of neat sketch explain concept of RVDT.
e) Describe the concept of motion transducer.

Q.5 Attempt any two. **12**

a) With the help of neat sketch explain concept of AC Tachometer & DC Tachometer.

b) Define following concepts:

1) Humidity Sensor
2) Vibration Sensor
3) Gas Sensor

c) With the help of neat sketch explain Thermocouple & Thermistor.

SLR-BD-257

Seat No.		Set	P

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the output of print(3 * 4.5 // 2)?
a) 5 b) 6
c) 7 d) 8

2) Which data type is mutable in Python?
a) int b) float
c) tuple d) list

3) What is the primary purpose of the Python interpreter?
a) To convert Python code into machine code directly.
b) To compile Python code into a .exe file.
c) To interpret and execute Python code line by line.
d) To optimize Python code for faster execution.

4) How do you import a function myfunc from a module mymodule?
a) import mymodule .myfunc
b) from mymodule import myfunc
c) import myfunc from mymodule
d) from myfunc import mymodule

5) Which statement about tuples in Python is true?
a) Tuples can be modified after creation.
b) Tuples are indexed starting from 1.
c) Tuples use square brackets for element access.
d) Tuples are immutable.

6) Given s = 'Hello World!', what does s[1:5] evaluate to?
a) 'Hell' b) 'ello'
c) 'ello ' d) None of the above

7) Which keyword is used to handle exceptions in Python?

a) catch b) except
c) handle d) recover

8) What does the self parameter represent in Python class methods?

a) It refers to the current instance of the class.
b) It is used to denote private attributes.
c) It is used for method overloading.
d) It refers to the superclass.

9) What does the following code output?

```
class MyClass:
    def greet(self):
    return "Hello!"
obj = MyClass()
print(obj.greet())
```

a) Hello! b) greet
c) Error d) None

10) How do you open a file myfile.txt in read mode in Python?

a) file = open('myfile.txt', 'r')
b) file = open('myfile.txf)
c) file = open('myfile.txt', mode='read')
d) file = open('myfile.txt', mode='w')

11) Which Python library is used for numerical operations and array manipulations?

a) numpy b) math
c) scipy d) statistics

12) Which Python module is commonly used for writing unit tests?

a) unittest b) pytest
c) testing d) check

13) Which module is used to generate pseudo-random numbers in Python?

a) random b) numpy
c) math d) os

14) What is the default logging level in Python?

a) DEBUG b) INFO
c) WARNING d) ERROR

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) What is python interpreter? Explain with neat diagram.
b) Differentiate between list and tuples in python.
c) Write a python program to check whether a given string is palindrome.
d) What are the class and objects in python? Explain with syntax and example.
e) What is exceptional handling in python? How it is implemented using try, except and finally block?

Q.3 Attempt any two. **12**

a) Illustrate following control structures and write syntax for each type of control structure.
1) Decision making statements
2) Iterative statements (Loop control statements)
3) Transfer statements
b) Explain string handling functions with syntax and example.
c) Explain inheritance in python with their types.

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic date and time types with syntax and example.
b) Differentiate between shallow copy and deep copy operations.
c) Write a python program to create a 2D Numpy array and perform basic operations like addition, subtraction, division and multiplication.
d) Implement a program to measure execution time of small code snippets.
e) Explain Logging facility in python with all levels of logging.

Q.5 Attempt any two. **12**

a) Explain mathematical functions and pseudo random functions with syntax and example.
b) Define data persistence and implement program for read & write operations on .csv file.
c) Explain the methods of testing and debugging in python. Explain unit test in python.

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What does the self parameter represent in Python class methods?
a) It refers to the current instance of the class.
b) It is used to denote private attributes.
c) It is used for method overloading.
d) It refers to the superclass.

2) What does the following code output?

```
class MyClass:
    def greet(self):
    return "Hello!"
obj = MyClass()
print(obj.greet())
```

a) Hello! b) greet
c) Error d) None

3) How do you open a file myfile.txt in read mode in Python?
a) file = open('myfile.txt', 'r')
b) file = open('myfile.txf)
c) file = open('myfile.txt', mode='read')
d) file = open('myfile.txt', mode='w')

4) Which Python library is used for numerical operations and array manipulations?
a) numpy b) math
c) scipy d) statistics

5) Which Python module is commonly used for writing unit tests?
a) unittest b) pytest
c) testing d) check

6) Which module is used to generate pseudo-random numbers in Python?

a) random b) numpy
c) math d) os

7) What is the default logging level in Python?

a) DEBUG b) INFO
c) WARNING d) ERROR

8) What is the output of print(3 * 4.5 // 2)?

a) 5 b) 6
c) 7 d) 8

9) Which data type is mutable in Python?

a) int b) float
c) tuple d) list

10) What is the primary purpose of the Python interpreter?

a) To convert Python code into machine code directly.
b) To compile Python code into a .exe file.
c) To interpret and execute Python code line by line.
d) To optimize Python code for faster execution.

11) How do you import a function myfunc from a module mymodule?

a) import mymodule .myfunc
b) from mymodule import myfunc
c) import myfunc from mymodule
d) from myfunc import mymodule

12) Which statement about tuples in Python is true?

a) Tuples can be modified after creation.
b) Tuples are indexed starting from 1.
c) Tuples use square brackets for element access.
d) Tuples are immutable.

13) Given s = 'Hello World!', what does s[1:5] evaluate to?

a) 'Hell' b) 'ello'
c) 'ello ' d) None of the above

14) Which keyword is used to handle exceptions in Python?

a) catch b) except
c) handle d) recover

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) What is python interpreter? Explain with neat diagram.
b) Differentiate between list and tuples in python.
c) Write a python program to check whether a given string is palindrome.
d) What are the class and objects in python? Explain with syntax and example.
e) What is exceptional handling in python? How it is implemented using try, except and finally block?

Q.3 Attempt any two. **12**

a) Illustrate following control structures and write syntax for each type of control structure.
1) Decision making statements
2) Iterative statements (Loop control statements)
3) Transfer statements
b) Explain string handling functions with syntax and example.
c) Explain inheritance in python with their types.

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic date and time types with syntax and example.
b) Differentiate between shallow copy and deep copy operations.
c) Write a python program to create a 2D Numpy array and perform basic operations like addition, subtraction, division and multiplication.
d) Implement a program to measure execution time of small code snippets.
e) Explain Logging facility in python with all levels of logging.

Q.5 Attempt any two. **12**

a) Explain mathematical functions and pseudo random functions with syntax and example.
b) Define data persistence and implement program for read & write operations on .csv file.
c) Explain the methods of testing and debugging in python. Explain unit test in python.

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which Python library is used for numerical operations and array manipulations?
a) numpy b) math
c) scipy d) statistics

2) Which Python module is commonly used for writing unit tests?
a) unittest b) pytest
c) testing d) check

3) Which module is used to generate pseudo-random numbers in Python?
a) random b) numpy
c) math d) os

4) What is the default logging level in Python?
a) DEBUG b) INFO
c) WARNING d) ERROR

5) What is the output of print(3 * 4.5 // 2)?
a) 5 b) 6
c) 7 d) 8

6) Which data type is mutable in Python?
a) int b) float
c) tuple d) list

7) What is the primary purpose of the Python interpreter?
a) To convert Python code into machine code directly.
b) To compile Python code into a .exe file.
c) To interpret and execute Python code line by line.
d) To optimize Python code for faster execution.

8) How do you import a function myfunc from a module mymodule?
a) import mymodule .myfunc
b) from mymodule import myfunc
c) import myfunc from mymodule
d) from myfunc import mymodule

9) Which statement about tuples in Python is true?
a) Tuples can be modified after creation.
b) Tuples are indexed starting from 1.
c) Tuples use square brackets for element access.
d) Tuples are immutable.

10) Given s = 'Hello World!', what does s[1:5] evaluate to?
a) 'Hell' b) 'ello'
c) 'ello ' d) None of the above

11) Which keyword is used to handle exceptions in Python?
a) catch b) except
c) handle d) recover

12) What does the self parameter represent in Python class methods?
a) It refers to the current instance of the class.
b) It is used to denote private attributes.
c) It is used for method overloading.
d) It refers to the superclass.

13) What does the following code output?

```
class MyClass:
    def greet(self):
    return "Hello!"
obj = MyClass()
print(obj.greet())
```

a) Hello! b) greet
c) Error d) None

14) How do you open a file myfile.txt in read mode in Python?
a) file = open('myfile.txt', 'r')
b) file = open('myfile.txf)
c) file = open('myfile.txt', mode='read')
d) file = open('myfile.txt', mode='w')

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) What is python interpreter? Explain with neat diagram.
b) Differentiate between list and tuples in python.
c) Write a python program to check whether a given string is palindrome.
d) What are the class and objects in python? Explain with syntax and example.
e) What is exceptional handling in python? How it is implemented using try, except and finally block?

Q.3 Attempt any two. **12**

a) Illustrate following control structures and write syntax for each type of control structure.
1) Decision making statements
2) Iterative statements (Loop control statements)
3) Transfer statements
b) Explain string handling functions with syntax and example.
c) Explain inheritance in python with their types.

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic date and time types with syntax and example.
b) Differentiate between shallow copy and deep copy operations.
c) Write a python program to create a 2D Numpy array and perform basic operations like addition, subtraction, division and multiplication.
d) Implement a program to measure execution time of small code snippets.
e) Explain Logging facility in python with all levels of logging.

Q.5 Attempt any two. **12**

a) Explain mathematical functions and pseudo random functions with syntax and example.
b) Define data persistence and implement program for read & write operations on .csv file.
c) Explain the methods of testing and debugging in python. Explain unit test in python.

Seat No.		Set	S

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Given s = 'Hello World!', what does s[1:5] evaluate to?
a) 'Hell' b) 'ello'
c) 'ello ' d) None of the above

2) Which keyword is used to handle exceptions in Python?
a) catch b) except
c) handle d) recover

3) What does the self parameter represent in Python class methods?
a) It refers to the current instance of the class.
b) It is used to denote private attributes.
c) It is used for method overloading.
d) It refers to the superclass.

4) What does the following code output?

```
class MyClass:
    def greet(self):
    return "Hello!"
obj = MyClass()
print(obj.greet())
```

a) Hello! b) greet
c) Error d) None

5) How do you open a file myfile.txt in read mode in Python?
a) file = open('myfile.txt', 'r')
b) file = open('myfile.txf)
c) file = open('myfile.txt', mode='read')
d) file = open('myfile.txt', mode='w')

6) Which Python library is used for numerical operations and array manipulations?

a) numpy b) math
c) scipy d) statistics

7) Which Python module is commonly used for writing unit tests?

a) unittest b) pytest
c) testing d) check

8) Which module is used to generate pseudo-random numbers in Python?

a) random b) numpy
c) math d) os

9) What is the default logging level in Python?

a) DEBUG b) INFO
c) WARNING d) ERROR

10) What is the output of print(3 * 4.5 // 2)?

a) 5 b) 6
c) 7 d) 8

11) Which data type is mutable in Python?

a) int b) float
c) tuple d) list

12) What is the primary purpose of the Python interpreter?

a) To convert Python code into machine code directly.
b) To compile Python code into a .exe file.
c) To interpret and execute Python code line by line.
d) To optimize Python code for faster execution.

13) How do you import a function myfunc from a module mymodule?

a) import mymodule .myfunc
b) from mymodule import myfunc
c) import myfunc from mymodule
d) from myfunc import mymodule

14) Which statement about tuples in Python is true?

a) Tuples can be modified after creation.
b) Tuples are indexed starting from 1.
c) Tuples use square brackets for element access.
d) Tuples are immutable.

SLR-BD-257

Seat No.	

Set S

S.Y. (B.Tech.) (Sem-I) (NEP New) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Programming basics using Python (CSEMDM-01A)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four. **16**

a) What is python interpreter? Explain with neat diagram.
b) Differentiate between list and tuples in python.
c) Write a python program to check whether a given string is palindrome.
d) What are the class and objects in python? Explain with syntax and example.
e) What is exceptional handling in python? How it is implemented using try, except and finally block?

Q.3 Attempt any two. **12**

a) Illustrate following control structures and write syntax for each type of control structure.
1) Decision making statements
2) Iterative statements (Loop control statements)
3) Transfer statements
b) Explain string handling functions with syntax and example.
c) Explain inheritance in python with their types.

Section – II

Q.4 Attempt any Four. **16**

a) Explain basic date and time types with syntax and example.
b) Differentiate between shallow copy and deep copy operations.
c) Write a python program to create a 2D Numpy array and perform basic operations like addition, subtraction, division and multiplication.
d) Implement a program to measure execution time of small code snippets.
e) Explain Logging facility in python with all levels of logging.

Q.5 Attempt any two. **12**

a) Explain mathematical functions and pseudo random functions with syntax and example.
b) Define data persistence and implement program for read & write operations on .csv file.
c) Explain the methods of testing and debugging in python. Explain unit test in python.

SLR-BD-258

Seat No.		Set	P

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ model is good for well understood problems, short duration project, and automation of existing manual systems.
a) Waterfall b) Iterative enhancement
c) Prototyping d) Spiral

2) Software consists of ____.
a) Set of instructions + operating procedures
b) Set of programs
c) Programs + documentation + operating procedures
d) Programs + hardware manuals

3) SDLC is framework for ____
a) Requirement b) Design
c) Code & Test d) All of above

4) Black box testing is also called as ____.
a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

5) A detailed project schedule is never ____.
a) fixed b) variable
c) dynamic d) static

6) What is the sequence of maturity levels in CMM framework?
a) Initial, defined, repeatable, managed, and optimizing
b) Initial, defined, repeatable, optimizing, and managed
c) Initial, repeatable, defined, managed, and optimizing
d) Initial, repeatable, defined, optimizing, and managed

7) A ____ is logically separable part of program. It is a program unit that is discrete and identifiable with respect to compiling and loading.

a) Component b) Connector
c) Module d) None of above

8) Risk Management aims to ____ and then take action to minimize their effect on project.

a) Identify cost and estimation
b) Identify risks
c) Identify plan
d) All of above

9) The output of requirement process is ____

a) Validated SRS b) Validation
c) Problem analysis d) Verification

10) White Box Testing is also called as ____.

a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

11) Agile Software Development is depends on ____.

a) Incremental Development
b) Iterative Development
c) Linear Development
d) Both Incremental and Iterative Development

12) ____ is a first level of testing.

a) Unit testing b) Integration Testing
c) System Testing d) None of above

13) CMM means ____.

a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

14) Which of the following is/are characteristics of SRS?

a) Unambiguous b) Verifiable
c) Consistent d) All of above

Seat No.	

Set **P**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Solve: (Any Four) **16**

a) Explain Prototype model.
b) What is SRS? Explain characteristics of SRS.
c) Explain Entity Relationship diagram in detail.
d) Write a short note on Function Oriented Design.
e) Explain characteristics of software process.

Q.3 Solve: (Any Two) **12**

a) Define DFD with all notations and levels. Draw Zero level DFD for Hotel Management System.
b) Draw and Explain waterfall model with its strength and weaknesses.
c) Write a short note on high level design & detailed design.

SECTION – II

Q.4 Solve: (Any Two) **16**

a) Compare White and Black box testing.
b) Explain equivalence partitioning technique of black box testing.
c) Explain CMM with diagram.
d) What are levels of testing? Explain Unit Testing in detail.
e) Write a short note on Agile Project Management.

Q.5 Solve: (Any Two) **12**

a) Explain top down & bottom-up effort estimation technique.
b) Explain Software Configuration Management Process.
c) What is Scrum? Explain in detail Scrum methodology.

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Risk Management aims to ____ and then take action to minimize their effect on project.
a) Identify cost and estimation
b) Identify risks
c) Identify plan
d) All of above

2) The output of requirement process is ____
a) Validated SRS b) Validation
c) Problem analysis d) Verification

3) White Box Testing is also called as ____.
a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

4) Agile Software Development is depends on ____.
a) Incremental Development
b) Iterative Development
c) Linear Development
d) Both Incremental and Iterative Development

5) ____ is a first level of testing.
a) Unit testing b) Integration Testing
c) System Testing d) None of above

6) CMM means ____.
a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

7) Which of the following is/are characteristics of SRS?
a) Unambiguous b) Verifiable
c) Consistent d) All of above

8) ____ model is good for well understood problems, short duration project, and automation of existing manual systems.
a) Waterfall b) Iterative enhancement
c) Prototyping d) Spiral

9) Software consists of ____.
a) Set of instructions + operating procedures
b) Set of programs
c) Programs + documentation + operating procedures
d) Programs + hardware manuals

10) SDLC is framework for ____
a) Requirement b) Design
c) Code & Test d) All of above

11) Black box testing is also called as ____.
a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

12) A detailed project schedule is never ____.
a) fixed b) variable
c) dynamic d) static

13) What is the sequence of maturity levels in CMM framework?
a) Initial, defined, repeatable, managed, and optimizing
b) Initial, defined, repeatable, optimizing, and managed
c) Initial, repeatable, defined, managed, and optimizing
d) Initial, repeatable, defined, optimizing, and managed

14) A ____ is logically separable part of program. It is a program unit that is discrete and identifiable with respect to compiling and loading.
a) Component b) Connector
c) Module d) None of above

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Solve: (Any Four) **16**

a) Explain Prototype model.
b) What is SRS? Explain characteristics of SRS.
c) Explain Entity Relationship diagram in detail.
d) Write a short note on Function Oriented Design.
e) Explain characteristics of software process.

Q.3 Solve: (Any Two) **12**

a) Define DFD with all notations and levels. Draw Zero level DFD for Hotel Management System.
b) Draw and Explain waterfall model with its strength and weaknesses.
c) Write a short note on high level design & detailed design.

SECTION – II

Q.4 Solve: (Any Two) **16**

a) Compare White and Black box testing.
b) Explain equivalence partitioning technique of black box testing.
c) Explain CMM with diagram.
d) What are levels of testing? Explain Unit Testing in detail.
e) Write a short note on Agile Project Management.

Q.5 Solve: (Any Two) **12**

a) Explain top down & bottom-up effort estimation technique.
b) Explain Software Configuration Management Process.
c) What is Scrum? Explain in detail Scrum methodology.

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Agile Software Development is depends on ____.
a) Incremental Development
b) Iterative Development
c) Linear Development
d) Both Incremental and Iterative Development

2) ____ is a first level of testing.
a) Unit testing b) Integration Testing
c) System Testing d) None of above

3) CMM means ____.
a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

4) Which of the following is/are characteristics of SRS?
a) Unambiguous b) Verifiable
c) Consistent d) All of above

5) ____ model is good for well understood problems, short duration project, and automation of existing manual systems.
a) Waterfall b) Iterative enhancement
c) Prototyping d) Spiral

6) Software consists of ____.
a) Set of instructions + operating procedures
b) Set of programs
c) Programs + documentation + operating procedures
d) Programs + hardware manuals

7) SDLC is framework for ____

a) Requirement b) Design
c) Code & Test d) All of above

8) Black box testing is also called as ____.

a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

9) A detailed project schedule is never ____.

a) fixed b) variable
c) dynamic d) static

10) What is the sequence of maturity levels in CMM framework?

a) Initial, defined, repeatable, managed, and optimizing
b) Initial, defined, repeatable, optimizing, and managed
c) Initial, repeatable, defined, managed, and optimizing
d) Initial, repeatable, defined, optimizing, and managed

11) A ____ is logically separable part of program. It is a program unit that is discrete and identifiable with respect to compiling and loading.

a) Component b) Connector
c) Module d) None of above

12) Risk Management aims to ____ and then take action to minimize their effect on project.

a) Identify cost and estimation
b) Identify risks
c) Identify plan
d) All of above

13) The output of requirement process is ____

a) Validated SRS b) Validation
c) Problem analysis d) Verification

14) White Box Testing is also called as ____.

a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

SLR-BD-258

Seat No.	

Set R

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Solve: (Any Four) **16**

a) Explain Prototype model.
b) What is SRS? Explain characteristics of SRS.
c) Explain Entity Relationship diagram in detail.
d) Write a short note on Function Oriented Design.
e) Explain characteristics of software process.

Q.3 Solve: (Any Two) **12**

a) Define DFD with all notations and levels. Draw Zero level DFD for Hotel Management System.
b) Draw and Explain waterfall model with its strength and weaknesses.
c) Write a short note on high level design & detailed design.

SECTION – II

Q.4 Solve: (Any Two) **16**

a) Compare White and Black box testing.
b) Explain equivalence partitioning technique of black box testing.
c) Explain CMM with diagram.
d) What are levels of testing? Explain Unit Testing in detail.
e) Write a short note on Agile Project Management.

Q.5 Solve: (Any Two) **12**

a) Explain top down & bottom-up effort estimation technique.
b) Explain Software Configuration Management Process.
c) What is Scrum? Explain in detail Scrum methodology.

Seat No.	

Set **S**

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the sequence of maturity levels in CMM framework?
a) Initial, defined, repeatable, managed, and optimizing
b) Initial, defined, repeatable, optimizing, and managed
c) Initial, repeatable, defined, managed, and optimizing
d) Initial, repeatable, defined, optimizing, and managed

2) A ____ is logically separable part of program. It is a program unit that is discrete and identifiable with respect to compiling and loading.
a) Component b) Connector
c) Module d) None of above

3) Risk Management aims to ____ and then take action to minimize their effect on project.
a) Identify cost and estimation
b) Identify risks
c) Identify plan
d) All of above

4) The output of requirement process is ____
a) Validated SRS b) Validation
c) Problem analysis d) Verification

5) White Box Testing is also called as ____.
a) Functional testing b) Structural testing
c) Stress testing d) Interface testing

6) Agile Software Development is depends on ____.
a) Incremental Development
b) Iterative Development
c) Linear Development
d) Both Incremental and Iterative Development

7) ____ is a first level of testing.
a) Unit testing b) Integration Testing
c) System Testing d) None of above

8) CMM means ____.
a) Common Maturity Model b) Cost Maturity Model
c) Capability Maturity Model d) All

9) Which of the following is/are characteristics of SRS?
a) Unambiguous b) Verifiable
c) Consistent d) All of above

10) ____ model is good for well understood problems, short duration project, and automation of existing manual systems.
a) Waterfall b) Iterative enhancement
c) Prototyping d) Spiral

11) Software consists of ____.
a) Set of instructions + operating procedures
b) Set of programs
c) Programs + documentation + operating procedures
d) Programs + hardware manuals

12) SDLC is framework for ____
a) Requirement b) Design
c) Code & Test d) All of above

13) Black box testing is also called as ____.
a) Structural testing b) Interface testing
c) Stress testing d) Functional testing

14) A detailed project schedule is never ____.
a) fixed b) variable
c) dynamic d) static

SLR-BD-258

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Software Engineering (CSEMDM-01B)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

SECTION – I

Q.2 Solve: (Any Four) **16**

a) Explain Prototype model.
b) What is SRS? Explain characteristics of SRS.
c) Explain Entity Relationship diagram in detail.
d) Write a short note on Function Oriented Design.
e) Explain characteristics of software process.

Q.3 Solve: (Any Two) **12**

a) Define DFD with all notations and levels. Draw Zero level DFD for Hotel Management System.
b) Draw and Explain waterfall model with its strength and weaknesses.
c) Write a short note on high level design & detailed design.

SECTION – II

Q.4 Solve: (Any Two) **16**

a) Compare White and Black box testing.
b) Explain equivalence partitioning technique of black box testing.
c) Explain CMM with diagram.
d) What are levels of testing? Explain Unit Testing in detail.
e) Write a short note on Agile Project Management.

Q.5 Solve: (Any Two) **12**

a) Explain top down & bottom-up effort estimation technique.
b) Explain Software Configuration Management Process.
c) What is Scrum? Explain in detail Scrum methodology.

Seat No.	

Set P

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electric Vehicle Technology (EEHn-01A)

Day & Date: Friday, 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Who invented the battery?
a) Alessandro Volta b) Alexander Bell
c) Alessandro Bell d) Tim Southee

2) Combination of cell is known as battery.
a) True b) False

3) Full form ICV is_____.
a) Internal combustion vehicle b) Internet combustion vehicle
c) Internally combined vehicle d) Internet combined vehicle

4) Newtons third law of motion explains the two forces namely as 'action' and 'reaction' coming into action when the two bodies are in contact with each other. These two forces _____.
a) Always act on the same body.
b) Always act on the different bodies in opposite direction.
c) Have the same magnitude and direction.
d) Acts on either body at normal to each other.

5) The SI unit of force is _____.
a) Newton meter b) Newton
c) Newton per second d) Newton per square meter

6) If the force acting on the body is zero, its momentum is _____.
a) Zero b) Constant
c) Infinite d) None of the above

7) A passengers in a moving train tosses a coin which fall the behind him, observing this statement what can you say about the motion of the train tracks.

a) Accelerated b) Retarded
c) Along circular tracks d) Uniform

8) The hybrid electric vehicle consist of _____.

a) Motor Electric 1 + Motor Electric 2
b) NGV engine + Gasoline engine
c) Internal combustion engine + Electric Motor
d) None of the above

9) The correct statement about integrated motor assist (IMA) system.

a) This system is the basis of many series-parallel hybrid vehicle.
b) This system is capable of instantaneously switching from one power source to another or combining the two.
c) Produced by Honda
d) None of the above

10) What is the challenge with electric vehicle?

a) Vehicle durability b) Cell life
c) Cost d) Both a & b

11) What type od battery is used in an electric vehicle?

a) Lithium ion b) Nickle metal hydride
c) Both a & b d) None of the above

12) The solar heater function is to convert the solar energy into _____.

a) Electrical energy b) Thermal energy
c) Radiation d) None of the above

13) All electric vehicle stations need to be hardwired and permanently mounted.

a) True b) False

14) How many mile of range per hour will the average EV get while charging on a 32 amp 240 volt, level 2 charger.

a) About 5 b) About 25
c) About 55 d) None of the above

Seat No.	

Set **P**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electric Vehicle Technology (EEHn-01A)

Day & Date: Friday, 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four questions. **16**

a) Explain the brief history of electric vehicle.
b) Explain the all law of motion with briefly.
c) Explain in details of electric vehicle configuration (any two).
d) Write note on engine rating and fuel economy.
e) Define.
1) Propulsion power
2) Speed
3) Velocity
4) Acceleration
f) Draw and explain electric motor characteristics for D.C. series and D.C. compound motor.

Q.3 Attempt any Two questions. **12**

a) What are the various electric component of electric vehicle? Explain each component in details.
b) Write a brief note on vehicle dynamics.
c) Explain electric vehicle of general configuration.

Section – II

Q.4 Attempt any Four questions. **16**

a) What is the different types of Hybrid Drive trains and explain in one of them.
b) Explain the Environmental Benefits of SPCS.
c) Explain EVs infrastructure system.
d) Explain in details of Electric vehicle Architecture power trains.
e) Explain in details of electric vehicle supply Equipment.
f) Explain the charge point side EV connector type.

Q.5 Attempt any Two questions. **12**

a) Explain in details of series hybrid Vehicle & parallel hybrid Vehicle.
b) Explain in details of Energy storage.
c) Explain the Tesla for Electric vehicle.

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electric Vehicle Technology (EEHn-01A)

Day & Date: Friday, 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The hybrid electric vehicle consist of _____.
a) Motor Electric 1 + Motor Electric 2
b) NGV engine + Gasoline engine
c) Internal combustion engine + Electric Motor
d) None of the above

2) The correct statement about integrated motor assist (IMA) system.
a) This system is the basis of many series-parallel hybrid vehicle.
b) This system is capable of instantaneously switching from one power source to another or combining the two.
c) Produced by Honda
d) None of the above

3) What is the challenge with electric vehicle?
a) Vehicle durability b) Cell life
c) Cost d) Both a & b

4) What type od battery is used in an electric vehicle?
a) Lithium ion b) Nickle metal hydride
c) Both a & b d) None of the above

5) The solar heater function is to convert the solar energy into _____.
a) Electrical energy b) Thermal energy
c) Radiation d) None of the above

6) All electric vehicle stations need to be hardwired and permanently mounted.
a) True b) False

7) How many mile of range per hour will the average EV get while charging on a 32 amp 240 volt, level 2 charger.

a) About 5 b) About 25
c) About 55 d) None of the above

8) Who invented the battery?

a) Alessandro Volta b) Alexander Bell
c) Alessandro Bell d) Tim Southee

9) Combination of cell is known as battery.

a) True b) False

10) Full form ICV is_____.

a) Internal combustion vehicle b) Internet combustion vehicle
c) Internally combined vehicle d) Internet combined vehicle

11) Newtons third law of motion explains the two forces namely as 'action' and 'reaction' coming into action when the two bodies are in contact with each other. These two forces _____.

a) Always act on the same body.
b) Always act on the different bodies in opposite direction.
c) Have the same magnitude and direction.
d) Acts on either body at normal to each other.

12) The SI unit of force is _____.

a) Newton meter b) Newton
c) Newton per second d) Newton per square meter

13) If the force acting on the body is zero, its momentum is _____.

a) Zero b) Constant
c) Infinite d) None of the above

14) A passengers in a moving train tosses a coin which fall the behind him, observing this statement what can you say about the motion of the train tracks.

a) Accelerated b) Retarded
c) Along circular tracks d) Uniform

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electric Vehicle Technology (EEHn-01A)

Day & Date: Friday, 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four questions. **16**

a) Explain the brief history of electric vehicle.
b) Explain the all law of motion with briefly.
c) Explain in details of electric vehicle configuration (any two).
d) Write note on engine rating and fuel economy.
e) Define.
1) Propulsion power
2) Speed
3) Velocity
4) Acceleration
f) Draw and explain electric motor characteristics for D.C. series and D.C. compound motor.

Q.3 Attempt any Two questions. **12**

a) What are the various electric component of electric vehicle? Explain each component in details.
b) Write a brief note on vehicle dynamics.
c) Explain electric vehicle of general configuration.

Section – II

Q.4 Attempt any Four questions. **16**

a) What is the different types of Hybrid Drive trains and explain in one of them.
b) Explain the Environmental Benefits of SPCS.
c) Explain EVs infrastructure system.
d) Explain in details of Electric vehicle Architecture power trains.
e) Explain in details of electric vehicle supply Equipment.
f) Explain the charge point side EV connector type.

Q.5 Attempt any Two questions. **12**

a) Explain in details of series hybrid Vehicle & parallel hybrid Vehicle.
b) Explain in details of Energy storage.
c) Explain the Tesla for Electric vehicle.

Seat No.	

Set R

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electric Vehicle Technology (EEHn-01A)

Day & Date: Friday, 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What type od battery is used in an electric vehicle?
a) Lithium ion b) Nickle metal hydride
c) Both a & b d) None of the above

2) The solar heater function is to convert the solar energy into _____.
a) Electrical energy b) Thermal energy
c) Radiation d) None of the above

3) All electric vehicle stations need to be hardwired and permanently mounted.
a) True b) False

4) How many mile of range per hour will the average EV get while charging on a 32 amp 240 volt, level 2 charger.
a) About 5 b) About 25
c) About 55 d) None of the above

5) Who invented the battery?
a) Alessandro Volta b) Alexander Bell
c) Alessandro Bell d) Tim Southee

6) Combination of cell is known as battery.
a) True b) False

7) Full form ICV is_____.
a) Internal combustion vehicle b) Internet combustion vehicle
c) Internally combined vehicle d) Internet combined vehicle

8) Newtons third law of motion explains the two forces namely as 'action' and 'reaction' coming into action when the two bodies are in contact with each other. These two forces _____.

a) Always act on the same body.
b) Always act on the different bodies in opposite direction.
c) Have the same magnitude and direction.
d) Acts on either body at normal to each other.

9) The SI unit of force is _____.

a) Newton meter
b) Newton
c) Newton per second
d) Newton per square meter

10) If the force acting on the body is zero, its momentum is _____.

a) Zero
b) Constant
c) Infinite
d) None of the above

11) A passengers in a moving train tosses a coin which fall the behind him, observing this statement what can you say about the motion of the train tracks.

a) Accelerated
b) Retarded
c) Along circular tracks
d) Uniform

12) The hybrid electric vehicle consist of _____.

a) Motor Electric 1 + Motor Electric 2
b) NGV engine + Gasoline engine
c) Internal combustion engine + Electric Motor
d) None of the above

13) The correct statement about integrated motor assist (IMA) system.

a) This system is the basis of many series-parallel hybrid vehicle.
b) This system is capable of instantaneously switching from one power source to another or combining the two.
c) Produced by Honda
d) None of the above

14) What is the challenge with electric vehicle?

a) Vehicle durability
b) Cell life
c) Cost
d) Both a & b

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electric Vehicle Technology (EEHn-01A)

Day & Date: Friday, 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four questions. **16**

a) Explain the brief history of electric vehicle.
b) Explain the all law of motion with briefly.
c) Explain in details of electric vehicle configuration (any two).
d) Write note on engine rating and fuel economy.
e) Define.
1) Propulsion power
2) Speed
3) Velocity
4) Acceleration
f) Draw and explain electric motor characteristics for D.C. series and D.C. compound motor.

Q.3 Attempt any Two questions. **12**

a) What are the various electric component of electric vehicle? Explain each component in details.
b) Write a brief note on vehicle dynamics.
c) Explain electric vehicle of general configuration.

Section – II

Q.4 Attempt any Four questions. **16**

a) What is the different types of Hybrid Drive trains and explain in one of them.
b) Explain the Environmental Benefits of SPCS.
c) Explain EVs infrastructure system.
d) Explain in details of Electric vehicle Architecture power trains.
e) Explain in details of electric vehicle supply Equipment.
f) Explain the charge point side EV connector type.

Q.5 Attempt any Two questions. **12**

a) Explain in details of series hybrid Vehicle & parallel hybrid Vehicle.
b) Explain in details of Energy storage.
c) Explain the Tesla for Electric vehicle.

Seat No.		Set	S

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electric Vehicle Technology (EEHn-01A)

Day & Date: Friday, 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) If the force acting on the body is zero, its momentum is _____.
a) Zero b) Constant
c) Infinite d) None of the above

2) A passengers in a moving train tosses a coin which fall the behind him, observing this statement what can you say about the motion of the train tracks.
a) Accelerated b) Retarded
c) Along circular tracks d) Uniform

3) The hybrid electric vehicle consist of _____.
a) Motor Electric 1 + Motor Electric 2
b) NGV engine + Gasoline engine
c) Internal combustion engine + Electric Motor
d) None of the above

4) The correct statement about integrated motor assist (IMA) system.
a) This system is the basis of many series-parallel hybrid vehicle.
b) This system is capable of instantaneously switching from one power source to another or combining the two.
c) Produced by Honda
d) None of the above

5) What is the challenge with electric vehicle?
a) Vehicle durability b) Cell life
c) Cost d) Both a & b

6) What type od battery is used in an electric vehicle?
a) Lithium ion b) Nickle metal hydride
c) Both a & b d) None of the above

7) The solar heater function is to convert the solar energy into _____.
a) Electrical energy b) Thermal energy
c) Radiation d) None of the above

8) All electric vehicle stations need to be hardwired and permanently mounted.
a) True b) False

9) How many mile of range per hour will the average EV get while charging on a 32 amp 240 volt, level 2 charger.
a) About 5 b) About 25
c) About 55 d) None of the above

10) Who invented the battery?
a) Alessandro Volta b) Alexander Bell
c) Alessandro Bell d) Tim Southee

11) Combination of cell is known as battery.
a) True b) False

12) Full form ICV is_____.
a) Internal combustion vehicle b) Internet combustion vehicle
c) Internally combined vehicle d) Internet combined vehicle

13) Newtons third law of motion explains the two forces namely as 'action' and 'reaction' coming into action when the two bodies are in contact with each other. These two forces _____.
a) Always act on the same body.
b) Always act on the different bodies in opposite direction.
c) Have the same magnitude and direction.
d) Acts on either body at normal to each other.

14) The SI unit of force is _____.
a) Newton meter b) Newton
c) Newton per second d) Newton per square meter

SLR-BD-259

Seat No.	

Set S

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electric Vehicle Technology (EEHn-01A)

Day & Date: Friday, 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four questions. **16**

a) Explain the brief history of electric vehicle.
b) Explain the all law of motion with briefly.
c) Explain in details of electric vehicle configuration (any two).
d) Write note on engine rating and fuel economy.
e) Define.
1) Propulsion power
2) Speed
3) Velocity
4) Acceleration
f) Draw and explain electric motor characteristics for D.C. series and D.C. compound motor.

Q.3 Attempt any Two questions. **12**

a) What are the various electric component of electric vehicle? Explain each component in details.
b) Write a brief note on vehicle dynamics.
c) Explain electric vehicle of general configuration.

Section – II

Q.4 Attempt any Four questions. **16**

a) What is the different types of Hybrid Drive trains and explain in one of them.
b) Explain the Environmental Benefits of SPCS.
c) Explain EVs infrastructure system.
d) Explain in details of Electric vehicle Architecture power trains.
e) Explain in details of electric vehicle supply Equipment.
f) Explain the charge point side EV connector type.

Q.5 Attempt any Two questions. **12**

a) Explain in details of series hybrid Vehicle & parallel hybrid Vehicle.
b) Explain in details of Energy storage.
c) Explain the Tesla for Electric vehicle.

Seat No.		Set	P

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Advanced and Sustainable Energy Sources (EEHn-01B)

Day & Date: Friday, 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Heating value of coal is approximately.
a) 1000-2000 kcal / kg b) 2000-4000 kcal / kg
c) 5000-6500 kcal / kg d) 9000-10,500 kcal / kg

2) Water gas is a mixture of _____.
a) CO_2 and O_2 b) O_2 and H_2
c) H_2, N_2 and O_2 d) CO, N_2 and H_2

3) Which of the following contributes to the improvement of efficiency of Rankine cycle in a thermal power plant?
a) Reheating of steam at intermediate stage
b) Regeneration use of steam for heating boiler feed water
c) Use of high pressures
d) All of the above

4) Steam pressures usually used in thermal power plants are _____.
a) 5 kg/cm^2 to 10 kg/cm^2 b) 50 kg/cm^2 to 100 kg/cm^2
c) 110 kg/cm^2 to 170 kg/cm^2 d) 200 kg/cm^2 to 215 kg/cm^2

5) Permissible pH value of water for boilers is _____.
a) 1 b) 7
c) slightly more than 7 d) 10

6) A condenser in a thermal power plant condenses steam combing out of _____.
a) Boiler b) Super-heater
c) Economizer d) Turbine

7) In a hydro-electric plant a conduct system for taking water from the intake works to the turbine is known as _____.

a) Dam b) Reservoir
c) Penstock d) Surge tank

8) A Pelton wheel is _____.

a) inward flow impulse turbine
b) outward flow impulse turbine
c) inward flow reaction turbine
d) axial flow impulse turbine

9) In a thermal power plant cooling towers are used to _____.

a) condense low pressure steam
b) cool condensed steam
c) cool water used in condenser for condensing steam
d) cool feed water of boiler

10) Major constituent of methane gas is?

a) CO b) Methane
c) Oxygen d) Hydrogen

11) The firing order of a four cylinder engine is _____.

a) 1-2-4-3 b) 1-4-2-3
c) 1-2-3-4 d) 1-3-2-4

12) The performance of engines of different HP, RPM and sizes can be compared on the basis of _____.

a) specific fuel consumption b) compression ratio
c) clearance volume d) cylinder volume

13) In hydrothermal systems when steam, water and dissolved solids are available as source of energy, the entrained solids are removed by _____.

a) filters b) centrifugal separators
c) strainers d) none of the above

14) Tidal energy mainly makes use of _____.

a) kinetic energy of water
b) potential energy of water
c) both kinetic as well as potential energy of water
d) none of the above

Seat No.	

Set P

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Advanced and Sustainable Energy Sources (EEHn-01B)

Day & Date: Friday, 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four questions. **16**

a) Write a short note on fluidized bed combustion.
b) Explain the basic characteristics of Sunlight.
c) Discuss the advantages and disadvantages of breeder reactor.
d) Describe the water hammer.
e) Show the P-V, H-S and T-S diagram for Rankine Cycle.

Q.3 Attempt any Two questions. **12**

a) Explain with neat sketch diesel engine power plant.
b) Name the Components of Gas Turbine Power plants.
c) Explain with a neat sketch the working of a thermal electric power plant station and discuss the function of major components in it.

Section – II

Q.4 Attempt any Four questions. **16**

a) Explain the design of biomass power generation.
b) With neat sketches explain briefly the Tidal power plant.
c) Explain with a neat diagram of wind electric generating power plant.
d) Describe the significance of two-part tariff and three-part tariff.
e) Explain the term depreciation and discuss various methods of calculating the depreciation of an electrical plant.

Q.5 Attempt any Two Questions. **12**

a) Write short note turbo Electric Nano generators.
b) Explain the waste disposal options for Coal Power Plant.
c) Generalize the merits and demerits site selection of power plant.

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Advanced and Sustainable Energy Sources (EEHn-01B)

Day & Date: Friday, 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) A Pelton wheel is _____.
a) inward flow impulse turbine
b) outward flow impulse turbine
c) inward flow reaction turbine
d) axial flow impulse turbine

2) In a thermal power plant cooling towers are used to _____.
a) condense low pressure steam
b) cool condensed steam
c) cool water used in condenser for condensing steam
d) cool feed water of boiler

3) Major constituent of methane gas is?
a) CO b) Methane
c) Oxygen d) Hydrogen

4) The firing order of a four cylinder engine is _____.
a) 1-2-4-3 b) 1-4-2-3
c) 1-2-3-4 d) 1-3-2-4

5) The performance of engines of different HP, RPM and sizes can be compared on the basis of _____.
a) specific fuel consumption b) compression ratio
c) clearance volume d) cylinder volume

6) In hydrothermal systems when steam, water and dissolved solids are available as source of energy, the entrained solids are removed by _____.
a) filters b) centrifugal separators
c) strainers d) none of the above

7) Tidal energy mainly makes use of _____.
a) kinetic energy of water
b) potential energy of water
c) both kinetic as well as potential energy of water
d) none of the above

8) Heating value of coal is approximately.
a) 1000-2000 kcal / kg b) 2000-4000 kcal / kg
c) 5000-6500 kcal / kg d) 9000-10,500 kcal / kg

9) Water gas is a mixture of _____.
a) CO_2 and O_2 b) O_2 and H_2
c) H_2, N_2 and O_2 d) CO, N_2 and H_2

10) Which of the following contributes to the improvement of efficiency of Rankine cycle in a thermal power plant?
a) Reheating of steam at intermediate stage
b) Regeneration use of steam for heating boiler feed water
c) Use of high pressures
d) All of the above

11) Steam pressures usually used in thermal power plants are _____.
a) 5 kg/cm^2 to 10 kg/cm^2 b) 50 kg/cm^2 to 100 kg/cm^2
c) 110 kg/cm^2 to 170 kg/cm^2 d) 200 kg/cm^2 to 215 kg/cm^2

12) Permissible pH value of water for boilers is _____.
a) 1 b) 7
c) slightly more than 7 d) 10

13) A condenser in a thermal power plant condenses steam combing out of _____.
a) Boiler b) Super-heater
c) Economizer d) Turbine

14) In a hydro-electric plant a conduct system for taking water from the intake works to the turbine is known as _____.
a) Dam b) Reservoir
c) Penstock d) Surge tank

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Advanced and Sustainable Energy Sources (EEHn-01B)

Day & Date: Friday, 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four questions. **16**

a) Write a short note on fluidized bed combustion.
b) Explain the basic characteristics of Sunlight.
c) Discuss the advantages and disadvantages of breeder reactor.
d) Describe the water hammer.
e) Show the P-V, H-S and T-S diagram for Rankine Cycle.

Q.3 Attempt any Two questions. **12**

a) Explain with neat sketch diesel engine power plant.
b) Name the Components of Gas Turbine Power plants.
c) Explain with a neat sketch the working of a thermal electric power plant station and discuss the function of major components in it.

Section – II

Q.4 Attempt any Four questions. **16**

a) Explain the design of biomass power generation.
b) With neat sketches explain briefly the Tidal power plant.
c) Explain with a neat diagram of wind electric generating power plant.
d) Describe the significance of two-part tariff and three-part tariff.
e) Explain the term depreciation and discuss various methods of calculating the depreciation of an electrical plant.

Q.5 Attempt any Two Questions. **12**

a) Write short note turbo Electric Nano generators.
b) Explain the waste disposal options for Coal Power Plant.
c) Generalize the merits and demerits site selection of power plant.

Seat No.	

Set R

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Advanced and Sustainable Energy Sources (EEHn-01B)

Day & Date: Friday, 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

11) The firing order of a four cylinder engine is _____.
a) 1-2-4-3 b) 1-4-2-3
c) 1-2-3-4 d) 1-3-2-4

2) The performance of engines of different HP, RPM and sizes can be compared on the basis of _____.
a) specific fuel consumption b) compression ratio
c) clearance volume d) cylinder volume

3) In hydrothermal systems when steam, water and dissolved solids are available as source of energy, the entrained solids are removed by _____.
a) filters b) centrifugal separators
c) strainers d) none of the above

4) Tidal energy mainly makes use of _____.
a) kinetic energy of water
b) potential energy of water
c) both kinetic as well as potential energy of water
d) none of the above

5) Heating value of coal is approximately.
a) 1000-2000 kcal / kg b) 2000-4000 kcal / kg
c) 5000-6500 kcal / kg d) 9000-10,500 kcal / kg

6) Water gas is a mixture of _____.
a) CO_2 and O_2 b) O_2 and H_2
c) H_2, N_2 and O_2 d) CO, N_2 and H_2

7) Which of the following contributes to the improvement of efficiency of Rankine cycle in a thermal power plant?
a) Reheating of steam at intermediate stage
b) Regeneration use of steam for heating boiler feed water
c) Use of high pressures
d) All of the above

8) Steam pressures usually used in thermal power plants are _____.
a) 5 kg/cm^2 to 10 kg/cm^2 b) 50 kg/cm^2 to 100 kg/cm^2
c) 110 kg/cm^2 to 170 kg/cm^2 d) 200 kg/cm^2 to 215 kg/cm^2

9) Permissible pH value of water for boilers is _____.
a) 1 b) 7
c) slightly more than 7 d) 10

10) A condenser in a thermal power plant condenses steam combing out of _____.
a) Boiler b) Super-heater
c) Economizer d) Turbine

11) In a hydro-electric plant a conduct system for taking water from the intake works to the turbine is known as _____.
a) Dam b) Reservoir
c) Penstock d) Surge tank

12) A Pelton wheel is _____.
a) inward flow impulse turbine
b) outward flow impulse turbine
c) inward flow reaction turbine
d) axial flow impulse turbine

13) In a thermal power plant cooling towers are used to _____.
a) condense low pressure steam
b) cool condensed steam
c) cool water used in condenser for condensing steam
d) cool feed water of boiler

14) Major constituent of methane gas is?
a) CO b) Methane
c) Oxygen d) Hydrogen

Seat No.	

Set R

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Advanced and Sustainable Energy Sources (EEHn-01B)

Day & Date: Friday, 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four questions. **16**

a) Write a short note on fluidized bed combustion.
b) Explain the basic characteristics of Sunlight.
c) Discuss the advantages and disadvantages of breeder reactor.
d) Describe the water hammer.
e) Show the P-V, H-S and T-S diagram for Rankine Cycle.

Q.3 Attempt any Two questions. **12**

a) Explain with neat sketch diesel engine power plant.
b) Name the Components of Gas Turbine Power plants.
c) Explain with a neat sketch the working of a thermal electric power plant station and discuss the function of major components in it.

Section – II

Q.4 Attempt any Four questions. **16**

a) Explain the design of biomass power generation.
b) With neat sketches explain briefly the Tidal power plant.
c) Explain with a neat diagram of wind electric generating power plant.
d) Describe the significance of two-part tariff and three-part tariff.
e) Explain the term depreciation and discuss various methods of calculating the depreciation of an electrical plant.

Q.5 Attempt any Two Questions. **12**

a) Write short note turbo Electric Nano generators.
b) Explain the waste disposal options for Coal Power Plant.
c) Generalize the merits and demerits site selection of power plant.

Seat No.		Set	S

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Advanced and Sustainable Energy Sources (EEHn-01B)

Day & Date: Friday, 23-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) A condenser in a thermal power plant condenses steam combing out of _____.
a) Boiler b) Super-heater
c) Economizer d) Turbine

2) In a hydro-electric plant a conduct system for taking water from the intake works to the turbine is known as _____.
a) Dam b) Reservoir
c) Penstock d) Surge tank

3) A Pelton wheel is _____.
a) inward flow impulse turbine
b) outward flow impulse turbine
c) inward flow reaction turbine
d) axial flow impulse turbine

4) In a thermal power plant cooling towers are used to _____.
a) condense low pressure steam
b) cool condensed steam
c) cool water used in condenser for condensing steam
d) cool feed water of boiler

5) Major constituent of methane gas is?
a) CO b) Methane
c) Oxygen d) Hydrogen

6) The firing order of a four cylinder engine is _____.
a) 1-2-4-3 b) 1-4-2-3
c) 1-2-3-4 d) 1-3-2-4

7) The performance of engines of different HP, RPM and sizes can be compared on the basis of _____.

a) specific fuel consumption b) compression ratio
c) clearance volume d) cylinder volume

8) In hydrothermal systems when steam, water and dissolved solids are available as source of energy, the entrained solids are removed by _____.

a) filters b) centrifugal separators
c) strainers d) none of the above

9) Tidal energy mainly makes use of _____.

a) kinetic energy of water
b) potential energy of water
c) both kinetic as well as potential energy of water
d) none of the above

10) Heating value of coal is approximately.

a) 1000-2000 kcal / kg b) 2000-4000 kcal / kg
c) 5000-6500 kcal / kg d) 9000-10,500 kcal / kg

11) Water gas is a mixture of _____.

a) CO_2 and O_2 b) O_2 and H_2
c) H_2, N_2 and O_2 d) CO, N_2 and H_2

12) Which of the following contributes to the improvement of efficiency of Rankine cycle in a thermal power plant?

a) Reheating of steam at intermediate stage
b) Regeneration use of steam for heating boiler feed water
c) Use of high pressures
d) All of the above

13) Steam pressures usually used in thermal power plants are _____.

a) 5 kg/cm^2 to 10 kg/cm^2 b) 50 kg/cm^2 to 100 kg/cm^2
c) 110 kg/cm^2 to 170 kg/cm^2 d) 200 kg/cm^2 to 215 kg/cm^2

14) Permissible pH value of water for boilers is _____.

a) 1 b) 7
c) slightly more than 7 d) 10

Seat No.	

Set **S**

S. Y. (B. Tech) (Sem-I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Advanced and Sustainable Energy Sources (EEHn-01B)

Day & Date: Friday, 23-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four questions. **16**

a) Write a short note on fluidized bed combustion.
b) Explain the basic characteristics of Sunlight.
c) Discuss the advantages and disadvantages of breeder reactor.
d) Describe the water hammer.
e) Show the P-V, H-S and T-S diagram for Rankine Cycle.

Q.3 Attempt any Two questions. **12**

a) Explain with neat sketch diesel engine power plant.
b) Name the Components of Gas Turbine Power plants.
c) Explain with a neat sketch the working of a thermal electric power plant station and discuss the function of major components in it.

Section – II

Q.4 Attempt any Four questions. **16**

a) Explain the design of biomass power generation.
b) With neat sketches explain briefly the Tidal power plant.
c) Explain with a neat diagram of wind electric generating power plant.
d) Describe the significance of two-part tariff and three-part tariff.
e) Explain the term depreciation and discuss various methods of calculating the depreciation of an electrical plant.

Q.5 Attempt any Two Questions. **12**

a) Write short note turbo Electric Nano generators.
b) Explain the waste disposal options for Coal Power Plant.
c) Generalize the merits and demerits site selection of power plant.

SLR-BD-261

Seat No.		Set	P

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Universal Human Values (VEC-01)

Day & Date: Saturday, 24-05-2025 Max. Marks: 50
Time: 03:00 PM To 4:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) Basic unit of human interaction is _____.
a) Family b) Society
c) Group d) None of the above

2) The Self(I) is the seer, _____.
a) Doer b) Enjoyer
c) Doer & Enjoyer d) None

3) PROSPERITY deals with _____.
a) Right understanding in the self
b) Fulfilment in relationship
c) Ensuring more than required physical facility
d) None

4) When we expect feelings from others for our happiness, it is a state of _____.
a) Swatantrata b) Partantrata
c) Prosperity d) None

5) For continuity of happiness, what is essential?
a) Right understanding in the Self
b) Right feeling and right thought in the Self
c) Recognition of needs, ensure more than required, make right utilisation of it
d) All the above

6) Right Understanding and Right Feeling is matter of _____.
a) Self b) Body
c) Both d) None

7) Acceptance of excellence in others is called _____.

a) Gratitude b) Reverence
c) Glory d) None of above

8) Self and _____ are different in nature, materiality, needs and activities.

a) Prosperity b) Right Understanding
c) Body d) None of above

9) _____ is assuming without knowing.

a) Knowing b) Assuming
c) Preconditioning d) Relationship

10) Imagination is combination of _____.

a) Desire & thought
b) Desire, thought & expectation
c) Expectation & thought
d) None of above

11) Following are the basic guidelines for value education except _____.

a) Universal b) Personal
c) Rational d) Natural

12) Natural acceptance and _____ are the two processes of knowing.

a) Self-Actualization b) Self-exploration
c) Self Evaluation d) Self control

13) Human Life is lived at four levels: Individual, Family, and Society and _____.

a) Nature b) Nurture
c) World d) Universe

14) Value education should not be based on dogmas or blind beliefs _____.

a) True b) False

15) Value of an entity is _____.

a) Physical Facility
b) Prosperity
c) Its participation in the larger order of which it is part
d) both a and b

16) _____ are as Basic Human Aspirations.

a) Money
b) Relationship without money
c) Physical Facility
d) Continuous Happiness and Prosperity

17) Please give the correct priority for Physical Facilities, Right Understanding and Relationship _____.

a) Physical Facilities, Right Understanding and Relationship
b) Relationship, Right Understanding and Physical Facilities
c) Right Understanding, Relationship and Physical Facilities
d) None of the above

18) Right Understanding in relationship lead to _____.

a) Mutual Happiness b) Mutual Prosperity
c) Both a and b d) All are wrong

19) SSDD stands for _____.

a) Sadhan Viheen Dukhi Daridra
b) Sadhan Sampan Dukhi Daridra
c) Sadhan Sampan Sukhi Samridha
d) None of the above

20) Natural acceptance does not change with _____.

a) Time b) Place
c) Beliefs d) All of above

21) Human being is co-existence of the _____ and the _____.

a) self, self b) body, body
c) self, body d) None

22) _____ is the feeling of responsibility for nurturing, protecting and right utilizing the body.

a) Swasthya b) Sanyam
c) Prosperity d) None

23) The _____ is an instrument of _____.

a) I, Body b) Body, I
c) Both a and b d) None

24) _____ is the information we get from the Body through the five sense organs.

a) Precondition b) Sensation
c) Natural acceptance d) None

25) Which of the following is NOT a response of the Self?

a) Knowing b) Assuming
c) Recognising d) Preconditioning

26) Needs of Body are quantitative whereas needs of Self are qualitative _____.

a) True b) False

27) Sah-astitva means _____.

a) Co-existence b) Co-operation
c) Cooption d) Corporate identity

28) Ensuring justice in the relationship, on the basis of values leads to _____ in society.

a) Fearlessness b) Confusion
c) Confidence d) Fear

29) _____ is the complete value in relationship.

a) Respect b) Love
c) Trust d) Glory

30) The feeling to nurture and protect the body of our relative is called _____.

a) Care b) Affection
c) Gratitude d) Respect

31) _____ is the feeling of acceptance for those who have made efforts for my excellence.

a) Reverence b) Glory
c) Gratitude d) Guidance

32) We all are similar at the level of our _____ but differ in our _____.

a) Competence, Intension b) Intension, Competence
c) Competence, Competence d) None

33) Abhay means _____.

a) Right understanding b) Trust and fearlessness
c) Prosperity d) Co-existance

34) All the units of nature can be classified into _____ orders.

a) Two b) Three
c) Four d) Six

35) Which of the following does not form an order in nature?

a) Bio b) Animal
c) Consciousness d) Human

36) According to quantity, which of the following is true for the orders in nature?

a) Bio order >> Physical order >> Animal order >> Human order
b) Animal order >> Bio order >> Physical order >> Human order
c) Physical order >> Bio order >> Animal order >> Human order
d) Physical order >> Animal order >> Bio order >> Human order

37) What is NOT acceptable naturally in the nature?

a) Enrichment of nature b) Pollution in nature
c) Protection of nature d) Right Utilization of nature

38) Which of the following is NOT a unit of physical order?

a) Soil b) Air
c) Tree d) Water

39) There is justice in relationship when there is _____.
a) Self-regulation b) Freedom
c) Mutual fulfillment d) None

40) Justice from family to world family leads to _____.
a) Powerful nation
b) Strong political ties between nations
c) Undivided society
d) Disruption of the family structure

41) _____ is and it exists between one self (I1) and other self (I2).
a) Body b) Relationship
c) Health d) All

42) Which of the following results from over-evaluation _____.
a) Ego b) Depression
c) Self-confidence d) Trust

43) Which of the following statement is true?
a) Intention of a human being is always doubtful
b) One's intension is always to make the other happy
c) Intension of a human keeps varying from time to time
d) Intension of a human being can never be understood

44) Feeling of relationship exist between _____.
a) Self and self b) Body and Body
c) Self and body d) None of the above

45) Which of the following is NOT one of the goals at the level of society?
a) Right Understanding b) Fearlessness
c) Madness for profit d) Prosperity

46) Intension of a human being is the same as _____.
a) Natural acceptance b) Competence
c) Thought d) Pre-conditioning

47) Harmony should be maintained in _____.
a) Between body and life b) Between self and body
c) Between self and society d) All of the above

48) If something is _____ to us without any force or compulsion, then it is often correct and does not change with time and people.
a) Not acceptable b) Completely acceptable
c) Naturally acceptable d) Less acceptable

49) Nurturing on the Body depends upon _____.
a) Ingestion b) Digestion
c) Excretion d) All of the above

50) Sensation is related to _____.

a) Body
b) Self 'I'
c) Both a and b
d) None of the above

SLR-BD-261

Seat No.		Set	Q

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Universal Human Values (VEC-01)

Day & Date: Saturday, 24-05-2025 Max. Marks: 50
Time: 03:00 PM To 4:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) _____ is the feeling of acceptance for those who have made efforts for my excellence.
a) Reverence b) Glory
c) Gratitude d) Guidance

2) We all are similar at the level of our _____ but differ in our _____.
a) Competence, Intension b) Intension, Competence
c) Competence, Competence d) None

3) Abhay means _____.
a) Right understanding b) Trust and fearlessness
c) Prosperity d) Co-existance

4) All the units of nature can be classified into _____ orders.
a) Two b) Three
c) Four d) Six

5) Which of the following does not form an order in nature?
a) Bio b) Animal
c) Consciousness d) Human

6) According to quantity, which of the following is true for the orders in nature?
a) Bio order >> Physical order >> Animal order >> Human order
b) Animal order >> Bio order >> Physical order >> Human order
c) Physical order >> Bio order >> Animal order >> Human order
d) Physical order >> Animal order >> Bio order >> Human order

7) What is NOT acceptable naturally in the nature?
a) Enrichment of nature b) Pollution in nature
c) Protection of nature d) Right Utilization of nature

8) Which of the following is NOT a unit of physical order?
a) Soil b) Air
c) Tree d) Water

9) There is justice in relationship when there is _____.
a) Self-regulation b) Freedom
c) Mutual fulfillment d) None

10) Justice from family to world family leads to _____.
a) Powerful nation
b) Strong political ties between nations
c) Undivided society
d) Disruption of the family structure

11) _____ is and it exists between one self (I1) and other self (I2).
a) Body b) Relationship
c) Health d) All

12) Which of the following results from over-evaluation _____.
a) Ego b) Depression
c) Self-confidence d) Trust

13) Which of the following statement is true?
a) Intention of a human being is always doubtful
b) One's intension is always to make the other happy
c) Intension of a human keeps varying from time to time
d) Intension of a human being can never be understood

14) Feeling of relationship exist between _____.
a) Self and self b) Body and Body
c) Self and body d) None of the above

15) Which of the following is NOT one of the goals at the level of society?
a) Right Understanding b) Fearlessness
c) Madness for profit d) Prosperity

16) Intension of a human being is the same as _____.
a) Natural acceptance b) Competence
c) Thought d) Pre-conditioning

17) Harmony should be maintained in _____.
a) Between body and life b) Between self and body
c) Between self and society d) All of the above

18) If something is _____ to us without any force or compulsion, then it is often correct and does not change with time and people.
a) Not acceptable b) Completely acceptable
c) Naturally acceptable d) Less acceptable

19) Nurturing on the Body depends upon _____.

a) Ingestion b) Digestion
c) Excretion d) All of the above

20) Sensation is related to _____.

a) Body b) Self 'I'
c) Both a and b d) None of the above

21) Basic unit of human interaction is _____.

a) Family b) Society
c) Group d) None of the above

22) The Self(I) is the seer, _____.

a) Doer b) Enjoyer
c) Doer & Enjoyer d) None

23) PROSPERITY deals with _____.

a) Right understanding in the self
b) Fulfilment in relationship
c) Ensuring more than required physical facility
d) None

24) When we expect feelings from others for our happiness, it is a state of _____.

a) Swatantrata b) Partantrata
c) Prosperity d) None

25) For continuity of happiness, what is essential?

a) Right understanding in the Self
b) Right feeling and right thought in the Self
c) Recognition of needs, ensure more than required, make right utilisation of it
d) All the above

26) Right Understanding and Right Feeling is matter of _____.

a) Self b) Body
c) Both d) None

27) Acceptance of excellence in others is called _____.

a) Gratitude b) Reverence
c) Glory d) None of above

28) Self and _____ are different in nature, materiality, needs and activities.

a) Prosperity b) Right Understanding
c) Body d) None of above

29) _____ is assuming without knowing.

a) Knowing b) Assuming
c) Preconditioning d) Relationship

30) Imagination is combination of _____.

a) Desire & thought
b) Desire, thought & expectation
c) Expectation & thought
d) None of above

31) Following are the basic guidelines for value education except _____.

a) Universal b) Personal
c) Rational d) Natural

32) Natural acceptance and _____ are the two processes of knowing.

a) Self-Actualization b) Self-exploration
c) Self Evaluation d) Self control

33) Human Life is lived at four levels: Individual, Family, and Society and _____.

a) Nature b) Nurture
c) World d) Universe

34) Value education should not be based on dogmas or blind beliefs _____.

a) True b) False

35) Value of an entity is _____.

a) Physical Facility
b) Prosperity
c) Its participation in the larger order of which it is part
d) both a and b

36) _____ are as Basic Human Aspirations.

a) Money
b) Relationship without money
c) Physical Facility
d) Continuous Happiness and Prosperity

37) Please give the correct priority for Physical Facilities, Right Understanding and Relationship _____.

a) Physical Facilities, Right Understanding and Relationship
b) Relationship, Right Understanding and Physical Facilities
c) Right Understanding, Relationship and Physical Facilities
d) None of the above

38) Right Understanding in relationship lead to _____.

a) Mutual Happiness b) Mutual Prosperity
c) Both a and b d) All are wrong

39) SSDD stands for _____.

a) Sadhan Viheen Dukhi Daridra
b) Sadhan Sampan Dukhi Daridra
c) Sadhan Sampan Sukhi Samridha
d) None of the above

40) Natural acceptance does not change with _____.

a) Time b) Place
c) Beliefs d) All of above

41) Human being is co-existence of the _____ and the _____.

a) self, self b) body, body
c) self, body d) None

42) _____ is the feeling of responsibility for nurturing, protecting and right utilizing the body.

a) Swasthya b) Sanyam
c) Prosperity d) None

43) The _____ is an instrument of _____.

a) I, Body b) Body, I
c) Both a and b d) None

44) _____ is the information we get from the Body through the five sense organs.

a) Precondition b) Sensation
c) Natural acceptance d) None

45) Which of the following is NOT a response of the Self?

a) Knowing b) Assuming
c) Recognising d) Preconditioning

46) Needs of Body are quantitative whereas needs of Self are qualitative _____.

a) True b) False

47) Sah-astitva means _____.

a) Co-existence b) Co-operation
c) Cooption d) Corporate identity

48) Ensuring justice in the relationship, on the basis of values leads to _____ in society.

a) Fearlessness b) Confusion
c) Confidence d) Fear

49) _____ is the complete value in relationship.

a) Respect b) Love

c) Trust d) Glory

50) The feeling to nurture and protect the body of our relative is called _____.

a) Care b) Affection

c) Gratitude d) Respect

SLR-BD-261

Seat No.		Set	R

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Universal Human Values (VEC-01)

Day & Date: Saturday, 24-05-2025 Max. Marks: 50
Time: 03:00 PM To 4:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) Following are the basic guidelines for value education except _____.
a) Universal b) Personal
c) Rational d) Natural

2) Natural acceptance and _____ are the two processes of knowing.
a) Self-Actualization b) Self-exploration
c) Self Evaluation d) Self control

3) Human Life is lived at four levels: Individual, Family, and Society and _____.
a) Nature b) Nurture
c) World d) Universe

4) Value education should not be based on dogmas or blind beliefs _____.
a) True b) False

5) Value of an entity is _____.
a) Physical Facility
b) Prosperity
c) Its participation in the larger order of which it is part
d) both a and b

6) _____ are as Basic Human Aspirations.
a) Money
b) Relationship without money
c) Physical Facility
d) Continuous Happiness and Prosperity

7) Please give the correct priority for Physical Facilities, Right Understanding and Relationship _____.

a) Physical Facilities, Right Understanding and Relationship
b) Relationship, Right Understanding and Physical Facilities
c) Right Understanding, Relationship and Physical Facilities
d) None of the above

8) Right Understanding in relationship lead to _____.

a) Mutual Happiness b) Mutual Prosperity
c) Both a and b d) All are wrong

9) SSDD stands for _____.

a) Sadhan Viheen Dukhi Daridra
b) Sadhan Sampan Dukhi Daridra
c) Sadhan Sampan Sukhi Samridha
d) None of the above

10) Natural acceptance does not change with _____.

a) Time b) Place
c) Beliefs d) All of above

11) Human being is co-existence of the _____ and the _____.

a) self, self b) body, body
c) self, body d) None

12) _____ is the feeling of responsibility for nurturing, protecting and right utilizing the body.

a) Swasthya b) Sanyam
c) Prosperity d) None

13) The _____ is an instrument of _____.

a) I, Body b) Body, I
c) Both a and b d) None

14) _____ is the information we get from the Body through the five sense organs.

a) Precondition b) Sensation
c) Natural acceptance d) None

15) Which of the following is NOT a response of the Self?

a) Knowing b) Assuming
c) Recognising d) Preconditioning

16) Needs of Body are quantitative whereas needs of Self are qualitative _____.

a) True b) False

17) Sah-astitva means _____.

a) Co-existence b) Co-operation
c) Cooption d) Corporate identity

18) Ensuring justice in the relationship, on the basis of values leads to _____ in society.

a) Fearlessness b) Confusion
c) Confidence d) Fear

19) _____ is the complete value in relationship.

a) Respect b) Love
c) Trust d) Glory

20) The feeling to nurture and protect the body of our relative is called _____.

a) Care b) Affection
c) Gratitude d) Respect

21) _____ is the feeling of acceptance for those who have made efforts for my excellence.

a) Reverence b) Glory
c) Gratitude d) Guidance

22) We all are similar at the level of our _____ but differ in our _____.

a) Competence, Intension b) Intension, Competence
c) Competence, Competence d) None

23) Abhay means _____.

a) Right understanding b) Trust and fearlessness
c) Prosperity d) Co-existance

24) All the units of nature can be classified into _____ orders.

a) Two b) Three
c) Four d) Six

25) Which of the following does not form an order in nature?

a) Bio b) Animal
c) Consciousness d) Human

26) According to quantity, which of the following is true for the orders in nature?

a) Bio order >> Physical order >> Animal order >> Human order
b) Animal order >> Bio order >> Physical order >> Human order
c) Physical order >> Bio order >> Animal order >> Human order
d) Physical order >> Animal order >> Bio order >> Human order

27) What is NOT acceptable naturally in the nature?

a) Enrichment of nature b) Pollution in nature
c) Protection of nature d) Right Utilization of nature

28) Which of the following is NOT a unit of physical order?

a) Soil b) Air
c) Tree d) Water

29) There is justice in relationship when there is _____.
a) Self-regulation b) Freedom
c) Mutual fulfillment d) None

30) Justice from family to world family leads to _____.
a) Powerful nation
b) Strong political ties between nations
c) Undivided society
d) Disruption of the family structure

31) _____ is and it exists between one self (I1) and other self (I2).
a) Body b) Relationship
c) Health d) All

32) Which of the following results from over-evaluation _____.
a) Ego b) Depression
c) Self-confidence d) Trust

33) Which of the following statement is true?
a) Intention of a human being is always doubtful
b) One's intension is always to make the other happy
c) Intension of a human keeps varying from time to time
d) Intension of a human being can never be understood

34) Feeling of relationship exist between _____.
a) Self and self b) Body and Body
c) Self and body d) None of the above

35) Which of the following is NOT one of the goals at the level of society?
a) Right Understanding b) Fearlessness
c) Madness for profit d) Prosperity

36) Intension of a human being is the same as _____.
a) Natural acceptance b) Competence
c) Thought d) Pre-conditioning

37) Harmony should be maintained in _____.
a) Between body and life b) Between self and body
c) Between self and society d) All of the above

38) If something is _____ to us without any force or compulsion, then it is often correct and does not change with time and people.
a) Not acceptable b) Completely acceptable
c) Naturally acceptable d) Less acceptable

39) Nurturing on the Body depends upon _____.
a) Ingestion b) Digestion
c) Excretion d) All of the above

40) Sensation is related to _____.

a) Body b) Self 'I'
c) Both a and b d) None of the above

41) Basic unit of human interaction is _____.

a) Family b) Society
c) Group d) None of the above

42) The Self(I) is the seer, _____.

a) Doer b) Enjoyer
c) Doer & Enjoyer d) None

43) PROSPERITY deals with _____.

a) Right understanding in the self
b) Fulfilment in relationship
c) Ensuring more than required physical facility
d) None

44) When we expect feelings from others for our happiness, it is a state of _____.

a) Swatantrata b) Partantrata
c) Prosperity d) None

45) For continuity of happiness, what is essential?

a) Right understanding in the Self
b) Right feeling and right thought in the Self
c) Recognition of needs, ensure more than required, make right utilisation of it
d) All the above

46) Right Understanding and Right Feeling is matter of _____.

a) Self b) Body
c) Both d) None

47) Acceptance of excellence in others is called _____.

a) Gratitude b) Reverence
c) Glory d) None of above

48) Self and _____ are different in nature, materiality, needs and activities.

a) Prosperity b) Right Understanding
c) Body d) None of above

49) _____ is assuming without knowing.

a) Knowing b) Assuming
c) Preconditioning d) Relationship

50) Imagination is combination of _____.

a) Desire & thought
b) Desire, thought & expectation
c) Expectation & thought
d) None of above

SLR-BD-261

Seat No.		Set	S

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - I) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Universal Human Values (VEC-01)

Day & Date: Saturday, 24-05-2025 Max. Marks: 50
Time: 03:00 PM To 4:30 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) _____ is and it exists between one self (I1) and other self (I2).
a) Body b) Relationship
c) Health d) All

2) Which of the following results from over-evaluation _____.
a) Ego b) Depression
c) Self-confidence d) Trust

3) Which of the following statement is true?
a) Intention of a human being is always doubtful
b) One's intension is always to make the other happy
c) Intension of a human keeps varying from time to time
d) Intension of a human being can never be understood

4) Feeling of relationship exist between _____.
a) Self and self b) Body and Body
c) Self and body d) None of the above

5) Which of the following is NOT one of the goals at the level of society?
a) Right Understanding b) Fearlessness
c) Madness for profit d) Prosperity

6) Intension of a human being is the same as _____.
a) Natural acceptance b) Competence
c) Thought d) Pre-conditioning

7) Harmony should be maintained in _____.
a) Between body and life b) Between self and body
c) Between self and society d) All of the above

8) If something is _____ to us without any force or compulsion, then it is often correct and does not change with time and people.

a) Not acceptable b) Completely acceptable
c) Naturally acceptable d) Less acceptable

9) Nurturing on the Body depends upon _____.

a) Ingestion b) Digestion
c) Excretion d) All of the above

10) Sensation is related to _____.

a) Body b) Self 'I'
c) Both a and b d) None of the above

11) Basic unit of human interaction is _____.

a) Family b) Society
c) Group d) None of the above

12) The Self(I) is the seer, _____.

a) Doer b) Enjoyer
c) Doer & Enjoyer d) None

13) PROSPERITY deals with _____.

a) Right understanding in the self
b) Fulfilment in relationship
c) Ensuring more than required physical facility
d) None

14) When we expect feelings from others for our happiness, it is a state of _____.

a) Swatantrata b) Partantrata
c) Prosperity d) None

15) For continuity of happiness, what is essential?

a) Right understanding in the Self
b) Right feeling and right thought in the Self
c) Recognition of needs, ensure more than required, make right utilisation of it
d) All the above

16) Right Understanding and Right Feeling is matter of _____.

a) Self b) Body
c) Both d) None

17) Acceptance of excellence in others is called _____.

a) Gratitude b) Reverence
c) Glory d) None of above

18) Self and _____ are different in nature, materiality, needs and activities.

a) Prosperity
b) Right Understanding
c) Body
d) None of above

19) _____ is assuming without knowing.

a) Knowing
b) Assuming
c) Preconditioning
d) Relationship

20) Imagination is combination of _____.

a) Desire & thought
b) Desire, thought & expectation
c) Expectation & thought
d) None of above

21) Following are the basic guidelines for value education except _____.

a) Universal
b) Personal
c) Rational
d) Natural

22) Natural acceptance and _____ are the two processes of knowing.

a) Self-Actualization
b) Self-exploration
c) Self Evaluation
d) Self control

23) Human Life is lived at four levels: Individual, Family, and Society and _____.

a) Nature
b) Nurture
c) World
d) Universe

24) Value education should not be based on dogmas or blind beliefs _____.

a) True
b) False

25) Value of an entity is _____.

a) Physical Facility
b) Prosperity
c) Its participation in the larger order of which it is part
d) both a and b

26) _____ are as Basic Human Aspirations.

a) Money
b) Relationship without money
c) Physical Facility
d) Continuous Happiness and Prosperity

27) Please give the correct priority for Physical Facilities, Right Understanding and Relationship _____.

a) Physical Facilities, Right Understanding and Relationship
b) Relationship, Right Understanding and Physical Facilities
c) Right Understanding, Relationship and Physical Facilities
d) None of the above

28) Right Understanding in relationship lead to _____.

a) Mutual Happiness
b) Mutual Prosperity
c) Both a and b
d) All are wrong

29) SSDD stands for _____.

a) Sadhan Viheen Dukhi Daridra
b) Sadhan Sampan Dukhi Daridra
c) Sadhan Sampan Sukhi Samridha
d) None of the above

30) Natural acceptance does not change with _____.

a) Time
b) Place
c) Beliefs
d) All of above

31) Human being is co-existence of the _____ and the _____.

a) self, self
b) body, body
c) self, body
d) None

32) _____ is the feeling of responsibility for nurturing, protecting and right utilizing the body.

a) Swasthya
b) Sanyam
c) Prosperity
d) None

33) The _____ is an instrument of _____.

a) I, Body
b) Body, I
c) Both a and b
d) None

34) _____ is the information we get from the Body through the five sense organs.

a) Precondition
b) Sensation
c) Natural acceptance
d) None

35) Which of the following is NOT a response of the Self?

a) Knowing
b) Assuming
c) Recognising
d) Preconditioning

36) Needs of Body are quantitative whereas needs of Self are qualitative _____.

a) True
b) False

37) Sah-astitva means _____.

a) Co-existence
b) Co-operation
c) Cooption
d) Corporate identity

38) Ensuring justice in the relationship, on the basis of values leads to _____ in society.

a) Fearlessness b) Confusion
c) Confidence d) Fear

39) _____ is the complete value in relationship.

a) Respect b) Love
c) Trust d) Glory

40) The feeling to nurture and protect the body of our relative is called _____.

a) Care b) Affection
c) Gratitude d) Respect

41) _____ is the feeling of acceptance for those who have made efforts for my excellence.

a) Reverence b) Glory
c) Gratitude d) Guidance

42) We all are similar at the level of our _____ but differ in our _____.

a) Competence, Intension b) Intension, Competence
c) Competence, Competence d) None

43) Abhay means _____.

a) Right understanding b) Trust and fearlessness
c) Prosperity d) Co-existance

44) All the units of nature can be classified into _____ orders.

a) Two b) Three
c) Four d) Six

45) Which of the following does not form an order in nature?

a) Bio b) Animal
c) Consciousness d) Human

46) According to quantity, which of the following is true for the orders in nature?

a) Bio order >> Physical order >> Animal order >> Human order
b) Animal order >> Bio order >> Physical order >> Human order
c) Physical order >> Bio order >> Animal order >> Human order
d) Physical order >> Animal order >> Bio order >> Human order

47) What is NOT acceptable naturally in the nature?

a) Enrichment of nature b) Pollution in nature
c) Protection of nature d) Right Utilization of nature

48) Which of the following is NOT a unit of physical order?

a) Soil b) Air
c) Tree d) Water

49) There is justice in relationship when there is _____.

a) Self-regulation b) Freedom

c) Mutual fulfillment d) None

50) Justice from family to world family leads to _____.

a) Powerful nation

b) Strong political ties between nations

c) Undivided society

d) Disruption of the family structure

Seat No.		Set	P

S.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2025
Engineering Mathematics – III (BTN07301)

Day & Date: Saturday, 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book Page no 03 (Starring page of the Answer Book Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of Page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) $L[e^t t^3]$ is _____.

a) $\frac{6}{(s-1)^4}$ b) $\frac{6}{s(s-1)^4}$

c) $\frac{1}{(s-1)^4}$ d) $\frac{1}{s(s-1)^4}$

2) If $L\{f(t)\} = \emptyset(s)$, then $L\{f(at)\} =$ _____.

a) $\emptyset\left(\frac{s}{a}\right)$ b) $\frac{1}{s}\emptyset\left(\frac{s}{a}\right)$

c) $\emptyset'\left(\frac{s}{a}\right)$ d) $\frac{1}{s}\emptyset\left(\frac{s}{a}\right)$

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

a) $\frac{1}{3}\sin 3t$ b) $\frac{1}{3}\cos 3t$

c) $\frac{1}{3}\cosh 3t$ d) $\frac{1}{3}\sinh 3t$

4) For $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 3y = 3ex^{2x}$, the particular integral is _____.

a) $\frac{1}{15}e^{2x}$ b) $3e^{2x}$

c) $\frac{1}{5}e^{2x}$ d) $c_1e^{-x} + c_2e^{-2x}$

5) The general solution of the equation $(D^3 - 7D - 6)y = 0$ is _____.

a) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{-3x}$ b) $y = c_1e^{x} + c_2e^{2x} + c_3e^{3x}$

c) $y = c_1e^{-x} + c_2e^{-2x} + c_3e^{-3x}$ d) None of these

6) $z\{k\} =$ for $|z| > 1$

a) $\frac{z}{z-1}$ b) $\frac{1}{(z-1)^2}$

c) $\frac{z}{(z-1)^2}$ d) $\frac{z}{(z+1)^2}$

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

a) $f\left(\frac{a}{z}\right)$ b) $f\left(\frac{z}{a}\right)$

c) $\frac{1}{a} f\left(\frac{a}{z}\right)$ d) None

8) The solution of the equation $pq = p + q$ is _____.

a) $z = ax + (a+1)y + c$

b) $z = (a+1)x + a(a-1)y + c$

c) $z(a-1) = a(a-1)x + ay + c$

d) $z = (a-1)x + a(a+1)y + c$

9) If $Z\{f(k)\} = F(z)$, then $Z\{kf(k)\} =$ _____.

a) $\frac{dF(z)}{dz}$ b) $-\frac{dF(z)}{dz}$

c) $z\frac{dF(z)}{dz}$ d) $-z\frac{dF(z)}{dz}$

10) The solution of a partial differential equation $xp + yq = z$ is _____.

a) $f(x^2, y^2) = 0$ b) $f(x, y) = 0$

c) $f(xz, yz) = 0$ d) $f\left(\frac{x}{y}, \frac{y}{z}\right)$

11) $L\left\{\int_0^t \sin 2u \, du\right\} =$_____.

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

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

12) The particular integral of $x^2 \frac{d^2y}{dx^2} + 2x\frac{dy}{dx} = \frac{1}{x^2}$ is _____.

a) $y = c_1 + c_2 x^2$ b) $y = x - \frac{1}{x^2}$

c) $y = \frac{1}{2x^2}$ d) $y = \frac{1}{x^2}$

13) The value of $\frac{1}{D+a}X =$ _____.

a) $e^{-ax}\int e^{-ax}Xdx$

b) $e^{-ax}\int e^{ax}Xdx$

c) $e^{ax}\int e^{-ax}Xdx|$

d) $e^{ax}\int e^{ax}Xdx$

14) The complementary function of $(D^2+2D+1)y = 2e^{3x}$ is _____.

a) $c_1e^{-x}+c_2e^{-x}$

b) $(c_1+c_2x)e^{-2x}$

c) $(c_1\cos x + c_2\sin x)$

d) $(c_1+c_2x)e^{-x}$

Seat No.	

Set P

S.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2025
Engineering Mathematics – III (BTN07301)

Day & Date: Saturday, 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any three. **09**

a) Solve $(D^3 + D)y = \cos x$

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

c) Solve $x^2\frac{d^2y}{dx^2} - 3x\frac{dy}{dx} + 4y = 2x$

d) Calculate $L\left\{\int_0^t u.e^{-4u}\sin 5u\, du\right\}$

e) Calculate $L\{te^{-4t}\sin 3t\}$

Q.3 Attempt any three. **09**

a) Evaluate $\int_0^\infty \frac{e^{-t}-e^{-3t}}{t}$ by using Laplace transform.

b) Find Laplace transform of $te^{-t}\cos 2t$

c) Solve $(D^3 + 3D^2 + 3D + 1)y = e^{-x}$

d) Solve $(x+1)^2\frac{d^2y}{dx^2} + (x+1)\frac{dy}{dx} + y = 2\sin(\log(1+x))$

e) Solve $\frac{d^2y}{dx^2} + 3\frac{dy}{dx} + 2y = e^{e^x}$

Q.4 Attempt any two. **10**

a) Find Z-transform of $x_k = a^{|k|}$ for all $k, 0 < a < 1$

b) Find the inverse Z-transform of $\frac{1}{(z-a)^2}$ if

1) $|z| < a$
2) $|z| > a$

c) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$

d) Solve $(D^2 - 6D + 13)y = e^{x\log 2} + 8e^{3x}\sin 4x$

e) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{1}{s(s^2+4)}\right]$

Section – II

Q.5 Attempt any three. **09**

a) Find Z- transform of $x_k = a^{|k|}$ for all $k, 0 < a < 1$

b) Solve $x(y-z)p + y(z-x)q = z(x-y)$

c) Evaluate $\oint \frac{z+2}{(z-3)(z-4)} dz$ where c is the circle $|z| = 1$.

d) Calculate inverse Z-Transform of $F(z) = \frac{1}{(z-5)^2}$ when $|z| > 5$

e) Solve $p(1+q^2) = q(z-a)$

Q.6 Attempt any three. **09**

a) Solve $pe^y = qe^x$

b) Solve $p^2 - q^2 = \frac{x-y}{z}$

c) Calculate Z-Transform of $f(x) = 2^k \cos\{3k+2\}, k \geq 0$.

d) Calculate $Z\{f(k)\}$ where $f(k) = \left(\frac{1}{3}\right)^{|k|}$ for all k.

e) Evaluate $\int_0^{2+i} z^2 dz$

1) Along the line $x = 2y$
2) Along the real axis from $z = 0$ to $z = 2$ and then along the line parallel to the imaginary axis from $z = 2$ to $z = 2 + i$
3) Along the imaginary axis from $z = 0$ to $z = 1$ and then along the line parallel to the real axis from $z = i$ to $z = 2 + i$ along the parabola $2y^2 = x$.

Q.7 Attempt any two. **10**

a) Calculate inverse Z-Transform of $F(z) = \frac{3z^2-18z+26}{(z-2)(z-3)(z-4)'}$ if region of Convergence is $3 < |z| < 4$

b) Evaluate $\oint \frac{z+2}{(z-3)(z-4)} dz$ where c is the circle $|z| = 1$

c) Use variable separable method to solve $\frac{\partial z}{\partial x} = 4\frac{\partial z}{\partial y}$ given $z(0, y) = 8e^{-3y}$

Seat No.	

Set Q

S.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2025
Engineering Mathematics – III (BTN07301)

Day & Date: Saturday, 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book Page no 03 (Starring page of the Answer Book Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of Page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The solution of the equation $pq = p + q$ is _____.
a) $z = ax + (a+1)y + c$
b) $z = (a+1)x + a(a-1)y + c$
c) $z(a-1) = a(a-1)x + ay + c$
d) $z = (a-1)x + a(a+1)y + c$

2) If $Z\{f(k)\} = F(z)$, then $Z\{kf(k)\} =$ _____.
a) $\frac{dF(z)}{dz}$ b) $-\frac{dF(z)}{dz}$
c) $z\frac{dF(z)}{dz}$ d) $-z\frac{dF(z)}{dz}$

3) The solution of a partial differential equation $xp + yq = z$ is _____.
a) $f(x^2, y^2) = 0$ b) $f(x, y) = 0$
c) $f(xz, yz) = 0$ d) $f\left(\frac{x}{y}, \frac{y}{z}\right)$

4) $L\left\{\int_0^t \sin 2u\, du\right\} =$_____.
a) $\frac{2}{s^2+4}$ b) $\frac{2}{s^2}$
c) $\frac{2}{(s^2+4)^2}$ d) $\frac{2}{s(s^2+4)}$

5) The particular integral of $x^2\frac{d^2y}{dx^2}+2x\frac{dy}{dx}=\frac{1}{x^2}$ is _____.

a) $y=c_1+c_2x^2$ b) $y=x-\frac{1}{x^2}$

c) $y=\frac{1}{2x^2}$ d) $y=\frac{1}{x^2}$

6) The value of $\frac{1}{D+a}X=$ _____.

a) $e^{-ax}\int e^{-ax}Xdx$ b) $e^{-ax}\int e^{ax}Xdx$

c) $e^{ax}\int e^{-ax}Xdx|$ d) $e^{ax}\int e^{ax}Xdx$

7) The complementary function of $(D^2+2D+1)y=2e^{3x}$ is _____.

a) $c_1e^{-x}+c_2e^{-x}$ b) $(c_1+c_2x)e^{-2x}$

c) $(c_1\cos x+c_2\sin x)$ d) $(c_1+c_2x)e^{-x}$

8) $L[e^tt^3]$ is _____.

a) $\frac{6}{(s-1)^4}$ b) $\frac{6}{s(s-1)^4}$

c) $\frac{1}{(s-1)^4}$ d) $\frac{1}{s(s-1)^4}$

9) If $L\{f(t)\}=\emptyset(s)$, then $L\{f(at)\}=$ _____.

a) $\emptyset\left(\frac{s}{a}\right)$ b) $\frac{1}{s}\emptyset\left(\frac{s}{a}\right)$

c) $\emptyset'\left(\frac{s}{a}\right)$ d) $\frac{1}{s}\emptyset\left(\frac{s}{a}\right)$

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

a) $\frac{1}{3}\sin 3t$ b) $\frac{1}{3}\cos 3t$

c) $\frac{1}{3}\cosh 3t$ d) $\frac{1}{3}\sinh 3t$

11) For $\frac{d^2y}{dx^2}+4\frac{dy}{dx}+3y=3ex^{2x}$, the particular integral is _____.

a) $\frac{1}{15}e^{2x}$ b) $3e^{2x}$

c) $\frac{1}{5}e^{2x}$ d) $c_1e^{-x}+c_2e^{-2x}$

12) The general solution of the equation $(D^3-7D-6)y=0$ is _____.

a) $y=c_1e^{-x}+c_2e^{2x}+c_3e^{-3x}$ b) $y=c_1e^{x}+c_2e^{2x}+c_3e^{3x}$

c) $y=c_1e^{-x}+c_2e^{-2x}+c_3e^{-3x}$ d) None of these

13) $z\{k\} =$ for $|z| > 1$

a) $\frac{z}{z-1}$ b) $\frac{1}{(z-1)^2}$

c) $\frac{z}{(z-1)^2}$ d) $\frac{z}{(z+1)^2}$

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

a) $f\left(\frac{a}{z}\right)$ b) $f\left(\frac{z}{a}\right)$

c) $\frac{1}{a} f\left(\frac{a}{z}\right)$ d) None

Seat No.	

Set Q

S.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2025
Engineering Mathematics – III (BTN07301)

Day & Date: Saturday, 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any three. **09**

a) Solve $(D^3 + D)y = \cos x$

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

c) Solve $x^2\frac{d^2y}{dx^2} - 3x\frac{dy}{dx} + 4y = 2x$

d) Calculate $L\left\{\int_0^t u.e^{-4u}\sin 5u\, du\right\}$

e) Calculate $L\{te^{-4t}\sin 3t\}$

Q.3 Attempt any three. **09**

a) Evaluate $\int_0^\infty \frac{e^{-t}-e^{-3t}}{t}$ by using Laplace transform.

b) Find Laplace transform of $te^{-t}\cos 2t$

c) Solve $(D^3 + 3D^2 + 3D + 1)y = e^{-x}$

d) Solve $(x+1)^2\frac{d^2y}{dx^2} + (x+1)\frac{dy}{dx} + y = 2\sin(\log(1+x))$

e) Solve $\frac{d^2y}{dx^2} + 3\frac{dy}{dx} + 2y = e^{e^x}$

Q.4 Attempt any two. **10**

a) Find Z-transform of $x_k = a^{|k|}$ for all $k, 0 < a < 1$

b) Find the inverse Z-transform of $\frac{1}{(z-a)^2}$ if

1) $|z| < a$
2) $|z| > a$

c) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$

d) Solve $(D^2 - 6D + 13)y = e^{x\log 2} + 8e^{3x}\sin 4x$

e) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{1}{s(s^2+4)}\right]$

Section – II

Q.5 Attempt any three. **09**

a) Find Z- transform of $x_k = a^{|k|}$ for all $k, 0 < a < 1$

b) Solve $x(y-z)p + y(z-x)q = z(x-y)$

c) Evaluate $\oint \frac{z+2}{(z-3)(z-4)} dz$ where c is the circle $|z| = 1$.

d) Calculate inverse Z-Transform of $F(z) = \frac{1}{(z-5)^2}$ when $|z| > 5$

e) Solve $p(1+q^2) = q(z-a)$

Q.6 Attempt any three. **09**

a) Solve $pe^y = qe^x$

b) Solve $p^2 - q^2 = \frac{x-y}{z}$

c) Calculate Z-Transform of $f(x) = 2^k \cos\{3k+2\}, k \geq 0$.

d) Calculate $Z\{f(k)\}$ where $f(k) = \left(\frac{1}{3}\right)^{|k|}$ for all k.

e) Evaluate $\int_0^{2+i} z^2 dz$

1) Along the line $x = 2y$
2) Along the real axis from $z = 0$ to $z = 2$ and then along the line parallel to the imaginary axis from $z = 2$ to $z = 2 + i$
3) Along the imaginary axis from $z = 0$ to $z = 1$ and then along the line parallel to the real axis from $z = i$ to $z = 2 + i$ along the parabola $2y^2 = x$.

Q.7 Attempt any two. **10**

a) Calculate inverse Z-Transform of $F(z) = \frac{3z^2-18z+26}{(z-2)(z-3)(z-4)'}$ if region of Convergence is $3 < |z| < 4$

b) Evaluate $\oint \frac{z+2}{(z-3)(z-4)} dz$ where c is the circle $|z| = 1$

c) Use variable separable method to solve $\frac{\partial z}{\partial x} = 4\frac{\partial z}{\partial y}$ given $z(0, y) = 8e^{-3y}$

Seat No.	

Set R

S.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2025
Engineering Mathematics – III (BTN07301)

Day & Date: Saturday, 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book Page no 03 (Starring page of the Answer Book Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of Page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) $L\left\{\int_0^t \sin 2u\, du\right\} =$_____.

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

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

2) The particular integral of $x^2\frac{d^2y}{dx^2} + 2x\frac{dy}{dx} = \frac{1}{x^2}$ is _____.

a) $y = c_1 + c_2x^2$ b) $y = x - \frac{1}{x^2}$

c) $y = \frac{1}{2x^2}$ d) $y = \frac{1}{x^2}$

3) The value of $\frac{1}{D+a}X =$ _____.

a) $e^{-ax}\int e^{-ax}Xdx$ b) $e^{-ax}\int e^{ax}Xdx$

c) $e^{ax}\int e^{-ax}Xdx|$ d) $e^{ax}\int e^{ax}Xdx$

4) The complementary function of $(D^2 + 2D + 1)y = 2e^{3x}$ is _____.

a) $c_1e^{-x} + c_2e^{-x}$ b) $(c_1 + c_2x)e^{-2x}$

c) $(c_1\cos x + c_2\sin x)$ d) $(c_1 + c_2x)e^{-x}$

5) $L[e^t t^3]$ is _____.

a) $\frac{6}{(s-1)^4}$ b) $\frac{6}{s(s-1)^4}$

c) $\frac{1}{(s-1)^4}$ d) $\frac{1}{s(s-1)^4}$

6) If $L\{f(t)\} = \emptyset(s)$, then $L\{f(at)\} =$ _____.

a) $\emptyset\left(\frac{s}{a}\right)$ b) $\frac{1}{s}\emptyset\left(\frac{s}{a}\right)$

c) $\emptyset'\left(\frac{s}{a}\right)$ d) $\frac{1}{s}\emptyset\left(\frac{s}{a}\right)$

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

a) $\frac{1}{3}\sin 3t$ b) $\frac{1}{3}\cos 3t$

c) $\frac{1}{3}\cosh 3t$ d) $\frac{1}{3}\sinh 3t$

8) For $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 3y = 3ex^{2x}$, the particular integral is _____.

a) $\frac{1}{15}e^{2x}$ b) $3e^{2x}$

c) $\frac{1}{5}e^{2x}$ d) $c_1e^{-x} + c_2e^{-2x}$

9) The general solution of the equation $(D^3 - 7D - 6)y = 0$ is _____.

a) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{-3x}$ b) $y = c_1e^{x} + c_2e^{2x} + c_3e^{3x}$

c) $y = c_1e^{-x} + c_2e^{-2x} + c_3e^{-3x}$ d) None of these

10) $z\{k\} =$ for $|z| > 1$

a) $\frac{z}{z-1}$ b) $\frac{1}{(z-1)^2}$

c) $\frac{z}{(z-1)^2}$ d) $\frac{z}{(z+1)^2}$

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

a) $f\left(\frac{a}{z}\right)$ b) $f\left(\frac{z}{a}\right)$

c) $\frac{1}{a}f\left(\frac{a}{z}\right)$ d) None

12) The solution of the equation $pq = p + q$ is _____.

a) $z = ax + (a+1)y + c$

b) $z = (a+1)x + a(a-1)y + c$

c) $z(a-1) = a(a-1)x + ay + c$

d) $z = (a-1)x + a(a+1)y + c$

13) If $Z\{f(k)\} = F(z)$, then $Z\{kf(k)\} =$ _____.

a) $\dfrac{dF(z)}{dz}$ b) $-\dfrac{dF(z)}{dz}$

c) $z\dfrac{dF(z)}{dz}$ d) $-z\dfrac{dF(z)}{dz}$

14) The solution of a partial differential equation $xp + yq = z$ is _____.

a) $f(x^2, y^2) = 0$ b) $f(x, y) = 0$

c) $f(xz, yz) = 0$ d) $f\left(\dfrac{x}{y}, \dfrac{y}{z}\right)$

Seat No.	

Set R

S.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2025
Engineering Mathematics – III (BTN07301)

Day & Date: Saturday, 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any three. **09**

a) Solve $(D^3 + D)y = \cos x$

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

c) Solve $x^2\frac{d^2y}{dx^2} - 3x\frac{dy}{dx} + 4y = 2x$

d) Calculate $L\left\{\int_0^t u.e^{-4u}\sin 5u\, du\right\}$

e) Calculate $L\{te^{-4t}\sin 3t\}$

Q.3 Attempt any three. **09**

a) Evaluate $\int_0^\infty \frac{e^{-t}-e^{-3t}}{t}$ by using Laplace transform.

b) Find Laplace transform of $te^{-t}\cos 2t$

c) Solve $(D^3 + 3D^2 + 3D + 1)y = e^{-x}$

d) Solve $(x+1)^2\frac{d^2y}{dx^2} + (x+1)\frac{dy}{dx} + y = 2\sin(\log(1+x))$

e) Solve $\frac{d^2y}{dx^2} + 3\frac{dy}{dx} + 2y = e^{e^x}$

Q.4 Attempt any two. **10**

a) Find Z-transform of $x_k = a^{|k|}$ for all $k, 0 < a < 1$

b) Find the inverse Z-transform of $\frac{1}{(z-a)^2}$ if

1) $|z| < a$
2) $|z| > a$

c) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$

d) Solve $(D^2 - 6D + 13)y = e^{x\log 2} + 8e^{3x}\sin 4x$

e) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{1}{s(s^2+4)}\right]$

Section – II

Q.5 Attempt any three. **09**

a) Find Z- transform of $x_k = a^{|k|}$ for all $k, 0 < a < 1$

b) Solve $x(y-z)p + y(z-x)q = z(x-y)$

c) Evaluate $\oint \frac{z+2}{(z-3)(z-4)} dz$ where c is the circle $|z| = 1$.

d) Calculate inverse Z-Transform of $F(z) = \frac{1}{(z-5)^2}$ when $|z| > 5$

e) Solve $p(1+q^2) = q(z-a)$

Q.6 Attempt any three. **09**

a) Solve $pe^y = qe^x$

b) Solve $p^2 - q^2 = \frac{x-y}{z}$

c) Calculate Z-Transform of $f(x) = 2^k \cos\{3k+2\}, k \geq 0$.

d) Calculate $Z\{f(k)\}$ where $f(k) = \left(\frac{1}{3}\right)^{|k|}$ for all k.

e) Evaluate $\int_0^{2+i} z^2 dz$

1) Along the line $x = 2y$
2) Along the real axis from $z = 0$ to $z = 2$ and then along the line parallel to the imaginary axis from $z = 2$ to $z = 2 + i$
3) Along the imaginary axis from $z = 0$ to $z = 1$ and then along the line parallel to the real axis from $z = i$ to $z = 2 + i$ along the parabola $2y^2 = x$.

Q.7 Attempt any two. **10**

a) Calculate inverse Z-Transform of $F(z) = \frac{3z^2-18z+26}{(z-2)(z-3)(z-4)'}$ if region of Convergence is $3 < |z| < 4$

b) Evaluate $\oint \frac{z+2}{(z-3)(z-4)} dz$ where c is the circle $|z| = 1$

c) Use variable separable method to solve $\frac{\partial z}{\partial x} = 4\frac{\partial z}{\partial y}$ given $z(0, y) = 8e^{-3y}$

Seat No.		Set	S

S.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2025
Engineering Mathematics – III (BTN07301)

Day & Date: Saturday, 17-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book Page no 03 (Starring page of the Answer Book Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of Page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) $z\{k\} =$ for $|z| > 1$

a) $\frac{z}{z-1}$ b) $\frac{1}{(z-1)^2}$

c) $\frac{z}{(z-1)^2}$ d) $\frac{z}{(z+1)^2}$

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

a) $f\left(\frac{a}{z}\right)$ b) $f\left(\frac{z}{a}\right)$

c) $\frac{1}{a} f\left(\frac{a}{z}\right)$ d) None

3) The solution of the equation $pq = p + q$ is _____.

a) $z = ax + (a+1)y + c$
b) $z = (a+1)x + a(a-1)y + c$
c) $z(a-1) = a(a-1)x + ay + c$
d) $z = (a-1)x + a(a+1)y + c$

4) If $Z\{f(k)\} = F(z)$, then $Z\{kf(k)\} =$ _____.

a) $\frac{dF(z)}{dz}$ b) $-\frac{dF(z)}{dz}$

c) $z\frac{dF(z)}{dz}$ d) $-z\frac{dF(z)}{dz}$

5) The solution of a partial differential equation $xp + yq = z$ is _____.

a) $f(x^2, y^2) = 0$ b) $f(x, y) = 0$

c) $f(xz, yz) = 0$ d) $f\left(\frac{x}{y}, \frac{y}{z}\right)$

6) $L\left\{\int_0^t \sin 2u\, du\right\} =$_____.

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

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

7) The particular integral of $x^2\frac{d^2y}{dx^2} + 2x\frac{dy}{dx} = \frac{1}{x^2}$ is _____.

a) $y = c_1 + c_2x^2$ b) $y = x - \frac{1}{x^2}$

c) $y = \frac{1}{2x^2}$ d) $y = \frac{1}{x^2}$

8) The value of $\frac{1}{D+a}X =$ _____.

a) $e^{-ax}\int e^{-ax}Xdx$ b) $e^{-ax}\int e^{ax}Xdx$

c) $e^{ax}\int e^{-ax}Xdx|$ d) $e^{ax}\int e^{ax}Xdx$

9) The complementary function of $(D^2 + 2D + 1)y = 2e^{3x}$ is _____.

a) $c_1e^{-x} + c_2e^{-x}$ b) $(c_1 + c_2x)e^{-2x}$

c) $(c_1\cos x + c_2\sin x)$ d) $(c_1 + c_2x)e^{-x}$

10) $L[e^t t^3]$ is _____.

a) $\frac{6}{(s-1)^4}$ b) $\frac{6}{s(s-1)^4}$

c) $\frac{1}{(s-1)^4}$ d) $\frac{1}{s(s-1)^4}$

11) If $L\{f(t)\} = \emptyset(s)$, then $L\{f(at)\} =$ _____.

a) $\emptyset\left(\frac{s}{a}\right)$ b) $\frac{1}{s}\emptyset\left(\frac{s}{a}\right)$

c) $\emptyset'\left(\frac{s}{a}\right)$ d) $\frac{1}{s}\emptyset\left(\frac{s}{a}\right)$

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

a) $\frac{1}{3}\sin 3t$ b) $\frac{1}{3}\cos 3t$

c) $\frac{1}{3}\cosh 3t$ d) $\frac{1}{3}\sinh 3t$

13) For $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 3y = 3ex^{2x}$, the particular integral is _____.

a) $\frac{1}{15}e^{2x}$ b) $3e^{2x}$

c) $\frac{1}{5}e^{2x}$ d) $c_1e^{-x} + c_2e^{-2x}$

14) The general solution of the equation $(D^3 - 7D - 6)y = 0$ is _____.

a) $y = c_1e^{-x} + c_2e^{2x} + c_3e^{-3x}$ b) $y = c_1e^{x} + c_2e^{2x} + c_3e^{3x}$

c) $y = c_1e^{-x} + c_2e^{-2x} + c_3e^{-3x}$ d) None of these

Seat No.	

Set S

S.Y. (B.Tech.) (Electrical Engineering) (Semester - I) (Old) (CBCS)
Examination: March/April - 2025
Engineering Mathematics – III (BTN07301)

Day & Date: Saturday, 17-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any three. **09**

a) Solve $(D^3 + D)y = \cos x$

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

c) Solve $x^2\frac{d^2y}{dx^2} - 3x\frac{dy}{dx} + 4y = 2x$

d) Calculate $L\left\{\int_0^t u.e^{-4u}\sin 5u\, du\right\}$

e) Calculate $L\{te^{-4t}\sin 3t\}$

Q.3 Attempt any three. **09**

a) Evaluate $\int_0^\infty \frac{e^{-t}-e^{-3t}}{t}$ by using Laplace transform.

b) Find Laplace transform of $te^{-t}\cos 2t$

c) Solve $(D^3 + 3D^2 + 3D + 1)y = e^{-x}$

d) Solve $(x+1)^2\frac{d^2y}{dx^2} + (x+1)\frac{dy}{dx} + y = 2\sin(\log(1+x))$

e) Solve $\frac{d^2y}{dx^2} + 3\frac{dy}{dx} + 2y = e^{e^x}$

Q.4 Attempt any two. **10**

a) Find Z-transform of $x_k = a^{|k|}$ for all $k, 0 < a < 1$

b) Find the inverse Z-transform of $\frac{1}{(z-a)^2}$ if

1) $|z| < a$
2) $|z| > a$

c) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$

d) Solve $(D^2 - 6D + 13)y = e^{x\log 2} + 8e^{3x}\sin 4x$

e) Find the inverse Laplace transform of following by using the Convolution theorem of $\left[\frac{1}{s(s^2+4)}\right]$

Section – II

Q.5 Attempt any three. **09**

a) Find Z- transform of $x_k = a^{|k|}$ for all $k, 0 < a < 1$

b) Solve $x(y-z)p + y(z-x)q = z(x-y)$

c) Evaluate $\oint \frac{z+2}{(z-3)(z-4)} dz$ where c is the circle $|z| = 1$.

d) Calculate inverse Z-Transform of $F(z) = \frac{1}{(z-5)^2}$ when $|z| > 5$

e) Solve $p(1+q^2) = q(z-a)$

Q.6 Attempt any three. **09**

a) Solve $pe^y = qe^x$

b) Solve $p^2 - q^2 = \frac{x-y}{z}$

c) Calculate Z-Transform of $f(x) = 2^k \cos\{3k+2\}, k \geq 0$.

d) Calculate $Z\{f(k)\}$ where $f(k) = \left(\frac{1}{3}\right)^{|k|}$ for all k.

e) Evaluate $\int_0^{2+i} z^2 dz$

1) Along the line $x = 2y$
2) Along the real axis from $z = 0$ to $z = 2$ and then along the line parallel to the imaginary axis from $z = 2$ to $z = 2 + i$
3) Along the imaginary axis from $z = 0$ to $z = 1$ and then along the line parallel to the real axis from $z = i$ to $z = 2 + i$ along the parabola $2y^2 = x$.

Q.7 Attempt any two. **10**

a) Calculate inverse Z-Transform of $F(z) = \frac{3z^2-18z+26}{(z-2)(z-3)(z-4)'}$ if region of Convergence is $3 < |z| < 4$

b) Evaluate $\oint \frac{z+2}{(z-3)(z-4)} dz$ where c is the circle $|z| = 1$

c) Use variable separable method to solve $\frac{\partial z}{\partial x} = 4\frac{\partial z}{\partial y}$ given $z(0, y) = 8e^{-3y}$

SLR-BD-264

Seat No.	

Set P

S. Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Machines – I (BTN07302)

Day & Date: Monday 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No.1 is compulsory. It should be solved in the first 30 minutes. Each question carries one mark.
2) All questions are compulsory.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.
5) Don't forget to mention, Q. P. Set (A/B/C/D) ON TOP OF page.
6) Separate answer books for each section.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. 14

1) The most likely cause(s) of sparking at the brushes in a d. c. the machine is /are _____.
a) open coil in the armature
b) defective interpoles
c) incorrect brush spring pressure
d) all of the above

2) In a clockwise rotating loaded d.c. generator, brushes have to be shifted _____.
a) clockwise b) counterclockwise
c) either (a) or (b) d) neither (a) nor (b)

3) In lap winding, the number of brushes is always _____.
a) double the number of poles
b) the same as the number of poles
c) half the number of poles
d) Two

4) The commutation process in a.d.c. generator involves the _____.
a) passage of current from a moving armature to a stationary load
b) reversal of current in an armature coil as it crosses MNA
c) conversion of a.c. to d.c.
d) suppression of reactance voltage

5) The current drawn by a 120V d.c. the motor of armature resistance 0.5 Ω and back e.m.f.110 V is _____ ampere.
a) 20 b) 240
c) 220 d) 5

6) The speed of a d.c. the motor can be controlled by varying _____.
a) its flux per pole
b) the resistance of the armature circuit
c) applied voltage
d) all of the above

7) When the load is removed, _____ motor will run at the highest speed.
a) Shunt
b) Cumulative-compound
c) Differential compound
d) Series

8) Which type of flux does transformer action need?
a) Alternating electric flux
b) Alternating magnetic flux
c) Increasing magnetic flux
d) Constant magnetic flux

9) The ordinary efficiency of a given transformer is maximum when _____.
a) it runs at half full-load
b) it runs at full-load
c) its Cu loss equals iron loss
d) it runs slightly overload

10) In an actual transformer the iron loss remains practically constant from no load to full load because _____.
a) Value of transformation ratio remains constant
b) Permeability of transformer core remains constant
c) Core flux remains practically constant
d) Primary voltage remains constant

11) When does star/star transformers work satisfactorily?
a) Load is unbalanced only
b) Load is balanced only
c) On balanced as well as unbalanced loads
d) Independent of load type

12) For the parallel operation of two single phase transformers it is necessary that they should have _____.
a) same efficiency
b) same polarity
c) same kVA rating
d) same number of turns on the secondary side

13) On which load power factor zero voltage regulation will be achieved?
a) 0
b) 1
c) Leading
d) Lagging

14) An autotransformer having a transformation ratio of 0.8 supplies a load of 3 kW. The power transferred conductively from primary to secondary is _____ kW.
a) 0.6
b) 2.4
c) 1.5
d) 0.27

Seat No.	

Set **P**

S. Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Machines – I (BTN07302)

Day & Date: Monday 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any four of the following. **16**

a) Derive an expression for cross magnetizing and demagnetizing Ampere Turns due to armature reaction in DC machine.

b) A six-pole lap-connected 230 V shunt motor has 410 armature conductors. It takes 41 A on full load. The flux per pole is 0.05 Weber. The armature and field resistances are 0.1 ohm and 230 ohms respectively. Contact drop per brush = 1 V. Determines the speed of the motor at full load.

c) What are the losses in DC motors, explain them and derive the condition for maximum efficiency.

d) A series generator delivers a current of 100 A at 250 V. Its armature and series field resistances are 0.1 Ω and 0.055 Ω respectively. Find:
i) Armature current
ii) Generated e.m.f.

e) Derive an EMF equation of the DC Generator.

f) What is the necessity of a starter? Explain the 4-point starter with a neat diagram.

Q.3 Attempt any two of the following. **12**

a) The open circuit characteristic (O.C.C.) of a separately excited generator, at 600r.p.m. is as under.

Field Current, A:	1.6	3.2	4.8	6.4	8.0	9.6	11.2
E.m.f.:	148	285	390	460	520	560	590

Find
i) The voltage to which the machine will excite as a shunt generator with a field circuit resistance of 60ohm.
ii) The critical resistance, at this speed.

b) With the help of a neat sketch explain the speed control methods of D.C. shunt motor.

c) With a neat circuit diagram explain Swinburne's test and how the efficiency of the generator and motor are computed with this test. Write the advantages of this test.

Section – II

Q.4 Attempt any four of the following: **16**

a) Derive an EMF equation of the transformer.

b) Explain with a phasor diagram the behavior of a transformer on no-load.

c) The primary and secondary of a 25 kVA transformer has 500 and 40 turns, respectively. If the primary is connected to 3000 V, 50 Hz mains, calculate

i) Primary and secondary currents at full load;
ii) The secondary emf and
iii) The maximum flux in the core

Neglect magnetic leakage, resistance of the winding, and the primary no-load current in relation to the full load current.

d) A single-phase transformer with a ratio 5: 1 has a primary resistance of 0.4 ohm and reactance of 1.2 ohm and a secondary resistance of 0.01 and reactance of 0.04 ohm. Determine the percentage regulation when delivering 125 A at 600 V at 0.8 p.f. lagging.

e) With a neat sketch explain the open circuit test and short circuit test for transformer.

f) Define the efficiency of a transformer and find the condition for obtaining maximum efficiency.

Q.5 Attempt any two of the following. **12**

a) Explain open delta and Scott connections for a three-phase transformer.

b) Explain the following connections of three-phase transformers;

i) Star-star
ii) Delta-delta
iii) Delta-star
iv) Star-delta giving the merits of each one of them.

c) Determine the percentage efficiency and regulation at full load 0.9 p.f. lagging of a 5 kVA, 220/440V single-phase transformer. When the following test data is obtained.
OC. Test - 220 V, 2 A, 100 W on L.V. side;
S.C. Test - 40 V. 11.4 A, 200 W on H.V. side.

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Machines – I (BTN07302)

Day & Date: Monday 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No.1 is compulsory. It should be solved in the first 30 minutes. Each question carries one mark.
2) All questions are compulsory.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.
5) Don't forget to mention, Q. P. Set (A/B/C/D) ON TOP OF page.
6) Separate answer books for each section.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which type of flux does transformer action need?
a) Alternating electric flux b) Alternating magnetic flux
c) Increasing magnetic flux d) Constant magnetic flux

2) The ordinary efficiency of a given transformer is maximum when _____.
a) it runs at half full-load b) it runs at full-load
c) its Cu loss equals iron loss d) it runs slightly overload

3) In an actual transformer the iron loss remains practically constant from no load to full load because _____.
a) Value of transformation ratio remains constant
b) Permeability of transformer core remains constant
c) Core flux remains practically constant
d) Primary voltage remains constant

4) When does star/star transformers work satisfactorily?
a) Load is unbalanced only
b) Load is balanced only
c) On balanced as well as unbalanced loads
d) Independent of load type

5) For the parallel operation of two single phase transformers it is necessary that they should have _____.
a) same efficiency
b) same polarity
c) same kVA rating
d) same number of turns on the secondary side

6) On which load power factor zero voltage regulation will be achieved?
a) 0 b) 1
c) Leading d) Lagging

7) An autotransformer having a transformation ratio of 0.8 supplies a load of 3 kW. The power transferred conductively from primary to secondary is _____ kW.
a) 0.6 b) 2.4
c) 1.5 d) 0.27

8) The most likely cause(s) of sparking at the brushes in a d. c. the machine is /are _____.
a) open coil in the armature
b) defective interpoles
c) incorrect brush spring pressure
d) all of the above

9) In a clockwise rotating loaded d.c. generator, brushes have to be shifted _____.
a) clockwise b) counterclockwise
c) either (a) or (b) d) neither (a) nor (b)

10) In lap winding, the number of brushes is always _____.
a) double the number of poles
b) the same as the number of poles
c) half the number of poles
d) Two

11) The commutation process in a.d.c. generator involves the _____.
a) passage of current from a moving armature to a stationary load
b) reversal of current in an armature coil as it crosses MNA
c) conversion of a.c. to d.c.
d) suppression of reactance voltage

12) The current drawn by a 120V d.c. the motor of armature resistance 0.5 Ω and back e.m.f.110 V is _____ ampere.
a) 20 b) 240
c) 220 d) 5

13) The speed of a d.c. the motor can be controlled by varying _____.
a) its flux per pole
b) the resistance of the armature circuit
c) applied voltage
d) all of the above

14) When the load is removed, _____ motor will run at the highest speed.
a) Shunt b) Cumulative-compound
c) Differential compound d) Series

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Machines – I (BTN07302)

Day & Date: Monday 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any four of the following. **16**

a) Derive an expression for cross magnetizing and demagnetizing Ampere Turns due to armature reaction in DC machine.

b) A six-pole lap-connected 230 V shunt motor has 410 armature conductors. It takes 41 A on full load. The flux per pole is 0.05 Weber. The armature and field resistances are 0.1 ohm and 230 ohms respectively. Contact drop per brush = 1 V. Determines the speed of the motor at full load.

c) What are the losses in DC motors, explain them and derive the condition for maximum efficiency.

d) A series generator delivers a current of 100 A at 250 V. Its armature and series field resistances are 0.1 Ω and 0.055 Ω respectively. Find:
i) Armature current
ii) Generated e.m.f.

e) Derive an EMF equation of the DC Generator.

f) What is the necessity of a starter? Explain the 4-point starter with a neat diagram.

Q.3 Attempt any two of the following. **12**

a) The open circuit characteristic (O.C.C.) of a separately excited generator, at 600r.p.m. is as under.

Field Current, A:	1.6	3.2	4.8	6.4	8.0	9.6	11.2
E.m.f.:	148	285	390	460	520	560	590

Find
i) The voltage to which the machine will excite as a shunt generator with a field circuit resistance of 60ohm.
ii) The critical resistance, at this speed.

b) With the help of a neat sketch explain the speed control methods of D.C. shunt motor.

c) With a neat circuit diagram explain Swinburne's test and how the efficiency of the generator and motor are computed with this test. Write the advantages of this test.

Section – II

Q.4 Attempt any four of the following: **16**

a) Derive an EMF equation of the transformer.

b) Explain with a phasor diagram the behavior of a transformer on no-load.

c) The primary and secondary of a 25 kVA transformer has 500 and 40 turns, respectively. If the primary is connected to 3000 V, 50 Hz mains, calculate

i) Primary and secondary currents at full load;
ii) The secondary emf and
iii) The maximum flux in the core

Neglect magnetic leakage, resistance of the winding, and the primary no-load current in relation to the full load current.

d) A single-phase transformer with a ratio 5: 1 has a primary resistance of 0.4 ohm and reactance of 1.2 ohm and a secondary resistance of 0.01 and reactance of 0.04 ohm. Determine the percentage regulation when delivering 125 A at 600 V at 0.8 p.f. lagging.

e) With a neat sketch explain the open circuit test and short circuit test for transformer.

f) Define the efficiency of a transformer and find the condition for obtaining maximum efficiency.

Q.5 Attempt any two of the following. **12**

a) Explain open delta and Scott connections for a three-phase transformer.

b) Explain the following connections of three-phase transformers;

i) Star-star
ii) Delta-delta
iii) Delta-star
iv) Star-delta giving the merits of each one of them.

c) Determine the percentage efficiency and regulation at full load 0.9 p.f. lagging of a 5 kVA, 220/440V single-phase transformer. When the following test data is obtained.
OC. Test - 220 V, 2 A, 100 W on L.V. side;
S.C. Test - 40 V. 11.4 A, 200 W on H.V. side.

Seat No.		Set	R

S. Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Machines – I (BTN07302)

Day & Date: Monday 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No.1 is compulsory. It should be solved in the first 30 minutes. Each question carries one mark.
2) All questions are compulsory.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.
5) Don't forget to mention, Q. P. Set (A/B/C/D) ON TOP OF page.
6) Separate answer books for each section.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) When does star/star transformers work satisfactorily?
a) Load is unbalanced only
b) Load is balanced only
c) On balanced as well as unbalanced loads
d) Independent of load type

2) For the parallel operation of two single phase transformers it is necessary that they should have _____.
a) same efficiency
b) same polarity
c) same kVA rating
d) same number of turns on the secondary side

3) On which load power factor zero voltage regulation will be achieved?
a) 0 b) 1
c) Leading d) Lagging

4) An autotransformer having a transformation ratio of 0.8 supplies a load of 3 kW. The power transferred conductively from primary to secondary is _____ kW.
a) 0.6 b) 2.4
c) 1.5 d) 0.27

5) The most likely cause(s) of sparking at the brushes in a d. c. the machine is /are _____.
a) open coil in the armature
b) defective interpoles
c) incorrect brush spring pressure
d) all of the above

6) In a clockwise rotating loaded d.c. generator, brushes have to be shifted _____.

a) clockwise
b) counterclockwise
c) either (a) or (b)
d) neither (a) nor (b)

7) In lap winding, the number of brushes is always _____.

a) double the number of poles
b) the same as the number of poles
c) half the number of poles
d) Two

8) The commutation process in a.d.c. generator involves the _____.

a) passage of current from a moving armature to a stationary load
b) reversal of current in an armature coil as it crosses MNA
c) conversion of a.c. to d.c.
d) suppression of reactance voltage

9) The current drawn by a 120V d.c. the motor of armature resistance 0.5 Ω and back e.m.f.110 V is _____ ampere.

a) 20
b) 240
c) 220
d) 5

10) The speed of a d.c. the motor can be controlled by varying _____.

a) its flux per pole
b) the resistance of the armature circuit
c) applied voltage
d) all of the above

11) When the load is removed, _____ motor will run at the highest speed.

a) Shunt
b) Cumulative-compound
c) Differential compound
d) Series

12) Which type of flux does transformer action need?

a) Alternating electric flux
b) Alternating magnetic flux
c) Increasing magnetic flux
d) Constant magnetic flux

13) The ordinary efficiency of a given transformer is maximum when _____.

a) it runs at half full-load
b) it runs at full-load
c) its Cu loss equals iron loss
d) it runs slightly overload

14) In an actual transformer the iron loss remains practically constant from no load to full load because _____.

a) Value of transformation ratio remains constant
b) Permeability of transformer core remains constant
c) Core flux remains practically constant
d) Primary voltage remains constant

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Machines – I (BTN07302)

Day & Date: Monday 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any four of the following. **16**

a) Derive an expression for cross magnetizing and demagnetizing Ampere Turns due to armature reaction in DC machine.

b) A six-pole lap-connected 230 V shunt motor has 410 armature conductors. It takes 41 A on full load. The flux per pole is 0.05 Weber. The armature and field resistances are 0.1 ohm and 230 ohms respectively. Contact drop per brush = 1 V. Determines the speed of the motor at full load.

c) What are the losses in DC motors, explain them and derive the condition for maximum efficiency.

d) A series generator delivers a current of 100 A at 250 V. Its armature and series field resistances are 0.1 Ω and 0.055 Ω respectively. Find:
i) Armature current
ii) Generated e.m.f.

e) Derive an EMF equation of the DC Generator.

f) What is the necessity of a starter? Explain the 4-point starter with a neat diagram.

Q.3 Attempt any two of the following. **12**

a) The open circuit characteristic (O.C.C.) of a separately excited generator, at 600r.p.m. is as under.

Field Current, A:	1.6	3.2	4.8	6.4	8.0	9.6	11.2
E.m.f.:	148	285	390	460	520	560	590

Find
i) The voltage to which the machine will excite as a shunt generator with a field circuit resistance of 60ohm.
ii) The critical resistance, at this speed.

b) With the help of a neat sketch explain the speed control methods of D.C. shunt motor.

c) With a neat circuit diagram explain Swinburne's test and how the efficiency of the generator and motor are computed with this test. Write the advantages of this test.

Section – II

Q.4 Attempt any four of the following: **16**

a) Derive an EMF equation of the transformer.

b) Explain with a phasor diagram the behavior of a transformer on no-load.

c) The primary and secondary of a 25 kVA transformer has 500 and 40 turns, respectively. If the primary is connected to 3000 V, 50 Hz mains, calculate

i) Primary and secondary currents at full load;
ii) The secondary emf and
iii) The maximum flux in the core

Neglect magnetic leakage, resistance of the winding, and the primary no-load current in relation to the full load current.

d) A single-phase transformer with a ratio 5: 1 has a primary resistance of 0.4 ohm and reactance of 1.2 ohm and a secondary resistance of 0.01 and reactance of 0.04 ohm. Determine the percentage regulation when delivering 125 A at 600 V at 0.8 p.f. lagging.

e) With a neat sketch explain the open circuit test and short circuit test for transformer.

f) Define the efficiency of a transformer and find the condition for obtaining maximum efficiency.

Q.5 Attempt any two of the following. **12**

a) Explain open delta and Scott connections for a three-phase transformer.

b) Explain the following connections of three-phase transformers;

i) Star-star
ii) Delta-delta
iii) Delta-star
iv) Star-delta giving the merits of each one of them.

c) Determine the percentage efficiency and regulation at full load 0.9 p.f. lagging of a 5 kVA, 220/440V single-phase transformer. When the following test data is obtained.
OC. Test - 220 V, 2 A, 100 W on L.V. side;
S.C. Test - 40 V. 11.4 A, 200 W on H.V. side.

Seat No.	

Set S

S. Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Machines – I (BTN07302)

Day & Date: Monday 19-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No.1 is compulsory. It should be solved in the first 30 minutes. Each question carries one mark.
2) All questions are compulsory.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.
5) Don't forget to mention, Q. P. Set (A/B/C/D) ON TOP OF page.
6) Separate answer books for each section.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer. 14

1) The speed of a d.c. the motor can be controlled by varying _____.
a) its flux per pole
b) the resistance of the armature circuit
c) applied voltage
d) all of the above

2) When the load is removed, _____ motor will run at the highest speed.
a) Shunt b) Cumulative-compound
c) Differential compound d) Series

3) Which type of flux does transformer action need?
a) Alternating electric flux b) Alternating magnetic flux
c) Increasing magnetic flux d) Constant magnetic flux

4) The ordinary efficiency of a given transformer is maximum when _____.
a) it runs at half full-load b) it runs at full-load
c) its Cu loss equals iron loss d) it runs slightly overload

5) In an actual transformer the iron loss remains practically constant from no load to full load because _____.
a) Value of transformation ratio remains constant
b) Permeability of transformer core remains constant
c) Core flux remains practically constant
d) Primary voltage remains constant

6) When does star/star transformers work satisfactorily?
a) Load is unbalanced only
b) Load is balanced only
c) On balanced as well as unbalanced loads
d) Independent of load type

7) For the parallel operation of two single phase transformers it is necessary that they should have _____.
a) same efficiency
b) same polarity
c) same kVA rating
d) same number of turns on the secondary side

8) On which load power factor zero voltage regulation will be achieved?
a) 0 b) 1
c) Leading d) Lagging

9) An autotransformer having a transformation ratio of 0.8 supplies a load of 3 kW. The power transferred conductively from primary to secondary is _____ kW.
a) 0.6 b) 2.4
c) 1.5 d) 0.27

10) The most likely cause(s) of sparking at the brushes in a d. c. the machine is /are _____.
a) open coil in the armature
b) defective interpoles
c) incorrect brush spring pressure
d) all of the above

11) In a clockwise rotating loaded d.c. generator, brushes have to be shifted _____.
a) clockwise b) counterclockwise
c) either (a) or (b) d) neither (a) nor (b)

12) In lap winding, the number of brushes is always _____.
a) double the number of poles
b) the same as the number of poles
c) half the number of poles
d) Two

13) The commutation process in a.d.c. generator involves the _____.
a) passage of current from a moving armature to a stationary load
b) reversal of current in an armature coil as it crosses MNA
c) conversion of a.c. to d.c.
d) suppression of reactance voltage

14) The current drawn by a 120V d.c. the motor of armature resistance 0.5 Ω and back e.m.f.110 V is _____ ampere.
a) 20 b) 240
c) 220 d) 5

Seat No.	

Set **S**

S. Y. (B.Tech.) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Machines – I (BTN07302)

Day & Date: Monday 19-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any four of the following. **16**

a) Derive an expression for cross magnetizing and demagnetizing Ampere Turns due to armature reaction in DC machine.

b) A six-pole lap-connected 230 V shunt motor has 410 armature conductors. It takes 41 A on full load. The flux per pole is 0.05 Weber. The armature and field resistances are 0.1 ohm and 230 ohms respectively. Contact drop per brush = 1 V. Determines the speed of the motor at full load.

c) What are the losses in DC motors, explain them and derive the condition for maximum efficiency.

d) A series generator delivers a current of 100 A at 250 V. Its armature and series field resistances are 0.1 Ω and 0.055 Ω respectively. Find:
i) Armature current
ii) Generated e.m.f.

e) Derive an EMF equation of the DC Generator.

f) What is the necessity of a starter? Explain the 4-point starter with a neat diagram.

Q.3 Attempt any two of the following. **12**

a) The open circuit characteristic (O.C.C.) of a separately excited generator, at 600r.p.m. is as under.

Field Current, A:	1.6	3.2	4.8	6.4	8.0	9.6	11.2
E.m.f.:	148	285	390	460	520	560	590

Find
i) The voltage to which the machine will excite as a shunt generator with a field circuit resistance of 60ohm.
ii) The critical resistance, at this speed.

b) With the help of a neat sketch explain the speed control methods of D.C. shunt motor.

c) With a neat circuit diagram explain Swinburne's test and how the efficiency of the generator and motor are computed with this test. Write the advantages of this test.

Section – II

Q.4 Attempt any four of the following: **16**

a) Derive an EMF equation of the transformer.

b) Explain with a phasor diagram the behavior of a transformer on no-load.

c) The primary and secondary of a 25 kVA transformer has 500 and 40 turns, respectively. If the primary is connected to 3000 V, 50 Hz mains, calculate

i) Primary and secondary currents at full load;
ii) The secondary emf and
iii) The maximum flux in the core

Neglect magnetic leakage, resistance of the winding, and the primary no-load current in relation to the full load current.

d) A single-phase transformer with a ratio 5: 1 has a primary resistance of 0.4 ohm and reactance of 1.2 ohm and a secondary resistance of 0.01 and reactance of 0.04 ohm. Determine the percentage regulation when delivering 125 A at 600 V at 0.8 p.f. lagging.

e) With a neat sketch explain the open circuit test and short circuit test for transformer.

f) Define the efficiency of a transformer and find the condition for obtaining maximum efficiency.

Q.5 Attempt any two of the following. **12**

a) Explain open delta and Scott connections for a three-phase transformer.

b) Explain the following connections of three-phase transformers;

i) Star-star
ii) Delta-delta
iii) Delta-star
iv) Star-delta giving the merits of each one of them.

c) Determine the percentage efficiency and regulation at full load 0.9 p.f. lagging of a 5 kVA, 220/440V single-phase transformer. When the following test data is obtained.
OC. Test - 220 V, 2 A, 100 W on L.V. side;
S.C. Test - 40 V. 11.4 A, 200 W on H.V. side.

SLR-BD-265

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Power System I (BTN07304)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers. **14**

1) Transmission and distribution of electric power by underground system is superior to overhead system in respect of ____
a) Appearance and public safety
b) Maintenance cost
c) Frequency of faults, power failure and accidents
d) All of the above

2) The volume of copper required for an ac transmission line is inversely proportional to ____.
a) Current b) Voltage
c) Power factor d) Both b and c

3) For the same conductor length, same amount of power, same losses and same maximum voltage to earth, which system requires minimum conductor area ____.
a) Single phase ac
b) 3 phase ac
c) 2 wire ac
d) Two Wire DC System with Mid-Point Earthed

4) The diesel plants are mainly used ____.
a) As peak load plants
b) As base load plants
c) As standby power plants
d) Both peak and stand by plants

5) Reflector mirrors used for exploiting the solar energy are called ____.
a) Mantle b) Heliostats
c) Diffusers d) Ponds

6) Temperature attained by cylindrical parabolic collector is of the order of ____.

a) 50 - 100 °C b) 100 - 150 °C
c) 150 - 200 °C d) 200 - 400 °C

7) Which among these is the fundamental economical principle which influences the design of transmission lines?

a) Economic choice of conductor size
b) Economic choice of transmission voltage
c) Both a and b
d) Economic, choice of transmission line length

8) Assembly of which type of insulators are used as strain type of insulators?

a) Pin type b) Shackle type
c) Suspension type d) None of these

9) The voltage across the various discs of a string of suspension insulator having identical discs is different due to ____.

a) Surface leakage currents
b) Series capacitance
c) Shunt capacitance to ground
d) Series and shunt capacitance

10) Which of the following enters at the super heater of a boiler?

a) Cold Water b) Wet steam
c) Hot water d) Super-heated steam

11) Maximum and Minimum loads on the load duration curve is represented on which respective side?

a) Left and Right b) Right and Left
c) Randomly d) None of these

12) Which of the following material can be used as a moderator?

a) Graphite b) Heavy water D
c) Beryllium d) Any of the above

13) Maximum demand on the power system is ____.

a) Sum of the maximum demands of all its consumers.
b) Greatest average load in a specified time
c) Peak value of load in a specified time
d) All of the above

14) In a power station, the cost of generation of power reduces most effectively when ____.

a) Diversity factor alone increases
b) Both diversity factor and load factor increase
c) Only load factor increases
d) Both diversity factor and load factor decrease

SLR-BD-265

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Power System I (BTN07304)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Attempt the following questions: (Any Four) **16**

a) Define:
i) Max. Demand,
ii) Load curve,
iii) Load duration curve,
iv) Diversity factor.

b) What is electrical load, explain type of load, in brief.

c) Write note on interconnected grid System, state the various merits of interconnected grid.

d) Enlist type of nuclear reactor & Draw & Explain in brief with schematic arrangement of Boiled Water reactor (BWR).

e) Write Short Note:
i) Reflector
ii) Moderator
iii) Control Rod
iv) Coolant used in a nuclear power plant

Q.3 Attempt the following: (Any Two) **12**

a) Describe with neat sketch schematic arrangement of thermal power station.

b) Draw and explain load curve and load duration curve.

c) Enlist type of tariff and explain in detail Block Rate Tariff and Three-Part Tariff in Electrical Power System.

Section – II

Q.4 Attempt the following: (Any Four) **16**

a) Write note on Economics of Transmission line, discuss what are the aspects related to Economics of Transmission line.

b) Write short note on selection of optimum Voltage level for Transmission line, also enlist various advantages & disadvantages if select higher voltage level.

c) Enlist the various main types of insulators of Overhead power system, explain Strain type of insulator.

d) Derive equation for conductor material required in three phase 4-wire AC system.

e) Derive equation for conductor material required in 2-wire DC system with midpoint earthed. (K/4)

Q.5 Attempt the following: (Any Two) **12**

a) In a 33 KV transmission line, there are three units of disc insulator in a string, if capacitance between the tower body & insulator is 11% of self-capacitance disc insulator.
Find the:
i) Voltage distribution over a 3-disc insulator and,
ii) String Efficiency.

b) Show that conductor material required in single phase 3-wire system is $\frac{15}{\cos^2\emptyset}$ times of volume of conductor material required in Two wire DC System with one conductor earthed.

c) State and explain kelvin's law to determine the economic size of transmission conductor.

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Power System I (BTN07304)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers. **14**

1) Assembly of which type of insulators are used as strain type of insulators?
a) Pin type b) Shackle type
c) Suspension type d) None of these

2) The voltage across the various discs of a string of suspension insulator having identical discs is different due to ____.
a) Surface leakage currents
b) Series capacitance
c) Shunt capacitance to ground
d) Series and shunt capacitance

3) Which of the following enters at the super heater of a boiler?
a) Cold Water b) Wet steam
c) Hot water d) Super-heated steam

4) Maximum and Minimum loads on the load duration curve is represented on which respective side?
a) Left and Right b) Right and Left
c) Randomly d) None of these

5) Which of the following material can be used as a moderator?
a) Graphite b) Heavy water D
c) Beryllium d) Any of the above

6) Maximum demand on the power system is ____.
a) Sum of the maximum demands of all its consumers.
b) Greatest average load in a specified time
c) Peak value of load in a specified time
d) All of the above

7) In a power station, the cost of generation of power reduces most effectively when ____.
a) Diversity factor alone increases
b) Both diversity factor and load factor increase
c) Only load factor increases
d) Both diversity factor and load factor decrease

8) Transmission and distribution of electric power by underground system is superior to overhead system in respect of ____
a) Appearance and public safety
b) Maintenance cost
c) Frequency of faults, power failure and accidents
d) All of the above

9) The volume of copper required for an ac transmission line is inversely proportional to ____.
a) Current b) Voltage
c) Power factor d) Both b and c

10) For the same conductor length, same amount of power, same losses and same maximum voltage to earth, which system requires minimum conductor area ____.
a) Single phase ac
b) 3 phase ac
c) 2 wire ac
d) Two Wire DC System with Mid-Point Earthed

11) The diesel plants are mainly used ____.
a) As peak load plants
b) As base load plants
c) As standby power plants
d) Both peak and stand by plants

12) Reflector mirrors used for exploiting the solar energy are called ____.
a) Mantle b) Heliostats
c) Diffusers d) Ponds

13) Temperature attained by cylindrical parabolic collector is of the order of ____.
a) 50 - 100 °C b) 100 - 150 °C
c) 150 - 200 °C d) 200 - 400 °C

14) Which among these is the fundamental economical principle which influences the design of transmission lines?
a) Economic choice of conductor size
b) Economic choice of transmission voltage
c) Both a and b
d) Economic, choice of transmission line length

SLR-BD-265

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Power System I (BTN07304)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Attempt the following questions: (Any Four) **16**

a) Define:
i) Max. Demand,
ii) Load curve,
iii) Load duration curve,
iv) Diversity factor.

b) What is electrical load, explain type of load, in brief.

c) Write note on interconnected grid System, state the various merits of interconnected grid.

d) Enlist type of nuclear reactor & Draw & Explain in brief with schematic arrangement of Boiled Water reactor (BWR).

e) Write Short Note:
i) Reflector
ii) Moderator
iii) Control Rod
iv) Coolant used in a nuclear power plant

Q.3 Attempt the following: (Any Two) **12**

a) Describe with neat sketch schematic arrangement of thermal power station.

b) Draw and explain load curve and load duration curve.

c) Enlist type of tariff and explain in detail Block Rate Tariff and Three-Part Tariff in Electrical Power System.

Section – II

Q.4 Attempt the following: (Any Four) **16**

a) Write note on Economics of Transmission line, discuss what are the aspects related to Economics of Transmission line.

b) Write short note on selection of optimum Voltage level for Transmission line, also enlist various advantages & disadvantages if select higher voltage level.

c) Enlist the various main types of insulators of Overhead power system, explain Strain type of insulator.

d) Derive equation for conductor material required in three phase 4-wire AC system.

e) Derive equation for conductor material required in 2-wire DC system with midpoint earthed. (K/4)

Q.5 Attempt the following: (Any Two) **12**

a) In a 33 KV transmission line, there are three units of disc insulator in a string, if capacitance between the tower body & insulator is 11% of self-capacitance disc insulator.
Find the:
i) Voltage distribution over a 3-disc insulator and,
ii) String Efficiency.

b) Show that conductor material required in single phase 3-wire system is $\frac{15}{\cos^2\emptyset}$ times of volume of conductor material required in Two wire DC System with one conductor earthed.

c) State and explain kelvin's law to determine the economic size of transmission conductor.

Seat No.	

Set R

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Power System I (BTN07304)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers. **14**

1) Maximum and Minimum loads on the load duration curve is represented on which respective side?
a) Left and Right b) Right and Left
c) Randomly d) None of these

2) Which of the following material can be used as a moderator?
a) Graphite b) Heavy water D
c) Beryllium d) Any of the above

3) Maximum demand on the power system is ____.
a) Sum of the maximum demands of all its consumers.
b) Greatest average load in a specified time
c) Peak value of load in a specified time
d) All of the above

4) In a power station, the cost of generation of power reduces most effectively when ____.
a) Diversity factor alone increases
b) Both diversity factor and load factor increase
c) Only load factor increases
d) Both diversity factor and load factor decrease

5) Transmission and distribution of electric power by underground system is superior to overhead system in respect of ____
a) Appearance and public safety
b) Maintenance cost
c) Frequency of faults, power failure and accidents
d) All of the above

6) The volume of copper required for an ac transmission line is inversely proportional to ____.

a) Current b) Voltage
c) Power factor d) Both b and c

7) For the same conductor length, same amount of power, same losses and same maximum voltage to earth, which system requires minimum conductor area ____.

a) Single phase ac
b) 3 phase ac
c) 2 wire ac
d) Two Wire DC System with Mid-Point Earthed

8) The diesel plants are mainly used ____.

a) As peak load plants
b) As base load plants
c) As standby power plants
d) Both peak and stand by plants

9) Reflector mirrors used for exploiting the solar energy are called ____.

a) Mantle b) Heliostats
c) Diffusers d) Ponds

10) Temperature attained by cylindrical parabolic collector is of the order of ____.

a) 50 - 100 °C b) 100 - 150 °C
c) 150 - 200 °C d) 200 - 400 °C

11) Which among these is the fundamental economical principle which influences the design of transmission lines?

a) Economic choice of conductor size
b) Economic choice of transmission voltage
c) Both a and b
d) Economic, choice of transmission line length

12) Assembly of which type of insulators are used as strain type of insulators?

a) Pin type b) Shackle type
c) Suspension type d) None of these

13) The voltage across the various discs of a string of suspension insulator having identical discs is different due to ____.

a) Surface leakage currents
b) Series capacitance
c) Shunt capacitance to ground
d) Series and shunt capacitance

14) Which of the following enters at the super heater of a boiler?

a) Cold Water b) Wet steam
c) Hot water d) Super-heated steam

SLR-BD-265

Seat No.	

Set R

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Power System I (BTN07304)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Attempt the following questions: (Any Four) **16**

a) Define:
i) Max. Demand,
ii) Load curve,
iii) Load duration curve,
iv) Diversity factor.

b) What is electrical load, explain type of load, in brief.

c) Write note on interconnected grid System, state the various merits of interconnected grid.

d) Enlist type of nuclear reactor & Draw & Explain in brief with schematic arrangement of Boiled Water reactor (BWR).

e) Write Short Note:
i) Reflector
ii) Moderator
iii) Control Rod
iv) Coolant used in a nuclear power plant

Q.3 Attempt the following: (Any Two) **12**

a) Describe with neat sketch schematic arrangement of thermal power station.

b) Draw and explain load curve and load duration curve.

c) Enlist type of tariff and explain in detail Block Rate Tariff and Three-Part Tariff in Electrical Power System.

Section – II

Q.4 Attempt the following: (Any Four) **16**

a) Write note on Economics of Transmission line, discuss what are the aspects related to Economics of Transmission line.

b) Write short note on selection of optimum Voltage level for Transmission line, also enlist various advantages & disadvantages if select higher voltage level.

c) Enlist the various main types of insulators of Overhead power system, explain Strain type of insulator.

d) Derive equation for conductor material required in three phase 4-wire AC system.

e) Derive equation for conductor material required in 2-wire DC system with midpoint earthed. (K/4)

Q.5 Attempt the following: (Any Two) **12**

a) In a 33 KV transmission line, there are three units of disc insulator in a string, if capacitance between the tower body & insulator is 11% of self-capacitance disc insulator.
Find the:
i) Voltage distribution over a 3-disc insulator and,
ii) String Efficiency.

b) Show that conductor material required in single phase 3-wire system is $\frac{15}{\cos^2\emptyset}$ times of volume of conductor material required in Two wire DC System with one conductor earthed.

c) State and explain kelvin's law to determine the economic size of transmission conductor.

Seat No.	

Set **S**

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Power System I (BTN07304)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in answer book. Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume data wherever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answers. **14**

1) Temperature attained by cylindrical parabolic collector is of the order of ____.
a) 50 - 100 °C b) 100 - 150 °C
c) 150 - 200 °C d) 200 - 400 °C

2) Which among these is the fundamental economical principle which influences the design of transmission lines?
a) Economic choice of conductor size
b) Economic choice of transmission voltage
c) Both a and b
d) Economic, choice of transmission line length

3) Assembly of which type of insulators are used as strain type of insulators?
a) Pin type b) Shackle type
c) Suspension type d) None of these

4) The voltage across the various discs of a string of suspension insulator having identical discs is different due to ____.
a) Surface leakage currents
b) Series capacitance
c) Shunt capacitance to ground
d) Series and shunt capacitance

5) Which of the following enters at the super heater of a boiler?
a) Cold Water b) Wet steam
c) Hot water d) Super-heated steam

6) Maximum and Minimum loads on the load duration curve is represented on which respective side?

a) Left and Right b) Right and Left
c) Randomly d) None of these

7) Which of the following material can be used as a moderator?

a) Graphite b) Heavy water D
c) Beryllium d) Any of the above

8) Maximum demand on the power system is ____.

a) Sum of the maximum demands of all its consumers.
b) Greatest average load in a specified time
c) Peak value of load in a specified time
d) All of the above

9) In a power station, the cost of generation of power reduces most effectively when ____.

a) Diversity factor alone increases
b) Both diversity factor and load factor increase
c) Only load factor increases
d) Both diversity factor and load factor decrease

10) Transmission and distribution of electric power by underground system is superior to overhead system in respect of ____

a) Appearance and public safety
b) Maintenance cost
c) Frequency of faults, power failure and accidents
d) All of the above

11) The volume of copper required for an ac transmission line is inversely proportional to ____.

a) Current b) Voltage
c) Power factor d) Both b and c

12) For the same conductor length, same amount of power, same losses and same maximum voltage to earth, which system requires minimum conductor area ____.

a) Single phase ac
b) 3 phase ac
c) 2 wire ac
d) Two Wire DC System with Mid-Point Earthed

13) The diesel plants are mainly used ____.

a) As peak load plants
b) As base load plants
c) As standby power plants
d) Both peak and stand by plants

14) Reflector mirrors used for exploiting the solar energy are called ____.

a) Mantle b) Heliostats
c) Diffusers d) Ponds

SLR-BD-265

Seat No.	

Set S

S. Y. (B.Tech.) (Sem - I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Power System I (BTN07304)

Day & Date: Tuesday, 20-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

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

Section – I

Q.2 Attempt the following questions: (Any Four) **16**

a) Define:
i) Max. Demand,
ii) Load curve,
iii) Load duration curve,
iv) Diversity factor.

b) What is electrical load, explain type of load, in brief.

c) Write note on interconnected grid System, state the various merits of interconnected grid.

d) Enlist type of nuclear reactor & Draw & Explain in brief with schematic arrangement of Boiled Water reactor (BWR).

e) Write Short Note:
i) Reflector
ii) Moderator
iii) Control Rod
iv) Coolant used in a nuclear power plant

Q.3 Attempt the following: (Any Two) **12**

a) Describe with neat sketch schematic arrangement of thermal power station.

b) Draw and explain load curve and load duration curve.

c) Enlist type of tariff and explain in detail Block Rate Tariff and Three-Part Tariff in Electrical Power System.

Section – II

Q.4 Attempt the following: (Any Four) **16**

a) Write note on Economics of Transmission line, discuss what are the aspects related to Economics of Transmission line.

b) Write short note on selection of optimum Voltage level for Transmission line, also enlist various advantages & disadvantages if select higher voltage level.

c) Enlist the various main types of insulators of Overhead power system, explain Strain type of insulator.

d) Derive equation for conductor material required in three phase 4-wire AC system.

e) Derive equation for conductor material required in 2-wire DC system with midpoint earthed. (K/4)

Q.5 Attempt the following: (Any Two) **12**

a) In a 33 KV transmission line, there are three units of disc insulator in a string, if capacitance between the tower body & insulator is 11% of self-capacitance disc insulator.
Find the:
i) Voltage distribution over a 3-disc insulator and,
ii) String Efficiency.

b) Show that conductor material required in single phase 3-wire system is $\frac{15}{\cos^2\emptyset}$ times of volume of conductor material required in Two wire DC System with one conductor earthed.

c) State and explain kelvin's law to determine the economic size of transmission conductor.

Seat No.	

Set P

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL & ENGINEERING
Electronic devices and Circuits (BTN07305)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Thermal runaway occurs when ____.
a) Collector is reverse biased b) Transistor is not biased
c) Emitter is forward biased d) Junction capacitance is high

2) The disadvantage of voltage divider bias, that it has ____.
a) High stability factor b) Low base current
c) Many resistor d) None of the above

3) Zener diode can be used as ____.
a) d. c. voltage regulator only
b) a. c. voltage regulator only
c) both d. c. and a. c. voltage regulator
d) none of the above

4) The dc current gain in common collector configuration is given by ____.
a) α b) β
c) $\beta + 1$ d) $\alpha + 1$

5) In which mode of BJT operation are both junctions reverse biased____.
a) active b) saturation
c) cut off d) reverse active

6) For an NPN transistor in normal bias ____.
a) Only holes cross the collector junction
b) Only majority carriers cross the collector junction
c) The emitter junction has high resistance
d) Emitter junction is forward biased and collector junction is reverse biased

7) The ideal value for stability factor for biasing circuit is ____.
a) 1 b) 5
c) 0 d) 100

8) In BJT base region is made very thin so that ____.
a) Recombination in base region is minimum
b) Electric field gradient in base is high
c) Base can be easily fabricated
d) Base can be easily biased

9) In the input RC circuit of a single stage BJT amplifier, by how much does the base voltage lead the input voltage for frequencies much larger than the cutoff frequency in the low frequency region?
a) About 0° b) 45°
c) About 90° d) None of the above

10) If temperature changes, h parameters of a transistor ____.
a) May or may not change b) Do not change
c) Also change d) None of the above

11) In an unregulated power supply, if load current increases, the output voltage ____.
a) Remains the same b) Decreases
c) Increases d) None of the above

12) The gain of an amplifier without feedback is 100 dB. If negative feedback of 3 db is applied, the gain of the amplifier will become ____.
a) 5 dB b) 300 dB
c) 103 dB d) 97 dB

13) An emitter-follower is also known as a ____.
a) common-emitter amplifier b) common-base amplifier
c) common-collector amplifier d) Darlington pair

14) A transistor behaves as a linear device for ____.
a) Small signals only b) Large signals only
c) Both small and large signals d) None of the above

Seat No.	

Set P

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL & ENGINEERING
Electronic devices and Circuits (BTN07305)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2 Solve the following: (Any Four) **16**

a) Explain neat diagram of DC load line of BJT. Write significance of load line.
b) Derive expression for operating point voltage, current and stability factor of voltage divider biasing circuit.
c) Explain the frequency response of RC coupled CE amplifier.
d) What is compensation techniques used in BJT? Explain in detail with circuit diagram.
e) Define the terms related to small signal parameter of JFET.
i) DC drain to source resistance
ii) Amplification factor
iii) AC drain resistance
iv) Transconductance

Q.3 Solve the following: (Any Two) **12**

a) Draw & Explain V-I characteristics of JFET, also draw & explain V-I characteristics for different value of VGS.
b) Derive expression for current gain and input impedance for amplifier in terms of h-parameters.
c) Design a single stage CE amplifier which has $\mathrm{VCEQ} = 5\mathrm{V}, \mathrm{ICEQ} = 5\ \mathrm{mA}, \mathrm{VCC} = 12\mathrm{V}, \mathrm{AV} = 100, \mathrm{Ai} = 150, \mathrm{VBE} = 0.6\mathrm{V}, \mathrm{hie} = 2.5\ \mathrm{k\Omega}, \mathrm{s} = 3, \mathrm{RL} = 1\mathrm{k\Omega}.$

Section- II

Q.4 Solve the following: (Any Four) **16**

a) Explain various types of filters.
b) Draw the Circuit diagram of Full wave center tap rectifier with π filter. Explain.
c) Differentiate between positive and negative feedback (At least four points).
d) Explain transformer coupled class B amplifier.
e) Explain the technical features of positive voltage regulators.

Q.5 Solve the following: (Any Two) **12**

a) Design stabilized power supply using inductor filter to give DC output voltage of 33 V at 2KΩ with ripple factor not exceeding 4%. Assume supply frequency of 50Hz & Use 2 diode FWR.

b) Derive the equation for voltage series feedback amplifier for effect of Input resistance (Rif).

c) Compare between class A, class B and class AB amplifiers (Any four points).

Seat No.		Set	Q

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL & ENGINEERING
Electronic devices and Circuits (BTN07305)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) In BJT base region is made very thin so that ____.
a) Recombination in base region is minimum
b) Electric field gradient in base is high
c) Base can be easily fabricated
d) Base can be easily biased

2) In the input RC circuit of a single stage BJT amplifier, by how much does the base voltage lead the input voltage for frequencies much larger than the cutoff frequency in the low frequency region?
a) About 0° b) 45°
c) About 90° d) None of the above

3) If temperature changes, h parameters of a transistor ____.
a) May or may not change b) Do not change
c) Also change d) None of the above

4) In an unregulated power supply, if load current increases, the output voltage ____.
a) Remains the same b) Decreases
c) Increases d) None of the above

5) The gain of an amplifier without feedback is 100 dB. If negative feedback of 3 db is applied, the gain of the amplifier will become ____.
a) 5 dB b) 300 dB
c) 103 dB d) 97 dB

6) An emitter-follower is also known as a ____.
a) common-emitter amplifier b) common-base amplifier
c) common-collector amplifier d) Darlington pair

7) A transistor behaves as a linear device for ____.
a) Small signals only b) Large signals only
c) Both small and large signals d) None of the above

8) Thermal runaway occurs when ____.
a) Collector is reverse biased b) Transistor is not biased
c) Emitter is forward biased d) Junction capacitance is high

9) The disadvantage of voltage divider bias, that it has ____.
a) High stability factor b) Low base current
c) Many resistor d) None of the above

10) Zener diode can be used as ____.
a) d. c. voltage regulator only
b) a. c. voltage regulator only
c) both d. c. and a. c. voltage regulator
d) none of the above

11) The dc current gain in common collector configuration is given by ____.
a) α b) β
c) $\beta + 1$ d) $\alpha + 1$

12) In which mode of BJT operation are both junctions reverse biased____.
a) active b) saturation
c) cut off d) reverse active

13) For an NPN transistor in normal bias ____.
a) Only holes cross the collector junction
b) Only majority carriers cross the collector junction
c) The emitter junction has high resistance
d) Emitter junction is forward biased and collector junction is reverse biased

14) The ideal value for stability factor for biasing circuit is ____.
a) 1 b) 5
c) 0 d) 100

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL & ENGINEERING
Electronic devices and Circuits (BTN07305)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2 Solve the following: (Any Four) **16**

a) Explain neat diagram of DC load line of BJT. Write significance of load line.
b) Derive expression for operating point voltage, current and stability factor of voltage divider biasing circuit.
c) Explain the frequency response of RC coupled CE amplifier.
d) What is compensation techniques used in BJT? Explain in detail with circuit diagram.
e) Define the terms related to small signal parameter of JFET.
i) DC drain to source resistance
ii) Amplification factor
iii) AC drain resistance
iv) Transconductance

Q.3 Solve the following: (Any Two) **12**

a) Draw & Explain V-I characteristics of JFET, also draw & explain V-I characteristics for different value of VGS.
b) Derive expression for current gain and input impedance for amplifier in terms of h-parameters.
c) Design a single stage CE amplifier which has $\mathrm{VCEQ} = 5\mathrm{V}, \mathrm{ICEQ} = 5\ \mathrm{mA}, \mathrm{VCC} = 12\mathrm{V}, \mathrm{AV} = 100, \mathrm{Ai} = 150, \mathrm{VBE} = 0.6\mathrm{V}, \mathrm{hie} = 2.5\ \mathrm{k\Omega}, \mathrm{s} = 3, \mathrm{RL} = 1\mathrm{k\Omega}.$

Section- II

Q.4 Solve the following: (Any Four) **16**

a) Explain various types of filters.
b) Draw the Circuit diagram of Full wave center tap rectifier with π filter. Explain.
c) Differentiate between positive and negative feedback (At least four points).
d) Explain transformer coupled class B amplifier.
e) Explain the technical features of positive voltage regulators.

Q.5 Solve the following: (Any Two) **12**

a) Design stabilized power supply using inductor filter to give DC output voltage of 33 V at 2KΩ with ripple factor not exceeding 4%. Assume supply frequency of 50Hz & Use 2 diode FWR.

b) Derive the equation for voltage series feedback amplifier for effect of Input resistance (Rif).

c) Compare between class A, class B and class AB amplifiers (Any four points).

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL & ENGINEERING
Electronic devices and Circuits (BTN07305)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) In an unregulated power supply, if load current increases, the output voltage ____.
a) Remains the same b) Decreases
c) Increases d) None of the above

2) The gain of an amplifier without feedback is 100 dB. If negative feedback of 3 db is applied, the gain of the amplifier will become ____.
a) 5 dB b) 300 dB
c) 103 dB d) 97 dB

3) An emitter-follower is also known as a ____.
a) common-emitter amplifier b) common-base amplifier
c) common-collector amplifier d) Darlington pair

4) A transistor behaves as a linear device for ____.
a) Small signals only b) Large signals only
c) Both small and large signals d) None of the above

5) Thermal runaway occurs when ____.
a) Collector is reverse biased b) Transistor is not biased
c) Emitter is forward biased d) Junction capacitance is high

6) The disadvantage of voltage divider bias, that it has ____.
a) High stability factor b) Low base current
c) Many resistor d) None of the above

7) Zener diode can be used as ____.
a) d. c. voltage regulator only
b) a. c. voltage regulator only
c) both d. c. and a. c. voltage regulator
d) none of the above

8) The dc current gain in common collector configuration is given by ____.
a) α b) β
c) $\beta + 1$ d) $\alpha + 1$

9) In which mode of BJT operation are both junctions reverse biased____.
a) active b) saturation
c) cut off d) reverse active

10) For an NPN transistor in normal bias ____.
a) Only holes cross the collector junction
b) Only majority carriers cross the collector junction
c) The emitter junction has high resistance
d) Emitter junction is forward biased and collector junction is reverse biased

11) The ideal value for stability factor for biasing circuit is ____.
a) 1 b) 5
c) 0 d) 100

12) In BJT base region is made very thin so that ____.
a) Recombination in base region is minimum
b) Electric field gradient in base is high
c) Base can be easily fabricated
d) Base can be easily biased

13) In the input RC circuit of a single stage BJT amplifier, by how much does the base voltage lead the input voltage for frequencies much larger than the cutoff frequency in the low frequency region?
a) About 0° b) 45°
c) About 90° d) None of the above

14) If temperature changes, h parameters of a transistor ____.
a) May or may not change b) Do not change
c) Also change d) None of the above

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL & ENGINEERING
Electronic devices and Circuits (BTN07305)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2 Solve the following: (Any Four) **16**

a) Explain neat diagram of DC load line of BJT. Write significance of load line.
b) Derive expression for operating point voltage, current and stability factor of voltage divider biasing circuit.
c) Explain the frequency response of RC coupled CE amplifier.
d) What is compensation techniques used in BJT? Explain in detail with circuit diagram.
e) Define the terms related to small signal parameter of JFET.
i) DC drain to source resistance
ii) Amplification factor
iii) AC drain resistance
iv) Transconductance

Q.3 Solve the following: (Any Two) **12**

a) Draw & Explain V-I characteristics of JFET, also draw & explain V-I characteristics for different value of VGS.
b) Derive expression for current gain and input impedance for amplifier in terms of h-parameters.
c) Design a single stage CE amplifier which has $\mathrm{VCEQ} = 5\mathrm{V}, \mathrm{ICEQ} = 5\ \mathrm{mA}, \mathrm{VCC} = 12\mathrm{V}, \mathrm{AV} = 100, \mathrm{Ai} = 150, \mathrm{VBE} = 0.6\mathrm{V}, \mathrm{hie} = 2.5\ \mathrm{k\Omega}, \mathrm{s} = 3, \mathrm{RL} = 1\mathrm{k\Omega}.$

Section- II

Q.4 Solve the following: (Any Four) **16**

a) Explain various types of filters.
b) Draw the Circuit diagram of Full wave center tap rectifier with π filter. Explain.
c) Differentiate between positive and negative feedback (At least four points).
d) Explain transformer coupled class B amplifier.
e) Explain the technical features of positive voltage regulators.

Q.5 Solve the following: (Any Two) **12**

a) Design stabilized power supply using inductor filter to give DC output voltage of 33 V at 2KΩ with ripple factor not exceeding 4%. Assume supply frequency of 50Hz & Use 2 diode FWR.

b) Derive the equation for voltage series feedback amplifier for effect of Input resistance (Rif).

c) Compare between class A, class B and class AB amplifiers (Any four points).

Seat No.		Set	S

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL & ENGINEERING
Electronic devices and Circuits (BTN07305)

Day & Date: Wednesday 21-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) For an NPN transistor in normal bias ____.
a) Only holes cross the collector junction
b) Only majority carriers cross the collector junction
c) The emitter junction has high resistance
d) Emitter junction is forward biased and collector junction is reverse biased

2) The ideal value for stability factor for biasing circuit is ____.
a) 1 b) 5
c) 0 d) 100

3) In BJT base region is made very thin so that ____.
a) Recombination in base region is minimum
b) Electric field gradient in base is high
c) Base can be easily fabricated
d) Base can be easily biased

4) In the input RC circuit of a single stage BJT amplifier, by how much does the base voltage lead the input voltage for frequencies much larger than the cutoff frequency in the low frequency region?
a) About 0° b) 45°
c) About 90° d) None of the above

5) If temperature changes, h parameters of a transistor ____.
a) May or may not change b) Do not change
c) Also change d) None of the above

6) In an unregulated power supply, if load current increases, the output voltage ____.
a) Remains the same b) Decreases
c) Increases d) None of the above

7) The gain of an amplifier without feedback is 100 dB. If negative feedback of 3 db is applied, the gain of the amplifier will become ____.
a) 5 dB b) 300 dB
c) 103 dB d) 97 dB

8) An emitter-follower is also known as a ____.
a) common-emitter amplifier b) common-base amplifier
c) common-collector amplifier d) Darlington pair

9) A transistor behaves as a linear device for ____.
a) Small signals only b) Large signals only
c) Both small and large signals d) None of the above

10) Thermal runaway occurs when ____.
a) Collector is reverse biased b) Transistor is not biased
c) Emitter is forward biased d) Junction capacitance is high

11) The disadvantage of voltage divider bias, that it has ____.
a) High stability factor b) Low base current
c) Many resistor d) None of the above

12) Zener diode can be used as ____.
a) d. c. voltage regulator only
b) a. c. voltage regulator only
c) both d. c. and a. c. voltage regulator
d) none of the above

13) The dc current gain in common collector configuration is given by ____.
a) α b) β
c) $\beta + 1$ d) $\alpha + 1$

14) In which mode of BJT operation are both junctions reverse biased____.
a) active b) saturation
c) cut off d) reverse active

Seat No.	

Set **S**

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL & ENGINEERING
Electronic devices and Circuits (BTN07305)

Day & Date: Wednesday 21-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and mention it clearly.

Section – I

Q.2 Solve the following: (Any Four) **16**

a) Explain neat diagram of DC load line of BJT. Write significance of load line.
b) Derive expression for operating point voltage, current and stability factor of voltage divider biasing circuit.
c) Explain the frequency response of RC coupled CE amplifier.
d) What is compensation techniques used in BJT? Explain in detail with circuit diagram.
e) Define the terms related to small signal parameter of JFET.
i) DC drain to source resistance
ii) Amplification factor
iii) AC drain resistance
iv) Transconductance

Q.3 Solve the following: (Any Two) **12**

a) Draw & Explain V-I characteristics of JFET, also draw & explain V-I characteristics for different value of VGS.
b) Derive expression for current gain and input impedance for amplifier in terms of h-parameters.
c) Design a single stage CE amplifier which has $\mathrm{VCEQ} = 5\mathrm{V}, \mathrm{ICEQ} = 5\ \mathrm{mA}, \mathrm{VCC} = 12\mathrm{V}, \mathrm{AV} = 100, \mathrm{Ai} = 150, \mathrm{VBE} = 0.6\mathrm{V}, \mathrm{hie} = 2.5\ \mathrm{k\Omega}, \mathrm{s} = 3, \mathrm{RL} = 1\mathrm{k\Omega}.$

Section- II

Q.4 Solve the following: (Any Four) **16**

a) Explain various types of filters.
b) Draw the Circuit diagram of Full wave center tap rectifier with π filter. Explain.
c) Differentiate between positive and negative feedback (At least four points).
d) Explain transformer coupled class B amplifier.
e) Explain the technical features of positive voltage regulators.

Q.5 Solve the following: (Any Two) **12**

a) Design stabilized power supply using inductor filter to give DC output voltage of 33 V at 2KΩ with ripple factor not exceeding 4%. Assume supply frequency of 50Hz & Use 2 diode FWR.

b) Derive the equation for voltage series feedback amplifier for effect of Input resistance (Rif).

c) Compare between class A, class B and class AB amplifiers (Any four points).

Seat No.	

Set P

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Measurement and Instrumentation (BTN07303)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ instruments are those which measure the total quantity of electricity delivered in a particular time.
a) Absolute b) Indicating
c) Recording d) Integrating

2) For handling greater currents induction wattmeters are used in conjunction with _____.
a) potential transformers b) current transformers
c) power transformer d) either of the above

3) Induction type single phase energy meters measure electric energy in _____.
a) kW b) Wh
c) kWh d) VAR

4) In majority of instruments damping is provided by _____.
a) fluid friction b) spring
c) eddy currents d) all of the above

5) Basically a potentiometer is a device for _____.
a) comparing two voltages b) measuring a current
c) comparing two currents d) measuring a voltage

6) In order to achieve high accuracy, the slide wire of a potentiometer should be _____.
a) as long as possible
b) as short as possible
c) neither too small not too large
d) very thick

7) Instrument transformers are _____.
a) potential transformers b) current transformers
c) both (a) and (b) d) power transformers

8) An instrument transformer is used to extend the range of _____.
a) induction instrument b) electrostatic instrument
c) moving coil instrument d) any of the above

9) For measurement of mutual inductance we can use _____.
a) Anderson bridge b) Maxwell's bridge
c) Heaviside bridge d) Any of the above

10) In a Weston frequency meter, the magnetic axes of the two fixed coils are _____.
a) parallel b) perpendicular
c) inclined at 60° d) inclined at 120°

11) To measure radio frequency, the suitable frequency meter is _____.
a) Weston frequency meter
b) reed vibrator frequency meter
c) heterodoxy frequency meter
d) electrical resonance frequency meter

12) A CRO can display _____.
a) AC signals b) DC signals
c) Both AC and DC signals d) Time invariant signals

13) The internal resistance of an ammeter should be _____.
a) very small b) medium
c) high d) infinity

14) In a moving coil instrument, the deflecting torque is proportional to ___.
a) current b) square of the current
c) square root of the current d) sine of the measurand

Seat No.	

Set **P**

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Measurement and Instrumentation (BTN07303)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four **16**

a) Write classification of measuring instruments.
b) Define standard & explain types of standard.
c) Explain the working of megger with neat diagram.
d) Explain Maxwell's inductance bridge with phasor diagram.
e) With neat sketch explain PMMC type instrument.

Q.3 Attempt any two. **12**

a) Explain construction & operation of $1\text{-}\Phi$ electro dynamo meter power factor meter.
b) Explain Schering Bridge measurement of unknown capacitance with phasor diagram
c) A bridge consist of the following :
Arm ab:- A choke coil having resistance R_1 & inductance L_1
Arm bc:- A non-inductive resistance R_3
Arm cd :- A mica condenser C_4 in series with non-inductive resistance R_4
Arm da :- A non-inductive resistance R_2
When this bridge fed from a source of 500 Hz, balance is obtained underfollowing conditions $\mathrm{R}_2 = 2410\Omega, \mathrm{R}_3 = 750\Omega, \mathrm{C}_4 = 0.35\mu\mathrm{F}$, $\mathrm{R}_4 = 64.5\Omega$
The series resistance of capacitor is 0.4Ω. Calculate resistance and Inductance of choke coil. The supply is connected between a & c and detector is between b & d.

Section – II

Q.4 Attempt any Four. **16**

a) Difference between CT and PT.
b) Write note on Digital voltmer.
c) Explain Q-meter with neat diagram.
d) Write note on digital storage oscilloscope.
e) Explain digital measurement of time period.

Q.5 Attempt any two. **12**

a) Draw the block diagram of CRO and explain each block.
b) Explain with neat diagram, working of ramp type digital voltmeter.
c) Draw typical phasor diagram of potential transformer. Derive an expression for actual transformation ratio.

Seat No.	

Set Q

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Measurement and Instrumentation (BTN07303)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) An instrument transformer is used to extend the range of _____.
a) induction instrument b) electrostatic instrument
c) moving coil instrument d) any of the above

2) For measurement of mutual inductance we can use _____.
a) Anderson bridge b) Maxwell's bridge
c) Heaviside bridge d) Any of the above

3) In a Weston frequency meter, the magnetic axes of the two fixed coils are _____.
a) parallel b) perpendicular
c) inclined at 60° d) inclined at 120°

4) To measure radio frequency, the suitable frequency meter is _____.
a) Weston frequency meter
b) reed vibrator frequency meter
c) heterodoxy frequency meter
d) electrical resonance frequency meter

5) A CRO can display _____.
a) AC signals b) DC signals
c) Both AC and DC signals d) Time invariant signals

6) The internal resistance of an ammeter should be _____.
a) very small b) medium
c) high d) infinity

7) In a moving coil instrument, the deflecting torque is proportional to ___.
a) current b) square of the current
c) square root of the current d) sine of the measurand

8) _____ instruments are those which measure the total quantity of electricity delivered in a particular time.

a) Absolute b) Indicating
c) Recording d) Integrating

9) For handling greater currents induction wattmeters are used in conjunction with _____.

a) potential transformers b) current transformers
c) power transformer d) either of the above

10) Induction type single phase energy meters measure electric energy in _____.

a) kW b) Wh
c) kWh d) VAR

11) In majority of instruments damping is provided by _____.

a) fluid friction b) spring
c) eddy currents d) all of the above

12) Basically a potentiometer is a device for _____.

a) comparing two voltages b) measuring a current
c) comparing two currents d) measuring a voltage

13) In order to achieve high accuracy, the slide wire of a potentiometer should be _____.

a) as long as possible
b) as short as possible
c) neither too small not too large
d) very thick

14) Instrument transformers are _____.

a) potential transformers b) current transformers
c) both (a) and (b) d) power transformers

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Measurement and Instrumentation (BTN07303)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four **16**

a) Write classification of measuring instruments.
b) Define standard & explain types of standard.
c) Explain the working of megger with neat diagram.
d) Explain Maxwell's inductance bridge with phasor diagram.
e) With neat sketch explain PMMC type instrument.

Q.3 Attempt any two. **12**

a) Explain construction & operation of $1\text{-}\Phi$ electro dynamo meter power factor meter.
b) Explain Schering Bridge measurement of unknown capacitance with phasor diagram
c) A bridge consist of the following :
Arm ab:- A choke coil having resistance R_1 & inductance L_1
Arm bc:- A non-inductive resistance R_3
Arm cd :- A mica condenser C_4 in series with non-inductive resistance R_4
Arm da :- A non-inductive resistance R_2
When this bridge fed from a source of 500 Hz, balance is obtained underfollowing conditions $\mathrm{R}_2 = 2410\Omega, \mathrm{R}_3 = 750\Omega, \mathrm{C}_4 = 0.35\mu\mathrm{F}$, $\mathrm{R}_4 = 64.5\Omega$
The series resistance of capacitor is 0.4Ω. Calculate resistance and Inductance of choke coil. The supply is connected between a & c and detector is between b & d.

Section – II

Q.4 Attempt any Four. **16**

a) Difference between CT and PT.
b) Write note on Digital voltmer.
c) Explain Q-meter with neat diagram.
d) Write note on digital storage oscilloscope.
e) Explain digital measurement of time period.

Q.5 Attempt any two. **12**

a) Draw the block diagram of CRO and explain each block.
b) Explain with neat diagram, working of ramp type digital voltmeter.
c) Draw typical phasor diagram of potential transformer. Derive an expression for actual transformation ratio.

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Measurement and Instrumentation (BTN07303)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) To measure radio frequency, the suitable frequency meter is _____.
a) Weston frequency meter
b) reed vibrator frequency meter
c) heterodoxy frequency meter
d) electrical resonance frequency meter

2) A CRO can display _____.
a) AC signals b) DC signals
c) Both AC and DC signals d) Time invariant signals

3) The internal resistance of an ammeter should be _____.
a) very small b) medium
c) high d) infinity

4) In a moving coil instrument, the deflecting torque is proportional to ___.
a) current b) square of the current
c) square root of the current d) sine of the measurand

5) _____ instruments are those which measure the total quantity of electricity delivered in a particular time.
a) Absolute b) Indicating
c) Recording d) Integrating

6) For handling greater currents induction wattmeters are used in conjunction with _____.
a) potential transformers b) current transformers
c) power transformer d) either of the above

7) Induction type single phase energy meters measure electric energy in _____.

a) kW b) Wh
c) kWh d) VAR

8) In majority of instruments damping is provided by _____.

a) fluid friction b) spring
c) eddy currents d) all of the above

9) Basically a potentiometer is a device for _____.

a) comparing two voltages b) measuring a current
c) comparing two currents d) measuring a voltage

10) In order to achieve high accuracy, the slide wire of a potentiometer should be _____.

a) as long as possible
b) as short as possible
c) neither too small not too large
d) very thick

11) Instrument transformers are _____.

a) potential transformers b) current transformers
c) both (a) and (b) d) power transformers

12) An instrument transformer is used to extend the range of _____.

a) induction instrument b) electrostatic instrument
c) moving coil instrument d) any of the above

13) For measurement of mutual inductance we can use _____.

a) Anderson bridge b) Maxwell's bridge
c) Heaviside bridge d) Any of the above

14) In a Weston frequency meter, the magnetic axes of the two fixed coils are _____.

a) parallel b) perpendicular
c) inclined at 60° d) inclined at 120°

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Measurement and Instrumentation (BTN07303)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four **16**

a) Write classification of measuring instruments.
b) Define standard & explain types of standard.
c) Explain the working of megger with neat diagram.
d) Explain Maxwell's inductance bridge with phasor diagram.
e) With neat sketch explain PMMC type instrument.

Q.3 Attempt any two. **12**

a) Explain construction & operation of $1\text{-}\Phi$ electro dynamo meter power factor meter.
b) Explain Schering Bridge measurement of unknown capacitance with phasor diagram
c) A bridge consist of the following :
Arm ab:- A choke coil having resistance R_1 & inductance L_1
Arm bc:- A non-inductive resistance R_3
Arm cd :- A mica condenser C_4 in series with non-inductive resistance R_4
Arm da :- A non-inductive resistance R_2
When this bridge fed from a source of 500 Hz, balance is obtained underfollowing conditions $\mathrm{R}_2 = 2410\Omega, \mathrm{R}_3 = 750\Omega, \mathrm{C}_4 = 0.35\mu\mathrm{F}$, $\mathrm{R}_4 = 64.5\Omega$
The series resistance of capacitor is 0.4Ω. Calculate resistance and Inductance of choke coil. The supply is connected between a & c and detector is between b & d.

Section – II

Q.4 Attempt any Four. **16**

a) Difference between CT and PT.
b) Write note on Digital voltmer.
c) Explain Q-meter with neat diagram.
d) Write note on digital storage oscilloscope.
e) Explain digital measurement of time period.

Q.5 Attempt any two. **12**

a) Draw the block diagram of CRO and explain each block.
b) Explain with neat diagram, working of ramp type digital voltmeter.
c) Draw typical phasor diagram of potential transformer. Derive an expression for actual transformation ratio.

Seat No.	

Set **S**

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Measurement and Instrumentation (BTN07303)

Day & Date: Thursday 22-05-2025 Max. Marks: 70
Time: 03:00 PM To 06:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) In order to achieve high accuracy, the slide wire of a potentiometer should be _____.
a) as long as possible
b) as short as possible
c) neither too small not too large
d) very thick

2) Instrument transformers are _____.
a) potential transformers b) current transformers
c) both (a) and (b) d) power transformers

3) An instrument transformer is used to extend the range of _____.
a) induction instrument b) electrostatic instrument
c) moving coil instrument d) any of the above

4) For measurement of mutual inductance we can use _____.
a) Anderson bridge b) Maxwell's bridge
c) Heaviside bridge d) Any of the above

5) In a Weston frequency meter, the magnetic axes of the two fixed coils are _____.
a) parallel b) perpendicular
c) inclined at 60° d) inclined at 120°

6) To measure radio frequency, the suitable frequency meter is _____.
a) Weston frequency meter
b) reed vibrator frequency meter
c) heterodoxy frequency meter
d) electrical resonance frequency meter

7) A CRO can display _____.
a) AC signals b) DC signals
c) Both AC and DC signals d) Time invariant signals

8) The internal resistance of an ammeter should be _____.
a) very small b) medium
c) high d) infinity

9) In a moving coil instrument, the deflecting torque is proportional to ___.
a) current b) square of the current
c) square root of the current d) sine of the measurand

10) _____ instruments are those which measure the total quantity of electricity delivered in a particular time.
a) Absolute b) Indicating
c) Recording d) Integrating

11) For handling greater currents induction wattmeters are used in conjunction with _____.
a) potential transformers b) current transformers
c) power transformer d) either of the above

12) Induction type single phase energy meters measure electric energy in _____.
a) kW b) Wh
c) kWh d) VAR

13) In majority of instruments damping is provided by _____.
a) fluid friction b) spring
c) eddy currents d) all of the above

14) Basically a potentiometer is a device for _____.
a) comparing two voltages b) measuring a current
c) comparing two currents d) measuring a voltage

Seat No.		Set	S

S. Y. (B. Tech) (Sem-I) (Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Measurement and Instrumentation (BTN07303)

Day & Date: Thursday 22-05-2025 Max. Marks: 56
Time: 03:00 PM To 06:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any Four **16**

a) Write classification of measuring instruments.
b) Define standard & explain types of standard.
c) Explain the working of megger with neat diagram.
d) Explain Maxwell's inductance bridge with phasor diagram.
e) With neat sketch explain PMMC type instrument.

Q.3 Attempt any two. **12**

a) Explain construction & operation of $1\text{-}\Phi$ electro dynamo meter power factor meter.
b) Explain Schering Bridge measurement of unknown capacitance with phasor diagram
c) A bridge consist of the following :
Arm ab:- A choke coil having resistance R_1 & inductance L_1
Arm bc:- A non-inductive resistance R_3
Arm cd :- A mica condenser C_4 in series with non-inductive resistance R_4
Arm da :- A non-inductive resistance R_2
When this bridge fed from a source of 500 Hz, balance is obtained underfollowing conditions $R_2 = 2410\Omega, R_3 = 750\Omega, C_4 = 0.35\mu F$, $R_4 = 64.5\Omega$
The series resistance of capacitor is 0.4Ω. Calculate resistance and Inductance of choke coil. The supply is connected between a & c and detector is between b & d.

Section – II

Q.4 Attempt any Four. **16**

a) Difference between CT and PT.
b) Write note on Digital voltmer.
c) Explain Q-meter with neat diagram.
d) Write note on digital storage oscilloscope.
e) Explain digital measurement of time period.

Q.5 Attempt any two. **12**

a) Draw the block diagram of CRO and explain each block.
b) Explain with neat diagram, working of ramp type digital voltmeter.
c) Draw typical phasor diagram of potential transformer. Derive an expression for actual transformation ratio.

SLR-BD-268

Seat No.		Set	P

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Transmission and Distribution (EEPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the Correct Alternatives from the Options and Rewrite the Sentence. **14**

1) The sag of a transmission line depends upon _____
a) Weight of conductor and directly proportional to span length
b) Weight of conductor and inversely proportional to span length
c) Weight of conductor and directly proportional to the square of span length
d) Weight of conductor and inversely proportional to the square of span length

2) The maximum tension in a section of overhead line conductor between two supports of unequal height occurs at _____
a) The higher support b) The lower point
c) The midpoint of the conductor d) None of the above

3) Corona is accompanied by _____
a) Violet visible light b) Hissing sound
c) Power loss and interference d) all of the above

4) Transmission line constants are _____
a) Capacitance b) Inductance
c) Resistance d) All of these

5) The inductance of line is minimum when _____
a) G M D is high b) G M R is high
c) Both G M D and G M R are high d) G M D is low but G M R is high

6) When two conductors between each of radius 'r' are at a distance D, the capacitance between the two is proportional to _____
a) loge (D/r) b) loge (r/D)
c) 1/loge (D/r) d) 1/loge (r/D)

7) Find the inductance per km of a 3- phase transmission line using 1.24 cm diameter conductors when these are placed at the corners of an equilateral triangle of each side 2 m.

a) 3.2 mH/Km b) 2.1 mH/Km
c) 1.205 mH/Km d) 2.3 mH/Km

8) In triangular configuration, inductance and capacitance values are _____ and _____ respective.

a) Less, Less b) Higher, Higher
c) Less, Higher d) Higher, Less

9) What is the purpose of bedding on the underground cables?

a) To avoid leakage of current
b) To protect the sheath against corrosion
c) To protect the sheath from mechanical injury due to armoring
d) Both (b) and (c)

10) The cable best suited for the transmission of voltages from 33 kV to 66kV is _____

a) Belted cables b) Screened cables
c) Pressure cables d) None of these

11) What does capacitance grade of cables mean?

a) Use of dielectrics in different concentrations.
b) Introduction of capacitance at various lengths of cable to counter the effect of inductance.
c) Use of dielectrics of different permittivity's.
d) Grading according to capacitance per km length of the cable.

12) In long transmission lines Resistance and Capacitance parameters of lines are connected in _____

a) Series, shunt b) Series, series
c) Shunt, shunt d) Shunt, parallel

13) In nominal-π method of solution of medium transmission line, capacitance is assumed to be _____

a) Distributed uniformly from sending end to receiving end
b) Divided into two halves
c) Lumped at the generation end
d) Lumped at middle of generation and load end

14) Which of the following distribution system is more reliable?

a) Radial system b) Tree system
c) Ring main system d) All are equally reliable

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Transmission and Distribution (EEPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any four **16**

a) Define corona discharge; enlist and describe in brief various methods of reducing the corona effect.

b) Calculate the loop inductance per km of a single-phase overhead line consisting of two conductors each 1 cm diameter and 1.2 m apart.

c) What is meant by sag? Derive an expression for sag in a transmission line having equal level of supports.

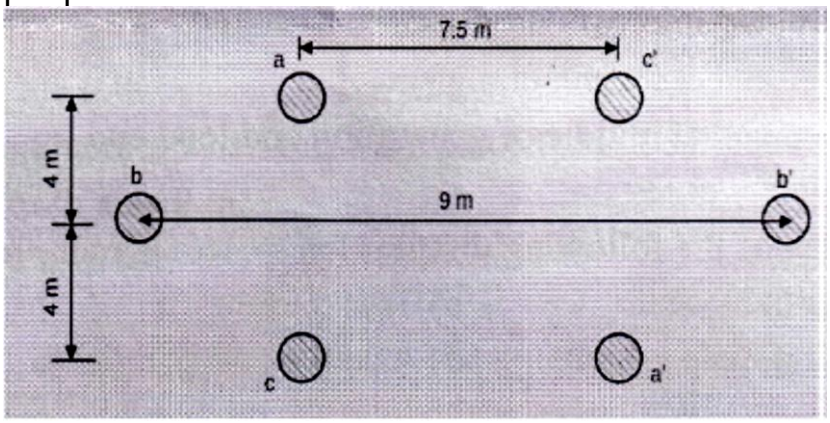
d) Derive the expression for capacitance of a single core underground cable with neat schematic diagram.

e) Find the line to line capacitance(Cab) per km of a three phase transmission line using 1.24 cm diameter conductor when these are placed at the corners of an equilateral triangle of each side 2m.

Q.3 Attempt any two. **12**

a) Derive the expression for Capacitance of 3-ph single circuit overhead triangular configuration of transmission line for symmetrical spacing.

b) The double circuit three-phase line has the configuration shown in figure the distance between conductor a and c' is 7.5 between b and b' is 9 m and between a and c is 8 m. Find inductance per kilometer per phase. The radius of each conductor is 1.25 cm.



c) Explain the following methods of cable grading with neat sketch:
i) Capacitance grading
ii) Inter-sheath grading

Section – II

Q.4 Attempt any four. **16**

a) Describe with neat diagram following AC Distribution System
   i) Radial system
   ii) Ring main system

b) Draw and describe the uniformly loaded distributor fed at one end in DC system with a point of minimum potential, maximum and minimum voltage drops.

c) Explain in detail effect of Power Factor on Voltage regulation, Losses, efficiency in case of transmission line.

d) Define and explain brief following terms: feeders, distributor and service mains with neat schematic diagram in case of AC Distribution System.

e) Enlist and explain brief different advantages and limitation of EHVAC Transmission System.

Q.5 Attempt any two. **12**

a) Explain in details with neat circuit and phasor/Vector diagram performance analysis of short transmission line.

b) Enlist various types of HV DC Transmission System and describe in brief with neat circuit diagram.
   i) Mono Polar and
   ii) Bipolar

HVDC Transmission System with advantages and disadvantages.

c) A 3-ph, 50 Hz OH lines 100km long has the following constant:
Resistance/ Km/phase=0.1Ω Inductive reactance /km/phase=0.2 Ω
Capacitive Susceptance/km/phase=0.04×10^4 Siemens
Determine:
   i) The sending end current
   ii) Sending end voltage
   iii) Sending end power factor and
   iv) Transmission efficiency when supporting a balanced load of 10000KW a 66 KV. P.F. 0.8 lagging. Use nominal T method

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Transmission and Distribution (EEPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the Correct Alternatives from the Options and Rewrite the Sentence. **14**

1) In triangular configuration, inductance and capacitance values are _____ and _____ respective.
a) Less, Less b) Higher, Higher
c) Less, Higher d) Higher, Less

2) What is the purpose of bedding on the underground cables?
a) To avoid leakage of current
b) To protect the sheath against corrosion
c) To protect the sheath from mechanical injury due to armoring
d) Both (b) and (c)

3) The cable best suited for the transmission of voltages from 33 kV to 66kV is _____
a) Belted cables b) Screened cables
c) Pressure cables d) None of these

4) What does capacitance grade of cables mean?
a) Use of dielectrics in different concentrations.
b) Introduction of capacitance at various lengths of cable to counter the effect of inductance.
c) Use of dielectrics of different permittivity's.
d) Grading according to capacitance per km length of the cable.

5) In long transmission lines Resistance and Capacitance parameters of lines are connected in _____
a) Series, shunt b) Series, series
c) Shunt, shunt d) Shunt, parallel

6) In nominal-π method of solution of medium transmission line, capacitance is assumed to be _____
a) Distributed uniformly from sending end to receiving end
b) Divided into two halves
c) Lumped at the generation end
d) Lumped at middle of generation and load end

7) Which of the following distribution system is more reliable?
a) Radial system b) Tree system
c) Ring main system d) All are equally reliable

8) The sag of a transmission line depends upon _____
a) Weight of conductor and directly proportional to span length
b) Weight of conductor and inversely proportional to span length
c) Weight of conductor and directly proportional to the square of span length
d) Weight of conductor and inversely proportional to the square of span length

9) The maximum tension in a section of overhead line conductor between two supports of unequal height occurs at _____
a) The higher support b) The lower point
c) The midpoint of the conductor d) None of the above

10) Corona is accompanied by _____
a) Violet visible light b) Hissing sound
c) Power loss and interference d) all of the above

11) Transmission line constants are _____
a) Capacitance b) Inductance
c) Resistance d) All of these

12) The inductance of line is minimum when _____
a) G M D is high b) G M R is high
c) Both G M D and G M R are high d) G M D is low but G M R is high

13) When two conductors between each of radius 'r' are at a distance D, the capacitance between the two is proportional to _____
a) loge (D/r) b) loge (r/D)
c) 1/loge (D/r) d) 1/loge (r/D)

14) Find the inductance per km of a 3- phase transmission line using 1.24 cm diameter conductors when these are placed at the corners of an equilateral triangle of each side 2 m.
a) 3.2 mH/Km b) 2.1 mH/Km
c) 1.205 mH/Km d) 2.3 mH/Km

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Transmission and Distribution (EEPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any four **16**

a) Define corona discharge; enlist and describe in brief various methods of reducing the corona effect.

b) Calculate the loop inductance per km of a single-phase overhead line consisting of two conductors each 1 cm diameter and 1.2 m apart.

c) What is meant by sag? Derive an expression for sag in a transmission line having equal level of supports.

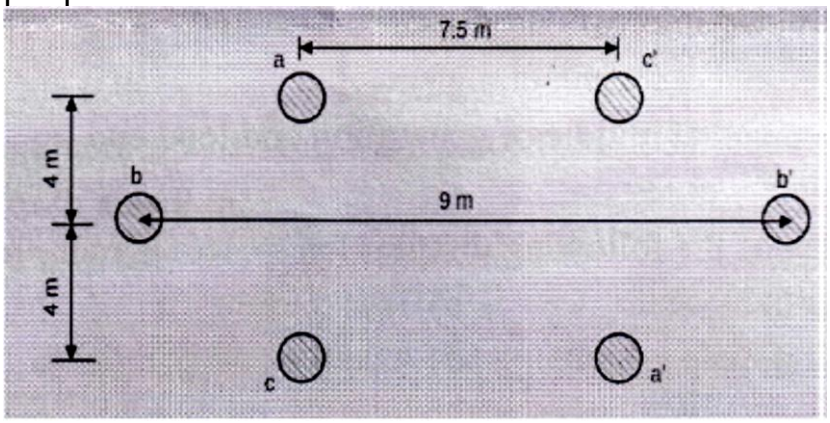
d) Derive the expression for capacitance of a single core underground cable with neat schematic diagram.

e) Find the line to line capacitance(Cab) per km of a three phase transmission line using 1.24 cm diameter conductor when these are placed at the corners of an equilateral triangle of each side 2m.

Q.3 Attempt any two. **12**

a) Derive the expression for Capacitance of 3-ph single circuit overhead triangular configuration of transmission line for symmetrical spacing.

b) The double circuit three-phase line has the configuration shown in figure the distance between conductor a and c' is 7.5 between b and b' is 9 m and between a and c is 8 m. Find inductance per kilometer per phase. The radius of each conductor is 1.25 cm.



c) Explain the following methods of cable grading with neat sketch:
i) Capacitance grading
ii) Inter-sheath grading

Section – II

Q.4 Attempt any four. **16**

a) Describe with neat diagram following AC Distribution System
   i) Radial system
   ii) Ring main system

b) Draw and describe the uniformly loaded distributor fed at one end in DC system with a point of minimum potential, maximum and minimum voltage drops.

c) Explain in detail effect of Power Factor on Voltage regulation, Losses, efficiency in case of transmission line.

d) Define and explain brief following terms: feeders, distributor and service mains with neat schematic diagram in case of AC Distribution System.

e) Enlist and explain brief different advantages and limitation of EHVAC Transmission System.

Q.5 Attempt any two. **12**

a) Explain in details with neat circuit and phasor/Vector diagram performance analysis of short transmission line.

b) Enlist various types of HV DC Transmission System and describe in brief with neat circuit diagram.
   i) Mono Polar and
   ii) Bipolar

HVDC Transmission System with advantages and disadvantages.

c) A 3-ph, 50 Hz OH lines 100km long has the following constant:
Resistance/ Km/phase=0.1Ω Inductive reactance /km/phase=0.2 Ω
Capacitive Susceptance/km/phase=0.04×10^4 Siemens
Determine:
   i) The sending end current
   ii) Sending end voltage
   iii) Sending end power factor and
   iv) Transmission efficiency when supporting a balanced load of 10000KW a 66 KV. P.F. 0.8 lagging. Use nominal T method

Seat No.		Set	R

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Transmission and Distribution (EEPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the Correct Alternatives from the Options and Rewrite the Sentence. **14**

1) What does capacitance grade of cables mean?
a) Use of dielectrics in different concentrations.
b) Introduction of capacitance at various lengths of cable to counter the effect of inductance.
c) Use of dielectrics of different permittivity's.
d) Grading according to capacitance per km length of the cable.

2) In long transmission lines Resistance and Capacitance parameters of lines are connected in _____
a) Series, shunt b) Series, series
c) Shunt, shunt d) Shunt, parallel

3) In nominal-π method of solution of medium transmission line, capacitance is assumed to be _____
a) Distributed uniformly from sending end to receiving end
b) Divided into two halves
c) Lumped at the generation end
d) Lumped at middle of generation and load end

4) Which of the following distribution system is more reliable?
a) Radial system b) Tree system
c) Ring main system d) All are equally reliable

5) The sag of a transmission line depends upon _____
a) Weight of conductor and directly proportional to span length
b) Weight of conductor and inversely proportional to span length
c) Weight of conductor and directly proportional to the square of span length
d) Weight of conductor and inversely proportional to the square of span length

6) The maximum tension in a section of overhead line conductor between two supports of unequal height occurs at _____

a) The higher support b) The lower point
c) The midpoint of the conductor d) None of the above

7) Corona is accompanied by _____

a) Violet visible light b) Hissing sound
c) Power loss and interference d) all of the above

8) Transmission line constants are _____

a) Capacitance b) Inductance
c) Resistance d) All of these

9) The inductance of line is minimum when _____

a) G M D is high b) G M R is high
c) Both G M D and G M R are high d) G M D is low but G M R is high

10) When two conductors between each of radius 'r' are at a distance D, the capacitance between the two is proportional to _____

a) loge (D/r) b) loge (r/D)
c) 1/loge (D/r) d) 1/loge (r/D)

11) Find the inductance per km of a 3- phase transmission line using 1.24 cm diameter conductors when these are placed at the corners of an equilateral triangle of each side 2 m.

a) 3.2 mH/Km b) 2.1 mH/Km
c) 1.205 mH/Km d) 2.3 mH/Km

12) In triangular configuration, inductance and capacitance values are _____ and _____ respective.

a) Less, Less b) Higher, Higher
c) Less, Higher d) Higher, Less

13) What is the purpose of bedding on the underground cables?

a) To avoid leakage of current
b) To protect the sheath against corrosion
c) To protect the sheath from mechanical injury due to armoring
d) Both (b) and (c)

14) The cable best suited for the transmission of voltages from 33 kV to 66kV is _____

a) Belted cables b) Screened cables
c) Pressure cables d) None of these

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Transmission and Distribution (EEPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any four **16**

a) Define corona discharge; enlist and describe in brief various methods of reducing the corona effect.

b) Calculate the loop inductance per km of a single-phase overhead line consisting of two conductors each 1 cm diameter and 1.2 m apart.

c) What is meant by sag? Derive an expression for sag in a transmission line having equal level of supports.

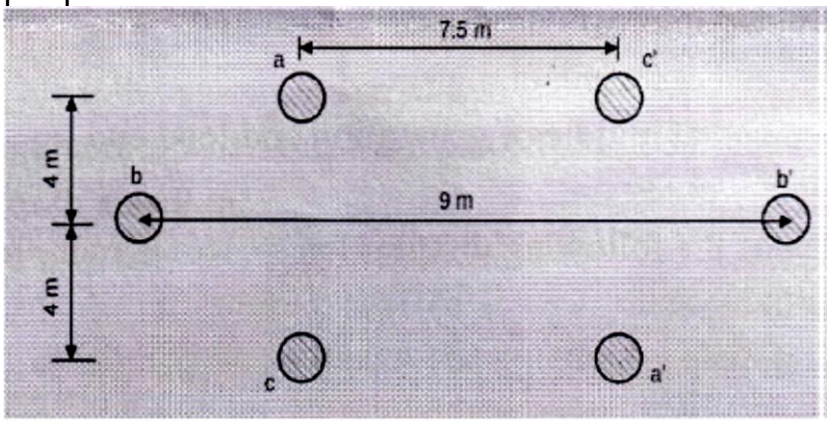
d) Derive the expression for capacitance of a single core underground cable with neat schematic diagram.

e) Find the line to line capacitance(Cab) per km of a three phase transmission line using 1.24 cm diameter conductor when these are placed at the corners of an equilateral triangle of each side 2m.

Q.3 Attempt any two. **12**

a) Derive the expression for Capacitance of 3-ph single circuit overhead triangular configuration of transmission line for symmetrical spacing.

b) The double circuit three-phase line has the configuration shown in figure the distance between conductor a and c' is 7.5 between b and b' is 9 m and between a and c is 8 m. Find inductance per kilometer per phase. The radius of each conductor is 1.25 cm.



c) Explain the following methods of cable grading with neat sketch:
i) Capacitance grading
ii) Inter-sheath grading

Section – II

Q.4 Attempt any four. **16**

a) Describe with neat diagram following AC Distribution System
   i) Radial system
   ii) Ring main system

b) Draw and describe the uniformly loaded distributor fed at one end in DC system with a point of minimum potential, maximum and minimum voltage drops.

c) Explain in detail effect of Power Factor on Voltage regulation, Losses, efficiency in case of transmission line.

d) Define and explain brief following terms: feeders, distributor and service mains with neat schematic diagram in case of AC Distribution System.

e) Enlist and explain brief different advantages and limitation of EHVAC Transmission System.

Q.5 Attempt any two. **12**

a) Explain in details with neat circuit and phasor/Vector diagram performance analysis of short transmission line.

b) Enlist various types of HV DC Transmission System and describe in brief with neat circuit diagram.
   i) Mono Polar and
   ii) Bipolar

HVDC Transmission System with advantages and disadvantages.

c) A 3-ph, 50 Hz OH lines 100km long has the following constant:
Resistance/ Km/phase=0.1Ω Inductive reactance /km/phase=0.2 Ω
Capacitive Susceptance/km/phase=0.04×10^4 Siemens
Determine:
   i) The sending end current
   ii) Sending end voltage
   iii) Sending end power factor and
   iv) Transmission efficiency when supporting a balanced load of 10000KW a 66 KV. P.F. 0.8 lagging. Use nominal T method

Seat No.		Set	S

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Transmission and Distribution (EEPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the Correct Alternatives from the Options and Rewrite the Sentence. **14**

1) When two conductors between each of radius 'r' are at a distance D, the capacitance between the two is proportional to _____
a) loge (D/r) b) loge (r/D)
c) 1/loge (D/r) d) 1/loge (r/D)

2) Find the inductance per km of a 3- phase transmission line using 1.24 cm diameter conductors when these are placed at the corners of an equilateral triangle of each side 2 m.
a) 3.2 mH/Km b) 2.1 mH/Km
c) 1.205 mH/Km d) 2.3 mH/Km

3) In triangular configuration, inductance and capacitance values are _____ and _____ respective.
a) Less, Less b) Higher, Higher
c) Less, Higher d) Higher, Less

4) What is the purpose of bedding on the underground cables?
a) To avoid leakage of current
b) To protect the sheath against corrosion
c) To protect the sheath from mechanical injury due to armoring
d) Both (b) and (c)

5) The cable best suited for the transmission of voltages from 33 kV to 66kV is _____
a) Belted cables b) Screened cables
c) Pressure cables d) None of these

6) What does capacitance grade of cables mean?
a) Use of dielectrics in different concentrations.
b) Introduction of capacitance at various lengths of cable to counter the effect of inductance.
c) Use of dielectrics of different permittivity's.
d) Grading according to capacitance per km length of the cable.

7) In long transmission lines Resistance and Capacitance parameters of lines are connected in _____
a) Series, shunt b) Series, series
c) Shunt, shunt d) Shunt, parallel

8) In nominal-π method of solution of medium transmission line, capacitance is assumed to be _____
a) Distributed uniformly from sending end to receiving end
b) Divided into two halves
c) Lumped at the generation end
d) Lumped at middle of generation and load end

9) Which of the following distribution system is more reliable?
a) Radial system b) Tree system
c) Ring main system d) All are equally reliable

10) The sag of a transmission line depends upon _____
a) Weight of conductor and directly proportional to span length
b) Weight of conductor and inversely proportional to span length
c) Weight of conductor and directly proportional to the square of span length
d) Weight of conductor and inversely proportional to the square of span length

11) The maximum tension in a section of overhead line conductor between two supports of unequal height occurs at _____
a) The higher support b) The lower point
c) The midpoint of the conductor d) None of the above

12) Corona is accompanied by _____
a) Violet visible light b) Hissing sound
c) Power loss and interference d) all of the above

13) Transmission line constants are _____
a) Capacitance b) Inductance
c) Resistance d) All of these

14) The inductance of line is minimum when _____
a) G M D is high b) G M R is high
c) Both G M D and G M R are high d) G M D is low but G M R is high

Seat No.	

Set | S

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Transmission and Distribution (EEPCC-04)

Day & Date: Monday 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt any four **16**

a) Define corona discharge; enlist and describe in brief various methods of reducing the corona effect.

b) Calculate the loop inductance per km of a single-phase overhead line consisting of two conductors each 1 cm diameter and 1.2 m apart.

c) What is meant by sag? Derive an expression for sag in a transmission line having equal level of supports.

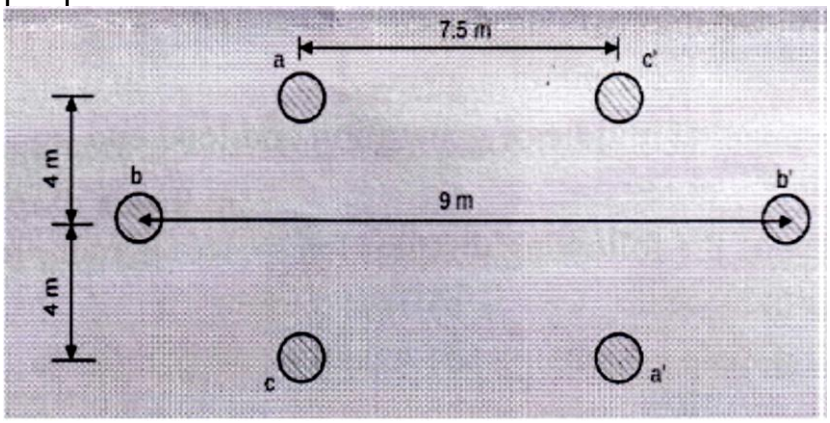
d) Derive the expression for capacitance of a single core underground cable with neat schematic diagram.

e) Find the line to line capacitance(Cab) per km of a three phase transmission line using 1.24 cm diameter conductor when these are placed at the corners of an equilateral triangle of each side 2m.

Q.3 Attempt any two. **12**

a) Derive the expression for Capacitance of 3-ph single circuit overhead triangular configuration of transmission line for symmetrical spacing.

b) The double circuit three-phase line has the configuration shown in figure the distance between conductor a and c' is 7.5 between b and b' is 9 m and between a and c is 8 m. Find inductance per kilometer per phase. The radius of each conductor is 1.25 cm.



c) Explain the following methods of cable grading with neat sketch:
i) Capacitance grading
ii) Inter-sheath grading

Section – II

Q.4 Attempt any four. **16**

a) Describe with neat diagram following AC Distribution System
   i) Radial system
   ii) Ring main system

b) Draw and describe the uniformly loaded distributor fed at one end in DC system with a point of minimum potential, maximum and minimum voltage drops.

c) Explain in detail effect of Power Factor on Voltage regulation, Losses, efficiency in case of transmission line.

d) Define and explain brief following terms: feeders, distributor and service mains with neat schematic diagram in case of AC Distribution System.

e) Enlist and explain brief different advantages and limitation of EHVAC Transmission System.

Q.5 Attempt any two. **12**

a) Explain in details with neat circuit and phasor/Vector diagram performance analysis of short transmission line.

b) Enlist various types of HV DC Transmission System and describe in brief with neat circuit diagram.
   i) Mono Polar and
   ii) Bipolar

HVDC Transmission System with advantages and disadvantages.

c) A 3-ph, 50 Hz OH lines 100km long has the following constant:
Resistance/ Km/phase=0.1Ω Inductive reactance /km/phase=0.2 Ω
Capacitive Susceptance/km/phase=0.04×10^4 Siemens
Determine:
   i) The sending end current
   ii) Sending end voltage
   iii) Sending end power factor and
   iv) Transmission efficiency when supporting a balanced load of 10000KW a 66 KV. P.F. 0.8 lagging. Use nominal T method

Seat No.		Set	P

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRIAL ENGINEERING
Network Analysis (EEPCC-05)

Day & Date: Wednesday 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

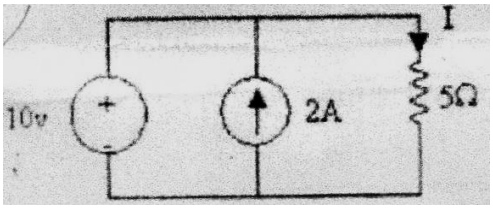
Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) In an electrical circuit dual of inductance is _____.
a) conductance b) resistance
c) capacitance d) susceptance

2) Four equal value resistors are connected in parallel. 5 V voltage is applied across the parallel circuit and 2.5 A current are measured from the source. What is the value of each resistor?
a) 4Ω b) 8Ω
c) 2.5Ω d) 5Ω

3) Calculate current I of the circuit shown below.



a) 4 A b) 2 A
c) -2 A d) -4 A

4) Application of Norton's theorem to a circuit yield _____
a) equivalent current source and impedance in series
b) equivalent current source and impedance in parallel
c) equivalent impedance
d) equivalent current source

5) The number of independent loops for a network with n nodes and b branches is _____
a) $n-1$ b) $b-n$
c) $b-n+1$ d) independent of the number of nodes

6) Between two open circuited terminals the current is _____.

a) Minimum b) Maximum
c) Zero d) None of the above

7) Superposition theorem is not applicable to network containing _____

a) Nonlinear elements
b) Dependent voltage source
c) Dependent current source
d) Transformers

8) The time constant of RC circuit is _____

a) RC b) C/R
c) R/C d) R

9) Laplace transform of a unit ramp function is _____.

a) 1 b) s
c) 1/s d) 1/s2

10) The value of impulse function for t > 0

a) Zero b) Unity
c) K where k is a constant d) Infinity

11) A capacitor does not allow sudden changes in _____.

a) currents b) Voltages
c) both a and b d) none of Above

12) Transients are presents in the circuit when the circuit is having _____

a) R b) L
c) C d) either b) or c)

13) For a 2-port network to be reciprocal, _____.

a) $Z_{11} = Z_{22}$ b) $Y_{21} = Y_{22}$
c) $h_{21} = -h_{12}$ d) $AD - BC = 0$

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

a) Z parameters b) ABCD parameters
c) Y parameters d) h parameters

Seat No.	

Set P

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRIAL ENGINEERING
Network Analysis (EEPCC-05)

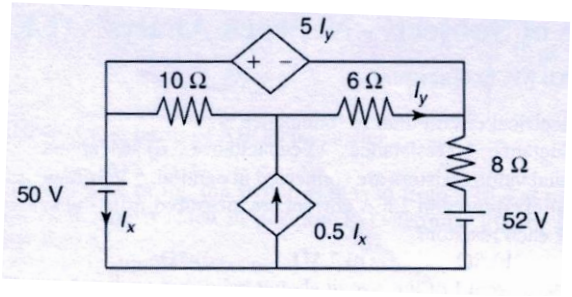
Day & Date: Wednesday 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are Compulsory.
2) Figures to the right indicate full marks.

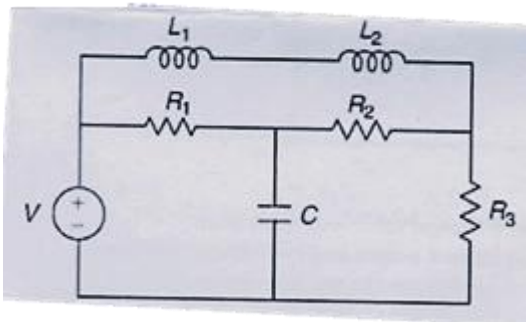
Section – I

Q.2 Attempt any four **16**

a) Find current through the 8Ω resistor by using mesh analysis.

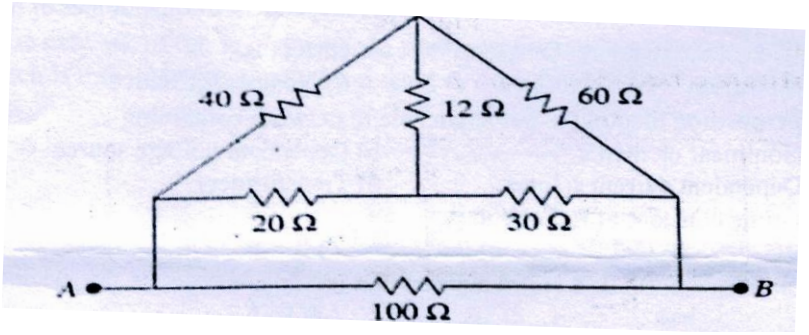


b) Draw the dual of the network.

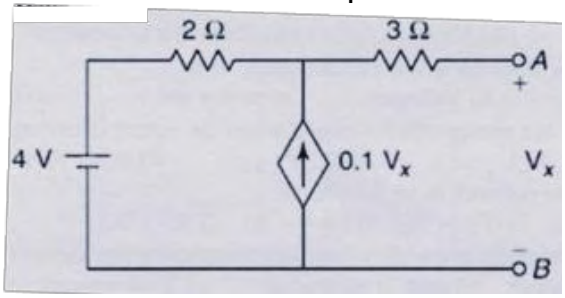


c) State and explain the Maximum Power transfer Theorem. Also derive the condition to deliver Maximum Power.

d) Find the Equivalent Resistance between terminal A&B.

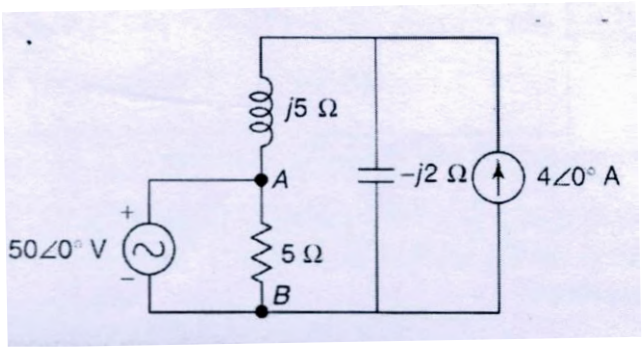


e) Find the Thevenin's equivalent network for the terminals A and B.

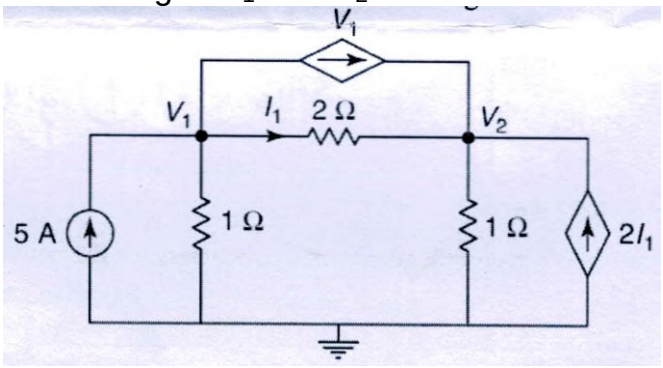


Q.3 Solve any two **12**

a) Determine the voltage V_{AB} for the network shown in Fig. Using Superposition Theorem.

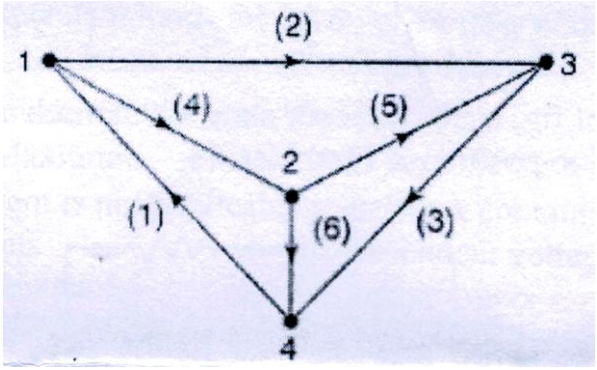


b) Find voltages V_1 and V_2 in the network shown in Fig.



c) The graph of a network shown in fig. write

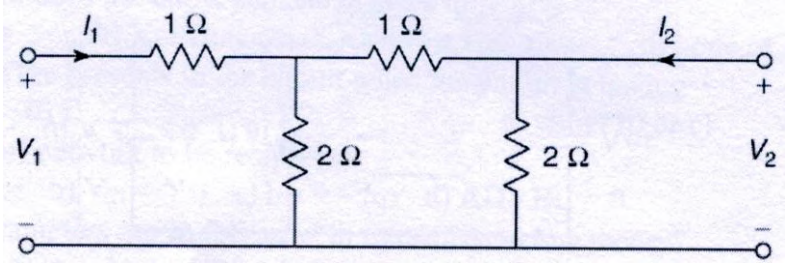
i) Incidence matrix
ii) Tie set matrix
iii) Cut set matrix



Section – II

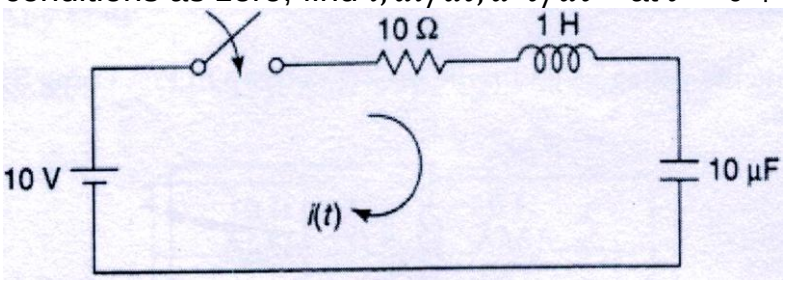
Q.4 Solve any four. **16**

a) Determine transmission parameters for the given network.



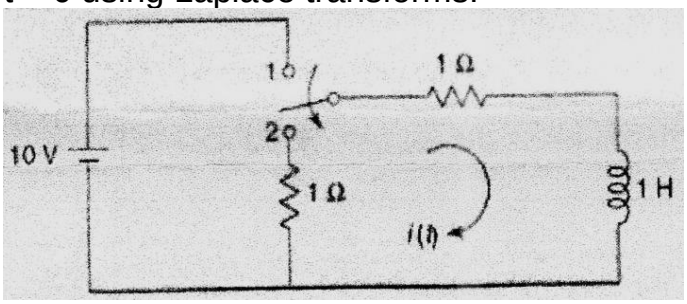
b) Derive an expression for response given by RL circuit.

c) In the network shown, the switch is closed. Assuming all initial conditions as zero, find $i, di/dt, d^2t/dt^2$ at $t = 0+$



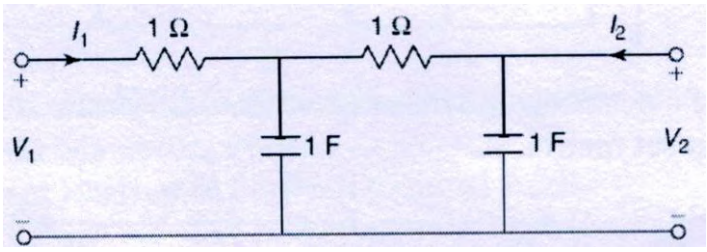
d) Derive Z parameter in terms of ABCD parameter.

e) In the network shown in fig. the switch is moved from 1 to 2 at t = 0. Steady state condition having reached in position 1. Determine i(t) for t > 0 using Laplace transforms.

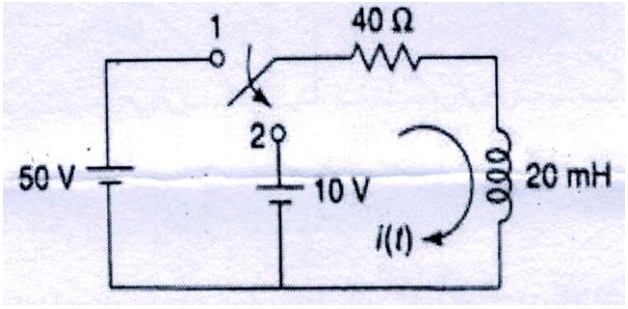


Q.5 Attempt any two of the following. **12**

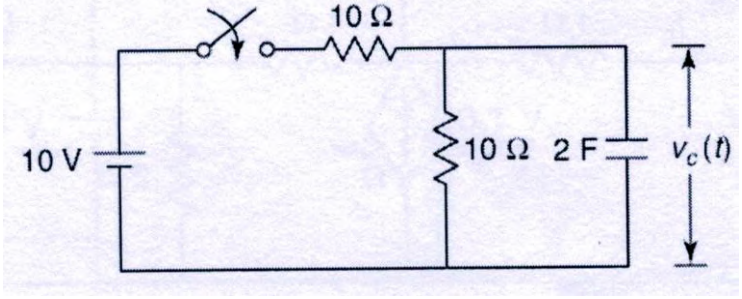
a) Determine the short-circuit admittance parameters for the network shown in Fig.



b) In the network of fig, is under steady state with switch is at position 1, at switch is moved to position 2. Find i (t).



c) The switch in the network shown in Fig. is closed at $t = 0$. Determine the voltage cross the capacitor using Laplace transform approach.



Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRIAL ENGINEERING
Network Analysis (EEPCC-05)

Day & Date: Wednesday 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The time constant of RC circuit is _____
a) RC b) C/R
c) R/C d) R

2) Laplace transform of a unit ramp function is _____.
a) 1 b) s
c) 1/s d) 1/s2

3) The value of impulse function for t > 0
a) Zero b) Unity
c) K where k is a constant d) Infinity

4) A capacitor does not allow sudden changes in _____.
a) currents b) Voltages
c) both a and b d) none of Above

5) Transients are presents in the circuit when the circuit is having _____
a) R b) L
c) C d) either b) or c)

6) For a 2-port network to be reciprocal, _____.
a) $Z_{11} = Z_{22}$ b) $Y_{21} = Y_{22}$
c) $h_{21} = -h_{12}$ d) $AD - BC = 0$

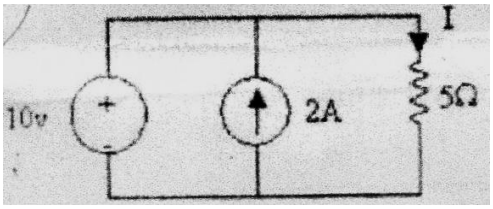
7) Which parameters are widely used in transmission line theory?
a) Z parameters b) ABCD parameters
c) Y parameters d) h parameters

8) In an electrical circuit dual of inductance is _____.
a) conductance b) resistance
c) capacitance d) susceptance

9) Four equal value resistors are connected in parallel. 5 V voltage is applied across the parallel circuit and 2.5 A current are measured from the source. What is the value of each resistor?

a) 4Ω b) 8Ω
c) 2.5Ω d) 5Ω

10) Calculate current I of the circuit shown below.



a) 4 A b) 2 A
c) -2 A d) -4 A

11) Application of Norton's theorem to a circuit yield _____

a) equivalent current source and impedance in series
b) equivalent current source and impedance in parallel
c) equivalent impedance
d) equivalent current source

12) The number of independent loops for a network with n nodes and b branches is _____

a) $n-1$ b) $b-n$
c) $b-n+1$ d) independent of the number of nodes

13) Between two open circuited terminals the current is _____.

a) Minimum b) Maximum
c) Zero d) None of the above

14) Superposition theorem is not applicable to network containing _____

a) Nonlinear elements
b) Dependent voltage source
c) Dependent current source
d) Transformers

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRIAL ENGINEERING
Network Analysis (EEPCC-05)

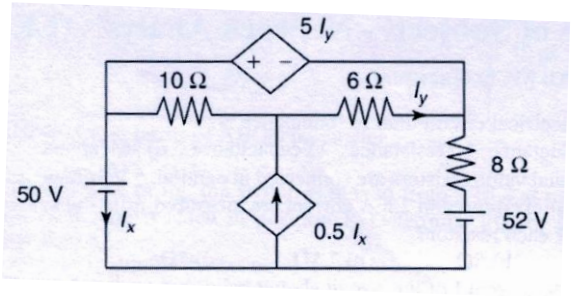
Day & Date: Wednesday 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are Compulsory.
2) Figures to the right indicate full marks.

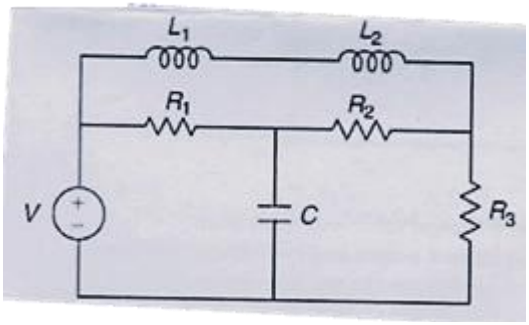
Section – I

Q.2 Attempt any four **16**

a) Find current through the 8Ω resistor by using mesh analysis.

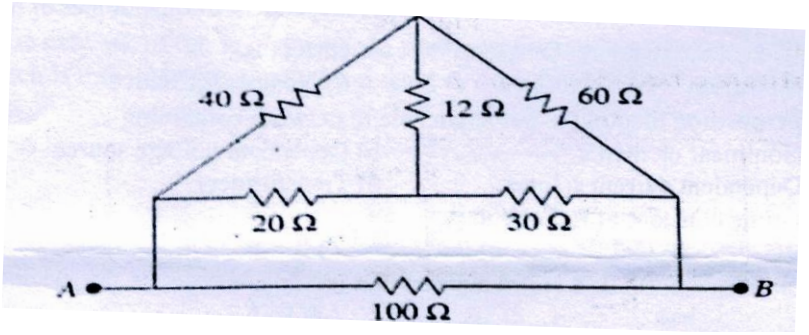


b) Draw the dual of the network.

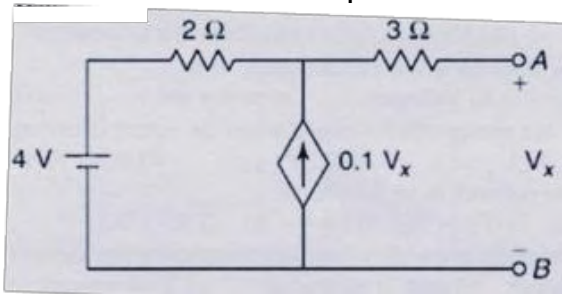


c) State and explain the Maximum Power transfer Theorem. Also derive the condition to deliver Maximum Power.

d) Find the Equivalent Resistance between terminal A&B.

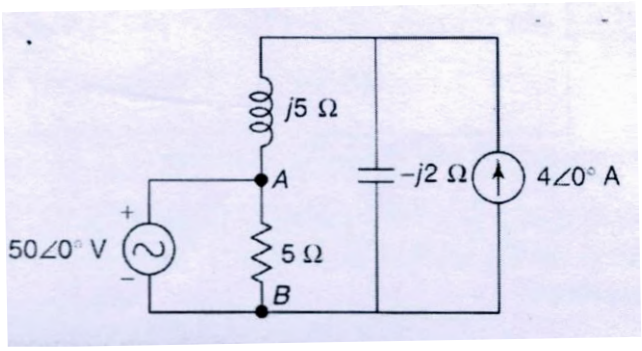


e) Find the Thevenin's equivalent network for the terminals A and B.

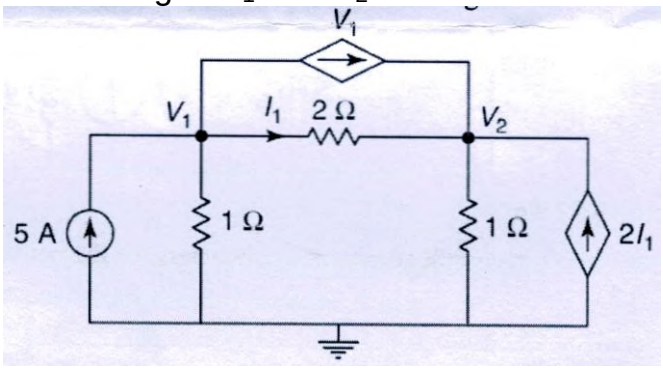


Q.3 Solve any two **12**

a) Determine the voltage V_{AB} for the network shown in Fig. Using Superposition Theorem.

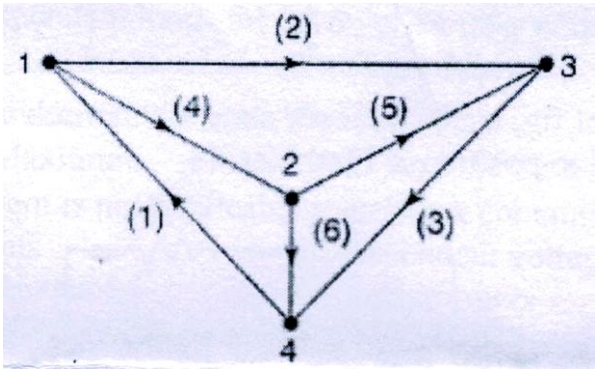


b) Find voltages V_1 and V_2 in the network shown in Fig.



c) The graph of a network shown in fig. write

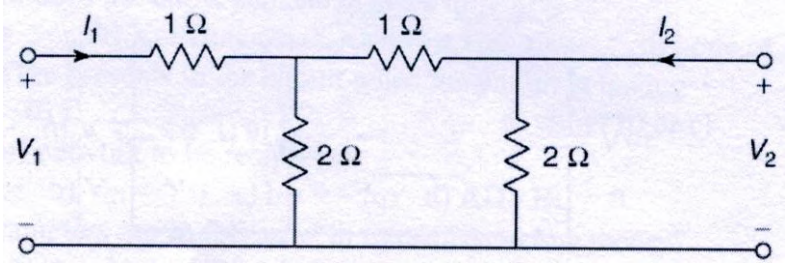
i) Incidence matrix
ii) Tie set matrix
iii) Cut set matrix



Section – II

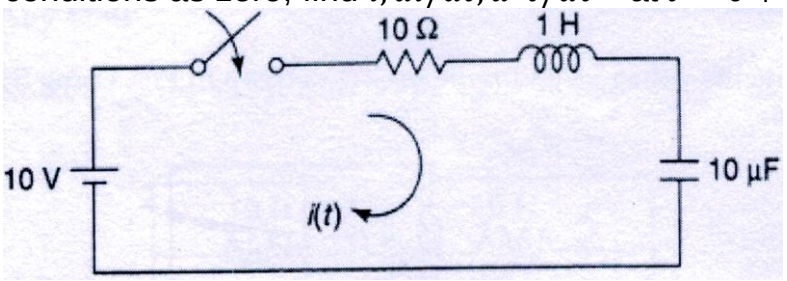
Q.4 Solve any four. **16**

a) Determine transmission parameters for the given network.



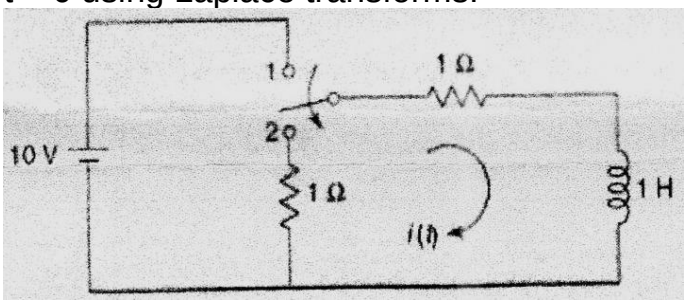
b) Derive an expression for response given by RL circuit.

c) In the network shown, the switch is closed. Assuming all initial conditions as zero, find $i, di/dt, d^2t/dt^2$ at $t = 0+$



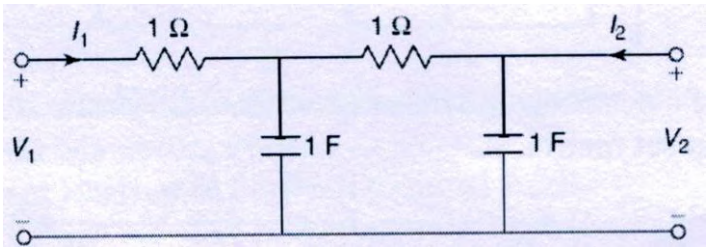
d) Derive Z parameter in terms of ABCD parameter.

e) In the network shown in fig. the switch is moved from 1 to 2 at t = 0. Steady state condition having reached in position 1. Determine i(t) for t > 0 using Laplace transforms.

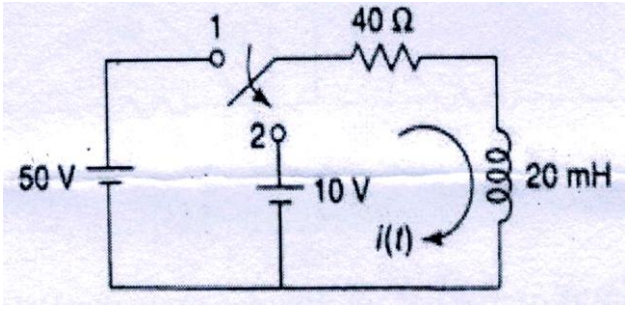


Q.5 Attempt any two of the following. **12**

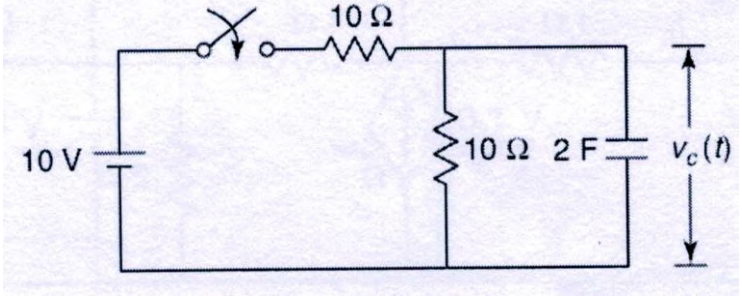
a) Determine the short-circuit admittance parameters for the network shown in Fig.



b) In the network of fig, is under steady state with switch is at position 1, at switch is moved to position 2. Find i (t).



c) The switch in the network shown in Fig. is closed at $t = 0$. Determine the voltage cross the capacitor using Laplace transform approach.



Seat No.	

Set R

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRIAL ENGINEERING
Network Analysis (EEPCC-05)

Day & Date: Wednesday 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) A capacitor does not allow sudden changes in _____.
a) currents b) Voltages
c) both a and b d) none of Above

2) Transients are presents in the circuit when the circuit is having _____
a) R b) L
c) C d) either b) or c)

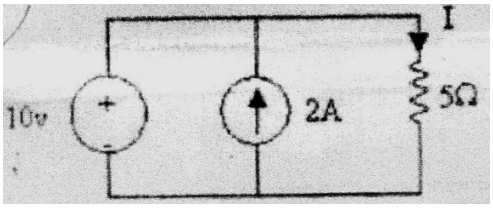
3) For a 2-port network to be reciprocal, _____.
a) $Z_{11} = Z_{22}$ b) $Y_{21} = Y_{22}$
c) $h_{21} = -h_{12}$ d) $AD - BC = 0$

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

5) In an electrical circuit dual of inductance is _____.
a) conductance b) resistance
c) capacitance d) susceptance

6) Four equal value resistors are connected in parallel. 5 V voltage is applied across the parallel circuit and 2.5 A current are measured from the source. What is the value of each resistor?
a) 4Ω b) 8Ω
c) 2.5Ω d) 5Ω

7) Calculate current I of the circuit shown below.



a) 4 A
b) 2 A
c) -2 A
d) -4 A

8) Application of Norton's theorem to a circuit yield _____
a) equivalent current source and impedance in series
b) equivalent current source and impedance in parallel
c) equivalent impedance
d) equivalent current source

9) The number of independent loops for a network with n nodes and b branches is _____
a) $n-1$
b) $b-n$
c) $b-n+1$
d) independent of the number of nodes

10) Between two open circuited terminals the current is _____.
a) Minimum
b) Maximum
c) Zero
d) None of the above

11) Superposition theorem is not applicable to network containing _____
a) Nonlinear elements
b) Dependent voltage source
c) Dependent current source
d) Transformers

12) The time constant of RC circuit is _____
a) RC
b) C/R
c) R/C
d) R

13) Laplace transform of a unit ramp function is _____.
a) 1
b) s
c) 1/s
d) 1/s2

14) The value of impulse function for t > 0
a) Zero
b) Unity
c) K where k is a constant
d) Infinity

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRIAL ENGINEERING
Network Analysis (EEPCC-05)

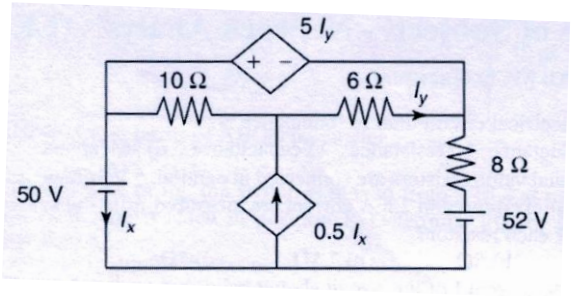
Day & Date: Wednesday 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are Compulsory.
2) Figures to the right indicate full marks.

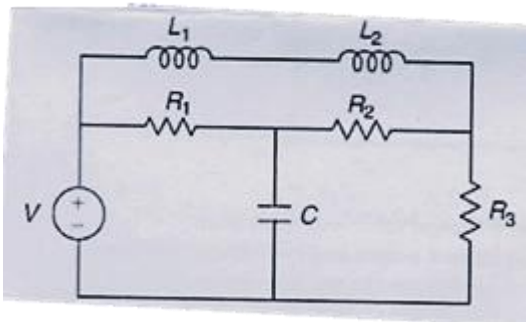
Section – I

Q.2 Attempt any four **16**

a) Find current through the 8Ω resistor by using mesh analysis.

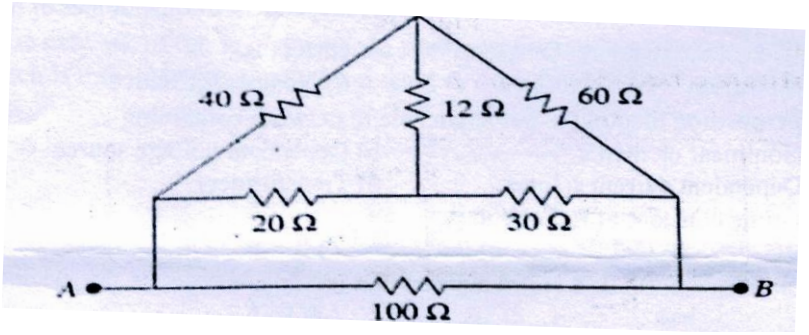


b) Draw the dual of the network.

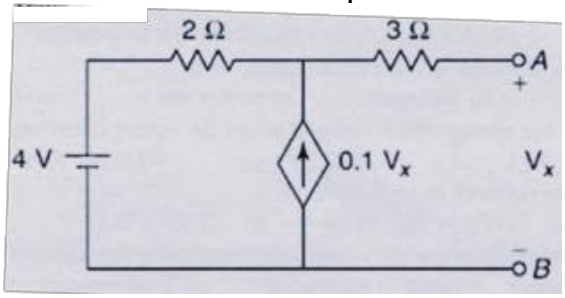


c) State and explain the Maximum Power transfer Theorem. Also derive the condition to deliver Maximum Power.

d) Find the Equivalent Resistance between terminal A&B.

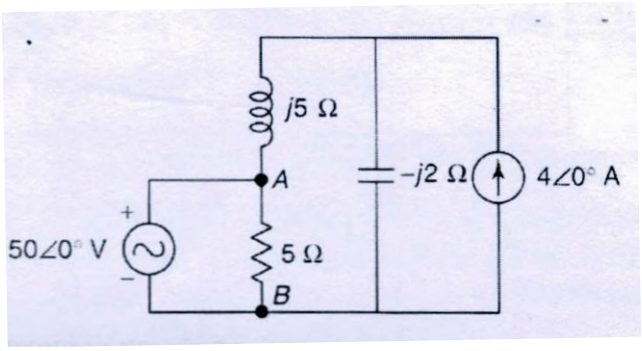


e) Find the Thevenin's equivalent network for the terminals A and B.

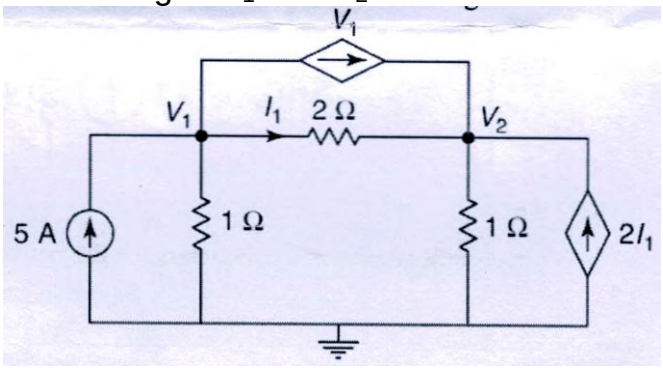


Q.3 Solve any two **12**

a) Determine the voltage V_{AB} for the network shown in Fig. Using Superposition Theorem.

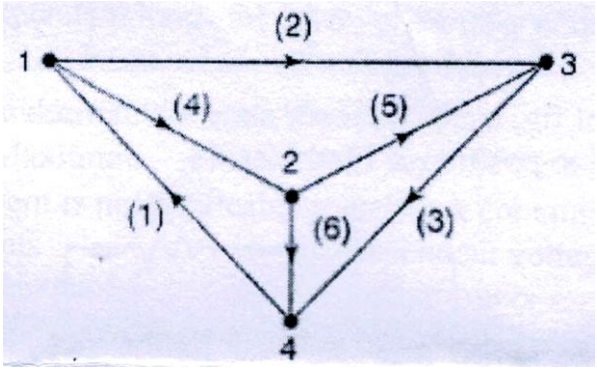


b) Find voltages V_1 and V_2 in the network shown in Fig.



c) The graph of a network shown in fig. write

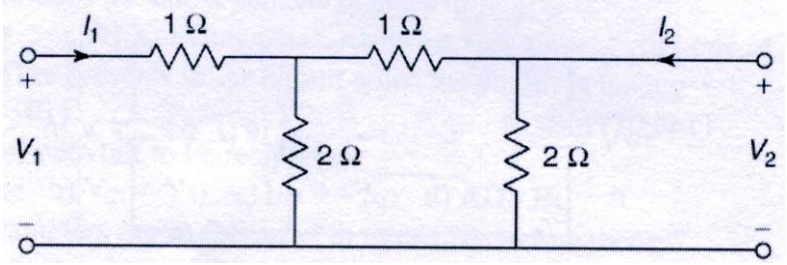
i) Incidence matrix
ii) Tie set matrix
iii) Cut set matrix



Section – II

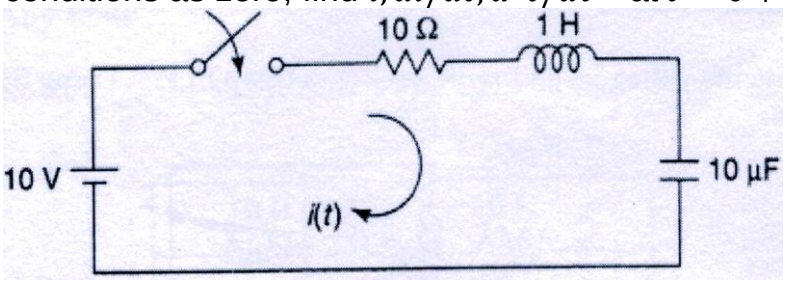
Q.4 Solve any four. **16**

a) Determine transmission parameters for the given network.



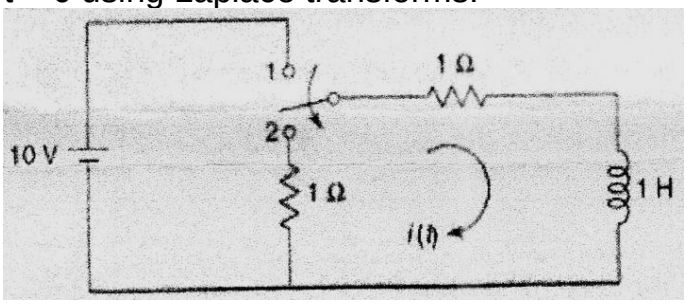
b) Derive an expression for response given by RL circuit.

c) In the network shown, the switch is closed. Assuming all initial conditions as zero, find $i, di/dt, d^2t/dt^2$ at $t = 0+$



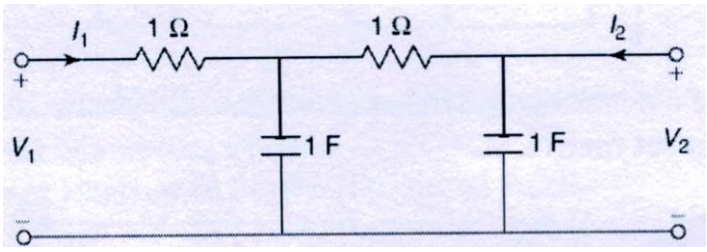
d) Derive Z parameter in terms of ABCD parameter.

e) In the network shown in fig. the switch is moved from 1 to 2 at t = 0. Steady state condition having reached in position 1. Determine i(t) for t > 0 using Laplace transforms.

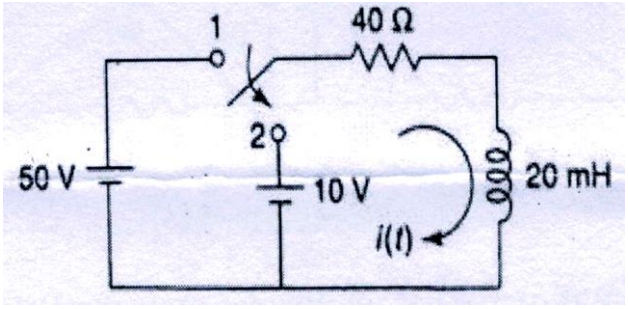


Q.5 Attempt any two of the following. **12**

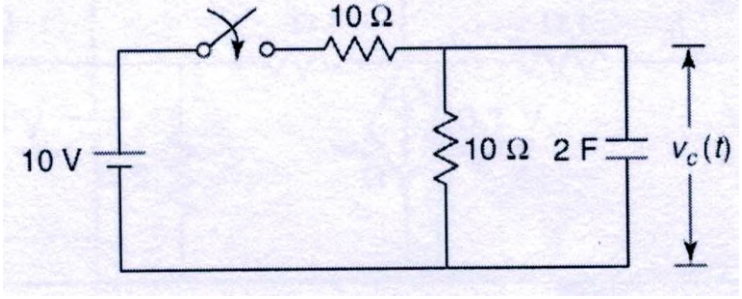
a) Determine the short-circuit admittance parameters for the network shown in Fig.



b) In the network of fig, is under steady state with switch is at position 1, at switch is moved to position 2. Find i (t).



c) The switch in the network shown in Fig. is closed at $t = 0$. Determine the voltage cross the capacitor using Laplace transform approach.



Seat No.		Set	S

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRIAL ENGINEERING
Network Analysis (EEPCC-05)

Day & Date: Wednesday 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Between two open circuited terminals the current is _____.
a) Minimum b) Maximum
c) Zero d) None of the above

2) Superposition theorem is not applicable to network containing _____
a) Nonlinear elements
b) Dependent voltage source
c) Dependent current source
d) Transformers

3) The time constant of RC circuit is _____
a) RC b) C/R
c) R/C d) R

4) Laplace transform of a unit ramp function is _____.
a) 1 b) s
c) 1/s d) 1/s2

5) The value of impulse function for t > 0
a) Zero b) Unity
c) K where k is a constant d) Infinity

6) A capacitor does not allow sudden changes in _____.
a) currents b) Voltages
c) both a and b d) none of Above

7) Transients are presents in the circuit when the circuit is having _____
a) R b) L
c) C d) either b) or c)

8) For a 2-port network to be reciprocal, _____.

a) $Z_{11} = Z_{22}$ b) $Y_{21} = Y_{22}$

c) $h_{21} = -h_{12}$ d) $AD - BC = 0$

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

a) Z parameters b) ABCD parameters

c) Y parameters d) h parameters

10) In an electrical circuit dual of inductance is _____.

a) conductance b) resistance

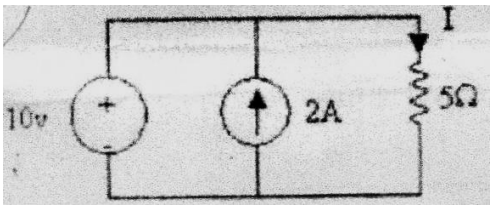
c) capacitance d) susceptance

11) Four equal value resistors are connected in parallel. 5 V voltage is applied across the parallel circuit and 2.5 A current are measured from the source. What is the value of each resistor?

a) 4Ω b) 8Ω

c) 2.5Ω d) 5Ω

12) Calculate current I of the circuit shown below.



a) 4 A b) 2 A

c) -2 A d) -4 A

13) Application of Norton's theorem to a circuit yield _____

a) equivalent current source and impedance in series

b) equivalent current source and impedance in parallel

c) equivalent impedance

d) equivalent current source

14) The number of independent loops for a network with n nodes and b branches is _____

a) $n - 1$ b) $b - n$

c) $b - n + 1$ d) independent of the number of nodes

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRIAL ENGINEERING
Network Analysis (EEPCC-05)

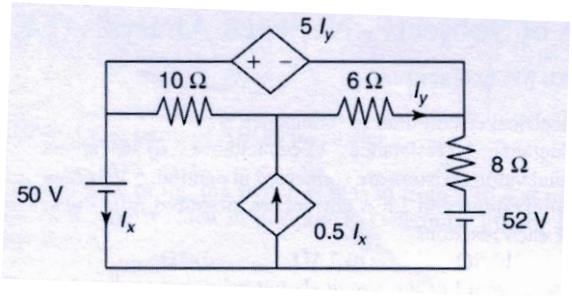
Day & Date: Wednesday 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are Compulsory.
2) Figures to the right indicate full marks.

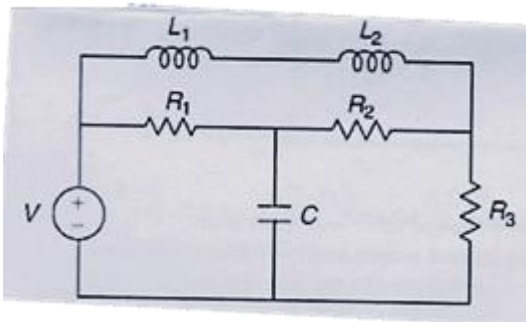
Section – I

Q.2 Attempt any four **16**

a) Find current through the 8Ω resistor by using mesh analysis.

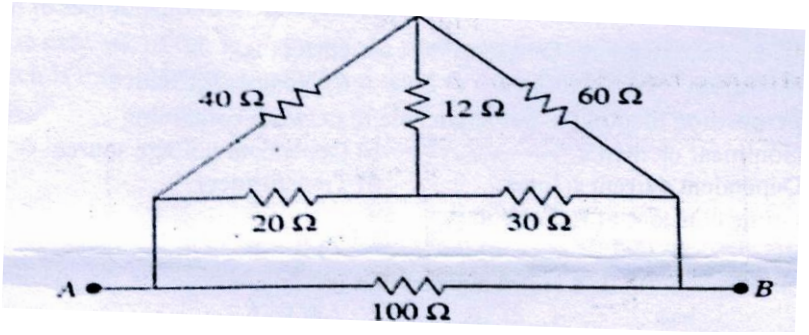


b) Draw the dual of the network.

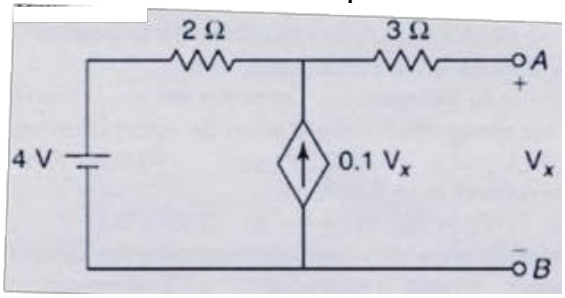


c) State and explain the Maximum Power transfer Theorem. Also derive the condition to deliver Maximum Power.

d) Find the Equivalent Resistance between terminal A&B.

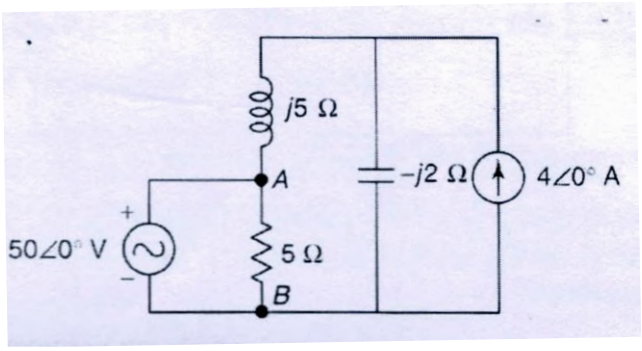


e) Find the Thevenin's equivalent network for the terminals A and B.

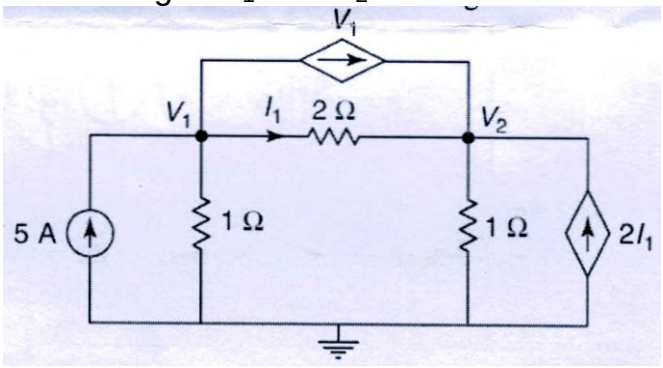


Q.3 Solve any two **12**

a) Determine the voltage V_{AB} for the network shown in Fig. Using Superposition Theorem.

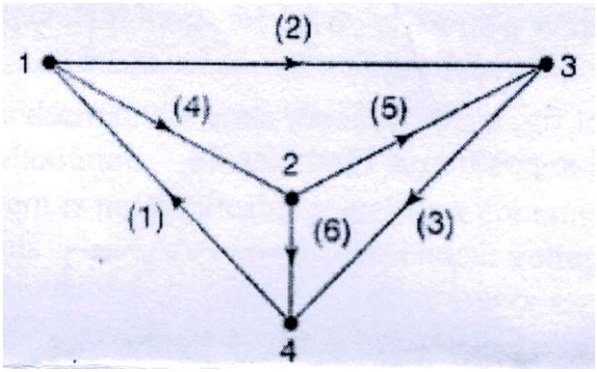


b) Find voltages V_1 and V_2 in the network shown in Fig.



c) The graph of a network shown in fig. write

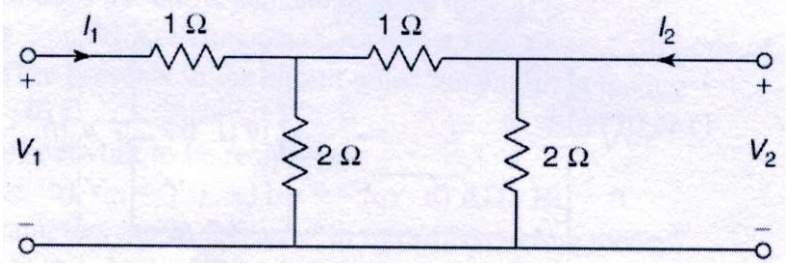
i) Incidence matrix
ii) Tie set matrix
iii) Cut set matrix



Section – II

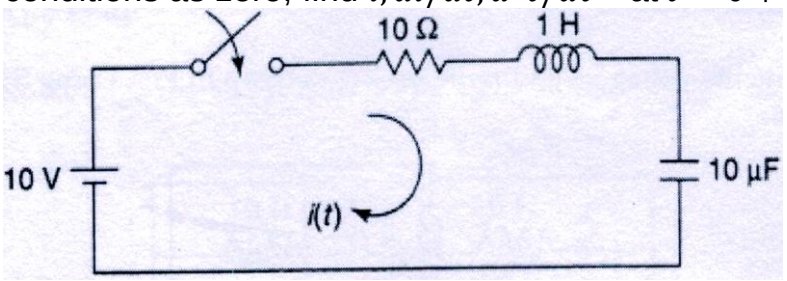
Q.4 Solve any four. **16**

a) Determine transmission parameters for the given network.



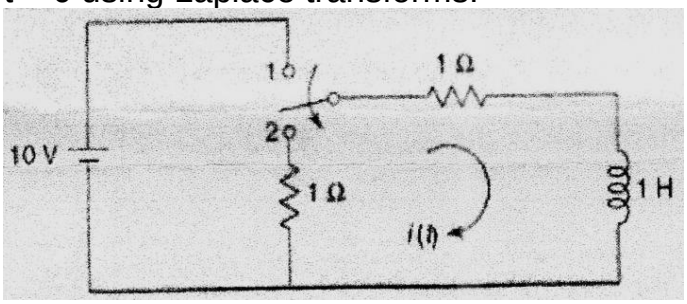
b) Derive an expression for response given by RL circuit.

c) In the network shown, the switch is closed. Assuming all initial conditions as zero, find $i, di/dt, d^2t/dt^2$ at $t = 0+$



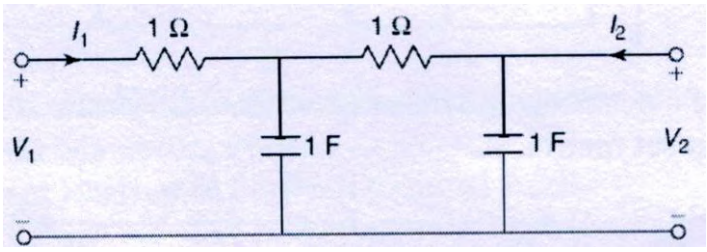
d) Derive Z parameter in terms of ABCD parameter.

e) In the network shown in fig. the switch is moved from 1 to 2 at t = 0. Steady state condition having reached in position 1. Determine i(t) for t > 0 using Laplace transforms.

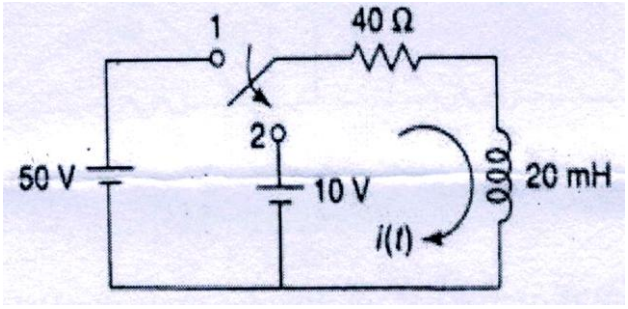


Q.5 Attempt any two of the following. **12**

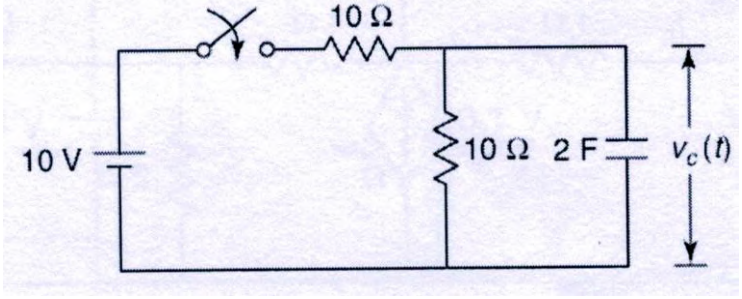
a) Determine the short-circuit admittance parameters for the network shown in Fig.



b) In the network of fig, is under steady state with switch is at position 1, at switch is moved to position 2. Find i (t).



c) The switch in the network shown in Fig. is closed at $t = 0$. Determine the voltage cross the capacitor using Laplace transform approach.



Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
AC Machines (EEPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Draw neat diagrams whenever necessary.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) A three-phase slip ring induction motor is fed from the rotor side with the stator winding short- circuited. The frequency of the current flowing in the short-circuited stator is _____
a) Slip frequency
b) Supply frequency
c) The frequency corresponding to rotor speed
d) Zero

2) A 3-phase induction motor with its rotor blocked behaves similar to a _____
a) transformer under open circuit of secondary
b) transformer under short circuit of secondary terminals
c) synchronous motor under slip test
d) synchronous motor under open circuit

3) The great advantage of the double squirrel-cage induction motor over single cage rotor is that its _____
a) efficiency is higher b) power factor is higher
c) slip is larger d) starting current is lower

4) Starters are required in the induction motor because _____
a) torque produced is very low at starting to overcome inertia
b) they are not self starting
c) of high starting current
d) all of the mentioned

5) Circle diagram of an induction motor is graphical representation of _____
a) its equivalent circuit
b) its rotor equivalent
c) its stator equivalent
d) its stationary equivalent circuit

6) Blocked rotor test comprises of _____
a) rotor copper and stator core losses
b) rotor and stator copper losses
c) rotor core losses
d) stator copper losses

7) The method which can be used for the speed control of induction motor from stator side is _____
a) V / f control
b) Controlling number of stator poles to control Ns
c) Adding rheostats in stator circuit
d) All of these

8) According to double revolving field theory, any alternating quantity can be resolved into two rotating components. The directions and magnitude of these components are _____
a) Same directions, each having magnitude equal to the maximum magnitude of alternating current
b) Opposite directions, each having magnitude equal to the maximum magnitude of alternating current
c) Opposite directions, each having magnitude half of the maximum magnitude of alternating current
d) Same directions, each having magnitude half of the maximum magnitude of alternating current

9) The spit phase induction motor has _____
a) Low starting current and high starting torque
b) Moderate starting current and moderate starting torque
c) Low starting current and moderate starting torque
d) Moderate starting current and low starting torque

10) When the load on an alternator is varied, its terminal voltage also changes due to _____
a) armature resistance
b) leakage reactance
c) armature reaction
d) all of the mentioned

11) Emf method of finding voltage regulation of alternator is also known as _____
a) pessimistic method
b) optimistic method
c) zero power factor method
d) none of the mentioned

12) Synchronous reactance of an alternator represents _____
a) armature reaction reactance and leakage reactance.
b) leakage reactance and field winding reactance.
c) field winding reactance and armature reaction reactance
d) a reactance connected in series with a synchronous generator.

13) When synchronous motor is running at synchronous speed, the damper winding produces?
a) damping torque
b) eddy current torque
c) no torque
d) torque aiding the developed torque

14) What are the probable causes of hunting?
a) sudden change in load
b) fault in supply
c) sudden change in field current
d) all of the mentioned

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
AC Machines (EEPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat diagrams whenever necessary.
4) Assume suitable data if necessary.

Section – I

Q.2 Attempt any four of the following: **16**

a) Explain the concept of rotating magnetic field (RMF) in three phase induction motor.

b) Explain the effect of slip on various parameters of rotor.

c) Draw and explain torque-slip characteristics of three phase induction motor.

d) A 440 V, 50 Hz, 6-pole, 3-phase induction motor draws an input power of 81 kW from the mains. The rotor emf makes 120 complete cycle per minute. Its stator losses are 1 kW and rotor current per phase is 65 ampere. Calculate:
(i) Rotor copper losses per phase;
(ii) Rotor resistance per phase

e) Explain with the help of a neat sketch the working of a star-delta starter.

f) Explain V/f method of speed control of 3-phase induction motor.

Q.3 Attempt the following: **12**

a) Derive the torque equation of three phase induction motor. Also derive the condition for maximum torque in case of three phase induction motor.

b) Draw the circle diagram and determine the line current and power factor at rated output for a 415 V, 29.84 kW, 50 Hz delta connected motor. The following test data is available:
No-load test: 415 V; 21 A; 1250 W
Blocked-rotor test: 100 V; 45 A; 2730 W
Assume that stator copper losses are equal to rotor copper losses at standstill.

OR

Explain slip-power recovery scheme of speed control 3-phase slip-ring induction motor.

Section – II

Q.4 Attempt any four of the following **16**

a) Explain why single phase induction motor is not self started.

b) Explain the construction and working of a single-phase capacitor start induction motor.

c) Explain the term Armature reaction in case of alternator. Explain armature reaction at lagging power factor.

d) Derive the generalized expression for an induced e.m.f. per phase in three phase alternator, when Winding is short pitched and distributed.

e) Explain working principle of synchronous motor.

f) Explain hunting of synchronous motor and methods of its prevention.

Q.5 Attempt any two of the following. **12**

a) Derive expression for pitch factor and distribution factor in alternator.

b) A 100 KVA, 3000 Volts, 50 Hz, 3- phase star connected alternator has effective armature resistance of 0.2 Ohm. The field current of 40 Amp produces a short circuit current of 200 Amp and an open circuit e.m.f. of 1040 (line value). Calculate the full load voltage regulation at 0.8 p.f. lagging and 0.8 p.f. leading. Draw phasor diagrams.

c) Explain the action of synchronous motor when loaded. Explain the effect of excitation on the Performance of a synchronous motor.

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
AC Machines (EEPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Draw neat diagrams whenever necessary.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) According to double revolving field theory, any alternating quantity can be resolved into two rotating components. The directions and magnitude of these components are _____
a) Same directions, each having magnitude equal to the maximum magnitude of alternating current
b) Opposite directions, each having magnitude equal to the maximum magnitude of alternating current
c) Opposite directions, each having magnitude half of the maximum magnitude of alternating current
d) Same directions, each having magnitude half of the maximum magnitude of alternating current

2) The spit phase induction motor has _____
a) Low starting current and high starting torque
b) Moderate starting current and moderate starting torque
c) Low starting current and moderate starting torque
d) Moderate starting current and low starting torque

3) When the load on an alternator is varied, its terminal voltage also changes due to _____
a) armature resistance b) leakage reactance
c) armature reaction d) all of the mentioned

4) Emf method of finding voltage regulation of alternator is also known as _____
a) pessimistic method b) optimistic method
c) zero power factor method d) none of the mentioned

5) Synchronous reactance of an alternator represents _____
a) armature reaction reactance and leakage reactance.
b) leakage reactance and field winding reactance.
c) field winding reactance and armature reaction reactance
d) a reactance connected in series with a synchronous generator.

6) When synchronous motor is running at synchronous speed, the damper winding produces?
a) damping torque
b) eddy current torque
c) no torque
d) torque aiding the developed torque

7) What are the probable causes of hunting?
a) sudden change in load
b) fault in supply
c) sudden change in field current
d) all of the mentioned

8) A three-phase slip ring induction motor is fed from the rotor side with the stator winding short- circuited. The frequency of the current flowing in the short-circuited stator is _____
a) Slip frequency
b) Supply frequency
c) The frequency corresponding to rotor speed
d) Zero

9) A 3-phase induction motor with its rotor blocked behaves similar to a _____
a) transformer under open circuit of secondary
b) transformer under short circuit of secondary terminals
c) synchronous motor under slip test
d) synchronous motor under open circuit

10) The great advantage of the double squirrel-cage induction motor over single cage rotor is that its _____
a) efficiency is higher
b) power factor is higher
c) slip is larger
d) starting current is lower

11) Starters are required in the induction motor because _____
a) torque produced is very low at starting to overcome inertia
b) they are not self starting
c) of high starting current
d) all of the mentioned

12) Circle diagram of an induction motor is graphical representation of _____
a) its equivalent circuit
b) its rotor equivalent
c) its stator equivalent
d) its stationary equivalent circuit

13) Blocked rotor test comprises of _____
a) rotor copper and stator core losses
b) rotor and stator copper losses
c) rotor core losses
d) stator copper losses

14) The method which can be used for the speed control of induction motor from stator side is _____
a) V / f control
b) Controlling number of stator poles to control Ns
c) Adding rheostats in stator circuit
d) All of these

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
AC Machines (EEPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat diagrams whenever necessary.
4) Assume suitable data if necessary.

Section – I

Q.2 Attempt any four of the following: **16**

a) Explain the concept of rotating magnetic field (RMF) in three phase induction motor.

b) Explain the effect of slip on various parameters of rotor.

c) Draw and explain torque-slip characteristics of three phase induction motor.

d) A 440 V, 50 Hz, 6-pole, 3-phase induction motor draws an input power of 81 kW from the mains. The rotor emf makes 120 complete cycle per minute. Its stator losses are 1 kW and rotor current per phase is 65 ampere. Calculate:
(i) Rotor copper losses per phase;
(ii) Rotor resistance per phase

e) Explain with the help of a neat sketch the working of a star-delta starter.

f) Explain V/f method of speed control of 3-phase induction motor.

Q.3 Attempt the following: **12**

a) Derive the torque equation of three phase induction motor. Also derive the condition for maximum torque in case of three phase induction motor.

b) Draw the circle diagram and determine the line current and power factor at rated output for a 415 V, 29.84 kW, 50 Hz delta connected motor. The following test data is available:
No-load test: 415 V; 21 A; 1250 W
Blocked-rotor test: 100 V; 45 A; 2730 W
Assume that stator copper losses are equal to rotor copper losses at standstill.

OR

Explain slip-power recovery scheme of speed control 3-phase slip-ring induction motor.

Section – II

Q.4 Attempt any four of the following **16**

a) Explain why single phase induction motor is not self started.

b) Explain the construction and working of a single-phase capacitor start induction motor.

c) Explain the term Armature reaction in case of alternator. Explain armature reaction at lagging power factor.

d) Derive the generalized expression for an induced e.m.f. per phase in three phase alternator, when Winding is short pitched and distributed.

e) Explain working principle of synchronous motor.

f) Explain hunting of synchronous motor and methods of its prevention.

Q.5 Attempt any two of the following. **12**

a) Derive expression for pitch factor and distribution factor in alternator.

b) A 100 KVA, 3000 Volts, 50 Hz, 3- phase star connected alternator has effective armature resistance of 0.2 Ohm. The field current of 40 Amp produces a short circuit current of 200 Amp and an open circuit e.m.f. of 1040 (line value). Calculate the full load voltage regulation at 0.8 p.f. lagging and 0.8 p.f. leading. Draw phasor diagrams.

c) Explain the action of synchronous motor when loaded. Explain the effect of excitation on the Performance of a synchronous motor.

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
AC Machines (EEPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Draw neat diagrams whenever necessary.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Emf method of finding voltage regulation of alternator is also known as _____
a) pessimistic method b) optimistic method
c) zero power factor method d) none of the mentioned

2) Synchronous reactance of an alternator represents _____
a) armature reaction reactance and leakage reactance.
b) leakage reactance and field winding reactance.
c) field winding reactance and armature reaction reactance
d) a reactance connected in series with a synchronous generator.

3) When synchronous motor is running at synchronous speed, the damper winding produces?
a) damping torque
b) eddy current torque
c) no torque
d) torque aiding the developed torque

4) What are the probable causes of hunting?
a) sudden change in load
b) fault in supply
c) sudden change in field current
d) all of the mentioned

5) A three-phase slip ring induction motor is fed from the rotor side with the stator winding short- circuited. The frequency of the current flowing in the short-circuited stator is _____

a) Slip frequency
b) Supply frequency
c) The frequency corresponding to rotor speed
d) Zero

6) A 3-phase induction motor with its rotor blocked behaves similar to a _____

a) transformer under open circuit of secondary
b) transformer under short circuit of secondary terminals
c) synchronous motor under slip test
d) synchronous motor under open circuit

7) The great advantage of the double squirrel-cage induction motor over single cage rotor is that its _____

a) efficiency is higher
b) power factor is higher
c) slip is larger
d) starting current is lower

8) Starters are required in the induction motor because _____

a) torque produced is very low at starting to overcome inertia
b) they are not self starting
c) of high starting current
d) all of the mentioned

9) Circle diagram of an induction motor is graphical representation of _____

a) its equivalent circuit
b) its rotor equivalent
c) its stator equivalent
d) its stationary equivalent circuit

10) Blocked rotor test comprises of _____

a) rotor copper and stator core losses
b) rotor and stator copper losses
c) rotor core losses
d) stator copper losses

11) The method which can be used for the speed control of induction motor from stator side is _____

a) V / f control
b) Controlling number of stator poles to control Ns
c) Adding rheostats in stator circuit
d) All of these

12) According to double revolving field theory, any alternating quantity can be resolved into two rotating components. The directions and magnitude of these components are _____

a) Same directions, each having magnitude equal to the maximum magnitude of alternating current
b) Opposite directions, each having magnitude equal to the maximum magnitude of alternating current
c) Opposite directions, each having magnitude half of the maximum magnitude of alternating current
d) Same directions, each having magnitude half of the maximum magnitude of alternating current

13) The spit phase induction motor has _____

a) Low starting current and high starting torque
b) Moderate starting current and moderate starting torque
c) Low starting current and moderate starting torque
d) Moderate starting current and low starting torque

14) When the load on an alternator is varied, its terminal voltage also changes due to _____

a) armature resistance
b) leakage reactance
c) armature reaction
d) all of the mentioned

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
AC Machines (EEPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat diagrams whenever necessary.
4) Assume suitable data if necessary.

Section – I

Q.2 Attempt any four of the following: **16**

a) Explain the concept of rotating magnetic field (RMF) in three phase induction motor.

b) Explain the effect of slip on various parameters of rotor.

c) Draw and explain torque-slip characteristics of three phase induction motor.

d) A 440 V, 50 Hz, 6-pole, 3-phase induction motor draws an input power of 81 kW from the mains. The rotor emf makes 120 complete cycle per minute. Its stator losses are 1 kW and rotor current per phase is 65 ampere. Calculate:
(i) Rotor copper losses per phase;
(ii) Rotor resistance per phase

e) Explain with the help of a neat sketch the working of a star-delta starter.

f) Explain V/f method of speed control of 3-phase induction motor.

Q.3 Attempt the following: **12**

a) Derive the torque equation of three phase induction motor. Also derive the condition for maximum torque in case of three phase induction motor.

b) Draw the circle diagram and determine the line current and power factor at rated output for a 415 V, 29.84 kW, 50 Hz delta connected motor. The following test data is available:
No-load test: 415 V; 21 A; 1250 W
Blocked-rotor test: 100 V; 45 A; 2730 W
Assume that stator copper losses are equal to rotor copper losses at standstill.

OR

Explain slip-power recovery scheme of speed control 3-phase slip-ring induction motor.

Section – II

Q.4 Attempt any four of the following **16**

a) Explain why single phase induction motor is not self started.

b) Explain the construction and working of a single-phase capacitor start induction motor.

c) Explain the term Armature reaction in case of alternator. Explain armature reaction at lagging power factor.

d) Derive the generalized expression for an induced e.m.f. per phase in three phase alternator, when Winding is short pitched and distributed.

e) Explain working principle of synchronous motor.

f) Explain hunting of synchronous motor and methods of its prevention.

Q.5 Attempt any two of the following. **12**

a) Derive expression for pitch factor and distribution factor in alternator.

b) A 100 KVA, 3000 Volts, 50 Hz, 3- phase star connected alternator has effective armature resistance of 0.2 Ohm. The field current of 40 Amp produces a short circuit current of 200 Amp and an open circuit e.m.f. of 1040 (line value). Calculate the full load voltage regulation at 0.8 p.f. lagging and 0.8 p.f. leading. Draw phasor diagrams.

c) Explain the action of synchronous motor when loaded. Explain the effect of excitation on the Performance of a synchronous motor.

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
AC Machines (EEPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Draw neat diagrams whenever necessary.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Blocked rotor test comprises of _____
a) rotor copper and stator core losses
b) rotor and stator copper losses
c) rotor core losses
d) stator copper losses

2) The method which can be used for the speed control of induction motor from stator side is _____
a) V / f control
b) Controlling number of stator poles to control Ns
c) Adding rheostats in stator circuit
d) All of these

3) According to double revolving field theory, any alternating quantity can be resolved into two rotating components. The directions and magnitude of these components are _____
a) Same directions, each having magnitude equal to the maximum magnitude of alternating current
b) Opposite directions, each having magnitude equal to the maximum magnitude of alternating current
c) Opposite directions, each having magnitude half of the maximum magnitude of alternating current
d) Same directions, each having magnitude half of the maximum magnitude of alternating current

4) The spit phase induction motor has _____
a) Low starting current and high starting torque
b) Moderate starting current and moderate starting torque
c) Low starting current and moderate starting torque
d) Moderate starting current and low starting torque

5) When the load on an alternator is varied, its terminal voltage also changes due to _____

a) armature resistance
b) leakage reactance
c) armature reaction
d) all of the mentioned

6) Emf method of finding voltage regulation of alternator is also known as _____

a) pessimistic method
b) optimistic method
c) zero power factor method
d) none of the mentioned

7) Synchronous reactance of an alternator represents _____

a) armature reaction reactance and leakage reactance.
b) leakage reactance and field winding reactance.
c) field winding reactance and armature reaction reactance
d) a reactance connected in series with a synchronous generator.

8) When synchronous motor is running at synchronous speed, the damper winding produces?

a) damping torque
b) eddy current torque
c) no torque
d) torque aiding the developed torque

9) What are the probable causes of hunting?

a) sudden change in load
b) fault in supply
c) sudden change in field current
d) all of the mentioned

10) A three-phase slip ring induction motor is fed from the rotor side with the stator winding short- circuited. The frequency of the current flowing in the short-circuited stator is _____

a) Slip frequency
b) Supply frequency
c) The frequency corresponding to rotor speed
d) Zero

11) A 3-phase induction motor with its rotor blocked behaves similar to a _____

a) transformer under open circuit of secondary
b) transformer under short circuit of secondary terminals
c) synchronous motor under slip test
d) synchronous motor under open circuit

12) The great advantage of the double squirrel-cage induction motor over single cage rotor is that its _____

a) efficiency is higher
b) power factor is higher
c) slip is larger
d) starting current is lower

13) Starters are required in the induction motor because _____
   a) torque produced is very low at starting to overcome inertia
   b) they are not self starting
   c) of high starting current
   d) all of the mentioned

14) Circle diagram of an induction motor is graphical representation of _____
   a) its equivalent circuit
   b) its rotor equivalent
   c) its stator equivalent
   d) its stationary equivalent circuit

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
AC Machines (EEPCC-06)

Day & Date: Friday 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Draw neat diagrams whenever necessary.
4) Assume suitable data if necessary.

Section – I

Q.2 Attempt any four of the following: **16**

a) Explain the concept of rotating magnetic field (RMF) in three phase induction motor.

b) Explain the effect of slip on various parameters of rotor.

c) Draw and explain torque-slip characteristics of three phase induction motor.

d) A 440 V, 50 Hz, 6-pole, 3-phase induction motor draws an input power of 81 kW from the mains. The rotor emf makes 120 complete cycle per minute. Its stator losses are 1 kW and rotor current per phase is 65 ampere. Calculate:
(i) Rotor copper losses per phase;
(ii) Rotor resistance per phase

e) Explain with the help of a neat sketch the working of a star-delta starter.

f) Explain V/f method of speed control of 3-phase induction motor.

Q.3 Attempt the following: **12**

a) Derive the torque equation of three phase induction motor. Also derive the condition for maximum torque in case of three phase induction motor.

b) Draw the circle diagram and determine the line current and power factor at rated output for a 415 V, 29.84 kW, 50 Hz delta connected motor. The following test data is available:
No-load test: 415 V; 21 A; 1250 W
Blocked-rotor test: 100 V; 45 A; 2730 W
Assume that stator copper losses are equal to rotor copper losses at standstill.

OR

Explain slip-power recovery scheme of speed control 3-phase slip-ring induction motor.

Section – II

Q.4 Attempt any four of the following **16**

a) Explain why single phase induction motor is not self started.

b) Explain the construction and working of a single-phase capacitor start induction motor.

c) Explain the term Armature reaction in case of alternator. Explain armature reaction at lagging power factor.

d) Derive the generalized expression for an induced e.m.f. per phase in three phase alternator, when Winding is short pitched and distributed.

e) Explain working principle of synchronous motor.

f) Explain hunting of synchronous motor and methods of its prevention.

Q.5 Attempt any two of the following. **12**

a) Derive expression for pitch factor and distribution factor in alternator.

b) A 100 KVA, 3000 Volts, 50 Hz, 3- phase star connected alternator has effective armature resistance of 0.2 Ohm. The field current of 40 Amp produces a short circuit current of 200 Amp and an open circuit e.m.f. of 1040 (line value). Calculate the full load voltage regulation at 0.8 p.f. lagging and 0.8 p.f. leading. Draw phasor diagrams.

c) Explain the action of synchronous motor when loaded. Explain the effect of excitation on the Performance of a synchronous motor.

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Innovation can be best described as: _____
a) A new idea only
b) The process of creating value through ideas
c) Invention
d) None of the above

2) Entrepreneurship is primarily related to: _____
a) Administration b) Risk-taking
c) Planning d) None of these

3) Which of the following is not an entrepreneurial competency?
a) Innovation b) Leadership
c) Laziness d) Decision making

4) An entrepreneur operates: _____
a) Outside the organization b) Within an existing company
c) As a freelancer d) None

5) "Push" type innovation comes from: _____
a) Market needs b) Customer demands
c) Internal ideas d) Suppliers

6) Agile management promotes: _____
a) Linear process b) Flexibility and iteration
c) Bureaucracy d) None

7) Blue Ocean strategy refers to: _____
a) Competing in existing markets
b) Creating new market space
c) Losing market share
d) None

8) Which of these is not a barrier to innovation?
a) Risk-taking culture b) Resistance to change
c) Lack of resources d) Poor leadership

9) The shifting composition of the economy refers to: _____
a) Stable industries b) Changing business models
c) Static job roles d) None

10) Lean start-up encourages: _____
a) High upfront investment b) Rapid prototyping
c) Formal structure d) None

11) Legal considerations for entrepreneurs include: _____
a) Taxation b) IP protection
c) Contracts d) All of these

12) One of the seven sources of innovation is: _____
a) Competitor's failure b) Demographics
c) Inflation d) GDP

13) Entrepreneurial opportunity recognition is: _____
a) Unimportant b) Intuition-based only
c) Structured process d) Not taught

14) Six Thinking Hats is a method for: _____
a) Innovation testing b) Decision-making
c) Funding d) Legal advice

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 All questions are compulsory.

a) Define innovation. Explain its relationship with entrepreneurship. **06**
b) Distinguish between Entrepreneur, Manager, and Intrapreneur. **04**

Q.3 Solve any three questions.

a) Explain classification of innovation. **06**
b) Describe the economic theories of entrepreneurship. **06**
c) Discuss need and importance of Entrepreneurship Development. **06**
d) Describe sources of innovation with examples. **06**
e) Explain Agile management and NUF test in innovation. **06**

Section – II

Q.4 All questions are compulsory.

a) Explain the purpose and process of innovation. **06**
b) What are the needs for continuous learning in innovation? **04**

Q.5 Solve any three questions.

a) Explain different types of innovative strategies. **06**
b) Describe Red Ocean vs Blue Ocean strategies. **06**
c) List barriers to innovation and explain with examples. **06**
d) Explain the entrepreneurial process and opportunity recognition. **06**
e) Write short note on Lean start-up methodology. **06**

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which of these is not a barrier to innovation?
a) Risk-taking culture b) Resistance to change
c) Lack of resources d) Poor leadership

2) The shifting composition of the economy refers to: _____
a) Stable industries b) Changing business models
c) Static job roles d) None

3) Lean start-up encourages: _____
a) High upfront investment b) Rapid prototyping
c) Formal structure d) None

4) Legal considerations for entrepreneurs include: _____
a) Taxation b) IP protection
c) Contracts d) All of these

5) One of the seven sources of innovation is: _____
a) Competitor's failure b) Demographics
c) Inflation d) GDP

6) Entrepreneurial opportunity recognition is: _____
a) Unimportant b) Intuition-based only
c) Structured process d) Not taught

7) Six Thinking Hats is a method for: _____
a) Innovation testing b) Decision-making
c) Funding d) Legal advice

8) Innovation can be best described as: _____
a) A new idea only
b) The process of creating value through ideas
c) Invention
d) None of the above

9) Entrepreneurship is primarily related to: _____
a) Administration
b) Risk-taking
c) Planning
d) None of these

10) Which of the following is not an entrepreneurial competency?
a) Innovation
b) Leadership
c) Laziness
d) Decision making

11) An entrepreneur operates: _____
a) Outside the organization
b) Within an existing company
c) As a freelancer
d) None

12) "Push" type innovation comes from: _____
a) Market needs
b) Customer demands
c) Internal ideas
d) Suppliers

13) Agile management promotes: _____
a) Linear process
b) Flexibility and iteration
c) Bureaucracy
d) None

14) Blue Ocean strategy refers to: _____
a) Competing in existing markets
b) Creating new market space
c) Losing market share
d) None

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 All questions are compulsory.

a) Define innovation. Explain its relationship with entrepreneurship. **06**
b) Distinguish between Entrepreneur, Manager, and Intrapreneur. **04**

Q.3 Solve any three questions.

a) Explain classification of innovation. **06**
b) Describe the economic theories of entrepreneurship. **06**
c) Discuss need and importance of Entrepreneurship Development. **06**
d) Describe sources of innovation with examples. **06**
e) Explain Agile management and NUF test in innovation. **06**

Section – II

Q.4 All questions are compulsory.

a) Explain the purpose and process of innovation. **06**
b) What are the needs for continuous learning in innovation? **04**

Q.5 Solve any three questions.

a) Explain different types of innovative strategies. **06**
b) Describe Red Ocean vs Blue Ocean strategies. **06**
c) List barriers to innovation and explain with examples. **06**
d) Explain the entrepreneurial process and opportunity recognition. **06**
e) Write short note on Lean start-up methodology. **06**

Seat No.		Set	R

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Legal considerations for entrepreneurs include: _____
a) Taxation b) IP protection
c) Contracts d) All of these

2) One of the seven sources of innovation is: _____
a) Competitor's failure b) Demographics
c) Inflation d) GDP

3) Entrepreneurial opportunity recognition is: _____
a) Unimportant b) Intuition-based only
c) Structured process d) Not taught

4) Six Thinking Hats is a method for: _____
a) Innovation testing b) Decision-making
c) Funding d) Legal advice

5) Innovation can be best described as: _____
a) A new idea only
b) The process of creating value through ideas
c) Invention
d) None of the above

6) Entrepreneurship is primarily related to: _____
a) Administration b) Risk-taking
c) Planning d) None of these

7) Which of the following is not an entrepreneurial competency?
a) Innovation b) Leadership
c) Laziness d) Decision making

8) An entrepreneur operates: _____
a) Outside the organization
b) Within an existing company
c) As a freelancer
d) None

9) "Push" type innovation comes from: _____
a) Market needs
b) Customer demands
c) Internal ideas
d) Suppliers

10) Agile management promotes: _____
a) Linear process
b) Flexibility and iteration
c) Bureaucracy
d) None

11) Blue Ocean strategy refers to: _____
a) Competing in existing markets
b) Creating new market space
c) Losing market share
d) None

12) Which of these is not a barrier to innovation?
a) Risk-taking culture
b) Resistance to change
c) Lack of resources
d) Poor leadership

13) The shifting composition of the economy refers to: _____
a) Stable industries
b) Changing business models
c) Static job roles
d) None

14) Lean start-up encourages: _____
a) High upfront investment
b) Rapid prototyping
c) Formal structure
d) None

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 All questions are compulsory.

a) Define innovation. Explain its relationship with entrepreneurship. **06**
b) Distinguish between Entrepreneur, Manager, and Intrapreneur. **04**

Q.3 Solve any three questions.

a) Explain classification of innovation. **06**
b) Describe the economic theories of entrepreneurship. **06**
c) Discuss need and importance of Entrepreneurship Development. **06**
d) Describe sources of innovation with examples. **06**
e) Explain Agile management and NUF test in innovation. **06**

Section – II

Q.4 All questions are compulsory.

a) Explain the purpose and process of innovation. **06**
b) What are the needs for continuous learning in innovation? **04**

Q.5 Solve any three questions.

a) Explain different types of innovative strategies. **06**
b) Describe Red Ocean vs Blue Ocean strategies. **06**
c) List barriers to innovation and explain with examples. **06**
d) Explain the entrepreneurial process and opportunity recognition. **06**
e) Write short note on Lean start-up methodology. **06**

Seat No.		Set	S

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Use of non-programmable calculators is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Agile management promotes: _____
a) Linear process b) Flexibility and iteration
c) Bureaucracy d) None

2) Blue Ocean strategy refers to: _____
a) Competing in existing markets
b) Creating new market space
c) Losing market share
d) None

3) Which of these is not a barrier to innovation?
a) Risk-taking culture b) Resistance to change
c) Lack of resources d) Poor leadership

4) The shifting composition of the economy refers to: _____
a) Stable industries b) Changing business models
c) Static job roles d) None

5) Lean start-up encourages: _____
a) High upfront investment b) Rapid prototyping
c) Formal structure d) None

6) Legal considerations for entrepreneurs include: _____
a) Taxation b) IP protection
c) Contracts d) All of these

7) One of the seven sources of innovation is: _____
a) Competitor's failure b) Demographics
c) Inflation d) GDP

8) Entrepreneurial opportunity recognition is: _____
a) Unimportant
b) Intuition-based only
c) Structured process
d) Not taught

9) Six Thinking Hats is a method for: _____
a) Innovation testing
b) Decision-making
c) Funding
d) Legal advice

10) Innovation can be best described as: _____
a) A new idea only
b) The process of creating value through ideas
c) Invention
d) None of the above

11) Entrepreneurship is primarily related to: _____
a) Administration
b) Risk-taking
c) Planning
d) None of these

12) Which of the following is not an entrepreneurial competency?
a) Innovation
b) Leadership
c) Laziness
d) Decision making

13) An entrepreneur operates: _____
a) Outside the organization
b) Within an existing company
c) As a freelancer
d) None

14) "Push" type innovation comes from: _____
a) Market needs
b) Customer demands
c) Internal ideas
d) Suppliers

SLR-BD-271

Seat No.	

Set S

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Entrepreneurship and Innovation (OE-02A)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 All questions are compulsory.

a) Define innovation. Explain its relationship with entrepreneurship. **06**
b) Distinguish between Entrepreneur, Manager, and Intrapreneur. **04**

Q.3 Solve any three questions.

a) Explain classification of innovation. **06**
b) Describe the economic theories of entrepreneurship. **06**
c) Discuss need and importance of Entrepreneurship Development. **06**
d) Describe sources of innovation with examples. **06**
e) Explain Agile management and NUF test in innovation. **06**

Section – II

Q.4 All questions are compulsory.

a) Explain the purpose and process of innovation. **06**
b) What are the needs for continuous learning in innovation? **04**

Q.5 Solve any three questions.

a) Explain different types of innovative strategies. **06**
b) Describe Red Ocean vs Blue Ocean strategies. **06**
c) List barriers to innovation and explain with examples. **06**
d) Explain the entrepreneurial process and opportunity recognition. **06**
e) Write short note on Lean start-up methodology. **06**

SLR-BD-272

Seat No.		Set	P

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) The Occupational Health and Safety Management System (OHSMS) primarily aims to: _____
a) Increase industrial profits
b) Reduce energy consumption
c) Ensure worker safety and reduce health risks in workplaces
d) Promote environmental tourism

2) In-situ conservation refers to: _____
a) Conservation of species in zoos
b) Conservation using biotechnology
c) Conservation in gene banks
d) Conservation of species in their natural habitats

3) Carbon footprint is a measure of: _____
a) Land occupied by forests
b) Energy consumption in a home
c) Greenhouse gas emissions by an activity or person
d) Amount of carbon in plants

4) The main goal of sustainability is to: _____
a) Meet present needs without compromising future needs
b) Increase profit only
c) Eliminate economic development
d) Promote urbanization

5) Which of the following is an example of hazardous waste?
a) Expired medicines b) Plastic bottles
c) Food scraps d) Paper waste

6) Biodiversity hotspots in India include: _____
a) Eastern Ghats and Indo-Gangetic Plain
b) Western Ghats and the Himalayas
c) Thar Desert and Sundarbans only
d) Deccan Plateau and Indo-Gangetic Basin

7) The 3R concept stands for: _____
a) Reuse, Reduce, Rebuild
b) Reduce, Reuse, Recycle
c) Replace, Reuse, Restore
d) Recycle, Recover, Rebuild

8) The ISO 14000 Series deals with: _____
a) Energy-efficient building design
b) Environmental Management Systems
c) Industrial Safety Standards
d) Economic Performance Indicators

9) Which of the following is a non-conventional source of energy?
a) Coal
b) Natural Gas
c) Wind
d) Diesel

10) The main goal of a circular economy is to: _____
a) Increase fossil fuel usage
b) Promote single-use products
c) Minimize waste and resource use
d) Maximize profit only

11) The first step in preparing an Environmental Impact Assessment (EIA) report is: _____
a) Cost-benefit analysis
b) Monitoring
c) Screening
d) Public hearing

12) Which of the following is not a principle of Environmental Management?
a) Polluter pays
b) Sustainability
c) Preventive action
d) Maximum profit generation

13) Cost-Benefit Analysis (CBA) in environmental policies is used to: _____
a) Maximize pollution
b) Evaluate environmental legislation
c) Compare environmental costs with economic benefits
d) Promote industrialization

14) An ecosystem consists of: _____
a) Living organisms only
b) Non-living components only
c) Living organisms and their physical environment
d) Plants and animals only

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following **12**

a) Define the term "environment". Discuss the scope and importance of environmental studies. Why is there a need for public awareness?
b) Describe the causes and effects of air and water pollution. Suggest two preventive measures for each.
c) Define sustainability. Discuss any two major challenges in achieving sustainable development.

Q.3 Attempt Any Two **10**

a) What are hazardous wastes and e-wastes? How should they be managed?
b) What are carbon credits and carbon footprints? Explain with examples.
c) List any two Millennium Development Goals (MDGs). Mention one environmental protocol.

Q.4 Write short notes on any two of the following: **06**

a) Genetic diversity
b) India as a mega-diversity nation
c) In-situ and Ex-situ conservation

Section – II

Q.5 Write short notes on any two of the following: **10**

a) ISO 14000 Series
b) Sustainable Habitat - Green Buildings
c) Non-conventional energy sources

Q.6 Attempt the following **10**

a) Define Environmental Management. Discuss its nature, scope, and components.
b) Define the 3R concept and explain how it supports the zero waste approach.

Q.7 Attempt any two **08**

a) Define Environmental Management. Discuss its nature, scope, and components.

b) What is Environmental Policy Analysis? Distinguish between macro-level and micro-level analysis.

c) Outline the steps involved in the Environmental Impact Assessment (EIA) process.

Seat No.		Set	Q

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) The ISO 14000 Series deals with: _____
a) Energy-efficient building design
b) Environmental Management Systems
c) Industrial Safety Standards
d) Economic Performance Indicators

2) Which of the following is a non-conventional source of energy?
a) Coal b) Natural Gas
c) Wind d) Diesel

3) The main goal of a circular economy is to: _____
a) Increase fossil fuel usage
b) Promote single-use products
c) Minimize waste and resource use
d) Maximize profit only

4) The first step in preparing an Environmental Impact Assessment (EIA) report is: _____
a) Cost-benefit analysis b) Monitoring
c) Screening d) Public hearing

5) Which of the following is not a principle of Environmental Management?
a) Polluter pays b) Sustainability
c) Preventive action d) Maximum profit generation

6) Cost-Benefit Analysis (CBA) in environmental policies is used to: _____
a) Maximize pollution
b) Evaluate environmental legislation
c) Compare environmental costs with economic benefits
d) Promote industrialization

7) An ecosystem consists of: _____
a) Living organisms only
b) Non-living components only
c) Living organisms and their physical environment
d) Plants and animals only

8) The Occupational Health and Safety Management System (OHSMS) primarily aims to: _____
a) Increase industrial profits
b) Reduce energy consumption
c) Ensure worker safety and reduce health risks in workplaces
d) Promote environmental tourism

9) In-situ conservation refers to: _____
a) Conservation of species in zoos
b) Conservation using biotechnology
c) Conservation in gene banks
d) Conservation of species in their natural habitats

10) Carbon footprint is a measure of: _____
a) Land occupied by forests
b) Energy consumption in a home
c) Greenhouse gas emissions by an activity or person
d) Amount of carbon in plants

11) The main goal of sustainability is to: _____
a) Meet present needs without compromising future needs
b) Increase profit only
c) Eliminate economic development
d) Promote urbanization

12) Which of the following is an example of hazardous waste?
a) Expired medicines b) Plastic bottles
c) Food scraps d) Paper waste

13) Biodiversity hotspots in India include: _____
a) Eastern Ghats and Indo-Gangetic Plain
b) Western Ghats and the Himalayas
c) Thar Desert and Sundarbans only
d) Deccan Plateau and Indo-Gangetic Basin

14) The 3R concept stands for: _____
a) Reuse, Reduce, Rebuild b) Reduce, Reuse, Recycle
c) Replace, Reuse, Restore d) Recycle, Recover, Rebuild

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following **12**

a) Define the term "environment". Discuss the scope and importance of environmental studies. Why is there a need for public awareness?
b) Describe the causes and effects of air and water pollution. Suggest two preventive measures for each.
c) Define sustainability. Discuss any two major challenges in achieving sustainable development.

Q.3 Attempt Any Two **10**

a) What are hazardous wastes and e-wastes? How should they be managed?
b) What are carbon credits and carbon footprints? Explain with examples.
c) List any two Millennium Development Goals (MDGs). Mention one environmental protocol.

Q.4 Write short notes on any two of the following: **06**

a) Genetic diversity
b) India as a mega-diversity nation
c) In-situ and Ex-situ conservation

Section – II

Q.5 Write short notes on any two of the following: **10**

a) ISO 14000 Series
b) Sustainable Habitat - Green Buildings
c) Non-conventional energy sources

Q.6 Attempt the following **10**

a) Define Environmental Management. Discuss its nature, scope, and components.
b) Define the 3R concept and explain how it supports the zero waste approach.

Q.7 Attempt any two **08**

a) Define Environmental Management. Discuss its nature, scope, and components.

b) What is Environmental Policy Analysis? Distinguish between macro-level and micro-level analysis.

c) Outline the steps involved in the Environmental Impact Assessment (EIA) process.

Seat No.		Set	R

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) The first step in preparing an Environmental Impact Assessment (EIA) report is: _____
a) Cost-benefit analysis b) Monitoring
c) Screening d) Public hearing

2) Which of the following is not a principle of Environmental Management?
a) Polluter pays b) Sustainability
c) Preventive action d) Maximum profit generation

3) Cost-Benefit Analysis (CBA) in environmental policies is used to: _____
a) Maximize pollution
b) Evaluate environmental legislation
c) Compare environmental costs with economic benefits
d) Promote industrialization

4) An ecosystem consists of: _____
a) Living organisms only
b) Non-living components only
c) Living organisms and their physical environment
d) Plants and animals only

5) The Occupational Health and Safety Management System (OHSMS) primarily aims to: _____
a) Increase industrial profits
b) Reduce energy consumption
c) Ensure worker safety and reduce health risks in workplaces
d) Promote environmental tourism

6) In-situ conservation refers to: _____
a) Conservation of species in zoos
b) Conservation using biotechnology
c) Conservation in gene banks
d) Conservation of species in their natural habitats

7) Carbon footprint is a measure of: _____
a) Land occupied by forests
b) Energy consumption in a home
c) Greenhouse gas emissions by an activity or person
d) Amount of carbon in plants

8) The main goal of sustainability is to: _____
a) Meet present needs without compromising future needs
b) Increase profit only
c) Eliminate economic development
d) Promote urbanization

9) Which of the following is an example of hazardous waste?
a) Expired medicines b) Plastic bottles
c) Food scraps d) Paper waste

10) Biodiversity hotspots in India include: _____
a) Eastern Ghats and Indo-Gangetic Plain
b) Western Ghats and the Himalayas
c) Thar Desert and Sundarbans only
d) Deccan Plateau and Indo-Gangetic Basin

11) The 3R concept stands for: _____
a) Reuse, Reduce, Rebuild b) Reduce, Reuse, Recycle
c) Replace, Reuse, Restore d) Recycle, Recover, Rebuild

12) The ISO 14000 Series deals with: _____
a) Energy-efficient building design
b) Environmental Management Systems
c) Industrial Safety Standards
d) Economic Performance Indicators

13) Which of the following is a non-conventional source of energy?
a) Coal b) Natural Gas
c) Wind d) Diesel

14) The main goal of a circular economy is to: _____
a) Increase fossil fuel usage
b) Promote single-use products
c) Minimize waste and resource use
d) Maximize profit only

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following **12**

a) Define the term "environment". Discuss the scope and importance of environmental studies. Why is there a need for public awareness?
b) Describe the causes and effects of air and water pollution. Suggest two preventive measures for each.
c) Define sustainability. Discuss any two major challenges in achieving sustainable development.

Q.3 Attempt Any Two **10**

a) What are hazardous wastes and e-wastes? How should they be managed?
b) What are carbon credits and carbon footprints? Explain with examples.
c) List any two Millennium Development Goals (MDGs). Mention one environmental protocol.

Q.4 Write short notes on any two of the following: **06**

a) Genetic diversity
b) India as a mega-diversity nation
c) In-situ and Ex-situ conservation

Section – II

Q.5 Write short notes on any two of the following: **10**

a) ISO 14000 Series
b) Sustainable Habitat - Green Buildings
c) Non-conventional energy sources

Q.6 Attempt the following **10**

a) Define Environmental Management. Discuss its nature, scope, and components.
b) Define the 3R concept and explain how it supports the zero waste approach.

Q.7 Attempt any two **08**

a) Define Environmental Management. Discuss its nature, scope, and components.

b) What is Environmental Policy Analysis? Distinguish between macro-level and micro-level analysis.

c) Outline the steps involved in the Environmental Impact Assessment (EIA) process.

Seat No.		Set	S

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) Biodiversity hotspots in India include: _____
a) Eastern Ghats and Indo-Gangetic Plain
b) Western Ghats and the Himalayas
c) Thar Desert and Sundarbans only
d) Deccan Plateau and Indo-Gangetic Basin

2) The 3R concept stands for: _____
a) Reuse, Reduce, Rebuild b) Reduce, Reuse, Recycle
c) Replace, Reuse, Restore d) Recycle, Recover, Rebuild

3) The ISO 14000 Series deals with: _____
a) Energy-efficient building design
b) Environmental Management Systems
c) Industrial Safety Standards
d) Economic Performance Indicators

4) Which of the following is a non-conventional source of energy?
a) Coal b) Natural Gas
c) Wind d) Diesel

5) The main goal of a circular economy is to: _____
a) Increase fossil fuel usage
b) Promote single-use products
c) Minimize waste and resource use
d) Maximize profit only

6) The first step in preparing an Environmental Impact Assessment (EIA) report is: _____
a) Cost-benefit analysis b) Monitoring
c) Screening d) Public hearing

7) Which of the following is not a principle of Environmental Management?
a) Polluter pays
b) Sustainability
c) Preventive action
d) Maximum profit generation

8) Cost-Benefit Analysis (CBA) in environmental policies is used to: _____
a) Maximize pollution
b) Evaluate environmental legislation
c) Compare environmental costs with economic benefits
d) Promote industrialization

9) An ecosystem consists of: _____
a) Living organisms only
b) Non-living components only
c) Living organisms and their physical environment
d) Plants and animals only

10) The Occupational Health and Safety Management System (OHSMS) primarily aims to: _____
a) Increase industrial profits
b) Reduce energy consumption
c) Ensure worker safety and reduce health risks in workplaces
d) Promote environmental tourism

11) In-situ conservation refers to: _____
a) Conservation of species in zoos
b) Conservation using biotechnology
c) Conservation in gene banks
d) Conservation of species in their natural habitats

12) Carbon footprint is a measure of: _____
a) Land occupied by forests
b) Energy consumption in a home
c) Greenhouse gas emissions by an activity or person
d) Amount of carbon in plants

13) The main goal of sustainability is to: _____
a) Meet present needs without compromising future needs
b) Increase profit only
c) Eliminate economic development
d) Promote urbanization

14) Which of the following is an example of hazardous waste?
a) Expired medicines
b) Plastic bottles
c) Food scraps
d) Paper waste

SLR-BD-272

Seat No.		Set	S

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Environmental Sustainability (OE-02B)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following **12**

a) Define the term "environment". Discuss the scope and importance of environmental studies. Why is there a need for public awareness?
b) Describe the causes and effects of air and water pollution. Suggest two preventive measures for each.
c) Define sustainability. Discuss any two major challenges in achieving sustainable development.

Q.3 Attempt Any Two **10**

a) What are hazardous wastes and e-wastes? How should they be managed?
b) What are carbon credits and carbon footprints? Explain with examples.
c) List any two Millennium Development Goals (MDGs). Mention one environmental protocol.

Q.4 Write short notes on any two of the following: **06**

a) Genetic diversity
b) India as a mega-diversity nation
c) In-situ and Ex-situ conservation

Section – II

Q.5 Write short notes on any two of the following: **10**

a) ISO 14000 Series
b) Sustainable Habitat - Green Buildings
c) Non-conventional energy sources

Q.6 Attempt the following **10**

a) Define Environmental Management. Discuss its nature, scope, and components.
b) Define the 3R concept and explain how it supports the zero waste approach.

Q.7 Attempt any two **08**

a) Define Environmental Management. Discuss its nature, scope, and components.

b) What is Environmental Policy Analysis? Distinguish between macro-level and micro-level analysis.

c) Outline the steps involved in the Environmental Impact Assessment (EIA) process.

SLR-BD-273

Seat No.		Set	P

S. Y. (B. Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which is the primary advantage of using solar energy power generation?
a) Low initial coast
b) Reduce environmental impact
c) Do not require large area
d) Simple storage method

2) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

3) Which of the following common application of solar energy?
a) Generating electricity
b) Heating water
c) Providing power for electronic device
d) All of the above

4) Passive solar energy refers to trapping the Suns energy _____.
a) Using mechanical devices
b) without using mechanical devices
c) Using chemical
d) Incineration

5) The process or digestion taking place in the presence of air is called as _____.
a) Aerobic digestion b) Anaerobic digestion
c) Hydrolysis d) None of these

6) Which type of renewable energy resources generate low power energy?

a) Biomass b) Solar
c) Wind d) All of the above

7) In wind turbine gear box is used to _____.

a) Step up the speed b) Reduce the speed
c) shut down d) None of these

8) Geothermal energy present _____ of the earth.

a) Rotation b) Exterior
c) North side d) Interior

9) Biogas is the gaseous fuel which is obtained from biomass by means of _____ fermentation.

a) Aerobic b) Anaerobic
c) Constant d) None of the above

10) _____ is produced by blending of vegetable oil.

a) CNG b) Methane gas
c) Biofuel d) Biodisel

11) Availability of Solar energy on the earth surface is _____MW.

a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

12) Energy is _____ of substance or a body to do work.

a) Obesity b) Power
c) Capacity d) None of the above

13) Wind energy used from _____ years ago.

a) 3000 b) 2000
c) 6000 d) 5000

14) The major source of the Geothermal energy is _____.

a) Water b) Hot water reservoir
c) Oil d) Gas

Seat No.	

Set P

S.Y. (B. Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Attempt any Four **16**

a) Explain advantages of biomass energy.
b) Explain in detail scope of renewable energy.
c) What is biomass energy and explain resources of biomass energy.
d) Write a note on applications of solar energy.
e) Explain function of biogas digester.
f) Write a note on aerobic and anaerobic digestion.

Q.3 Attempt any two. **12**

a) Explain Solar photovoltaic technology.
b) Explain Basic components of wind energy conversion system.
c) Explain in detail advantages and disadvantages of renewable energy.
d) Explain in detail advantage and disadvantage of Solar energy.

Section – II

Q.4 Attempt any Four. **16**

a) Write a note on wave energy.
b) Merits and demerits of hydropower energy.
c) Explain specifications of energy storage devices.
d) Main parts of hydropower station.
e) Importance of tidal energy.
f) Importance of energy storage devices

Q.5 Attempt any two. **12**

a) Write a note on potential of wave energy in India.
b) Explain different methods of energy storage.
c) Explain with neat diagram hydropower plant.
d) Explain in detail ocean thermal energy conversion (OTEC).

SLR-BD-273

Seat No.	

Set Q

S. Y. (B. Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Geothermal energy present _____ of the earth.
a) Rotation b) Exterior
c) North side d) Interior

2) Biogas is the gaseous fuel which is obtained from biomass by means of _____ fermentation.
a) Aerobic b) Anaerobic
c) Constant d) None of the above

3) _____ is produced by blending of vegetable oil.
a) CNG b) Methane gas
c) Biofuel d) Biodisel

4) Availability of Solar energy on the earth surface is _____MW.
a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

5) Energy is _____ of substance or a body to do work.
a) Obesity b) Power
c) Capacity d) None of the above

6) Wind energy used from _____ years ago.
a) 3000 b) 2000
c) 6000 d) 5000

7) The major source of the Geothermal energy is _____.
a) Water b) Hot water reservoir
c) Oil d) Gas

8) Which is the primary advantage of using solar energy power generation?
a) Low initial coast
b) Reduce environmental impact
c) Do not require large area
d) Simple storage method

9) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

10) Which of the following common application of solar energy?
a) Generating electricity
b) Heating water
c) Providing power for electronic device
d) All of the above

11) Passive solar energy refers to trapping the Suns energy _____.
a) Using mechanical devices
b) without using mechanical devices
c) Using chemical
d) Incineration

12) The process or digestion taking place in the presence of air is called as _____.
a) Aerobic digestion b) Anaerobic digestion
c) Hydrolysis d) None of these

13) Which type of renewable energy resources generate low power energy?
a) Biomass b) Solar
c) Wind d) All of the above

14) In wind turbine gear box is used to _____.
a) Step up the speed b) Reduce the speed
c) shut down d) None of these

SLR-BD-273

Seat No.	

Set Q

S.Y. (B. Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Attempt any Four **16**

a) Explain advantages of biomass energy.
b) Explain in detail scope of renewable energy.
c) What is biomass energy and explain resources of biomass energy.
d) Write a note on applications of solar energy.
e) Explain function of biogas digester.
f) Write a note on aerobic and anaerobic digestion.

Q.3 Attempt any two. **12**

a) Explain Solar photovoltaic technology.
b) Explain Basic components of wind energy conversion system.
c) Explain in detail advantages and disadvantages of renewable energy.
d) Explain in detail advantage and disadvantage of Solar energy.

Section – II

Q.4 Attempt any Four. **16**

a) Write a note on wave energy.
b) Merits and demerits of hydropower energy.
c) Explain specifications of energy storage devices.
d) Main parts of hydropower station.
e) Importance of tidal energy.
f) Importance of energy storage devices

Q.5 Attempt any two. **12**

a) Write a note on potential of wave energy in India.
b) Explain different methods of energy storage.
c) Explain with neat diagram hydropower plant.
d) Explain in detail ocean thermal energy conversion (OTEC).

Seat No.	

Set **R**

S. Y. (B. Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Availability of Solar energy on the earth surface is _____MW.
a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

2) Energy is _____ of substance or a body to do work.
a) Obesity b) Power
c) Capacity d) None of the above

3) Wind energy used from _____ years ago.
a) 3000 b) 2000
c) 6000 d) 5000

4) The major source of the Geothermal energy is _____.
a) Water b) Hot water reservoir
c) Oil d) Gas

5) Which is the primary advantage of using solar energy power generation?
a) Low initial coast
b) Reduce environmental impact
c) Do not require large area
d) Simple storage method

6) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

7) Which of the following common application of solar energy?
a) Generating electricity
b) Heating water
c) Providing power for electronic device
d) All of the above

8) Passive solar energy refers to trapping the Suns energy _____.
a) Using mechanical devices
b) without using mechanical devices
c) Using chemical
d) Incineration

9) The process or digestion taking place in the presence of air is called as _____.
a) Aerobic digestion
b) Anaerobic digestion
c) Hydrolysis
d) None of these

10) Which type of renewable energy resources generate low power energy?
a) Biomass
b) Solar
c) Wind
d) All of the above

11) In wind turbine gear box is used to _____.
a) Step up the speed
b) Reduce the speed
c) shut down
d) None of these

12) Geothermal energy present _____ of the earth.
a) Rotation
b) Exterior
c) North side
d) Interior

13) Biogas is the gaseous fuel which is obtained from biomass by means of _____ fermentation.
a) Aerobic
b) Anaerobic
c) Constant
d) None of the above

14) _____ is produced by blending of vegetable oil.
a) CNG
b) Methane gas
c) Biofuel
d) Biodisel

Seat No.	

Set R

S.Y. (B. Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Attempt any Four **16**

a) Explain advantages of biomass energy.
b) Explain in detail scope of renewable energy.
c) What is biomass energy and explain resources of biomass energy.
d) Write a note on applications of solar energy.
e) Explain function of biogas digester.
f) Write a note on aerobic and anaerobic digestion.

Q.3 Attempt any two. **12**

a) Explain Solar photovoltaic technology.
b) Explain Basic components of wind energy conversion system.
c) Explain in detail advantages and disadvantages of renewable energy.
d) Explain in detail advantage and disadvantage of Solar energy.

Section – II

Q.4 Attempt any Four. **16**

a) Write a note on wave energy.
b) Merits and demerits of hydropower energy.
c) Explain specifications of energy storage devices.
d) Main parts of hydropower station.
e) Importance of tidal energy.
f) Importance of energy storage devices

Q.5 Attempt any two. **12**

a) Write a note on potential of wave energy in India.
b) Explain different methods of energy storage.
c) Explain with neat diagram hydropower plant.
d) Explain in detail ocean thermal energy conversion (OTEC).

Seat No.	

Set **S**

S. Y. (B. Tech.) (Sem-II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which type of renewable energy resources generate low power energy?
a) Biomass b) Solar
c) Wind d) All of the above

2) In wind turbine gear box is used to _____.
a) Step up the speed b) Reduce the speed
c) shut down d) None of these

3) Geothermal energy present _____ of the earth.
a) Rotation b) Exterior
c) North side d) Interior

4) Biogas is the gaseous fuel which is obtained from biomass by means of _____ fermentation.
a) Aerobic b) Anaerobic
c) Constant d) None of the above

5) _____ is produced by blending of vegetable oil.
a) CNG b) Methane gas
c) Biofuel d) Biodisel

6) Availability of Solar energy on the earth surface is _____MW.
a) 190 billion b) 178 billion
c) 150 billion d) 250 billion

7) Energy is _____ of substance or a body to do work.
a) Obesity b) Power
c) Capacity d) None of the above

8) Wind energy used from _____ years ago.
a) 3000 b) 2000
c) 6000 d) 5000

9) The major source of the Geothermal energy is _____.
a) Water b) Hot water reservoir
c) Oil d) Gas

10) Which is the primary advantage of using solar energy power generation?
a) Low initial coast
b) Reduce environmental impact
c) Do not require large area
d) Simple storage method

11) OTEC stands for _____.
a) Ocean thermal energy conversion
b) Ocean thermal energy Component
c) Ocean thermal energy contact
d) Ocean thermodynamic energy conversion

12) Which of the following common application of solar energy?
a) Generating electricity
b) Heating water
c) Providing power for electronic device
d) All of the above

13) Passive solar energy refers to trapping the Suns energy _____.
a) Using mechanical devices
b) without using mechanical devices
c) Using chemical
d) Incineration

14) The process or digestion taking place in the presence of air is called as _____.
a) Aerobic digestion b) Anaerobic digestion
c) Hydrolysis d) None of these

SLR-BD-273

Seat No.		Set	S

S.Y. (B. Tech.) (Sem-II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Renewable Energy (OE-02C)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Attempt any Four **16**

a) Explain advantages of biomass energy.
b) Explain in detail scope of renewable energy.
c) What is biomass energy and explain resources of biomass energy.
d) Write a note on applications of solar energy.
e) Explain function of biogas digester.
f) Write a note on aerobic and anaerobic digestion.

Q.3 Attempt any two. **12**

a) Explain Solar photovoltaic technology.
b) Explain Basic components of wind energy conversion system.
c) Explain in detail advantages and disadvantages of renewable energy.
d) Explain in detail advantage and disadvantage of Solar energy.

Section – II

Q.4 Attempt any Four. **16**

a) Write a note on wave energy.
b) Merits and demerits of hydropower energy.
c) Explain specifications of energy storage devices.
d) Main parts of hydropower station.
e) Importance of tidal energy.
f) Importance of energy storage devices

Q.5 Attempt any two. **12**

a) Write a note on potential of wave energy in India.
b) Explain different methods of energy storage.
c) Explain with neat diagram hydropower plant.
d) Explain in detail ocean thermal energy conversion (OTEC).

SLR-BD-274

Seat No.	

Set P

S. Y. (B. Tech.)(Sem-II)(New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Draw neat diagrams whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) An instrument transformer is used to extend the range of _____.
a) induction instrument b) electrostatic instrument
c) moving coil instrument d) any of the above

2) The internal resistance of an ammeter should be _____.
a) Very small b) Medium
c) High d) Infinity

3) The smallest change which a sensor can detect is termed: _____
a) Accuracy b) Precision
c) Resolution d) Scale

4) Sensor effectiveness depends on _____ parameter.
a) Sensitivity b) Radiation
c) Restively d) All the above

5) The desirable static characteristics of a measuring system are _____
a) accuracy and drift
b) accuracy, sensitivity and reproducibility
c) drift and dead zone
d) static error

6) A _____ device prevents the oscillation of the moving system and enables the latter to reach its final position quickly.
a) Deflecting b) Controlling
c) Damping d) any of the above

7) _____ is an instrument which measures the insulation resistance of an electric circuit relative to earth and one another.
a) Tangent galvanometer
b) Megger
c) Current transformer
d) None of the above

8) Which of the following is a key characteristic of a sensor?
a) It can only measure temperature
b) It is an active component
c) It converts physical parameters into an electrical signal
d) Il requires no external power

9) Which of the following is a type of magnetic sensor?
a) Thermistor
b) Strain gauge
c) Hall effect sensor
d) LVDT

10) Typical conversion speed of ADC is _____
a) Less than 1 μs
b) Less than 100 μs
c) Less than 500 μs
d) Greater than 1000 μs

11) What is signal conditioning?
a) To analyze any signal
b) Conversion or modification is referred to as conditioning
c) Conversion from analog to digital is signal conditioning
d) Conversion from digital to analog is signal conditioning

12) Touch screen devices use which sensor?
a) Touch sensor
b) Temperature sensor
c) Humidity sensor
d) Pressure sensor

13) ENOB in ADC stand for _____
a) Effective number of bytes
b) Effective number of bits
c) Effective nibble baud
d) None of the mentioned

14) A simple bridge circuit consists of a network of _____
a) 3 resistance arms
b) 2 resistance arms
c) 4 resistance arms
d) 6 resistance arms

Seat No.	

Set **P**

S. Y. (B. Tech.)(Sem-II)(New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt any four of the following: **16**

a) Define standard & explain types of standards.
b) Define the following characteristics
1) Linearity 2) Accuracy 3) Repeatability 4) Sensitivity
c) Derive the expression for unknown capacitance with phasor diagram by using Schering Bridge.
d) Write difference between Current Transformer and Potential Transformer.
e) Explain working of digital storage oscilloscope with suitable block diagram.

Q.3 Attempt any two of the following: **12**

a) Illustrate and derive the torque equation for a Moving iron instrument with neat diagram.
b) Draw the equivalent circuit and phasor diagram of a CT. Derive the expressions for ratio and phase angle errors.
c) Explain digital ramp type and dual slope integrating type digital voltmeter.

Section – II

Q.4 Attempt any four of the following: **16**

a) Explain the principle of working of Hall effect sensor.
b) Explain different types of temperature sensor with details.
c) Discuss Classification of sensor and explain active and passive sensor.
d) State and explain the methods of data transmission.
e) State and Explain the Modes of Heat transfer.

Q.5 Attempt any two of the following: **12**

a) Stale the sensors used for Velocity and Acceleration application and explain any one of them.
b) Slate and explain the sensors used for occupancy and motion detector application.
c) Define the temperature and explain the thermal properties of material.

SLR-BD-274

Seat No.	

Set Q

S. Y. (B. Tech.)(Sem-II)(New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Draw neat diagrams whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) Which of the following is a key characteristic of a sensor?
a) It can only measure temperature
b) It is an active component
c) It converts physical parameters into an electrical signal
d) Il requires no external power

2) Which of the following is a type of magnetic sensor?
a) Thermistor b) Strain gauge
c) Hall effect sensor d) LVDT

3) Typical conversion speed of ADC is _____
a) Less than 1 μs b) Less than 100 μs
c) Less than 500 μs d) Greater than 1000 μs

4) What is signal conditioning?
a) To analyze any signal
b) Conversion or modification is referred to as conditioning
c) Conversion from analog to digital is signal conditioning
d) Conversion from digital to analog is signal conditioning

5) Touch screen devices use which sensor?
a) Touch sensor b) Temperature sensor
c) Humidity sensor d) Pressure sensor

6) ENOB in ADC stand for _____
a) Effective number of bytes b) Effective number of bits
c) Effective nibble baud d) None of the mentioned

7) A simple bridge circuit consists of a network of _____
a) 3 resistance arms b) 2 resistance arms
c) 4 resistance arms d) 6 resistance arms

8) An instrument transformer is used to extend the range of _____.
a) induction instrument b) electrostatic instrument
c) moving coil instrument d) any of the above

9) The internal resistance of an ammeter should be _____.
a) Very small b) Medium
c) High d) Infinity

10) The smallest change which a sensor can detect is termed: _____
a) Accuracy b) Precision
c) Resolution d) Scale

11) Sensor effectiveness depends on _____ parameter.
a) Sensitivity b) Radiation
c) Restively d) All the above

12) The desirable static characteristics of a measuring system are _____
a) accuracy and drift
b) accuracy, sensitivity and reproducibility
c) drift and dead zone
d) static error

13) A _____ device prevents the oscillation of the moving system and enables the latter to reach its final position quickly.
a) Deflecting b) Controlling
c) Damping d) any of the above

14) _____ is an instrument which measures the insulation resistance of an electric circuit relative to earth and one another.
a) Tangent galvanometer
b) Megger
c) Current transformer
d) None of the above

Seat No.	

Set **Q**

S. Y. (B. Tech.)(Sem-II)(New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt any four of the following: **16**

a) Define standard & explain types of standards.
b) Define the following characteristics
1) Linearity 2) Accuracy 3) Repeatability 4) Sensitivity
c) Derive the expression for unknown capacitance with phasor diagram by using Schering Bridge.
d) Write difference between Current Transformer and Potential Transformer.
e) Explain working of digital storage oscilloscope with suitable block diagram.

Q.3 Attempt any two of the following: **12**

a) Illustrate and derive the torque equation for a Moving iron instrument with neat diagram.
b) Draw the equivalent circuit and phasor diagram of a CT. Derive the expressions for ratio and phase angle errors.
c) Explain digital ramp type and dual slope integrating type digital voltmeter.

Section – II

Q.4 Attempt any four of the following: **16**

a) Explain the principle of working of Hall effect sensor.
b) Explain different types of temperature sensor with details.
c) Discuss Classification of sensor and explain active and passive sensor.
d) State and explain the methods of data transmission.
e) State and Explain the Modes of Heat transfer.

Q.5 Attempt any two of the following: **12**

a) Stale the sensors used for Velocity and Acceleration application and explain any one of them.
b) Slate and explain the sensors used for occupancy and motion detector application.
c) Define the temperature and explain the thermal properties of material.

Seat No.	

Set R

S. Y. (B. Tech.)(Sem-II)(New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Draw neat diagrams whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) What is signal conditioning?
a) To analyze any signal
b) Conversion or modification is referred to as conditioning
c) Conversion from analog to digital is signal conditioning
d) Conversion from digital to analog is signal conditioning

2) Touch screen devices use which sensor?
a) Touch sensor b) Temperature sensor
c) Humidity sensor d) Pressure sensor

3) ENOB in ADC stand for _____
a) Effective number of bytes b) Effective number of bits
c) Effective nibble baud d) None of the mentioned

4) A simple bridge circuit consists of a network of _____
a) 3 resistance arms b) 2 resistance arms
c) 4 resistance arms d) 6 resistance arms

5) An instrument transformer is used to extend the range of _____.
a) induction instrument b) electrostatic instrument
c) moving coil instrument d) any of the above

6) The internal resistance of an ammeter should be _____.
a) Very small b) Medium
c) High d) Infinity

7) The smallest change which a sensor can detect is termed: _____
a) Accuracy b) Precision
c) Resolution d) Scale

8) Sensor effectiveness depends on _____ parameter.
a) Sensitivity b) Radiation
c) Restively d) All the above

9) The desirable static characteristics of a measuring system are _____
a) accuracy and drift
b) accuracy, sensitivity and reproducibility
c) drift and dead zone
d) static error

10) A _____ device prevents the oscillation of the moving system and enables the latter to reach its final position quickly.
a) Deflecting b) Controlling
c) Damping d) any of the above

11) _____ is an instrument which measures the insulation resistance of an electric circuit relative to earth and one another.
a) Tangent galvanometer
b) Megger
c) Current transformer
d) None of the above

12) Which of the following is a key characteristic of a sensor?
a) It can only measure temperature
b) It is an active component
c) It converts physical parameters into an electrical signal
d) Il requires no external power

13) Which of the following is a type of magnetic sensor?
a) Thermistor b) Strain gauge
c) Hall effect sensor d) LVDT

14) Typical conversion speed of ADC is _____
a) Less than 1 μs b) Less than 100 μs
c) Less than 500 μs d) Greater than 1000 μs

Seat No.	

Set **R**

S. Y. (B. Tech.)(Sem-II)(New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt any four of the following: **16**

a) Define standard & explain types of standards.
b) Define the following characteristics
1) Linearity 2) Accuracy 3) Repeatability 4) Sensitivity
c) Derive the expression for unknown capacitance with phasor diagram by using Schering Bridge.
d) Write difference between Current Transformer and Potential Transformer.
e) Explain working of digital storage oscilloscope with suitable block diagram.

Q.3 Attempt any two of the following: **12**

a) Illustrate and derive the torque equation for a Moving iron instrument with neat diagram.
b) Draw the equivalent circuit and phasor diagram of a CT. Derive the expressions for ratio and phase angle errors.
c) Explain digital ramp type and dual slope integrating type digital voltmeter.

Section – II

Q.4 Attempt any four of the following: **16**

a) Explain the principle of working of Hall effect sensor.
b) Explain different types of temperature sensor with details.
c) Discuss Classification of sensor and explain active and passive sensor.
d) State and explain the methods of data transmission.
e) State and Explain the Modes of Heat transfer.

Q.5 Attempt any two of the following: **12**

a) Stale the sensors used for Velocity and Acceleration application and explain any one of them.
b) Slate and explain the sensors used for occupancy and motion detector application.
c) Define the temperature and explain the thermal properties of material.

Seat No.	

Set S

S. Y. (B. Tech.)(Sem-II)(New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page
3) Figures to the right indicates full marks.
4) Assume suitable data if necessary.
5) Draw neat diagrams whenever necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) A _____ device prevents the oscillation of the moving system and enables the latter to reach its final position quickly.
a) Deflecting b) Controlling
c) Damping d) any of the above

2) _____ is an instrument which measures the insulation resistance of an electric circuit relative to earth and one another.
a) Tangent galvanometer
b) Megger
c) Current transformer
d) None of the above

3) Which of the following is a key characteristic of a sensor?
a) It can only measure temperature
b) It is an active component
c) It converts physical parameters into an electrical signal
d) Il requires no external power

4) Which of the following is a type of magnetic sensor?
a) Thermistor b) Strain gauge
c) Hall effect sensor d) LVDT

5) Typical conversion speed of ADC is _____
a) Less than 1 μs b) Less than 100 μs
c) Less than 500 μs d) Greater than 1000 μs

6) What is signal conditioning?
a) To analyze any signal
b) Conversion or modification is referred to as conditioning
c) Conversion from analog to digital is signal conditioning
d) Conversion from digital to analog is signal conditioning

7) Touch screen devices use which sensor?
a) Touch sensor b) Temperature sensor
c) Humidity sensor d) Pressure sensor

8) ENOB in ADC stand for _____
a) Effective number of bytes b) Effective number of bits
c) Effective nibble baud d) None of the mentioned

9) A simple bridge circuit consists of a network of _____
a) 3 resistance arms b) 2 resistance arms
c) 4 resistance arms d) 6 resistance arms

10) An instrument transformer is used to extend the range of _____.
a) induction instrument b) electrostatic instrument
c) moving coil instrument d) any of the above

11) The internal resistance of an ammeter should be _____.
a) Very small b) Medium
c) High d) Infinity

12) The smallest change which a sensor can detect is termed: _____
a) Accuracy b) Precision
c) Resolution d) Scale

13) Sensor effectiveness depends on _____ parameter.
a) Sensitivity b) Radiation
c) Restively d) All the above

14) The desirable static characteristics of a measuring system are _____
a) accuracy and drift
b) accuracy, sensitivity and reproducibility
c) drift and dead zone
d) static error

SLR-BD-274

Seat No.		Set	S

S. Y. (B. Tech.)(Sem-II)(New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Measurement, Instrumentation and Sensors (OE-02D)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt any four of the following: 16

a) Define standard & explain types of standards.
b) Define the following characteristics
1) Linearity 2) Accuracy 3) Repeatability 4) Sensitivity
c) Derive the expression for unknown capacitance with phasor diagram by using Schering Bridge.
d) Write difference between Current Transformer and Potential Transformer.
e) Explain working of digital storage oscilloscope with suitable block diagram.

Q.3 Attempt any two of the following: 12

a) Illustrate and derive the torque equation for a Moving iron instrument with neat diagram.
b) Draw the equivalent circuit and phasor diagram of a CT. Derive the expressions for ratio and phase angle errors.
c) Explain digital ramp type and dual slope integrating type digital voltmeter.

Section – II

Q.4 Attempt any four of the following: 16

a) Explain the principle of working of Hall effect sensor.
b) Explain different types of temperature sensor with details.
c) Discuss Classification of sensor and explain active and passive sensor.
d) State and explain the methods of data transmission.
e) State and Explain the Modes of Heat transfer.

Q.5 Attempt any two of the following: 12

a) Stale the sensors used for Velocity and Acceleration application and explain any one of them.
b) Slate and explain the sensors used for occupancy and motion detector application.
c) Define the temperature and explain the thermal properties of material.

SLR-BD-275

Seat No.		Set	P

S. Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Linear programming deals with the optimization of a function of variables is, known as _____
a) Subjective function b) Objective function
c) Combined Equation d) None of these

2) What is the condition of Balance Assignment Problem?
a) Σ Demand$=\Sigma$ Supply
b) No. of rows $>$ No. of column
c) No. of rows $<$ No. of column
d) No. of rows $=$ No. of columns

3) EOQ means: _____
a) Economic Offering Quantity b) Empty Order Quantity
c) Economic Order Quantity d) Economic Order Quality

4) In ABC analysis, high monitoring and control are required for: _____
a) A class items b) B class items
c) C class items d) All of these

5) Graphical method, simplex method, and transportation method are concerned with _____.
a) Break-even analysis b) Value analysis
c) Linear programming d) Queueing theory

6) The cost of keeping items in inventory is called _____
a) Set up cost b) Holding cost
c) Shortage cost d) None of these

7) Dual of the Dual is _____
a) Dual b) Primal
c) Zero d) Infinity

8) At the Break-Even Point _____
a) Profit > Loss
b) Profit < Loss
c) Profit = Loss
d) None of these

9) The PERT in project management means Program Evaluation and _____ Technique.
a) Resource
b) Reconciliation
c) Reconsideration
d) Review

10) _____ Stock is the lower limit of stock below which the stock should not be allowed to fall.
a) Maximum
b) Average
c) Safety
d) Standard

11) Optimization Means _____.
a) Maximization
b) Minimization
c) Minimization or Maximization
d) Mean of Minimization & Maximization

12) A feasible solution to LPP _____.
a) Must satisfy all the constraints simultaneously
b) Need not satisfy all the constraints
c) Must be a corner point of feasible region
d) Must optimize the objective function

13) In a project network, the critical path _____.
a) May be the shortest path
b) Is the longest path
c) May be the longest path
d) Is the shortest path

14) The inventory carrying costs are also called as _____.
a) Procurement costs
b) Set-up costs
c) Storage costs
d) None of the above

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt Any Three. **24**

a) Using Graphical method, Solve

Maximize $Z = 10X_1 + 8X_2$
Subject to, $2X_1 + X_2 \leq 40;$
$2X_1 + 3X_2 \leq 80;$
$0 \leq X_1; 0 \leq X_2$

b) Solve the following assignment model for minimum processing time.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Find the initial basic feasible solution by Least Cost Method.

	W1	W2	W3	W4	Supply
F1	48	60	56	58	140
F2	45	55	53	60	260
F3	50	65	60	62	360
F4	52	64	55	61	220
Demand	200	320	250	210	

d) What are the different Limitations & Applications of 'Operation Research'?

e) How do you solve unbalanced transportation problem? What are different methods to solve Transportation Model? Explain in details.

Q.3 Answer any one. **04**

a) What is LPP? What are different components of LPP?

b) How assignment model is useful in practical life?

Section – II

Q.4 Attempt Any Three. **24**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/- Find economic order quantity and number of orders to be placed per month?

b) Write a note various types inventory cost.

c) Draw network, find out CP & PD. Calculate All floats of each non-critical Activity.

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Immediate Predecessor	-	-	-	B	A	A	B	C,D	C,D	E	F,G,H	F,G,H	I	J,K
Time in Months	2	6	4	3	6	8	3	7	2	5	4	3	13	7

d) A small project consists of seven activities. The time estimates in weeks of different activities are given below. Find out probability of completing the project in 18 weeks.

Activity	Estimated Time		
	to	tm	tp
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

Probability Factor	Probability
0	50%
1	84.13%
2	97.72%
3	99.87%

e) Explain Sequencing Problem Technique. What are its Different Elements, also elaborate its assumptions.

Q.3 Attempt Any One. **04**

a) What is EOQ? What is its important?

b) Distinguish between CPM & PERT (At least 4 points)

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) At the Break-Even Point _____
a) Profit > Loss b) Profit < Loss
c) Profit = Loss d) None of these

2) The PERT in project management means Program Evaluation and _____ Technique.
a) Resource b) Reconciliation
c) Reconsideration d) Review

3) _____ Stock is the lower limit of stock below which the stock should not be allowed to fall.
a) Maximum b) Average
c) Safety d) Standard

4) Optimization Means _____.
a) Maximization
b) Minimization
c) Minimization or Maximization
d) Mean of Minimization & Maximization

5) A feasible solution to LPP _____.
a) Must satisfy all the constraints simultaneously
b) Need not satisfy all the constraints
c) Must be a corner point of feasible region
d) Must optimize the objective function

6) In a project network, the critical path _____.
a) May be the shortest path b) Is the longest path
c) May be the longest path d) Is the shortest path

7) The inventory carrying costs are also called as _____.
a) Procurement costs b) Set-up costs
c) Storage costs d) None of the above

8) Linear programming deals with the optimization of a function of variables is, known as _____
a) Subjective function b) Objective function
c) Combined Equation d) None of these

9) What is the condition of Balance Assignment Problem?
a) Σ Demand= Σ Supply
b) No. of rows > No. of column
c) No. of rows < No. of column
d) No. of rows = No. of columns

10) EOQ means: _____
a) Economic Offering Quantity b) Empty Order Quantity
c) Economic Order Quantity d) Economic Order Quality

11) In ABC analysis, high monitoring and control are required for: _____
a) A class items b) B class items
c) C class items d) All of these

12) Graphical method, simplex method, and transportation method are concerned with _____.
a) Break-even analysis b) Value analysis
c) Linear programming d) Queueing theory

13) The cost of keeping items in inventory is called _____
a) Set up cost b) Holding cost
c) Shortage cost d) None of these

14) Dual of the Dual is _____
a) Dual b) Primal
c) Zero d) Infinity

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt Any Three. **24**

a) Using Graphical method, Solve

Maximize $Z = 10X_1 + 8X_2$
Subject to, $2X_1 + X_2 \leq 40;$
$2X_1 + 3X_2 \leq 80;$
$0 \leq X_1; 0 \leq X_2$

b) Solve the following assignment model for minimum processing time.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Find the initial basic feasible solution by Least Cost Method.

	W1	W2	W3	W4	Supply
F1	48	60	56	58	140
F2	45	55	53	60	260
F3	50	65	60	62	360
F4	52	64	55	61	220
Demand	200	320	250	210	

d) What are the different Limitations & Applications of 'Operation Research'?

e) How do you solve unbalanced transportation problem? What are different methods to solve Transportation Model? Explain in details.

Q.3 Answer any one. **04**

a) What is LPP? What are different components of LPP?

b) How assignment model is useful in practical life?

Section – II

Q.4 Attempt Any Three. **24**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/- Find economic order quantity and number of orders to be placed per month?

b) Write a note various types inventory cost.

c) Draw network, find out CP & PD. Calculate All floats of each non-critical Activity.

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Immediate Predecessor	-	-	-	B	A	A	B	C,D	C,D	E	F,G,H	F,G,H	I	J,K
Time in Months	2	6	4	3	6	8	3	7	2	5	4	3	13	7

d) A small project consists of seven activities. The time estimates in weeks of different activities are given below. Find out probability of completing the project in 18 weeks.

Activity	Estimated Time		
	to	tm	tp
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

Probability Factor	Probability
0	50%
1	84.13%
2	97.72%
3	99.87%

e) Explain Sequencing Problem Technique. What are its Different Elements, also elaborate its assumptions.

Q.3 Attempt Any One. **04**

a) What is EOQ? What is its important?

b) Distinguish between CPM & PERT (At least 4 points)

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) Optimization Means _____.
a) Maximization
b) Minimization
c) Minimization or Maximization
d) Mean of Minimization & Maximization

2) A feasible solution to LPP _____.
a) Must satisfy all the constraints simultaneously
b) Need not satisfy all the constraints
c) Must be a corner point of feasible region
d) Must optimize the objective function

3) In a project network, the critical path _____.
a) May be the shortest path b) Is the longest path
c) May be the longest path d) Is the shortest path

4) The inventory carrying costs are also called as _____.
a) Procurement costs b) Set-up costs
c) Storage costs d) None of the above

5) Linear programming deals with the optimization of a function of variables is, known as _____
a) Subjective function b) Objective function
c) Combined Equation d) None of these

6) What is the condition of Balance Assignment Problem?
a) Σ Demand$=\Sigma$ Supply
b) No. of rows $>$ No. of column
c) No. of rows $<$ No. of column
d) No. of rows $=$ No. of columns

7) EOQ means: _____

a) Economic Offering Quantity b) Empty Order Quantity
c) Economic Order Quantity d) Economic Order Quality

8) In ABC analysis, high monitoring and control are required for: _____

a) A class items b) B class items
c) C class items d) All of these

9) Graphical method, simplex method, and transportation method are concerned with _____.

a) Break-even analysis b) Value analysis
c) Linear programming d) Queueing theory

10) The cost of keeping items in inventory is called _____

a) Set up cost b) Holding cost
c) Shortage cost d) None of these

11) Dual of the Dual is _____

a) Dual b) Primal
c) Zero d) Infinity

12) At the Break-Even Point _____

a) Profit > Loss b) Profit < Loss
c) Profit = Loss d) None of these

13) The PERT in project management means Program Evaluation and _____ Technique.

a) Resource b) Reconciliation
c) Reconsideration d) Review

14) _____ Stock is the lower limit of stock below which the stock should not be allowed to fall.

a) Maximum b) Average
c) Safety d) Standard

Seat No.	

Set R

S. Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt Any Three. **24**

a) Using Graphical method, Solve

Maximize $Z = 10X_1 + 8X_2$
Subject to, $2X_1 + X_2 \leq 40;$
$2X_1 + 3X_2 \leq 80;$
$0 \leq X_1; 0 \leq X_2$

b) Solve the following assignment model for minimum processing time.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Find the initial basic feasible solution by Least Cost Method.

	W1	W2	W3	W4	Supply
F1	48	60	56	58	140
F2	45	55	53	60	260
F3	50	65	60	62	360
F4	52	64	55	61	220
Demand	200	320	250	210	

d) What are the different Limitations & Applications of 'Operation Research'?
e) How do you solve unbalanced transportation problem? What are different methods to solve Transportation Model? Explain in details.

Q.3 Answer any one. **04**

a) What is LPP? What are different components of LPP?
b) How assignment model is useful in practical life?

Section – II

Q.4 Attempt Any Three. **24**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/- Find economic order quantity and number of orders to be placed per month?

b) Write a note various types inventory cost.

c) Draw network, find out CP & PD. Calculate All floats of each non-critical Activity.

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Immediate Predecessor	-	-	-	B	A	A	B	C,D	C,D	E	F,G,H	F,G,H	I	J,K
Time in Months	2	6	4	3	6	8	3	7	2	5	4	3	13	7

d) A small project consists of seven activities. The time estimates in weeks of different activities are given below. Find out probability of completing the project in 18 weeks.

Activity	Estimated Time		
	to	tm	tp
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

Probability Factor	Probability
0	50%
1	84.13%
2	97.72%
3	99.87%

e) Explain Sequencing Problem Technique. What are its Different Elements, also elaborate its assumptions.

Q.3 Attempt Any One. **04**

a) What is EOQ? What is its important?

b) Distinguish between CPM & PERT (At least 4 points)

Seat No.	

Set **S**

S. Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) The cost of keeping items in inventory is called _____
a) Set up cost b) Holding cost
c) Shortage cost d) None of these

2) Dual of the Dual is _____
a) Dual b) Primal
c) Zero d) Infinity

3) At the Break-Even Point _____
a) Profit > Loss b) Profit < Loss
c) Profit = Loss d) None of these

4) The PERT in project management means Program Evaluation and _____ Technique.
a) Resource b) Reconciliation
c) Reconsideration d) Review

5) _____ Stock is the lower limit of stock below which the stock should not be allowed to fall.
a) Maximum b) Average
c) Safety d) Standard

6) Optimization Means _____.
a) Maximization
b) Minimization
c) Minimization or Maximization
d) Mean of Minimization & Maximization

7) A feasible solution to LPP _____.
a) Must satisfy all the constraints simultaneously
b) Need not satisfy all the constraints
c) Must be a corner point of feasible region
d) Must optimize the objective function

8) In a project network, the critical path _____.
a) May be the shortest path b) Is the longest path
c) May be the longest path d) Is the shortest path

9) The inventory carrying costs are also called as _____.
a) Procurement costs b) Set-up costs
c) Storage costs d) None of the above

10) Linear programming deals with the optimization of a function of variables is, known as _____
a) Subjective function b) Objective function
c) Combined Equation d) None of these

11) What is the condition of Balance Assignment Problem?
a) Σ Demand$=\Sigma$ Supply
b) No. of rows $>$ No. of column
c) No. of rows $<$ No. of column
d) No. of rows $=$ No. of columns

12) EOQ means: _____
a) Economic Offering Quantity b) Empty Order Quantity
c) Economic Order Quantity d) Economic Order Quality

13) In ABC analysis, high monitoring and control are required for: _____
a) A class items b) B class items
c) C class items d) All of these

14) Graphical method, simplex method, and transportation method are concerned with _____.
a) Break-even analysis b) Value analysis
c) Linear programming d) Queueing theory

Seat No.	

Set S

S. Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Operation Research (OE-02E)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary and mention it clearly.
4) Use of non-programmable calculator is allowed.

Section – I

Q.2 Attempt Any Three. **24**

a) Using Graphical method, Solve

Maximize $Z = 10X_1 + 8X_2$
Subject to, $2X_1 + X_2 \leq 40;$
$2X_1 + 3X_2 \leq 80;$
$0 \leq X_1; 0 \leq X_2$

b) Solve the following assignment model for minimum processing time.

		Machines			
		M1	M2	M3	M4
Jobs	J1	51	77	49	55
	J2	32	34	59	68
	J3	37	44	70	54
	J4	55	55	58	55

c) Find the initial basic feasible solution by Least Cost Method.

	W1	W2	W3	W4	Supply
F1	48	60	56	58	140
F2	45	55	53	60	260
F3	50	65	60	62	360
F4	52	64	55	61	220
Demand	200	320	250	210	

d) What are the different Limitations & Applications of 'Operation Research'?

e) How do you solve unbalanced transportation problem? What are different methods to solve Transportation Model? Explain in details.

Q.3 Answer any one. **04**

a) What is LPP? What are different components of LPP?

b) How assignment model is useful in practical life?

Section – II

Q.4 Attempt Any Three. **24**

a) A construction company consumes 4000 bags of cement per month. Price per bag of cement is Rs. 320/-. Inventory carrying cost per bag per year is Rs. 30/- and procurement cost per order is Rs. 500/- Find economic order quantity and number of orders to be placed per month?

b) Write a note various types inventory cost.

c) Draw network, find out CP & PD. Calculate All floats of each non-critical Activity.

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Immediate Predecessor	-	-	-	B	A	A	B	C,D	C,D	E	F,G,H	F,G,H	I	J,K
Time in Months	2	6	4	3	6	8	3	7	2	5	4	3	13	7

d) A small project consists of seven activities. The time estimates in weeks of different activities are given below. Find out probability of completing the project in 18 weeks.

Activity	Estimated Time		
	to	tm	tp
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

Probability Factor	Probability
0	50%
1	84.13%
2	97.72%
3	99.87%

e) Explain Sequencing Problem Technique. What are its Different Elements, also elaborate its assumptions.

Q.3 Attempt Any One. **04**

a) What is EOQ? What is its important?

b) Distinguish between CPM & PERT (At least 4 points)

SLR-BD-276

Seat No.	

Set P

S.Y. (B.Tech.)(Sem-II)(New)(NEP CBCS) Examination: March/April - 2025
ELECTRICAL ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) A transcendental equation is an equation that involves _____.
a) Only algebraic terms
b) Only transcendental functions
c) Both algebraic and transcendental functions
d) Linear terms only

2) The interval in which a real root of the equation $x^3 - 2x - 5 = 0$ lies is _____.
a) $(1,2)$ b) $(0,1)$
c) $(2,3)$ d) $(3,4)$

3) The Gauss-Seidel method is used for solving _____.
a) Nonlinear equations
b) Systems of linear equations
c) Ordinary differential equations
d) Partial differential equations

4) Which of the following is a disadvantage of the Gauss-Jacobi method?
a) It converges faster than most direct methods
b) It requires a large number of iterations for a good approximation
c) It cannot be used for systems with more than two equations
d) It works only for symmetric systems

5) The use of Romberg's method is _____.
a) To solve simultaneous linear equation
b) To find root of linear equation
c) To evaluate definite integration
d) To find the Eigen values

6) The order of convergence of Newton-Raphson method is _____.

a) 1 b) 2

c) $\sqrt{2}$ d) 1.6

7) Power Method is used to find _____.

a) Negative Eigen Value b) Largest Eigen value

c) Positive Eigen Value d) None of these

8) To find the Numerically largest Eigen value using iterative Method we use the equation _____.

a) $A = \lambda X$ b) $AX = X$

c) $X = \lambda X$ d) $AX = \lambda X$

9) If $\frac{dy}{dx} = x - y$ and $y(0) = 1$ then by Picard's method the value of $y_1(1)$ is _____.

a) 0.905 b) 1.905

c) 2.905 d) none

10) Runge-Kutta method is self-starting method _____.

a) true d) false

c) we can't say d) none

11) If the data is equally spaced and interpolation is near the beginning of the data then _____ Interpolation formula is used.

a) Newton's backward difference

b) Newton's divided difference

c) Newton's forward difference

d) Lagrange's

12) The process of finding the value inside the interval (x_0, x_n) is called ___.

a) Interpolation b) Extrapolation

c) Iterative d) polynomial equation

13) Using Newton-Raphson method the first approximation to the root of the equation $x^4 - x - 10 = 0$ near to $x_0 = 2$ is _____.

a) 1.671 b) 2.271

c) 2.071 d) 1.871

14) To apply Simpson's one-third rule the number of sub-intervals must be _____.

a) Even b) Odd

c) Multiple of 3 d) Multiple of 6

Seat No.	

Set **P**

S.Y. (B.Tech.)(Sem-II)(New)(NEP CBCS) Examination: March/April - 2025
ELECTRICAL ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any three. **09**

a) Find the double root of the equation $x^3 - 5.4x^2 + 9.24x - 5.096 = 0$ given that it is nearer to 1.5.

b) Solve the system of equations by Jacobi's iterative method (perform 3 iterations) $27x + 6y - z = 85,\ 6x + 15y + 2z = 72,\ x + y + 54z = 110$

c) Find positive real root of the equation $x \sin x + \cos x = 0$ using Newton Raphson method correct to 3 decimal places.

d) Solve the system of equation by using Gauss-Elimination method. $x + 4y - z = -5, x + y - 6z = -12, -3x - y - z = 4$

e) Solve $\frac{dy}{dx} = -xy$ with $x_0 = 0\ ,\ y_0 = 1$ using Picard's method upto 3rd approximation.

Q.3 Answer any three. **09**

a) Solve $\frac{dy}{dx} = x + y$ with $x_0 = 0\ , y_0 = 1$ using Range kutta forth order method and find approximate value of y when $x = 0.2$

b) Solve $\frac{dy}{dx} = 1 + xy$ with $y(0) = 1$ using Picard's method take first approximation and find y for $x = 0.1$

c) Solve by Gauss Seidel Method, the equations $20x + y - 2z = 17, 3x + 20y - z = -18, 2x - 3y + 20z = 25$ Perform 3 iteration.

d) Find the value of $\sqrt{5}$ using newton's iterative formula. Perform 3 iteration.

e) Find the positive root of $f(x) = 2x^3 - 3x - 6$ by Newton's Raphson method perform 3 iteration.

Q.4 Answer any two. **10**

a) Perform 2-iteration by Newton's Raphson Method to Solve the non-linear equation $x = x^2 + y^2,\ y = x^2 - y^2$ Take initial approximation $x_0 = 0.8, y_0 = 0.4$

b) Solve the system of equation by LU decomposition Method $3x + 2y + 7z = 4,\quad 2x + 3y + z = 5,\quad 3x + 4y + z = 7$

c) Solve differential equation $\frac{dy}{dx} = 1 + xz,\ \frac{dz}{dx} = -xy$ for $x = 0.3$ using 4th order Runge-Kutta Method Initial Values are $x = 0,\ y = 0,\ z = 1$

Section – II

Q.5 Answer any Three. **09**

a) Evaluate the integral $\int_0^1 \frac{x^2}{1+x^3}\,dx$ using Simpson's $\frac{1}{3}$rd rule, Take $h = 0.25$

b) Determine the largest Eigen value and corresponding Eigen vector of the matrix $\begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$ by using power method perform three iteration.

c) Use Trapezoidal Rule to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as 0.5

d) Using Newton's divided difference formula, find the value of $f(2)$. Given the following table.

x	4	5	7	10	11	13
$f(x)$	48	100	294	900	1210	2028

e) Construct Newton's Forward interpolation polynomial for the following data:

x	4	6	8	10
y	1	3	8	16

Hence find the value of y for $x = 5$

Q.6 Answer any Three. **09**

a) Solve the integral $\int_0^{1/2} \frac{1}{\sqrt{1-x^2}}\,dx$ using Weddle's rule Taking $n = 6$

b) Solve $\int_3^5 \frac{4}{(2x^2)}\,dx$ Using Gauss Formula for $n = 2$ and $n = 3$.

c) Find all Eigen values and Eigen vectors of the following matrix by using Gauss Jacobi's Method. $\begin{bmatrix} 2 & 3 \\ 3 & 2 \end{bmatrix}$

d) Solve $\int_0^6 \frac{dx}{1+x^2}$ by using Simpsons 3/8th rule take $h = 1$

e) Using Newton's Backward formula, find the value of $f(2)$ if

x	1	1.4	1.8	2.2
$f(x)$	3.49	4.82	5.96	6.5

Q.7 Answer any two. **10**

a) Find the largest eigen value and the corresponding eigen vector of the matrix:

$\begin{bmatrix} 25 & 1 & 2 \\ 1 & 3 & 0 \\ 2 & 0 & -4 \end{bmatrix}$ by using power method

Take $[1 \quad 0 \quad 0]^r$ as initial eigen vector (perform 5 iterations)

b) Use Romberg's method to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as $0.5, 0.25, 0.125$

c) Given the Values

x	5	7	11	13	17
$f(x)$	150	392	1452	2366	5202

Evaluate $f(9)$,using Lagrange's Formula.

Seat No.	

Set **Q**

S.Y. (B.Tech.)(Sem-II)(New)(NEP CBCS) Examination: March/April - 2025
ELECTRICAL ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) To find the Numerically largest Eigen value using iterative Method we use the equation _____.
a) $A = \lambda X$ b) $AX = X$
c) $X = \lambda X$ d) $AX = \lambda X$

2) If $\frac{dy}{dx} = x - y$ and $y(0) = 1$ then by Picard's method the value of $y_1(1)$ is _____.
a) 0.905 b) 1.905
c) 2.905 d) none

3) Runge-Kutta method is self-starting method _____.
a) true d) false
c) we can't say d) none

4) If the data is equally spaced and interpolation is near the beginning of the data then _____ Interpolation formula is used.
a) Newton's backward difference
b) Newton's divided difference
c) Newton's forward difference
d) Lagrange's

5) The process of finding the value inside the interval (x_0, x_n) is called ___.
a) Interpolation b) Extrapolation
c) Iterative d) polynomial equation

6) Using Newton-Raphson method the first approximation to the root of the equation $x^4 - x - 10 = 0$ near to $x_0 = 2$ is _____.
a) 1.671 b) 2.271
c) 2.071 d) 1.871

7) To apply Simpson's one-third rule the number of sub-intervals must be _____.
a) Even b) Odd
c) Multiple of 3 d) Multiple of 6

8) A transcendental equation is an equation that involves _____.
a) Only algebraic terms
b) Only transcendental functions
c) Both algebraic and transcendental functions
d) Linear terms only

9) The interval in which a real root of the equation $x^3 - 2x - 5 = 0$ lies is _____.
a) $(1,2)$ b) $(0,1)$
c) $(2,3)$ d) $(3,4)$

10) The Gauss-Seidel method is used for solving _____.
a) Nonlinear equations
b) Systems of linear equations
c) Ordinary differential equations
d) Partial differential equations

11) Which of the following is a disadvantage of the Gauss-Jacobi method?
a) It converges faster than most direct methods
b) It requires a large number of iterations for a good approximation
c) It cannot be used for systems with more than two equations
d) It works only for symmetric systems

12) The use of Romberg's method is _____.
a) To solve simultaneous linear equation
b) To find root of linear equation
c) To evaluate definite integration
d) To find the Eigen values

13) The order of convergence of Newton-Raphson method is _____.
a) 1 b) 2
c) $\sqrt{2}$ d) 1.6

14) Power Method is used to find _____.
a) Negative Eigen Value b) Largest Eigen value
c) Positive Eigen Value d) None of these

Seat No.	

Set **Q**

S.Y. (B.Tech.)(Sem-II)(New)(NEP CBCS) Examination: March/April - 2025
ELECTRICAL ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any three. **09**

a) Find the double root of the equation $x^3 - 5.4x^2 + 9.24x - 5.096 = 0$ given that it is nearer to 1.5.

b) Solve the system of equations by Jacobi's iterative method (perform 3 iterations) $27x + 6y - z = 85,\ 6x + 15y + 2z = 72,\ x + y + 54z = 110$

c) Find positive real root of the equation $x \sin x + \cos x = 0$ using Newton Raphson method correct to 3 decimal places.

d) Solve the system of equation by using Gauss-Elimination method.
$x + 4y - z = -5, x + y - 6z = -12, -3x - y - z = 4$

e) Solve $\frac{dy}{dx} = -xy$ with $x_0 = 0\ ,\ y_0 = 1$ using Picard's method upto 3rd approximation.

Q.3 Answer any three. **09**

a) Solve $\frac{dy}{dx} = x + y$ with $x_0 = 0\ , y_0 = 1$ using Range kutta forth order method and find approximate value of y when $x = 0.2$

b) Solve $\frac{dy}{dx} = 1 + xy$ with $y(0) = 1$ using Picard's method take first approximation and find y for $x = 0.1$

c) Solve by Gauss Seidel Method, the equations
$20x + y - 2z = 17, 3x + 20y - z = -18, 2x - 3y + 20z = 25$
Perform 3 iteration.

d) Find the value of $\sqrt{5}$ using newton's iterative formula. Perform 3 iteration.

e) Find the positive root of $f(x) = 2x^3 - 3x - 6$ by Newton's Raphson method perform 3 iteration.

Q.4 Answer any two. **10**

a) Perform 2-iteration by Newton's Raphson Method to Solve the non-linear equation $x = x^2 + y^2,\ y = x^2 - y^2$ Take initial approximation $x_0 = 0.8, y_0 = 0.4$

b) Solve the system of equation by LU decomposition Method
$3x + 2y + 7z = 4,\quad 2x + 3y + z = 5,\quad 3x + 4y + z = 7$

c) Solve differential equation $\frac{dy}{dx} = 1 + xz,\ \frac{dz}{dx} = -xy$ for $x = 0.3$ using 4th order Runge-Kutta Method Initial Values are $x = 0,\ y = 0,\ z = 1$

Section – II

Q.5 Answer any Three. **09**

a) Evaluate the integral $\int_0^1 \frac{x^2}{1+x^3}\,dx$ using Simpson's $\frac{1}{3}$rd rule, Take $h = 0.25$

b) Determine the largest Eigen value and corresponding Eigen vector of the matrix $\begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$ by using power method perform three iteration.

c) Use Trapezoidal Rule to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as 0.5

d) Using Newton's divided difference formula, find the value of $f(2)$. Given the following table.

x	4	5	7	10	11	13
$f(x)$	48	100	294	900	1210	2028

e) Construct Newton's Forward interpolation polynomial for the following data:

x	4	6	8	10
y	1	3	8	16

Hence find the value of y for $x = 5$

Q.6 Answer any Three. **09**

a) Solve the integral $\int_0^{1/2} \frac{1}{\sqrt{1-x^2}}\,dx$ using Weddle's rule Taking $n = 6$

b) Solve $\int_3^5 \frac{4}{(2x^2)}\,dx$ Using Gauss Formula for $n = 2$ and $n = 3$.

c) Find all Eigen values and Eigen vectors of the following matrix by using Gauss Jacobi's Method. $\begin{bmatrix} 2 & 3 \\ 3 & 2 \end{bmatrix}$

d) Solve $\int_0^6 \frac{dx}{1+x^2}$ by using Simpsons 3/8th rule take $h = 1$

e) Using Newton's Backward formula, find the value of $f(2)$ if

x	1	1.4	1.8	2.2
$f(x)$	3.49	4.82	5.96	6.5

Q.7 Answer any two. **10**

a) Find the largest eigen value and the corresponding eigen vector of the matrix:

$\begin{bmatrix} 25 & 1 & 2 \\ 1 & 3 & 0 \\ 2 & 0 & -4 \end{bmatrix}$ by using power method

Take $[1 \quad 0 \quad 0]^r$ as initial eigen vector (perform 5 iterations)

b) Use Romberg's method to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as $0.5, 0.25, 0.125$

c) Given the Values

x	5	7	11	13	17
$f(x)$	150	392	1452	2366	5202

Evaluate $f(9)$,using Lagrange's Formula.

Seat No.	

Set R

S.Y. (B.Tech.)(Sem-II)(New)(NEP CBCS) Examination: March/April - 2025
ELECTRICAL ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) If the data is equally spaced and interpolation is near the beginning of the data then _____ Interpolation formula is used.
a) Newton's backward difference
b) Newton's divided difference
c) Newton's forward difference
d) Lagrange's

2) The process of finding the value inside the interval (x_0, x_n) is called ___.
a) Interpolation b) Extrapolation
c) Iterative d) polynomial equation

3) Using Newton-Raphson method the first approximation to the root of the equation $x^4 - x - 10 = 0$ near to $x_0 = 2$ is _____.
a) 1.671 b) 2.271
c) 2.071 d) 1.871

4) To apply Simpson's one-third rule the number of sub-intervals must be _____.
a) Even b) Odd
c) Multiple of 3 d) Multiple of 6

5) A transcendental equation is an equation that involves _____.
a) Only algebraic terms
b) Only transcendental functions
c) Both algebraic and transcendental functions
d) Linear terms only

6) The interval in which a real root of the equation $x^3 - 2x - 5 = 0$ lies is _____.

a) $(1,2)$ b) $(0,1)$
c) $(2,3)$ d) $(3,4)$

7) The Gauss-Seidel method is used for solving _____.

a) Nonlinear equations
b) Systems of linear equations
c) Ordinary differential equations
d) Partial differential equations

8) Which of the following is a disadvantage of the Gauss-Jacobi method?

a) It converges faster than most direct methods
b) It requires a large number of iterations for a good approximation
c) It cannot be used for systems with more than two equations
d) It works only for symmetric systems

9) The use of Romberg's method is _____.

a) To solve simultaneous linear equation
b) To find root of linear equation
c) To evaluate definite integration
d) To find the Eigen values

10) The order of convergence of Newton-Raphson method is _____.

a) 1 b) 2
c) $\sqrt{2}$ d) 1.6

11) Power Method is used to find _____.

a) Negative Eigen Value b) Largest Eigen value
c) Positive Eigen Value d) None of these

12) To find the Numerically largest Eigen value using iterative Method we use the equation _____.

a) $A = \lambda X$ b) $AX = X$
c) $X = \lambda X$ d) $AX = \lambda X$

13) If $\frac{dy}{dx} = x - y$ and $y(0) = 1$ then by Picard's method the value of $y_1(1)$ is _____.

a) 0.905 b) 1.905
c) 2.905 d) none

14) Runge-Kutta method is self-starting method _____.

a) true d) false
c) we can't say d) none

SLR-BD-276

Seat No.	

Set R

S.Y. (B.Tech.)(Sem-II)(New)(NEP CBCS) Examination: March/April - 2025
ELECTRICAL ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any three. **09**

a) Find the double root of the equation $x^3 - 5.4x^2 + 9.24x - 5.096 = 0$ given that it is nearer to 1.5.

b) Solve the system of equations by Jacobi's iterative method (perform 3 iterations) $27x + 6y - z = 85,\ 6x + 15y + 2z = 72,\ x + y + 54z = 110$

c) Find positive real root of the equation $x \sin x + \cos x = 0$ using Newton Raphson method correct to 3 decimal places.

d) Solve the system of equation by using Gauss-Elimination method. $x + 4y - z = -5, x + y - 6z = -12, -3x - y - z = 4$

e) Solve $\frac{dy}{dx} = -xy$ with $x_0 = 0\ ,\ y_0 = 1$ using Picard's method upto 3rd approximation.

Q.3 Answer any three. **09**

a) Solve $\frac{dy}{dx} = x + y$ with $x_0 = 0\ , y_0 = 1$ using Range kutta forth order method and find approximate value of y when $x = 0.2$

b) Solve $\frac{dy}{dx} = 1 + xy$ with $y(0) = 1$ using Picard's method take first approximation and find y for $x = 0.1$

c) Solve by Gauss Seidel Method, the equations $20x + y - 2z = 17, 3x + 20y - z = -18, 2x - 3y + 20z = 25$ Perform 3 iteration.

d) Find the value of $\sqrt{5}$ using newton's iterative formula. Perform 3 iteration.

e) Find the positive root of $f(x) = 2x^3 - 3x - 6$ by Newton's Raphson method perform 3 iteration.

Q.4 Answer any two. **10**

a) Perform 2-iteration by Newton's Raphson Method to Solve the non-linear equation $x = x^2 + y^2,\ y = x^2 - y^2$ Take initial approximation $x_0 = 0.8, y_0 = 0.4$

b) Solve the system of equation by LU decomposition Method $3x + 2y + 7z = 4,\quad 2x + 3y + z = 5,\quad 3x + 4y + z = 7$

c) Solve differential equation $\frac{dy}{dx} = 1 + xz,\ \frac{dz}{dx} = -xy$ for $x = 0.3$ using 4th order Runge-Kutta Method Initial Values are $x = 0,\ y = 0,\ z = 1$

Section – II

Q.5 Answer any Three. **09**

a) Evaluate the integral $\int_0^1 \frac{x^2}{1+x^3}\,dx$ using Simpson's $\frac{1}{3}$rd rule, Take $h = 0.25$

b) Determine the largest Eigen value and corresponding Eigen vector of the matrix $\begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$ by using power method perform three iteration.

c) Use Trapezoidal Rule to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as 0.5

d) Using Newton's divided difference formula, find the value of $f(2)$. Given the following table.

x	4	5	7	10	11	13
$f(x)$	48	100	294	900	1210	2028

e) Construct Newton's Forward interpolation polynomial for the following data:

x	4	6	8	10
y	1	3	8	16

Hence find the value of y for $x = 5$

Q.6 Answer any Three. **09**

a) Solve the integral $\int_0^{1/2} \frac{1}{\sqrt{1-x^2}}\,dx$ using Weddle's rule Taking $n = 6$

b) Solve $\int_3^5 \frac{4}{(2x^2)}\,dx$ Using Gauss Formula for $n = 2$ and $n = 3$.

c) Find all Eigen values and Eigen vectors of the following matrix by using Gauss Jacobi's Method. $\begin{bmatrix} 2 & 3 \\ 3 & 2 \end{bmatrix}$

d) Solve $\int_0^6 \frac{dx}{1+x^2}$ by using Simpsons 3/8th rule take $h = 1$

e) Using Newton's Backward formula, find the value of $f(2)$ if

x	1	1.4	1.8	2.2
$f(x)$	3.49	4.82	5.96	6.5

Q.7 Answer any two. **10**

a) Find the largest eigen value and the corresponding eigen vector of the matrix:

$\begin{bmatrix} 25 & 1 & 2 \\ 1 & 3 & 0 \\ 2 & 0 & -4 \end{bmatrix}$ by using power method

Take $[1 \quad 0 \quad 0]^r$ as initial eigen vector (perform 5 iterations)

b) Use Romberg's method to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as $0.5, 0.25, 0.125$

c) Given the Values

x	5	7	11	13	17
$f(x)$	150	392	1452	2366	5202

Evaluate $f(9)$,using Lagrange's Formula.

Seat No.	

Set S

S.Y. (B.Tech.)(Sem-II)(New)(NEP CBCS) Examination: March/April - 2025
ELECTRICAL ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The order of convergence of Newton-Raphson method is _____.
a) 1 b) 2
c) $\sqrt{2}$ d) 1.6

2) Power Method is used to find _____.
a) Negative Eigen Value b) Largest Eigen value
c) Positive Eigen Value d) None of these

3) To find the Numerically largest Eigen value using iterative Method we use the equation _____.
a) $A = \lambda X$ b) $AX = X$
c) $X = \lambda X$ d) $AX = \lambda X$

4) If $\frac{dy}{dx} = x - y$ and $y(0) = 1$ then by Picard's method the value of $y_1(1)$ is _____.
a) 0.905 b) 1.905
c) 2.905 d) none

5) Runge-Kutta method is self-starting method _____.
a) true d) false
c) we can't say d) none

6) If the data is equally spaced and interpolation is near the beginning of the data then _____ Interpolation formula is used.
a) Newton's backward difference
b) Newton's divided difference
c) Newton's forward difference
d) Lagrange's

7) The process of finding the value inside the interval (x_0, x_n) is called ___.
a) Interpolation b) Extrapolation
c) Iterative d) polynomial equation

8) Using Newton-Raphson method the first approximation to the root of the equation $x^4 - x - 10 = 0$ near to $x_0 = 2$ is _____.
a) 1.671 b) 2.271
c) 2.071 d) 1.871

9) To apply Simpson's one-third rule the number of sub-intervals must be _____.
a) Even b) Odd
c) Multiple of 3 d) Multiple of 6

10) A transcendental equation is an equation that involves _____.
a) Only algebraic terms
b) Only transcendental functions
c) Both algebraic and transcendental functions
d) Linear terms only

11) The interval in which a real root of the equation $x^3 - 2x - 5 = 0$ lies is _____.
a) $(1,2)$ b) $(0,1)$
c) $(2,3)$ d) $(3,4)$

12) The Gauss-Seidel method is used for solving _____.
a) Nonlinear equations
b) Systems of linear equations
c) Ordinary differential equations
d) Partial differential equations

13) Which of the following is a disadvantage of the Gauss-Jacobi method?
a) It converges faster than most direct methods
b) It requires a large number of iterations for a good approximation
c) It cannot be used for systems with more than two equations
d) It works only for symmetric systems

14) The use of Romberg's method is _____.
a) To solve simultaneous linear equation
b) To find root of linear equation
c) To evaluate definite integration
d) To find the Eigen values

SLR-BD-276

Seat No.		Set	S

S.Y. (B.Tech.)(Sem-II)(New)(NEP CBCS) Examination: March/April - 2025
ELECTRICAL ENGINEERING
Computational Mathematics (OE-02F)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer any three. **09**

a) Find the double root of the equation $x^3 - 5.4x^2 + 9.24x - 5.096 = 0$ given that it is nearer to 1.5.

b) Solve the system of equations by Jacobi's iterative method (perform 3 iterations) $27x + 6y - z = 85,\ 6x + 15y + 2z = 72,\ x + y + 54z = 110$

c) Find positive real root of the equation $x \sin x + \cos x = 0$ using Newton Raphson method correct to 3 decimal places.

d) Solve the system of equation by using Gauss-Elimination method. $x + 4y - z = -5, x + y - 6z = -12, -3x - y - z = 4$

e) Solve $\frac{dy}{dx} = -xy$ with $x_0 = 0\ ,\ y_0 = 1$ using Picard's method upto 3rd approximation.

Q.3 Answer any three. **09**

a) Solve $\frac{dy}{dx} = x + y$ with $x_0 = 0\ , y_0 = 1$ using Range kutta forth order method and find approximate value of y when $x = 0.2$

b) Solve $\frac{dy}{dx} = 1 + xy$ with $y(0) = 1$ using Picard's method take first approximation and find y for $x = 0.1$

c) Solve by Gauss Seidel Method, the equations $20x + y - 2z = 17, 3x + 20y - z = -18, 2x - 3y + 20z = 25$ Perform 3 iteration.

d) Find the value of $\sqrt{5}$ using newton's iterative formula. Perform 3 iteration.

e) Find the positive root of $f(x) = 2x^3 - 3x - 6$ by Newton's Raphson method perform 3 iteration.

Q.4 Answer any two. **10**

a) Perform 2-iteration by Newton's Raphson Method to Solve the non-linear equation $x = x^2 + y^2,\ y = x^2 - y^2$ Take initial approximation $x_0 = 0.8, y_0 = 0.4$

b) Solve the system of equation by LU decomposition Method $3x + 2y + 7z = 4,\quad 2x + 3y + z = 5,\quad 3x + 4y + z = 7$

c) Solve differential equation $\frac{dy}{dx} = 1 + xz,\ \frac{dz}{dx} = -xy$ for $x = 0.3$ using 4th order Runge-Kutta Method Initial Values are $x = 0,\ y = 0,\ z = 1$

Section – II

Q.5 Answer any Three. **09**

a) Evaluate the integral $\int_0^1 \frac{x^2}{1+x^3}\,dx$ using Simpson's $\frac{1}{3}$rd rule, Take $h = 0.25$

b) Determine the largest Eigen value and corresponding Eigen vector of the matrix $\begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$ by using power method perform three iteration.

c) Use Trapezoidal Rule to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as 0.5

d) Using Newton's divided difference formula, find the value of $f(2)$. Given the following table.

x	4	5	7	10	11	13
$f(x)$	48	100	294	900	1210	2028

e) Construct Newton's Forward interpolation polynomial for the following data:

x	4	6	8	10
y	1	3	8	16

Hence find the value of y for $x = 5$

Q.6 Answer any Three. **09**

a) Solve the integral $\int_0^{1/2} \frac{1}{\sqrt{1-x^2}}\,dx$ using Weddle's rule Taking $n = 6$

b) Solve $\int_3^5 \frac{4}{(2x^2)}\,dx$ Using Gauss Formula for $n = 2$ and $n = 3$.

c) Find all Eigen values and Eigen vectors of the following matrix by using Gauss Jacobi's Method. $\begin{bmatrix} 2 & 3 \\ 3 & 2 \end{bmatrix}$

d) Solve $\int_0^6 \frac{dx}{1+x^2}$ by using Simpsons 3/8th rule take $h = 1$

e) Using Newton's Backward formula, find the value of $f(2)$ if

x	1	1.4	1.8	2.2
$f(x)$	3.49	4.82	5.96	6.5

Q.7 Answer any two. **10**

a) Find the largest eigen value and the corresponding eigen vector of the matrix:

$\begin{bmatrix} 25 & 1 & 2 \\ 1 & 3 & 0 \\ 2 & 0 & -4 \end{bmatrix}$ by using power method

Take $[1 \quad 0 \quad 0]^r$ as initial eigen vector (perform 5 iterations)

b) Use Romberg's method to compute $\int_0^1 \frac{1}{1+x^2}\,dx$ Take h as $0.5, 0.25, 0.125$

c) Given the Values

x	5	7	11	13	17
$f(x)$	150	392	1452	2366	5202

Evaluate $f(9)$,using Lagrange's Formula.

SLR-BD-277

Seat No.	

Set P

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
ELECTRICAL ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) In communication, _____ is the person who receives and decodes the message.
a) Sender b) Receiver
c) Driver d) Cleaner

2) Which among the following is not a manmade channel of communication?
a) Telephone b) Cell phone
c) Fax d) Air

3) Communication is the part of _____ skills.
a) Rough b) Soft
c) Hard d) Short

4) Which among the following are the barriers to communication?
a) Physical b) Mechanical
c) Psychological d) All of above

5) To overcome language barrier, which of the ways should not be followed?
a) Easy and understandable words should be used.
b) Jokes should be told to the audience.
c) The language of audience should be used.
d) Non-verbal ways should be used to the extent possible.

6) Which of the following is not among 7Cs?
a) Conciseness b) Completeness
c) Clarity d) Charity

7) Posters fall under _____ communication.
a) oral b) visual
c) written d) spoken

8) On the _____ it is possible to get immediate feedback.
a) letter b) e-mail
c) fax d) telephone

9) The response to a sender's message is called as _____.
a) Reply b) Feedback
c) Answer d) None of the above

10) _____ is the soul of communication.
a) Sender b) Receiver
c) Message d) Feedback

11) Which of these is not an element of non-verbal communication?
a) Personal appearance b) Posture
c) Eye contact d) Name of the speaker

12) Telephonic conversation is a form of: _____
a) verbal communication b) non-verbal communication
c) visual communication d) Written

13) To give a good presentation, full rehearsal is: _____
a) Optional b) Necessary
c) Useless d) Audience based

14) Which of the following is not an advantage of oral presentation?
a) Flexibility b) Scope for body language
c) Expensive d) Time-saving

SLR-BD-277

Seat No.	

Set P

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
ELECTRICAL ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Three. **12**

a) Explain how communication is necessary for business.
b) What is feedback? Explain its necessity in communication.
c) Write short note on: Different channels of communication.
d) Explain language barriers to communication with the ways to overcome them.
e) Explain language as a tool of communication.

Q.3 Attempt Any Four. **16**

a) Explain seven C's of effective communication.
b) Explain various types of barriers to communication and the ways to overcome them.
c) What is oral communication? Explain its advantages.
d) Explain various steps in the process of communication.
e) What is written communication? Explain its benefits.

Section – II

Q.4 Attempt Any Three. **12**

a) Explain the difference between formal and informal communication.
b) Explain vertical communication with its types.
c) Explain farewell speech by the departing person, with an example
d) Explain the speech for vote of thanks, with an example.
e) Write short note on: Non- verbal aspects of presentation.

Q.5 Attempt Any Four. **16**

a) Explain the structure of a business letter with its various components.
b) Explain the steps in the process of presentation.
c) You had purchased some furniture items from a vendor. Afterwards you found that the furniture items are in a damaged condition. Write a letter of complaint and ask for replacement.
d) Explain four P's of effective presentations.
e) You are in need of some computer hardware parts. Prepare a letter placing order to the supplier. Specify the terms and conditions of purchase.

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
ELECTRICAL ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) On the _____ it is possible to get immediate feedback.
a) letter b) e-mail
c) fax d) telephone

2) The response to a sender's message is called as _____.
a) Reply b) Feedback
c) Answer d) None of the above

3) _____ is the soul of communication.
a) Sender b) Receiver
c) Message d) Feedback

4) Which of these is not an element of non-verbal communication?
a) Personal appearance b) Posture
c) Eye contact d) Name of the speaker

5) Telephonic conversation is a form of: _____
a) verbal communication b) non-verbal communication
c) visual communication d) Written

6) To give a good presentation, full rehearsal is: _____
a) Optional b) Necessary
c) Useless d) Audience based

7) Which of the following is not an advantage of oral presentation?
a) Flexibility b) Scope for body language
c) Expensive d) Time-saving

8) In communication, _____ is the person who receives and decodes the message.
a) Sender b) Receiver
c) Driver d) Cleaner

9) Which among the following is not a manmade channel of communication?
a) Telephone b) Cell phone
c) Fax d) Air

10) Communication is the part of _____ skills.
a) Rough b) Soft
c) Hard d) Short

11) Which among the following are the barriers to communication?
a) Physical b) Mechanical
c) Psychological d) All of above

12) To overcome language barrier, which of the ways should not be followed?
a) Easy and understandable words should be used.
b) Jokes should be told to the audience.
c) The language of audience should be used.
d) Non-verbal ways should be used to the extent possible.

13) Which of the following is not among 7Cs?
a) Conciseness b) Completeness
c) Clarity d) Charity

14) Posters fall under _____ communication.
a) oral b) visual
c) written d) spoken

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
ELECTRICAL ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Three. **12**

a) Explain how communication is necessary for business.
b) What is feedback? Explain its necessity in communication.
c) Write short note on: Different channels of communication.
d) Explain language barriers to communication with the ways to overcome them.
e) Explain language as a tool of communication.

Q.3 Attempt Any Four. **16**

a) Explain seven C's of effective communication.
b) Explain various types of barriers to communication and the ways to overcome them.
c) What is oral communication? Explain its advantages.
d) Explain various steps in the process of communication.
e) What is written communication? Explain its benefits.

Section – II

Q.4 Attempt Any Three. **12**

a) Explain the difference between formal and informal communication.
b) Explain vertical communication with its types.
c) Explain farewell speech by the departing person, with an example
d) Explain the speech for vote of thanks, with an example.
e) Write short note on: Non- verbal aspects of presentation.

Q.5 Attempt Any Four. **16**

a) Explain the structure of a business letter with its various components.
b) Explain the steps in the process of presentation.
c) You had purchased some furniture items from a vendor. Afterwards you found that the furniture items are in a damaged condition. Write a letter of complaint and ask for replacement.
d) Explain four P's of effective presentations.
e) You are in need of some computer hardware parts. Prepare a letter placing order to the supplier. Specify the terms and conditions of purchase.

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
ELECTRICAL ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. 14

1) Which of these is not an element of non-verbal communication?
a) Personal appearance b) Posture
c) Eye contact d) Name of the speaker

2) Telephonic conversation is a form of: _____
a) verbal communication b) non-verbal communication
c) visual communication d) Written

3) To give a good presentation, full rehearsal is: _____
a) Optional b) Necessary
c) Useless d) Audience based

4) Which of the following is not an advantage of oral presentation?
a) Flexibility b) Scope for body language
c) Expensive d) Time-saving

5) In communication, _____ is the person who receives and decodes the message.
a) Sender b) Receiver
c) Driver d) Cleaner

6) Which among the following is not a manmade channel of communication?
a) Telephone b) Cell phone
c) Fax d) Air

7) Communication is the part of _____ skills.
a) Rough b) Soft
c) Hard d) Short

8) Which among the following are the barriers to communication?
a) Physical b) Mechanical
c) Psychological d) All of above

9) To overcome language barrier, which of the ways should not be followed?
a) Easy and understandable words should be used.
b) Jokes should be told to the audience.
c) The language of audience should be used.
d) Non-verbal ways should be used to the extent possible.

10) Which of the following is not among 7Cs?
a) Conciseness b) Completeness
c) Clarity d) Charity

11) Posters fall under _____ communication.
a) oral b) visual
c) written d) spoken

12) On the _____ it is possible to get immediate feedback.
a) letter b) e-mail
c) fax d) telephone

13) The response to a sender's message is called as _____.
a) Reply b) Feedback
c) Answer d) None of the above

14) _____ is the soul of communication.
a) Sender b) Receiver
c) Message d) Feedback

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
ELECTRICAL ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Three. **12**

a) Explain how communication is necessary for business.
b) What is feedback? Explain its necessity in communication.
c) Write short note on: Different channels of communication.
d) Explain language barriers to communication with the ways to overcome them.
e) Explain language as a tool of communication.

Q.3 Attempt Any Four. **16**

a) Explain seven C's of effective communication.
b) Explain various types of barriers to communication and the ways to overcome them.
c) What is oral communication? Explain its advantages.
d) Explain various steps in the process of communication.
e) What is written communication? Explain its benefits.

Section – II

Q.4 Attempt Any Three. **12**

a) Explain the difference between formal and informal communication.
b) Explain vertical communication with its types.
c) Explain farewell speech by the departing person, with an example
d) Explain the speech for vote of thanks, with an example.
e) Write short note on: Non- verbal aspects of presentation.

Q.5 Attempt Any Four. **16**

a) Explain the structure of a business letter with its various components.
b) Explain the steps in the process of presentation.
c) You had purchased some furniture items from a vendor. Afterwards you found that the furniture items are in a damaged condition. Write a letter of complaint and ask for replacement.
d) Explain four P's of effective presentations.
e) You are in need of some computer hardware parts. Prepare a letter placing order to the supplier. Specify the terms and conditions of purchase.

Seat No.		Set	S

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
ELECTRICAL ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternatives from the options. **14**

1) Which of the following is not among 7Cs?
a) Conciseness b) Completeness
c) Clarity d) Charity

2) Posters fall under _____ communication.
a) oral b) visual
c) written d) spoken

3) On the _____ it is possible to get immediate feedback.
a) letter b) e-mail
c) fax d) telephone

4) The response to a sender's message is called as _____.
a) Reply b) Feedback
c) Answer d) None of the above

5) _____ is the soul of communication.
a) Sender b) Receiver
c) Message d) Feedback

6) Which of these is not an element of non-verbal communication?
a) Personal appearance b) Posture
c) Eye contact d) Name of the speaker

7) Telephonic conversation is a form of: _____
a) verbal communication b) non-verbal communication
c) visual communication d) Written

8) To give a good presentation, full rehearsal is: _____
a) Optional b) Necessary
c) Useless d) Audience based

9) Which of the following is not an advantage of oral presentation?
a) Flexibility
b) Scope for body language
c) Expensive
d) Time-saving

10) In communication, _____ is the person who receives and decodes the message.
a) Sender
b) Receiver
c) Driver
d) Cleaner

11) Which among the following is not a manmade channel of communication?
a) Telephone
b) Cell phone
c) Fax
d) Air

12) Communication is the part of _____ skills.
a) Rough
b) Soft
c) Hard
d) Short

13) Which among the following are the barriers to communication?
a) Physical
b) Mechanical
c) Psychological
d) All of above

14) To overcome language barrier, which of the ways should not be followed?
a) Easy and understandable words should be used.
b) Jokes should be told to the audience.
c) The language of audience should be used.
d) Non-verbal ways should be used to the extent possible.

SLR-BD-277

Seat No.	

Set S

S.Y. (B.Tech.) (Sem - II) (New) (NEP CBCS) Examination: March/April - 2025
ELECTRICAL ENGINEERING
Professional Business Communication (OE-02G)

Day & Date: Tuesday 03-06-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Three. **12**

a) Explain how communication is necessary for business.
b) What is feedback? Explain its necessity in communication.
c) Write short note on: Different channels of communication.
d) Explain language barriers to communication with the ways to overcome them.
e) Explain language as a tool of communication.

Q.3 Attempt Any Four. **16**

a) Explain seven C's of effective communication.
b) Explain various types of barriers to communication and the ways to overcome them.
c) What is oral communication? Explain its advantages.
d) Explain various steps in the process of communication.
e) What is written communication? Explain its benefits.

Section – II

Q.4 Attempt Any Three. **12**

a) Explain the difference between formal and informal communication.
b) Explain vertical communication with its types.
c) Explain farewell speech by the departing person, with an example
d) Explain the speech for vote of thanks, with an example.
e) Write short note on: Non- verbal aspects of presentation.

Q.5 Attempt Any Four. **16**

a) Explain the structure of a business letter with its various components.
b) Explain the steps in the process of presentation.
c) You had purchased some furniture items from a vendor. Afterwards you found that the furniture items are in a damaged condition. Write a letter of complaint and ask for replacement.
d) Explain four P's of effective presentations.
e) You are in need of some computer hardware parts. Prepare a letter placing order to the supplier. Specify the terms and conditions of purchase.

SLR-BD-278

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Which of the following is a non-renewable energy source?
a) Solar energy b) Wind energy
c) Coal d) Biomass

2) What is the main goal of energy strategy for the future?
a) Reduce energy usage
b) Maximize fossil fuel usage
c) Ensure energy security and sustainability
d) Export all energy sources

3) Which of the following is a common hydrogen production method?
a) Electrolysis b) Pyrolysis
c) Filtration d) Oxidation

4) Which of these is a key challenge in hydrogen energy?
a) High density b) Easy storage
c) High cost of production d) Lack of oxygen

5) Which of the following is a passive heating technique?
a) Air conditioner b) Direct Gain
c) Radiator d) Heat Pump

6) A thermal storage wall is used in: _____.
a) Lighting systems b) Active cooling
c) Passive solar heating d) Water pumping

7) Which of the following helps in dehumidification?
a) Ground coupling b) Radiation cooling
c) Solar panels d) Thermal mass

8) Which of the following is a direct-type solar dryer?
a) Hybrid dryer b) Natural convection dryer
c) Hot air dryer d) Industrial dryer

9) In forced circulation type dryers, the air is: _____.
a) Heated by gas burners b) Moved using fans
c) Naturally circulated d) Removed completely

10) What is the main purpose of solar drying?
a) Heating buildings b) Producing electricity
c) Preserving food d) Storing energy

11) Which of the following is a standard for PV system performance?
a) ISO 31000 b) IEC 61215
c) ASTM C1303 d) IEEE 519

12) Rooftop PV systems are typically: _____.
a) Off-grid b) Grid-connected
c) Hybrid systems only d) Diesel based

13) The cost analysis of solar PV systems includes: _____.
a) Only capital cost
b) Only labor cost
c) Performance ratio and LCOE
d) None of the above

14) What is the role of semiconductor material in PV cells?
a) Store energy
b) Reflect sunlight
c) Conduct electricity
d) Convert sunlight to electricity

SLR-BD-278

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Four **16**

a) Define renewable and non-renewable energy sources with examples.
b) State the challenges in transporting hydrogen.
c) Mention two differences between primary and secondary batteries.
d) What is direct gain in solar heating?
e) Explain thermal storage walls.

Q.3 Attempt Any Two **12**

a) Explain the prospects and challenges of renewable energy in India.
b) Explain the methods of hydrogen production in detail.
c) Explain the auxiliary heat supply system and control systems used in solar buildings.

Section – II

Q.4 Attempt Any Four **16**

a) What is solar drying? Mention its two key advantages.
b) Differentiate between direct-type and indirect-type solar dryers.
c) Explain hot air industrial process heat systems in solar drying.
d) What is the photovoltaic effect? Explain in brief.
e) What is net-metering in solar PV systems?

Q.5 Attempt Any Two **12**

a) Explain the performance prediction of a basin-type solar still.
b) Describe solar PV battery charging systems and their importance.
c) Explain the typical schematic of a rooftop solar PV system and its components.

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Which of the following is a direct-type solar dryer?
a) Hybrid dryer b) Natural convection dryer
c) Hot air dryer d) Industrial dryer

2) In forced circulation type dryers, the air is: _____.
a) Heated by gas burners b) Moved using fans
c) Naturally circulated d) Removed completely

3) What is the main purpose of solar drying?
a) Heating buildings b) Producing electricity
c) Preserving food d) Storing energy

4) Which of the following is a standard for PV system performance?
a) ISO 31000 b) IEC 61215
c) ASTM C1303 d) IEEE 519

5) Rooftop PV systems are typically: _____.
a) Off-grid b) Grid-connected
c) Hybrid systems only d) Diesel based

6) The cost analysis of solar PV systems includes: _____.
a) Only capital cost
b) Only labor cost
c) Performance ratio and LCOE
d) None of the above

7) What is the role of semiconductor material in PV cells?
a) Store energy
b) Reflect sunlight
c) Conduct electricity
d) Convert sunlight to electricity

8) Which of the following is a non-renewable energy source?
a) Solar energy b) Wind energy
c) Coal d) Biomass

9) What is the main goal of energy strategy for the future?
a) Reduce energy usage
b) Maximize fossil fuel usage
c) Ensure energy security and sustainability
d) Export all energy sources

10) Which of the following is a common hydrogen production method?
a) Electrolysis b) Pyrolysis
c) Filtration d) Oxidation

11) Which of these is a key challenge in hydrogen energy?
a) High density b) Easy storage
c) High cost of production d) Lack of oxygen

12) Which of the following is a passive heating technique?
a) Air conditioner b) Direct Gain
c) Radiator d) Heat Pump

13) A thermal storage wall is used in: _____.
a) Lighting systems b) Active cooling
c) Passive solar heating d) Water pumping

14) Which of the following helps in dehumidification?
a) Ground coupling b) Radiation cooling
c) Solar panels d) Thermal mass

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Four **16**

a) Define renewable and non-renewable energy sources with examples.
b) State the challenges in transporting hydrogen.
c) Mention two differences between primary and secondary batteries.
d) What is direct gain in solar heating?
e) Explain thermal storage walls.

Q.3 Attempt Any Two **12**

a) Explain the prospects and challenges of renewable energy in India.
b) Explain the methods of hydrogen production in detail.
c) Explain the auxiliary heat supply system and control systems used in solar buildings.

Section – II

Q.4 Attempt Any Four **16**

a) What is solar drying? Mention its two key advantages.
b) Differentiate between direct-type and indirect-type solar dryers.
c) Explain hot air industrial process heat systems in solar drying.
d) What is the photovoltaic effect? Explain in brief.
e) What is net-metering in solar PV systems?

Q.5 Attempt Any Two **12**

a) Explain the performance prediction of a basin-type solar still.
b) Describe solar PV battery charging systems and their importance.
c) Explain the typical schematic of a rooftop solar PV system and its components.

Seat No.	

Set R

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Which of the following is a standard for PV system performance?
a) ISO 31000 b) IEC 61215
c) ASTM C1303 d) IEEE 519

2) Rooftop PV systems are typically: _____.
a) Off-grid b) Grid-connected
c) Hybrid systems only d) Diesel based

3) The cost analysis of solar PV systems includes: _____.
a) Only capital cost
b) Only labor cost
c) Performance ratio and LCOE
d) None of the above

4) What is the role of semiconductor material in PV cells?
a) Store energy
b) Reflect sunlight
c) Conduct electricity
d) Convert sunlight to electricity

5) Which of the following is a non-renewable energy source?
a) Solar energy b) Wind energy
c) Coal d) Biomass

6) What is the main goal of energy strategy for the future?
a) Reduce energy usage
b) Maximize fossil fuel usage
c) Ensure energy security and sustainability
d) Export all energy sources

7) Which of the following is a common hydrogen production method?
a) Electrolysis b) Pyrolysis
c) Filtration d) Oxidation

8) Which of these is a key challenge in hydrogen energy?
a) High density b) Easy storage
c) High cost of production d) Lack of oxygen

9) Which of the following is a passive heating technique?
a) Air conditioner b) Direct Gain
c) Radiator d) Heat Pump

10) A thermal storage wall is used in: _____.
a) Lighting systems b) Active cooling
c) Passive solar heating d) Water pumping

11) Which of the following helps in dehumidification?
a) Ground coupling b) Radiation cooling
c) Solar panels d) Thermal mass

12) Which of the following is a direct-type solar dryer?
a) Hybrid dryer b) Natural convection dryer
c) Hot air dryer d) Industrial dryer

13) In forced circulation type dryers, the air is: _____.
a) Heated by gas burners b) Moved using fans
c) Naturally circulated d) Removed completely

14) What is the main purpose of solar drying?
a) Heating buildings b) Producing electricity
c) Preserving food d) Storing energy

Seat No.	

Set | R

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Four **16**

a) Define renewable and non-renewable energy sources with examples.
b) State the challenges in transporting hydrogen.
c) Mention two differences between primary and secondary batteries.
d) What is direct gain in solar heating?
e) Explain thermal storage walls.

Q.3 Attempt Any Two **12**

a) Explain the prospects and challenges of renewable energy in India.
b) Explain the methods of hydrogen production in detail.
c) Explain the auxiliary heat supply system and control systems used in solar buildings.

Section – II

Q.4 Attempt Any Four **16**

a) What is solar drying? Mention its two key advantages.
b) Differentiate between direct-type and indirect-type solar dryers.
c) Explain hot air industrial process heat systems in solar drying.
d) What is the photovoltaic effect? Explain in brief.
e) What is net-metering in solar PV systems?

Q.5 Attempt Any Two **12**

a) Explain the performance prediction of a basin-type solar still.
b) Describe solar PV battery charging systems and their importance.
c) Explain the typical schematic of a rooftop solar PV system and its components.

Seat No.	

Set **S**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) A thermal storage wall is used in: _____.
a) Lighting systems b) Active cooling
c) Passive solar heating d) Water pumping

2) Which of the following helps in dehumidification?
a) Ground coupling b) Radiation cooling
c) Solar panels d) Thermal mass

3) Which of the following is a direct-type solar dryer?
a) Hybrid dryer b) Natural convection dryer
c) Hot air dryer d) Industrial dryer

4) In forced circulation type dryers, the air is: _____.
a) Heated by gas burners b) Moved using fans
c) Naturally circulated d) Removed completely

5) What is the main purpose of solar drying?
a) Heating buildings b) Producing electricity
c) Preserving food d) Storing energy

6) Which of the following is a standard for PV system performance?
a) ISO 31000 b) IEC 61215
c) ASTM C1303 d) IEEE 519

7) Rooftop PV systems are typically: _____.
a) Off-grid b) Grid-connected
c) Hybrid systems only d) Diesel based

8) The cost analysis of solar PV systems includes: _____.
a) Only capital cost
b) Only labor cost
c) Performance ratio and LCOE
d) None of the above

9) What is the role of semiconductor material in PV cells?
a) Store energy
b) Reflect sunlight
c) Conduct electricity
d) Convert sunlight to electricity

10) Which of the following is a non-renewable energy source?
a) Solar energy b) Wind energy
c) Coal d) Biomass

11) What is the main goal of energy strategy for the future?
a) Reduce energy usage
b) Maximize fossil fuel usage
c) Ensure energy security and sustainability
d) Export all energy sources

12) Which of the following is a common hydrogen production method?
a) Electrolysis b) Pyrolysis
c) Filtration d) Oxidation

13) Which of these is a key challenge in hydrogen energy?
a) High density b) Easy storage
c) High cost of production d) Lack of oxygen

14) Which of the following is a passive heating technique?
a) Air conditioner b) Direct Gain
c) Radiator d) Heat Pump

SLR-BD-278

Seat No.	

Set S

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
CIVIL ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Four **16**
- **a)** Define renewable and non-renewable energy sources with examples.
- **b)** State the challenges in transporting hydrogen.
- **c)** Mention two differences between primary and secondary batteries.
- **d)** What is direct gain in solar heating?
- **e)** Explain thermal storage walls.

Q.3 Attempt Any Two **12**
- **a)** Explain the prospects and challenges of renewable energy in India.
- **b)** Explain the methods of hydrogen production in detail.
- **c)** Explain the auxiliary heat supply system and control systems used in solar buildings.

Section – II

Q.4 Attempt Any Four **16**
- **a)** What is solar drying? Mention its two key advantages.
- **b)** Differentiate between direct-type and indirect-type solar dryers.
- **c)** Explain hot air industrial process heat systems in solar drying.
- **d)** What is the photovoltaic effect? Explain in brief.
- **e)** What is net-metering in solar PV systems?

Q.5 Attempt Any Two **12**
- **a)** Explain the performance prediction of a basin-type solar still.
- **b)** Describe solar PV battery charging systems and their importance.
- **c)** Explain the typical schematic of a rooftop solar PV system and its components.

SLR-BD-278

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Which of the following is a non-renewable energy source?
a) Solar energy b) Wind energy
c) Coal d) Biomass

2) What is the main goal of energy strategy for the future?
a) Reduce energy usage
b) Maximize fossil fuel usage
c) Ensure energy security and sustainability
d) Export all energy sources

3) Which of the following is a common hydrogen production method?
a) Electrolysis b) Pyrolysis
c) Filtration d) Oxidation

4) Which of these is a key challenge in hydrogen energy?
a) High density b) Easy storage
c) High cost of production d) Lack of oxygen

5) Which of the following is a passive heating technique?
a) Air conditioner b) Direct Gain
c) Radiator d) Heat Pump

6) A thermal storage wall is used in: _____.
a) Lighting systems b) Active cooling
c) Passive solar heating d) Water pumping

7) Which of the following helps in dehumidification?
a) Ground coupling b) Radiation cooling
c) Solar panels d) Thermal mass

8) Which of the following is a direct-type solar dryer?
a) Hybrid dryer b) Natural convection dryer
c) Hot air dryer d) Industrial dryer

9) In forced circulation type dryers, the air is: _____.
a) Heated by gas burners b) Moved using fans
c) Naturally circulated d) Removed completely

10) What is the main purpose of solar drying?
a) Heating buildings b) Producing electricity
c) Preserving food d) Storing energy

11) Which of the following is a standard for PV system performance?
a) ISO 31000 b) IEC 61215
c) ASTM C1303 d) IEEE 519

12) Rooftop PV systems are typically: _____.
a) Off-grid b) Grid-connected
c) Hybrid systems only d) Diesel based

13) The cost analysis of solar PV systems includes: _____.
a) Only capital cost
b) Only labor cost
c) Performance ratio and LCOE
d) None of the above

14) What is the role of semiconductor material in PV cells?
a) Store energy
b) Reflect sunlight
c) Conduct electricity
d) Convert sunlight to electricity

Seat No.	

Set | P

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Four **16**

a) Define renewable and non-renewable energy sources with examples.
b) State the challenges in transporting hydrogen.
c) Mention two differences between primary and secondary batteries.
d) What is direct gain in solar heating?
e) Explain thermal storage walls.

Q.3 Attempt Any Two **12**

a) Explain the prospects and challenges of renewable energy in India.
b) Explain the methods of hydrogen production in detail.
c) Explain the auxiliary heat supply system and control systems used in solar buildings.

Section – II

Q.4 Attempt Any Four **16**

a) What is solar drying? Mention its two key advantages.
b) Differentiate between direct-type and indirect-type solar dryers.
c) Explain hot air industrial process heat systems in solar drying.
d) What is the photovoltaic effect? Explain in brief.
e) What is net-metering in solar PV systems?

Q.5 Attempt Any Two **12**

a) Explain the performance prediction of a basin-type solar still.
b) Describe solar PV battery charging systems and their importance.
c) Explain the typical schematic of a rooftop solar PV system and its components.

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Which of the following is a direct-type solar dryer?
a) Hybrid dryer b) Natural convection dryer
c) Hot air dryer d) Industrial dryer

2) In forced circulation type dryers, the air is: _____.
a) Heated by gas burners b) Moved using fans
c) Naturally circulated d) Removed completely

3) What is the main purpose of solar drying?
a) Heating buildings b) Producing electricity
c) Preserving food d) Storing energy

4) Which of the following is a standard for PV system performance?
a) ISO 31000 b) IEC 61215
c) ASTM C1303 d) IEEE 519

5) Rooftop PV systems are typically: _____.
a) Off-grid b) Grid-connected
c) Hybrid systems only d) Diesel based

6) The cost analysis of solar PV systems includes: _____.
a) Only capital cost
b) Only labor cost
c) Performance ratio and LCOE
d) None of the above

7) What is the role of semiconductor material in PV cells?
a) Store energy
b) Reflect sunlight
c) Conduct electricity
d) Convert sunlight to electricity

8) Which of the following is a non-renewable energy source?
a) Solar energy b) Wind energy
c) Coal d) Biomass

9) What is the main goal of energy strategy for the future?
a) Reduce energy usage
b) Maximize fossil fuel usage
c) Ensure energy security and sustainability
d) Export all energy sources

10) Which of the following is a common hydrogen production method?
a) Electrolysis b) Pyrolysis
c) Filtration d) Oxidation

11) Which of these is a key challenge in hydrogen energy?
a) High density b) Easy storage
c) High cost of production d) Lack of oxygen

12) Which of the following is a passive heating technique?
a) Air conditioner b) Direct Gain
c) Radiator d) Heat Pump

13) A thermal storage wall is used in: _____.
a) Lighting systems b) Active cooling
c) Passive solar heating d) Water pumping

14) Which of the following helps in dehumidification?
a) Ground coupling b) Radiation cooling
c) Solar panels d) Thermal mass

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Four **16**

a) Define renewable and non-renewable energy sources with examples.
b) State the challenges in transporting hydrogen.
c) Mention two differences between primary and secondary batteries.
d) What is direct gain in solar heating?
e) Explain thermal storage walls.

Q.3 Attempt Any Two **12**

a) Explain the prospects and challenges of renewable energy in India.
b) Explain the methods of hydrogen production in detail.
c) Explain the auxiliary heat supply system and control systems used in solar buildings.

Section – II

Q.4 Attempt Any Four **16**

a) What is solar drying? Mention its two key advantages.
b) Differentiate between direct-type and indirect-type solar dryers.
c) Explain hot air industrial process heat systems in solar drying.
d) What is the photovoltaic effect? Explain in brief.
e) What is net-metering in solar PV systems?

Q.5 Attempt Any Two **12**

a) Explain the performance prediction of a basin-type solar still.
b) Describe solar PV battery charging systems and their importance.
c) Explain the typical schematic of a rooftop solar PV system and its components.

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Which of the following is a standard for PV system performance?
a) ISO 31000 b) IEC 61215
c) ASTM C1303 d) IEEE 519

2) Rooftop PV systems are typically: _____.
a) Off-grid b) Grid-connected
c) Hybrid systems only d) Diesel based

3) The cost analysis of solar PV systems includes: _____.
a) Only capital cost
b) Only labor cost
c) Performance ratio and LCOE
d) None of the above

4) What is the role of semiconductor material in PV cells?
a) Store energy
b) Reflect sunlight
c) Conduct electricity
d) Convert sunlight to electricity

5) Which of the following is a non-renewable energy source?
a) Solar energy b) Wind energy
c) Coal d) Biomass

6) What is the main goal of energy strategy for the future?
a) Reduce energy usage
b) Maximize fossil fuel usage
c) Ensure energy security and sustainability
d) Export all energy sources

7) Which of the following is a common hydrogen production method?
a) Electrolysis b) Pyrolysis
c) Filtration d) Oxidation

8) Which of these is a key challenge in hydrogen energy?
a) High density b) Easy storage
c) High cost of production d) Lack of oxygen

9) Which of the following is a passive heating technique?
a) Air conditioner b) Direct Gain
c) Radiator d) Heat Pump

10) A thermal storage wall is used in: _____.
a) Lighting systems b) Active cooling
c) Passive solar heating d) Water pumping

11) Which of the following helps in dehumidification?
a) Ground coupling b) Radiation cooling
c) Solar panels d) Thermal mass

12) Which of the following is a direct-type solar dryer?
a) Hybrid dryer b) Natural convection dryer
c) Hot air dryer d) Industrial dryer

13) In forced circulation type dryers, the air is: _____.
a) Heated by gas burners b) Moved using fans
c) Naturally circulated d) Removed completely

14) What is the main purpose of solar drying?
a) Heating buildings b) Producing electricity
c) Preserving food d) Storing energy

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Four **16**

a) Define renewable and non-renewable energy sources with examples.
b) State the challenges in transporting hydrogen.
c) Mention two differences between primary and secondary batteries.
d) What is direct gain in solar heating?
e) Explain thermal storage walls.

Q.3 Attempt Any Two **12**

a) Explain the prospects and challenges of renewable energy in India.
b) Explain the methods of hydrogen production in detail.
c) Explain the auxiliary heat supply system and control systems used in solar buildings.

Section – II

Q.4 Attempt Any Four **16**

a) What is solar drying? Mention its two key advantages.
b) Differentiate between direct-type and indirect-type solar dryers.
c) Explain hot air industrial process heat systems in solar drying.
d) What is the photovoltaic effect? Explain in brief.
e) What is net-metering in solar PV systems?

Q.5 Attempt Any Two **12**

a) Explain the performance prediction of a basin-type solar still.
b) Describe solar PV battery charging systems and their importance.
c) Explain the typical schematic of a rooftop solar PV system and its components.

Seat No.	

Set **S**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) A thermal storage wall is used in: _____.
a) Lighting systems b) Active cooling
c) Passive solar heating d) Water pumping

2) Which of the following helps in dehumidification?
a) Ground coupling b) Radiation cooling
c) Solar panels d) Thermal mass

3) Which of the following is a direct-type solar dryer?
a) Hybrid dryer b) Natural convection dryer
c) Hot air dryer d) Industrial dryer

4) In forced circulation type dryers, the air is: _____.
a) Heated by gas burners b) Moved using fans
c) Naturally circulated d) Removed completely

5) What is the main purpose of solar drying?
a) Heating buildings b) Producing electricity
c) Preserving food d) Storing energy

6) Which of the following is a standard for PV system performance?
a) ISO 31000 b) IEC 61215
c) ASTM C1303 d) IEEE 519

7) Rooftop PV systems are typically: _____.
a) Off-grid b) Grid-connected
c) Hybrid systems only d) Diesel based

8) The cost analysis of solar PV systems includes: _____.
a) Only capital cost
b) Only labor cost
c) Performance ratio and LCOE
d) None of the above

9) What is the role of semiconductor material in PV cells?
a) Store energy
b) Reflect sunlight
c) Conduct electricity
d) Convert sunlight to electricity

10) Which of the following is a non-renewable energy source?
a) Solar energy b) Wind energy
c) Coal d) Biomass

11) What is the main goal of energy strategy for the future?
a) Reduce energy usage
b) Maximize fossil fuel usage
c) Ensure energy security and sustainability
d) Export all energy sources

12) Which of the following is a common hydrogen production method?
a) Electrolysis b) Pyrolysis
c) Filtration d) Oxidation

13) Which of these is a key challenge in hydrogen energy?
a) High density b) Easy storage
c) High cost of production d) Lack of oxygen

14) Which of the following is a passive heating technique?
a) Air conditioner b) Direct Gain
c) Radiator d) Heat Pump

SLR-BD-278

Seat No.		Set	S

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
COMPUTER SCIENCE AND ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Four **16**
- **a)** Define renewable and non-renewable energy sources with examples.
- **b)** State the challenges in transporting hydrogen.
- **c)** Mention two differences between primary and secondary batteries.
- **d)** What is direct gain in solar heating?
- **e)** Explain thermal storage walls.

Q.3 Attempt Any Two **12**
- **a)** Explain the prospects and challenges of renewable energy in India.
- **b)** Explain the methods of hydrogen production in detail.
- **c)** Explain the auxiliary heat supply system and control systems used in solar buildings.

Section – II

Q.4 Attempt Any Four **16**
- **a)** What is solar drying? Mention its two key advantages.
- **b)** Differentiate between direct-type and indirect-type solar dryers.
- **c)** Explain hot air industrial process heat systems in solar drying.
- **d)** What is the photovoltaic effect? Explain in brief.
- **e)** What is net-metering in solar PV systems?

Q.5 Attempt Any Two **12**
- **a)** Explain the performance prediction of a basin-type solar still.
- **b)** Describe solar PV battery charging systems and their importance.
- **c)** Explain the typical schematic of a rooftop solar PV system and its components.

SLR-BD-278

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April - 2025
ELECTRICAL ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Which of the following is a non-renewable energy source?
a) Solar energy b) Wind energy
c) Coal d) Biomass

2) What is the main goal of energy strategy for the future?
a) Reduce energy usage
b) Maximize fossil fuel usage
c) Ensure energy security and sustainability
d) Export all energy sources

3) Which of the following is a common hydrogen production method?
a) Electrolysis b) Pyrolysis
c) Filtration d) Oxidation

4) Which of these is a key challenge in hydrogen energy?
a) High density b) Easy storage
c) High cost of production d) Lack of oxygen

5) Which of the following is a passive heating technique?
a) Air conditioner b) Direct Gain
c) Radiator d) Heat Pump

6) A thermal storage wall is used in: _____.
a) Lighting systems b) Active cooling
c) Passive solar heating d) Water pumping

7) Which of the following helps in dehumidification?
a) Ground coupling b) Radiation cooling
c) Solar panels d) Thermal mass

8) Which of the following is a direct-type solar dryer?
a) Hybrid dryer b) Natural convection dryer
c) Hot air dryer d) Industrial dryer

9) In forced circulation type dryers, the air is: _____.
a) Heated by gas burners b) Moved using fans
c) Naturally circulated d) Removed completely

10) What is the main purpose of solar drying?
a) Heating buildings b) Producing electricity
c) Preserving food d) Storing energy

11) Which of the following is a standard for PV system performance?
a) ISO 31000 b) IEC 61215
c) ASTM C1303 d) IEEE 519

12) Rooftop PV systems are typically: _____.
a) Off-grid b) Grid-connected
c) Hybrid systems only d) Diesel based

13) The cost analysis of solar PV systems includes: _____.
a) Only capital cost
b) Only labor cost
c) Performance ratio and LCOE
d) None of the above

14) What is the role of semiconductor material in PV cells?
a) Store energy
b) Reflect sunlight
c) Conduct electricity
d) Convert sunlight to electricity

SLR-BD-278

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April - 2025
ELECTRICAL ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Four **16**

a) Define renewable and non-renewable energy sources with examples.
b) State the challenges in transporting hydrogen.
c) Mention two differences between primary and secondary batteries.
d) What is direct gain in solar heating?
e) Explain thermal storage walls.

Q.3 Attempt Any Two **12**

a) Explain the prospects and challenges of renewable energy in India.
b) Explain the methods of hydrogen production in detail.
c) Explain the auxiliary heat supply system and control systems used in solar buildings.

Section – II

Q.4 Attempt Any Four **16**

a) What is solar drying? Mention its two key advantages.
b) Differentiate between direct-type and indirect-type solar dryers.
c) Explain hot air industrial process heat systems in solar drying.
d) What is the photovoltaic effect? Explain in brief.
e) What is net-metering in solar PV systems?

Q.5 Attempt Any Two **12**

a) Explain the performance prediction of a basin-type solar still.
b) Describe solar PV battery charging systems and their importance.
c) Explain the typical schematic of a rooftop solar PV system and its components.

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April - 2025
ELECTRICAL ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Which of the following is a direct-type solar dryer?
a) Hybrid dryer b) Natural convection dryer
c) Hot air dryer d) Industrial dryer

2) In forced circulation type dryers, the air is: _____.
a) Heated by gas burners b) Moved using fans
c) Naturally circulated d) Removed completely

3) What is the main purpose of solar drying?
a) Heating buildings b) Producing electricity
c) Preserving food d) Storing energy

4) Which of the following is a standard for PV system performance?
a) ISO 31000 b) IEC 61215
c) ASTM C1303 d) IEEE 519

5) Rooftop PV systems are typically: _____.
a) Off-grid b) Grid-connected
c) Hybrid systems only d) Diesel based

6) The cost analysis of solar PV systems includes: _____.
a) Only capital cost
b) Only labor cost
c) Performance ratio and LCOE
d) None of the above

7) What is the role of semiconductor material in PV cells?
a) Store energy
b) Reflect sunlight
c) Conduct electricity
d) Convert sunlight to electricity

8) Which of the following is a non-renewable energy source?
a) Solar energy b) Wind energy
c) Coal d) Biomass

9) What is the main goal of energy strategy for the future?
a) Reduce energy usage
b) Maximize fossil fuel usage
c) Ensure energy security and sustainability
d) Export all energy sources

10) Which of the following is a common hydrogen production method?
a) Electrolysis b) Pyrolysis
c) Filtration d) Oxidation

11) Which of these is a key challenge in hydrogen energy?
a) High density b) Easy storage
c) High cost of production d) Lack of oxygen

12) Which of the following is a passive heating technique?
a) Air conditioner b) Direct Gain
c) Radiator d) Heat Pump

13) A thermal storage wall is used in: _____.
a) Lighting systems b) Active cooling
c) Passive solar heating d) Water pumping

14) Which of the following helps in dehumidification?
a) Ground coupling b) Radiation cooling
c) Solar panels d) Thermal mass

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April - 2025
ELECTRICAL ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Four **16**

a) Define renewable and non-renewable energy sources with examples.
b) State the challenges in transporting hydrogen.
c) Mention two differences between primary and secondary batteries.
d) What is direct gain in solar heating?
e) Explain thermal storage walls.

Q.3 Attempt Any Two **12**

a) Explain the prospects and challenges of renewable energy in India.
b) Explain the methods of hydrogen production in detail.
c) Explain the auxiliary heat supply system and control systems used in solar buildings.

Section – II

Q.4 Attempt Any Four **16**

a) What is solar drying? Mention its two key advantages.
b) Differentiate between direct-type and indirect-type solar dryers.
c) Explain hot air industrial process heat systems in solar drying.
d) What is the photovoltaic effect? Explain in brief.
e) What is net-metering in solar PV systems?

Q.5 Attempt Any Two **12**

a) Explain the performance prediction of a basin-type solar still.
b) Describe solar PV battery charging systems and their importance.
c) Explain the typical schematic of a rooftop solar PV system and its components.

Seat No.	

Set R

S. Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April - 2025
ELECTRICAL ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Which of the following is a standard for PV system performance?
a) ISO 31000 b) IEC 61215
c) ASTM C1303 d) IEEE 519

2) Rooftop PV systems are typically: _____.
a) Off-grid b) Grid-connected
c) Hybrid systems only d) Diesel based

3) The cost analysis of solar PV systems includes: _____.
a) Only capital cost
b) Only labor cost
c) Performance ratio and LCOE
d) None of the above

4) What is the role of semiconductor material in PV cells?
a) Store energy
b) Reflect sunlight
c) Conduct electricity
d) Convert sunlight to electricity

5) Which of the following is a non-renewable energy source?
a) Solar energy b) Wind energy
c) Coal d) Biomass

6) What is the main goal of energy strategy for the future?
a) Reduce energy usage
b) Maximize fossil fuel usage
c) Ensure energy security and sustainability
d) Export all energy sources

7) Which of the following is a common hydrogen production method?
a) Electrolysis b) Pyrolysis
c) Filtration d) Oxidation

8) Which of these is a key challenge in hydrogen energy?
a) High density b) Easy storage
c) High cost of production d) Lack of oxygen

9) Which of the following is a passive heating technique?
a) Air conditioner b) Direct Gain
c) Radiator d) Heat Pump

10) A thermal storage wall is used in: _____.
a) Lighting systems b) Active cooling
c) Passive solar heating d) Water pumping

11) Which of the following helps in dehumidification?
a) Ground coupling b) Radiation cooling
c) Solar panels d) Thermal mass

12) Which of the following is a direct-type solar dryer?
a) Hybrid dryer b) Natural convection dryer
c) Hot air dryer d) Industrial dryer

13) In forced circulation type dryers, the air is: _____.
a) Heated by gas burners b) Moved using fans
c) Naturally circulated d) Removed completely

14) What is the main purpose of solar drying?
a) Heating buildings b) Producing electricity
c) Preserving food d) Storing energy

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April - 2025
ELECTRICAL ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Four **16**

a) Define renewable and non-renewable energy sources with examples.
b) State the challenges in transporting hydrogen.
c) Mention two differences between primary and secondary batteries.
d) What is direct gain in solar heating?
e) Explain thermal storage walls.

Q.3 Attempt Any Two **12**

a) Explain the prospects and challenges of renewable energy in India.
b) Explain the methods of hydrogen production in detail.
c) Explain the auxiliary heat supply system and control systems used in solar buildings.

Section – II

Q.4 Attempt Any Four **16**

a) What is solar drying? Mention its two key advantages.
b) Differentiate between direct-type and indirect-type solar dryers.
c) Explain hot air industrial process heat systems in solar drying.
d) What is the photovoltaic effect? Explain in brief.
e) What is net-metering in solar PV systems?

Q.5 Attempt Any Two **12**

a) Explain the performance prediction of a basin-type solar still.
b) Describe solar PV battery charging systems and their importance.
c) Explain the typical schematic of a rooftop solar PV system and its components.

Seat No.	

Set **S**

S. Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April - 2025
ELECTRICAL ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) A thermal storage wall is used in: _____.
a) Lighting systems b) Active cooling
c) Passive solar heating d) Water pumping

2) Which of the following helps in dehumidification?
a) Ground coupling b) Radiation cooling
c) Solar panels d) Thermal mass

3) Which of the following is a direct-type solar dryer?
a) Hybrid dryer b) Natural convection dryer
c) Hot air dryer d) Industrial dryer

4) In forced circulation type dryers, the air is: _____.
a) Heated by gas burners b) Moved using fans
c) Naturally circulated d) Removed completely

5) What is the main purpose of solar drying?
a) Heating buildings b) Producing electricity
c) Preserving food d) Storing energy

6) Which of the following is a standard for PV system performance?
a) ISO 31000 b) IEC 61215
c) ASTM C1303 d) IEEE 519

7) Rooftop PV systems are typically: _____.
a) Off-grid b) Grid-connected
c) Hybrid systems only d) Diesel based

8) The cost analysis of solar PV systems includes: _____.
a) Only capital cost
b) Only labor cost
c) Performance ratio and LCOE
d) None of the above

9) What is the role of semiconductor material in PV cells?
a) Store energy
b) Reflect sunlight
c) Conduct electricity
d) Convert sunlight to electricity

10) Which of the following is a non-renewable energy source?
a) Solar energy b) Wind energy
c) Coal d) Biomass

11) What is the main goal of energy strategy for the future?
a) Reduce energy usage
b) Maximize fossil fuel usage
c) Ensure energy security and sustainability
d) Export all energy sources

12) Which of the following is a common hydrogen production method?
a) Electrolysis b) Pyrolysis
c) Filtration d) Oxidation

13) Which of these is a key challenge in hydrogen energy?
a) High density b) Easy storage
c) High cost of production d) Lack of oxygen

14) Which of the following is a passive heating technique?
a) Air conditioner b) Direct Gain
c) Radiator d) Heat Pump

SLR-BD-278

Seat No.	

Set S

S. Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April - 2025
ELECTRICAL ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Four **16**

a) Define renewable and non-renewable energy sources with examples.
b) State the challenges in transporting hydrogen.
c) Mention two differences between primary and secondary batteries.
d) What is direct gain in solar heating?
e) Explain thermal storage walls.

Q.3 Attempt Any Two **12**

a) Explain the prospects and challenges of renewable energy in India.
b) Explain the methods of hydrogen production in detail.
c) Explain the auxiliary heat supply system and control systems used in solar buildings.

Section – II

Q.4 Attempt Any Four **16**

a) What is solar drying? Mention its two key advantages.
b) Differentiate between direct-type and indirect-type solar dryers.
c) Explain hot air industrial process heat systems in solar drying.
d) What is the photovoltaic effect? Explain in brief.
e) What is net-metering in solar PV systems?

Q.5 Attempt Any Two **12**

a) Explain the performance prediction of a basin-type solar still.
b) Describe solar PV battery charging systems and their importance.
c) Explain the typical schematic of a rooftop solar PV system and its components.

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Which of the following is a non-renewable energy source?
a) Solar energy b) Wind energy
c) Coal d) Biomass

2) What is the main goal of energy strategy for the future?
a) Reduce energy usage
b) Maximize fossil fuel usage
c) Ensure energy security and sustainability
d) Export all energy sources

3) Which of the following is a common hydrogen production method?
a) Electrolysis b) Pyrolysis
c) Filtration d) Oxidation

4) Which of these is a key challenge in hydrogen energy?
a) High density b) Easy storage
c) High cost of production d) Lack of oxygen

5) Which of the following is a passive heating technique?
a) Air conditioner b) Direct Gain
c) Radiator d) Heat Pump

6) A thermal storage wall is used in: _____.
a) Lighting systems b) Active cooling
c) Passive solar heating d) Water pumping

7) Which of the following helps in dehumidification?
a) Ground coupling b) Radiation cooling
c) Solar panels d) Thermal mass

8) Which of the following is a direct-type solar dryer?
a) Hybrid dryer b) Natural convection dryer
c) Hot air dryer d) Industrial dryer

9) In forced circulation type dryers, the air is: _____.
a) Heated by gas burners b) Moved using fans
c) Naturally circulated d) Removed completely

10) What is the main purpose of solar drying?
a) Heating buildings b) Producing electricity
c) Preserving food d) Storing energy

11) Which of the following is a standard for PV system performance?
a) ISO 31000 b) IEC 61215
c) ASTM C1303 d) IEEE 519

12) Rooftop PV systems are typically: _____.
a) Off-grid b) Grid-connected
c) Hybrid systems only d) Diesel based

13) The cost analysis of solar PV systems includes: _____.
a) Only capital cost
b) Only labor cost
c) Performance ratio and LCOE
d) None of the above

14) What is the role of semiconductor material in PV cells?
a) Store energy
b) Reflect sunlight
c) Conduct electricity
d) Convert sunlight to electricity

Seat No.	

Set **P**

S. Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Four **16**

a) Define renewable and non-renewable energy sources with examples.
b) State the challenges in transporting hydrogen.
c) Mention two differences between primary and secondary batteries.
d) What is direct gain in solar heating?
e) Explain thermal storage walls.

Q.3 Attempt Any Two **12**

a) Explain the prospects and challenges of renewable energy in India.
b) Explain the methods of hydrogen production in detail.
c) Explain the auxiliary heat supply system and control systems used in solar buildings.

Section – II

Q.4 Attempt Any Four **16**

a) What is solar drying? Mention its two key advantages.
b) Differentiate between direct-type and indirect-type solar dryers.
c) Explain hot air industrial process heat systems in solar drying.
d) What is the photovoltaic effect? Explain in brief.
e) What is net-metering in solar PV systems?

Q.5 Attempt Any Two **12**

a) Explain the performance prediction of a basin-type solar still.
b) Describe solar PV battery charging systems and their importance.
c) Explain the typical schematic of a rooftop solar PV system and its components.

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Which of the following is a direct-type solar dryer?
a) Hybrid dryer b) Natural convection dryer
c) Hot air dryer d) Industrial dryer

2) In forced circulation type dryers, the air is: _____.
a) Heated by gas burners b) Moved using fans
c) Naturally circulated d) Removed completely

3) What is the main purpose of solar drying?
a) Heating buildings b) Producing electricity
c) Preserving food d) Storing energy

4) Which of the following is a standard for PV system performance?
a) ISO 31000 b) IEC 61215
c) ASTM C1303 d) IEEE 519

5) Rooftop PV systems are typically: _____.
a) Off-grid b) Grid-connected
c) Hybrid systems only d) Diesel based

6) The cost analysis of solar PV systems includes: _____.
a) Only capital cost
b) Only labor cost
c) Performance ratio and LCOE
d) None of the above

7) What is the role of semiconductor material in PV cells?
a) Store energy
b) Reflect sunlight
c) Conduct electricity
d) Convert sunlight to electricity

8) Which of the following is a non-renewable energy source?
a) Solar energy b) Wind energy
c) Coal d) Biomass

9) What is the main goal of energy strategy for the future?
a) Reduce energy usage
b) Maximize fossil fuel usage
c) Ensure energy security and sustainability
d) Export all energy sources

10) Which of the following is a common hydrogen production method?
a) Electrolysis b) Pyrolysis
c) Filtration d) Oxidation

11) Which of these is a key challenge in hydrogen energy?
a) High density b) Easy storage
c) High cost of production d) Lack of oxygen

12) Which of the following is a passive heating technique?
a) Air conditioner b) Direct Gain
c) Radiator d) Heat Pump

13) A thermal storage wall is used in: _____.
a) Lighting systems b) Active cooling
c) Passive solar heating d) Water pumping

14) Which of the following helps in dehumidification?
a) Ground coupling b) Radiation cooling
c) Solar panels d) Thermal mass

Seat No.	

Set **Q**

S. Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Four **16**

a) Define renewable and non-renewable energy sources with examples.
b) State the challenges in transporting hydrogen.
c) Mention two differences between primary and secondary batteries.
d) What is direct gain in solar heating?
e) Explain thermal storage walls.

Q.3 Attempt Any Two **12**

a) Explain the prospects and challenges of renewable energy in India.
b) Explain the methods of hydrogen production in detail.
c) Explain the auxiliary heat supply system and control systems used in solar buildings.

Section – II

Q.4 Attempt Any Four **16**

a) What is solar drying? Mention its two key advantages.
b) Differentiate between direct-type and indirect-type solar dryers.
c) Explain hot air industrial process heat systems in solar drying.
d) What is the photovoltaic effect? Explain in brief.
e) What is net-metering in solar PV systems?

Q.5 Attempt Any Two **12**

a) Explain the performance prediction of a basin-type solar still.
b) Describe solar PV battery charging systems and their importance.
c) Explain the typical schematic of a rooftop solar PV system and its components.

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Which of the following is a standard for PV system performance?
a) ISO 31000 b) IEC 61215
c) ASTM C1303 d) IEEE 519

2) Rooftop PV systems are typically: _____.
a) Off-grid b) Grid-connected
c) Hybrid systems only d) Diesel based

3) The cost analysis of solar PV systems includes: _____.
a) Only capital cost
b) Only labor cost
c) Performance ratio and LCOE
d) None of the above

4) What is the role of semiconductor material in PV cells?
a) Store energy
b) Reflect sunlight
c) Conduct electricity
d) Convert sunlight to electricity

5) Which of the following is a non-renewable energy source?
a) Solar energy b) Wind energy
c) Coal d) Biomass

6) What is the main goal of energy strategy for the future?
a) Reduce energy usage
b) Maximize fossil fuel usage
c) Ensure energy security and sustainability
d) Export all energy sources

7) Which of the following is a common hydrogen production method?
a) Electrolysis b) Pyrolysis
c) Filtration d) Oxidation

8) Which of these is a key challenge in hydrogen energy?
a) High density b) Easy storage
c) High cost of production d) Lack of oxygen

9) Which of the following is a passive heating technique?
a) Air conditioner b) Direct Gain
c) Radiator d) Heat Pump

10) A thermal storage wall is used in: _____.
a) Lighting systems b) Active cooling
c) Passive solar heating d) Water pumping

11) Which of the following helps in dehumidification?
a) Ground coupling b) Radiation cooling
c) Solar panels d) Thermal mass

12) Which of the following is a direct-type solar dryer?
a) Hybrid dryer b) Natural convection dryer
c) Hot air dryer d) Industrial dryer

13) In forced circulation type dryers, the air is: _____.
a) Heated by gas burners b) Moved using fans
c) Naturally circulated d) Removed completely

14) What is the main purpose of solar drying?
a) Heating buildings b) Producing electricity
c) Preserving food d) Storing energy

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Four **16**

a) Define renewable and non-renewable energy sources with examples.
b) State the challenges in transporting hydrogen.
c) Mention two differences between primary and secondary batteries.
d) What is direct gain in solar heating?
e) Explain thermal storage walls.

Q.3 Attempt Any Two **12**

a) Explain the prospects and challenges of renewable energy in India.
b) Explain the methods of hydrogen production in detail.
c) Explain the auxiliary heat supply system and control systems used in solar buildings.

Section – II

Q.4 Attempt Any Four **16**

a) What is solar drying? Mention its two key advantages.
b) Differentiate between direct-type and indirect-type solar dryers.
c) Explain hot air industrial process heat systems in solar drying.
d) What is the photovoltaic effect? Explain in brief.
e) What is net-metering in solar PV systems?

Q.5 Attempt Any Two **12**

a) Explain the performance prediction of a basin-type solar still.
b) Describe solar PV battery charging systems and their importance.
c) Explain the typical schematic of a rooftop solar PV system and its components.

Seat No.	

Set S

S. Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) A thermal storage wall is used in: _____.
a) Lighting systems b) Active cooling
c) Passive solar heating d) Water pumping

2) Which of the following helps in dehumidification?
a) Ground coupling b) Radiation cooling
c) Solar panels d) Thermal mass

3) Which of the following is a direct-type solar dryer?
a) Hybrid dryer b) Natural convection dryer
c) Hot air dryer d) Industrial dryer

4) In forced circulation type dryers, the air is: _____.
a) Heated by gas burners b) Moved using fans
c) Naturally circulated d) Removed completely

5) What is the main purpose of solar drying?
a) Heating buildings b) Producing electricity
c) Preserving food d) Storing energy

6) Which of the following is a standard for PV system performance?
a) ISO 31000 b) IEC 61215
c) ASTM C1303 d) IEEE 519

7) Rooftop PV systems are typically: _____.
a) Off-grid b) Grid-connected
c) Hybrid systems only d) Diesel based

8) The cost analysis of solar PV systems includes: _____.
a) Only capital cost
b) Only labor cost
c) Performance ratio and LCOE
d) None of the above

9) What is the role of semiconductor material in PV cells?
a) Store energy
b) Reflect sunlight
c) Conduct electricity
d) Convert sunlight to electricity

10) Which of the following is a non-renewable energy source?
a) Solar energy b) Wind energy
c) Coal d) Biomass

11) What is the main goal of energy strategy for the future?
a) Reduce energy usage
b) Maximize fossil fuel usage
c) Ensure energy security and sustainability
d) Export all energy sources

12) Which of the following is a common hydrogen production method?
a) Electrolysis b) Pyrolysis
c) Filtration d) Oxidation

13) Which of these is a key challenge in hydrogen energy?
a) High density b) Easy storage
c) High cost of production d) Lack of oxygen

14) Which of the following is a passive heating technique?
a) Air conditioner b) Direct Gain
c) Radiator d) Heat Pump

Seat No.		Set	S

S. Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April - 2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Four **16**

a) Define renewable and non-renewable energy sources with examples.
b) State the challenges in transporting hydrogen.
c) Mention two differences between primary and secondary batteries.
d) What is direct gain in solar heating?
e) Explain thermal storage walls.

Q.3 Attempt Any Two **12**

a) Explain the prospects and challenges of renewable energy in India.
b) Explain the methods of hydrogen production in detail.
c) Explain the auxiliary heat supply system and control systems used in solar buildings.

Section – II

Q.4 Attempt Any Four **16**

a) What is solar drying? Mention its two key advantages.
b) Differentiate between direct-type and indirect-type solar dryers.
c) Explain hot air industrial process heat systems in solar drying.
d) What is the photovoltaic effect? Explain in brief.
e) What is net-metering in solar PV systems?

Q.5 Attempt Any Two **12**

a) Explain the performance prediction of a basin-type solar still.
b) Describe solar PV battery charging systems and their importance.
c) Explain the typical schematic of a rooftop solar PV system and its components.

SLR-BD-278

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Which of the following is a non-renewable energy source?
a) Solar energy b) Wind energy
c) Coal d) Biomass

2) What is the main goal of energy strategy for the future?
a) Reduce energy usage
b) Maximize fossil fuel usage
c) Ensure energy security and sustainability
d) Export all energy sources

3) Which of the following is a common hydrogen production method?
a) Electrolysis b) Pyrolysis
c) Filtration d) Oxidation

4) Which of these is a key challenge in hydrogen energy?
a) High density b) Easy storage
c) High cost of production d) Lack of oxygen

5) Which of the following is a passive heating technique?
a) Air conditioner b) Direct Gain
c) Radiator d) Heat Pump

6) A thermal storage wall is used in: _____.
a) Lighting systems b) Active cooling
c) Passive solar heating d) Water pumping

7) Which of the following helps in dehumidification?
a) Ground coupling b) Radiation cooling
c) Solar panels d) Thermal mass

8) Which of the following is a direct-type solar dryer?
a) Hybrid dryer b) Natural convection dryer
c) Hot air dryer d) Industrial dryer

9) In forced circulation type dryers, the air is: _____.
a) Heated by gas burners b) Moved using fans
c) Naturally circulated d) Removed completely

10) What is the main purpose of solar drying?
a) Heating buildings b) Producing electricity
c) Preserving food d) Storing energy

11) Which of the following is a standard for PV system performance?
a) ISO 31000 b) IEC 61215
c) ASTM C1303 d) IEEE 519

12) Rooftop PV systems are typically: _____.
a) Off-grid b) Grid-connected
c) Hybrid systems only d) Diesel based

13) The cost analysis of solar PV systems includes: _____.
a) Only capital cost
b) Only labor cost
c) Performance ratio and LCOE
d) None of the above

14) What is the role of semiconductor material in PV cells?
a) Store energy
b) Reflect sunlight
c) Conduct electricity
d) Convert sunlight to electricity

SLR-BD-278

Seat No.	

Set P

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Four **16**

a) Define renewable and non-renewable energy sources with examples.
b) State the challenges in transporting hydrogen.
c) Mention two differences between primary and secondary batteries.
d) What is direct gain in solar heating?
e) Explain thermal storage walls.

Q.3 Attempt Any Two **12**

a) Explain the prospects and challenges of renewable energy in India.
b) Explain the methods of hydrogen production in detail.
c) Explain the auxiliary heat supply system and control systems used in solar buildings.

Section – II

Q.4 Attempt Any Four **16**

a) What is solar drying? Mention its two key advantages.
b) Differentiate between direct-type and indirect-type solar dryers.
c) Explain hot air industrial process heat systems in solar drying.
d) What is the photovoltaic effect? Explain in brief.
e) What is net-metering in solar PV systems?

Q.5 Attempt Any Two **12**

a) Explain the performance prediction of a basin-type solar still.
b) Describe solar PV battery charging systems and their importance.
c) Explain the typical schematic of a rooftop solar PV system and its components.

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) Which of the following is a direct-type solar dryer?
a) Hybrid dryer b) Natural convection dryer
c) Hot air dryer d) Industrial dryer

2) In forced circulation type dryers, the air is: _____.
a) Heated by gas burners b) Moved using fans
c) Naturally circulated d) Removed completely

3) What is the main purpose of solar drying?
a) Heating buildings b) Producing electricity
c) Preserving food d) Storing energy

4) Which of the following is a standard for PV system performance?
a) ISO 31000 b) IEC 61215
c) ASTM C1303 d) IEEE 519

5) Rooftop PV systems are typically: _____.
a) Off-grid b) Grid-connected
c) Hybrid systems only d) Diesel based

6) The cost analysis of solar PV systems includes: _____.
a) Only capital cost
b) Only labor cost
c) Performance ratio and LCOE
d) None of the above

7) What is the role of semiconductor material in PV cells?
a) Store energy
b) Reflect sunlight
c) Conduct electricity
d) Convert sunlight to electricity

8) Which of the following is a non-renewable energy source?
a) Solar energy b) Wind energy
c) Coal d) Biomass

9) What is the main goal of energy strategy for the future?
a) Reduce energy usage
b) Maximize fossil fuel usage
c) Ensure energy security and sustainability
d) Export all energy sources

10) Which of the following is a common hydrogen production method?
a) Electrolysis b) Pyrolysis
c) Filtration d) Oxidation

11) Which of these is a key challenge in hydrogen energy?
a) High density b) Easy storage
c) High cost of production d) Lack of oxygen

12) Which of the following is a passive heating technique?
a) Air conditioner b) Direct Gain
c) Radiator d) Heat Pump

13) A thermal storage wall is used in: _____.
a) Lighting systems b) Active cooling
c) Passive solar heating d) Water pumping

14) Which of the following helps in dehumidification?
a) Ground coupling b) Radiation cooling
c) Solar panels d) Thermal mass

SLR-BD-278

Seat No.	

Set Q

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Four **16**

a) Define renewable and non-renewable energy sources with examples.
b) State the challenges in transporting hydrogen.
c) Mention two differences between primary and secondary batteries.
d) What is direct gain in solar heating?
e) Explain thermal storage walls.

Q.3 Attempt Any Two **12**

a) Explain the prospects and challenges of renewable energy in India.
b) Explain the methods of hydrogen production in detail.
c) Explain the auxiliary heat supply system and control systems used in solar buildings.

Section – II

Q.4 Attempt Any Four **16**

a) What is solar drying? Mention its two key advantages.
b) Differentiate between direct-type and indirect-type solar dryers.
c) Explain hot air industrial process heat systems in solar drying.
d) What is the photovoltaic effect? Explain in brief.
e) What is net-metering in solar PV systems?

Q.5 Attempt Any Two **12**

a) Explain the performance prediction of a basin-type solar still.
b) Describe solar PV battery charging systems and their importance.
c) Explain the typical schematic of a rooftop solar PV system and its components.

Seat No.	

Set R

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. 14

1) Which of the following is a standard for PV system performance?
a) ISO 31000 b) IEC 61215
c) ASTM C1303 d) IEEE 519

2) Rooftop PV systems are typically: _____.
a) Off-grid b) Grid-connected
c) Hybrid systems only d) Diesel based

3) The cost analysis of solar PV systems includes: _____.
a) Only capital cost
b) Only labor cost
c) Performance ratio and LCOE
d) None of the above

4) What is the role of semiconductor material in PV cells?
a) Store energy
b) Reflect sunlight
c) Conduct electricity
d) Convert sunlight to electricity

5) Which of the following is a non-renewable energy source?
a) Solar energy b) Wind energy
c) Coal d) Biomass

6) What is the main goal of energy strategy for the future?
a) Reduce energy usage
b) Maximize fossil fuel usage
c) Ensure energy security and sustainability
d) Export all energy sources

7) Which of the following is a common hydrogen production method?
a) Electrolysis b) Pyrolysis
c) Filtration d) Oxidation

8) Which of these is a key challenge in hydrogen energy?
a) High density b) Easy storage
c) High cost of production d) Lack of oxygen

9) Which of the following is a passive heating technique?
a) Air conditioner b) Direct Gain
c) Radiator d) Heat Pump

10) A thermal storage wall is used in: _____.
a) Lighting systems b) Active cooling
c) Passive solar heating d) Water pumping

11) Which of the following helps in dehumidification?
a) Ground coupling b) Radiation cooling
c) Solar panels d) Thermal mass

12) Which of the following is a direct-type solar dryer?
a) Hybrid dryer b) Natural convection dryer
c) Hot air dryer d) Industrial dryer

13) In forced circulation type dryers, the air is: _____.
a) Heated by gas burners b) Moved using fans
c) Naturally circulated d) Removed completely

14) What is the main purpose of solar drying?
a) Heating buildings b) Producing electricity
c) Preserving food d) Storing energy

Seat No.	

Set **R**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Four **16**

a) Define renewable and non-renewable energy sources with examples.
b) State the challenges in transporting hydrogen.
c) Mention two differences between primary and secondary batteries.
d) What is direct gain in solar heating?
e) Explain thermal storage walls.

Q.3 Attempt Any Two **12**

a) Explain the prospects and challenges of renewable energy in India.
b) Explain the methods of hydrogen production in detail.
c) Explain the auxiliary heat supply system and control systems used in solar buildings.

Section – II

Q.4 Attempt Any Four **16**

a) What is solar drying? Mention its two key advantages.
b) Differentiate between direct-type and indirect-type solar dryers.
c) Explain hot air industrial process heat systems in solar drying.
d) What is the photovoltaic effect? Explain in brief.
e) What is net-metering in solar PV systems?

Q.5 Attempt Any Two **12**

a) Explain the performance prediction of a basin-type solar still.
b) Describe solar PV battery charging systems and their importance.
c) Explain the typical schematic of a rooftop solar PV system and its components.

Seat No.	

Set **S**

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Alternatives. **14**

1) A thermal storage wall is used in: _____.
a) Lighting systems b) Active cooling
c) Passive solar heating d) Water pumping

2) Which of the following helps in dehumidification?
a) Ground coupling b) Radiation cooling
c) Solar panels d) Thermal mass

3) Which of the following is a direct-type solar dryer?
a) Hybrid dryer b) Natural convection dryer
c) Hot air dryer d) Industrial dryer

4) In forced circulation type dryers, the air is: _____.
a) Heated by gas burners b) Moved using fans
c) Naturally circulated d) Removed completely

5) What is the main purpose of solar drying?
a) Heating buildings b) Producing electricity
c) Preserving food d) Storing energy

6) Which of the following is a standard for PV system performance?
a) ISO 31000 b) IEC 61215
c) ASTM C1303 d) IEEE 519

7) Rooftop PV systems are typically: _____.
a) Off-grid b) Grid-connected
c) Hybrid systems only d) Diesel based

8) The cost analysis of solar PV systems includes: _____.
a) Only capital cost
b) Only labor cost
c) Performance ratio and LCOE
d) None of the above

9) What is the role of semiconductor material in PV cells?
a) Store energy
b) Reflect sunlight
c) Conduct electricity
d) Convert sunlight to electricity

10) Which of the following is a non-renewable energy source?
a) Solar energy b) Wind energy
c) Coal d) Biomass

11) What is the main goal of energy strategy for the future?
a) Reduce energy usage
b) Maximize fossil fuel usage
c) Ensure energy security and sustainability
d) Export all energy sources

12) Which of the following is a common hydrogen production method?
a) Electrolysis b) Pyrolysis
c) Filtration d) Oxidation

13) Which of these is a key challenge in hydrogen energy?
a) High density b) Easy storage
c) High cost of production d) Lack of oxygen

14) Which of the following is a passive heating technique?
a) Air conditioner b) Direct Gain
c) Radiator d) Heat Pump

SLR-BD-278

Seat No.		Set	S

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April - 2025
MECHANICAL ENGINEERING
Advanced application in renewable Energy (EEMDM-02A)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt Any Four **16**
- **a)** Define renewable and non-renewable energy sources with examples.
- **b)** State the challenges in transporting hydrogen.
- **c)** Mention two differences between primary and secondary batteries.
- **d)** What is direct gain in solar heating?
- **e)** Explain thermal storage walls.

Q.3 Attempt Any Two **12**
- **a)** Explain the prospects and challenges of renewable energy in India.
- **b)** Explain the methods of hydrogen production in detail.
- **c)** Explain the auxiliary heat supply system and control systems used in solar buildings.

Section – II

Q.4 Attempt Any Four **16**
- **a)** What is solar drying? Mention its two key advantages.
- **b)** Differentiate between direct-type and indirect-type solar dryers.
- **c)** Explain hot air industrial process heat systems in solar drying.
- **d)** What is the photovoltaic effect? Explain in brief.
- **e)** What is net-metering in solar PV systems?

Q.5 Attempt Any Two **12**
- **a)** Explain the performance prediction of a basin-type solar still.
- **b)** Describe solar PV battery charging systems and their importance.
- **c)** Explain the typical schematic of a rooftop solar PV system and its components.

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve All MCQ Questions: 14

1) What is the primary role of electric motors in Electric Vehicles (EVs)?
a) To generate electricity b) To propel the vehicle
c) To charge the battery d) To power accessories

2) Which type of electric motor uses a permanent magnet as the rotor?
a) DC motor b) Induction motor
c) Synchronous motor d) Permanent Magnet (PM) motor

3) What is the fundamental principle behind the operation of electric motors?
a) Faraday's law b) Lorentz force
c) Newton's law d) Ohm's law

4) Which of the following DC motors has the highest starting torque?
a) DC Shunt Motor b) DC Series Motor
c) DC Compound Motor d) None of the above

5) In a DC shunt motor, the field winding is connected: _____
a) In series with the armature
b) In parallel with the armature
c) In series with the load
d) In parallel with the load

6) A DC compound motor has: ____.
a) Only series field winding
b) Only shunt field winding
c) Both series and shunt field windings
d) Neither series nor shunt field winding

7) What is the primary advantage of using three-phase induction motors in Electric Vehicles (EVs)?
a) High power density b) Low cost
c) High efficiency d) Simple control

8) Which of the following design considerations is crucial for induction motors in EVs?

a) High torque density b) Low noise emission
c) High power factor d) All of the above

9) What is the primary function of a Variable Frequency Drive (VFD) in an induction motor?

a) To regulate the motor speed
b) To control the motor torque
c) To optimize the motor efficiency
d) To convert DC power to AC power

10) What is the primary reason for using starters in electric motors used in Electric Vehicles (EVs)?

a) To increase the starting torque
b) To reduce the starting current
c) To improve the motor efficiency
d) To increase the motor speed

11) Which of the following is a benefit of using starters in electric motors used in EVs?

a) Increased starting torque b) Reduced starting current
c) Improved motor efficiency d) All of the above

12) What happens when an electric motor is started without a starter?

a) The motor starts smoothly
b) The motor starts with a high starting torque
c) The motor draws a high inrush current
d) The motor does not start

13) What is the primary advantage of PMSMs?

a) High efficiency b) Low cost
c) Simple construction d) High torque ripple

14) PMSMs use: ____.

a) Permanent magnets b) Electromagnets
c) Induction coils d) None of the above

Seat No.		Set	P

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer the following: (Any Four) **16**

a) Describe the main components of an electric propulsion system.
b) Describe the role of electric motors in Electric Vehicles (EVs).
c) Explain the construction and component of electric motors.
d) Comparison between DC Motor, induction Motor, synchronous Motor and permanent magnet motors.
e) Draw and explain in details of Shunt DC motor.
f) Draw and explain in details of Series DC motor.

Q.3 Answer the following: (Any Two) **12**

a) Explain in details of principles of electric motors (Faraday's law, Lorentz force, torque production).
b) Explain the construction and component of electric motors.
c) Comparison between DC series motor and Shunt motor.

Section – II

Q.4 Solve the following: (Any Four) **16**

a) Explain the working principle of three-phase induction motor.
b) Comparison between Squirrel Cage & Slip Ring Induction Motor.
c) Explain the need for starters in electric motors used in EVs.
d) Describe the function and operation of stator resistance starter.
e) Explain in brief working and construction of Permanent Magnet Synchronous motor.
f) Explain in brief working and construction of Switched Reluctance motor.

Q.5 Solve the following: (Any Two) **12**

a) Explain in details design considerations for induction motors in Electric Vehicle.
b) Describe the function and operation of star-delta starters.
c) Explain in brief working and construction of Brushless DC motor.

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve All MCQ Questions: **14**

1) Which of the following design considerations is crucial for induction motors in EVs?
a) High torque density b) Low noise emission
c) High power factor d) All of the above

2) What is the primary function of a Variable Frequency Drive (VFD) in an induction motor?
a) To regulate the motor speed
b) To control the motor torque
c) To optimize the motor efficiency
d) To convert DC power to AC power

3) What is the primary reason for using starters in electric motors used in Electric Vehicles (EVs)?
a) To increase the starting torque
b) To reduce the starting current
c) To improve the motor efficiency
d) To increase the motor speed

4) Which of the following is a benefit of using starters in electric motors used in EVs?
a) Increased starting torque b) Reduced starting current
c) Improved motor efficiency d) All of the above

5) What happens when an electric motor is started without a starter?
a) The motor starts smoothly
b) The motor starts with a high starting torque
c) The motor draws a high inrush current
d) The motor does not start

6) What is the primary advantage of PMSMs?
a) High efficiency b) Low cost
c) Simple construction d) High torque ripple

7) PMSMs use: ____.
a) Permanent magnets b) Electromagnets
c) Induction coils d) None of the above

8) What is the primary role of electric motors in Electric Vehicles (EVs)?
a) To generate electricity b) To propel the vehicle
c) To charge the battery d) To power accessories

9) Which type of electric motor uses a permanent magnet as the rotor?
a) DC motor b) Induction motor
c) Synchronous motor d) Permanent Magnet (PM) motor

10) What is the fundamental principle behind the operation of electric motors?
a) Faraday's law b) Lorentz force
c) Newton's law d) Ohm’s law

11) Which of the following DC motors has the highest starting torque?
a) DC Shunt Motor b) DC Series Motor
c) DC Compound Motor d) None of the above

12) In a DC shunt motor, the field winding is connected: _____
a) In series with the armature
b) In parallel with the armature
c) In series with the load
d) In parallel with the load

13) A DC compound motor has: ____.
a) Only series field winding
b) Only shunt field winding
c) Both series and shunt field windings
d) Neither series nor shunt field winding

14) What is the primary advantage of using three-phase induction motors in Electric Vehicles (EVs)?
a) High power density b) Low cost
c) High efficiency d) Simple control

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer the following: (Any Four) **16**

a) Describe the main components of an electric propulsion system.
b) Describe the role of electric motors in Electric Vehicles (EVs).
c) Explain the construction and component of electric motors.
d) Comparison between DC Motor, induction Motor, synchronous Motor and permanent magnet motors.
e) Draw and explain in details of Shunt DC motor.
f) Draw and explain in details of Series DC motor.

Q.3 Answer the following: (Any Two) **12**

a) Explain in details of principles of electric motors (Faraday's law, Lorentz force, torque production).
b) Explain the construction and component of electric motors.
c) Comparison between DC series motor and Shunt motor.

Section – II

Q.4 Solve the following: (Any Four) **16**

a) Explain the working principle of three-phase induction motor.
b) Comparison between Squirrel Cage & Slip Ring Induction Motor.
c) Explain the need for starters in electric motors used in EVs.
d) Describe the function and operation of stator resistance starter.
e) Explain in brief working and construction of Permanent Magnet Synchronous motor.
f) Explain in brief working and construction of Switched Reluctance motor.

Q.5 Solve the following: (Any Two) **12**

a) Explain in details design considerations for induction motors in Electric Vehicle.
b) Describe the function and operation of star-delta starters.
c) Explain in brief working and construction of Brushless DC motor.

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve All MCQ Questions: **14**

1) Which of the following is a benefit of using starters in electric motors used in EVs?
a) Increased starting torque b) Reduced starting current
c) Improved motor efficiency d) All of the above

2) What happens when an electric motor is started without a starter?
a) The motor starts smoothly
b) The motor starts with a high starting torque
c) The motor draws a high inrush current
d) The motor does not start

3) What is the primary advantage of PMSMs?
a) High efficiency b) Low cost
c) Simple construction d) High torque ripple

4) PMSMs use: ____.
a) Permanent magnets b) Electromagnets
c) Induction coils d) None of the above

5) What is the primary role of electric motors in Electric Vehicles (EVs)?
a) To generate electricity b) To propel the vehicle
c) To charge the battery d) To power accessories

6) Which type of electric motor uses a permanent magnet as the rotor?
a) DC motor b) Induction motor
c) Synchronous motor d) Permanent Magnet (PM) motor

7) What is the fundamental principle behind the operation of electric motors?
a) Faraday's law b) Lorentz force
c) Newton's law d) Ohm's law

8) Which of the following DC motors has the highest starting torque?
a) DC Shunt Motor b) DC Series Motor
c) DC Compound Motor d) None of the above

9) In a DC shunt motor, the field winding is connected: _____
a) In series with the armature
b) In parallel with the armature
c) In series with the load
d) In parallel with the load

10) A DC compound motor has: ____.
a) Only series field winding
b) Only shunt field winding
c) Both series and shunt field windings
d) Neither series nor shunt field winding

11) What is the primary advantage of using three-phase induction motors in Electric Vehicles (EVs)?
a) High power density b) Low cost
c) High efficiency d) Simple control

12) Which of the following design considerations is crucial for induction motors in EVs?
a) High torque density b) Low noise emission
c) High power factor d) All of the above

13) What is the primary function of a Variable Frequency Drive (VFD) in an induction motor?
a) To regulate the motor speed
b) To control the motor torque
c) To optimize the motor efficiency
d) To convert DC power to AC power

14) What is the primary reason for using starters in electric motors used in Electric Vehicles (EVs)?
a) To increase the starting torque
b) To reduce the starting current
c) To improve the motor efficiency
d) To increase the motor speed

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer the following: (Any Four) **16**

a) Describe the main components of an electric propulsion system.
b) Describe the role of electric motors in Electric Vehicles (EVs).
c) Explain the construction and component of electric motors.
d) Comparison between DC Motor, induction Motor, synchronous Motor and permanent magnet motors.
e) Draw and explain in details of Shunt DC motor.
f) Draw and explain in details of Series DC motor.

Q.3 Answer the following: (Any Two) **12**

a) Explain in details of principles of electric motors (Faraday's law, Lorentz force, torque production).
b) Explain the construction and component of electric motors.
c) Comparison between DC series motor and Shunt motor.

Section – II

Q.4 Solve the following: (Any Four) **16**

a) Explain the working principle of three-phase induction motor.
b) Comparison between Squirrel Cage & Slip Ring Induction Motor.
c) Explain the need for starters in electric motors used in EVs.
d) Describe the function and operation of stator resistance starter.
e) Explain in brief working and construction of Permanent Magnet Synchronous motor.
f) Explain in brief working and construction of Switched Reluctance motor.

Q.5 Solve the following: (Any Two) **12**

a) Explain in details design considerations for induction motors in Electric Vehicle.
b) Describe the function and operation of star-delta starters.
c) Explain in brief working and construction of Brushless DC motor.

Seat No.		Set	S

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve All MCQ Questions: **14**

1) A DC compound motor has: ____.
a) Only series field winding
b) Only shunt field winding
c) Both series and shunt field windings
d) Neither series nor shunt field winding

2) What is the primary advantage of using three-phase induction motors in Electric Vehicles (EVs)?
a) High power density b) Low cost
c) High efficiency d) Simple control

3) Which of the following design considerations is crucial for induction motors in EVs?
a) High torque density b) Low noise emission
c) High power factor d) All of the above

4) What is the primary function of a Variable Frequency Drive (VFD) in an induction motor?
a) To regulate the motor speed
b) To control the motor torque
c) To optimize the motor efficiency
d) To convert DC power to AC power

5) What is the primary reason for using starters in electric motors used in Electric Vehicles (EVs)?
a) To increase the starting torque
b) To reduce the starting current
c) To improve the motor efficiency
d) To increase the motor speed

6) Which of the following is a benefit of using starters in electric motors used in EVs?
a) Increased starting torque b) Reduced starting current
c) Improved motor efficiency d) All of the above

7) What happens when an electric motor is started without a starter?
a) The motor starts smoothly
b) The motor starts with a high starting torque
c) The motor draws a high inrush current
d) The motor does not start

8) What is the primary advantage of PMSMs?
a) High efficiency b) Low cost
c) Simple construction d) High torque ripple

9) PMSMs use: ____.
a) Permanent magnets b) Electromagnets
c) Induction coils d) None of the above

10) What is the primary role of electric motors in Electric Vehicles (EVs)?
a) To generate electricity b) To propel the vehicle
c) To charge the battery d) To power accessories

11) Which type of electric motor uses a permanent magnet as the rotor?
a) DC motor b) Induction motor
c) Synchronous motor d) Permanent Magnet (PM) motor

12) What is the fundamental principle behind the operation of electric motors?
a) Faraday's law b) Lorentz force
c) Newton's law d) Ohm’s law

13) Which of the following DC motors has the highest starting torque?
a) DC Shunt Motor b) DC Series Motor
c) DC Compound Motor d) None of the above

14) In a DC shunt motor, the field winding is connected: _____
a) In series with the armature
b) In parallel with the armature
c) In series with the load
d) In parallel with the load

SLR-BD-279

Seat No.		Set	S

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer the following: (Any Four) **16**

a) Describe the main components of an electric propulsion system.
b) Describe the role of electric motors in Electric Vehicles (EVs).
c) Explain the construction and component of electric motors.
d) Comparison between DC Motor, induction Motor, synchronous Motor and permanent magnet motors.
e) Draw and explain in details of Shunt DC motor.
f) Draw and explain in details of Series DC motor.

Q.3 Answer the following: (Any Two) **12**

a) Explain in details of principles of electric motors (Faraday's law, Lorentz force, torque production).
b) Explain the construction and component of electric motors.
c) Comparison between DC series motor and Shunt motor.

Section – II

Q.4 Solve the following: (Any Four) **16**

a) Explain the working principle of three-phase induction motor.
b) Comparison between Squirrel Cage & Slip Ring Induction Motor.
c) Explain the need for starters in electric motors used in EVs.
d) Describe the function and operation of stator resistance starter.
e) Explain in brief working and construction of Permanent Magnet Synchronous motor.
f) Explain in brief working and construction of Switched Reluctance motor.

Q.5 Solve the following: (Any Two) **12**

a) Explain in details design considerations for induction motors in Electric Vehicle.
b) Describe the function and operation of star-delta starters.
c) Explain in brief working and construction of Brushless DC motor.

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve All MCQ Questions: 14

1) What is the primary role of electric motors in Electric Vehicles (EVs)?
a) To generate electricity b) To propel the vehicle
c) To charge the battery d) To power accessories

2) Which type of electric motor uses a permanent magnet as the rotor?
a) DC motor b) Induction motor
c) Synchronous motor d) Permanent Magnet (PM) motor

3) What is the fundamental principle behind the operation of electric motors?
a) Faraday's law b) Lorentz force
c) Newton's law d) Ohm's law

4) Which of the following DC motors has the highest starting torque?
a) DC Shunt Motor b) DC Series Motor
c) DC Compound Motor d) None of the above

5) In a DC shunt motor, the field winding is connected: _____
a) In series with the armature
b) In parallel with the armature
c) In series with the load
d) In parallel with the load

6) A DC compound motor has: ____.
a) Only series field winding
b) Only shunt field winding
c) Both series and shunt field windings
d) Neither series nor shunt field winding

7) What is the primary advantage of using three-phase induction motors in Electric Vehicles (EVs)?
a) High power density b) Low cost
c) High efficiency d) Simple control

8) Which of the following design considerations is crucial for induction motors in EVs?

a) High torque density b) Low noise emission
c) High power factor d) All of the above

9) What is the primary function of a Variable Frequency Drive (VFD) in an induction motor?

a) To regulate the motor speed
b) To control the motor torque
c) To optimize the motor efficiency
d) To convert DC power to AC power

10) What is the primary reason for using starters in electric motors used in Electric Vehicles (EVs)?

a) To increase the starting torque
b) To reduce the starting current
c) To improve the motor efficiency
d) To increase the motor speed

11) Which of the following is a benefit of using starters in electric motors used in EVs?

a) Increased starting torque b) Reduced starting current
c) Improved motor efficiency d) All of the above

12) What happens when an electric motor is started without a starter?

a) The motor starts smoothly
b) The motor starts with a high starting torque
c) The motor draws a high inrush current
d) The motor does not start

13) What is the primary advantage of PMSMs?

a) High efficiency b) Low cost
c) Simple construction d) High torque ripple

14) PMSMs use: ____.

a) Permanent magnets b) Electromagnets
c) Induction coils d) None of the above

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer the following: (Any Four) **16**

a) Describe the main components of an electric propulsion system.
b) Describe the role of electric motors in Electric Vehicles (EVs).
c) Explain the construction and component of electric motors.
d) Comparison between DC Motor, induction Motor, synchronous Motor and permanent magnet motors.
e) Draw and explain in details of Shunt DC motor.
f) Draw and explain in details of Series DC motor.

Q.3 Answer the following: (Any Two) **12**

a) Explain in details of principles of electric motors (Faraday's law, Lorentz force, torque production).
b) Explain the construction and component of electric motors.
c) Comparison between DC series motor and Shunt motor.

Section – II

Q.4 Solve the following: (Any Four) **16**

a) Explain the working principle of three-phase induction motor.
b) Comparison between Squirrel Cage & Slip Ring Induction Motor.
c) Explain the need for starters in electric motors used in EVs.
d) Describe the function and operation of stator resistance starter.
e) Explain in brief working and construction of Permanent Magnet Synchronous motor.
f) Explain in brief working and construction of Switched Reluctance motor.

Q.5 Solve the following: (Any Two) **12**

a) Explain in details design considerations for induction motors in Electric Vehicle.
b) Describe the function and operation of star-delta starters.
c) Explain in brief working and construction of Brushless DC motor.

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve All MCQ Questions: **14**

1) Which of the following design considerations is crucial for induction motors in EVs?
a) High torque density b) Low noise emission
c) High power factor d) All of the above

2) What is the primary function of a Variable Frequency Drive (VFD) in an induction motor?
a) To regulate the motor speed
b) To control the motor torque
c) To optimize the motor efficiency
d) To convert DC power to AC power

3) What is the primary reason for using starters in electric motors used in Electric Vehicles (EVs)?
a) To increase the starting torque
b) To reduce the starting current
c) To improve the motor efficiency
d) To increase the motor speed

4) Which of the following is a benefit of using starters in electric motors used in EVs?
a) Increased starting torque b) Reduced starting current
c) Improved motor efficiency d) All of the above

5) What happens when an electric motor is started without a starter?
a) The motor starts smoothly
b) The motor starts with a high starting torque
c) The motor draws a high inrush current
d) The motor does not start

6) What is the primary advantage of PMSMs?
a) High efficiency b) Low cost
c) Simple construction d) High torque ripple

7) PMSMs use: ____.
a) Permanent magnets b) Electromagnets
c) Induction coils d) None of the above

8) What is the primary role of electric motors in Electric Vehicles (EVs)?
a) To generate electricity b) To propel the vehicle
c) To charge the battery d) To power accessories

9) Which type of electric motor uses a permanent magnet as the rotor?
a) DC motor b) Induction motor
c) Synchronous motor d) Permanent Magnet (PM) motor

10) What is the fundamental principle behind the operation of electric motors?
a) Faraday's law b) Lorentz force
c) Newton's law d) Ohm’s law

11) Which of the following DC motors has the highest starting torque?
a) DC Shunt Motor b) DC Series Motor
c) DC Compound Motor d) None of the above

12) In a DC shunt motor, the field winding is connected: _____
a) In series with the armature
b) In parallel with the armature
c) In series with the load
d) In parallel with the load

13) A DC compound motor has: ____.
a) Only series field winding
b) Only shunt field winding
c) Both series and shunt field windings
d) Neither series nor shunt field winding

14) What is the primary advantage of using three-phase induction motors in Electric Vehicles (EVs)?
a) High power density b) Low cost
c) High efficiency d) Simple control

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer the following: (Any Four) **16**

a) Describe the main components of an electric propulsion system.
b) Describe the role of electric motors in Electric Vehicles (EVs).
c) Explain the construction and component of electric motors.
d) Comparison between DC Motor, induction Motor, synchronous Motor and permanent magnet motors.
e) Draw and explain in details of Shunt DC motor.
f) Draw and explain in details of Series DC motor.

Q.3 Answer the following: (Any Two) **12**

a) Explain in details of principles of electric motors (Faraday's law, Lorentz force, torque production).
b) Explain the construction and component of electric motors.
c) Comparison between DC series motor and Shunt motor.

Section – II

Q.4 Solve the following: (Any Four) **16**

a) Explain the working principle of three-phase induction motor.
b) Comparison between Squirrel Cage & Slip Ring Induction Motor.
c) Explain the need for starters in electric motors used in EVs.
d) Describe the function and operation of stator resistance starter.
e) Explain in brief working and construction of Permanent Magnet Synchronous motor.
f) Explain in brief working and construction of Switched Reluctance motor.

Q.5 Solve the following: (Any Two) **12**

a) Explain in details design considerations for induction motors in Electric Vehicle.
b) Describe the function and operation of star-delta starters.
c) Explain in brief working and construction of Brushless DC motor.

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve All MCQ Questions: **14**

1) Which of the following is a benefit of using starters in electric motors used in EVs?
a) Increased starting torque b) Reduced starting current
c) Improved motor efficiency d) All of the above

2) What happens when an electric motor is started without a starter?
a) The motor starts smoothly
b) The motor starts with a high starting torque
c) The motor draws a high inrush current
d) The motor does not start

3) What is the primary advantage of PMSMs?
a) High efficiency b) Low cost
c) Simple construction d) High torque ripple

4) PMSMs use: ____.
a) Permanent magnets b) Electromagnets
c) Induction coils d) None of the above

5) What is the primary role of electric motors in Electric Vehicles (EVs)?
a) To generate electricity b) To propel the vehicle
c) To charge the battery d) To power accessories

6) Which type of electric motor uses a permanent magnet as the rotor?
a) DC motor b) Induction motor
c) Synchronous motor d) Permanent Magnet (PM) motor

7) What is the fundamental principle behind the operation of electric motors?
a) Faraday's law b) Lorentz force
c) Newton's law d) Ohm's law

8) Which of the following DC motors has the highest starting torque?
a) DC Shunt Motor b) DC Series Motor
c) DC Compound Motor d) None of the above

9) In a DC shunt motor, the field winding is connected: _____
a) In series with the armature
b) In parallel with the armature
c) In series with the load
d) In parallel with the load

10) A DC compound motor has: ____.
a) Only series field winding
b) Only shunt field winding
c) Both series and shunt field windings
d) Neither series nor shunt field winding

11) What is the primary advantage of using three-phase induction motors in Electric Vehicles (EVs)?
a) High power density b) Low cost
c) High efficiency d) Simple control

12) Which of the following design considerations is crucial for induction motors in EVs?
a) High torque density b) Low noise emission
c) High power factor d) All of the above

13) What is the primary function of a Variable Frequency Drive (VFD) in an induction motor?
a) To regulate the motor speed
b) To control the motor torque
c) To optimize the motor efficiency
d) To convert DC power to AC power

14) What is the primary reason for using starters in electric motors used in Electric Vehicles (EVs)?
a) To increase the starting torque
b) To reduce the starting current
c) To improve the motor efficiency
d) To increase the motor speed

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer the following: (Any Four) **16**

a) Describe the main components of an electric propulsion system.
b) Describe the role of electric motors in Electric Vehicles (EVs).
c) Explain the construction and component of electric motors.
d) Comparison between DC Motor, induction Motor, synchronous Motor and permanent magnet motors.
e) Draw and explain in details of Shunt DC motor.
f) Draw and explain in details of Series DC motor.

Q.3 Answer the following: (Any Two) **12**

a) Explain in details of principles of electric motors (Faraday's law, Lorentz force, torque production).
b) Explain the construction and component of electric motors.
c) Comparison between DC series motor and Shunt motor.

Section – II

Q.4 Solve the following: (Any Four) **16**

a) Explain the working principle of three-phase induction motor.
b) Comparison between Squirrel Cage & Slip Ring Induction Motor.
c) Explain the need for starters in electric motors used in EVs.
d) Describe the function and operation of stator resistance starter.
e) Explain in brief working and construction of Permanent Magnet Synchronous motor.
f) Explain in brief working and construction of Switched Reluctance motor.

Q.5 Solve the following: (Any Two) **12**

a) Explain in details design considerations for induction motors in Electric Vehicle.
b) Describe the function and operation of star-delta starters.
c) Explain in brief working and construction of Brushless DC motor.

Seat No.		Set	S

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve All MCQ Questions: **14**

1) A DC compound motor has: ____.
a) Only series field winding
b) Only shunt field winding
c) Both series and shunt field windings
d) Neither series nor shunt field winding

2) What is the primary advantage of using three-phase induction motors in Electric Vehicles (EVs)?
a) High power density b) Low cost
c) High efficiency d) Simple control

3) Which of the following design considerations is crucial for induction motors in EVs?
a) High torque density b) Low noise emission
c) High power factor d) All of the above

4) What is the primary function of a Variable Frequency Drive (VFD) in an induction motor?
a) To regulate the motor speed
b) To control the motor torque
c) To optimize the motor efficiency
d) To convert DC power to AC power

5) What is the primary reason for using starters in electric motors used in Electric Vehicles (EVs)?
a) To increase the starting torque
b) To reduce the starting current
c) To improve the motor efficiency
d) To increase the motor speed

6) Which of the following is a benefit of using starters in electric motors used in EVs?
a) Increased starting torque b) Reduced starting current
c) Improved motor efficiency d) All of the above

7) What happens when an electric motor is started without a starter?
a) The motor starts smoothly
b) The motor starts with a high starting torque
c) The motor draws a high inrush current
d) The motor does not start

8) What is the primary advantage of PMSMs?
a) High efficiency b) Low cost
c) Simple construction d) High torque ripple

9) PMSMs use: ____.
a) Permanent magnets b) Electromagnets
c) Induction coils d) None of the above

10) What is the primary role of electric motors in Electric Vehicles (EVs)?
a) To generate electricity b) To propel the vehicle
c) To charge the battery d) To power accessories

11) Which type of electric motor uses a permanent magnet as the rotor?
a) DC motor b) Induction motor
c) Synchronous motor d) Permanent Magnet (PM) motor

12) What is the fundamental principle behind the operation of electric motors?
a) Faraday's law b) Lorentz force
c) Newton's law d) Ohm’s law

13) Which of the following DC motors has the highest starting torque?
a) DC Shunt Motor b) DC Series Motor
c) DC Compound Motor d) None of the above

14) In a DC shunt motor, the field winding is connected: _____
a) In series with the armature
b) In parallel with the armature
c) In series with the load
d) In parallel with the load

SLR-BD-279

Seat No.		Set	S

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer the following: (Any Four) **16**

a) Describe the main components of an electric propulsion system.
b) Describe the role of electric motors in Electric Vehicles (EVs).
c) Explain the construction and component of electric motors.
d) Comparison between DC Motor, induction Motor, synchronous Motor and permanent magnet motors.
e) Draw and explain in details of Shunt DC motor.
f) Draw and explain in details of Series DC motor.

Q.3 Answer the following: (Any Two) **12**

a) Explain in details of principles of electric motors (Faraday's law, Lorentz force, torque production).
b) Explain the construction and component of electric motors.
c) Comparison between DC series motor and Shunt motor.

Section – II

Q.4 Solve the following: (Any Four) **16**

a) Explain the working principle of three-phase induction motor.
b) Comparison between Squirrel Cage & Slip Ring Induction Motor.
c) Explain the need for starters in electric motors used in EVs.
d) Describe the function and operation of stator resistance starter.
e) Explain in brief working and construction of Permanent Magnet Synchronous motor.
f) Explain in brief working and construction of Switched Reluctance motor.

Q.5 Solve the following: (Any Two) **12**

a) Explain in details design considerations for induction motors in Electric Vehicle.
b) Describe the function and operation of star-delta starters.
c) Explain in brief working and construction of Brushless DC motor.

Seat No.	

Set P

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve All MCQ Questions: 14

1) What is the primary role of electric motors in Electric Vehicles (EVs)?
a) To generate electricity b) To propel the vehicle
c) To charge the battery d) To power accessories

2) Which type of electric motor uses a permanent magnet as the rotor?
a) DC motor b) Induction motor
c) Synchronous motor d) Permanent Magnet (PM) motor

3) What is the fundamental principle behind the operation of electric motors?
a) Faraday's law b) Lorentz force
c) Newton's law d) Ohm's law

4) Which of the following DC motors has the highest starting torque?
a) DC Shunt Motor b) DC Series Motor
c) DC Compound Motor d) None of the above

5) In a DC shunt motor, the field winding is connected: _____
a) In series with the armature
b) In parallel with the armature
c) In series with the load
d) In parallel with the load

6) A DC compound motor has: ____.
a) Only series field winding
b) Only shunt field winding
c) Both series and shunt field windings
d) Neither series nor shunt field winding

7) What is the primary advantage of using three-phase induction motors in Electric Vehicles (EVs)?
a) High power density b) Low cost
c) High efficiency d) Simple control

8) Which of the following design considerations is crucial for induction motors in EVs?

a) High torque density
b) Low noise emission
c) High power factor
d) All of the above

9) What is the primary function of a Variable Frequency Drive (VFD) in an induction motor?

a) To regulate the motor speed
b) To control the motor torque
c) To optimize the motor efficiency
d) To convert DC power to AC power

10) What is the primary reason for using starters in electric motors used in Electric Vehicles (EVs)?

a) To increase the starting torque
b) To reduce the starting current
c) To improve the motor efficiency
d) To increase the motor speed

11) Which of the following is a benefit of using starters in electric motors used in EVs?

a) Increased starting torque
b) Reduced starting current
c) Improved motor efficiency
d) All of the above

12) What happens when an electric motor is started without a starter?

a) The motor starts smoothly
b) The motor starts with a high starting torque
c) The motor draws a high inrush current
d) The motor does not start

13) What is the primary advantage of PMSMs?

a) High efficiency
b) Low cost
c) Simple construction
d) High torque ripple

14) PMSMs use: ____.

a) Permanent magnets
b) Electromagnets
c) Induction coils
d) None of the above

Seat No.		Set	P

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer the following: (Any Four) **16**

a) Describe the main components of an electric propulsion system.
b) Describe the role of electric motors in Electric Vehicles (EVs).
c) Explain the construction and component of electric motors.
d) Comparison between DC Motor, induction Motor, synchronous Motor and permanent magnet motors.
e) Draw and explain in details of Shunt DC motor.
f) Draw and explain in details of Series DC motor.

Q.3 Answer the following: (Any Two) **12**

a) Explain in details of principles of electric motors (Faraday's law, Lorentz force, torque production).
b) Explain the construction and component of electric motors.
c) Comparison between DC series motor and Shunt motor.

Section – II

Q.4 Solve the following: (Any Four) **16**

a) Explain the working principle of three-phase induction motor.
b) Comparison between Squirrel Cage & Slip Ring Induction Motor.
c) Explain the need for starters in electric motors used in EVs.
d) Describe the function and operation of stator resistance starter.
e) Explain in brief working and construction of Permanent Magnet Synchronous motor.
f) Explain in brief working and construction of Switched Reluctance motor.

Q.5 Solve the following: (Any Two) **12**

a) Explain in details design considerations for induction motors in Electric Vehicle.
b) Describe the function and operation of star-delta starters.
c) Explain in brief working and construction of Brushless DC motor.

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve All MCQ Questions: **14**

1) Which of the following design considerations is crucial for induction motors in EVs?
a) High torque density b) Low noise emission
c) High power factor d) All of the above

2) What is the primary function of a Variable Frequency Drive (VFD) in an induction motor?
a) To regulate the motor speed
b) To control the motor torque
c) To optimize the motor efficiency
d) To convert DC power to AC power

3) What is the primary reason for using starters in electric motors used in Electric Vehicles (EVs)?
a) To increase the starting torque
b) To reduce the starting current
c) To improve the motor efficiency
d) To increase the motor speed

4) Which of the following is a benefit of using starters in electric motors used in EVs?
a) Increased starting torque b) Reduced starting current
c) Improved motor efficiency d) All of the above

5) What happens when an electric motor is started without a starter?
a) The motor starts smoothly
b) The motor starts with a high starting torque
c) The motor draws a high inrush current
d) The motor does not start

6) What is the primary advantage of PMSMs?
a) High efficiency b) Low cost
c) Simple construction d) High torque ripple

7) PMSMs use: ____.
a) Permanent magnets b) Electromagnets
c) Induction coils d) None of the above

8) What is the primary role of electric motors in Electric Vehicles (EVs)?
a) To generate electricity b) To propel the vehicle
c) To charge the battery d) To power accessories

9) Which type of electric motor uses a permanent magnet as the rotor?
a) DC motor b) Induction motor
c) Synchronous motor d) Permanent Magnet (PM) motor

10) What is the fundamental principle behind the operation of electric motors?
a) Faraday's law b) Lorentz force
c) Newton's law d) Ohm’s law

11) Which of the following DC motors has the highest starting torque?
a) DC Shunt Motor b) DC Series Motor
c) DC Compound Motor d) None of the above

12) In a DC shunt motor, the field winding is connected: _____
a) In series with the armature
b) In parallel with the armature
c) In series with the load
d) In parallel with the load

13) A DC compound motor has: ____.
a) Only series field winding
b) Only shunt field winding
c) Both series and shunt field windings
d) Neither series nor shunt field winding

14) What is the primary advantage of using three-phase induction motors in Electric Vehicles (EVs)?
a) High power density b) Low cost
c) High efficiency d) Simple control

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer the following: (Any Four) **16**

a) Describe the main components of an electric propulsion system.
b) Describe the role of electric motors in Electric Vehicles (EVs).
c) Explain the construction and component of electric motors.
d) Comparison between DC Motor, induction Motor, synchronous Motor and permanent magnet motors.
e) Draw and explain in details of Shunt DC motor.
f) Draw and explain in details of Series DC motor.

Q.3 Answer the following: (Any Two) **12**

a) Explain in details of principles of electric motors (Faraday's law, Lorentz force, torque production).
b) Explain the construction and component of electric motors.
c) Comparison between DC series motor and Shunt motor.

Section – II

Q.4 Solve the following: (Any Four) **16**

a) Explain the working principle of three-phase induction motor.
b) Comparison between Squirrel Cage & Slip Ring Induction Motor.
c) Explain the need for starters in electric motors used in EVs.
d) Describe the function and operation of stator resistance starter.
e) Explain in brief working and construction of Permanent Magnet Synchronous motor.
f) Explain in brief working and construction of Switched Reluctance motor.

Q.5 Solve the following: (Any Two) **12**

a) Explain in details design considerations for induction motors in Electric Vehicle.
b) Describe the function and operation of star-delta starters.
c) Explain in brief working and construction of Brushless DC motor.

Seat No.		Set	R

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve All MCQ Questions: **14**

1) Which of the following is a benefit of using starters in electric motors used in EVs?
a) Increased starting torque b) Reduced starting current
c) Improved motor efficiency d) All of the above

2) What happens when an electric motor is started without a starter?
a) The motor starts smoothly
b) The motor starts with a high starting torque
c) The motor draws a high inrush current
d) The motor does not start

3) What is the primary advantage of PMSMs?
a) High efficiency b) Low cost
c) Simple construction d) High torque ripple

4) PMSMs use: ____.
a) Permanent magnets b) Electromagnets
c) Induction coils d) None of the above

5) What is the primary role of electric motors in Electric Vehicles (EVs)?
a) To generate electricity b) To propel the vehicle
c) To charge the battery d) To power accessories

6) Which type of electric motor uses a permanent magnet as the rotor?
a) DC motor b) Induction motor
c) Synchronous motor d) Permanent Magnet (PM) motor

7) What is the fundamental principle behind the operation of electric motors?
a) Faraday's law b) Lorentz force
c) Newton's law d) Ohm's law

8) Which of the following DC motors has the highest starting torque?
a) DC Shunt Motor b) DC Series Motor
c) DC Compound Motor d) None of the above

9) In a DC shunt motor, the field winding is connected: _____
a) In series with the armature
b) In parallel with the armature
c) In series with the load
d) In parallel with the load

10) A DC compound motor has: ____.
a) Only series field winding
b) Only shunt field winding
c) Both series and shunt field windings
d) Neither series nor shunt field winding

11) What is the primary advantage of using three-phase induction motors in Electric Vehicles (EVs)?
a) High power density b) Low cost
c) High efficiency d) Simple control

12) Which of the following design considerations is crucial for induction motors in EVs?
a) High torque density b) Low noise emission
c) High power factor d) All of the above

13) What is the primary function of a Variable Frequency Drive (VFD) in an induction motor?
a) To regulate the motor speed
b) To control the motor torque
c) To optimize the motor efficiency
d) To convert DC power to AC power

14) What is the primary reason for using starters in electric motors used in Electric Vehicles (EVs)?
a) To increase the starting torque
b) To reduce the starting current
c) To improve the motor efficiency
d) To increase the motor speed

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer the following: (Any Four) **16**

a) Describe the main components of an electric propulsion system.
b) Describe the role of electric motors in Electric Vehicles (EVs).
c) Explain the construction and component of electric motors.
d) Comparison between DC Motor, induction Motor, synchronous Motor and permanent magnet motors.
e) Draw and explain in details of Shunt DC motor.
f) Draw and explain in details of Series DC motor.

Q.3 Answer the following: (Any Two) **12**

a) Explain in details of principles of electric motors (Faraday's law, Lorentz force, torque production).
b) Explain the construction and component of electric motors.
c) Comparison between DC series motor and Shunt motor.

Section – II

Q.4 Solve the following: (Any Four) **16**

a) Explain the working principle of three-phase induction motor.
b) Comparison between Squirrel Cage & Slip Ring Induction Motor.
c) Explain the need for starters in electric motors used in EVs.
d) Describe the function and operation of stator resistance starter.
e) Explain in brief working and construction of Permanent Magnet Synchronous motor.
f) Explain in brief working and construction of Switched Reluctance motor.

Q.5 Solve the following: (Any Two) **12**

a) Explain in details design considerations for induction motors in Electric Vehicle.
b) Describe the function and operation of star-delta starters.
c) Explain in brief working and construction of Brushless DC motor.

Seat No.		Set	S

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve All MCQ Questions: **14**

1) A DC compound motor has: ____.
a) Only series field winding
b) Only shunt field winding
c) Both series and shunt field windings
d) Neither series nor shunt field winding

2) What is the primary advantage of using three-phase induction motors in Electric Vehicles (EVs)?
a) High power density b) Low cost
c) High efficiency d) Simple control

3) Which of the following design considerations is crucial for induction motors in EVs?
a) High torque density b) Low noise emission
c) High power factor d) All of the above

4) What is the primary function of a Variable Frequency Drive (VFD) in an induction motor?
a) To regulate the motor speed
b) To control the motor torque
c) To optimize the motor efficiency
d) To convert DC power to AC power

5) What is the primary reason for using starters in electric motors used in Electric Vehicles (EVs)?
a) To increase the starting torque
b) To reduce the starting current
c) To improve the motor efficiency
d) To increase the motor speed

6) Which of the following is a benefit of using starters in electric motors used in EVs?
a) Increased starting torque b) Reduced starting current
c) Improved motor efficiency d) All of the above

7) What happens when an electric motor is started without a starter?
a) The motor starts smoothly
b) The motor starts with a high starting torque
c) The motor draws a high inrush current
d) The motor does not start

8) What is the primary advantage of PMSMs?
a) High efficiency b) Low cost
c) Simple construction d) High torque ripple

9) PMSMs use: ____.
a) Permanent magnets b) Electromagnets
c) Induction coils d) None of the above

10) What is the primary role of electric motors in Electric Vehicles (EVs)?
a) To generate electricity b) To propel the vehicle
c) To charge the battery d) To power accessories

11) Which type of electric motor uses a permanent magnet as the rotor?
a) DC motor b) Induction motor
c) Synchronous motor d) Permanent Magnet (PM) motor

12) What is the fundamental principle behind the operation of electric motors?
a) Faraday's law b) Lorentz force
c) Newton's law d) Ohm’s law

13) Which of the following DC motors has the highest starting torque?
a) DC Shunt Motor b) DC Series Motor
c) DC Compound Motor d) None of the above

14) In a DC shunt motor, the field winding is connected: _____
a) In series with the armature
b) In parallel with the armature
c) In series with the load
d) In parallel with the load

SLR-BD-279

Seat No.	

Set S

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer the following: (Any Four) **16**

a) Describe the main components of an electric propulsion system.
b) Describe the role of electric motors in Electric Vehicles (EVs).
c) Explain the construction and component of electric motors.
d) Comparison between DC Motor, induction Motor, synchronous Motor and permanent magnet motors.
e) Draw and explain in details of Shunt DC motor.
f) Draw and explain in details of Series DC motor.

Q.3 Answer the following: (Any Two) **12**

a) Explain in details of principles of electric motors (Faraday's law, Lorentz force, torque production).
b) Explain the construction and component of electric motors.
c) Comparison between DC series motor and Shunt motor.

Section – II

Q.4 Solve the following: (Any Four) **16**

a) Explain the working principle of three-phase induction motor.
b) Comparison between Squirrel Cage & Slip Ring Induction Motor.
c) Explain the need for starters in electric motors used in EVs.
d) Describe the function and operation of stator resistance starter.
e) Explain in brief working and construction of Permanent Magnet Synchronous motor.
f) Explain in brief working and construction of Switched Reluctance motor.

Q.5 Solve the following: (Any Two) **12**

a) Explain in details design considerations for induction motors in Electric Vehicle.
b) Describe the function and operation of star-delta starters.
c) Explain in brief working and construction of Brushless DC motor.

Seat No.		Set	P

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve All MCQ Questions: 14

1) What is the primary role of electric motors in Electric Vehicles (EVs)?
a) To generate electricity b) To propel the vehicle
c) To charge the battery d) To power accessories

2) Which type of electric motor uses a permanent magnet as the rotor?
a) DC motor b) Induction motor
c) Synchronous motor d) Permanent Magnet (PM) motor

3) What is the fundamental principle behind the operation of electric motors?
a) Faraday's law b) Lorentz force
c) Newton's law d) Ohm's law

4) Which of the following DC motors has the highest starting torque?
a) DC Shunt Motor b) DC Series Motor
c) DC Compound Motor d) None of the above

5) In a DC shunt motor, the field winding is connected: _____
a) In series with the armature
b) In parallel with the armature
c) In series with the load
d) In parallel with the load

6) A DC compound motor has: ____.
a) Only series field winding
b) Only shunt field winding
c) Both series and shunt field windings
d) Neither series nor shunt field winding

7) What is the primary advantage of using three-phase induction motors in Electric Vehicles (EVs)?
a) High power density b) Low cost
c) High efficiency d) Simple control

8) Which of the following design considerations is crucial for induction motors in EVs?

a) High torque density b) Low noise emission
c) High power factor d) All of the above

9) What is the primary function of a Variable Frequency Drive (VFD) in an induction motor?

a) To regulate the motor speed
b) To control the motor torque
c) To optimize the motor efficiency
d) To convert DC power to AC power

10) What is the primary reason for using starters in electric motors used in Electric Vehicles (EVs)?

a) To increase the starting torque
b) To reduce the starting current
c) To improve the motor efficiency
d) To increase the motor speed

11) Which of the following is a benefit of using starters in electric motors used in EVs?

a) Increased starting torque b) Reduced starting current
c) Improved motor efficiency d) All of the above

12) What happens when an electric motor is started without a starter?

a) The motor starts smoothly
b) The motor starts with a high starting torque
c) The motor draws a high inrush current
d) The motor does not start

13) What is the primary advantage of PMSMs?

a) High efficiency b) Low cost
c) Simple construction d) High torque ripple

14) PMSMs use: ____.

a) Permanent magnets b) Electromagnets
c) Induction coils d) None of the above

Seat No.	

Set P

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer the following: (Any Four) **16**

a) Describe the main components of an electric propulsion system.
b) Describe the role of electric motors in Electric Vehicles (EVs).
c) Explain the construction and component of electric motors.
d) Comparison between DC Motor, induction Motor, synchronous Motor and permanent magnet motors.
e) Draw and explain in details of Shunt DC motor.
f) Draw and explain in details of Series DC motor.

Q.3 Answer the following: (Any Two) **12**

a) Explain in details of principles of electric motors (Faraday's law, Lorentz force, torque production).
b) Explain the construction and component of electric motors.
c) Comparison between DC series motor and Shunt motor.

Section – II

Q.4 Solve the following: (Any Four) **16**

a) Explain the working principle of three-phase induction motor.
b) Comparison between Squirrel Cage & Slip Ring Induction Motor.
c) Explain the need for starters in electric motors used in EVs.
d) Describe the function and operation of stator resistance starter.
e) Explain in brief working and construction of Permanent Magnet Synchronous motor.
f) Explain in brief working and construction of Switched Reluctance motor.

Q.5 Solve the following: (Any Two) **12**

a) Explain in details design considerations for induction motors in Electric Vehicle.
b) Describe the function and operation of star-delta starters.
c) Explain in brief working and construction of Brushless DC motor.

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve All MCQ Questions: **14**

1) Which of the following design considerations is crucial for induction motors in EVs?
a) High torque density b) Low noise emission
c) High power factor d) All of the above

2) What is the primary function of a Variable Frequency Drive (VFD) in an induction motor?
a) To regulate the motor speed
b) To control the motor torque
c) To optimize the motor efficiency
d) To convert DC power to AC power

3) What is the primary reason for using starters in electric motors used in Electric Vehicles (EVs)?
a) To increase the starting torque
b) To reduce the starting current
c) To improve the motor efficiency
d) To increase the motor speed

4) Which of the following is a benefit of using starters in electric motors used in EVs?
a) Increased starting torque b) Reduced starting current
c) Improved motor efficiency d) All of the above

5) What happens when an electric motor is started without a starter?
a) The motor starts smoothly
b) The motor starts with a high starting torque
c) The motor draws a high inrush current
d) The motor does not start

6) What is the primary advantage of PMSMs?
a) High efficiency b) Low cost
c) Simple construction d) High torque ripple

7) PMSMs use: ____.
a) Permanent magnets b) Electromagnets
c) Induction coils d) None of the above

8) What is the primary role of electric motors in Electric Vehicles (EVs)?
a) To generate electricity b) To propel the vehicle
c) To charge the battery d) To power accessories

9) Which type of electric motor uses a permanent magnet as the rotor?
a) DC motor b) Induction motor
c) Synchronous motor d) Permanent Magnet (PM) motor

10) What is the fundamental principle behind the operation of electric motors?
a) Faraday's law b) Lorentz force
c) Newton's law d) Ohm’s law

11) Which of the following DC motors has the highest starting torque?
a) DC Shunt Motor b) DC Series Motor
c) DC Compound Motor d) None of the above

12) In a DC shunt motor, the field winding is connected: _____
a) In series with the armature
b) In parallel with the armature
c) In series with the load
d) In parallel with the load

13) A DC compound motor has: ____.
a) Only series field winding
b) Only shunt field winding
c) Both series and shunt field windings
d) Neither series nor shunt field winding

14) What is the primary advantage of using three-phase induction motors in Electric Vehicles (EVs)?
a) High power density b) Low cost
c) High efficiency d) Simple control

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer the following: (Any Four) **16**

a) Describe the main components of an electric propulsion system.
b) Describe the role of electric motors in Electric Vehicles (EVs).
c) Explain the construction and component of electric motors.
d) Comparison between DC Motor, induction Motor, synchronous Motor and permanent magnet motors.
e) Draw and explain in details of Shunt DC motor.
f) Draw and explain in details of Series DC motor.

Q.3 Answer the following: (Any Two) **12**

a) Explain in details of principles of electric motors (Faraday's law, Lorentz force, torque production).
b) Explain the construction and component of electric motors.
c) Comparison between DC series motor and Shunt motor.

Section – II

Q.4 Solve the following: (Any Four) **16**

a) Explain the working principle of three-phase induction motor.
b) Comparison between Squirrel Cage & Slip Ring Induction Motor.
c) Explain the need for starters in electric motors used in EVs.
d) Describe the function and operation of stator resistance starter.
e) Explain in brief working and construction of Permanent Magnet Synchronous motor.
f) Explain in brief working and construction of Switched Reluctance motor.

Q.5 Solve the following: (Any Two) **12**

a) Explain in details design considerations for induction motors in Electric Vehicle.
b) Describe the function and operation of star-delta starters.
c) Explain in brief working and construction of Brushless DC motor.

Seat No.		Set	R

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve All MCQ Questions: 14

1) Which of the following is a benefit of using starters in electric motors used in EVs?
a) Increased starting torque b) Reduced starting current
c) Improved motor efficiency d) All of the above

2) What happens when an electric motor is started without a starter?
a) The motor starts smoothly
b) The motor starts with a high starting torque
c) The motor draws a high inrush current
d) The motor does not start

3) What is the primary advantage of PMSMs?
a) High efficiency b) Low cost
c) Simple construction d) High torque ripple

4) PMSMs use: ____.
a) Permanent magnets b) Electromagnets
c) Induction coils d) None of the above

5) What is the primary role of electric motors in Electric Vehicles (EVs)?
a) To generate electricity b) To propel the vehicle
c) To charge the battery d) To power accessories

6) Which type of electric motor uses a permanent magnet as the rotor?
a) DC motor b) Induction motor
c) Synchronous motor d) Permanent Magnet (PM) motor

7) What is the fundamental principle behind the operation of electric motors?
a) Faraday's law b) Lorentz force
c) Newton's law d) Ohm's law

8) Which of the following DC motors has the highest starting torque?
a) DC Shunt Motor b) DC Series Motor
c) DC Compound Motor d) None of the above

9) In a DC shunt motor, the field winding is connected: _____
a) In series with the armature
b) In parallel with the armature
c) In series with the load
d) In parallel with the load

10) A DC compound motor has: ____.
a) Only series field winding
b) Only shunt field winding
c) Both series and shunt field windings
d) Neither series nor shunt field winding

11) What is the primary advantage of using three-phase induction motors in Electric Vehicles (EVs)?
a) High power density b) Low cost
c) High efficiency d) Simple control

12) Which of the following design considerations is crucial for induction motors in EVs?
a) High torque density b) Low noise emission
c) High power factor d) All of the above

13) What is the primary function of a Variable Frequency Drive (VFD) in an induction motor?
a) To regulate the motor speed
b) To control the motor torque
c) To optimize the motor efficiency
d) To convert DC power to AC power

14) What is the primary reason for using starters in electric motors used in Electric Vehicles (EVs)?
a) To increase the starting torque
b) To reduce the starting current
c) To improve the motor efficiency
d) To increase the motor speed

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer the following: (Any Four) **16**

a) Describe the main components of an electric propulsion system.
b) Describe the role of electric motors in Electric Vehicles (EVs).
c) Explain the construction and component of electric motors.
d) Comparison between DC Motor, induction Motor, synchronous Motor and permanent magnet motors.
e) Draw and explain in details of Shunt DC motor.
f) Draw and explain in details of Series DC motor.

Q.3 Answer the following: (Any Two) **12**

a) Explain in details of principles of electric motors (Faraday's law, Lorentz force, torque production).
b) Explain the construction and component of electric motors.
c) Comparison between DC series motor and Shunt motor.

Section – II

Q.4 Solve the following: (Any Four) **16**

a) Explain the working principle of three-phase induction motor.
b) Comparison between Squirrel Cage & Slip Ring Induction Motor.
c) Explain the need for starters in electric motors used in EVs.
d) Describe the function and operation of stator resistance starter.
e) Explain in brief working and construction of Permanent Magnet Synchronous motor.
f) Explain in brief working and construction of Switched Reluctance motor.

Q.5 Solve the following: (Any Two) **12**

a) Explain in details design considerations for induction motors in Electric Vehicle.
b) Describe the function and operation of star-delta starters.
c) Explain in brief working and construction of Brushless DC motor.

Seat No.		Set	S

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve All MCQ Questions: **14**

1) A DC compound motor has: ____.
a) Only series field winding
b) Only shunt field winding
c) Both series and shunt field windings
d) Neither series nor shunt field winding

2) What is the primary advantage of using three-phase induction motors in Electric Vehicles (EVs)?
a) High power density b) Low cost
c) High efficiency d) Simple control

3) Which of the following design considerations is crucial for induction motors in EVs?
a) High torque density b) Low noise emission
c) High power factor d) All of the above

4) What is the primary function of a Variable Frequency Drive (VFD) in an induction motor?
a) To regulate the motor speed
b) To control the motor torque
c) To optimize the motor efficiency
d) To convert DC power to AC power

5) What is the primary reason for using starters in electric motors used in Electric Vehicles (EVs)?
a) To increase the starting torque
b) To reduce the starting current
c) To improve the motor efficiency
d) To increase the motor speed

6) Which of the following is a benefit of using starters in electric motors used in EVs?
a) Increased starting torque b) Reduced starting current
c) Improved motor efficiency d) All of the above

7) What happens when an electric motor is started without a starter?
a) The motor starts smoothly
b) The motor starts with a high starting torque
c) The motor draws a high inrush current
d) The motor does not start

8) What is the primary advantage of PMSMs?
a) High efficiency b) Low cost
c) Simple construction d) High torque ripple

9) PMSMs use: ____.
a) Permanent magnets b) Electromagnets
c) Induction coils d) None of the above

10) What is the primary role of electric motors in Electric Vehicles (EVs)?
a) To generate electricity b) To propel the vehicle
c) To charge the battery d) To power accessories

11) Which type of electric motor uses a permanent magnet as the rotor?
a) DC motor b) Induction motor
c) Synchronous motor d) Permanent Magnet (PM) motor

12) What is the fundamental principle behind the operation of electric motors?
a) Faraday's law b) Lorentz force
c) Newton's law d) Ohm’s law

13) Which of the following DC motors has the highest starting torque?
a) DC Shunt Motor b) DC Series Motor
c) DC Compound Motor d) None of the above

14) In a DC shunt motor, the field winding is connected: _____
a) In series with the armature
b) In parallel with the armature
c) In series with the load
d) In parallel with the load

SLR-BD-279

Seat No.		Set	S

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer the following: (Any Four) **16**

a) Describe the main components of an electric propulsion system.
b) Describe the role of electric motors in Electric Vehicles (EVs).
c) Explain the construction and component of electric motors.
d) Comparison between DC Motor, induction Motor, synchronous Motor and permanent magnet motors.
e) Draw and explain in details of Shunt DC motor.
f) Draw and explain in details of Series DC motor.

Q.3 Answer the following: (Any Two) **12**

a) Explain in details of principles of electric motors (Faraday's law, Lorentz force, torque production).
b) Explain the construction and component of electric motors.
c) Comparison between DC series motor and Shunt motor.

Section – II

Q.4 Solve the following: (Any Four) **16**

a) Explain the working principle of three-phase induction motor.
b) Comparison between Squirrel Cage & Slip Ring Induction Motor.
c) Explain the need for starters in electric motors used in EVs.
d) Describe the function and operation of stator resistance starter.
e) Explain in brief working and construction of Permanent Magnet Synchronous motor.
f) Explain in brief working and construction of Switched Reluctance motor.

Q.5 Solve the following: (Any Two) **12**

a) Explain in details design considerations for induction motors in Electric Vehicle.
b) Describe the function and operation of star-delta starters.
c) Explain in brief working and construction of Brushless DC motor.

Seat No.		Set	P

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve All MCQ Questions: 14

1) What is the primary role of electric motors in Electric Vehicles (EVs)?
a) To generate electricity b) To propel the vehicle
c) To charge the battery d) To power accessories

2) Which type of electric motor uses a permanent magnet as the rotor?
a) DC motor b) Induction motor
c) Synchronous motor d) Permanent Magnet (PM) motor

3) What is the fundamental principle behind the operation of electric motors?
a) Faraday's law b) Lorentz force
c) Newton's law d) Ohm's law

4) Which of the following DC motors has the highest starting torque?
a) DC Shunt Motor b) DC Series Motor
c) DC Compound Motor d) None of the above

5) In a DC shunt motor, the field winding is connected: _____
a) In series with the armature
b) In parallel with the armature
c) In series with the load
d) In parallel with the load

6) A DC compound motor has: ____.
a) Only series field winding
b) Only shunt field winding
c) Both series and shunt field windings
d) Neither series nor shunt field winding

7) What is the primary advantage of using three-phase induction motors in Electric Vehicles (EVs)?
a) High power density b) Low cost
c) High efficiency d) Simple control

8) Which of the following design considerations is crucial for induction motors in EVs?

a) High torque density b) Low noise emission
c) High power factor d) All of the above

9) What is the primary function of a Variable Frequency Drive (VFD) in an induction motor?

a) To regulate the motor speed
b) To control the motor torque
c) To optimize the motor efficiency
d) To convert DC power to AC power

10) What is the primary reason for using starters in electric motors used in Electric Vehicles (EVs)?

a) To increase the starting torque
b) To reduce the starting current
c) To improve the motor efficiency
d) To increase the motor speed

11) Which of the following is a benefit of using starters in electric motors used in EVs?

a) Increased starting torque b) Reduced starting current
c) Improved motor efficiency d) All of the above

12) What happens when an electric motor is started without a starter?

a) The motor starts smoothly
b) The motor starts with a high starting torque
c) The motor draws a high inrush current
d) The motor does not start

13) What is the primary advantage of PMSMs?

a) High efficiency b) Low cost
c) Simple construction d) High torque ripple

14) PMSMs use: ____.

a) Permanent magnets b) Electromagnets
c) Induction coils d) None of the above

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer the following: (Any Four) **16**

a) Describe the main components of an electric propulsion system.
b) Describe the role of electric motors in Electric Vehicles (EVs).
c) Explain the construction and component of electric motors.
d) Comparison between DC Motor, induction Motor, synchronous Motor and permanent magnet motors.
e) Draw and explain in details of Shunt DC motor.
f) Draw and explain in details of Series DC motor.

Q.3 Answer the following: (Any Two) **12**

a) Explain in details of principles of electric motors (Faraday's law, Lorentz force, torque production).
b) Explain the construction and component of electric motors.
c) Comparison between DC series motor and Shunt motor.

Section – II

Q.4 Solve the following: (Any Four) **16**

a) Explain the working principle of three-phase induction motor.
b) Comparison between Squirrel Cage & Slip Ring Induction Motor.
c) Explain the need for starters in electric motors used in EVs.
d) Describe the function and operation of stator resistance starter.
e) Explain in brief working and construction of Permanent Magnet Synchronous motor.
f) Explain in brief working and construction of Switched Reluctance motor.

Q.5 Solve the following: (Any Two) **12**

a) Explain in details design considerations for induction motors in Electric Vehicle.
b) Describe the function and operation of star-delta starters.
c) Explain in brief working and construction of Brushless DC motor.

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve All MCQ Questions: **14**

1) Which of the following design considerations is crucial for induction motors in EVs?
a) High torque density b) Low noise emission
c) High power factor d) All of the above

2) What is the primary function of a Variable Frequency Drive (VFD) in an induction motor?
a) To regulate the motor speed
b) To control the motor torque
c) To optimize the motor efficiency
d) To convert DC power to AC power

3) What is the primary reason for using starters in electric motors used in Electric Vehicles (EVs)?
a) To increase the starting torque
b) To reduce the starting current
c) To improve the motor efficiency
d) To increase the motor speed

4) Which of the following is a benefit of using starters in electric motors used in EVs?
a) Increased starting torque b) Reduced starting current
c) Improved motor efficiency d) All of the above

5) What happens when an electric motor is started without a starter?
a) The motor starts smoothly
b) The motor starts with a high starting torque
c) The motor draws a high inrush current
d) The motor does not start

6) What is the primary advantage of PMSMs?
a) High efficiency b) Low cost
c) Simple construction d) High torque ripple

7) PMSMs use: ____.
a) Permanent magnets b) Electromagnets
c) Induction coils d) None of the above

8) What is the primary role of electric motors in Electric Vehicles (EVs)?
a) To generate electricity b) To propel the vehicle
c) To charge the battery d) To power accessories

9) Which type of electric motor uses a permanent magnet as the rotor?
a) DC motor b) Induction motor
c) Synchronous motor d) Permanent Magnet (PM) motor

10) What is the fundamental principle behind the operation of electric motors?
a) Faraday's law b) Lorentz force
c) Newton's law d) Ohm’s law

11) Which of the following DC motors has the highest starting torque?
a) DC Shunt Motor b) DC Series Motor
c) DC Compound Motor d) None of the above

12) In a DC shunt motor, the field winding is connected: _____
a) In series with the armature
b) In parallel with the armature
c) In series with the load
d) In parallel with the load

13) A DC compound motor has: ____.
a) Only series field winding
b) Only shunt field winding
c) Both series and shunt field windings
d) Neither series nor shunt field winding

14) What is the primary advantage of using three-phase induction motors in Electric Vehicles (EVs)?
a) High power density b) Low cost
c) High efficiency d) Simple control

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer the following: (Any Four) **16**

a) Describe the main components of an electric propulsion system.
b) Describe the role of electric motors in Electric Vehicles (EVs).
c) Explain the construction and component of electric motors.
d) Comparison between DC Motor, induction Motor, synchronous Motor and permanent magnet motors.
e) Draw and explain in details of Shunt DC motor.
f) Draw and explain in details of Series DC motor.

Q.3 Answer the following: (Any Two) **12**

a) Explain in details of principles of electric motors (Faraday's law, Lorentz force, torque production).
b) Explain the construction and component of electric motors.
c) Comparison between DC series motor and Shunt motor.

Section – II

Q.4 Solve the following: (Any Four) **16**

a) Explain the working principle of three-phase induction motor.
b) Comparison between Squirrel Cage & Slip Ring Induction Motor.
c) Explain the need for starters in electric motors used in EVs.
d) Describe the function and operation of stator resistance starter.
e) Explain in brief working and construction of Permanent Magnet Synchronous motor.
f) Explain in brief working and construction of Switched Reluctance motor.

Q.5 Solve the following: (Any Two) **12**

a) Explain in details design considerations for induction motors in Electric Vehicle.
b) Describe the function and operation of star-delta starters.
c) Explain in brief working and construction of Brushless DC motor.

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve All MCQ Questions: **14**

1) Which of the following is a benefit of using starters in electric motors used in EVs?
a) Increased starting torque b) Reduced starting current
c) Improved motor efficiency d) All of the above

2) What happens when an electric motor is started without a starter?
a) The motor starts smoothly
b) The motor starts with a high starting torque
c) The motor draws a high inrush current
d) The motor does not start

3) What is the primary advantage of PMSMs?
a) High efficiency b) Low cost
c) Simple construction d) High torque ripple

4) PMSMs use: ____.
a) Permanent magnets b) Electromagnets
c) Induction coils d) None of the above

5) What is the primary role of electric motors in Electric Vehicles (EVs)?
a) To generate electricity b) To propel the vehicle
c) To charge the battery d) To power accessories

6) Which type of electric motor uses a permanent magnet as the rotor?
a) DC motor b) Induction motor
c) Synchronous motor d) Permanent Magnet (PM) motor

7) What is the fundamental principle behind the operation of electric motors?
a) Faraday's law b) Lorentz force
c) Newton's law d) Ohm's law

8) Which of the following DC motors has the highest starting torque?
a) DC Shunt Motor b) DC Series Motor
c) DC Compound Motor d) None of the above

9) In a DC shunt motor, the field winding is connected: _____
a) In series with the armature
b) In parallel with the armature
c) In series with the load
d) In parallel with the load

10) A DC compound motor has: ____.
a) Only series field winding
b) Only shunt field winding
c) Both series and shunt field windings
d) Neither series nor shunt field winding

11) What is the primary advantage of using three-phase induction motors in Electric Vehicles (EVs)?
a) High power density b) Low cost
c) High efficiency d) Simple control

12) Which of the following design considerations is crucial for induction motors in EVs?
a) High torque density b) Low noise emission
c) High power factor d) All of the above

13) What is the primary function of a Variable Frequency Drive (VFD) in an induction motor?
a) To regulate the motor speed
b) To control the motor torque
c) To optimize the motor efficiency
d) To convert DC power to AC power

14) What is the primary reason for using starters in electric motors used in Electric Vehicles (EVs)?
a) To increase the starting torque
b) To reduce the starting current
c) To improve the motor efficiency
d) To increase the motor speed

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer the following: (Any Four) **16**

a) Describe the main components of an electric propulsion system.
b) Describe the role of electric motors in Electric Vehicles (EVs).
c) Explain the construction and component of electric motors.
d) Comparison between DC Motor, induction Motor, synchronous Motor and permanent magnet motors.
e) Draw and explain in details of Shunt DC motor.
f) Draw and explain in details of Series DC motor.

Q.3 Answer the following: (Any Two) **12**

a) Explain in details of principles of electric motors (Faraday's law, Lorentz force, torque production).
b) Explain the construction and component of electric motors.
c) Comparison between DC series motor and Shunt motor.

Section – II

Q.4 Solve the following: (Any Four) **16**

a) Explain the working principle of three-phase induction motor.
b) Comparison between Squirrel Cage & Slip Ring Induction Motor.
c) Explain the need for starters in electric motors used in EVs.
d) Describe the function and operation of stator resistance starter.
e) Explain in brief working and construction of Permanent Magnet Synchronous motor.
f) Explain in brief working and construction of Switched Reluctance motor.

Q.5 Solve the following: (Any Two) **12**

a) Explain in details design considerations for induction motors in Electric Vehicle.
b) Describe the function and operation of star-delta starters.
c) Explain in brief working and construction of Brushless DC motor.

Seat No.		Set	S

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Solve All MCQ Questions: **14**

1) A DC compound motor has: ____.
a) Only series field winding
b) Only shunt field winding
c) Both series and shunt field windings
d) Neither series nor shunt field winding

2) What is the primary advantage of using three-phase induction motors in Electric Vehicles (EVs)?
a) High power density b) Low cost
c) High efficiency d) Simple control

3) Which of the following design considerations is crucial for induction motors in EVs?
a) High torque density b) Low noise emission
c) High power factor d) All of the above

4) What is the primary function of a Variable Frequency Drive (VFD) in an induction motor?
a) To regulate the motor speed
b) To control the motor torque
c) To optimize the motor efficiency
d) To convert DC power to AC power

5) What is the primary reason for using starters in electric motors used in Electric Vehicles (EVs)?
a) To increase the starting torque
b) To reduce the starting current
c) To improve the motor efficiency
d) To increase the motor speed

6) Which of the following is a benefit of using starters in electric motors used in EVs?
a) Increased starting torque b) Reduced starting current
c) Improved motor efficiency d) All of the above

7) What happens when an electric motor is started without a starter?
a) The motor starts smoothly
b) The motor starts with a high starting torque
c) The motor draws a high inrush current
d) The motor does not start

8) What is the primary advantage of PMSMs?
a) High efficiency b) Low cost
c) Simple construction d) High torque ripple

9) PMSMs use: ____.
a) Permanent magnets b) Electromagnets
c) Induction coils d) None of the above

10) What is the primary role of electric motors in Electric Vehicles (EVs)?
a) To generate electricity b) To propel the vehicle
c) To charge the battery d) To power accessories

11) Which type of electric motor uses a permanent magnet as the rotor?
a) DC motor b) Induction motor
c) Synchronous motor d) Permanent Magnet (PM) motor

12) What is the fundamental principle behind the operation of electric motors?
a) Faraday's law b) Lorentz force
c) Newton's law d) Ohm’s law

13) Which of the following DC motors has the highest starting torque?
a) DC Shunt Motor b) DC Series Motor
c) DC Compound Motor d) None of the above

14) In a DC shunt motor, the field winding is connected: _____
a) In series with the armature
b) In parallel with the armature
c) In series with the load
d) In parallel with the load

SLR-BD-279

Seat No.	

Set S

S.Y. (B. Tech) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Electrical Vehicle Motors (EEMDM-02B)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Answer the following: (Any Four) **16**

a) Describe the main components of an electric propulsion system.
b) Describe the role of electric motors in Electric Vehicles (EVs).
c) Explain the construction and component of electric motors.
d) Comparison between DC Motor, induction Motor, synchronous Motor and permanent magnet motors.
e) Draw and explain in details of Shunt DC motor.
f) Draw and explain in details of Series DC motor.

Q.3 Answer the following: (Any Two) **12**

a) Explain in details of principles of electric motors (Faraday's law, Lorentz force, torque production).
b) Explain the construction and component of electric motors.
c) Comparison between DC series motor and Shunt motor.

Section – II

Q.4 Solve the following: (Any Four) **16**

a) Explain the working principle of three-phase induction motor.
b) Comparison between Squirrel Cage & Slip Ring Induction Motor.
c) Explain the need for starters in electric motors used in EVs.
d) Describe the function and operation of stator resistance starter.
e) Explain in brief working and construction of Permanent Magnet Synchronous motor.
f) Explain in brief working and construction of Switched Reluctance motor.

Q.5 Solve the following: (Any Two) **12**

a) Explain in details design considerations for induction motors in Electric Vehicle.
b) Describe the function and operation of star-delta starters.
c) Explain in brief working and construction of Brushless DC motor.

SLR-BD-280

Seat No.		Set	P

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electric Motors and Controls for Electric Vehicle (EEHn-02A)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Make suitable assumptions (if necessary and state them clearly

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct Answer. **14**

1) How many thyristors does we need in half wave converter?
a) 1 b) 2
c) 3 d) Many

2) In a hybrid electric vehicle one energy source is_____& the other is a conversion of a _____.
a) combustion, energy to fuel b) storage, energy to fuel
c) storage, energy to energy d) storage, Fuel to energy

3) Dual converters provide
a) two quadrant operation b) three quadrant operation
c) four quadrant operation d) none of the mentioned

4) Electric motors are ideal for vehicular applications because of
a) the torque speed characteristics
b) the V 1 characteristics
c) the Pd characteristics
d) the alpha delta characteristics

5) The disadvantage of stator voltage control method using $3-\Phi$ ac voltage controller feeding a $3-\Phi 1.\mathrm{M}$ is /are
a) offers limited speed range
b) introduces pronounce harmonic contents
c) supply p.f. for the voltage is quite low
d) all of the above

6) For a step-up chopper, when the duty cycle is increased the average value of the output voltage
a) Increases b) Decreases
c) remains the same d) none of the mentioned

7) A fully controlled converter uses
a) diodes only
b) thyristors only
c) both diodes and thyristors
d) none of the mentioned

8) In VSI fed Induction Motor drives the magnitude of the load current depends on the nature of
a) load voltage
b) load impedance
c) load power
d) supply current

9) _____ method relies on keeping V/f ratio constant so as to maintain air gap flux at constant value
a) Scalar Control
b) Vector Control
c) Torque Control
d) none of the above

10) _____analysis of an IM allows decoupled analysis where the flux and torque component can be independently controlled?
a) Scalar Control
b) Vector Control
c) V/F Control
d) none of the above

11) _____is a technique that allows you to instantaneously control the motor magnetic flux and its electromagnetic torque in a decoupled way.
a) Scalar Control
b) Vector Control
c) Direct Torque Control
d) none of the above

12) The Field Oriented Control (FOC) enables the induction machine being controlled alike the
a) separately excited DC Machine
b) Permanent magnet DC Machine
c) Switched reluctance machine
d) Stepper motor

13) Which of the following control loops used by Direct torque control?
a) speed control loop
b) torque control loop
c) both a & b
d) none of the above

14) Space vector modulation is responsible for generating pulse width modulated signals to control the switches of an inverter
a) generating pulse width modulated signals to control the switches of an inverter
b) generating pulse width modulated signals only
c) control the switches of an inverter only
d) none of the above

Seat No.	

Set **P**

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electric Motors and Controls for Electric Vehicle (EEHn-02A)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Attempt any four of the following: **16**

a) Explain power flow in Hybrid Electric Drive Train System with different modes.
b) Explain frequency modulation in case of Chopper Control.
c) Explain with diagram Parallel Hybrid Electric Drive Train System.
d) Describe single phase half wave converter feeding a separately excited dc motor with circuit diagram and waveform.
e) Explain in detail basic structure of switched reluctance motor.
f) Explain the operation of V/F control method of speed control of induction motor drive.

Q.3 Attempt any two of the following: **12**

a) Explain in detail power flow in n Hybrid Electric Drive Train System with different modes.
b) Explain Closed loop Speed control of CSI fed Induction machine with suitable diagram.
c) Explain performance and control strategy of multi-quadrant operation in case of Chopper controlled dc motor.

Section – II

Q.4 Attempt any four of the following: **16**

a) Explain in detail lndirect/Feed forward vector control of induction machine.
b) Explain principle of direct vector control of induction machine.
c) Explain optimum switching vector control strategy in case of DTC control of induction machine.
d) Describe the torque expression with stator and rotor fluxes in case of Direct Torque control of induction machine.
e) Explain Vehicle Supervisory Control in the context of hybrid and electric vehicles.
f) Describe space vector modulation control in case of induction machine.

Q.5 Attempt any two of the following: **12**

a) Explain different Modal Control Strategy and Mode Selection Strategy for control of electric vehicles.

b) Explain in detail theory and dc drive analogy of field-oriented control of Induction Machine.

c) Explain with block diagram Direct Torque Control of induction motor.

SLR-BD-280

Seat No.		Set	Q

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electric Motors and Controls for Electric Vehicle (EEHn-02A)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Make suitable assumptions (if necessary and state them clearly

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct Answer. 14

1) In VSI fed Induction Motor drives the magnitude of the load current depends on the nature of
a) load voltage b) load impedance
c) load power d) supply current

2) _____ method relies on keeping V/f ratio constant so as to maintain air gap flux at constant value
a) Scalar Control b) Vector Control
c) Torque Control d) none of the above

3) _____analysis of an IM allows decoupled analysis where the flux and torque component can be independently controlled?
a) Scalar Control b) Vector Control
c) V/F Control d) none of the above

4) _____is a technique that allows you to instantaneously control the motor magnetic flux and its electromagnetic torque in a decoupled way.
a) Scalar Control b) Vector Control
c) Direct Torque Control d) none of the above

5) The Field Oriented Control (FOC) enables the induction machine being controlled alike the
a) separately excited DC Machine
b) Permanent magnet DC Machine
c) Switched reluctance machine
d) Stepper motor

6) Which of the following control loops used by Direct torque control?
a) speed control loop b) torque control loop
c) both a & b d) none of the above

7) Space vector modulation is responsible for generating pulse width modulated signals to control the switches of an inverter
a) generating pulse width modulated signals to control the switches of an inverter
b) generating pulse width modulated signals only
c) control the switches of an inverter only
d) none of the above

8) How many thyristors does we need in half wave converter?
a) 1 b) 2
c) 3 d) Many

9) In a hybrid electric vehicle one energy source is_____& the other is a conversion of a _____.
a) combustion, energy to fuel b) storage, energy to fuel
c) storage, energy to energy d) storage, Fuel to energy

10) Dual converters provide
a) two quadrant operation b) three quadrant operation
c) four quadrant operation d) none of the mentioned

11) Electric motors are ideal for vehicular applications because of
a) the torque speed characteristics
b) the V 1 characteristics
c) the Pd characteristics
d) the alpha delta characteristics

12) The disadvantage of stator voltage control method using $3-\Phi$ ac voltage controller feeding a $3-\Phi 1.\mathrm{M}$ is /are
a) offers limited speed range
b) introduces pronounce harmonic contents
c) supply p.f. for the voltage is quite low
d) all of the above

13) For a step-up chopper, when the duty cycle is increased the average value of the output voltage
a) Increases b) Decreases
c) remains the same d) none of the mentioned

14) A fully controlled converter uses
a) diodes only b) thyristors only
c) both diodes and thyristors d) none of the mentioned

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electric Motors and Controls for Electric Vehicle (EEHn-02A)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Attempt any four of the following: **16**

a) Explain power flow in Hybrid Electric Drive Train System with different modes.
b) Explain frequency modulation in case of Chopper Control.
c) Explain with diagram Parallel Hybrid Electric Drive Train System.
d) Describe single phase half wave converter feeding a separately excited dc motor with circuit diagram and waveform.
e) Explain in detail basic structure of switched reluctance motor.
f) Explain the operation of V/F control method of speed control of induction motor drive.

Q.3 Attempt any two of the following: **12**

a) Explain in detail power flow in n Hybrid Electric Drive Train System with different modes.
b) Explain Closed loop Speed control of CSI fed Induction machine with suitable diagram.
c) Explain performance and control strategy of multi-quadrant operation in case of Chopper controlled dc motor.

Section – II

Q.4 Attempt any four of the following: **16**

a) Explain in detail lndirect/Feed forward vector control of induction machine.
b) Explain principle of direct vector control of induction machine.
c) Explain optimum switching vector control strategy in case of DTC control of induction machine.
d) Describe the torque expression with stator and rotor fluxes in case of Direct Torque control of induction machine.
e) Explain Vehicle Supervisory Control in the context of hybrid and electric vehicles.
f) Describe space vector modulation control in case of induction machine.

Q.5 Attempt any two of the following: **12**

a) Explain different Modal Control Strategy and Mode Selection Strategy for control of electric vehicles.

b) Explain in detail theory and dc drive analogy of field-oriented control of Induction Machine.

c) Explain with block diagram Direct Torque Control of induction motor.

SLR-BD-280

Seat No.		Set	R

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electric Motors and Controls for Electric Vehicle (EEHn-02A)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Make suitable assumptions (if necessary and state them clearly

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct Answer. **14**

1) _____is a technique that allows you to instantaneously control the motor magnetic flux and its electromagnetic torque in a decoupled way.

a) Scalar Control b) Vector Control
c) Direct Torque Control d) none of the above

2) The Field Oriented Control (FOC) enables the induction machine being controlled alike the

a) separately excited DC Machine
b) Permanent magnet DC Machine
c) Switched reluctance machine
d) Stepper motor

3) Which of the following control loops used by Direct torque control?

a) speed control loop b) torque control loop
c) both a & b d) none of the above

4) Space vector modulation is responsible for generating pulse width modulated signals to control the switches of an inverter

a) generating pulse width modulated signals to control the switches of an inverter
b) generating pulse width modulated signals only
c) control the switches of an inverter only
d) none of the above

5) How many thyristors does we need in half wave converter?

a) 1 b) 2
c) 3 d) Many

6) In a hybrid electric vehicle one energy source is_____& the other is a conversion of a _____.

a) combustion, energy to fuel b) storage, energy to fuel
c) storage, energy to energy d) storage, Fuel to energy

7) Dual converters provide

a) two quadrant operation b) three quadrant operation
c) four quadrant operation d) none of the mentioned

8) Electric motors are ideal for vehicular applications because of

a) the torque speed characteristics
b) the V 1 characteristics
c) the Pd characteristics
d) the alpha delta characteristics

9) The disadvantage of stator voltage control method using $3-\Phi$ ac voltage controller feeding a $3-\Phi 1.\mathrm{M}$ is /are

a) offers limited speed range
b) introduces pronounce harmonic contents
c) supply p.f. for the voltage is quite low
d) all of the above

10) For a step-up chopper, when the duty cycle is increased the average value of the output voltage

a) Increases b) Decreases
c) remains the same d) none of the mentioned

11) A fully controlled converter uses

a) diodes only b) thyristors only
c) both diodes and thyristors d) none of the mentioned

12) In VSI fed Induction Motor drives the magnitude of the load current depends on the nature of

a) load voltage b) load impedance
c) load power d) supply current

13) _____ method relies on keeping V/f ratio constant so as to maintain air gap flux at constant value

a) Scalar Control b) Vector Control
c) Torque Control d) none of the above

14) _____analysis of an IM allows decoupled analysis where the flux and torque component can be independently controlled?

a) Scalar Control b) Vector Control
c) V/F Control d) none of the above

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electric Motors and Controls for Electric Vehicle (EEHn-02A)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Attempt any four of the following: **16**

a) Explain power flow in Hybrid Electric Drive Train System with different modes.
b) Explain frequency modulation in case of Chopper Control.
c) Explain with diagram Parallel Hybrid Electric Drive Train System.
d) Describe single phase half wave converter feeding a separately excited dc motor with circuit diagram and waveform.
e) Explain in detail basic structure of switched reluctance motor.
f) Explain the operation of V/F control method of speed control of induction motor drive.

Q.3 Attempt any two of the following: **12**

a) Explain in detail power flow in n Hybrid Electric Drive Train System with different modes.
b) Explain Closed loop Speed control of CSI fed Induction machine with suitable diagram.
c) Explain performance and control strategy of multi-quadrant operation in case of Chopper controlled dc motor.

Section – II

Q.4 Attempt any four of the following: **16**

a) Explain in detail lndirect/Feed forward vector control of induction machine.
b) Explain principle of direct vector control of induction machine.
c) Explain optimum switching vector control strategy in case of DTC control of induction machine.
d) Describe the torque expression with stator and rotor fluxes in case of Direct Torque control of induction machine.
e) Explain Vehicle Supervisory Control in the context of hybrid and electric vehicles.
f) Describe space vector modulation control in case of induction machine.

Q.5 Attempt any two of the following: **12**

a) Explain different Modal Control Strategy and Mode Selection Strategy for control of electric vehicles.

b) Explain in detail theory and dc drive analogy of field-oriented control of Induction Machine.

c) Explain with block diagram Direct Torque Control of induction motor.

Seat No.		Set	S

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electric Motors and Controls for Electric Vehicle (EEHn-02A)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Make suitable assumptions (if necessary and state them clearly

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct Answer. **14**

1) For a step-up chopper, when the duty cycle is increased the average value of the output voltage
a) Increases b) Decreases
c) remains the same d) none of the mentioned

2) A fully controlled converter uses
a) diodes only b) thyristors only
c) both diodes and thyristors d) none of the mentioned

3) In VSI fed Induction Motor drives the magnitude of the load current depends on the nature of
a) load voltage b) load impedance
c) load power d) supply current

4) _____ method relies on keeping V/f ratio constant so as to maintain air gap flux at constant value
a) Scalar Control b) Vector Control
c) Torque Control d) none of the above

5) _____analysis of an IM allows decoupled analysis where the flux and torque component can be independently controlled?
a) Scalar Control b) Vector Control
c) V/F Control d) none of the above

6) _____is a technique that allows you to instantaneously control the motor magnetic flux and its electromagnetic torque in a decoupled way.
a) Scalar Control b) Vector Control
c) Direct Torque Control d) none of the above

7) The Field Oriented Control (FOC) enables the induction machine being controlled alike the

a) separately excited DC Machine
b) Permanent magnet DC Machine
c) Switched reluctance machine
d) Stepper motor

8) Which of the following control loops used by Direct torque control?

a) speed control loop
b) torque control loop
c) both a & b
d) none of the above

9) Space vector modulation is responsible for generating pulse width modulated signals to control the switches of an inverter

a) generating pulse width modulated signals to control the switches of an inverter
b) generating pulse width modulated signals only
c) control the switches of an inverter only
d) none of the above

10) How many thyristors does we need in half wave converter?

a) 1
b) 2
c) 3
d) Many

11) In a hybrid electric vehicle one energy source is_____& the other is a conversion of a _____.

a) combustion, energy to fuel
b) storage, energy to fuel
c) storage, energy to energy
d) storage, Fuel to energy

12) Dual converters provide

a) two quadrant operation
b) three quadrant operation
c) four quadrant operation
d) none of the mentioned

13) Electric motors are ideal for vehicular applications because of

a) the torque speed characteristics
b) the V 1 characteristics
c) the Pd characteristics
d) the alpha delta characteristics

14) The disadvantage of stator voltage control method using $3-\Phi$ ac voltage controller feeding a $3-\Phi 1.\mathrm{M}$ is /are

a) offers limited speed range
b) introduces pronounce harmonic contents
c) supply p.f. for the voltage is quite low
d) all of the above

SLR-BD-280

Seat No.	

Set S

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electric Motors and Controls for Electric Vehicle (EEHn-02A)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

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

Section – I

Q.2 Attempt any four of the following: **16**

a) Explain power flow in Hybrid Electric Drive Train System with different modes.
b) Explain frequency modulation in case of Chopper Control.
c) Explain with diagram Parallel Hybrid Electric Drive Train System.
d) Describe single phase half wave converter feeding a separately excited dc motor with circuit diagram and waveform.
e) Explain in detail basic structure of switched reluctance motor.
f) Explain the operation of V/F control method of speed control of induction motor drive.

Q.3 Attempt any two of the following: **12**

a) Explain in detail power flow in n Hybrid Electric Drive Train System with different modes.
b) Explain Closed loop Speed control of CSI fed Induction machine with suitable diagram.
c) Explain performance and control strategy of multi-quadrant operation in case of Chopper controlled dc motor.

Section – II

Q.4 Attempt any four of the following: **16**

a) Explain in detail lndirect/Feed forward vector control of induction machine.
b) Explain principle of direct vector control of induction machine.
c) Explain optimum switching vector control strategy in case of DTC control of induction machine.
d) Describe the torque expression with stator and rotor fluxes in case of Direct Torque control of induction machine.
e) Explain Vehicle Supervisory Control in the context of hybrid and electric vehicles.
f) Describe space vector modulation control in case of induction machine.

Q.5 Attempt any two of the following: **12**

a) Explain different Modal Control Strategy and Mode Selection Strategy for control of electric vehicles.

b) Explain in detail theory and dc drive analogy of field-oriented control of Induction Machine.

c) Explain with block diagram Direct Torque Control of induction motor.

SLR-BD-281

Seat No.	

Set P

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Smart Energy Management System (EEHn-02B)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Make suitable assumptions (if necessary and state them clearly).
4) Separate answer books for each section.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct Answer. **14**

1) An Which of the following is a key feature of smart grids?
a) Manual operation b) One-way communication
c) Two-way communication d) Analog control

2) Which of the following is NOT a smart grid objective?
a) Enhanced reliability b) Increased blackouts
c) Improved efficiency d) Better load management

3) Which of these is a decision-making tool used in smart grid management?
a) SCADA b) CRM
c) ERP d) HTML

4) Which of the following is a grid-scale energy storage system?
a) Lead-acid battery b) Supercapacitor
c) Pumped hydro storage d) Mobile power bank

5) Demand aggregation refers to:
a) Combining power from multiple generators
b) Accumulating power losses
c) Consolidating loads for efficient energy use
d) Grouping substations

6) Fundamentals of demand response include:
a) Increasing transformer size
b) Real-time pricing and incentives
c) Installing solar panels
d) Extending transmission lines

7) Which of the following is ***not*** a feature of grid computing?
a) Scalability
b) Decentralized control
c) Limited resource usage
d) Fault tolerance

8) Which of the following is an example of dynamic pricing used in residential metering?
a) Flat Rate
b) Block Rate Pricing
c) Real-Time Pricing (RTP)
d) Monthly Average Pricing

9) Which of the following parameters is ***not*** typically monitored in equipment condition monitoring?
a) Vibration
b) Temperature
c) Voltage Stability Margin
d) Insulation resistance

10) Smart vending machines are designed to:
a) Provide offline transactions
b) Monitor stock and usage patterns
c) Reduce product prices
d) Operate manually

11) Which system manages heating, cooling, and electricity in a smart home?
a) HVAC System
b) IoT router
c) Central lighting panel
d) Water purifier

12) Which of the following is NOT a component of a Smart City?
a) Smart Lighting
b) Smart Toilets
c) Smart Roads
d) Smart Parking

13) PHEVs can contribute to smart grid applications through:
a) Generating electricity
b) Peak load shaving via V2G
c) Demand forecasting
d) Power factor correction

14) What is the primary goal of Demand Side Management (DSM)?
a) Increase generation capacity
b) Enhance customer billing
c) Modify consumer demand pattern
d) Reduce electricity theft

Seat No.		Set	P

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Smart Energy Management System (EEHn-02B)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt any four of the following: **16**

a) Write short notes on Hardware-Software communication in smart grids.
b) Explain the use of estimation techniques in smart grid control.
c) List different types of energy storage mediums and explain any two briefly.
d) List and explain any two applications of data mining techniques in power system analysis.
e) Briefly explain how grid computing improves reliability in smart grids.

Q.3 Attempt any two of the following: **12**

a) Discuss the key technologies used for smart grid generation, networks, and load control.
b) Describe the principles, tools, and techniques used in Demand Side Management (DSM).
c) Describe the working principle and benefits of optimization algorithms in SEMS with suitable examples.

Section – II

Q.4 Attempt any four of the following: **16**

a) Define the characteristics of distribution grids in terms of topology and assets.
b) Explain the concept of substation automation in modern distribution grids.
c) Define Advanced Metering Infrastructure (AMI) and list its key components.
d) List any two impacts of smart grid integration on the distribution network.
e) What are the main challenges in smart city modeling?

Q.5 Attempt any two of the following: **12**

a) How does substation automation contribute to grid reliability and efficiency? Discuss with applications.

b) Describe how demand response helps in load balancing and peak load reduction in a smart grid.

c) Explain in detail Smart Home System.

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Smart Energy Management System (EEHn-02B)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Make suitable assumptions (if necessary and state them clearly).
4) Separate answer books for each section.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct Answer. **14**

1) Which of the following is an example of dynamic pricing used in residential metering?
a) Flat Rate b) Block Rate Pricing
c) Real-Time Pricing (RTP) d) Monthly Average Pricing

2) Which of the following parameters is ***not*** typically monitored in equipment condition monitoring?
a) Vibration b) Temperature
c) Voltage Stability Margin d) Insulation resistance

3) Smart vending machines are designed to:
a) Provide offline transactions
b) Monitor stock and usage patterns
c) Reduce product prices
d) Operate manually

4) Which system manages heating, cooling, and electricity in a smart home?
a) HVAC System b) IoT router
c) Central lighting panel d) Water purifier

5) Which of the following is NOT a component of a Smart City?
a) Smart Lighting b) Smart Toilets
c) Smart Roads d) Smart Parking

6) PHEVs can contribute to smart grid applications through:
a) Generating electricity b) Peak load shaving via V2G
c) Demand forecasting d) Power factor correction

7) What is the primary goal of Demand Side Management (DSM)?
a) Increase generation capacity
b) Enhance customer billing
c) Modify consumer demand pattern
d) Reduce electricity theft

8) An Which of the following is a key feature of smart grids?
a) Manual operation
b) One-way communication
c) Two-way communication
d) Analog control

9) Which of the following is NOT a smart grid objective?
a) Enhanced reliability
b) Increased blackouts
c) Improved efficiency
d) Better load management

10) Which of these is a decision-making tool used in smart grid management?
a) SCADA
b) CRM
c) ERP
d) HTML

11) Which of the following is a grid-scale energy storage system?
a) Lead-acid battery
b) Supercapacitor
c) Pumped hydro storage
d) Mobile power bank

12) Demand aggregation refers to:
a) Combining power from multiple generators
b) Accumulating power losses
c) Consolidating loads for efficient energy use
d) Grouping substations

13) Fundamentals of demand response include:
a) Increasing transformer size
b) Real-time pricing and incentives
c) Installing solar panels
d) Extending transmission lines

14) Which of the following is ***not*** a feature of grid computing?
a) Scalability
b) Decentralized control
c) Limited resource usage
d) Fault tolerance

Seat No.	

Set **Q**

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Smart Energy Management System (EEHn-02B)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt any four of the following: **16**

a) Write short notes on Hardware-Software communication in smart grids.
b) Explain the use of estimation techniques in smart grid control.
c) List different types of energy storage mediums and explain any two briefly.
d) List and explain any two applications of data mining techniques in power system analysis.
e) Briefly explain how grid computing improves reliability in smart grids.

Q.3 Attempt any two of the following: **12**

a) Discuss the key technologies used for smart grid generation, networks, and load control.
b) Describe the principles, tools, and techniques used in Demand Side Management (DSM).
c) Describe the working principle and benefits of optimization algorithms in SEMS with suitable examples.

Section – II

Q.4 Attempt any four of the following: **16**

a) Define the characteristics of distribution grids in terms of topology and assets.
b) Explain the concept of substation automation in modern distribution grids.
c) Define Advanced Metering Infrastructure (AMI) and list its key components.
d) List any two impacts of smart grid integration on the distribution network.
e) What are the main challenges in smart city modeling?

Q.5 Attempt any two of the following: **12**

a) How does substation automation contribute to grid reliability and efficiency? Discuss with applications.

b) Describe how demand response helps in load balancing and peak load reduction in a smart grid.

c) Explain in detail Smart Home System.

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Smart Energy Management System (EEHn-02B)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Make suitable assumptions (if necessary and state them clearly).
4) Separate answer books for each section.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct Answer. **14**

1) Which system manages heating, cooling, and electricity in a smart home?
a) HVAC System b) IoT router
c) Central lighting panel d) Water purifier

2) Which of the following is NOT a component of a Smart City?
a) Smart Lighting b) Smart Toilets
c) Smart Roads d) Smart Parking

3) PHEVs can contribute to smart grid applications through:
a) Generating electricity b) Peak load shaving via V2G
c) Demand forecasting d) Power factor correction

4) What is the primary goal of Demand Side Management (DSM)?
a) Increase generation capacity
b) Enhance customer billing
c) Modify consumer demand pattern
d) Reduce electricity theft

5) An Which of the following is a key feature of smart grids?
a) Manual operation b) One-way communication
c) Two-way communication d) Analog control

6) Which of the following is NOT a smart grid objective?
a) Enhanced reliability b) Increased blackouts
c) Improved efficiency d) Better load management

7) Which of these is a decision-making tool used in smart grid management?

a) SCADA b) CRM
c) ERP d) HTML

8) Which of the following is a grid-scale energy storage system?

a) Lead-acid battery b) Supercapacitor
c) Pumped hydro storage d) Mobile power bank

9) Demand aggregation refers to:

a) Combining power from multiple generators
b) Accumulating power losses
c) Consolidating loads for efficient energy use
d) Grouping substations

10) Fundamentals of demand response include:

a) Increasing transformer size
b) Real-time pricing and incentives
c) Installing solar panels
d) Extending transmission lines

11) Which of the following is ***not*** a feature of grid computing?

a) Scalability b) Decentralized control
c) Limited resource usage d) Fault tolerance

12) Which of the following is an example of dynamic pricing used in residential metering?

a) Flat Rate b) Block Rate Pricing
c) Real-Time Pricing (RTP) d) Monthly Average Pricing

13) Which of the following parameters is ***not*** typically monitored in equipment condition monitoring?

a) Vibration b) Temperature
c) Voltage Stability Margin d) Insulation resistance

14) Smart vending machines are designed to:

a) Provide offline transactions
b) Monitor stock and usage patterns
c) Reduce product prices
d) Operate manually

Seat No.	

Set **R**

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Smart Energy Management System (EEHn-02B)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt any four of the following: **16**

a) Write short notes on Hardware-Software communication in smart grids.
b) Explain the use of estimation techniques in smart grid control.
c) List different types of energy storage mediums and explain any two briefly.
d) List and explain any two applications of data mining techniques in power system analysis.
e) Briefly explain how grid computing improves reliability in smart grids.

Q.3 Attempt any two of the following: **12**

a) Discuss the key technologies used for smart grid generation, networks, and load control.
b) Describe the principles, tools, and techniques used in Demand Side Management (DSM).
c) Describe the working principle and benefits of optimization algorithms in SEMS with suitable examples.

Section – II

Q.4 Attempt any four of the following: **16**

a) Define the characteristics of distribution grids in terms of topology and assets.
b) Explain the concept of substation automation in modern distribution grids.
c) Define Advanced Metering Infrastructure (AMI) and list its key components.
d) List any two impacts of smart grid integration on the distribution network.
e) What are the main challenges in smart city modeling?

Q.5 Attempt any two of the following: **12**

a) How does substation automation contribute to grid reliability and efficiency? Discuss with applications.

b) Describe how demand response helps in load balancing and peak load reduction in a smart grid.

c) Explain in detail Smart Home System.

Seat No.		Set	S

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Smart Energy Management System (EEHn-02B)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Make suitable assumptions (if necessary and state them clearly).
4) Separate answer books for each section.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks: 14

Q.1 Choose the correct Answer. **14**

1) Fundamentals of demand response include:
a) Increasing transformer size
b) Real-time pricing and incentives
c) Installing solar panels
d) Extending transmission lines

2) Which of the following is ***not*** a feature of grid computing?
a) Scalability b) Decentralized control
c) Limited resource usage d) Fault tolerance

3) Which of the following is an example of dynamic pricing used in residential metering?
a) Flat Rate b) Block Rate Pricing
c) Real-Time Pricing (RTP) d) Monthly Average Pricing

4) Which of the following parameters is ***not*** typically monitored in equipment condition monitoring?
a) Vibration b) Temperature
c) Voltage Stability Margin d) Insulation resistance

5) Smart vending machines are designed to:
a) Provide offline transactions
b) Monitor stock and usage patterns
c) Reduce product prices
d) Operate manually

6) Which system manages heating, cooling, and electricity in a smart home?
a) HVAC System b) IoT router
c) Central lighting panel d) Water purifier

7) Which of the following is NOT a component of a Smart City?
a) Smart Lighting b) Smart Toilets
c) Smart Roads d) Smart Parking

8) PHEVs can contribute to smart grid applications through:
a) Generating electricity b) Peak load shaving via V2G
c) Demand forecasting d) Power factor correction

9) What is the primary goal of Demand Side Management (DSM)?
a) Increase generation capacity
b) Enhance customer billing
c) Modify consumer demand pattern
d) Reduce electricity theft

10) An Which of the following is a key feature of smart grids?
a) Manual operation b) One-way communication
c) Two-way communication d) Analog control

11) Which of the following is NOT a smart grid objective?
a) Enhanced reliability b) Increased blackouts
c) Improved efficiency d) Better load management

12) Which of these is a decision-making tool used in smart grid management?
a) SCADA b) CRM
c) ERP d) HTML

13) Which of the following is a grid-scale energy storage system?
a) Lead-acid battery b) Supercapacitor
c) Pumped hydro storage d) Mobile power bank

14) Demand aggregation refers to:
a) Combining power from multiple generators
b) Accumulating power losses
c) Consolidating loads for efficient energy use
d) Grouping substations

SLR-BD-281

Seat No.		Set	S

S.Y. (B. Tech) (Sem - II) (New) (NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Smart Energy Management System (EEHn-02B)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data wherever necessary.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt any four of the following: **16**

a) Write short notes on Hardware-Software communication in smart grids.
b) Explain the use of estimation techniques in smart grid control.
c) List different types of energy storage mediums and explain any two briefly.
d) List and explain any two applications of data mining techniques in power system analysis.
e) Briefly explain how grid computing improves reliability in smart grids.

Q.3 Attempt any two of the following: **12**

a) Discuss the key technologies used for smart grid generation, networks, and load control.
b) Describe the principles, tools, and techniques used in Demand Side Management (DSM).
c) Describe the working principle and benefits of optimization algorithms in SEMS with suitable examples.

Section – II

Q.4 Attempt any four of the following: **16**

a) Define the characteristics of distribution grids in terms of topology and assets.
b) Explain the concept of substation automation in modern distribution grids.
c) Define Advanced Metering Infrastructure (AMI) and list its key components.
d) List any two impacts of smart grid integration on the distribution network.
e) What are the main challenges in smart city modeling?

Q.5 Attempt any two of the following: **12**

a) How does substation automation contribute to grid reliability and efficiency? Discuss with applications.

b) Describe how demand response helps in load balancing and peak load reduction in a smart grid.

c) Explain in detail Smart Home System.

SLR-BD-282

Seat No.	

Set P

S.Y. (B.Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Machines - II (BTN07402)

Day & Date: Monday 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume sutiable fata if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) If the phase sequence of supply currents is reversed, then the direction of rotation of the resultant Magnetic Field will _____
a) Be reversed b) Remains unchanged
c) Cannot be determined d) None of the mentioned

2) Slip ring induction motor has ____
a) Low starting torque
b) Medium starting torque
c) High starting torque
d) None of these

3) The maximum torque in an IM depends on ____
a) Frequency
b) rotor inductive reactance
c) square of supply voltage
d) all the above

4) The auto-starters (using three auto transformers) can be used to start cage induction motor of the following type ____
a) star connected only b) delta connected only
c) (a) and (b) both d) none of the above

5) For which motor the speed can be controlled from rotor side?
a) Squirrel-cage induction motor
b) Slip-ring induction motor
c) Both (a) and (b)
d) None of the above

6) A 10kW, 400V, 4-pole delta connected induction motor gave the following test results: No-load test: 400V, 8A, 250 W Blocked rotor test: 90, 35A,1350 W. The dc resistance per phase is 0.6 ohms. The effective stator resistance is _____

a) 0.72 ohms b) 0.6 ohms
c) 0.3 ohms d) 1.2 ohms

7) The electrical analogous of the mechanical load in the induction machine is given by _____

a) (r2)*(1-s)/s b) (r2)
c) (r2)/s d) (r2)/(1-s)

8) A single-phase induction motor is _____

a) inherently self-starting with high torque
b) inherently non-self-starting with low torque
c) inherently self-starting with low torque
d) inherently non-self-starting with high torque

9) In a single phase motor the centrifugal switch _____

a) disconnects auxiliary winding of the motor
b) disconnects main winding of the motor
c) reconnects the main winding the motor
d) reconnects the auxiliary winding of the motor

10) The short circuit characteristic of alternator is a straight line due to _____

a) no saturation b) no armature reaction
c) no eddy current d) all of the mentioned

11) The zero power factor of an alternator can be obtained by _____ at rated Ia.

a) conducting short circuit of secondary terminals
b) over exciting
c) under excitation
d) running as reluctance motor

12) Synchronous motor always runs at _____

a) speed which is less than synchronous speed
b) speed which is greater than synchronous speed
c) synchronous speed
d) none of the above

13) The voltage equation of synchronous motor is?

a) $\mathrm{Ef} = \mathrm{Vt} + \mathrm{Ia} * (\mathrm{ra} + \mathrm{jXa})$ b) $\mathrm{Ef} = \mathrm{Vt} - \mathrm{Ia} * (\mathrm{ra} + \mathrm{jXa})$
c) $\mathrm{Ef} = \mathrm{Vt} + \mathrm{Ia} * (\mathrm{ra} - \mathrm{jXa})$ d) $\mathrm{Ef} = \mathrm{Vt} - \mathrm{Ia} * (\mathrm{ra} - \mathrm{jXa})$

14) Mostly, synchronous motors are of _____

a) alternator type machines b) induction type machines
c) salient pole type machines d) smooth cylindrical type machines

Seat No.	

Set **P**

S.Y. (B.Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Machines - II (BTN07402)

Day & Date: Monday 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt any four of the following **16**

a) Explain Crawling and Cogging effects in 3 phase IM.

b) Explain how rotating magnetic field is created when 3-Ph supply voltage is given to the stator winding. Give the important assumptions in this case.

c) A three-phase, 50 Hz induction motor with its rotor star connected gives 500 V (r.m.s.) at standstill between the slip rings on open circuit. Calculate the current and power factor at standstill when the rotor winding is joined to a star connected external circuit, each phase of which has a resistance of 10 Ω and an inductance of 0.04 H. The resistance per phase of the rotor winding is 0.2 Ω and an inductance of 0.04 H. Also calculate the current and power factor when slip rings are short circuited and the motor is running with a slip of 5 per cent. Assume flux remains constant.

d) What is the necessity of starter? Explain with diagram, working and features of star delta starter for a 3 Ph induction motor.

e) Draw and explain equivalent circuit of 3 Ph IM.

f) The rotor resistance/phase of a 4 pole, 50 Hz, Induction motor are 0.024 Ω and 0.12 Ω respectively. Find the speed at maximum torque. Also find the value of additional rotor resistance per phase to be added to develop 80% of maximum torque starting.

Q.3 Attempt any two of the following **12**

a) With a neat sketch explain: i) DOL starter ii) Auto transformer starter

b) Draw and explain procedure to construct a circle diagram for IM.

c) The power input to the rotor of a 440 V, 50 Hz, 6 pole 3- induction motor is 80 kW. The rotor electromotive force is observed to make 100 cycles per minute, calculate:
(i) the slip
(ii) the rotor speed
(iii) mechanical power developed
(iv) the rotor cu loss per phase

Section – II

Q.4 Solve any four. **16**

a) Explain with circuit diagram and vector diagram capacitor start single phase induction motor.

b) Explain in detail the cross field theory related to single phase induction motor.

c) Derive EMF equation of alternator with short pitched coils and distributed windings.

d) Explain the role of damper winding in synchronous machine.

e) Derive an expression for the power developed in synchronous motor.

f) Explain constructional details of alternator.

Q.5 Solve the following. **12**

a) What is armature reaction? Explain the effect of armature reaction on terminal voltage of an alternator at i) unity power factor ii) lagging power factor.

b) Explain in detail the determination of synchronous reactance of an alternator.

c) Explain the operation of synchronous motor with constant load and following type of excitation with phasor diagram.

i) Under excitation

ii) Over excitation

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Machines - II (BTN07402)

Day & Date: Monday 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume sutiable fata if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) A single-phase induction motor is _____
a) inherently self-starting with high torque
b) inherently non-self-starting with low torque
c) inherently self-starting with low torque
d) inherently non-self-starting with high torque

2) In a single phase motor the centrifugal switch _____
a) disconnects auxiliary winding of the motor
b) disconnects main winding of the motor
c) reconnects the main winding the motor
d) reconnects the auxiliary winding of the motor

3) The short circuit characteristic of alternator is a straight line due to _____
a) no saturation b) no armature reaction
c) no eddy current d) all of the mentioned

4) The zero power factor of an alternator can be obtained by _____ at rated la.
a) conducting short circuit of secondary terminals
b) over exciting
c) under excitation
d) running as reluctance motor

5) Synchronous motor always runs at _____
a) speed which is less than synchronous speed
b) speed which is greater than synchronous speed
c) synchronous speed
d) none of the above

6) The voltage equation of synchronous motor is?

a) $\mathrm{Ef} = \mathrm{Vt} + \mathrm{Ia} * (\mathrm{ra} + \mathrm{jXa})$ b) $\mathrm{Ef} = \mathrm{Vt} - \mathrm{Ia} * (\mathrm{ra} + \mathrm{jXa})$

c) $\mathrm{Ef} = \mathrm{Vt} + \mathrm{Ia} * (\mathrm{ra} - \mathrm{jXa})$ d) $\mathrm{Ef} = \mathrm{Vt} - \mathrm{Ia} * (\mathrm{ra} - \mathrm{jXa})$

7) Mostly, synchronous motors are of _____

a) alternator type machines b) induction type machines

c) salient pole type machines d) smooth cylindrical type machines

8) If the phase sequence of supply currents is reversed, then the direction of rotation of the resultant Magnetic Field will _____

a) Be reversed b) Remains unchanged

c) Cannot be determined d) None of the mentioned

9) Slip ring induction motor has ____

a) Low starting torque

b) Medium starting torque

c) High starting torque

d) None of these

10) The maximum torque in an IM depends on ____

a) Frequency

b) rotor inductive reactance

c) square of supply voltage

d) all the above

11) The auto-starters (using three auto transformers) can be used to start cage induction motor of the following type ____

a) star connected only b) delta connected only

c) (a) and (b) both d) none of the above

12) For which motor the speed can be controlled from rotor side?

a) Squirrel-cage induction motor

b) Slip-ring induction motor

c) Both (a) and (b)

d) None of the above

13) A 10kW, 400V, 4-pole delta connected induction motor gave the following test results: No-load test: 400V, 8A, 250 W Blocked rotor test: 90, 35A,1350 W. The dc resistance per phase is 0.6 ohms. The effective stator resistance is _____

a) 0.72 ohms b) 0.6 ohms

c) 0.3 ohms d) 1.2 ohms

14) The electrical analogous of the mechanical load in the induction machine is given by _____

a) (r2)*(1-s)/s b) (r2)

c) (r2)/s d) (r2)/(1-s)

Seat No.	

Set **Q**

S.Y. (B.Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Machines - II (BTN07402)

Day & Date: Monday 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt any four of the following **16**

a) Explain Crawling and Cogging effects in 3 phase IM.

b) Explain how rotating magnetic field is created when 3-Ph supply voltage is given to the stator winding. Give the important assumptions in this case.

c) A three-phase, 50 Hz induction motor with its rotor star connected gives 500 V (r.m.s.) at standstill between the slip rings on open circuit. Calculate the current and power factor at standstill when the rotor winding is joined to a star connected external circuit, each phase of which has a resistance of 10 Ω and an inductance of 0.04 H. The resistance per phase of the rotor winding is 0.2 Ω and an inductance of 0.04 H. Also calculate the current and power factor when slip rings are short circuited and the motor is running with a slip of 5 per cent. Assume flux remains constant.

d) What is the necessity of starter? Explain with diagram, working and features of star delta starter for a 3 Ph induction motor.

e) Draw and explain equivalent circuit of 3 Ph IM.

f) The rotor resistance/phase of a 4 pole, 50 Hz, Induction motor are 0.024 Ω and 0.12 Ω respectively. Find the speed at maximum torque. Also find the value of additional rotor resistance per phase to be added to develop 80% of maximum torque starting.

Q.3 Attempt any two of the following **12**

a) With a neat sketch explain: i) DOL starter ii) Auto transformer starter

b) Draw and explain procedure to construct a circle diagram for IM.

c) The power input to the rotor of a 440 V, 50 Hz, 6 pole 3- induction motor is 80 kW. The rotor electromotive force is observed to make 100 cycles per minute, calculate:
(i) the slip
(ii) the rotor speed
(iii) mechanical power developed
(iv) the rotor cu loss per phase

Section – II

Q.4 Solve any four. **16**

a) Explain with circuit diagram and vector diagram capacitor start single phase induction motor.

b) Explain in detail the cross field theory related to single phase induction motor.

c) Derive EMF equation of alternator with short pitched coils and distributed windings.

d) Explain the role of damper winding in synchronous machine.

e) Derive an expression for the power developed in synchronous motor.

f) Explain constructional details of alternator.

Q.5 Solve the following. **12**

a) What is armature reaction? Explain the effect of armature reaction on terminal voltage of an alternator at i) unity power factor ii) lagging power factor.

b) Explain in detail the determination of synchronous reactance of an alternator.

c) Explain the operation of synchronous motor with constant load and following type of excitation with phasor diagram.

i) Under excitation

ii) Over excitation

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Machines - II (BTN07402)

Day & Date: Monday 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume sutiable fata if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) The zero power factor of an alternator can be obtained by _____ at rated Ia.
a) conducting short circuit of secondary terminals
b) over exciting
c) under excitation
d) running as reluctance motor

2) Synchronous motor always runs at _____
a) speed which is less than synchronous speed
b) speed which is greater than synchronous speed
c) synchronous speed
d) none of the above

3) The voltage equation of synchronous motor is?
a) $\mathrm{Ef} = \mathrm{Vt} + \mathrm{Ia} * (\mathrm{ra} + \mathrm{jXa})$ b) $\mathrm{Ef} = \mathrm{Vt} - \mathrm{Ia} * (\mathrm{ra} + \mathrm{jXa})$
c) $\mathrm{Ef} = \mathrm{Vt} + \mathrm{Ia} * (\mathrm{ra} - \mathrm{jXa})$ d) $\mathrm{Ef} = \mathrm{Vt} - \mathrm{Ia} * (\mathrm{ra} - \mathrm{jXa})$

4) Mostly, synchronous motors are of _____
a) alternator type machines b) induction type machines
c) salient pole type machines d) smooth cylindrical type machines

5) If the phase sequence of supply currents is reversed, then the direction of rotation of the resultant Magnetic Field will _____
a) Be reversed b) Remains unchanged
c) Cannot be determined d) None of the mentioned

6) Slip ring induction motor has ____
a) Low starting torque
b) Medium starting torque
c) High starting torque
d) None of these

7) The maximum torque in an IM depends on ____
a) Frequency
b) rotor inductive reactance
c) square of supply voltage
d) all the above

8) The auto-starters (using three auto transformers) can be used to start cage induction motor of the following type ____
a) star connected only b) delta connected only
c) (a) and (b) both d) none of the above

9) For which motor the speed can be controlled from rotor side?
a) Squirrel-cage induction motor
b) Slip-ring induction motor
c) Both (a) and (b)
d) None of the above

10) A 10kW, 400V, 4-pole delta connected induction motor gave the following test results: No-load test: 400V, 8A, 250 W Blocked rotor test: 90, 35A,1350 W. The dc resistance per phase is 0.6 ohms. The effective stator resistance is _____
a) 0.72 ohms b) 0.6 ohms
c) 0.3 ohms d) 1.2 ohms

11) The electrical analogous of the mechanical load in the induction machine is given by _____
a) (r2)*(1-s)/s b) (r2)
c) (r2)/s d) (r2)/(1-s)

12) A single-phase induction motor is _____
a) inherently self-starting with high torque
b) inherently non-self-starting with low torque
c) inherently self-starting with low torque
d) inherently non-self-starting with high torque

13) In a single phase motor the centrifugal switch _____
a) disconnects auxiliary winding of the motor
b) disconnects main winding of the motor
c) reconnects the main winding the motor
d) reconnects the auxiliary winding of the motor

14) The short circuit characteristic of alternator is a straight line due to _____

a) no saturation
b) no armature reaction
c) no eddy current
d) all of the mentioned

Seat No.	

Set **R**

S.Y. (B.Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Machines - II (BTN07402)

Day & Date: Monday 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt any four of the following **16**

a) Explain Crawling and Cogging effects in 3 phase IM.

b) Explain how rotating magnetic field is created when 3-Ph supply voltage is given to the stator winding. Give the important assumptions in this case.

c) A three-phase, 50 Hz induction motor with its rotor star connected gives 500 V (r.m.s.) at standstill between the slip rings on open circuit. Calculate the current and power factor at standstill when the rotor winding is joined to a star connected external circuit, each phase of which has a resistance of 10 Ω and an inductance of 0.04 H. The resistance per phase of the rotor winding is 0.2 Ω and an inductance of 0.04 H. Also calculate the current and power factor when slip rings are short circuited and the motor is running with a slip of 5 per cent. Assume flux remains constant.

d) What is the necessity of starter? Explain with diagram, working and features of star delta starter for a 3 Ph induction motor.

e) Draw and explain equivalent circuit of 3 Ph IM.

f) The rotor resistance/phase of a 4 pole, 50 Hz, Induction motor are 0.024 Ω and 0.12 Ω respectively. Find the speed at maximum torque. Also find the value of additional rotor resistance per phase to be added to develop 80% of maximum torque starting.

Q.3 Attempt any two of the following **12**

a) With a neat sketch explain: i) DOL starter ii) Auto transformer starter

b) Draw and explain procedure to construct a circle diagram for IM.

c) The power input to the rotor of a 440 V, 50 Hz, 6 pole 3- induction motor is 80 kW. The rotor electromotive force is observed to make 100 cycles per minute, calculate:
(i) the slip
(ii) the rotor speed
(iii) mechanical power developed
(iv) the rotor cu loss per phase

Section – II

Q.4 Solve any four. **16**

a) Explain with circuit diagram and vector diagram capacitor start single phase induction motor.

b) Explain in detail the cross field theory related to single phase induction motor.

c) Derive EMF equation of alternator with short pitched coils and distributed windings.

d) Explain the role of damper winding in synchronous machine.

e) Derive an expression for the power developed in synchronous motor.

f) Explain constructional details of alternator.

Q.5 Solve the following. **12**

a) What is armature reaction? Explain the effect of armature reaction on terminal voltage of an alternator at i) unity power factor ii) lagging power factor.

b) Explain in detail the determination of synchronous reactance of an alternator.

c) Explain the operation of synchronous motor with constant load and following type of excitation with phasor diagram.

i) Under excitation

ii) Over excitation

Seat No.		Set	S

S.Y. (B.Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Machines - II (BTN07402)

Day & Date: Monday 26-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Assume sutiable fata if necessary.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct answer: 14

1) A 10kW, 400V, 4-pole delta connected induction motor gave the following test results: No-load test: 400V, 8A, 250 W Blocked rotor test: 90, 35A,1350 W. The dc resistance per phase is 0.6 ohms. The effective stator resistance is _____

a) 0.72 ohms b) 0.6 ohms
c) 0.3 ohms d) 1.2 ohms

2) The electrical analogous of the mechanical load in the induction machine is given by _____

a) (r2)*(1-s)/s b) (r2)
c) (r2)/s d) (r2)/(1-s)

3) A single-phase induction motor is _____

a) inherently self-starting with high torque
b) inherently non-self-starting with low torque
c) inherently self-starting with low torque
d) inherently non-self-starting with high torque

4) In a single phase motor the centrifugal switch _____

a) disconnects auxiliary winding of the motor
b) disconnects main winding of the motor
c) reconnects the main winding the motor
d) reconnects the auxiliary winding of the motor

5) The short circuit characteristic of alternator is a straight line due to _____

a) no saturation b) no armature reaction
c) no eddy current d) all of the mentioned

6) The zero power factor of an alternator can be obtained by _____ at rated Ia.
a) conducting short circuit of secondary terminals
b) over exciting
c) under excitation
d) running as reluctance motor

7) Synchronous motor always runs at _____
a) speed which is less than synchronous speed
b) speed which is greater than synchronous speed
c) synchronous speed
d) none of the above

8) The voltage equation of synchronous motor is?
a) $\mathrm{Ef} = \mathrm{Vt} + \mathrm{Ia} * (\mathrm{ra} + \mathrm{jXa})$
b) $\mathrm{Ef} = \mathrm{Vt} - \mathrm{Ia} * (\mathrm{ra} + \mathrm{jXa})$
c) $\mathrm{Ef} = \mathrm{Vt} + \mathrm{Ia} * (\mathrm{ra} - \mathrm{jXa})$
d) $\mathrm{Ef} = \mathrm{Vt} - \mathrm{Ia} * (\mathrm{ra} - \mathrm{jXa})$

9) Mostly, synchronous motors are of _____
a) alternator type machines
b) induction type machines
c) salient pole type machines
d) smooth cylindrical type machines

10) If the phase sequence of supply currents is reversed, then the direction of rotation of the resultant Magnetic Field will _____
a) Be reversed
b) Remains unchanged
c) Cannot be determined
d) None of the mentioned

11) Slip ring induction motor has ____
a) Low starting torque
b) Medium starting torque
c) High starting torque
d) None of these

12) The maximum torque in an IM depends on ____
a) Frequency
b) rotor inductive reactance
c) square of supply voltage
d) all the above

13) The auto-starters (using three auto transformers) can be used to start cage induction motor of the following type ____
a) star connected only
b) delta connected only
c) (a) and (b) both
d) none of the above

14) For which motor the speed can be controlled from rotor side?
a) Squirrel-cage induction motor
b) Slip-ring induction motor
c) Both (a) and (b)
d) None of the above

Seat No.	

Set **S**

S.Y. (B.Tech.) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electrical Machines - II (BTN07402)

Day & Date: Monday 26-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.
4) Draw neat diagrams whenever necessary.

Section – I

Q.2 Attempt any four of the following **16**

a) Explain Crawling and Cogging effects in 3 phase IM.

b) Explain how rotating magnetic field is created when 3-Ph supply voltage is given to the stator winding. Give the important assumptions in this case.

c) A three-phase, 50 Hz induction motor with its rotor star connected gives 500 V (r.m.s.) at standstill between the slip rings on open circuit. Calculate the current and power factor at standstill when the rotor winding is joined to a star connected external circuit, each phase of which has a resistance of 10 Ω and an inductance of 0.04 H. The resistance per phase of the rotor winding is 0.2 Ω and an inductance of 0.04 H. Also calculate the current and power factor when slip rings are short circuited and the motor is running with a slip of 5 per cent. Assume flux remains constant.

d) What is the necessity of starter? Explain with diagram, working and features of star delta starter for a 3 Ph induction motor.

e) Draw and explain equivalent circuit of 3 Ph IM.

f) The rotor resistance/phase of a 4 pole, 50 Hz, Induction motor are 0.024 Ω and 0.12 Ω respectively. Find the speed at maximum torque. Also find the value of additional rotor resistance per phase to be added to develop 80% of maximum torque starting.

Q.3 Attempt any two of the following **12**

a) With a neat sketch explain: i) DOL starter ii) Auto transformer starter

b) Draw and explain procedure to construct a circle diagram for IM.

c) The power input to the rotor of a 440 V, 50 Hz, 6 pole 3- induction motor is 80 kW. The rotor electromotive force is observed to make 100 cycles per minute, calculate:
(i) the slip
(ii) the rotor speed
(iii) mechanical power developed
(iv) the rotor cu loss per phase

Section – II

Q.4 Solve any four. **16**

a) Explain with circuit diagram and vector diagram capacitor start single phase induction motor.

b) Explain in detail the cross field theory related to single phase induction motor.

c) Derive EMF equation of alternator with short pitched coils and distributed windings.

d) Explain the role of damper winding in synchronous machine.

e) Derive an expression for the power developed in synchronous motor.

f) Explain constructional details of alternator.

Q.5 Solve the following. **12**

a) What is armature reaction? Explain the effect of armature reaction on terminal voltage of an alternator at i) unity power factor ii) lagging power factor.

b) Explain in detail the determination of synchronous reactance of an alternator.

c) Explain the operation of synchronous motor with constant load and following type of excitation with phasor diagram.

i) Under excitation

ii) Over excitation

SLR-BD-283

Seat No.		Set	P

S. Y. (B. Tech) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Power System II (BTN07403)

Day & Date: Wednesday 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given option and rewrite the sentence. **14**

1) In triangular configuration, inductance and capacitance values are _____ and _____ respectively.
a) less, less b) higher, higher
c) less, higher d) higher, less

2) What is the purpose of bedding on the underground cables?
a) To avoid leakage of current.
b) To protect the sheath against corrosion.
c) To protect the sheath from mechanical injury due to armoring.
d) Both (b) and (c)

3) The cable best suited for the transmission of voltages from 33 kV to 66 kV is _____.
a) Belted cables b) Screened cables
c) Pressure cables d) None of these

4) What does capacitance grade of cables mean?
a) Use of dielectrics in different concentrations.
b) Introduction of capacitance at various lengths of cable to counter the effect of inductance.
c) Use of dielectrics of different permittivity's
d) Grading according to capacitance per km length of the cable.

5) In long transmission lines Resistance and Capacitance parameters of lines are connected in _____.
a) Series, shunt b) Series, series
c) Shunt, shunt d) Shunt, parallel

6) In nominal -π method of solution of medium transmission line, capacitance is assumed to be: _____.

a) Distributed uniformly from sending end to receiving end
b) Divided into two halves
c) Lumped at the generation end
d) Lumped at middle of generation and load end

7) Which of the following distribution system is more reliable?

a) Radial system b) Tree system
c) Ring main system d) All are equally reliable

8) The sag of a transmission line depends upon _____.

a) Weight of conductor and directly proportional to span length
b) Weight of conductor and inversely proportional to span length
c) Weight of conductor and directly proportional to the square of span length
d) Weight of conductor and inversely proportional to the square of span length

9) The maximum tension in a section of overhead line conductor between two supports of unequal height occurs at _____.

a) The higher support b) The lower point
c) The midpoint of the conductor d) None of the above

10) Corona is accompanied by _____.

a) violet visible light b) hissing sound
c) power loss and interference d) all of the above

11) Transmission line constants are _____.

a) Capacitance b) Inductance
c) Resistance d) All of these

12) The inductance of line is minimum when _____.

a) G M D is high
b) G M R is high
c) Both G M D and G M R are high
d) G M D is low but G M R is high

13) When two conductors between each of radius 'r' are at a distance D, the capacitance between the two is proportional to _____.

a) loge(D/r) b) loge (r/ D)
c) 1/loge(D/r) d) 1/loge (r/D)

14) Find the inductance per km of a 3-phase transmission line using 1.24 cm diameter conductors when these are placed at the corners of an equilateral triangle of each side 2 m.

a) 3.2 mH/Km b) 2.1 mH/Km
c) 1.205 mH/Km d) 2.3 mH/Km

Seat No.	

Set **P**

S. Y. (B. Tech) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Power System II (BTN07403)

Day & Date: Wednesday 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following Questions. (Any Four) **16**

a) Define corona discharge: enlist the methods of reducing the corona effect.

b) Calculate the loop inductance per km of a single-phase overhead line consisting of two conductors each 1 cm diameter and 1.2 m apart.

c) What is meant by sag? Derive an expression for sag in a transmission line having equal level of supports.

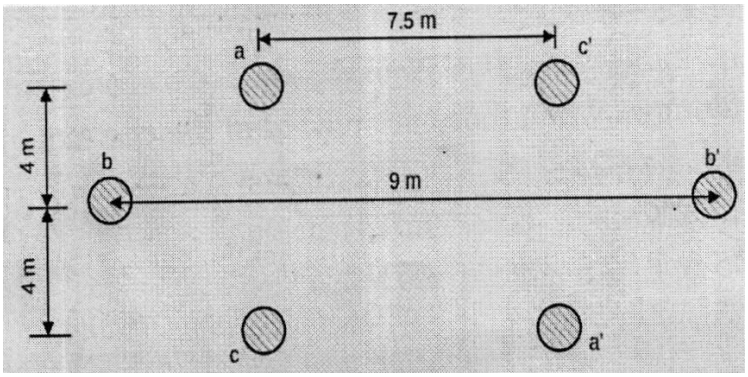
d) Explain the following methods of cable grading:
i) Capacitance grading
ii) Inters heath grading

e) Find the line to line capacitance per km of a three phase transmission line using 1.24 cm diameter conductor when these are placed at the corners of an equilateral triangle of each side 2m.

Q.3 Attempt the following Questions. (Any Two) **12**

a) Derive the expression for inductance of 3-ph single circuit overhead triangular configuration of transmission line for symmetrical spacing.

b) The double circuit three-phase line has the configuration shown in figure the distance between conductor a and c' is 7.5 between b and b' is 9 m and between a and c is 8 m. Find inductance per kilometer per phase. The radius of each conductor is 1.25 cm.



c) Derive the expression for Insulation resistance of a cable.

Section – II

Q.4 Attempt the following Questions. (Any Four) **16**

a) Describe with diagram.
- i) Radial system
- ii) Ring main system

b) Derive an expression for voltage regulation and efficiency of short transmission line.

c) Explain in detail effect of Power Factor on Voltage regulation, Losses, efficiency in case of transmission line.

d) Define and explain terms: feeders, distributor and service mains with neat schematic diagram.

e) Explain various types of equipment in substation with neat symbol.

Q.5 Attempt the following Questions. (Any Two) **12**

a) What is mean by Neutral grounding and Explain with neat circuit diagram various methods of Neutral grounding.
- i) Resistance grounding
- ii) Reactance grounding
- iii) Solid grounding

b) With neat diagram derive the expression for A, B, C, D constants of medium transmission line using nominal T method.

c) A single-phase overhead transmission line delivers 1100 kW at 33KV at 0.8p. f lagging. The total resistance and inductive reactance of the line are 10 Ω and15 Ω respectively.
Determine:
- i) Sending end voltage
- ii) Sending end power factor
- iii) Transmission Efficiency

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Power System II (BTN07403)

Day & Date: Wednesday 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given option and rewrite the sentence. **14**

1) The sag of a transmission line depends upon _____.
a) Weight of conductor and directly proportional to span length
b) Weight of conductor and inversely proportional to span length
c) Weight of conductor and directly proportional to the square of span length
d) Weight of conductor and inversely proportional to the square of span length

2) The maximum tension in a section of overhead line conductor between two supports of unequal height occurs at _____.
a) The higher support b) The lower point
c) The midpoint of the conductor d) None of the above

3) Corona is accompanied by _____.
a) violet visible light b) hissing sound
c) power loss and interference d) all of the above

4) Transmission line constants are _____.
a) Capacitance b) Inductance
c) Resistance d) All of these

5) The inductance of line is minimum when _____.
a) G M D is high
b) G M R is high
c) Both G M D and G M R are high
d) G M D is low but G M R is high

6) When two conductors between each of radius 'r' are at a distance D, the capacitance between the two is proportional to _____.

a) loge(D/r) b) loge (r/ D)
c) 1/loge(D/r) d) 1/loge (r/D)

7) Find the inductance per km of a 3-phase transmission line using 1.24 cm diameter conductors when these are placed at the corners of an equilateral triangle of each side 2 m.

a) 3.2 mH/Km b) 2.1 mH/Km
c) 1.205 mH/Km d) 2.3 mH/Km

8) In triangular configuration, inductance and capacitance values are _____ and _____ respectively.

a) less, less b) higher, higher
c) less, higher d) higher, less

9) What is the purpose of bedding on the underground cables?

a) To avoid leakage of current.
b) To protect the sheath against corrosion.
c) To protect the sheath from mechanical injury due to armoring.
d) Both (b) and (c)

10) The cable best suited for the transmission of voltages from 33 kV to 66 kV is _____.

a) Belted cables b) Screened cables
c) Pressure cables d) None of these

11) What does capacitance grade of cables mean?

a) Use of dielectrics in different concentrations.
b) Introduction of capacitance at various lengths of cable to counter the effect of inductance.
c) Use of dielectrics of different permittivity's
d) Grading according to capacitance per km length of the cable.

12) In long transmission lines Resistance and Capacitance parameters of lines are connected in _____.

a) Series, shunt b) Series, series
c) Shunt, shunt d) Shunt, parallel

13) In nominal -π method of solution of medium transmission line, capacitance is assumed to be: _____.

a) Distributed uniformly from sending end to receiving end
b) Divided into two halves
c) Lumped at the generation end
d) Lumped at middle of generation and load end

14) Which of the following distribution system is more reliable?

a) Radial system b) Tree system
c) Ring main system d) All are equally reliable

Seat No.	

Set **Q**

S. Y. (B. Tech) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Power System II (BTN07403)

Day & Date: Wednesday 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following Questions. (Any Four) **16**

a) Define corona discharge: enlist the methods of reducing the corona effect.

b) Calculate the loop inductance per km of a single-phase overhead line consisting of two conductors each 1 cm diameter and 1.2 m apart.

c) What is meant by sag? Derive an expression for sag in a transmission line having equal level of supports.

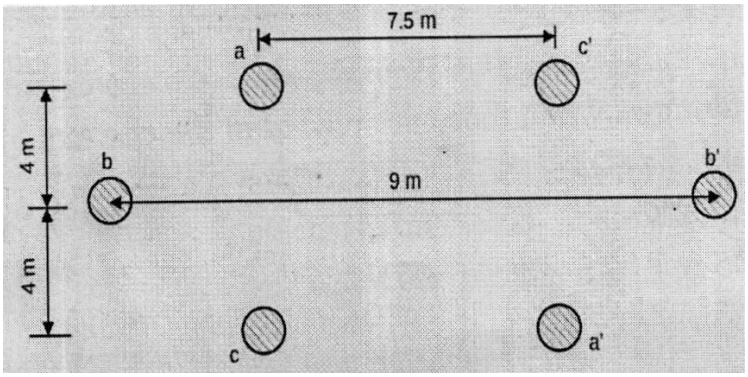
d) Explain the following methods of cable grading:
i) Capacitance grading
ii) Inters heath grading

e) Find the line to line capacitance per km of a three phase transmission line using 1.24 cm diameter conductor when these are placed at the corners of an equilateral triangle of each side 2m.

Q.3 Attempt the following Questions. (Any Two) **12**

a) Derive the expression for inductance of 3-ph single circuit overhead triangular configuration of transmission line for symmetrical spacing.

b) The double circuit three-phase line has the configuration shown in figure the distance between conductor a and c' is 7.5 between b and b' is 9 m and between a and c is 8 m. Find inductance per kilometer per phase. The radius of each conductor is 1.25 cm.



c) Derive the expression for Insulation resistance of a cable.

Section – II

Q.4 Attempt the following Questions. (Any Four) **16**

a) Describe with diagram.
- i) Radial system
- ii) Ring main system

b) Derive an expression for voltage regulation and efficiency of short transmission line.

c) Explain in detail effect of Power Factor on Voltage regulation, Losses, efficiency in case of transmission line.

d) Define and explain terms: feeders, distributor and service mains with neat schematic diagram.

e) Explain various types of equipment in substation with neat symbol.

Q.5 Attempt the following Questions. (Any Two) **12**

a) What is mean by Neutral grounding and Explain with neat circuit diagram various methods of Neutral grounding.
- i) Resistance grounding
- ii) Reactance grounding
- iii) Solid grounding

b) With neat diagram derive the expression for A, B, C, D constants of medium transmission line using nominal T method.

c) A single-phase overhead transmission line delivers 1100 kW at 33KV at 0.8p. f lagging. The total resistance and inductive reactance of the line are 10 Ω and15 Ω respectively.
Determine:
- i) Sending end voltage
- ii) Sending end power factor
- iii) Transmission Efficiency

Seat No.		Set	R

S. Y. (B. Tech) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Power System II (BTN07403)

Day & Date: Wednesday 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given option and rewrite the sentence. 14

1) Transmission line constants are _____.
a) Capacitance b) Inductance
c) Resistance d) All of these

2) The inductance of line is minimum when _____.
a) G M D is high
b) G M R is high
c) Both G M D and G M R are high
d) G M D is low but G M R is high

3) When two conductors between each of radius 'r' are at a distance D, the capacitance between the two is proportional to _____.
a) loge(D/r) b) loge (r/ D)
c) 1/loge(D/r) d) 1/loge (r/D)

4) Find the inductance per km of a 3-phase transmission line using 1.24 cm diameter conductors when these are placed at the corners of an equilateral triangle of each side 2 m.
a) 3.2 mH/Km b) 2.1 mH/Km
c) 1.205 mH/Km d) 2.3 mH/Km

5) In triangular configuration, inductance and capacitance values are _____ and _____ respectively.
a) less, less b) higher, higher
c) less, higher d) higher, less

6) What is the purpose of bedding on the underground cables?
a) To avoid leakage of current.
b) To protect the sheath against corrosion.
c) To protect the sheath from mechanical injury due to armoring.
d) Both (b) and (c)

7) The cable best suited for the transmission of voltages from 33 kV to 66 kV is _____.
a) Belted cables
b) Screened cables
c) Pressure cables
d) None of these

8) What does capacitance grade of cables mean?
a) Use of dielectrics in different concentrations.
b) Introduction of capacitance at various lengths of cable to counter the effect of inductance.
c) Use of dielectrics of different permittivity's
d) Grading according to capacitance per km length of the cable.

9) In long transmission lines Resistance and Capacitance parameters of lines are connected in _____.
a) Series, shunt
b) Series, series
c) Shunt, shunt
d) Shunt, parallel

10) In nominal -π method of solution of medium transmission line, capacitance is assumed to be: _____.
a) Distributed uniformly from sending end to receiving end
b) Divided into two halves
c) Lumped at the generation end
d) Lumped at middle of generation and load end

11) Which of the following distribution system is more reliable?
a) Radial system
b) Tree system
c) Ring main system
d) All are equally reliable

12) The sag of a transmission line depends upon _____.
a) Weight of conductor and directly proportional to span length
b) Weight of conductor and inversely proportional to span length
c) Weight of conductor and directly proportional to the square of span length
d) Weight of conductor and inversely proportional to the square of span length

13) The maximum tension in a section of overhead line conductor between two supports of unequal height occurs at _____.
a) The higher support
b) The lower point
c) The midpoint of the conductor
d) None of the above

14) Corona is accompanied by _____.

a) violet visible light b) hissing sound

c) power loss and interference d) all of the above

Seat No.	

Set **R**

S. Y. (B. Tech) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Power System II (BTN07403)

Day & Date: Wednesday 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following Questions. (Any Four) **16**

a) Define corona discharge: enlist the methods of reducing the corona effect.

b) Calculate the loop inductance per km of a single-phase overhead line consisting of two conductors each 1 cm diameter and 1.2 m apart.

c) What is meant by sag? Derive an expression for sag in a transmission line having equal level of supports.

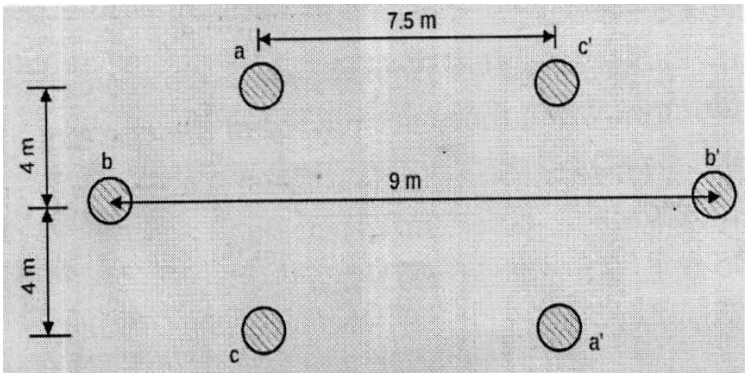
d) Explain the following methods of cable grading:
i) Capacitance grading
ii) Inters heath grading

e) Find the line to line capacitance per km of a three phase transmission line using 1.24 cm diameter conductor when these are placed at the corners of an equilateral triangle of each side 2m.

Q.3 Attempt the following Questions. (Any Two) **12**

a) Derive the expression for inductance of 3-ph single circuit overhead triangular configuration of transmission line for symmetrical spacing.

b) The double circuit three-phase line has the configuration shown in figure the distance between conductor a and c' is 7.5 between b and b' is 9 m and between a and c is 8 m. Find inductance per kilometer per phase. The radius of each conductor is 1.25 cm.



c) Derive the expression for Insulation resistance of a cable.

Section – II

Q.4 Attempt the following Questions. (Any Four) **16**

a) Describe with diagram.
- i) Radial system
- ii) Ring main system

b) Derive an expression for voltage regulation and efficiency of short transmission line.

c) Explain in detail effect of Power Factor on Voltage regulation, Losses, efficiency in case of transmission line.

d) Define and explain terms: feeders, distributor and service mains with neat schematic diagram.

e) Explain various types of equipment in substation with neat symbol.

Q.5 Attempt the following Questions. (Any Two) **12**

a) What is mean by Neutral grounding and Explain with neat circuit diagram various methods of Neutral grounding.
- i) Resistance grounding
- ii) Reactance grounding
- iii) Solid grounding

b) With neat diagram derive the expression for A, B, C, D constants of medium transmission line using nominal T method.

c) A single-phase overhead transmission line delivers 1100 kW at 33KV at 0.8p. f lagging. The total resistance and inductive reactance of the line are 10 Ω and15 Ω respectively.
Determine:
- i) Sending end voltage
- ii) Sending end power factor
- iii) Transmission Efficiency

Seat No.		Set	S

S. Y. (B. Tech) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Power System II (BTN07403)

Day & Date: Wednesday 28-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct alternative from the given option and rewrite the sentence. **14**

1) In nominal -π method of solution of medium transmission line, capacitance is assumed to be: _____.
a) Distributed uniformly from sending end to receiving end
b) Divided into two halves
c) Lumped at the generation end
d) Lumped at middle of generation and load end

2) Which of the following distribution system is more reliable?
a) Radial system b) Tree system
c) Ring main system d) All are equally reliable

3) The sag of a transmission line depends upon _____.
a) Weight of conductor and directly proportional to span length
b) Weight of conductor and inversely proportional to span length
c) Weight of conductor and directly proportional to the square of span length
d) Weight of conductor and inversely proportional to the square of span length

4) The maximum tension in a section of overhead line conductor between two supports of unequal height occurs at _____.
a) The higher support b) The lower point
c) The midpoint of the conductor d) None of the above

5) Corona is accompanied by _____.
a) violet visible light b) hissing sound
c) power loss and interference d) all of the above

6) Transmission line constants are _____.
a) Capacitance b) Inductance
c) Resistance d) All of these

7) The inductance of line is minimum when _____.
a) G M D is high
b) G M R is high
c) Both G M D and G M R are high
d) G M D is low but G M R is high

8) When two conductors between each of radius 'r' are at a distance D, the capacitance between the two is proportional to _____.
a) loge(D/r) b) loge (r/ D)
c) 1/loge(D/r) d) 1/loge (r/D)

9) Find the inductance per km of a 3-phase transmission line using 1.24 cm diameter conductors when these are placed at the corners of an equilateral triangle of each side 2 m.
a) 3.2 mH/Km b) 2.1 mH/Km
c) 1.205 mH/Km d) 2.3 mH/Km

10) In triangular configuration, inductance and capacitance values are _____ and _____ respectively.
a) less, less b) higher, higher
c) less, higher d) higher, less

11) What is the purpose of bedding on the underground cables?
a) To avoid leakage of current.
b) To protect the sheath against corrosion.
c) To protect the sheath from mechanical injury due to armoring.
d) Both (b) and (c)

12) The cable best suited for the transmission of voltages from 33 kV to 66 kV is _____.
a) Belted cables b) Screened cables
c) Pressure cables d) None of these

13) What does capacitance grade of cables mean?
a) Use of dielectrics in different concentrations.
b) Introduction of capacitance at various lengths of cable to counter the effect of inductance.
c) Use of dielectrics of different permittivity's
d) Grading according to capacitance per km length of the cable.

14) In long transmission lines Resistance and Capacitance parameters of lines are connected in _____.
a) Series, shunt b) Series, series
c) Shunt, shunt d) Shunt, parallel

Seat No.	

Set **S**

S. Y. (B. Tech) (Sem - II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Power System II (BTN07403)

Day & Date: Wednesday 28-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

Section – I

Q.2 Attempt the following Questions. (Any Four) **16**

a) Define corona discharge: enlist the methods of reducing the corona effect.

b) Calculate the loop inductance per km of a single-phase overhead line consisting of two conductors each 1 cm diameter and 1.2 m apart.

c) What is meant by sag? Derive an expression for sag in a transmission line having equal level of supports.

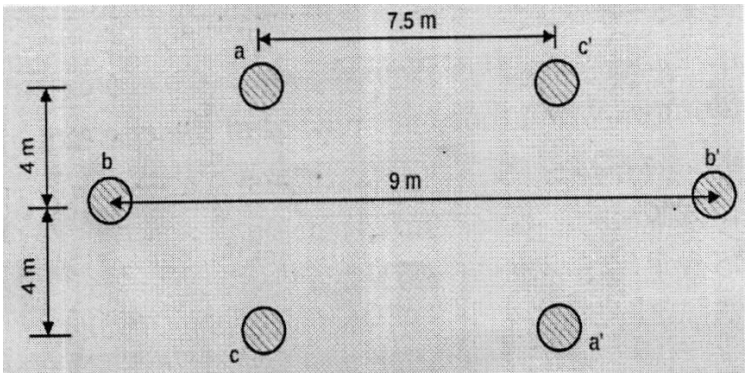
d) Explain the following methods of cable grading:
i) Capacitance grading
ii) Inters heath grading

e) Find the line to line capacitance per km of a three phase transmission line using 1.24 cm diameter conductor when these are placed at the corners of an equilateral triangle of each side 2m.

Q.3 Attempt the following Questions. (Any Two) **12**

a) Derive the expression for inductance of 3-ph single circuit overhead triangular configuration of transmission line for symmetrical spacing.

b) The double circuit three-phase line has the configuration shown in figure the distance between conductor a and c' is 7.5 between b and b' is 9 m and between a and c is 8 m. Find inductance per kilometer per phase. The radius of each conductor is 1.25 cm.



c) Derive the expression for Insulation resistance of a cable.

Section – II

Q.4 Attempt the following Questions. (Any Four) **16**

a) Describe with diagram.
- i) Radial system
- ii) Ring main system

b) Derive an expression for voltage regulation and efficiency of short transmission line.

c) Explain in detail effect of Power Factor on Voltage regulation, Losses, efficiency in case of transmission line.

d) Define and explain terms: feeders, distributor and service mains with neat schematic diagram.

e) Explain various types of equipment in substation with neat symbol.

Q.5 Attempt the following Questions. (Any Two) **12**

a) What is mean by Neutral grounding and Explain with neat circuit diagram various methods of Neutral grounding.
- i) Resistance grounding
- ii) Reactance grounding
- iii) Solid grounding

b) With neat diagram derive the expression for A, B, C, D constants of medium transmission line using nominal T method.

c) A single-phase overhead transmission line delivers 1100 kW at 33KV at 0.8p. f lagging. The total resistance and inductive reactance of the line are 10 Ω and15 Ω respectively.
Determine:
- i) Sending end voltage
- ii) Sending end power factor
- iii) Transmission Efficiency

SLR-BD-284

Seat No.	

Set P

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Analog & Digital Integrated circuits (BTN07404)

Day & Date: Friday, 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) When a differential amplifier is operated single-ended, _____.
a) the output is grounded
b) one input is grounded and signal is applied to the other
c) both inputs are connected together
d) the output is not inverted

2) For an Op-amp with negative feedback, the output is _____.
a) equal to the input
b) increased
c) fed back to the inverting input
d) fed back to the non-inverting input

3) A voltage follower _____.
a) has a voltage gain of 1 b) is non-inverting
c) has no feedback resistor d) has all of these

4) The Op-amp can amplify _____.
a) a.c. signals only b) d.c. signals only
c) both a.c. and d.c. signals d) neither d.c. nor a.c. signals

5) The input stage of an Op-amp is usually a _____.
a) differential amplifier b) class B push-pull amplifier
c) CE amplifier d) swamped amplifier

6) _____ is defined ratio of change in output voltage to change in time.
a) Slew rate b) CMRR
c) Unity Gain Frequency d) SVRR

7) Input resistance of op-amp is _____.
a) very high b) very low
c) zero d) one

8) _____ can also be called as data distributor.
a) Multiplexer b) Demultiplexer
c) Adder d) Subtractor

9) Universal Shift Register _____.
a) Accepts serial input
b) Accepts parallel input
c) Gives serial and parallel output
d) Is capable of all the above

10) In K-map, 8-square eliminates _____ variables.
a) 2 b) 3
c) 4 d) 5

11) Twisted ring counter is _____ register.
a) Serial In Serial Out b) Serial In Parallel Out
c) Parallel In Serial Out d) Parallel In Parallel Out

12) Each term in the standard SOP form is called a _____.
a) Minterm b) Maxterm
c) Don't care d) Literal

13) Toggle state for JK flip flop is when _____.
a) J=0, K=0 b) J=0, K=1
c) J=1, K=1 d) J=1, K=0

14) In sequential circuits the present input depends on _____.
a) past inputs only
b) present inputs only
c) present as well as past inputs
d) past outputs

Seat No.		Set	P

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Analog & Digital Integrated circuits (BTN07404)

Day & Date: Friday, 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Solve any Four: **16**

a) Explain DC Analysis of differential amplifier (DIBO).
b) With neat circuit diagram explain working of adder circuit.
c) Draw and explain block diagram representation of closed loop configurations of op-amp.
1) voltage-series feedback
2) voltage-shunt feedback
3) current-series feedback
4) current-shunt feedback
d) Explain voltage to current converter with grounded load.
e) Draw and explain ideal voltage transfer curve.

Q.3 Solve any Two: **12**

a) Draw and explain the block diagram of operational amplifier.
b) Explain the working of instrumentation amplifier.
c) Derive an expression for closed loop voltage gain and input resistance with feedback for voltage series feedback op-amp.

Section – II

Q.4 Solve any Four: **16**

a) Explain in detail ring counter.
b) With truth table explain operation of D flip flop.
c) Simplify the following function using K-map
F(A, B, C) = (1, 3, 5, 7)
d) Explain 4:1 Mux with truth table.
e) Explain Parallel in Serial Out (PISO) shift register.

Q.5 Solve any Two: **12**

a) Define flip flop. Explain the operation of Master Slave JK flip flop.
b) Obtain the real minimal expression for $f = \sum m\,(1, 2, 4, 6, 7)$ and implement it in universal gates.
c) Explain universal shift registers.

SLR-BD-284

Seat No.	

Set Q

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Analog & Digital Integrated circuits (BTN07404)

Day & Date: Friday, 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) _____ can also be called as data distributor.
a) Multiplexer b) Demultiplexer
c) Adder d) Subtractor

2) Universal Shift Register _____.
a) Accepts serial input
b) Accepts parallel input
c) Gives serial and parallel output
d) Is capable of all the above

3) In K-map, 8-square eliminates _____ variables.
a) 2 b) 3
c) 4 d) 5

4) Twisted ring counter is _____ register.
a) Serial In Serial Out b) Serial In Parallel Out
c) Parallel In Serial Out d) Parallel In Parallel Out

5) Each term in the standard SOP form is called a _____.
a) Minterm b) Maxterm
c) Don't care d) Literal

6) Toggle state for JK flip flop is when _____.
a) J=0, K=0 b) J=0, K=1
c) J=1, K=1 d) J=1, K=0

7) In sequential circuits the present input depends on _____.
a) past inputs only
b) present inputs only
c) present as well as past inputs
d) past outputs

8) When a differential amplifier is operated single-ended, _____.
a) the output is grounded
b) one input is grounded and signal is applied to the other
c) both inputs are connected together
d) the output is not inverted

9) For an Op-amp with negative feedback, the output is _____.
a) equal to the input
b) increased
c) fed back to the inverting input
d) fed back to the non-inverting input

10) A voltage follower _____.
a) has a voltage gain of 1 b) is non-inverting
c) has no feedback resistor d) has all of these

11) The Op-amp can amplify _____.
a) a.c. signals only b) d.c. signals only
c) both a.c. and d.c. signals d) neither d.c. nor a.c. signals

12) The input stage of an Op-amp is usually a _____.
a) differential amplifier b) class B push-pull amplifier
c) CE amplifier d) swamped amplifier

13) _____ is defined ratio of change in output voltage to change in time.
a) Slew rate b) CMRR
c) Unity Gain Frequency d) SVRR

14) Input resistance of op-amp is _____.
a) very high b) very low
c) zero d) one

SLR-BD-284

Seat No.	

Set Q

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Analog & Digital Integrated circuits (BTN07404)

Day & Date: Friday, 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Solve any Four: **16**

a) Explain DC Analysis of differential amplifier (DIBO).
b) With neat circuit diagram explain working of adder circuit.
c) Draw and explain block diagram representation of closed loop configurations of op-amp.
1) voltage-series feedback
2) voltage-shunt feedback
3) current-series feedback
4) current-shunt feedback
d) Explain voltage to current converter with grounded load.
e) Draw and explain ideal voltage transfer curve.

Q.3 Solve any Two: **12**

a) Draw and explain the block diagram of operational amplifier.
b) Explain the working of instrumentation amplifier.
c) Derive an expression for closed loop voltage gain and input resistance with feedback for voltage series feedback op-amp.

Section – II

Q.4 Solve any Four: **16**

a) Explain in detail ring counter.
b) With truth table explain operation of D flip flop.
c) Simplify the following function using K-map
F(A, B, C) = (1, 3, 5, 7)
d) Explain 4:1 Mux with truth table.
e) Explain Parallel in Serial Out (PISO) shift register.

Q.5 Solve any Two: **12**

a) Define flip flop. Explain the operation of Master Slave JK flip flop.
b) Obtain the real minimal expression for $f = \sum m\,(1, 2, 4, 6, 7)$ and implement it in universal gates.
c) Explain universal shift registers.

Seat No.	

Set **R**

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Analog & Digital Integrated circuits (BTN07404)

Day & Date: Friday, 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Twisted ring counter is _____ register.
a) Serial In Serial Out b) Serial In Parallel Out
c) Parallel In Serial Out d) Parallel In Parallel Out

2) Each term in the standard SOP form is called a _____.
a) Minterm b) Maxterm
c) Don't care d) Literal

3) Toggle state for JK flip flop is when _____.
a) J=0, K=0 b) J=0, K=1
c) J=1, K=1 d) J=1, K=0

4) In sequential circuits the present input depends on _____.
a) past inputs only
b) present inputs only
c) present as well as past inputs
d) past outputs

5) When a differential amplifier is operated single-ended, _____.
a) the output is grounded
b) one input is grounded and signal is applied to the other
c) both inputs are connected together
d) the output is not inverted

6) For an Op-amp with negative feedback, the output is _____.
a) equal to the input
b) increased
c) fed back to the inverting input
d) fed back to the non-inverting input

7) A voltage follower _____.
a) has a voltage gain of 1 b) is non-inverting
c) has no feedback resistor d) has all of these

8) The Op-amp can amplify _____.
a) a.c. signals only b) d.c. signals only
c) both a.c. and d.c. signals d) neither d.c. nor a.c. signals

9) The input stage of an Op-amp is usually a _____.
a) differential amplifier b) class B push-pull amplifier
c) CE amplifier d) swamped amplifier

10) _____ is defined ratio of change in output voltage to change in time.
a) Slew rate b) CMRR
c) Unity Gain Frequency d) SVRR

11) Input resistance of op-amp is _____.
a) very high b) very low
c) zero d) one

12) _____ can also be called as data distributor.
a) Multiplexer b) Demultiplexer
c) Adder d) Subtractor

13) Universal Shift Register _____.
a) Accepts serial input
b) Accepts parallel input
c) Gives serial and parallel output
d) Is capable of all the above

14) In K-map, 8-square eliminates _____ variables.
a) 2 b) 3
c) 4 d) 5

Seat No.	

Set **R**

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Analog & Digital Integrated circuits (BTN07404)

Day & Date: Friday, 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Solve any Four: **16**

a) Explain DC Analysis of differential amplifier (DIBO).
b) With neat circuit diagram explain working of adder circuit.
c) Draw and explain block diagram representation of closed loop configurations of op-amp.
1) voltage-series feedback
2) voltage-shunt feedback
3) current-series feedback
4) current-shunt feedback
d) Explain voltage to current converter with grounded load.
e) Draw and explain ideal voltage transfer curve.

Q.3 Solve any Two: **12**

a) Draw and explain the block diagram of operational amplifier.
b) Explain the working of instrumentation amplifier.
c) Derive an expression for closed loop voltage gain and input resistance with feedback for voltage series feedback op-amp.

Section – II

Q.4 Solve any Four: **16**

a) Explain in detail ring counter.
b) With truth table explain operation of D flip flop.
c) Simplify the following function using K-map
F(A, B, C) = (1, 3, 5, 7)
d) Explain 4:1 Mux with truth table.
e) Explain Parallel in Serial Out (PISO) shift register.

Q.5 Solve any Two: **12**

a) Define flip flop. Explain the operation of Master Slave JK flip flop.
b) Obtain the real minimal expression for $f = \sum m\,(1, 2, 4, 6, 7)$ and implement it in universal gates.
c) Explain universal shift registers.

Seat No.		Set	S

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Analog & Digital Integrated circuits (BTN07404)

Day & Date: Friday, 30-05-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. 14

1) _____ is defined ratio of change in output voltage to change in time.
a) Slew rate b) CMRR
c) Unity Gain Frequency d) SVRR

2) Input resistance of op-amp is _____.
a) very high b) very low
c) zero d) one

3) _____ can also be called as data distributor.
a) Multiplexer b) Demultiplexer
c) Adder d) Subtractor

4) Universal Shift Register _____.
a) Accepts serial input
b) Accepts parallel input
c) Gives serial and parallel output
d) Is capable of all the above

5) In K-map, 8-square eliminates _____ variables.
a) 2 b) 3
c) 4 d) 5

6) Twisted ring counter is _____ register.
a) Serial In Serial Out b) Serial In Parallel Out
c) Parallel In Serial Out d) Parallel In Parallel Out

7) Each term in the standard SOP form is called a _____.
a) Minterm b) Maxterm
c) Don't care d) Literal

8) Toggle state for JK flip flop is when _____.

a) J=0, K=0 b) J=0, K=1
c) J=1, K=1 d) J=1, K=0

9) In sequential circuits the present input depends on _____.

a) past inputs only
b) present inputs only
c) present as well as past inputs
d) past outputs

10) When a differential amplifier is operated single-ended, _____.

a) the output is grounded
b) one input is grounded and signal is applied to the other
c) both inputs are connected together
d) the output is not inverted

11) For an Op-amp with negative feedback, the output is _____.

a) equal to the input
b) increased
c) fed back to the inverting input
d) fed back to the non-inverting input

12) A voltage follower _____.

a) has a voltage gain of 1 b) is non-inverting
c) has no feedback resistor d) has all of these

13) The Op-amp can amplify _____.

a) a.c. signals only b) d.c. signals only
c) both a.c. and d.c. signals d) neither d.c. nor a.c. signals

14) The input stage of an Op-amp is usually a _____.

a) differential amplifier b) class B push-pull amplifier
c) CE amplifier d) swamped amplifier

SLR-BD-284

Seat No.		Set	S

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Analog & Digital Integrated circuits (BTN07404)

Day & Date: Friday, 30-05-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Make suitable assumptions if necessary and state them clearly.

Section – I

Q.2 Solve any Four: **16**

a) Explain DC Analysis of differential amplifier (DIBO).
b) With neat circuit diagram explain working of adder circuit.
c) Draw and explain block diagram representation of closed loop configurations of op-amp.
1) voltage-series feedback
2) voltage-shunt feedback
3) current-series feedback
4) current-shunt feedback
d) Explain voltage to current converter with grounded load.
e) Draw and explain ideal voltage transfer curve.

Q.3 Solve any Two: **12**

a) Draw and explain the block diagram of operational amplifier.
b) Explain the working of instrumentation amplifier.
c) Derive an expression for closed loop voltage gain and input resistance with feedback for voltage series feedback op-amp.

Section – II

Q.4 Solve any Four: **16**

a) Explain in detail ring counter.
b) With truth table explain operation of D flip flop.
c) Simplify the following function using K-map
F(A, B, C) = (1, 3, 5, 7)
d) Explain 4:1 Mux with truth table.
e) Explain Parallel in Serial Out (PISO) shift register.

Q.5 Solve any Two: **12**

a) Define flip flop. Explain the operation of Master Slave JK flip flop.
b) Obtain the real minimal expression for $f = \sum m\,(1, 2, 4, 6, 7)$ and implement it in universal gates.
c) Explain universal shift registers.

SLR-BD-285

Seat No.	

Set P

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Network Analysis (BTN07405)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) A practical current source consists of _____.
a) An ideal current source in series with a resistance
b) An ideal current source in parallel with a resistance
c) Both are correct
d) None of the above

2) Four equal value resistors are connected in parallel. 5 V voltage is applied across the parallel circuit and 2.5 A current are measured from the source. What is the value of each resistor?
a) 4Ω b) 8Ω
c) 2.5Ω d) 5Ω

3) Between two open circuited terminals the current is_____
a) Minimum b) Maximum
c) Zero d) None of the above

4) In Nortons theorem, to find ZN _____.
a) All independent current sources are short circuited and independent voltage sources are open circuited
b) All independent voltage and current sources are open circuited
c) All independent voltage and current sources are short circuited
d) All independent voltage sources are short circuited and independent current sources are open circuited

5) Superposition theorem is not applicable to network containing _____.
a) Nonlinear elements b) Dependent voltage source
c) Dependent current source d) Transformers

6) In an electrical circuit dual of inductance is _____.
a) conductance b) resistance
c) capacitance d) susceptance

7) Rank of Cut- set matrix is _____.
a) N b) N – 1
c) B – N + 1 d) B – N – 1

8) An RC circuit has R = 2 ohm and C = 4F. The time constant is _____.
a) 0.5 s b) 2 s
c) 8 s d) 1.5 s

9) In RLC circuit, if $\alpha < \omega 0$ then thee current gives _____.
a) over damped b) under damped
c) critically damped d) undamped

10) The value of unity impulse function at time (t) = 0 is _____.
a) 0 b) 1
c) Infinite d) Indeterminate

11) The Inductor doesn't allow sudden changes in _____.
a) Voltage b) Current
c) Resistance d) Inductance

12) In an electrical circuit's transient are due to _____.
a) inductor b) capacitor
c) inductor and capacitor d) none of the above

13) What does the connectivity of energy source at the port of network known as?
a) Driving Point b) Transfer Point
c) Both a and b d) None of the above

14) Which of the following ABCD parameters is unit less?
a) A and D b) A and B
c) B and C d) A and C

Seat No.	

Set **P**

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Network Analysis (BTN07405)

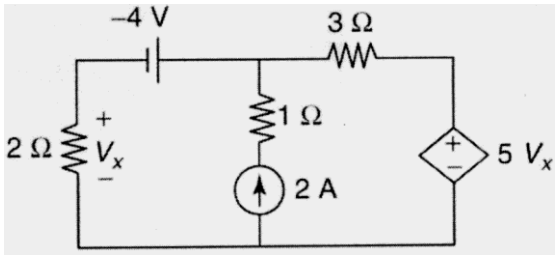
Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

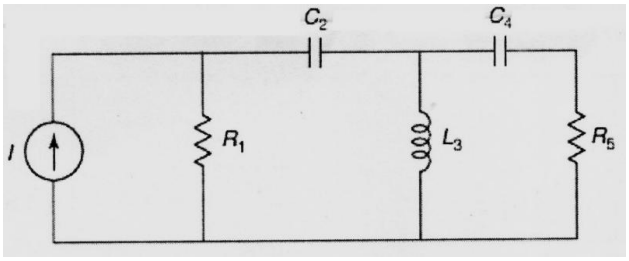
Section – I

Q.2 Attempt any Four **16**

a) Find the current through 3Ω resistor.

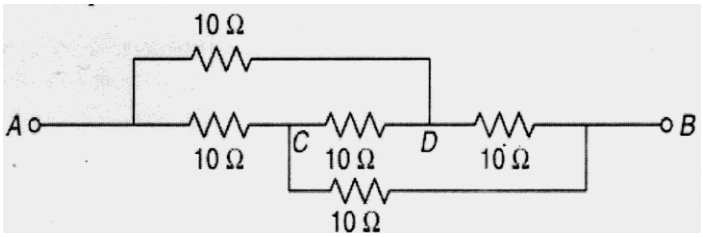


b) Draw the dual of the network.

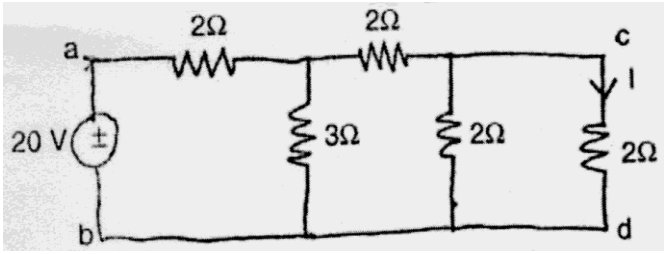


c) State and explain Maximum Power transfer Theorem. Also, Derive the Condition for maximum power transfer.

d) Find the Equivalent Resistance between terminal A&B.

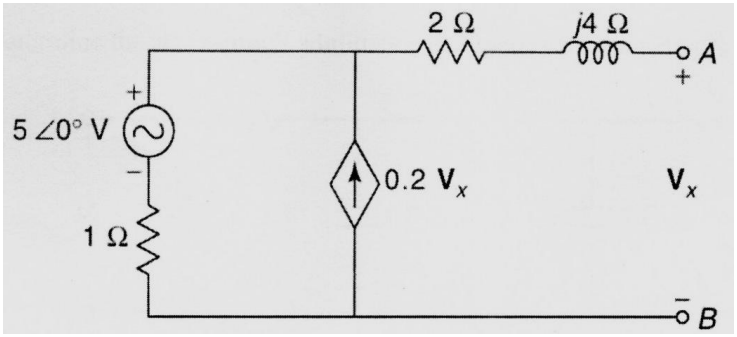


e) Verify the Reciprocity theorem for the network shown below Find the Thevenin's equivalent network for the terminals A and B.

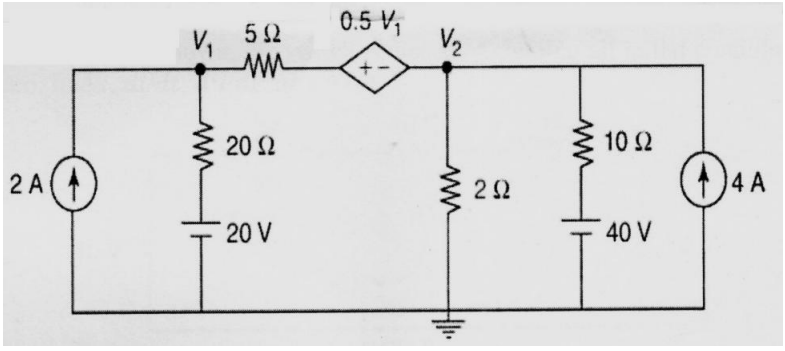


Q.3 Attempt any two. **12**

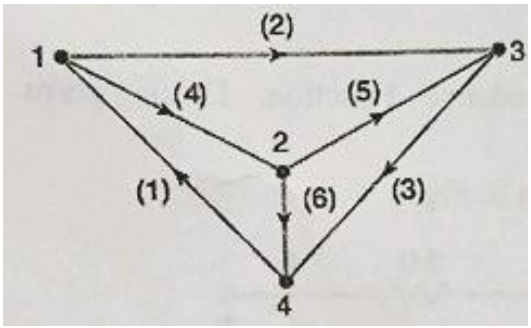
a) Find Thevenin's equivalent network across terminals A and B.



b) For the network shown below find voltages V_1 and V_2.



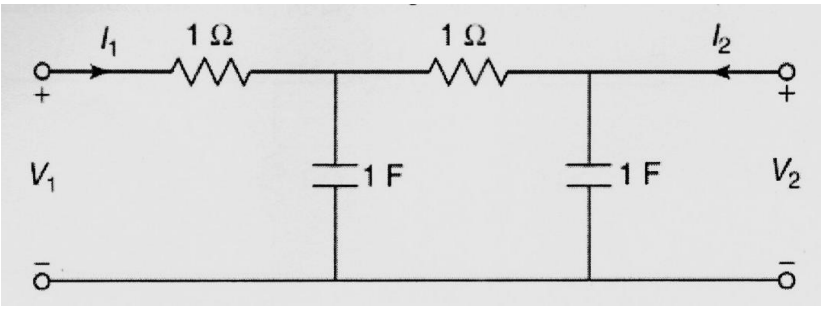
c) The graph of a network shown in fig. write a) Incidence matrix b) Tie set matrix c) Cut set matrix.



Section – II

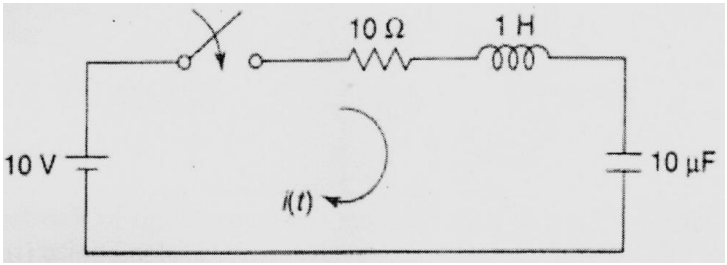
Q.4 Attempt any Four. **16**

a) Determine the short-circuit admittance parameters for the network shown.



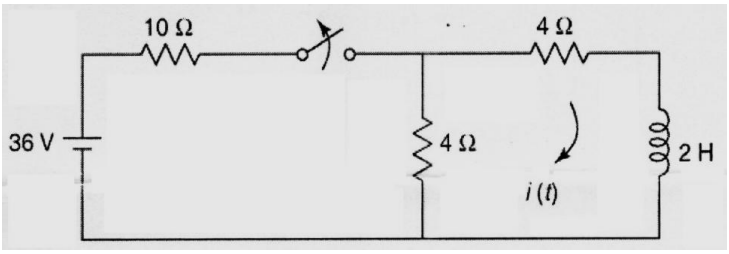
b) Derive an expression for response given by RC circuit.

c) In the network shown, the switch is closed. Assuming all initial conditions as zero, find $i, di/dt, d^2i/dt^2$ at $t = 0+$.



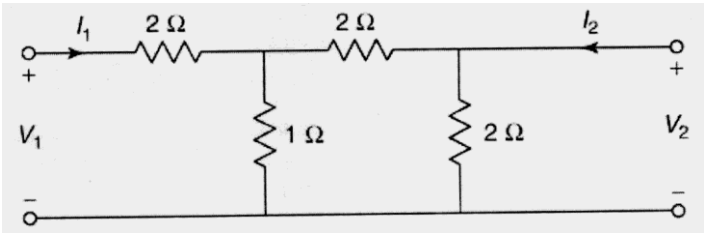
d) Derive Z- Parameter in terms of ABCD Parameter.

e) The network shown in Fig. has acquired steady-state with the switch closed for t < 0. At t = 0, the switch is opened. Obtain i (t) for t > 0. using Laplace transforms.

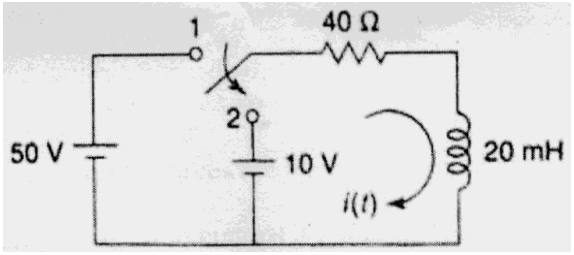


Q.5 Attempt any two. **12**

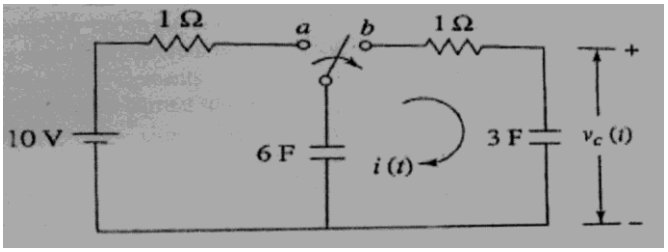
a) Two identical sections of the network shown are connected in cascade. Obtain the transmission parameters of the overall connection.



b) In the network of fig, is under steady state with switch is at position 1, at switch is moved to position 2. Find i (t).



c) In the network of fig. the switch is moved from a to b at t = 0. Determine i(t) and Vc (t) using Laplace transform.



Seat No.	

Set **Q**

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Network Analysis (BTN07405)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) An RC circuit has R = 2 ohm and C = 4F. The time constant is _____.
a) 0.5 s b) 2 s
c) 8 s d) 1.5 s

2) In RLC circuit, if $\alpha < \omega 0$ then thee current gives _____.
a) over damped b) under damped
c) critically damped d) undamped

3) The value of unity impulse function at time (t) = 0 is _____.
a) 0 b) 1
c) Infinite d) Indeterminate

4) The Inductor doesn't allow sudden changes in _____.
a) Voltage b) Current
c) Resistance d) Inductance

5) In an electrical circuit's transient are due to _____.
a) inductor b) capacitor
c) inductor and capacitor d) none of the above

6) What does the connectivity of energy source at the port of network known as?
a) Driving Point b) Transfer Point
c) Both a and b d) None of the above

7) Which of the following ABCD parameters is unit less?
a) A and D b) A and B
c) B and C d) A and C

8) A practical current source consists of _____.
   a) An ideal current source in series with a resistance
   b) An ideal current source in parallel with a resistance
   c) Both are correct
   d) None of the above

9) Four equal value resistors are connected in parallel. 5 V voltage is applied across the parallel circuit and 2.5 A current are measured from the source. What is the value of each resistor?
   a) 4Ω b) 8Ω
   c) 2.5Ω d) 5Ω

10) Between two open circuited terminals the current is_____
   a) Minimum b) Maximum
   c) Zero d) None of the above

11) In Nortons theorem, to find ZN _____.
   a) All independent current sources are short circuited and independent voltage sources are open circuited
   b) All independent voltage and current sources are open circuited
   c) All independent voltage and current sources are short circuited
   d) All independent voltage sources are short circuited and independent current sources are open circuited

12) Superposition theorem is not applicable to network containing _____.
   a) Nonlinear elements b) Dependent voltage source
   c) Dependent current source d) Transformers

13) In an electrical circuit dual of inductance is _____.
   a) conductance b) resistance
   c) capacitance d) susceptance

14) Rank of Cut- set matrix is _____.
   a) N b) N – 1
   c) B – N + 1 d) B – N – 1

Seat No.	

Set **Q**

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Network Analysis (BTN07405)

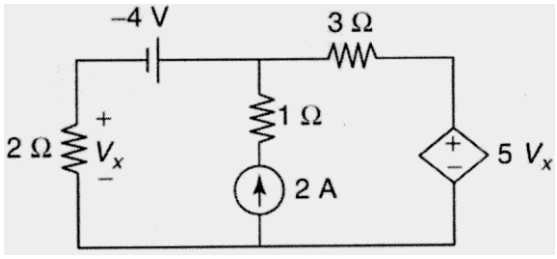
Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

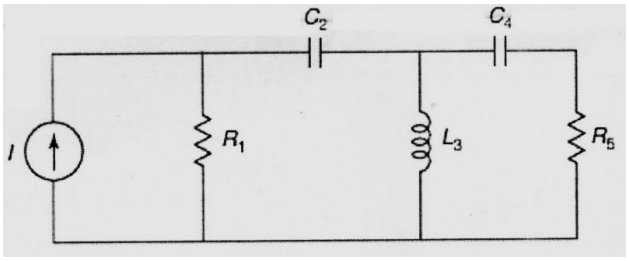
Section – I

Q.2 Attempt any Four **16**

a) Find the current through 3Ω resistor.

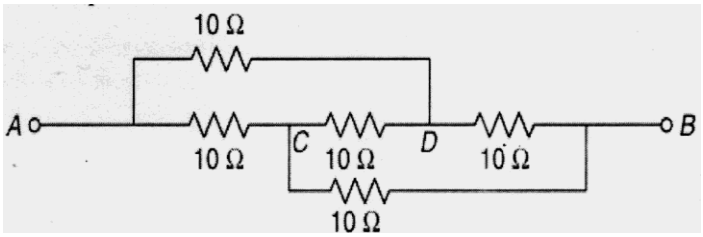


b) Draw the dual of the network.

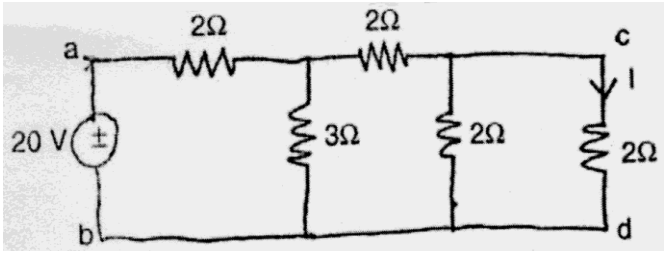


c) State and explain Maximum Power transfer Theorem. Also, Derive the Condition for maximum power transfer.

d) Find the Equivalent Resistance between terminal A&B.

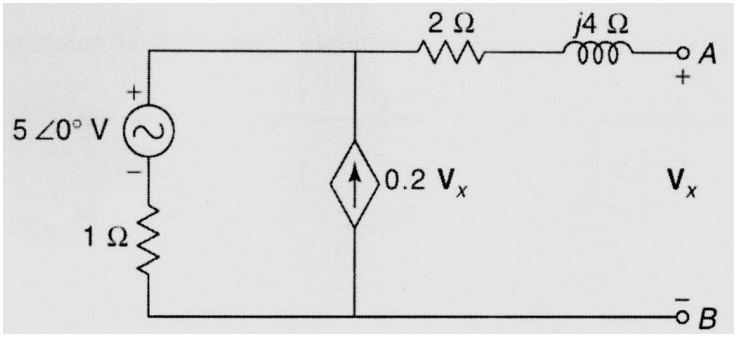


e) Verify the Reciprocity theorem for the network shown below Find the Thevenin's equivalent network for the terminals A and B.

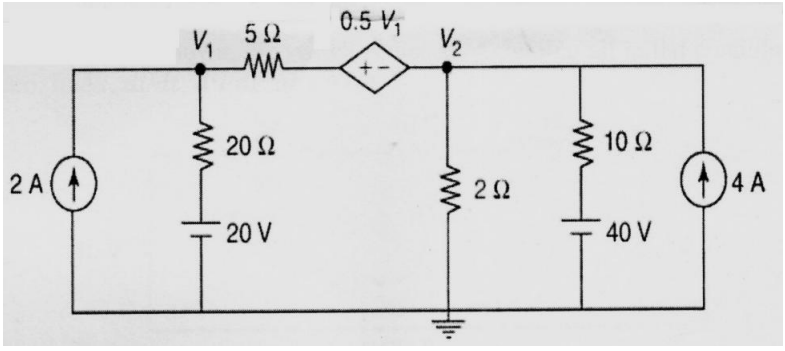


Q.3 Attempt any two. **12**

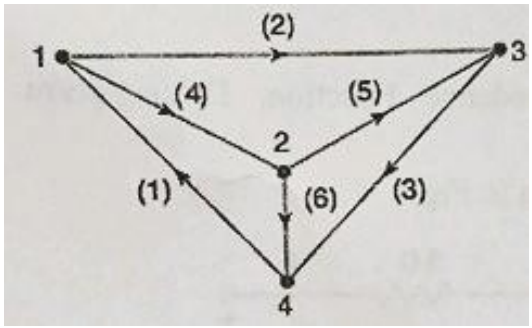
a) Find Thevenin's equivalent network across terminals A and B.



b) For the network shown below find voltages V_1 and V_2.



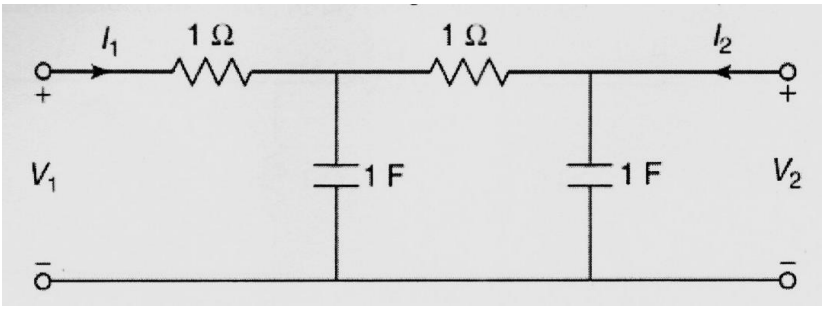
c) The graph of a network shown in fig. write a) Incidence matrix b) Tie set matrix c) Cut set matrix.



Section – II

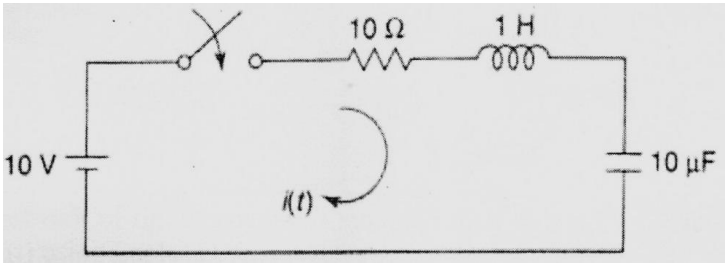
Q.4 Attempt any Four. **16**

a) Determine the short-circuit admittance parameters for the network shown.



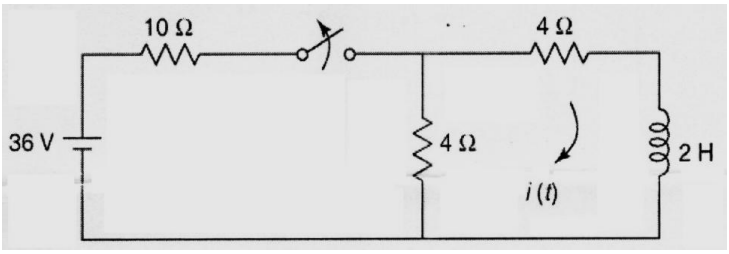
b) Derive an expression for response given by RC circuit.

c) In the network shown, the switch is closed. Assuming all initial conditions as zero, find $i, di/dt, d^2i/dt^2$ at $t = 0+$.



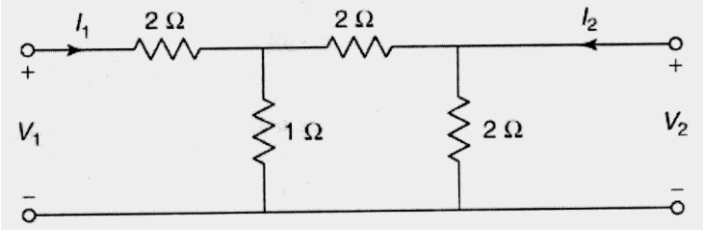
d) Derive Z- Parameter in terms of ABCD Parameter.

e) The network shown in Fig. has acquired steady-state with the switch closed for t < 0. At t = 0, the switch is opened. Obtain i (t) for t > 0. using Laplace transforms.

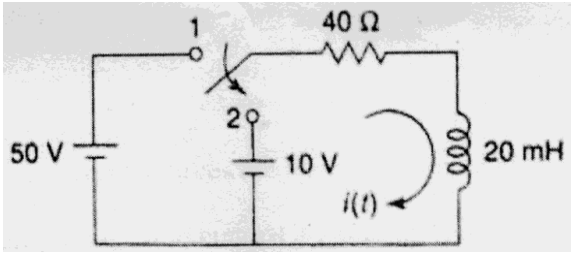


Q.5 Attempt any two. **12**

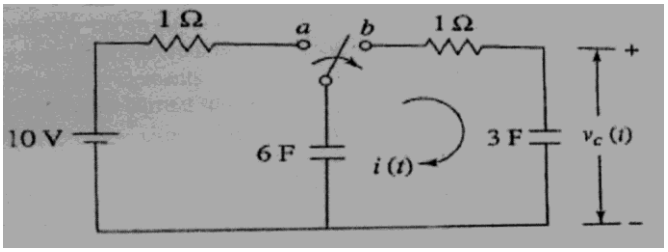
a) Two identical sections of the network shown are connected in cascade. Obtain the transmission parameters of the overall connection.



b) In the network of fig, is under steady state with switch is at position 1, at switch is moved to position 2. Find i (t).



c) In the network of fig. the switch is moved from a to b at t = 0. Determine i(t) and Vc (t) using Laplace transform.



Seat No.	

Set **R**

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Network Analysis (BTN07405)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) The Inductor doesn't allow sudden changes in _____.
a) Voltage b) Current
c) Resistance d) Inductance

2) In an electrical circuit's transient are due to _____.
a) inductor b) capacitor
c) inductor and capacitor d) none of the above

3) What does the connectivity of energy source at the port of network known as?
a) Driving Point b) Transfer Point
c) Both a and b d) None of the above

4) Which of the following ABCD parameters is unit less?
a) A and D b) A and B
c) B and C d) A and C

5) A practical current source consists of _____.
a) An ideal current source in series with a resistance
b) An ideal current source in parallel with a resistance
c) Both are correct
d) None of the above

6) Four equal value resistors are connected in parallel. 5 V voltage is applied across the parallel circuit and 2.5 A current are measured from the source. What is the value of each resistor?
a) 4Ω b) 8Ω
c) 2.5Ω d) 5Ω

7) Between two open circuited terminals the current is_____
a) Minimum b) Maximum
c) Zero d) None of the above

8) In Nortons theorem, to find ZN _____.
- a) All independent current sources are short circuited and independent voltage sources are open circuited
- b) All independent voltage and current sources are open circuited
- c) All independent voltage and current sources are short circuited
- d) All independent voltage sources are short circuited and independent current sources are open circuited

9) Superposition theorem is not applicable to network containing _____.
- a) Nonlinear elements
- b) Dependent voltage source
- c) Dependent current source
- d) Transformers

10) In an electrical circuit dual of inductance is _____.
- a) conductance
- b) resistance
- c) capacitance
- d) susceptance

11) Rank of Cut- set matrix is _____.
- a) N
- b) N – 1
- c) B – N + 1
- d) B – N – 1

12) An RC circuit has R = 2 ohm and C = 4F. The time constant is _____.
- a) 0.5 s
- b) 2 s
- c) 8 s
- d) 1.5 s

13) In RLC circuit, if $\alpha < \omega 0$ then thee current gives _____.
- a) over damped
- b) under damped
- c) critically damped
- d) undamped

14) The value of unity impulse function at time (t) = 0 is _____.
- a) 0
- b) 1
- c) Infinite
- d) Indeterminate

Seat No.	

Set **R**

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Network Analysis (BTN07405)

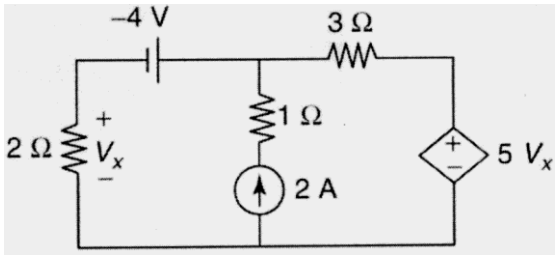
Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

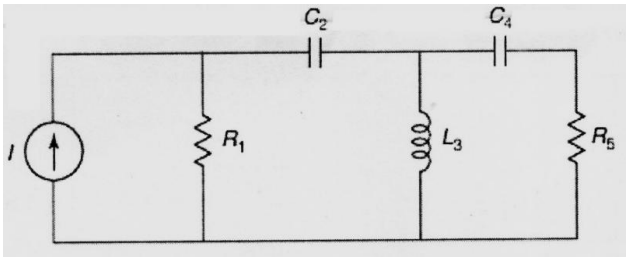
Section – I

Q.2 Attempt any Four **16**

a) Find the current through 3Ω resistor.

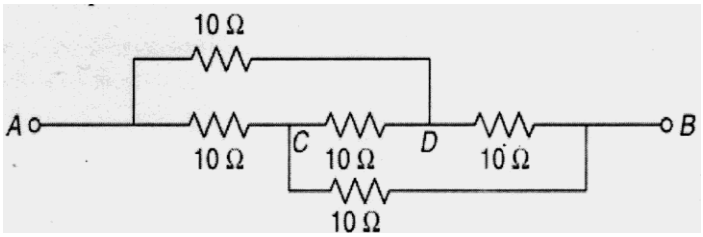


b) Draw the dual of the network.

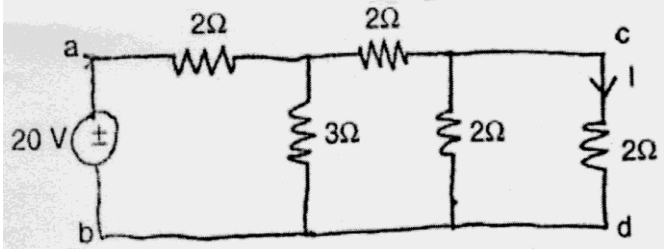


c) State and explain Maximum Power transfer Theorem. Also, Derive the Condition for maximum power transfer.

d) Find the Equivalent Resistance between terminal A&B.

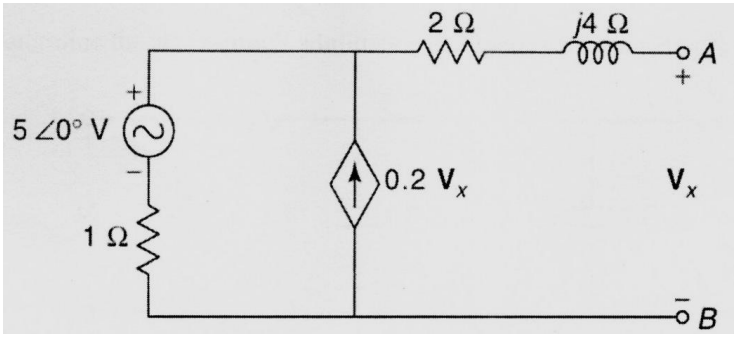


e) Verify the Reciprocity theorem for the network shown below Find the Thevenin's equivalent network for the terminals A and B.

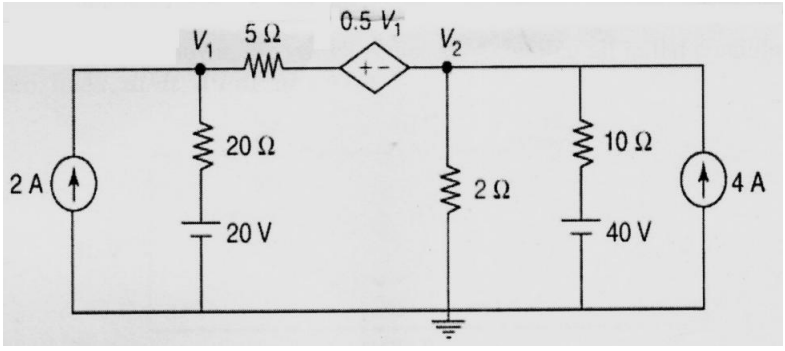


Q.3 Attempt any two. **12**

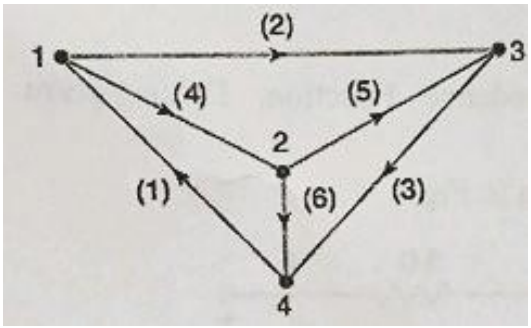
a) Find Thevenin's equivalent network across terminals A and B.



b) For the network shown below find voltages V_1 and V_2.



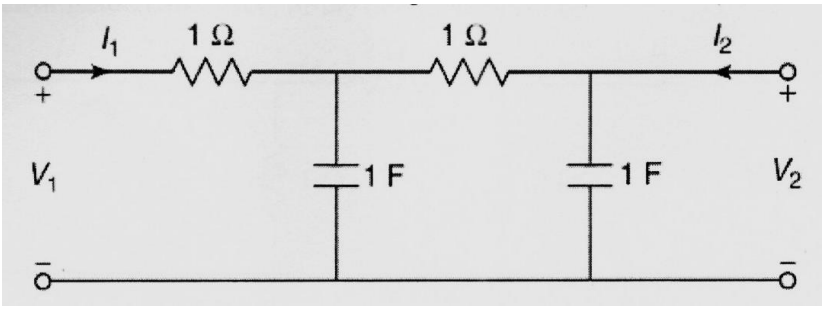
c) The graph of a network shown in fig. write a) Incidence matrix b) Tie set matrix c) Cut set matrix.



Section – II

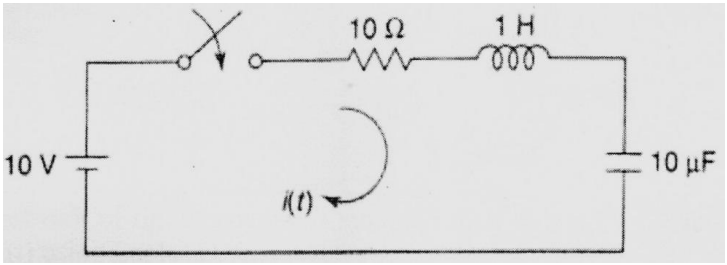
Q.4 Attempt any Four. **16**

a) Determine the short-circuit admittance parameters for the network shown.



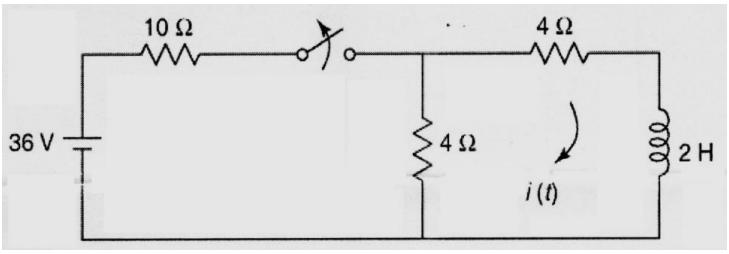
b) Derive an expression for response given by RC circuit.

c) In the network shown, the switch is closed. Assuming all initial conditions as zero, find $i, di/dt, d^2i/dt^2$ at $t = 0+$.



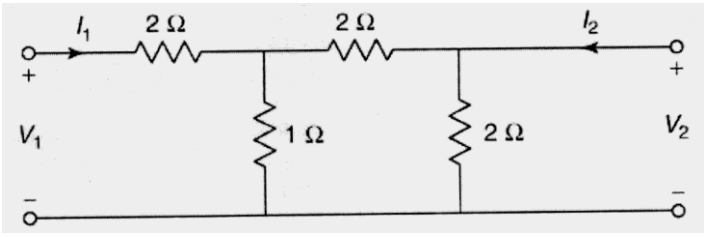
d) Derive Z- Parameter in terms of ABCD Parameter.

e) The network shown in Fig. has acquired steady-state with the switch closed for t < 0. At t = 0, the switch is opened. Obtain i (t) for t > 0. using Laplace transforms.

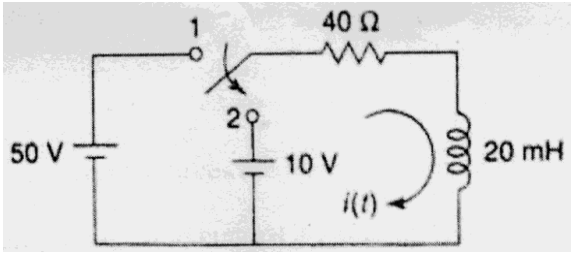


Q.5 Attempt any two. **12**

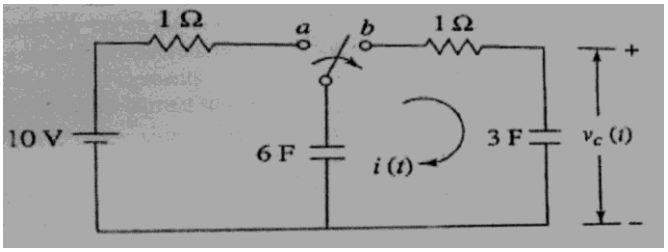
a) Two identical sections of the network shown are connected in cascade. Obtain the transmission parameters of the overall connection.



b) In the network of fig, is under steady state with switch is at position 1, at switch is moved to position 2. Find i (t).



c) In the network of fig. the switch is moved from a to b at t = 0. Determine i(t) and Vc (t) using Laplace transform.



Seat No.	

Set **S**

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Network Analysis (BTN07405)

Day & Date: Tuesday, 03-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) In an electrical circuit dual of inductance is _____.
a) conductance b) resistance
c) capacitance d) susceptance

2) Rank of Cut- set matrix is _____.
a) N b) N – 1
c) B – N + 1 d) B – N – 1

3) An RC circuit has R = 2 ohm and C = 4F. The time constant is _____.
a) 0.5 s b) 2 s
c) 8 s d) 1.5 s

4) In RLC circuit, if $\alpha < \omega 0$ then thee current gives _____.
a) over damped b) under damped
c) critically damped d) undamped

5) The value of unity impulse function at time (t) = 0 is _____.
a) 0 b) 1
c) Infinite d) Indeterminate

6) The Inductor doesn't allow sudden changes in _____.
a) Voltage b) Current
c) Resistance d) Inductance

7) In an electrical circuit's transient are due to _____.
a) inductor b) capacitor
c) inductor and capacitor d) none of the above

8) What does the connectivity of energy source at the port of network known as?
a) Driving Point b) Transfer Point
c) Both a and b d) None of the above

9) Which of the following ABCD parameters is unit less?
a) A and D b) A and B
c) B and C d) A and C

10) A practical current source consists of _____.
a) An ideal current source in series with a resistance
b) An ideal current source in parallel with a resistance
c) Both are correct
d) None of the above

11) Four equal value resistors are connected in parallel. 5 V voltage is applied across the parallel circuit and 2.5 A current are measured from the source. What is the value of each resistor?
a) 4Ω b) 8Ω
c) 2.5Ω d) 5Ω

12) Between two open circuited terminals the current is_____
a) Minimum b) Maximum
c) Zero d) None of the above

13) In Nortons theorem, to find ZN _____.
a) All independent current sources are short circuited and independent voltage sources are open circuited
b) All independent voltage and current sources are open circuited
c) All independent voltage and current sources are short circuited
d) All independent voltage sources are short circuited and independent current sources are open circuited

14) Superposition theorem is not applicable to network containing _____.
a) Nonlinear elements b) Dependent voltage source
c) Dependent current source d) Transformers

Seat No.	

Set **S**

S. Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Network Analysis (BTN07405)

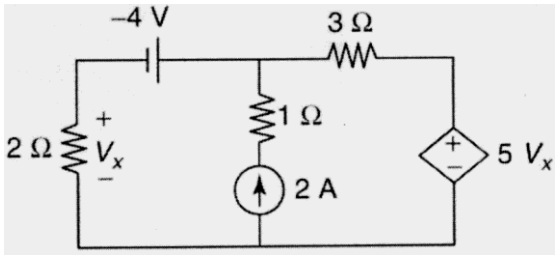
Day & Date: Tuesday, 03-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

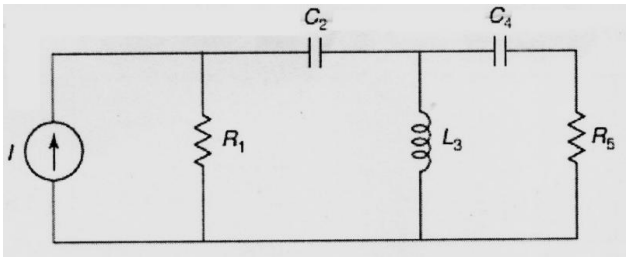
Section – I

Q.2 Attempt any Four **16**

a) Find the current through 3Ω resistor.

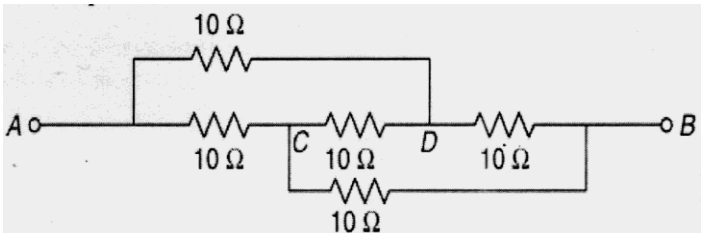


b) Draw the dual of the network.

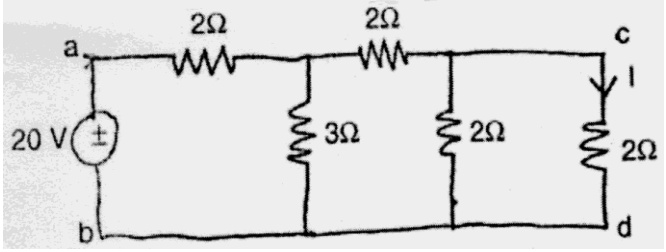


c) State and explain Maximum Power transfer Theorem. Also, Derive the Condition for maximum power transfer.

d) Find the Equivalent Resistance between terminal A&B.

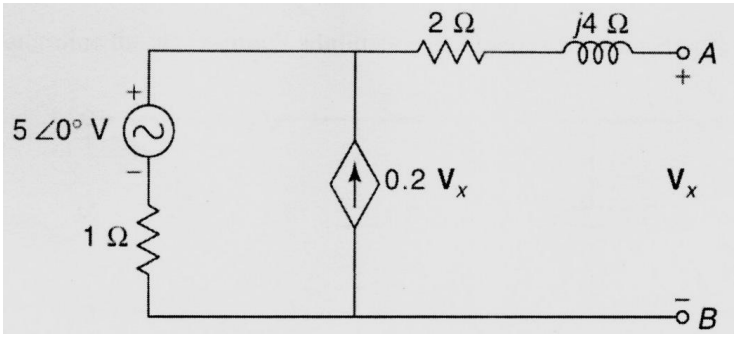


e) Verify the Reciprocity theorem for the network shown below Find the Thevenin's equivalent network for the terminals A and B.

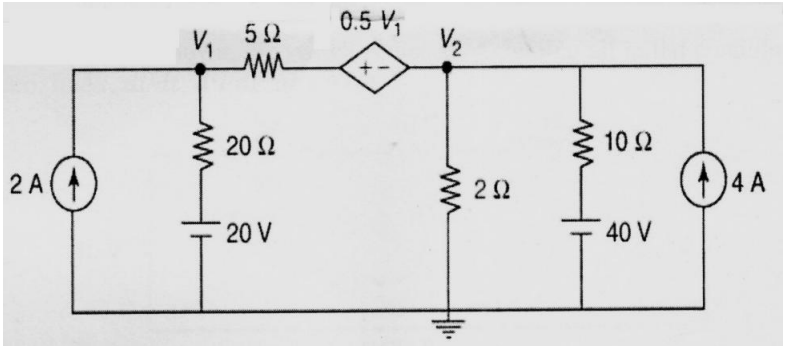


Q.3 Attempt any two. **12**

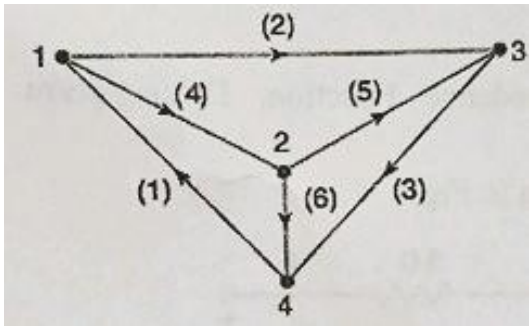
a) Find Thevenin's equivalent network across terminals A and B.



b) For the network shown below find voltages V_1 and V_2.



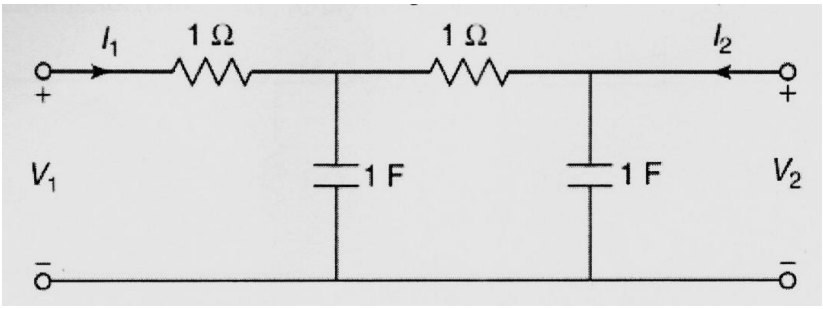
c) The graph of a network shown in fig. write a) Incidence matrix b) Tie set matrix c) Cut set matrix.



Section – II

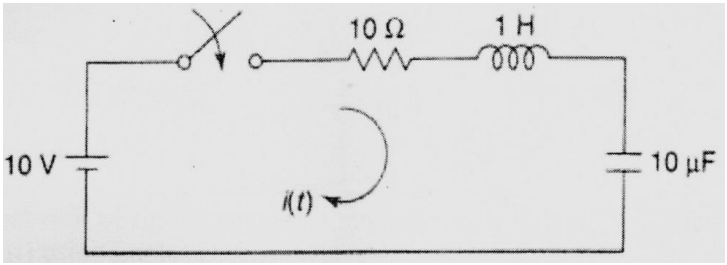
Q.4 Attempt any Four. **16**

a) Determine the short-circuit admittance parameters for the network shown.



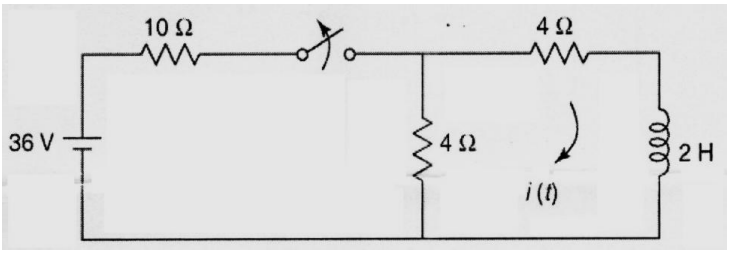
b) Derive an expression for response given by RC circuit.

c) In the network shown, the switch is closed. Assuming all initial conditions as zero, find $i, di/dt, d^2i/dt^2$ at $t = 0+$.



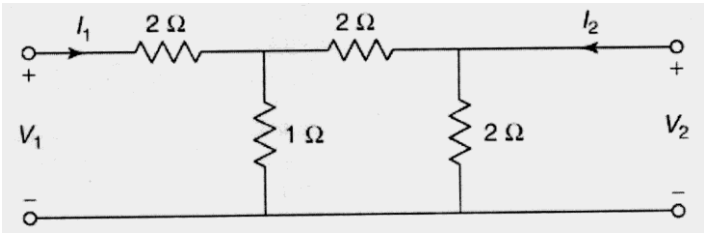
d) Derive Z- Parameter in terms of ABCD Parameter.

e) The network shown in Fig. has acquired steady-state with the switch closed for t < 0. At t = 0, the switch is opened. Obtain i (t) for t > 0. using Laplace transforms.

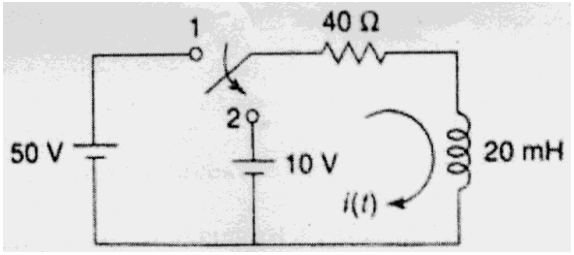


Q.5 Attempt any two. **12**

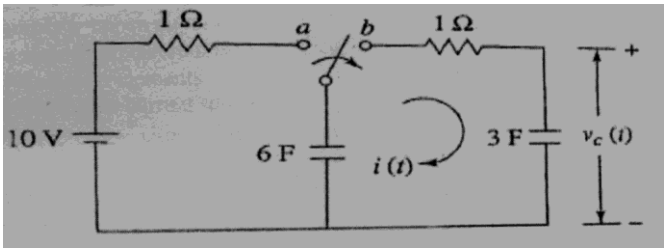
a) Two identical sections of the network shown are connected in cascade. Obtain the transmission parameters of the overall connection.



b) In the network of fig, is under steady state with switch is at position 1, at switch is moved to position 2. Find i (t).



c) In the network of fig. the switch is moved from a to b at t = 0. Determine i(t) and Vc (t) using Laplace transform.



SLR-BD-286

Seat No.	

Set P

S.Y (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Numerical Methods and Linear Algebra (BTN07401)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.
5) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) In solving simultaneous linear equation which of the following method is iterative?
a) Factorisation b) Jacobi
c) Gauss-Seidel d) Both b and c

2) Error in the Trapezoidal rule is of the order _____.
a) h^2 b) h^3
c) h^4 d) h^5

3) If $\frac{dy}{dx} = x^2 + y^2$ and $y(0) = 1$ then Picard's first approximation is ____.
a) $1 + x$ b) $x + \frac{x^3}{3}$
c) $1 + x - \frac{x^3}{3}$ d) $1 + x + \frac{x^3}{3}$

4) Romberg method is used to solve _____.
a) Ordinary differential equations
b) Integration
c) Partial differential equations
d) All of these

5) The quantity K obtained by Runge-Kutta method of fourth order for differential equation $\frac{dy}{dx} = x^2 + y^2$ and $y(0) = 1$ when $h = 0.1$ is _____.
a) 0.1 b) 0
c) 1 d) 0.01

6) LU decomposition of matrix is possible only for _____.

a) Invertible matrix b) Singular matrix
c) Square matrix d) Ordered matrix

7) The order of convergence of Newton-Raphson method is _____.

a) 3 b) 2
c) 1 d) 0

8) If all eigen values are negative then the quadratic form $X'AX$ is _____.

a) Positive definite b) Negative definite
c) Indefinite d) none

9) $||v|| = \sqrt{v.v}$

a) True b) False

10) If $u = \begin{bmatrix}7\\1\end{bmatrix}, v = \begin{bmatrix}3\\2\end{bmatrix}$ then $||u - v||$

a) $\sqrt{7}$ b) $\sqrt{17}$
c) $\sqrt{71}$ d) $\sqrt{7}0$

11) -2 is the eigen values of A where $A = \begin{bmatrix}2 & 4 & 3\\-4 & -6 & -3\\3 & 3 & 1\end{bmatrix}$

a) True b) False

12) Let A be an $n \times n$ invertible matrix then which of the following is not true _____.

a) The columns of A forms a basis of R^n
b) The rows of A forms a basis of R^n
c) Rank $A = n$
d) $\text{Nul}A \neq \{0\}$

13) If a system of equations has no free variables then it has _____.

a) Unique solution b) No solution
c) Infinite solution d) none

14) Power method is used to find _____.

a) Smallest eigen values b) Zero Eigen values
c) Largest eigen values d) None

Seat No.	

Set **P**

S.Y (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Numerical Methods and Linear Algebra (BTN07401)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Solve any three from the following. **09**

a) Evaluate $I = \int_0^1 \frac{1}{1+x}\, dx$ correct to three decimal places by Trapezoidal rule taking $h = 0.25$.

b) Find a real root of the equation $x \sin x + \cos x = 0$ by Newton Raphson method (Take $x_0 = \pi$).

c) Find a double root of the equation $f(x) = x^3 - x^2 - x + 1 = 0$ choosing $x_0 = 0.8$

d) Evaluate $I = \int_0^1 \frac{x^2}{1+x^3}\, dx$ using Simpson's $\frac{3}{8}$ th rule.

e) Apply Runge-Kutta method of fourth order to find an approximate value of y when $x = 0.1$ given that $\frac{dy}{dx} = x + y$ and $y(0) = 1$.

Q.3 Solve any three of the following. **09**

a) Solve the system by Gauss-Elimination method
$x - y + z = 1, -3x + 2y - 3z = -6, 2x - 5y + 4z = 5$

b) Solve by Picard's method $\frac{dy}{dx} = 1 + xy$ and $y(2) = 0$ up to third approximation.

c) Find an iterative formula for $\sqrt{N}$ (where N is an Positive number) and hence find $\sqrt{5}$.

d) Solve by Gauss-Seidel method
$10x - 5y - 2z = 3, 4x - 10y + 3z = -3, x + 6y + 10z = -3$

e) Evaluate $I = \int_0^1 \frac{1}{1+x}\, dx$ by Gaussian quadrature three-point formula.

Q.4 Solve any two of the following. **10**

a) Apply factorisation method to solve the equations
$x + 5y + z = 14, 2x + y + 3z = 13, 3x + y + 4z = 17$

b) Evaluate $I = \int_0^2 \frac{1}{1+x^2}\, dx$ using Romberg method, hence obtain an approximate value of π.

c) Solve the differential equation $\frac{dy}{dx} = 1 + xz, \frac{dz}{dx} = -xy$ for $x = 0.3$ Using fourth order Runge-Kutta method and initial values are $x = 0$, $y = 0, z = 1$ up to second approximation.

Section – II

Q.5 Solve any three of the following. **09**

a) Determine the rank of matrix A

$$A = \begin{bmatrix} 2 & -3 & 6 & 2 & 5 \\ -2 & 3 & -3 & -3 & -4 \\ 4 & -6 & 9 & 5 & 9 \\ -2 & 3 & 3 & -4 & 1 \end{bmatrix}$$

b) Find the bases for the row space of the matrix A

$$A \begin{bmatrix} -2 & -5 & 8 & 0 & -17 \\ 1 & 3 & -5 & 1 & 5 \\ 3 & 11 & -19 & 7 & 1 \\ 1 & 7 & -13 & 5 & -3 \end{bmatrix}$$

c) Compute quadratic form $X'AX$ for $A = \begin{bmatrix} 3 & 2 & 0 \\ 2 & 2 & 2 \\ 0 & 2 & 1 \end{bmatrix}$ and $X = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$

Also find eigen values of quadratic form $X'AX$

d) Determine whether the vectors are dependent or independent

$$v_1 = \begin{bmatrix} 3 \\ 0 \\ -6 \end{bmatrix} \quad v_2 = \begin{bmatrix} -4 \\ 1 \\ 7 \end{bmatrix} \quad v_3 = \begin{bmatrix} -2 \\ 1 \\ 5 \end{bmatrix}$$

e) Assume that T is linear transformation. Find standard matrix of $T: R^3 \to R^2$ defined by $T(e_1) = (1,3)\ T(e_2) = (4,-7) T(e_3) = (-5,4)$

Q.6 Solve any three of the following. **09**

a) Determine whether the vectors are orthogonal if orthogonal Normalize the vector to produce the orthonormal set

$$u = \begin{bmatrix} \frac{-2}{3} \\ \frac{1}{3} \\ \frac{2}{3} \end{bmatrix} \quad v = \begin{bmatrix} \frac{1}{3} \\ \frac{2}{3} \\ 0 \end{bmatrix}$$

b) Show that $\{v_1, v_2, v_3\}$ is orthonormal basis for R^3 where

$$v_1 = \begin{bmatrix} \frac{1}{\sqrt{10}} \\ \frac{3}{\sqrt{20}} \\ \frac{3}{\sqrt{20}} \end{bmatrix} \quad v_1 = \begin{bmatrix} \frac{3}{\sqrt{10}} \\ \frac{-1}{\sqrt{20}} \\ \frac{-1}{\sqrt{20}} \end{bmatrix} \quad v_3 = \begin{bmatrix} 0 \\ \frac{-1}{\sqrt{20}} \\ \frac{1}{\sqrt{20}} \end{bmatrix}$$

c) Describe all solutions of $AX = B$ where $A = \begin{bmatrix} 3 & 5 & -4 \\ -3 & -2 & 4 \\ 6 & 1 & -8 \end{bmatrix} b = \begin{bmatrix} 7 \\ -1 \\ 4 \end{bmatrix}$

d) Let $b_1 = \begin{bmatrix}2\\1\end{bmatrix}, b_2 = \begin{bmatrix}-1\\1\end{bmatrix}, X = \begin{bmatrix}4\\5\end{bmatrix}$ & $B = \{b_1, b_2\}$ Find the co-ordinate vector $[X]_B$ of X relative to B

e) Let $A = \begin{bmatrix}2 & 4 & -2 & 1\\-2 & -5 & 7 & 3\\3 & 7 & -8 & 6\end{bmatrix}$ and $u = \begin{bmatrix}3\\-2\\-1\\0\end{bmatrix}$ $v = \begin{bmatrix}3\\-1\\3\end{bmatrix}$

Is u is in $\mathrm{Nu}1A$?

Is v is in $\mathrm{Co}1A$?

Q.7 Solve any two of the following. **10**

a) Find the numerically largest eigen values of A by Power method

$$A = \begin{bmatrix}1 & 6 & 1\\1 & 2 & 0\\0 & 0 & 3\end{bmatrix} x_0 = \begin{bmatrix}1\\0\\0\end{bmatrix}$$

b) If possible, diagonalize the matrix A

$$A = \begin{bmatrix}6 & -2 & -1\\-2 & 6 & -1\\-1 & -1 & 5\end{bmatrix}$$

c) Find the dimension of $\mathrm{Nu}1A$ & $\mathrm{Co}1A$ of matrix A where

$$A = \begin{bmatrix}1 & 2 & -4 & 3 & 3\\5 & 10 & -9 & -7 & 8\\4 & 8 & -9 & -2 & 7\\-2 & -4 & 5 & 0 & 6\end{bmatrix}$$

Seat No.	

Set **Q**

S.Y (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Numerical Methods and Linear Algebra (BTN07401)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.
5) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) If all eigen values are negative then the quadratic form $X'AX$ is _____.
a) Positive definite b) Negative definite
c) Indefinite d) none

2) $\big||v|\big| = \sqrt{v.v}$
a) True b) False

3) If $u = \begin{bmatrix}7\\1\end{bmatrix}, v = \begin{bmatrix}3\\2\end{bmatrix}$ then $\big||u-v|\big|$
a) $\sqrt{7}$ b) $\sqrt{17}$
c) $\sqrt{71}$ d) $\sqrt{70}$

4) -2 is the eigen values of A where $A = \begin{bmatrix}2 & 4 & 3\\-4 & -6 & -3\\3 & 3 & 1\end{bmatrix}$
a) True b) False

5) Let A be an $n \times n$ invertible matrix then which of the following is not true _____.
a) The columns of A forms a basis of R^n
b) The rows of A forms a basis of R^n
c) Rank $A = n$
d) $\text{Nul}A \neq \{0\}$

6) If a system of equations has no free variables then it has _____.
a) Unique solution b) No solution
c) Infinite solution d) none

7) Power method is used to find _____.
a) Smallest eigen values b) Zero Eigen values
c) Largest eigen values d) None

8) In solving simultaneous linear equation which of the following method is iterative?
a) Factorisation b) Jacobi
c) Gauss-Seidel d) Both b and c

9) Error in the Trapezoidal rule is of the order _____.
a) h^2 b) h^3
c) h^4 d) h^5

10) If $\frac{dy}{dx} = x^2 + y^2$ and $y(0) = 1$ then Picard's first approximation is ____.
a) $1 + x$ b) $x + \frac{x^3}{3}$
c) $1 + x - \frac{x^3}{3}$ d) $1 + x + \frac{x^3}{3}$

11) Romberg method is used to solve _____.
a) Ordinary differential equations
b) Integration
c) Partial differential equations
d) All of these

12) The quantity K obtained by Runge-Kutta method of fourth order for differential equation $\frac{dy}{dx} = x^2 + y^2$ and $y(0) = 1$ when $h = 0.1$ is _____.
a) 0.1 b) 0
c) 1 d) 0.01

13) LU decomposition of matrix is possible only for _____.
a) Invertible matrix b) Singular matrix
c) Square matrix d) Ordered matrix

14) The order of convergence of Newton-Raphson method is _____.
a) 3 b) 2
c) 1 d) 0

Seat No.	

Set **Q**

S.Y (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Numerical Methods and Linear Algebra (BTN07401)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Solve any three from the following. **09**

a) Evaluate $I = \int_0^1 \frac{1}{1+x}\, dx$ correct to three decimal places by Trapezoidal rule taking $h = 0.25$.

b) Find a real root of the equation $x \sin x + \cos x = 0$ by Newton Raphson method (Take $x_0 = \pi$).

c) Find a double root of the equation $f(x) = x^3 - x^2 - x + 1 = 0$ choosing $x_0 = 0.8$

d) Evaluate $I = \int_0^1 \frac{x^2}{1+x^3}\, dx$ using Simpson's $\frac{3}{8}$ th rule.

e) Apply Runge-Kutta method of fourth order to find an approximate value of y when $x = 0.1$ given that $\frac{dy}{dx} = x + y$ and $y(0) = 1$.

Q.3 Solve any three of the following. **09**

a) Solve the system by Gauss-Elimination method
$x - y + z = 1, -3x + 2y - 3z = -6, 2x - 5y + 4z = 5$

b) Solve by Picard's method $\frac{dy}{dx} = 1 + xy$ and $y(2) = 0$ up to third approximation.

c) Find an iterative formula for $\sqrt{N}$ (where N is an Positive number) and hence find $\sqrt{5}$.

d) Solve by Gauss-Seidel method
$10x - 5y - 2z = 3, 4x - 10y + 3z = -3, x + 6y + 10z = -3$

e) Evaluate $I = \int_0^1 \frac{1}{1+x}\, dx$ by Gaussian quadrature three-point formula.

Q.4 Solve any two of the following. **10**

a) Apply factorisation method to solve the equations
$x + 5y + z = 14, 2x + y + 3z = 13, 3x + y + 4z = 17$

b) Evaluate $I = \int_0^2 \frac{1}{1+x^2}\, dx$ using Romberg method, hence obtain an approximate value of π.

c) Solve the differential equation $\frac{dy}{dx} = 1 + xz, \frac{dz}{dx} = -xy$ for $x = 0.3$ Using fourth order Runge-Kutta method and initial values are $x = 0$, $y = 0, z = 1$ up to second approximation.

Section – II

Q.5 Solve any three of the following. **09**

a) Determine the rank of matrix A

$$A = \begin{bmatrix} 2 & -3 & 6 & 2 & 5 \\ -2 & 3 & -3 & -3 & -4 \\ 4 & -6 & 9 & 5 & 9 \\ -2 & 3 & 3 & -4 & 1 \end{bmatrix}$$

b) Find the bases for the row space of the matrix A

$$A \begin{bmatrix} -2 & -5 & 8 & 0 & -17 \\ 1 & 3 & -5 & 1 & 5 \\ 3 & 11 & -19 & 7 & 1 \\ 1 & 7 & -13 & 5 & -3 \end{bmatrix}$$

c) Compute quadratic form $X'AX$ for $A = \begin{bmatrix} 3 & 2 & 0 \\ 2 & 2 & 2 \\ 0 & 2 & 1 \end{bmatrix}$ and $X = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$

Also find eigen values of quadratic form $X'AX$

d) Determine whether the vectors are dependent or independent

$$v_1 = \begin{bmatrix} 3 \\ 0 \\ -6 \end{bmatrix} \quad v_2 = \begin{bmatrix} -4 \\ 1 \\ 7 \end{bmatrix} \quad v_3 = \begin{bmatrix} -2 \\ 1 \\ 5 \end{bmatrix}$$

e) Assume that T is linear transformation. Find standard matrix of $T: R^3 \to R^2$ defined by $T(e_1) = (1,3)\ T(e_2) = (4,-7) T(e_3) = (-5,4)$

Q.6 Solve any three of the following. **09**

a) Determine whether the vectors are orthogonal if orthogonal Normalize the vector to produce the orthonormal set

$$u = \begin{bmatrix} \frac{-2}{3} \\ \frac{1}{3} \\ \frac{2}{3} \end{bmatrix} \quad v = \begin{bmatrix} \frac{1}{3} \\ \frac{2}{3} \\ 0 \end{bmatrix}$$

b) Show that $\{v_1, v_2, v_3\}$ is orthonormal basis for R^3 where

$$v_1 = \begin{bmatrix} \frac{1}{\sqrt{10}} \\ \frac{3}{\sqrt{20}} \\ \frac{3}{\sqrt{20}} \end{bmatrix} \quad v_1 = \begin{bmatrix} \frac{3}{\sqrt{10}} \\ \frac{-1}{\sqrt{20}} \\ \frac{-1}{\sqrt{20}} \end{bmatrix} \quad v_3 = \begin{bmatrix} 0 \\ \frac{-1}{\sqrt{20}} \\ \frac{1}{\sqrt{20}} \end{bmatrix}$$

c) Describe all solutions of $AX = B$ where $A = \begin{bmatrix} 3 & 5 & -4 \\ -3 & -2 & 4 \\ 6 & 1 & -8 \end{bmatrix}$ $b = \begin{bmatrix} 7 \\ -1 \\ 4 \end{bmatrix}$

d) Let $b_1 = \begin{bmatrix}2\\1\end{bmatrix}, b_2 = \begin{bmatrix}-1\\1\end{bmatrix}, X = \begin{bmatrix}4\\5\end{bmatrix}$ & $B = \{b_1, b_2\}$ Find the co-ordinate vector $[X]_B$ of X relative to B

e) Let $A = \begin{bmatrix}2 & 4 & -2 & 1\\-2 & -5 & 7 & 3\\3 & 7 & -8 & 6\end{bmatrix}$ and $u = \begin{bmatrix}3\\-2\\-1\\0\end{bmatrix}$ $v = \begin{bmatrix}3\\-1\\3\end{bmatrix}$

Is u is in $\mathrm{Nu}1A$?

Is v is in $\mathrm{Co}1A$?

Q.7 Solve any two of the following. **10**

a) Find the numerically largest eigen values of A by Power method

$$A = \begin{bmatrix}1 & 6 & 1\\1 & 2 & 0\\0 & 0 & 3\end{bmatrix} x_0 = \begin{bmatrix}1\\0\\0\end{bmatrix}$$

b) If possible, diagonalize the matrix A

$$A = \begin{bmatrix}6 & -2 & -1\\-2 & 6 & -1\\-1 & -1 & 5\end{bmatrix}$$

c) Find the dimension of $\mathrm{Nu}1A$ & $\mathrm{Co}1A$ of matrix A where

$$A = \begin{bmatrix}1 & 2 & -4 & 3 & 3\\5 & 10 & -9 & -7 & 8\\4 & 8 & -9 & -2 & 7\\-2 & -4 & 5 & 0 & 6\end{bmatrix}$$

Seat No.	

Set **R**

S.Y (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Numerical Methods and Linear Algebra (BTN07401)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.
5) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) -2 is the eigen values of A where $A = \begin{bmatrix} 2 & 4 & 3 \\ -4 & -6 & -3 \\ 3 & 3 & 1 \end{bmatrix}$

a) True b) False

2) Let A be an $n \times n$ invertible matrix then which of the following is not true _____.
a) The columns of A forms a basis of R^n
b) The rows of A forms a basis of R^n
c) Rank $A = n$
d) $\text{Nul}A \neq \{0\}$

3) If a system of equations has no free variables then it has _____.
a) Unique solution b) No solution
c) Infinite solution d) none

4) Power method is used to find _____.
a) Smallest eigen values b) Zero Eigen values
c) Largest eigen values d) None

5) In solving simultaneous linear equation which of the following method is iterative?
a) Factorisation b) Jacobi
c) Gauss-Seidel d) Both b and c

6) Error in the Trapezoidal rule is of the order _____.
a) h^2 b) h^3
c) h^4 d) h^5

7) If $\frac{dy}{dx} = x^2 + y^2$ and $y(0) = 1$ then Picard's first approximation is ____.

a) $1 + x$ b) $x + \frac{x^3}{3}$

c) $1 + x - \frac{x^3}{3}$ d) $1 + x + \frac{x^3}{3}$

8) Romberg method is used to solve _____.

a) Ordinary differential equations
b) Integration
c) Partial differential equations
d) All of these

9) The quantity K obtained by Runge-Kutta method of fourth order for differential equation $\frac{dy}{dx} = x^2 + y^2$ and $y(0) = 1$ when $h = 0.1$ is _____.

a) 0.1 b) 0

c) 1 d) 0.01

10) LU decomposition of matrix is possible only for _____.

a) Invertible matrix b) Singular matrix
c) Square matrix d) Ordered matrix

11) The order of convergence of Newton-Raphson method is _____.

a) 3 b) 2
c) 1 d) 0

12) If all eigen values are negative then the quadratic form $X'AX$ is _____.

a) Positive definite b) Negative definite
c) Indefinite d) none

13) $\big||v|\big| = \sqrt{v.v}$

a) True b) False

14) If $u = \begin{bmatrix} 7 \\ 1 \end{bmatrix}, v = \begin{bmatrix} 3 \\ 2 \end{bmatrix}$ then $\big||u - v|\big|$

a) $\sqrt{7}$ b) $\sqrt{17}$

c) $\sqrt{71}$ d) $\sqrt{70}$

Seat No.	

Set **R**

S.Y (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Numerical Methods and Linear Algebra (BTN07401)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Solve any three from the following. **09**

a) Evaluate $I = \int_0^1 \frac{1}{1+x}\, dx$ correct to three decimal places by Trapezoidal rule taking $h = 0.25$.

b) Find a real root of the equation $x \sin x + \cos x = 0$ by Newton Raphson method (Take $x_0 = \pi$).

c) Find a double root of the equation $f(x) = x^3 - x^2 - x + 1 = 0$ choosing $x_0 = 0.8$

d) Evaluate $I = \int_0^1 \frac{x^2}{1+x^3}\, dx$ using Simpson's $\frac{3}{8}$ th rule.

e) Apply Runge-Kutta method of fourth order to find an approximate value of y when $x = 0.1$ given that $\frac{dy}{dx} = x + y$ and $y(0) = 1$.

Q.3 Solve any three of the following. **09**

a) Solve the system by Gauss-Elimination method
$x - y + z = 1, -3x + 2y - 3z = -6, 2x - 5y + 4z = 5$

b) Solve by Picard's method $\frac{dy}{dx} = 1 + xy$ and $y(2) = 0$ up to third approximation.

c) Find an iterative formula for $\sqrt{N}$ (where N is an Positive number) and hence find $\sqrt{5}$.

d) Solve by Gauss-Seidel method
$10x - 5y - 2z = 3, 4x - 10y + 3z = -3, x + 6y + 10z = -3$

e) Evaluate $I = \int_0^1 \frac{1}{1+x}\, dx$ by Gaussian quadrature three-point formula.

Q.4 Solve any two of the following. **10**

a) Apply factorisation method to solve the equations
$x + 5y + z = 14, 2x + y + 3z = 13, 3x + y + 4z = 17$

b) Evaluate $I = \int_0^2 \frac{1}{1+x^2}\, dx$ using Romberg method, hence obtain an approximate value of π.

c) Solve the differential equation $\frac{dy}{dx} = 1 + xz, \frac{dz}{dx} = -xy$ for $x = 0.3$ Using fourth order Runge-Kutta method and initial values are $x = 0$, $y = 0, z = 1$ up to second approximation.

Section – II

Q.5 Solve any three of the following. **09**

a) Determine the rank of matrix A

$$A = \begin{bmatrix} 2 & -3 & 6 & 2 & 5 \\ -2 & 3 & -3 & -3 & -4 \\ 4 & -6 & 9 & 5 & 9 \\ -2 & 3 & 3 & -4 & 1 \end{bmatrix}$$

b) Find the bases for the row space of the matrix A

$$A \begin{bmatrix} -2 & -5 & 8 & 0 & -17 \\ 1 & 3 & -5 & 1 & 5 \\ 3 & 11 & -19 & 7 & 1 \\ 1 & 7 & -13 & 5 & -3 \end{bmatrix}$$

c) Compute quadratic form $X'AX$ for $A = \begin{bmatrix} 3 & 2 & 0 \\ 2 & 2 & 2 \\ 0 & 2 & 1 \end{bmatrix}$ and $X = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$

Also find eigen values of quadratic form $X'AX$

d) Determine whether the vectors are dependent or independent

$$v_1 = \begin{bmatrix} 3 \\ 0 \\ -6 \end{bmatrix} \quad v_2 = \begin{bmatrix} -4 \\ 1 \\ 7 \end{bmatrix} \quad v_3 = \begin{bmatrix} -2 \\ 1 \\ 5 \end{bmatrix}$$

e) Assume that T is linear transformation. Find standard matrix of $T: R^3 \to R^2$ defined by $T(e_1) = (1,3)\ T(e_2) = (4,-7) T(e_3) = (-5,4)$

Q.6 Solve any three of the following. **09**

a) Determine whether the vectors are orthogonal if orthogonal Normalize the vector to produce the orthonormal set

$$u = \begin{bmatrix} \frac{-2}{3} \\ \frac{1}{3} \\ \frac{2}{3} \end{bmatrix} \quad v = \begin{bmatrix} \frac{1}{3} \\ \frac{2}{3} \\ 0 \end{bmatrix}$$

b) Show that $\{v_1, v_2, v_3\}$ is orthonormal basis for R^3 where

$$v_1 = \begin{bmatrix} \frac{1}{\sqrt{10}} \\ \frac{3}{\sqrt{20}} \\ \frac{3}{\sqrt{20}} \end{bmatrix} \quad v_1 = \begin{bmatrix} \frac{3}{\sqrt{10}} \\ \frac{-1}{\sqrt{20}} \\ \frac{-1}{\sqrt{20}} \end{bmatrix} \quad v_3 = \begin{bmatrix} 0 \\ \frac{-1}{\sqrt{20}} \\ \frac{1}{\sqrt{20}} \end{bmatrix}$$

c) Describe all solutions of $AX = B$ where $A = \begin{bmatrix} 3 & 5 & -4 \\ -3 & -2 & 4 \\ 6 & 1 & -8 \end{bmatrix} b = \begin{bmatrix} 7 \\ -1 \\ 4 \end{bmatrix}$

d) Let $b_1 = \begin{bmatrix}2\\1\end{bmatrix}, b_2 = \begin{bmatrix}-1\\1\end{bmatrix}, X = \begin{bmatrix}4\\5\end{bmatrix}$ & $B = \{b_1, b_2\}$ Find the co-ordinate vector $[X]_B$ of X relative to B

e) Let $A = \begin{bmatrix}2 & 4 & -2 & 1\\-2 & -5 & 7 & 3\\3 & 7 & -8 & 6\end{bmatrix}$ and $u = \begin{bmatrix}3\\-2\\-1\\0\end{bmatrix}$ $v = \begin{bmatrix}3\\-1\\3\end{bmatrix}$

Is u is in $\mathrm{Nu}1A$?

Is v is in $\mathrm{Co}1A$?

Q.7 Solve any two of the following. **10**

a) Find the numerically largest eigen values of A by Power method

$$A = \begin{bmatrix}1 & 6 & 1\\1 & 2 & 0\\0 & 0 & 3\end{bmatrix} x_0 = \begin{bmatrix}1\\0\\0\end{bmatrix}$$

b) If possible, diagonalize the matrix A

$$A = \begin{bmatrix}6 & -2 & -1\\-2 & 6 & -1\\-1 & -1 & 5\end{bmatrix}$$

c) Find the dimension of $\mathrm{Nu}1A$ & $\mathrm{Co}1A$ of matrix A where

$$A = \begin{bmatrix}1 & 2 & -4 & 3 & 3\\5 & 10 & -9 & -7 & 8\\4 & 8 & -9 & -2 & 7\\-2 & -4 & 5 & 0 & 6\end{bmatrix}$$

Seat No.	

Set **S**

S.Y (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Numerical Methods and Linear Algebra (BTN07401)

Day & Date: Thursday, 05-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.
4) Make suitable assumptions if necessary and state them clearly.
5) Use of non-programmable calculator is allowed.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

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

1) LU decomposition of matrix is possible only for _____.
a) Invertible matrix b) Singular matrix
c) Square matrix d) Ordered matrix

2) The order of convergence of Newton-Raphson method is _____.
a) 3 b) 2
c) 1 d) 0

3) If all eigen values are negative then the quadratic form $X'AX$ is _____.
a) Positive definite b) Negative definite
c) Indefinite d) none

4) $\big||v|\big| = \sqrt{v.v}$
a) True b) False

5) If $u = \begin{bmatrix}7\\1\end{bmatrix}, v = \begin{bmatrix}3\\2\end{bmatrix}$ then $\big||u-v|\big|$
a) $\sqrt{7}$ b) $\sqrt{17}$
c) $\sqrt{71}$ d) $\sqrt{70}$

6) -2 is the eigen values of A where $A = \begin{bmatrix}2 & 4 & 3\\-4 & -6 & -3\\3 & 3 & 1\end{bmatrix}$
a) True b) False

7) Let A be an $n \times n$ invertible matrix then which of the following is not true _____.

a) The columns of A forms a basis of R^n
b) The rows of A forms a basis of R^n
c) Rank $A = n$
d) $\text{Nul}A \neq \{0\}$

8) If a system of equations has no free variables then it has _____.

a) Unique solution
b) No solution
c) Infinite solution
d) none

9) Power method is used to find _____.

a) Smallest eigen values
b) Zero Eigen values
c) Largest eigen values
d) None

10) In solving simultaneous linear equation which of the following method is iterative?

a) Factorisation
b) Jacobi
c) Gauss-Seidel
d) Both b and c

11) Error in the Trapezoidal rule is of the order _____.

a) h^2
b) h^3
c) h^4
d) h^5

12) If $\frac{dy}{dx} = x^2 + y^2$ and $y(0) = 1$ then Picard's first approximation is ____.

a) $1 + x$
b) $x + \frac{x^3}{3}$
c) $1 + x - \frac{x^3}{3}$
d) $1 + x + \frac{x^3}{3}$

13) Romberg method is used to solve _____.

a) Ordinary differential equations
b) Integration
c) Partial differential equations
d) All of these

14) The quantity K obtained by Runge-Kutta method of fourth order for differential equation $\frac{dy}{dx} = x^2 + y^2$ and $y(0) = 1$ when $h = 0.1$ is _____.

a) 0.1
b) 0
c) 1
d) 0.01

Seat No.		Set	S

S.Y (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Numerical Methods and Linear Algebra (BTN07401)

Day & Date: Thursday, 05-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All question are compulsory.
2) Figures to the right indicate full marks.
3) Use of non-programmable calculator is allowed.

Section – I

Q.2 Solve any three from the following. **09**

a) Evaluate $I = \int_0^1 \frac{1}{1+x}\, dx$ correct to three decimal places by Trapezoidal rule taking $h = 0.25$.

b) Find a real root of the equation $x \sin x + \cos x = 0$ by Newton Raphson method (Take $x_0 = \pi$).

c) Find a double root of the equation $f(x) = x^3 - x^2 - x + 1 = 0$ choosing $x_0 = 0.8$

d) Evaluate $I = \int_0^1 \frac{x^2}{1+x^3}\, dx$ using Simpson's $\frac{3}{8}$ th rule.

e) Apply Runge-Kutta method of fourth order to find an approximate value of y when $x = 0.1$ given that $\frac{dy}{dx} = x + y$ and $y(0) = 1$.

Q.3 Solve any three of the following. **09**

a) Solve the system by Gauss-Elimination method
$x - y + z = 1, -3x + 2y - 3z = -6, 2x - 5y + 4z = 5$

b) Solve by Picard's method $\frac{dy}{dx} = 1 + xy$ and $y(2) = 0$ up to third approximation.

c) Find an iterative formula for $\sqrt{N}$ (where N is an Positive number) and hence find $\sqrt{5}$.

d) Solve by Gauss-Seidel method
$10x - 5y - 2z = 3, 4x - 10y + 3z = -3, x + 6y + 10z = -3$

e) Evaluate $I = \int_0^1 \frac{1}{1+x}\, dx$ by Gaussian quadrature three-point formula.

Q.4 Solve any two of the following. **10**

a) Apply factorisation method to solve the equations
$x + 5y + z = 14, 2x + y + 3z = 13, 3x + y + 4z = 17$

b) Evaluate $I = \int_0^2 \frac{1}{1+x^2}\, dx$ using Romberg method, hence obtain an approximate value of π.

c) Solve the differential equation $\frac{dy}{dx} = 1 + xz, \frac{dz}{dx} = -xy$ for $x = 0.3$ Using fourth order Runge-Kutta method and initial values are $x = 0$, $y = 0, z = 1$ up to second approximation.

Section – II

Q.5 Solve any three of the following. **09**

a) Determine the rank of matrix A

$$A = \begin{bmatrix} 2 & -3 & 6 & 2 & 5 \\ -2 & 3 & -3 & -3 & -4 \\ 4 & -6 & 9 & 5 & 9 \\ -2 & 3 & 3 & -4 & 1 \end{bmatrix}$$

b) Find the bases for the row space of the matrix A

$$A \begin{bmatrix} -2 & -5 & 8 & 0 & -17 \\ 1 & 3 & -5 & 1 & 5 \\ 3 & 11 & -19 & 7 & 1 \\ 1 & 7 & -13 & 5 & -3 \end{bmatrix}$$

c) Compute quadratic form $X'AX$ for $A = \begin{bmatrix} 3 & 2 & 0 \\ 2 & 2 & 2 \\ 0 & 2 & 1 \end{bmatrix}$ and $X = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$

Also find eigen values of quadratic form $X'AX$

d) Determine whether the vectors are dependent or independent

$$v_1 = \begin{bmatrix} 3 \\ 0 \\ -6 \end{bmatrix} \quad v_2 = \begin{bmatrix} -4 \\ 1 \\ 7 \end{bmatrix} \quad v_3 = \begin{bmatrix} -2 \\ 1 \\ 5 \end{bmatrix}$$

e) Assume that T is linear transformation. Find standard matrix of $T: R^3 \to R^2$ defined by $T(e_1) = (1,3)\ T(e_2) = (4,-7) T(e_3) = (-5,4)$

Q.6 Solve any three of the following. **09**

a) Determine whether the vectors are orthogonal if orthogonal Normalize the vector to produce the orthonormal set

$$u = \begin{bmatrix} \frac{-2}{3} \\ \frac{1}{3} \\ \frac{2}{3} \end{bmatrix} \quad v = \begin{bmatrix} \frac{1}{3} \\ \frac{2}{3} \\ 0 \end{bmatrix}$$

b) Show that $\{v_1, v_2, v_3\}$ is orthonormal basis for R^3 where

$$v_1 = \begin{bmatrix} \frac{1}{\sqrt{10}} \\ \frac{3}{\sqrt{20}} \\ \frac{3}{\sqrt{20}} \end{bmatrix} \quad v_1 = \begin{bmatrix} \frac{3}{\sqrt{10}} \\ \frac{-1}{\sqrt{20}} \\ \frac{-1}{\sqrt{20}} \end{bmatrix} \quad v_3 = \begin{bmatrix} 0 \\ \frac{-1}{\sqrt{20}} \\ \frac{1}{\sqrt{20}} \end{bmatrix}$$

c) Describe all solutions of $AX = B$ where $A = \begin{bmatrix} 3 & 5 & -4 \\ -3 & -2 & 4 \\ 6 & 1 & -8 \end{bmatrix} b = \begin{bmatrix} 7 \\ -1 \\ 4 \end{bmatrix}$

d) Let $b_1 = \begin{bmatrix}2\\1\end{bmatrix}, b_2 = \begin{bmatrix}-1\\1\end{bmatrix}, X = \begin{bmatrix}4\\5\end{bmatrix}$ & $B = \{b_1, b_2\}$ Find the co-ordinate vector $[X]_B$ of X relative to B

e) Let $A = \begin{bmatrix}2 & 4 & -2 & 1\\-2 & -5 & 7 & 3\\3 & 7 & -8 & 6\end{bmatrix}$ and $u = \begin{bmatrix}3\\-2\\-1\\0\end{bmatrix}$ $v = \begin{bmatrix}3\\-1\\3\end{bmatrix}$

Is u is in $\mathrm{Nu}1A$?

Is v is in $\mathrm{Co}1A$?

Q.7 Solve any two of the following. **10**

a) Find the numerically largest eigen values of A by Power method

$$A = \begin{bmatrix}1 & 6 & 1\\1 & 2 & 0\\0 & 0 & 3\end{bmatrix} x_0 = \begin{bmatrix}1\\0\\0\end{bmatrix}$$

b) If possible, diagonalize the matrix A

$$A = \begin{bmatrix}6 & -2 & -1\\-2 & 6 & -1\\-1 & -1 & 5\end{bmatrix}$$

c) Find the dimension of $\mathrm{Nu}1A$ & $\mathrm{Co}1A$ of matrix A where

$$A = \begin{bmatrix}1 & 2 & -4 & 3 & 3\\5 & 10 & -9 & -7 & 8\\4 & 8 & -9 & -2 & 7\\-2 & -4 & 5 & 0 & 6\end{bmatrix}$$

SLR-BD-288

Seat No.	

Set P

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electric Vehicle Technology (BTN07408)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Which motor is suitable for high starting torque?
a) DC series motor b) DC shunt motor
c) DC separately excited motor d) Synchronous motor

2) Which of the following vehicle produces zero emissions?
a) Gasoline vehicle b) Electrical vehicle
c) Hybrid vehicle d) Diesel vehicle

3) Who coined the term battery?
a) George Franklin b) Benjamin Fernandes
c) Benjamin Franklin d) George Bush

4) The solar energy essentially used in ____ contexts.
a) Soar thermal
b) Solar photovoltaics
c) Solar thermal and Solar photovoltaics
d) None of above

5) When was the first electric car invented?
a) 1830 b) 1985
c) 1832 d) 1945

6) Full form of ICV is ____.
a) Internal combustion vehicles b) Internet combustion vehicles
c) Internally combined vehicles d) Internet combined vehicles

7) What is S.I. unit of force is ____.
a) Newton-meter b) Newton
c) Newton per second d) Newton per square meter

8) What is the challenge with electric vehicles?

a) Vehicle durability b) Cell life
c) Cost d) Both a) and b)

9) A fuel cells converts ____ energy into electrical energy.

a) Mechanical b) Magnetic
c) Solar d) Chemical

10) The solar cell efficiency is about ____.

a) 25% b) 15%
c) 48% d) 63%

11) Where do most electric vehicle owners charge their cars?

a) At home b) At work
c) At public charging stations d) Both (a) and (b)

12) The capacity of batteries is expressed in terms of ____.

a) Current rating b) Voltage rating
c) Ampere hour rating d) None of the above

13) How to increase the range on electric vehicles?

a) By increasing the battery capacity
b) By reducing battery capacity
c) By installing another DC motor
d) By installing turbocharger

14) From where tractive effort generate in EV?

a) Battery b) Convertor
c) Driving Shaft d) Motor

Seat No.	

Set **P**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electric Vehicle Technology (BTN07408)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION - I

Q.2 Solve the following: (Any Four) **16**

a) Explain history of vehicle in detail.
b) State and explain laws of motion.
c) Write note on tractive effort and transmission requirement.
d) Explain electric vehicle market.
e) Explain in brief vehicle kinetics.
f) Write note on energy consumption and vehicle performance.

Q.3 Solve the following: (Any Two) **12**

a) What is meant by Electric vehicle and explain the components of electric vehicle in brief.
b) State and explain electric motor characteristics in detail.
c) Explain propulsion power along with velocity and acceleration.

SECTION - II

Q.4 Solve the following: (Any Four) **16**

a) Explain concept of plug-in hybrid electric vehicle.
b) Explain social benefits of solar powered charging systems.
c) Explain the integration of EV's smart grid.
d) Explain in detail powertrain component sizing.
e) Explain electric vehicle supply equipment.
f) Explain different types of EV charging connector.

Q.5 Attempt the following: (Any Two) **12**

a) Explain in detail hybrid electric drive with series and parallel concept.
b) State and explain environmental and economic benefits of solar powered charging systems.
c) State and explain different types of plug standard in different countries.

Seat No.	

Set **Q**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electric Vehicle Technology (BTN07408)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) What is the challenge with electric vehicles?
a) Vehicle durability b) Cell life
c) Cost d) Both a) and b)

2) A fuel cells converts ____ energy into electrical energy.
a) Mechanical b) Magnetic
c) Solar d) Chemical

3) The solar cell efficiency is about ____.
a) 25% b) 15%
c) 48% d) 63%

4) Where do most electric vehicle owners charge their cars?
a) At home b) At work
c) At public charging stations d) Both (a) and (b)

5) The capacity of batteries is expressed in terms of ____.
a) Current rating b) Voltage rating
c) Ampere hour rating d) None of the above

6) How to increase the range on electric vehicles?
a) By increasing the battery capacity
b) By reducing battery capacity
c) By installing another DC motor
d) By installing turbocharger

7) From where tractive effort generate in EV?
a) Battery b) Convertor
c) Driving Shaft d) Motor

8) Which motor is suitable for high starting torque?
a) DC series motor b) DC shunt motor
c) DC separately excited motor d) Synchronous motor

9) Which of the following vehicle produces zero emissions?
a) Gasoline vehicle b) Electrical vehicle
c) Hybrid vehicle d) Diesel vehicle

10) Who coined the term battery?
a) George Franklin b) Benjamin Fernandes
c) Benjamin Franklin d) George Bush

11) The solar energy essentially used in ____ contexts.
a) Soar thermal
b) Solar photovoltaics
c) Solar thermal and Solar photovoltaics
d) None of above

12) When was the first electric car invented?
a) 1830 b) 1985
c) 1832 d) 1945

13) Full form of ICV is ____.
a) Internal combustion vehicles b) Internet combustion vehicles
c) Internally combined vehicles d) Internet combined vehicles

14) What is S.I. unit of force is ____.
a) Newton-meter b) Newton
c) Newton per second d) Newton per square meter

Seat No.	

Set **Q**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electric Vehicle Technology (BTN07408)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION - I

Q.2 Solve the following: (Any Four) **16**

a) Explain history of vehicle in detail.
b) State and explain laws of motion.
c) Write note on tractive effort and transmission requirement.
d) Explain electric vehicle market.
e) Explain in brief vehicle kinetics.
f) Write note on energy consumption and vehicle performance.

Q.3 Solve the following: (Any Two) **12**

a) What is meant by Electric vehicle and explain the components of electric vehicle in brief.
b) State and explain electric motor characteristics in detail.
c) Explain propulsion power along with velocity and acceleration.

SECTION - II

Q.4 Solve the following: (Any Four) **16**

a) Explain concept of plug-in hybrid electric vehicle.
b) Explain social benefits of solar powered charging systems.
c) Explain the integration of EV's smart grid.
d) Explain in detail powertrain component sizing.
e) Explain electric vehicle supply equipment.
f) Explain different types of EV charging connector.

Q.5 Attempt the following: (Any Two) **12**

a) Explain in detail hybrid electric drive with series and parallel concept.
b) State and explain environmental and economic benefits of solar powered charging systems.
c) State and explain different types of plug standard in different countries.

Seat No.	

Set **R**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electric Vehicle Technology (BTN07408)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Where do most electric vehicle owners charge their cars?
a) At home b) At work
c) At public charging stations d) Both (a) and (b)

2) The capacity of batteries is expressed in terms of ____.
a) Current rating b) Voltage rating
c) Ampere hour rating d) None of the above

3) How to increase the range on electric vehicles?
a) By increasing the battery capacity
b) By reducing battery capacity
c) By installing another DC motor
d) By installing turbocharger

4) From where tractive effort generate in EV?
a) Battery b) Convertor
c) Driving Shaft d) Motor

5) Which motor is suitable for high starting torque?
a) DC series motor b) DC shunt motor
c) DC separately excited motor d) Synchronous motor

6) Which of the following vehicle produces zero emissions?
a) Gasoline vehicle b) Electrical vehicle
c) Hybrid vehicle d) Diesel vehicle

7) Who coined the term battery?
a) George Franklin b) Benjamin Fernandes
c) Benjamin Franklin d) George Bush

8) The solar energy essentially used in ____ contexts.
a) Soar thermal
b) Solar photovoltaics
c) Solar thermal and Solar photovoltaics
d) None of above

9) When was the first electric car invented?
a) 1830 b) 1985
c) 1832 d) 1945

10) Full form of ICV is ____.
a) Internal combustion vehicles b) Internet combustion vehicles
c) Internally combined vehicles d) Internet combined vehicles

11) What is S.I. unit of force is ____.
a) Newton-meter b) Newton
c) Newton per second d) Newton per square meter

12) What is the challenge with electric vehicles?
a) Vehicle durability b) Cell life
c) Cost d) Both a) and b)

13) A fuel cells converts ____ energy into electrical energy.
a) Mechanical b) Magnetic
c) Solar d) Chemical

14) The solar cell efficiency is about ____.
a) 25% b) 15%
c) 48% d) 63%

Seat No.	

Set **R**

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electric Vehicle Technology (BTN07408)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION - I

Q.2 Solve the following: (Any Four) **16**

a) Explain history of vehicle in detail.
b) State and explain laws of motion.
c) Write note on tractive effort and transmission requirement.
d) Explain electric vehicle market.
e) Explain in brief vehicle kinetics.
f) Write note on energy consumption and vehicle performance.

Q.3 Solve the following: (Any Two) **12**

a) What is meant by Electric vehicle and explain the components of electric vehicle in brief.
b) State and explain electric motor characteristics in detail.
c) Explain propulsion power along with velocity and acceleration.

SECTION - II

Q.4 Solve the following: (Any Four) **16**

a) Explain concept of plug-in hybrid electric vehicle.
b) Explain social benefits of solar powered charging systems.
c) Explain the integration of EV's smart grid.
d) Explain in detail powertrain component sizing.
e) Explain electric vehicle supply equipment.
f) Explain different types of EV charging connector.

Q.5 Attempt the following: (Any Two) **12**

a) Explain in detail hybrid electric drive with series and parallel concept.
b) State and explain environmental and economic benefits of solar powered charging systems.
c) State and explain different types of plug standard in different countries.

Seat No.	

Set | S

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electric Vehicle Technology (BTN07408)

Day & Date: Monday, 09-June-2025 Max. Marks: 70
Time: 10:00 AM To 01:00 PM

Instructions: 1) Q. No. 1 is compulsory. It should be solved in the first 30 minutes in Answer Book Page no 03 (Starting page of the Answer Book). Each question carries one mark.
2) Don't forget to Mention question paper set (P/Q/R/S) on top of page.
3) Figures to the right indicates full marks.

MCQ/Objective Type Questions

Duration: 30 Minutes Marks:14

Q.1 Choose the correct Answer. **14**

1) Full form of ICV is ____.
a) Internal combustion vehicles b) Internet combustion vehicles
c) Internally combined vehicles d) Internet combined vehicles

2) What is S.I. unit of force is ____.
a) Newton-meter b) Newton
c) Newton per second d) Newton per square meter

3) What is the challenge with electric vehicles?
a) Vehicle durability b) Cell life
c) Cost d) Both a) and b)

4) A fuel cells converts ____ energy into electrical energy.
a) Mechanical b) Magnetic
c) Solar d) Chemical

5) The solar cell efficiency is about ____.
a) 25% b) 15%
c) 48% d) 63%

6) Where do most electric vehicle owners charge their cars?
a) At home b) At work
c) At public charging stations d) Both (a) and (b)

7) The capacity of batteries is expressed in terms of ____.
a) Current rating b) Voltage rating
c) Ampere hour rating d) None of the above

8) How to increase the range on electric vehicles?
a) By increasing the battery capacity
b) By reducing battery capacity
c) By installing another DC motor
d) By installing turbocharger

9) From where tractive effort generate in EV?
a) Battery b) Convertor
c) Driving Shaft d) Motor

10) Which motor is suitable for high starting torque?
a) DC series motor b) DC shunt motor
c) DC separately excited motor d) Synchronous motor

11) Which of the following vehicle produces zero emissions?
a) Gasoline vehicle b) Electrical vehicle
c) Hybrid vehicle d) Diesel vehicle

12) Who coined the term battery?
a) George Franklin b) Benjamin Fernandes
c) Benjamin Franklin d) George Bush

13) The solar energy essentially used in ____ contexts.
a) Soar thermal
b) Solar photovoltaics
c) Solar thermal and Solar photovoltaics
d) None of above

14) When was the first electric car invented?
a) 1830 b) 1985
c) 1832 d) 1945

SLR-BD-288

Seat No.	

Set S

S.Y. (B. Tech.) (Sem-II) (New/Old) (CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Electric Vehicle Technology (BTN07408)

Day & Date: Monday, 09-June-2025 Max. Marks: 56
Time: 10:00 AM To 01:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.

SECTION - I

Q.2 Solve the following: (Any Four) **16**

a) Explain history of vehicle in detail.
b) State and explain laws of motion.
c) Write note on tractive effort and transmission requirement.
d) Explain electric vehicle market.
e) Explain in brief vehicle kinetics.
f) Write note on energy consumption and vehicle performance.

Q.3 Solve the following: (Any Two) **12**

a) What is meant by Electric vehicle and explain the components of electric vehicle in brief.
b) State and explain electric motor characteristics in detail.
c) Explain propulsion power along with velocity and acceleration.

SECTION - II

Q.4 Solve the following: (Any Four) **16**

a) Explain concept of plug-in hybrid electric vehicle.
b) Explain social benefits of solar powered charging systems.
c) Explain the integration of EV's smart grid.
d) Explain in detail powertrain component sizing.
e) Explain electric vehicle supply equipment.
f) Explain different types of EV charging connector.

Q.5 Attempt the following: (Any Two) **12**

a) Explain in detail hybrid electric drive with series and parallel concept.
b) State and explain environmental and economic benefits of solar powered charging systems.
c) State and explain different types of plug standard in different countries.

SLR-BD-631

Seat No.		Set	P

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Professional Ethics (VEC-02)

Day & Date: Wednesday, 11-06-2025 Max. Marks: 50
Time: 10:00 AM To 11:30 AM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) The primary meaning of "ethics"?
a) Financial management
b) Principles governing the behavior of individuals
c) Rules for social interaction
d) Legal frameworks for business

2) The following is an example of a moral value?
a) Earning money b) Achieving fame
c) Helping others in need d) Increasing personal wealth

3) Integrity refers to: _____
a) Working hard at any cost
b) Being honest and having strong moral principles
c) Competing with others
d) Disregarding rules for personal gain

4) The concept of "work ethics" includes: _____
a) The right to leave work early
b) Consistently producing quality work
c) Avoiding all responsibilities
d) Expecting promotions without effort

5) The primary purpose of service learning is _____.
a) Earning money while volunteering
b) Acquiring knowledge through practical experiences
c) Participating in online courses
d) Building a professional career

6) Civic virtue is: _____
a) Attending religious services
b) Demonstrating good behavior and contributing to the welfare of society
c) Building personal wealth
d) Following family traditions

7) The following is an example of "respect for others" is _____.
a) Ignoring people's opinions
b) Listening attentively to others and valuing their viewpoints
c) Interrupting others in conversations
d) Arguing to prove your point

8) Living peacefully involves: _____
a) Suppressing all emotions
b) Treating others with kindness and understanding
c) Avoiding any conflict
d) Always agreeing with others

9) The value of "caring" means: _____
a) Always focusing on personal success
b) Showing concern and compassion for others
c) Ignoring the needs of others
d) Only helping when there is a reward

10) Honesty is best defined as: _____
a) Telling the truth regardless of the consequences
b) Saying only what others want to hear
c) Keeping secrets for friends
d) Telling lies to avoid conflict

11) According to Kohlberg's theory, the highest stage of moral development is: _____
a) Obedience and punishment orientation
b) Conventional morality
c) Post-conventional morality
d) Self-interest orientation

12) Which of the following is a key characteristic of Gilligan's moral development theory?
a) Emphasis on justice and rights
b) Focus on the value of relationships and care
c) Focus on maximizing personal gain
d) Belief that all moral issues are universal and objective

13) Which of the following models of professional roles emphasizes the engineer's responsibility to society and the public welfare?

a) The Engineer as Technocrat
b) The Engineer as Contractor
c) The Engineer as Guardian
d) The Engineer as Entrepreneur

14) Which theory of moral development emphasizes the importance of care and relationships, particularly for women?

a) Kohlberg's theory
b) Aristotle's virtue ethics
c) Gilligan's theory
d) Rawls' theory of justice

15) Which model of professional role in engineering sees the engineer as a neutral expert, focused only on technical competence without concern for social values?

a) The Engineer as Guardian
b) The Engineer as Technocrat
c) The Engineer as Entrepreneur
d) The Engineer as Contractor

16) Which ethical theory suggests that individuals should act in ways that maximize their own happiness and well-being?

a) Deontological ethics
b) Utilitarianism
c) Ethical egoism
d) Virtue ethics

17) The concept of "professional ethics" in engineering involves: _____

a) The personal beliefs of engineers
b) The specific ethical standards and principles set by professional organizations
c) The opinions of senior management
d) The religious views of the engineers

18) In engineering ethics, a "conflict of interest" occurs when: _____

a) Engineers prioritize their personal interests over their professional duties
b) Engineers follow the orders of their superiors without question
c) Engineers act in ways that promote the well-being of society
d) Engineers make decisions based solely on technical expertise

19) In engineering ethics, what is the purpose of "risk assessment"?

a) To identify and mitigate potential dangers and harm to society
b) To increase profits and minimize costs
c) To ensure that engineers do not make mistakes
d) To promote the engineer's personal career advancement

20) What does "ethical responsibility" in engineering imply?
a) Only following orders from superiors
b) Making decisions that benefit only the company
c) Balancing technical, legal, and moral considerations to ensure public safety and well-being
d) Prioritizing efficiency over quality

21) Safety and risk primarily deal with: _____
a) Managing hazards and assessing potential harm
b) Legal contracts
c) Maximizing productivity
d) Reducing work hours

22) Risk-benefit analysis involves: _____
a) Estimating the cost of a project
b) Evaluating potential risks against possible benefits
c) Managing legal liabilities
d) Defining workplace responsibilities

23) The Chernobyl disaster is an example of: _____
a) A technological breakthrough
b) An ethical failure in managing risks
c) A successful safety protocol implementation
d) An engineering success

24) Which of the following is a key factor in assessing safety and risk?
a) The cost of implementation
b) The likelihood and impact of potential hazards
c) The speed of technology adoption
d) The market demand for a product

25) The Three Mile Island incident was caused by: _____
a) Technological failure
b) Natural disasters
c) Lack of training for engineers
d) Poor risk assessment and safety protocol failures

26) Collegiality in a professional setting refers to: _____
a) Loyalty to your employer
b) Cooperation and mutual respect among colleagues
c) Competing for individual success
d) Avoiding work conflicts

27) Professional loyalty involves: _____
a) Reporting colleagues' mistakes publicly
b) Protecting the interests of the team or organization
c) Ignoring safety violations to avoid
d) Disclosing confidential information for personal conflict gain

28) Employee rights include: _____
a) The right to work without discrimination
b) The right to disregard company policies
c) The right to personal opinion but not affecting work
d) The right to ignore workplace safety standards

29) Intellectual Property Rights (IPR) protect: _____
a) The financial interests of corporations
b) The ownership and use of creative ideas and inventions
c) The physical assets of a company
d) Workplace performance evaluations

30) *Risk assessment* is important because it helps in: _____
a) Evaluating the potential impact of hazards on health and safety
b) Minimizing workplace productivity
c) Defining job roles
d) Ignoring environmental issues

31) In risk management, mitigation strategies aim to: _____
a) Accept all risks in the workplace
b) Reduce or eliminate identified risks
c) Increase the likelihood of hazards
d) Focus only on maximizing profits

32) Which of the following is a potential consequence of *occupational crime*?
a) Increased workplace productivity
b) Legal consequences and loss of reputation
c) Improvement in company safety standards
d) Higher employee satisfaction

33) Risk reduction in engineering refers to: _____
a) Implementing measures to lower the chances of accidents
b) Increasing the number of hazards in the work environment
c) Ignoring potential risks
d) Cutting costs by removing safety measures

34) Public safety regulations are primarily designed to: _____
a) Ensure the safety of the company's assets
b) Protect the general public from potential harm
c) Increase revenue for the government
d) Focus only on preventing natural disasters

35) Multinational corporations (MNCs) are characterized by: _____
a) Operations in multiple countries with a centralized headquarters
b) Operating only in their home country
c) Limited influence on global markets
d) No responsibility toward environmental concerns

36) Environmental ethics primarily deals with: _____
a) Human responsibility to manage the environment and natural resources
b) Minimizing corporate profits
c) Technological advancements in engineering
d) Treating employees equally

37) Which of the following is NOT an example of environmental ethics?
a) Reducing pollution and waste
b) Maximizing resource use regardless of environmental impact
c) Preserving biodiversity
d) Sustainable development

38) Computer ethics involves: _____
a) Programming and coding without considering social consequences
b) Understanding the moral implications of computing technologies
c) Focusing only on technological innovation
d) Ignoring privacy issues

39) Weapons development ethics deals with: _____
a) The development of new technologies to enhance military capabilities
b) Restricting the use of all technological advancements
c) Focusing only on civilian safety
d) Only addressing the legal aspects of weapon development

40) Engineers as managers are expected to: _____
a) Focus solely on technical tasks
b) Lead teams, make strategic decisions, and manage projects
c) Ignore the business aspects of their work
d) Avoid taking responsibility for team outcomes

41) Consulting engineers are hired to: _____
a) Work on projects within the company they are employed
b) Provide expert advice on technical and engineering problems
c) Manage public relations for a company
d) Conduct legal investigations

42) Engineers acting as expert witnesses typically: _____
a) Present evidence and offer testimony in legal cases
b) Focus on public relations during a case
c) Manage engineering projects for legal firms
d) Directly represent the interests of a company in court

43) Sample Code of Ethics of professional organizations typically includes: _____
a) Guidelines for acceptable behavior and decision-making
b) Rules for maximizing profits at any cost
c) Detailed technical specifications for projects
d) Guidelines for political involvement in engineering

44) ASME stands for: _____
a) American Society of Mechanical Engineers
b) American Society of Management Engineers
c) Association of Safety and Mechanical Engineers
d) Association of Scientific and Mechanical Engineers

45) The ASCE Code of Ethics emphasizes: _____
a) Following only local regulations
b) Maintaining professional integrity and responsibility
c) Focusing on personal financial gain
d) Ignoring environmental impacts

46) **T**he IEEE Code of Ethics is primarily concerned with: _____
a) Fostering professional competence and integrity
b) Protecting corporate secrets
c) Maximizing technological advancements at any cost
d) Developing weapons for defense purposes

47) Global issues in engineering ethics include: _____
a) Cultural differences in engineering practices
b) Lack of understanding between technical and ethical concerns
c) Addressing both local and international engineering challenges
d) All of the above

48) A key challenge faced by multinational corporations is: _____
a) Balancing profits with social and environmental
b) Competing only within their home country responsibilities
c) Focusing solely on domestic issues
d) Ignoring corporate social responsibility

49) Empathy is the ability to: _____
a) Solve problems logically
b) Understand and share the feelings of others
c) Be indifferent to others' emotions
d) Only care about your own well-being

50) The quality of "caring" includes: _____
a) Showing concern for others' well-being
b) Ignoring the needs of others
c) Only helping family and friends
d) Seeking praise for helping others

SLR-BD-631

Seat No.		Set	Q

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Professional Ethics (VEC-02)

Day & Date: Wednesday, 11-06-2025 Max. Marks: 50
Time: 10:00 AM To 11:30 AM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) In risk management, mitigation strategies aim to: _____
a) Accept all risks in the workplace
b) Reduce or eliminate identified risks
c) Increase the likelihood of hazards
d) Focus only on maximizing profits

2) Which of the following is a potential consequence of *occupational crime*?
a) Increased workplace productivity
b) Legal consequences and loss of reputation
c) Improvement in company safety standards
d) Higher employee satisfaction

3) Risk reduction in engineering refers to: _____
a) Implementing measures to lower the chances of accidents
b) Increasing the number of hazards in the work environment
c) Ignoring potential risks
d) Cutting costs by removing safety measures

4) Public safety regulations are primarily designed to: _____
a) Ensure the safety of the company's assets
b) Protect the general public from potential harm
c) Increase revenue for the government
d) Focus only on preventing natural disasters

5) Multinational corporations (MNCs) are characterized by: _____
a) Operations in multiple countries with a centralized headquarters
b) Operating only in their home country
c) Limited influence on global markets
d) No responsibility toward environmental concerns

6) Environmental ethics primarily deals with: _____
a) Human responsibility to manage the environment and natural resources
b) Minimizing corporate profits
c) Technological advancements in engineering
d) Treating employees equally

7) Which of the following is NOT an example of environmental ethics?
a) Reducing pollution and waste
b) Maximizing resource use regardless of environmental impact
c) Preserving biodiversity
d) Sustainable development

8) Computer ethics involves: _____
a) Programming and coding without considering social consequences
b) Understanding the moral implications of computing technologies
c) Focusing only on technological innovation
d) Ignoring privacy issues

9) Weapons development ethics deals with: _____
a) The development of new technologies to enhance military capabilities
b) Restricting the use of all technological advancements
c) Focusing only on civilian safety
d) Only addressing the legal aspects of weapon development

10) Engineers as managers are expected to: _____
a) Focus solely on technical tasks
b) Lead teams, make strategic decisions, and manage projects
c) Ignore the business aspects of their work
d) Avoid taking responsibility for team outcomes

11) Consulting engineers are hired to: _____
a) Work on projects within the company they are employed
b) Provide expert advice on technical and engineering problems
c) Manage public relations for a company
d) Conduct legal investigations

12) Engineers acting as expert witnesses typically: _____
a) Present evidence and offer testimony in legal cases
b) Focus on public relations during a case
c) Manage engineering projects for legal firms
d) Directly represent the interests of a company in court

13) Sample Code of Ethics of professional organizations typically includes: _____
a) Guidelines for acceptable behavior and decision-making
b) Rules for maximizing profits at any cost
c) Detailed technical specifications for projects
d) Guidelines for political involvement in engineering

14) ASME stands for: _____
a) American Society of Mechanical Engineers
b) American Society of Management Engineers
c) Association of Safety and Mechanical Engineers
d) Association of Scientific and Mechanical Engineers

15) The ASCE Code of Ethics emphasizes: _____
a) Following only local regulations
b) Maintaining professional integrity and responsibility
c) Focusing on personal financial gain
d) Ignoring environmental impacts

16) **T**he IEEE Code of Ethics is primarily concerned with: _____
a) Fostering professional competence and integrity
b) Protecting corporate secrets
c) Maximizing technological advancements at any cost
d) Developing weapons for defense purposes

17) Global issues in engineering ethics include: _____
a) Cultural differences in engineering practices
b) Lack of understanding between technical and ethical concerns
c) Addressing both local and international engineering challenges
d) All of the above

18) A key challenge faced by multinational corporations is: _____
a) Balancing profits with social and environmental
b) Competing only within their home country responsibilities
c) Focusing solely on domestic issues
d) Ignoring corporate social responsibility

19) Empathy is the ability to: _____
a) Solve problems logically
b) Understand and share the feelings of others
c) Be indifferent to others' emotions
d) Only care about your own well-being

20) The quality of "caring" includes: _____
a) Showing concern for others' well-being
b) Ignoring the needs of others
c) Only helping family and friends
d) Seeking praise for helping others

21) The primary meaning of "ethics"?
a) Financial management
b) Principles governing the behavior of individuals
c) Rules for social interaction
d) Legal frameworks for business

22) The following is an example of a moral value?
a) Earning money
b) Achieving fame
c) Helping others in need
d) Increasing personal wealth

23) Integrity refers to: _____
a) Working hard at any cost
b) Being honest and having strong moral principles
c) Competing with others
d) Disregarding rules for personal gain

24) The concept of "work ethics" includes: _____
a) The right to leave work early
b) Consistently producing quality work
c) Avoiding all responsibilities
d) Expecting promotions without effort

25) The primary purpose of service learning is _____.
a) Earning money while volunteering
b) Acquiring knowledge through practical experiences
c) Participating in online courses
d) Building a professional career

26) Civic virtue is: _____
a) Attending religious services
b) Demonstrating good behavior and contributing to the welfare of society
c) Building personal wealth
d) Following family traditions

27) The following is an example of "respect for others" is _____.
a) Ignoring people's opinions
b) Listening attentively to others and valuing their viewpoints
c) Interrupting others in conversations
d) Arguing to prove your point

28) Living peacefully involves: _____
a) Suppressing all emotions
b) Treating others with kindness and understanding
c) Avoiding any conflict
d) Always agreeing with others

29) The value of "caring" means: _____
a) Always focusing on personal success
b) Showing concern and compassion for others
c) Ignoring the needs of others
d) Only helping when there is a reward

30) Honesty is best defined as: _____
a) Telling the truth regardless of the consequences
b) Saying only what others want to hear
c) Keeping secrets for friends
d) Telling lies to avoid conflict

31) According to Kohlberg's theory, the highest stage of moral development is: _____
a) Obedience and punishment orientation
b) Conventional morality
c) Post-conventional morality
d) Self-interest orientation

32) Which of the following is a key characteristic of Gilligan's moral development theory?
a) Emphasis on justice and rights
b) Focus on the value of relationships and care
c) Focus on maximizing personal gain
d) Belief that all moral issues are universal and objective

33) Which of the following models of professional roles emphasizes the engineer's responsibility to society and the public welfare?
a) The Engineer as Technocrat
b) The Engineer as Contractor
c) The Engineer as Guardian
d) The Engineer as Entrepreneur

34) Which theory of moral development emphasizes the importance of care and relationships, particularly for women?
a) Kohlberg's theory
b) Aristotle's virtue ethics
c) Gilligan's theory
d) Rawls' theory of justice

35) Which model of professional role in engineering sees the engineer as a neutral expert, focused only on technical competence without concern for social values?
a) The Engineer as Guardian
b) The Engineer as Technocrat
c) The Engineer as Entrepreneur
d) The Engineer as Contractor

36) Which ethical theory suggests that individuals should act in ways that maximize their own happiness and well-being?

a) Deontological ethics b) Utilitarianism
c) Ethical egoism d) Virtue ethics

37) The concept of "professional ethics" in engineering involves: _____

a) The personal beliefs of engineers
b) The specific ethical standards and principles set by professional organizations
c) The opinions of senior management
d) The religious views of the engineers

38) In engineering ethics, a "conflict of interest" occurs when: _____

a) Engineers prioritize their personal interests over their professional duties
b) Engineers follow the orders of their superiors without question
c) Engineers act in ways that promote the well-being of society
d) Engineers make decisions based solely on technical expertise

39) In engineering ethics, what is the purpose of "risk assessment"?

a) To identify and mitigate potential dangers and harm to society
b) To increase profits and minimize costs
c) To ensure that engineers do not make mistakes
d) To promote the engineer's personal career advancement

40) What does "ethical responsibility" in engineering imply?

a) Only following orders from superiors
b) Making decisions that benefit only the company
c) Balancing technical, legal, and moral considerations to ensure public safety and well-being
d) Prioritizing efficiency over quality

41) Safety and risk primarily deal with: _____

a) Managing hazards and assessing potential harm
b) Legal contracts
c) Maximizing productivity
d) Reducing work hours

42) Risk-benefit analysis involves: _____

a) Estimating the cost of a project
b) Evaluating potential risks against possible benefits
c) Managing legal liabilities
d) Defining workplace responsibilities

43) The Chernobyl disaster is an example of: _____

a) A technological breakthrough
b) An ethical failure in managing risks
c) A successful safety protocol implementation
d) An engineering success

44) Which of the following is a key factor in assessing safety and risk?
a) The cost of implementation
b) The likelihood and impact of potential hazards
c) The speed of technology adoption
d) The market demand for a product

45) The Three Mile Island incident was caused by: _____
a) Technological failure
b) Natural disasters
c) Lack of training for engineers
d) Poor risk assessment and safety protocol failures

46) Collegiality in a professional setting refers to: _____
a) Loyalty to your employer
b) Cooperation and mutual respect among colleagues
c) Competing for individual success
d) Avoiding work conflicts

47) Professional loyalty involves: _____
a) Reporting colleagues' mistakes publicly
b) Protecting the interests of the team or organization
c) Ignoring safety violations to avoid
d) Disclosing confidential information for personal conflict gain

48) Employee rights include: _____
a) The right to work without discrimination
b) The right to disregard company policies
c) The right to personal opinion but not affecting work
d) The right to ignore workplace safety standards

49) Intellectual Property Rights (IPR) protect: _____
a) The financial interests of corporations
b) The ownership and use of creative ideas and inventions
c) The physical assets of a company
d) Workplace performance evaluations

50) *Risk assessment* is important because it helps in: _____
a) Evaluating the potential impact of hazards on health and safety
b) Minimizing workplace productivity
c) Defining job roles
d) Ignoring environmental issues

SLR-BD-631

Seat No.		Set	R

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Professional Ethics (VEC-02)

Day & Date: Wednesday, 11-06-2025 Max. Marks: 50
Time: 10:00 AM To 11:30 AM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) According to Kohlberg's theory, the highest stage of moral development is: _____
a) Obedience and punishment orientation
b) Conventional morality
c) Post-conventional morality
d) Self-interest orientation

2) Which of the following is a key characteristic of Gilligan's moral development theory?
a) Emphasis on justice and rights
b) Focus on the value of relationships and care
c) Focus on maximizing personal gain
d) Belief that all moral issues are universal and objective

3) Which of the following models of professional roles emphasizes the engineer’s responsibility to society and the public welfare?
a) The Engineer as Technocrat
b) The Engineer as Contractor
c) The Engineer as Guardian
d) The Engineer as Entrepreneur

4) Which theory of moral development emphasizes the importance of care and relationships, particularly for women?
a) Kohlberg's theory b) Aristotle's virtue ethics
c) Gilligan's theory d) Rawls' theory of justice

5) Which model of professional role in engineering sees the engineer as a neutral expert, focused only on technical competence without concern for social values?

a) The Engineer as Guardian
b) The Engineer as Technocrat
c) The Engineer as Entrepreneur
d) The Engineer as Contractor

6) Which ethical theory suggests that individuals should act in ways that maximize their own happiness and well-being?

a) Deontological ethics b) Utilitarianism
c) Ethical egoism d) Virtue ethics

7) The concept of "professional ethics" in engineering involves: _____

a) The personal beliefs of engineers
b) The specific ethical standards and principles set by professional organizations
c) The opinions of senior management
d) The religious views of the engineers

8) In engineering ethics, a "conflict of interest" occurs when: _____

a) Engineers prioritize their personal interests over their professional duties
b) Engineers follow the orders of their superiors without question
c) Engineers act in ways that promote the well-being of society
d) Engineers make decisions based solely on technical expertise

9) In engineering ethics, what is the purpose of "risk assessment"?

a) To identify and mitigate potential dangers and harm to society
b) To increase profits and minimize costs
c) To ensure that engineers do not make mistakes
d) To promote the engineer's personal career advancement

10) What does "ethical responsibility" in engineering imply?

a) Only following orders from superiors
b) Making decisions that benefit only the company
c) Balancing technical, legal, and moral considerations to ensure public safety and well-being
d) Prioritizing efficiency over quality

11) Safety and risk primarily deal with: _____

a) Managing hazards and assessing potential harm
b) Legal contracts
c) Maximizing productivity
d) Reducing work hours

12) Risk-benefit analysis involves: _____
a) Estimating the cost of a project
b) Evaluating potential risks against possible benefits
c) Managing legal liabilities
d) Defining workplace responsibilities

13) The Chernobyl disaster is an example of: _____
a) A technological breakthrough
b) An ethical failure in managing risks
c) A successful safety protocol implementation
d) An engineering success

14) Which of the following is a key factor in assessing safety and risk?
a) The cost of implementation
b) The likelihood and impact of potential hazards
c) The speed of technology adoption
d) The market demand for a product

15) The Three Mile Island incident was caused by: _____
a) Technological failure
b) Natural disasters
c) Lack of training for engineers
d) Poor risk assessment and safety protocol failures

16) Collegiality in a professional setting refers to: _____
a) Loyalty to your employer
b) Cooperation and mutual respect among colleagues
c) Competing for individual success
d) Avoiding work conflicts

17) Professional loyalty involves: _____
a) Reporting colleagues' mistakes publicly
b) Protecting the interests of the team or organization
c) Ignoring safety violations to avoid
d) Disclosing confidential information for personal conflict gain

18) Employee rights include: _____
a) The right to work without discrimination
b) The right to disregard company policies
c) The right to personal opinion but not affecting work
d) The right to ignore workplace safety standards

19) Intellectual Property Rights (IPR) protect: _____
a) The financial interests of corporations
b) The ownership and use of creative ideas and inventions
c) The physical assets of a company
d) Workplace performance evaluations

20) *Risk assessment* is important because it helps in: _____
a) Evaluating the potential impact of hazards on health and safety
b) Minimizing workplace productivity
c) Defining job roles
d) Ignoring environmental issues

21) In risk management, mitigation strategies aim to: _____
a) Accept all risks in the workplace
b) Reduce or eliminate identified risks
c) Increase the likelihood of hazards
d) Focus only on maximizing profits

22) Which of the following is a potential consequence of *occupational crime*?
a) Increased workplace productivity
b) Legal consequences and loss of reputation
c) Improvement in company safety standards
d) Higher employee satisfaction

23) Risk reduction in engineering refers to: _____
a) Implementing measures to lower the chances of accidents
b) Increasing the number of hazards in the work environment
c) Ignoring potential risks
d) Cutting costs by removing safety measures

24) Public safety regulations are primarily designed to: _____
a) Ensure the safety of the company's assets
b) Protect the general public from potential harm
c) Increase revenue for the government
d) Focus only on preventing natural disasters

25) Multinational corporations (MNCs) are characterized by: _____
a) Operations in multiple countries with a centralized headquarters
b) Operating only in their home country
c) Limited influence on global markets
d) No responsibility toward environmental concerns

26) Environmental ethics primarily deals with: _____
a) Human responsibility to manage the environment and natural resources
b) Minimizing corporate profits
c) Technological advancements in engineering
d) Treating employees equally

27) Which of the following is NOT an example of environmental ethics?
a) Reducing pollution and waste
b) Maximizing resource use regardless of environmental impact
c) Preserving biodiversity
d) Sustainable development

28) Computer ethics involves: _____
a) Programming and coding without considering social consequences
b) Understanding the moral implications of computing technologies
c) Focusing only on technological innovation
d) Ignoring privacy issues

29) Weapons development ethics deals with: _____
a) The development of new technologies to enhance military capabilities
b) Restricting the use of all technological advancements
c) Focusing only on civilian safety
d) Only addressing the legal aspects of weapon development

30) Engineers as managers are expected to: _____
a) Focus solely on technical tasks
b) Lead teams, make strategic decisions, and manage projects
c) Ignore the business aspects of their work
d) Avoid taking responsibility for team outcomes

31) Consulting engineers are hired to: _____
a) Work on projects within the company they are employed
b) Provide expert advice on technical and engineering problems
c) Manage public relations for a company
d) Conduct legal investigations

32) Engineers acting as expert witnesses typically: _____
a) Present evidence and offer testimony in legal cases
b) Focus on public relations during a case
c) Manage engineering projects for legal firms
d) Directly represent the interests of a company in court

33) Sample Code of Ethics of professional organizations typically includes: _____
a) Guidelines for acceptable behavior and decision-making
b) Rules for maximizing profits at any cost
c) Detailed technical specifications for projects
d) Guidelines for political involvement in engineering

34) ASME stands for: _____
a) American Society of Mechanical Engineers
b) American Society of Management Engineers
c) Association of Safety and Mechanical Engineers
d) Association of Scientific and Mechanical Engineers

35) The ASCE Code of Ethics emphasizes: _____
a) Following only local regulations
b) Maintaining professional integrity and responsibility
c) Focusing on personal financial gain
d) Ignoring environmental impacts

36) **T**he IEEE Code of Ethics is primarily concerned with: _____
a) Fostering professional competence and integrity
b) Protecting corporate secrets
c) Maximizing technological advancements at any cost
d) Developing weapons for defense purposes

37) Global issues in engineering ethics include: _____
a) Cultural differences in engineering practices
b) Lack of understanding between technical and ethical concerns
c) Addressing both local and international engineering challenges
d) All of the above

38) A key challenge faced by multinational corporations is: _____
a) Balancing profits with social and environmental
b) Competing only within their home country responsibilities
c) Focusing solely on domestic issues
d) Ignoring corporate social responsibility

39) Empathy is the ability to: _____
a) Solve problems logically
b) Understand and share the feelings of others
c) Be indifferent to others' emotions
d) Only care about your own well-being

40) The quality of "caring" includes: _____
a) Showing concern for others' well-being
b) Ignoring the needs of others
c) Only helping family and friends
d) Seeking praise for helping others

41) The primary meaning of "ethics"?
a) Financial management
b) Principles governing the behavior of individuals
c) Rules for social interaction
d) Legal frameworks for business

42) The following is an example of a moral value?
a) Earning money b) Achieving fame
c) Helping others in need d) Increasing personal wealth

43) Integrity refers to: _____
a) Working hard at any cost
b) Being honest and having strong moral principles
c) Competing with others
d) Disregarding rules for personal gain

44) The concept of "work ethics" includes: _____
a) The right to leave work early
b) Consistently producing quality work
c) Avoiding all responsibilities
d) Expecting promotions without effort

45) The primary purpose of service learning is _____.
a) Earning money while volunteering
b) Acquiring knowledge through practical experiences
c) Participating in online courses
d) Building a professional career

46) Civic virtue is: _____
a) Attending religious services
b) Demonstrating good behavior and contributing to the welfare of society
c) Building personal wealth
d) Following family traditions

47) The following is an example of "respect for others" is _____.
a) Ignoring people's opinions
b) Listening attentively to others and valuing their viewpoints
c) Interrupting others in conversations
d) Arguing to prove your point

48) Living peacefully involves: _____
a) Suppressing all emotions
b) Treating others with kindness and understanding
c) Avoiding any conflict
d) Always agreeing with others

49) The value of "caring" means: _____
a) Always focusing on personal success
b) Showing concern and compassion for others
c) Ignoring the needs of others
d) Only helping when there is a reward

50) Honesty is best defined as: _____

a) Telling the truth regardless of the consequences
b) Saying only what others want to hear
c) Keeping secrets for friends
d) Telling lies to avoid conflict

SLR-BD-631

Seat No.		Set	S

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
CIVIL ENGINEERING
Professional Ethics (VEC-02)

Day & Date: Wednesday, 11-06-2025 Max. Marks: 50
Time: 10:00 AM To 11:30 AM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) Consulting engineers are hired to: _____
a) Work on projects within the company they are employed
b) Provide expert advice on technical and engineering problems
c) Manage public relations for a company
d) Conduct legal investigations

2) Engineers acting as expert witnesses typically: _____
a) Present evidence and offer testimony in legal cases
b) Focus on public relations during a case
c) Manage engineering projects for legal firms
d) Directly represent the interests of a company in court

3) Sample Code of Ethics of professional organizations typically includes: _____
a) Guidelines for acceptable behavior and decision-making
b) Rules for maximizing profits at any cost
c) Detailed technical specifications for projects
d) Guidelines for political involvement in engineering

4) ASME stands for: _____
a) American Society of Mechanical Engineers
b) American Society of Management Engineers
c) Association of Safety and Mechanical Engineers
d) Association of Scientific and Mechanical Engineers

5) The ASCE Code of Ethics emphasizes: _____
a) Following only local regulations
b) Maintaining professional integrity and responsibility
c) Focusing on personal financial gain
d) Ignoring environmental impacts

6) **T**he IEEE Code of Ethics is primarily concerned with: _____
a) Fostering professional competence and integrity
b) Protecting corporate secrets
c) Maximizing technological advancements at any cost
d) Developing weapons for defense purposes

7) Global issues in engineering ethics include: _____
a) Cultural differences in engineering practices
b) Lack of understanding between technical and ethical concerns
c) Addressing both local and international engineering challenges
d) All of the above

8) A key challenge faced by multinational corporations is: _____
a) Balancing profits with social and environmental
b) Competing only within their home country responsibilities
c) Focusing solely on domestic issues
d) Ignoring corporate social responsibility

9) Empathy is the ability to: _____
a) Solve problems logically
b) Understand and share the feelings of others
c) Be indifferent to others' emotions
d) Only care about your own well-being

10) The quality of "caring" includes: _____
a) Showing concern for others' well-being
b) Ignoring the needs of others
c) Only helping family and friends
d) Seeking praise for helping others

11) The primary meaning of "ethics"?
a) Financial management
b) Principles governing the behavior of individuals
c) Rules for social interaction
d) Legal frameworks for business

12) The following is an example of a moral value?
a) Earning money
b) Achieving fame
c) Helping others in need
d) Increasing personal wealth

13) Integrity refers to: _____
a) Working hard at any cost
b) Being honest and having strong moral principles
c) Competing with others
d) Disregarding rules for personal gain

14) The concept of "work ethics" includes: _____
a) The right to leave work early
b) Consistently producing quality work
c) Avoiding all responsibilities
d) Expecting promotions without effort

15) The primary purpose of service learning is _____.
a) Earning money while volunteering
b) Acquiring knowledge through practical experiences
c) Participating in online courses
d) Building a professional career

16) Civic virtue is: _____
a) Attending religious services
b) Demonstrating good behavior and contributing to the welfare of society
c) Building personal wealth
d) Following family traditions

17) The following is an example of "respect for others" is _____.
a) Ignoring people's opinions
b) Listening attentively to others and valuing their viewpoints
c) Interrupting others in conversations
d) Arguing to prove your point

18) Living peacefully involves: _____
a) Suppressing all emotions
b) Treating others with kindness and understanding
c) Avoiding any conflict
d) Always agreeing with others

19) The value of "caring" means: _____
a) Always focusing on personal success
b) Showing concern and compassion for others
c) Ignoring the needs of others
d) Only helping when there is a reward

20) Honesty is best defined as: _____
a) Telling the truth regardless of the consequences
b) Saying only what others want to hear
c) Keeping secrets for friends
d) Telling lies to avoid conflict

21) According to Kohlberg's theory, the highest stage of moral development is: _____

a) Obedience and punishment orientation
b) Conventional morality
c) Post-conventional morality
d) Self-interest orientation

22) Which of the following is a key characteristic of Gilligan's moral development theory?

a) Emphasis on justice and rights
b) Focus on the value of relationships and care
c) Focus on maximizing personal gain
d) Belief that all moral issues are universal and objective

23) Which of the following models of professional roles emphasizes the engineer's responsibility to society and the public welfare?

a) The Engineer as Technocrat
b) The Engineer as Contractor
c) The Engineer as Guardian
d) The Engineer as Entrepreneur

24) Which theory of moral development emphasizes the importance of care and relationships, particularly for women?

a) Kohlberg's theory
b) Aristotle's virtue ethics
c) Gilligan's theory
d) Rawls' theory of justice

25) Which model of professional role in engineering sees the engineer as a neutral expert, focused only on technical competence without concern for social values?

a) The Engineer as Guardian
b) The Engineer as Technocrat
c) The Engineer as Entrepreneur
d) The Engineer as Contractor

26) Which ethical theory suggests that individuals should act in ways that maximize their own happiness and well-being?

a) Deontological ethics
b) Utilitarianism
c) Ethical egoism
d) Virtue ethics

27) The concept of "professional ethics" in engineering involves: _____

a) The personal beliefs of engineers
b) The specific ethical standards and principles set by professional organizations
c) The opinions of senior management
d) The religious views of the engineers

28) In engineering ethics, a "conflict of interest" occurs when: _____
a) Engineers prioritize their personal interests over their professional duties
b) Engineers follow the orders of their superiors without question
c) Engineers act in ways that promote the well-being of society
d) Engineers make decisions based solely on technical expertise

29) In engineering ethics, what is the purpose of "risk assessment"?
a) To identify and mitigate potential dangers and harm to society
b) To increase profits and minimize costs
c) To ensure that engineers do not make mistakes
d) To promote the engineer's personal career advancement

30) What does "ethical responsibility" in engineering imply?
a) Only following orders from superiors
b) Making decisions that benefit only the company
c) Balancing technical, legal, and moral considerations to ensure public safety and well-being
d) Prioritizing efficiency over quality

31) Safety and risk primarily deal with: _____
a) Managing hazards and assessing potential harm
b) Legal contracts
c) Maximizing productivity
d) Reducing work hours

32) Risk-benefit analysis involves: _____
a) Estimating the cost of a project
b) Evaluating potential risks against possible benefits
c) Managing legal liabilities
d) Defining workplace responsibilities

33) The Chernobyl disaster is an example of: _____
a) A technological breakthrough
b) An ethical failure in managing risks
c) A successful safety protocol implementation
d) An engineering success

34) Which of the following is a key factor in assessing safety and risk?
a) The cost of implementation
b) The likelihood and impact of potential hazards
c) The speed of technology adoption
d) The market demand for a product

35) The Three Mile Island incident was caused by: _____
a) Technological failure
b) Natural disasters
c) Lack of training for engineers
d) Poor risk assessment and safety protocol failures

36) Collegiality in a professional setting refers to: _____
a) Loyalty to your employer
b) Cooperation and mutual respect among colleagues
c) Competing for individual success
d) Avoiding work conflicts

37) Professional loyalty involves: _____
a) Reporting colleagues' mistakes publicly
b) Protecting the interests of the team or organization
c) Ignoring safety violations to avoid
d) Disclosing confidential information for personal conflict gain

38) Employee rights include: _____
a) The right to work without discrimination
b) The right to disregard company policies
c) The right to personal opinion but not affecting work
d) The right to ignore workplace safety standards

39) Intellectual Property Rights (IPR) protect: _____
a) The financial interests of corporations
b) The ownership and use of creative ideas and inventions
c) The physical assets of a company
d) Workplace performance evaluations

40) *Risk assessment* is important because it helps in: _____
a) Evaluating the potential impact of hazards on health and safety
b) Minimizing workplace productivity
c) Defining job roles
d) Ignoring environmental issues

41) In risk management, mitigation strategies aim to: _____
a) Accept all risks in the workplace
b) Reduce or eliminate identified risks
c) Increase the likelihood of hazards
d) Focus only on maximizing profits

42) Which of the following is a potential consequence of *occupational crime*?
a) Increased workplace productivity
b) Legal consequences and loss of reputation
c) Improvement in company safety standards
d) Higher employee satisfaction

43) Risk reduction in engineering refers to: _____
a) Implementing measures to lower the chances of accidents
b) Increasing the number of hazards in the work environment
c) Ignoring potential risks
d) Cutting costs by removing safety measures

44) Public safety regulations are primarily designed to: _____
a) Ensure the safety of the company's assets
b) Protect the general public from potential harm
c) Increase revenue for the government
d) Focus only on preventing natural disasters

45) Multinational corporations (MNCs) are characterized by: _____
a) Operations in multiple countries with a centralized headquarters
b) Operating only in their home country
c) Limited influence on global markets
d) No responsibility toward environmental concerns

46) Environmental ethics primarily deals with: _____
a) Human responsibility to manage the environment and natural resources
b) Minimizing corporate profits
c) Technological advancements in engineering
d) Treating employees equally

47) Which of the following is NOT an example of environmental ethics?
a) Reducing pollution and waste
b) Maximizing resource use regardless of environmental impact
c) Preserving biodiversity
d) Sustainable development

48) Computer ethics involves: _____
a) Programming and coding without considering social consequences
b) Understanding the moral implications of computing technologies
c) Focusing only on technological innovation
d) Ignoring privacy issues

49) Weapons development ethics deals with: _____
a) The development of new technologies to enhance military capabilities
b) Restricting the use of all technological advancements
c) Focusing only on civilian safety
d) Only addressing the legal aspects of weapon development

50) Engineers as managers are expected to: _____
a) Focus solely on technical tasks
b) Lead teams, make strategic decisions, and manage projects
c) Ignore the business aspects of their work
d) Avoid taking responsibility for team outcomes

SLR-BD-632

Seat No.		Set	P

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Professional Ethics (VEC-02)

Day & Date: Wednesday, 11-06-2025 Max. Marks: 50
Time: 10:00 AM To 11:30 AM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) The primary meaning of "ethics"?
a) Financial management
b) Principles governing the behavior of individuals
c) Rules for social interaction
d) Legal frameworks for business

2) The following is an example of a moral value?
a) Earning money b) Achieving fame
c) Helping others in need d) Increasing personal wealth

3) Integrity refers to: _____
a) Working hard at any cost
b) Being honest and having strong moral principles
c) Competing with others
d) Disregarding rules for personal gain

4) The concept of "work ethics" includes: _____
a) The right to leave work early
b) Consistently producing quality work
c) Avoiding all responsibilities
d) Expecting promotions without effort

5) The primary purpose of service learning is _____.
a) Earning money while volunteering
b) Acquiring knowledge through practical experiences
c) Participating in online courses
d) Building a professional career

6) Civic virtue is: _____
a) Attending religious services
b) Demonstrating good behavior and contributing to the welfare of society
c) Building personal wealth
d) Following family traditions

7) The following is an example of "respect for others" is _____.
a) Ignoring people's opinions
b) Listening attentively to others and valuing their viewpoints
c) Interrupting others in conversations
d) Arguing to prove your point

8) Living peacefully involves: _____
a) Suppressing all emotions
b) Treating others with kindness and understanding
c) Avoiding any conflict
d) Always agreeing with others

9) The value of "caring" means: _____
a) Always focusing on personal success
b) Showing concern and compassion for others
c) Ignoring the needs of others
d) Only helping when there is a reward

10) Honesty is best defined as: _____
a) Telling the truth regardless of the consequences
b) Saying only what others want to hear
c) Keeping secrets for friends
d) Telling lies to avoid conflict

11) According to Kohlberg's theory, the highest stage of moral development is: _____
a) Obedience and punishment orientation
b) Conventional morality
c) Post-conventional morality
d) Self-interest orientation

12) Which of the following is a key characteristic of Gilligan's moral development theory?
a) Emphasis on justice and rights
b) Focus on the value of relationships and care
c) Focus on maximizing personal gain
d) Belief that all moral issues are universal and objective

13) Which of the following models of professional roles emphasizes the engineer's responsibility to society and the public welfare?

a) The Engineer as Technocrat
b) The Engineer as Contractor
c) The Engineer as Guardian
d) The Engineer as Entrepreneur

14) Which theory of moral development emphasizes the importance of care and relationships, particularly for women?

a) Kohlberg's theory
b) Aristotle's virtue ethics
c) Gilligan's theory
d) Rawls' theory of justice

15) Which model of professional role in engineering sees the engineer as a neutral expert, focused only on technical competence without concern for social values?

a) The Engineer as Guardian
b) The Engineer as Technocrat
c) The Engineer as Entrepreneur
d) The Engineer as Contractor

16) Which ethical theory suggests that individuals should act in ways that maximize their own happiness and well-being?

a) Deontological ethics
b) Utilitarianism
c) Ethical egoism
d) Virtue ethics

17) The concept of "professional ethics" in engineering involves: _____

a) The personal beliefs of engineers
b) The specific ethical standards and principles set by professional organizations
c) The opinions of senior management
d) The religious views of the engineers

18) In engineering ethics, a "conflict of interest" occurs when: _____

a) Engineers prioritize their personal interests over their professional duties
b) Engineers follow the orders of their superiors without question
c) Engineers act in ways that promote the well-being of society
d) Engineers make decisions based solely on technical expertise

19) In engineering ethics, what is the purpose of "risk assessment"?

a) To identify and mitigate potential dangers and harm to society
b) To increase profits and minimize costs
c) To ensure that engineers do not make mistakes
d) To promote the engineer's personal career advancement

20) What does "ethical responsibility" in engineering imply?
a) Only following orders from superiors
b) Making decisions that benefit only the company
c) Balancing technical, legal, and moral considerations to ensure public safety and well-being
d) Prioritizing efficiency over quality

21) Safety and risk primarily deal with: _____
a) Managing hazards and assessing potential harm
b) Legal contracts
c) Maximizing productivity
d) Reducing work hours

22) Risk-benefit analysis involves: _____
a) Estimating the cost of a project
b) Evaluating potential risks against possible benefits
c) Managing legal liabilities
d) Defining workplace responsibilities

23) The Chernobyl disaster is an example of: _____
a) A technological breakthrough
b) An ethical failure in managing risks
c) A successful safety protocol implementation
d) An engineering success

24) Which of the following is a key factor in assessing safety and risk?
a) The cost of implementation
b) The likelihood and impact of potential hazards
c) The speed of technology adoption
d) The market demand for a product

25) The Three Mile Island incident was caused by: _____
a) Technological failure
b) Natural disasters
c) Lack of training for engineers
d) Poor risk assessment and safety protocol failures

26) Collegiality in a professional setting refers to: _____
a) Loyalty to your employer
b) Cooperation and mutual respect among colleagues
c) Competing for individual success
d) Avoiding work conflicts

27) Professional loyalty involves: _____
a) Reporting colleagues' mistakes publicly
b) Protecting the interests of the team or organization
c) Ignoring safety violations to avoid
d) Disclosing confidential information for personal conflict gain

28) Employee rights include: _____
a) The right to work without discrimination
b) The right to disregard company policies
c) The right to personal opinion but not affecting work
d) The right to ignore workplace safety standards

29) Intellectual Property Rights (IPR) protect: _____
a) The financial interests of corporations
b) The ownership and use of creative ideas and inventions
c) The physical assets of a company
d) Workplace performance evaluations

30) *Risk assessment* is important because it helps in: _____
a) Evaluating the potential impact of hazards on health and safety
b) Minimizing workplace productivity
c) Defining job roles
d) Ignoring environmental issues

31) In risk management, mitigation strategies aim to: _____
a) Accept all risks in the workplace
b) Reduce or eliminate identified risks
c) Increase the likelihood of hazards
d) Focus only on maximizing profits

32) Which of the following is a potential consequence of *occupational crime*?
a) Increased workplace productivity
b) Legal consequences and loss of reputation
c) Improvement in company safety standards
d) Higher employee satisfaction

33) Risk reduction in engineering refers to: _____
a) Implementing measures to lower the chances of accidents
b) Increasing the number of hazards in the work environment
c) Ignoring potential risks
d) Cutting costs by removing safety measures

34) Public safety regulations are primarily designed to: _____
a) Ensure the safety of the company's assets
b) Protect the general public from potential harm
c) Increase revenue for the government
d) Focus only on preventing natural disasters

35) Multinational corporations (MNCs) are characterized by: _____
a) Operations in multiple countries with a centralized headquarters
b) Operating only in their home country
c) Limited influence on global markets
d) No responsibility toward environmental concerns

36) Environmental ethics primarily deals with: _____
a) Human responsibility to manage the environment and natural resources
b) Minimizing corporate profits
c) Technological advancements in engineering
d) Treating employees equally

37) Which of the following is NOT an example of environmental ethics?
a) Reducing pollution and waste
b) Maximizing resource use regardless of environmental impact
c) Preserving biodiversity
d) Sustainable development

38) Computer ethics involves: _____
a) Programming and coding without considering social consequences
b) Understanding the moral implications of computing technologies
c) Focusing only on technological innovation
d) Ignoring privacy issues

39) Weapons development ethics deals with: _____
a) The development of new technologies to enhance military capabilities
b) Restricting the use of all technological advancements
c) Focusing only on civilian safety
d) Only addressing the legal aspects of weapon development

40) Engineers as managers are expected to: _____
a) Focus solely on technical tasks
b) Lead teams, make strategic decisions, and manage projects
c) Ignore the business aspects of their work
d) Avoid taking responsibility for team outcomes

41) Consulting engineers are hired to: _____
a) Work on projects within the company they are employed
b) Provide expert advice on technical and engineering problems
c) Manage public relations for a company
d) Conduct legal investigations

42) Engineers acting as expert witnesses typically: _____
a) Present evidence and offer testimony in legal cases
b) Focus on public relations during a case
c) Manage engineering projects for legal firms
d) Directly represent the interests of a company in court

43) Sample Code of Ethics of professional organizations typically includes: _____
a) Guidelines for acceptable behavior and decision-making
b) Rules for maximizing profits at any cost
c) Detailed technical specifications for projects
d) Guidelines for political involvement in engineering

44) ASME stands for: _____
a) American Society of Mechanical Engineers
b) American Society of Management Engineers
c) Association of Safety and Mechanical Engineers
d) Association of Scientific and Mechanical Engineers

45) The ASCE Code of Ethics emphasizes: _____
a) Following only local regulations
b) Maintaining professional integrity and responsibility
c) Focusing on personal financial gain
d) Ignoring environmental impacts

46) **T**he IEEE Code of Ethics is primarily concerned with: _____
a) Fostering professional competence and integrity
b) Protecting corporate secrets
c) Maximizing technological advancements at any cost
d) Developing weapons for defense purposes

47) Global issues in engineering ethics include: _____
a) Cultural differences in engineering practices
b) Lack of understanding between technical and ethical concerns
c) Addressing both local and international engineering challenges
d) All of the above

48) A key challenge faced by multinational corporations is: _____
a) Balancing profits with social and environmental
b) Competing only within their home country responsibilities
c) Focusing solely on domestic issues
d) Ignoring corporate social responsibility

49) Empathy is the ability to: _____
a) Solve problems logically
b) Understand and share the feelings of others
c) Be indifferent to others' emotions
d) Only care about your own well-being

50) The quality of "caring" includes: _____
a) Showing concern for others' well-being
b) Ignoring the needs of others
c) Only helping family and friends
d) Seeking praise for helping others

SLR-BD-632

Seat No.		Set	Q

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Professional Ethics (VEC-02)

Day & Date: Wednesday, 11-06-2025 Max. Marks: 50
Time: 10:00 AM To 11:30 AM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) In risk management, mitigation strategies aim to: _____
a) Accept all risks in the workplace
b) Reduce or eliminate identified risks
c) Increase the likelihood of hazards
d) Focus only on maximizing profits

2) Which of the following is a potential consequence of *occupational crime*?
a) Increased workplace productivity
b) Legal consequences and loss of reputation
c) Improvement in company safety standards
d) Higher employee satisfaction

3) Risk reduction in engineering refers to: _____
a) Implementing measures to lower the chances of accidents
b) Increasing the number of hazards in the work environment
c) Ignoring potential risks
d) Cutting costs by removing safety measures

4) Public safety regulations are primarily designed to: _____
a) Ensure the safety of the company's assets
b) Protect the general public from potential harm
c) Increase revenue for the government
d) Focus only on preventing natural disasters

5) Multinational corporations (MNCs) are characterized by: _____
a) Operations in multiple countries with a centralized headquarters
b) Operating only in their home country
c) Limited influence on global markets
d) No responsibility toward environmental concerns

6) Environmental ethics primarily deals with: _____
a) Human responsibility to manage the environment and natural resources
b) Minimizing corporate profits
c) Technological advancements in engineering
d) Treating employees equally

7) Which of the following is NOT an example of environmental ethics?
a) Reducing pollution and waste
b) Maximizing resource use regardless of environmental impact
c) Preserving biodiversity
d) Sustainable development

8) Computer ethics involves: _____
a) Programming and coding without considering social consequences
b) Understanding the moral implications of computing technologies
c) Focusing only on technological innovation
d) Ignoring privacy issues

9) Weapons development ethics deals with: _____
a) The development of new technologies to enhance military capabilities
b) Restricting the use of all technological advancements
c) Focusing only on civilian safety
d) Only addressing the legal aspects of weapon development

10) Engineers as managers are expected to: _____
a) Focus solely on technical tasks
b) Lead teams, make strategic decisions, and manage projects
c) Ignore the business aspects of their work
d) Avoid taking responsibility for team outcomes

11) Consulting engineers are hired to: _____
a) Work on projects within the company they are employed
b) Provide expert advice on technical and engineering problems
c) Manage public relations for a company
d) Conduct legal investigations

12) Engineers acting as expert witnesses typically: _____
a) Present evidence and offer testimony in legal cases
b) Focus on public relations during a case
c) Manage engineering projects for legal firms
d) Directly represent the interests of a company in court

13) Sample Code of Ethics of professional organizations typically includes: _____
a) Guidelines for acceptable behavior and decision-making
b) Rules for maximizing profits at any cost
c) Detailed technical specifications for projects
d) Guidelines for political involvement in engineering

14) ASME stands for: _____
a) American Society of Mechanical Engineers
b) American Society of Management Engineers
c) Association of Safety and Mechanical Engineers
d) Association of Scientific and Mechanical Engineers

15) The ASCE Code of Ethics emphasizes: _____
a) Following only local regulations
b) Maintaining professional integrity and responsibility
c) Focusing on personal financial gain
d) Ignoring environmental impacts

16) **T**he IEEE Code of Ethics is primarily concerned with: _____
a) Fostering professional competence and integrity
b) Protecting corporate secrets
c) Maximizing technological advancements at any cost
d) Developing weapons for defense purposes

17) Global issues in engineering ethics include: _____
a) Cultural differences in engineering practices
b) Lack of understanding between technical and ethical concerns
c) Addressing both local and international engineering challenges
d) All of the above

18) A key challenge faced by multinational corporations is: _____
a) Balancing profits with social and environmental
b) Competing only within their home country responsibilities
c) Focusing solely on domestic issues
d) Ignoring corporate social responsibility

19) Empathy is the ability to: _____
a) Solve problems logically
b) Understand and share the feelings of others
c) Be indifferent to others' emotions
d) Only care about your own well-being

20) The quality of "caring" includes: _____
a) Showing concern for others' well-being
b) Ignoring the needs of others
c) Only helping family and friends
d) Seeking praise for helping others

21) The primary meaning of "ethics"?
a) Financial management
b) Principles governing the behavior of individuals
c) Rules for social interaction
d) Legal frameworks for business

22) The following is an example of a moral value?
a) Earning money
b) Achieving fame
c) Helping others in need
d) Increasing personal wealth

23) Integrity refers to: _____
a) Working hard at any cost
b) Being honest and having strong moral principles
c) Competing with others
d) Disregarding rules for personal gain

24) The concept of "work ethics" includes: _____
a) The right to leave work early
b) Consistently producing quality work
c) Avoiding all responsibilities
d) Expecting promotions without effort

25) The primary purpose of service learning is _____.
a) Earning money while volunteering
b) Acquiring knowledge through practical experiences
c) Participating in online courses
d) Building a professional career

26) Civic virtue is: _____
a) Attending religious services
b) Demonstrating good behavior and contributing to the welfare of society
c) Building personal wealth
d) Following family traditions

27) The following is an example of "respect for others" is _____.
a) Ignoring people's opinions
b) Listening attentively to others and valuing their viewpoints
c) Interrupting others in conversations
d) Arguing to prove your point

28) Living peacefully involves: _____
a) Suppressing all emotions
b) Treating others with kindness and understanding
c) Avoiding any conflict
d) Always agreeing with others

29) The value of "caring" means: _____
a) Always focusing on personal success
b) Showing concern and compassion for others
c) Ignoring the needs of others
d) Only helping when there is a reward

30) Honesty is best defined as: _____
a) Telling the truth regardless of the consequences
b) Saying only what others want to hear
c) Keeping secrets for friends
d) Telling lies to avoid conflict

31) According to Kohlberg's theory, the highest stage of moral development is: _____
a) Obedience and punishment orientation
b) Conventional morality
c) Post-conventional morality
d) Self-interest orientation

32) Which of the following is a key characteristic of Gilligan's moral development theory?
a) Emphasis on justice and rights
b) Focus on the value of relationships and care
c) Focus on maximizing personal gain
d) Belief that all moral issues are universal and objective

33) Which of the following models of professional roles emphasizes the engineer's responsibility to society and the public welfare?
a) The Engineer as Technocrat
b) The Engineer as Contractor
c) The Engineer as Guardian
d) The Engineer as Entrepreneur

34) Which theory of moral development emphasizes the importance of care and relationships, particularly for women?
a) Kohlberg's theory
b) Aristotle's virtue ethics
c) Gilligan's theory
d) Rawls' theory of justice

35) Which model of professional role in engineering sees the engineer as a neutral expert, focused only on technical competence without concern for social values?
a) The Engineer as Guardian
b) The Engineer as Technocrat
c) The Engineer as Entrepreneur
d) The Engineer as Contractor

36) Which ethical theory suggests that individuals should act in ways that maximize their own happiness and well-being?

a) Deontological ethics b) Utilitarianism
c) Ethical egoism d) Virtue ethics

37) The concept of "professional ethics" in engineering involves: _____

a) The personal beliefs of engineers
b) The specific ethical standards and principles set by professional organizations
c) The opinions of senior management
d) The religious views of the engineers

38) In engineering ethics, a "conflict of interest" occurs when: _____

a) Engineers prioritize their personal interests over their professional duties
b) Engineers follow the orders of their superiors without question
c) Engineers act in ways that promote the well-being of society
d) Engineers make decisions based solely on technical expertise

39) In engineering ethics, what is the purpose of "risk assessment"?

a) To identify and mitigate potential dangers and harm to society
b) To increase profits and minimize costs
c) To ensure that engineers do not make mistakes
d) To promote the engineer's personal career advancement

40) What does "ethical responsibility" in engineering imply?

a) Only following orders from superiors
b) Making decisions that benefit only the company
c) Balancing technical, legal, and moral considerations to ensure public safety and well-being
d) Prioritizing efficiency over quality

41) Safety and risk primarily deal with: _____

a) Managing hazards and assessing potential harm
b) Legal contracts
c) Maximizing productivity
d) Reducing work hours

42) Risk-benefit analysis involves: _____

a) Estimating the cost of a project
b) Evaluating potential risks against possible benefits
c) Managing legal liabilities
d) Defining workplace responsibilities

43) The Chernobyl disaster is an example of: _____

a) A technological breakthrough
b) An ethical failure in managing risks
c) A successful safety protocol implementation
d) An engineering success

44) Which of the following is a key factor in assessing safety and risk?
a) The cost of implementation
b) The likelihood and impact of potential hazards
c) The speed of technology adoption
d) The market demand for a product

45) The Three Mile Island incident was caused by: _____
a) Technological failure
b) Natural disasters
c) Lack of training for engineers
d) Poor risk assessment and safety protocol failures

46) Collegiality in a professional setting refers to: _____
a) Loyalty to your employer
b) Cooperation and mutual respect among colleagues
c) Competing for individual success
d) Avoiding work conflicts

47) Professional loyalty involves: _____
a) Reporting colleagues' mistakes publicly
b) Protecting the interests of the team or organization
c) Ignoring safety violations to avoid
d) Disclosing confidential information for personal conflict gain

48) Employee rights include: _____
a) The right to work without discrimination
b) The right to disregard company policies
c) The right to personal opinion but not affecting work
d) The right to ignore workplace safety standards

49) Intellectual Property Rights (IPR) protect: _____
a) The financial interests of corporations
b) The ownership and use of creative ideas and inventions
c) The physical assets of a company
d) Workplace performance evaluations

50) *Risk assessment* is important because it helps in: _____
a) Evaluating the potential impact of hazards on health and safety
b) Minimizing workplace productivity
c) Defining job roles
d) Ignoring environmental issues

SLR-BD-632

Seat No.		Set	R

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Professional Ethics (VEC-02)

Day & Date: Wednesday, 11-06-2025 Max. Marks: 50
Time: 10:00 AM To 11:30 AM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) According to Kohlberg's theory, the highest stage of moral development is: _____
a) Obedience and punishment orientation
b) Conventional morality
c) Post-conventional morality
d) Self-interest orientation

2) Which of the following is a key characteristic of Gilligan's moral development theory?
a) Emphasis on justice and rights
b) Focus on the value of relationships and care
c) Focus on maximizing personal gain
d) Belief that all moral issues are universal and objective

3) Which of the following models of professional roles emphasizes the engineer’s responsibility to society and the public welfare?
a) The Engineer as Technocrat
b) The Engineer as Contractor
c) The Engineer as Guardian
d) The Engineer as Entrepreneur

4) Which theory of moral development emphasizes the importance of care and relationships, particularly for women?
a) Kohlberg's theory b) Aristotle's virtue ethics
c) Gilligan's theory d) Rawls' theory of justice

5) Which model of professional role in engineering sees the engineer as a neutral expert, focused only on technical competence without concern for social values?

a) The Engineer as Guardian
b) The Engineer as Technocrat
c) The Engineer as Entrepreneur
d) The Engineer as Contractor

6) Which ethical theory suggests that individuals should act in ways that maximize their own happiness and well-being?

a) Deontological ethics
b) Utilitarianism
c) Ethical egoism
d) Virtue ethics

7) The concept of "professional ethics" in engineering involves: _____

a) The personal beliefs of engineers
b) The specific ethical standards and principles set by professional organizations
c) The opinions of senior management
d) The religious views of the engineers

8) In engineering ethics, a "conflict of interest" occurs when: _____

a) Engineers prioritize their personal interests over their professional duties
b) Engineers follow the orders of their superiors without question
c) Engineers act in ways that promote the well-being of society
d) Engineers make decisions based solely on technical expertise

9) In engineering ethics, what is the purpose of "risk assessment"?

a) To identify and mitigate potential dangers and harm to society
b) To increase profits and minimize costs
c) To ensure that engineers do not make mistakes
d) To promote the engineer's personal career advancement

10) What does "ethical responsibility" in engineering imply?

a) Only following orders from superiors
b) Making decisions that benefit only the company
c) Balancing technical, legal, and moral considerations to ensure public safety and well-being
d) Prioritizing efficiency over quality

11) Safety and risk primarily deal with: _____

a) Managing hazards and assessing potential harm
b) Legal contracts
c) Maximizing productivity
d) Reducing work hours

12) Risk-benefit analysis involves: _____
a) Estimating the cost of a project
b) Evaluating potential risks against possible benefits
c) Managing legal liabilities
d) Defining workplace responsibilities

13) The Chernobyl disaster is an example of: _____
a) A technological breakthrough
b) An ethical failure in managing risks
c) A successful safety protocol implementation
d) An engineering success

14) Which of the following is a key factor in assessing safety and risk?
a) The cost of implementation
b) The likelihood and impact of potential hazards
c) The speed of technology adoption
d) The market demand for a product

15) The Three Mile Island incident was caused by: _____
a) Technological failure
b) Natural disasters
c) Lack of training for engineers
d) Poor risk assessment and safety protocol failures

16) Collegiality in a professional setting refers to: _____
a) Loyalty to your employer
b) Cooperation and mutual respect among colleagues
c) Competing for individual success
d) Avoiding work conflicts

17) Professional loyalty involves: _____
a) Reporting colleagues' mistakes publicly
b) Protecting the interests of the team or organization
c) Ignoring safety violations to avoid
d) Disclosing confidential information for personal conflict gain

18) Employee rights include: _____
a) The right to work without discrimination
b) The right to disregard company policies
c) The right to personal opinion but not affecting work
d) The right to ignore workplace safety standards

19) Intellectual Property Rights (IPR) protect: _____
a) The financial interests of corporations
b) The ownership and use of creative ideas and inventions
c) The physical assets of a company
d) Workplace performance evaluations

20) *Risk assessment* is important because it helps in: _____
a) Evaluating the potential impact of hazards on health and safety
b) Minimizing workplace productivity
c) Defining job roles
d) Ignoring environmental issues

21) In risk management, mitigation strategies aim to: _____
a) Accept all risks in the workplace
b) Reduce or eliminate identified risks
c) Increase the likelihood of hazards
d) Focus only on maximizing profits

22) Which of the following is a potential consequence of *occupational crime*?
a) Increased workplace productivity
b) Legal consequences and loss of reputation
c) Improvement in company safety standards
d) Higher employee satisfaction

23) Risk reduction in engineering refers to: _____
a) Implementing measures to lower the chances of accidents
b) Increasing the number of hazards in the work environment
c) Ignoring potential risks
d) Cutting costs by removing safety measures

24) Public safety regulations are primarily designed to: _____
a) Ensure the safety of the company's assets
b) Protect the general public from potential harm
c) Increase revenue for the government
d) Focus only on preventing natural disasters

25) Multinational corporations (MNCs) are characterized by: _____
a) Operations in multiple countries with a centralized headquarters
b) Operating only in their home country
c) Limited influence on global markets
d) No responsibility toward environmental concerns

26) Environmental ethics primarily deals with: _____
a) Human responsibility to manage the environment and natural resources
b) Minimizing corporate profits
c) Technological advancements in engineering
d) Treating employees equally

27) Which of the following is NOT an example of environmental ethics?
a) Reducing pollution and waste
b) Maximizing resource use regardless of environmental impact
c) Preserving biodiversity
d) Sustainable development

28) Computer ethics involves: _____
a) Programming and coding without considering social consequences
b) Understanding the moral implications of computing technologies
c) Focusing only on technological innovation
d) Ignoring privacy issues

29) Weapons development ethics deals with: _____
a) The development of new technologies to enhance military capabilities
b) Restricting the use of all technological advancements
c) Focusing only on civilian safety
d) Only addressing the legal aspects of weapon development

30) Engineers as managers are expected to: _____
a) Focus solely on technical tasks
b) Lead teams, make strategic decisions, and manage projects
c) Ignore the business aspects of their work
d) Avoid taking responsibility for team outcomes

31) Consulting engineers are hired to: _____
a) Work on projects within the company they are employed
b) Provide expert advice on technical and engineering problems
c) Manage public relations for a company
d) Conduct legal investigations

32) Engineers acting as expert witnesses typically: _____
a) Present evidence and offer testimony in legal cases
b) Focus on public relations during a case
c) Manage engineering projects for legal firms
d) Directly represent the interests of a company in court

33) Sample Code of Ethics of professional organizations typically includes: _____
a) Guidelines for acceptable behavior and decision-making
b) Rules for maximizing profits at any cost
c) Detailed technical specifications for projects
d) Guidelines for political involvement in engineering

34) ASME stands for: _____
a) American Society of Mechanical Engineers
b) American Society of Management Engineers
c) Association of Safety and Mechanical Engineers
d) Association of Scientific and Mechanical Engineers

35) The ASCE Code of Ethics emphasizes: _____
a) Following only local regulations
b) Maintaining professional integrity and responsibility
c) Focusing on personal financial gain
d) Ignoring environmental impacts

36) **T**he IEEE Code of Ethics is primarily concerned with: _____
a) Fostering professional competence and integrity
b) Protecting corporate secrets
c) Maximizing technological advancements at any cost
d) Developing weapons for defense purposes

37) Global issues in engineering ethics include: _____
a) Cultural differences in engineering practices
b) Lack of understanding between technical and ethical concerns
c) Addressing both local and international engineering challenges
d) All of the above

38) A key challenge faced by multinational corporations is: _____
a) Balancing profits with social and environmental
b) Competing only within their home country responsibilities
c) Focusing solely on domestic issues
d) Ignoring corporate social responsibility

39) Empathy is the ability to: _____
a) Solve problems logically
b) Understand and share the feelings of others
c) Be indifferent to others' emotions
d) Only care about your own well-being

40) The quality of "caring" includes: _____
a) Showing concern for others' well-being
b) Ignoring the needs of others
c) Only helping family and friends
d) Seeking praise for helping others

41) The primary meaning of "ethics"?
a) Financial management
b) Principles governing the behavior of individuals
c) Rules for social interaction
d) Legal frameworks for business

42) The following is an example of a moral value?

a) Earning money b) Achieving fame
c) Helping others in need d) Increasing personal wealth

43) Integrity refers to: _____

a) Working hard at any cost
b) Being honest and having strong moral principles
c) Competing with others
d) Disregarding rules for personal gain

44) The concept of "work ethics" includes: _____

a) The right to leave work early
b) Consistently producing quality work
c) Avoiding all responsibilities
d) Expecting promotions without effort

45) The primary purpose of service learning is _____.

a) Earning money while volunteering
b) Acquiring knowledge through practical experiences
c) Participating in online courses
d) Building a professional career

46) Civic virtue is: _____

a) Attending religious services
b) Demonstrating good behavior and contributing to the welfare of society
c) Building personal wealth
d) Following family traditions

47) The following is an example of "respect for others" is _____.

a) Ignoring people's opinions
b) Listening attentively to others and valuing their viewpoints
c) Interrupting others in conversations
d) Arguing to prove your point

48) Living peacefully involves: _____

a) Suppressing all emotions
b) Treating others with kindness and understanding
c) Avoiding any conflict
d) Always agreeing with others

49) The value of "caring" means: _____

a) Always focusing on personal success
b) Showing concern and compassion for others
c) Ignoring the needs of others
d) Only helping when there is a reward

50) Honesty is best defined as: _____

a) Telling the truth regardless of the consequences
b) Saying only what others want to hear
c) Keeping secrets for friends
d) Telling lies to avoid conflict

SLR-BD-632

Seat No.		Set	S

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
MECHANICAL ENGINEERING
Professional Ethics (VEC-02)

Day & Date: Wednesday, 11-06-2025 Max. Marks: 50
Time: 10:00 AM To 11:30 AM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) Consulting engineers are hired to: _____
a) Work on projects within the company they are employed
b) Provide expert advice on technical and engineering problems
c) Manage public relations for a company
d) Conduct legal investigations

2) Engineers acting as expert witnesses typically: _____
a) Present evidence and offer testimony in legal cases
b) Focus on public relations during a case
c) Manage engineering projects for legal firms
d) Directly represent the interests of a company in court

3) Sample Code of Ethics of professional organizations typically includes: _____
a) Guidelines for acceptable behavior and decision-making
b) Rules for maximizing profits at any cost
c) Detailed technical specifications for projects
d) Guidelines for political involvement in engineering

4) ASME stands for: _____
a) American Society of Mechanical Engineers
b) American Society of Management Engineers
c) Association of Safety and Mechanical Engineers
d) Association of Scientific and Mechanical Engineers

5) The ASCE Code of Ethics emphasizes: _____
a) Following only local regulations
b) Maintaining professional integrity and responsibility
c) Focusing on personal financial gain
d) Ignoring environmental impacts

6) **T**he IEEE Code of Ethics is primarily concerned with: _____
a) Fostering professional competence and integrity
b) Protecting corporate secrets
c) Maximizing technological advancements at any cost
d) Developing weapons for defense purposes

7) Global issues in engineering ethics include: _____
a) Cultural differences in engineering practices
b) Lack of understanding between technical and ethical concerns
c) Addressing both local and international engineering challenges
d) All of the above

8) A key challenge faced by multinational corporations is: _____
a) Balancing profits with social and environmental
b) Competing only within their home country responsibilities
c) Focusing solely on domestic issues
d) Ignoring corporate social responsibility

9) Empathy is the ability to: _____
a) Solve problems logically
b) Understand and share the feelings of others
c) Be indifferent to others' emotions
d) Only care about your own well-being

10) The quality of "caring" includes: _____
a) Showing concern for others' well-being
b) Ignoring the needs of others
c) Only helping family and friends
d) Seeking praise for helping others

11) The primary meaning of "ethics"?
a) Financial management
b) Principles governing the behavior of individuals
c) Rules for social interaction
d) Legal frameworks for business

12) The following is an example of a moral value?
a) Earning money
b) Achieving fame
c) Helping others in need
d) Increasing personal wealth

13) Integrity refers to: _____
a) Working hard at any cost
b) Being honest and having strong moral principles
c) Competing with others
d) Disregarding rules for personal gain

14) The concept of "work ethics" includes: _____
a) The right to leave work early
b) Consistently producing quality work
c) Avoiding all responsibilities
d) Expecting promotions without effort

15) The primary purpose of service learning is _____.
a) Earning money while volunteering
b) Acquiring knowledge through practical experiences
c) Participating in online courses
d) Building a professional career

16) Civic virtue is: _____
a) Attending religious services
b) Demonstrating good behavior and contributing to the welfare of society
c) Building personal wealth
d) Following family traditions

17) The following is an example of "respect for others" is _____.
a) Ignoring people's opinions
b) Listening attentively to others and valuing their viewpoints
c) Interrupting others in conversations
d) Arguing to prove your point

18) Living peacefully involves: _____
a) Suppressing all emotions
b) Treating others with kindness and understanding
c) Avoiding any conflict
d) Always agreeing with others

19) The value of "caring" means: _____
a) Always focusing on personal success
b) Showing concern and compassion for others
c) Ignoring the needs of others
d) Only helping when there is a reward

20) Honesty is best defined as: _____
a) Telling the truth regardless of the consequences
b) Saying only what others want to hear
c) Keeping secrets for friends
d) Telling lies to avoid conflict

21) According to Kohlberg's theory, the highest stage of moral development is: _____

a) Obedience and punishment orientation
b) Conventional morality
c) Post-conventional morality
d) Self-interest orientation

22) Which of the following is a key characteristic of Gilligan's moral development theory?

a) Emphasis on justice and rights
b) Focus on the value of relationships and care
c) Focus on maximizing personal gain
d) Belief that all moral issues are universal and objective

23) Which of the following models of professional roles emphasizes the engineer's responsibility to society and the public welfare?

a) The Engineer as Technocrat
b) The Engineer as Contractor
c) The Engineer as Guardian
d) The Engineer as Entrepreneur

24) Which theory of moral development emphasizes the importance of care and relationships, particularly for women?

a) Kohlberg's theory
b) Aristotle's virtue ethics
c) Gilligan's theory
d) Rawls' theory of justice

25) Which model of professional role in engineering sees the engineer as a neutral expert, focused only on technical competence without concern for social values?

a) The Engineer as Guardian
b) The Engineer as Technocrat
c) The Engineer as Entrepreneur
d) The Engineer as Contractor

26) Which ethical theory suggests that individuals should act in ways that maximize their own happiness and well-being?

a) Deontological ethics
b) Utilitarianism
c) Ethical egoism
d) Virtue ethics

27) The concept of "professional ethics" in engineering involves: _____

a) The personal beliefs of engineers
b) The specific ethical standards and principles set by professional organizations
c) The opinions of senior management
d) The religious views of the engineers

28) In engineering ethics, a "conflict of interest" occurs when: _____
a) Engineers prioritize their personal interests over their professional duties
b) Engineers follow the orders of their superiors without question
c) Engineers act in ways that promote the well-being of society
d) Engineers make decisions based solely on technical expertise

29) In engineering ethics, what is the purpose of "risk assessment"?
a) To identify and mitigate potential dangers and harm to society
b) To increase profits and minimize costs
c) To ensure that engineers do not make mistakes
d) To promote the engineer's personal career advancement

30) What does "ethical responsibility" in engineering imply?
a) Only following orders from superiors
b) Making decisions that benefit only the company
c) Balancing technical, legal, and moral considerations to ensure public safety and well-being
d) Prioritizing efficiency over quality

31) Safety and risk primarily deal with: _____
a) Managing hazards and assessing potential harm
b) Legal contracts
c) Maximizing productivity
d) Reducing work hours

32) Risk-benefit analysis involves: _____
a) Estimating the cost of a project
b) Evaluating potential risks against possible benefits
c) Managing legal liabilities
d) Defining workplace responsibilities

33) The Chernobyl disaster is an example of: _____
a) A technological breakthrough
b) An ethical failure in managing risks
c) A successful safety protocol implementation
d) An engineering success

34) Which of the following is a key factor in assessing safety and risk?
a) The cost of implementation
b) The likelihood and impact of potential hazards
c) The speed of technology adoption
d) The market demand for a product

35) The Three Mile Island incident was caused by: _____
a) Technological failure
b) Natural disasters
c) Lack of training for engineers
d) Poor risk assessment and safety protocol failures

36) Collegiality in a professional setting refers to: _____
a) Loyalty to your employer
b) Cooperation and mutual respect among colleagues
c) Competing for individual success
d) Avoiding work conflicts

37) Professional loyalty involves: _____
a) Reporting colleagues' mistakes publicly
b) Protecting the interests of the team or organization
c) Ignoring safety violations to avoid
d) Disclosing confidential information for personal conflict gain

38) Employee rights include: _____
a) The right to work without discrimination
b) The right to disregard company policies
c) The right to personal opinion but not affecting work
d) The right to ignore workplace safety standards

39) Intellectual Property Rights (IPR) protect: _____
a) The financial interests of corporations
b) The ownership and use of creative ideas and inventions
c) The physical assets of a company
d) Workplace performance evaluations

40) *Risk assessment* is important because it helps in: _____
a) Evaluating the potential impact of hazards on health and safety
b) Minimizing workplace productivity
c) Defining job roles
d) Ignoring environmental issues

41) In risk management, mitigation strategies aim to: _____
a) Accept all risks in the workplace
b) Reduce or eliminate identified risks
c) Increase the likelihood of hazards
d) Focus only on maximizing profits

42) Which of the following is a potential consequence of *occupational crime*?
a) Increased workplace productivity
b) Legal consequences and loss of reputation
c) Improvement in company safety standards
d) Higher employee satisfaction

43) Risk reduction in engineering refers to: _____
a) Implementing measures to lower the chances of accidents
b) Increasing the number of hazards in the work environment
c) Ignoring potential risks
d) Cutting costs by removing safety measures

44) Public safety regulations are primarily designed to: _____
a) Ensure the safety of the company's assets
b) Protect the general public from potential harm
c) Increase revenue for the government
d) Focus only on preventing natural disasters

45) Multinational corporations (MNCs) are characterized by: _____
a) Operations in multiple countries with a centralized headquarters
b) Operating only in their home country
c) Limited influence on global markets
d) No responsibility toward environmental concerns

46) Environmental ethics primarily deals with: _____
a) Human responsibility to manage the environment and natural resources
b) Minimizing corporate profits
c) Technological advancements in engineering
d) Treating employees equally

47) Which of the following is NOT an example of environmental ethics?
a) Reducing pollution and waste
b) Maximizing resource use regardless of environmental impact
c) Preserving biodiversity
d) Sustainable development

48) Computer ethics involves: _____
a) Programming and coding without considering social consequences
b) Understanding the moral implications of computing technologies
c) Focusing only on technological innovation
d) Ignoring privacy issues

49) Weapons development ethics deals with: _____
a) The development of new technologies to enhance military capabilities
b) Restricting the use of all technological advancements
c) Focusing only on civilian safety
d) Only addressing the legal aspects of weapon development

50) Engineers as managers are expected to: _____
a) Focus solely on technical tasks
b) Lead teams, make strategic decisions, and manage projects
c) Ignore the business aspects of their work
d) Avoid taking responsibility for team outcomes

SLR-BD-633

Seat No.		Set	P

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Professional Ethics (VEC-02)

Day & Date: Wednesday, 11-06-2025 Max. Marks: 50
Time: 10:00 AM To 11:30 AM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) The primary meaning of "ethics"?
a) Financial management
b) Principles governing the behavior of individuals
c) Rules for social interaction
d) Legal frameworks for business

2) The following is an example of a moral value?
a) Earning money b) Achieving fame
c) Helping others in need d) Increasing personal wealth

3) Integrity refers to: _____
a) Working hard at any cost
b) Being honest and having strong moral principles
c) Competing with others
d) Disregarding rules for personal gain

4) The concept of "work ethics" includes: _____
a) The right to leave work early
b) Consistently producing quality work
c) Avoiding all responsibilities
d) Expecting promotions without effort

5) The primary purpose of service learning is _____.
a) Earning money while volunteering
b) Acquiring knowledge through practical experiences
c) Participating in online courses
d) Building a professional career

6) Civic virtue is: _____
a) Attending religious services
b) Demonstrating good behavior and contributing to the welfare of society
c) Building personal wealth
d) Following family traditions

7) The following is an example of "respect for others" is _____.
a) Ignoring people's opinions
b) Listening attentively to others and valuing their viewpoints
c) Interrupting others in conversations
d) Arguing to prove your point

8) Living peacefully involves: _____
a) Suppressing all emotions
b) Treating others with kindness and understanding
c) Avoiding any conflict
d) Always agreeing with others

9) The value of "caring" means: _____
a) Always focusing on personal success
b) Showing concern and compassion for others
c) Ignoring the needs of others
d) Only helping when there is a reward

10) Honesty is best defined as: _____
a) Telling the truth regardless of the consequences
b) Saying only what others want to hear
c) Keeping secrets for friends
d) Telling lies to avoid conflict

11) According to Kohlberg's theory, the highest stage of moral development is: _____
a) Obedience and punishment orientation
b) Conventional morality
c) Post-conventional morality
d) Self-interest orientation

12) Which of the following is a key characteristic of Gilligan's moral development theory?
a) Emphasis on justice and rights
b) Focus on the value of relationships and care
c) Focus on maximizing personal gain
d) Belief that all moral issues are universal and objective

13) Which of the following models of professional roles emphasizes the engineer's responsibility to society and the public welfare?

a) The Engineer as Technocrat
b) The Engineer as Contractor
c) The Engineer as Guardian
d) The Engineer as Entrepreneur

14) Which theory of moral development emphasizes the importance of care and relationships, particularly for women?

a) Kohlberg's theory
b) Aristotle's virtue ethics
c) Gilligan's theory
d) Rawls' theory of justice

15) Which model of professional role in engineering sees the engineer as a neutral expert, focused only on technical competence without concern for social values?

a) The Engineer as Guardian
b) The Engineer as Technocrat
c) The Engineer as Entrepreneur
d) The Engineer as Contractor

16) Which ethical theory suggests that individuals should act in ways that maximize their own happiness and well-being?

a) Deontological ethics
b) Utilitarianism
c) Ethical egoism
d) Virtue ethics

17) The concept of "professional ethics" in engineering involves: _____

a) The personal beliefs of engineers
b) The specific ethical standards and principles set by professional organizations
c) The opinions of senior management
d) The religious views of the engineers

18) In engineering ethics, a "conflict of interest" occurs when: _____

a) Engineers prioritize their personal interests over their professional duties
b) Engineers follow the orders of their superiors without question
c) Engineers act in ways that promote the well-being of society
d) Engineers make decisions based solely on technical expertise

19) In engineering ethics, what is the purpose of "risk assessment"?

a) To identify and mitigate potential dangers and harm to society
b) To increase profits and minimize costs
c) To ensure that engineers do not make mistakes
d) To promote the engineer's personal career advancement

20) What does "ethical responsibility" in engineering imply?
a) Only following orders from superiors
b) Making decisions that benefit only the company
c) Balancing technical, legal, and moral considerations to ensure public safety and well-being
d) Prioritizing efficiency over quality

21) Safety and risk primarily deal with: _____
a) Managing hazards and assessing potential harm
b) Legal contracts
c) Maximizing productivity
d) Reducing work hours

22) Risk-benefit analysis involves: _____
a) Estimating the cost of a project
b) Evaluating potential risks against possible benefits
c) Managing legal liabilities
d) Defining workplace responsibilities

23) The Chernobyl disaster is an example of: _____
a) A technological breakthrough
b) An ethical failure in managing risks
c) A successful safety protocol implementation
d) An engineering success

24) Which of the following is a key factor in assessing safety and risk?
a) The cost of implementation
b) The likelihood and impact of potential hazards
c) The speed of technology adoption
d) The market demand for a product

25) The Three Mile Island incident was caused by: _____
a) Technological failure
b) Natural disasters
c) Lack of training for engineers
d) Poor risk assessment and safety protocol failures

26) Collegiality in a professional setting refers to: _____
a) Loyalty to your employer
b) Cooperation and mutual respect among colleagues
c) Competing for individual success
d) Avoiding work conflicts

27) Professional loyalty involves: _____
a) Reporting colleagues' mistakes publicly
b) Protecting the interests of the team or organization
c) Ignoring safety violations to avoid
d) Disclosing confidential information for personal conflict gain

28) Employee rights include: _____
a) The right to work without discrimination
b) The right to disregard company policies
c) The right to personal opinion but not affecting work
d) The right to ignore workplace safety standards

29) Intellectual Property Rights (IPR) protect: _____
a) The financial interests of corporations
b) The ownership and use of creative ideas and inventions
c) The physical assets of a company
d) Workplace performance evaluations

30) *Risk assessment* is important because it helps in: _____
a) Evaluating the potential impact of hazards on health and safety
b) Minimizing workplace productivity
c) Defining job roles
d) Ignoring environmental issues

31) In risk management, mitigation strategies aim to: _____
a) Accept all risks in the workplace
b) Reduce or eliminate identified risks
c) Increase the likelihood of hazards
d) Focus only on maximizing profits

32) Which of the following is a potential consequence of *occupational crime*?
a) Increased workplace productivity
b) Legal consequences and loss of reputation
c) Improvement in company safety standards
d) Higher employee satisfaction

33) Risk reduction in engineering refers to: _____
a) Implementing measures to lower the chances of accidents
b) Increasing the number of hazards in the work environment
c) Ignoring potential risks
d) Cutting costs by removing safety measures

34) Public safety regulations are primarily designed to: _____
a) Ensure the safety of the company's assets
b) Protect the general public from potential harm
c) Increase revenue for the government
d) Focus only on preventing natural disasters

35) Multinational corporations (MNCs) are characterized by: _____
a) Operations in multiple countries with a centralized headquarters
b) Operating only in their home country
c) Limited influence on global markets
d) No responsibility toward environmental concerns

36) Environmental ethics primarily deals with: _____
a) Human responsibility to manage the environment and natural resources
b) Minimizing corporate profits
c) Technological advancements in engineering
d) Treating employees equally

37) Which of the following is NOT an example of environmental ethics?
a) Reducing pollution and waste
b) Maximizing resource use regardless of environmental impact
c) Preserving biodiversity
d) Sustainable development

38) Computer ethics involves: _____
a) Programming and coding without considering social consequences
b) Understanding the moral implications of computing technologies
c) Focusing only on technological innovation
d) Ignoring privacy issues

39) Weapons development ethics deals with: _____
a) The development of new technologies to enhance military capabilities
b) Restricting the use of all technological advancements
c) Focusing only on civilian safety
d) Only addressing the legal aspects of weapon development

40) Engineers as managers are expected to: _____
a) Focus solely on technical tasks
b) Lead teams, make strategic decisions, and manage projects
c) Ignore the business aspects of their work
d) Avoid taking responsibility for team outcomes

41) Consulting engineers are hired to: _____
a) Work on projects within the company they are employed
b) Provide expert advice on technical and engineering problems
c) Manage public relations for a company
d) Conduct legal investigations

42) Engineers acting as expert witnesses typically: _____
a) Present evidence and offer testimony in legal cases
b) Focus on public relations during a case
c) Manage engineering projects for legal firms
d) Directly represent the interests of a company in court

43) Sample Code of Ethics of professional organizations typically includes: _____
a) Guidelines for acceptable behavior and decision-making
b) Rules for maximizing profits at any cost
c) Detailed technical specifications for projects
d) Guidelines for political involvement in engineering

44) ASME stands for: _____
a) American Society of Mechanical Engineers
b) American Society of Management Engineers
c) Association of Safety and Mechanical Engineers
d) Association of Scientific and Mechanical Engineers

45) The ASCE Code of Ethics emphasizes: _____
a) Following only local regulations
b) Maintaining professional integrity and responsibility
c) Focusing on personal financial gain
d) Ignoring environmental impacts

46) **T**he IEEE Code of Ethics is primarily concerned with: _____
a) Fostering professional competence and integrity
b) Protecting corporate secrets
c) Maximizing technological advancements at any cost
d) Developing weapons for defense purposes

47) Global issues in engineering ethics include: _____
a) Cultural differences in engineering practices
b) Lack of understanding between technical and ethical concerns
c) Addressing both local and international engineering challenges
d) All of the above

48) A key challenge faced by multinational corporations is: _____
a) Balancing profits with social and environmental
b) Competing only within their home country responsibilities
c) Focusing solely on domestic issues
d) Ignoring corporate social responsibility

49) Empathy is the ability to: _____
a) Solve problems logically
b) Understand and share the feelings of others
c) Be indifferent to others' emotions
d) Only care about your own well-being

50) The quality of "caring" includes: _____
a) Showing concern for others' well-being
b) Ignoring the needs of others
c) Only helping family and friends
d) Seeking praise for helping others

SLR-BD-633

Seat No.		Set	Q

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Professional Ethics (VEC-02)

Day & Date: Wednesday, 11-06-2025 Max. Marks: 50
Time: 10:00 AM To 11:30 AM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) In risk management, mitigation strategies aim to: _____
a) Accept all risks in the workplace
b) Reduce or eliminate identified risks
c) Increase the likelihood of hazards
d) Focus only on maximizing profits

2) Which of the following is a potential consequence of *occupational crime*?
a) Increased workplace productivity
b) Legal consequences and loss of reputation
c) Improvement in company safety standards
d) Higher employee satisfaction

3) Risk reduction in engineering refers to: _____
a) Implementing measures to lower the chances of accidents
b) Increasing the number of hazards in the work environment
c) Ignoring potential risks
d) Cutting costs by removing safety measures

4) Public safety regulations are primarily designed to: _____
a) Ensure the safety of the company's assets
b) Protect the general public from potential harm
c) Increase revenue for the government
d) Focus only on preventing natural disasters

5) Multinational corporations (MNCs) are characterized by: _____
a) Operations in multiple countries with a centralized headquarters
b) Operating only in their home country
c) Limited influence on global markets
d) No responsibility toward environmental concerns

6) Environmental ethics primarily deals with: _____
a) Human responsibility to manage the environment and natural resources
b) Minimizing corporate profits
c) Technological advancements in engineering
d) Treating employees equally

7) Which of the following is NOT an example of environmental ethics?
a) Reducing pollution and waste
b) Maximizing resource use regardless of environmental impact
c) Preserving biodiversity
d) Sustainable development

8) Computer ethics involves: _____
a) Programming and coding without considering social consequences
b) Understanding the moral implications of computing technologies
c) Focusing only on technological innovation
d) Ignoring privacy issues

9) Weapons development ethics deals with: _____
a) The development of new technologies to enhance military capabilities
b) Restricting the use of all technological advancements
c) Focusing only on civilian safety
d) Only addressing the legal aspects of weapon development

10) Engineers as managers are expected to: _____
a) Focus solely on technical tasks
b) Lead teams, make strategic decisions, and manage projects
c) Ignore the business aspects of their work
d) Avoid taking responsibility for team outcomes

11) Consulting engineers are hired to: _____
a) Work on projects within the company they are employed
b) Provide expert advice on technical and engineering problems
c) Manage public relations for a company
d) Conduct legal investigations

12) Engineers acting as expert witnesses typically: _____
a) Present evidence and offer testimony in legal cases
b) Focus on public relations during a case
c) Manage engineering projects for legal firms
d) Directly represent the interests of a company in court

13) Sample Code of Ethics of professional organizations typically includes: _____
a) Guidelines for acceptable behavior and decision-making
b) Rules for maximizing profits at any cost
c) Detailed technical specifications for projects
d) Guidelines for political involvement in engineering

14) ASME stands for: _____
a) American Society of Mechanical Engineers
b) American Society of Management Engineers
c) Association of Safety and Mechanical Engineers
d) Association of Scientific and Mechanical Engineers

15) The ASCE Code of Ethics emphasizes: _____
a) Following only local regulations
b) Maintaining professional integrity and responsibility
c) Focusing on personal financial gain
d) Ignoring environmental impacts

16) **T**he IEEE Code of Ethics is primarily concerned with: _____
a) Fostering professional competence and integrity
b) Protecting corporate secrets
c) Maximizing technological advancements at any cost
d) Developing weapons for defense purposes

17) Global issues in engineering ethics include: _____
a) Cultural differences in engineering practices
b) Lack of understanding between technical and ethical concerns
c) Addressing both local and international engineering challenges
d) All of the above

18) A key challenge faced by multinational corporations is: _____
a) Balancing profits with social and environmental
b) Competing only within their home country responsibilities
c) Focusing solely on domestic issues
d) Ignoring corporate social responsibility

19) Empathy is the ability to: _____
a) Solve problems logically
b) Understand and share the feelings of others
c) Be indifferent to others' emotions
d) Only care about your own well-being

20) The quality of "caring" includes: _____
a) Showing concern for others' well-being
b) Ignoring the needs of others
c) Only helping family and friends
d) Seeking praise for helping others

21) The primary meaning of "ethics"?
a) Financial management
b) Principles governing the behavior of individuals
c) Rules for social interaction
d) Legal frameworks for business

22) The following is an example of a moral value?
a) Earning money
b) Achieving fame
c) Helping others in need
d) Increasing personal wealth

23) Integrity refers to: _____
a) Working hard at any cost
b) Being honest and having strong moral principles
c) Competing with others
d) Disregarding rules for personal gain

24) The concept of "work ethics" includes: _____
a) The right to leave work early
b) Consistently producing quality work
c) Avoiding all responsibilities
d) Expecting promotions without effort

25) The primary purpose of service learning is _____.
a) Earning money while volunteering
b) Acquiring knowledge through practical experiences
c) Participating in online courses
d) Building a professional career

26) Civic virtue is: _____
a) Attending religious services
b) Demonstrating good behavior and contributing to the welfare of society
c) Building personal wealth
d) Following family traditions

27) The following is an example of "respect for others" is _____.
a) Ignoring people's opinions
b) Listening attentively to others and valuing their viewpoints
c) Interrupting others in conversations
d) Arguing to prove your point

28) Living peacefully involves: _____
a) Suppressing all emotions
b) Treating others with kindness and understanding
c) Avoiding any conflict
d) Always agreeing with others

29) The value of "caring" means: _____
a) Always focusing on personal success
b) Showing concern and compassion for others
c) Ignoring the needs of others
d) Only helping when there is a reward

30) Honesty is best defined as: _____
a) Telling the truth regardless of the consequences
b) Saying only what others want to hear
c) Keeping secrets for friends
d) Telling lies to avoid conflict

31) According to Kohlberg's theory, the highest stage of moral development is: _____
a) Obedience and punishment orientation
b) Conventional morality
c) Post-conventional morality
d) Self-interest orientation

32) Which of the following is a key characteristic of Gilligan's moral development theory?
a) Emphasis on justice and rights
b) Focus on the value of relationships and care
c) Focus on maximizing personal gain
d) Belief that all moral issues are universal and objective

33) Which of the following models of professional roles emphasizes the engineer's responsibility to society and the public welfare?
a) The Engineer as Technocrat
b) The Engineer as Contractor
c) The Engineer as Guardian
d) The Engineer as Entrepreneur

34) Which theory of moral development emphasizes the importance of care and relationships, particularly for women?
a) Kohlberg's theory
b) Aristotle's virtue ethics
c) Gilligan's theory
d) Rawls' theory of justice

35) Which model of professional role in engineering sees the engineer as a neutral expert, focused only on technical competence without concern for social values?
a) The Engineer as Guardian
b) The Engineer as Technocrat
c) The Engineer as Entrepreneur
d) The Engineer as Contractor

36) Which ethical theory suggests that individuals should act in ways that maximize their own happiness and well-being?

a) Deontological ethics b) Utilitarianism
c) Ethical egoism d) Virtue ethics

37) The concept of "professional ethics" in engineering involves: _____

a) The personal beliefs of engineers
b) The specific ethical standards and principles set by professional organizations
c) The opinions of senior management
d) The religious views of the engineers

38) In engineering ethics, a "conflict of interest" occurs when: _____

a) Engineers prioritize their personal interests over their professional duties
b) Engineers follow the orders of their superiors without question
c) Engineers act in ways that promote the well-being of society
d) Engineers make decisions based solely on technical expertise

39) In engineering ethics, what is the purpose of "risk assessment"?

a) To identify and mitigate potential dangers and harm to society
b) To increase profits and minimize costs
c) To ensure that engineers do not make mistakes
d) To promote the engineer's personal career advancement

40) What does "ethical responsibility" in engineering imply?

a) Only following orders from superiors
b) Making decisions that benefit only the company
c) Balancing technical, legal, and moral considerations to ensure public safety and well-being
d) Prioritizing efficiency over quality

41) Safety and risk primarily deal with: _____

a) Managing hazards and assessing potential harm
b) Legal contracts
c) Maximizing productivity
d) Reducing work hours

42) Risk-benefit analysis involves: _____

a) Estimating the cost of a project
b) Evaluating potential risks against possible benefits
c) Managing legal liabilities
d) Defining workplace responsibilities

43) The Chernobyl disaster is an example of: _____

a) A technological breakthrough
b) An ethical failure in managing risks
c) A successful safety protocol implementation
d) An engineering success

44) Which of the following is a key factor in assessing safety and risk?
a) The cost of implementation
b) The likelihood and impact of potential hazards
c) The speed of technology adoption
d) The market demand for a product

45) The Three Mile Island incident was caused by: _____
a) Technological failure
b) Natural disasters
c) Lack of training for engineers
d) Poor risk assessment and safety protocol failures

46) Collegiality in a professional setting refers to: _____
a) Loyalty to your employer
b) Cooperation and mutual respect among colleagues
c) Competing for individual success
d) Avoiding work conflicts

47) Professional loyalty involves: _____
a) Reporting colleagues' mistakes publicly
b) Protecting the interests of the team or organization
c) Ignoring safety violations to avoid
d) Disclosing confidential information for personal conflict gain

48) Employee rights include: _____
a) The right to work without discrimination
b) The right to disregard company policies
c) The right to personal opinion but not affecting work
d) The right to ignore workplace safety standards

49) Intellectual Property Rights (IPR) protect: _____
a) The financial interests of corporations
b) The ownership and use of creative ideas and inventions
c) The physical assets of a company
d) Workplace performance evaluations

50) *Risk assessment* is important because it helps in: _____
a) Evaluating the potential impact of hazards on health and safety
b) Minimizing workplace productivity
c) Defining job roles
d) Ignoring environmental issues

SLR-BD-633

Seat No.		Set	R

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Professional Ethics (VEC-02)

Day & Date: Wednesday, 11-06-2025 Max. Marks: 50
Time: 10:00 AM To 11:30 AM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) According to Kohlberg's theory, the highest stage of moral development is: _____
a) Obedience and punishment orientation
b) Conventional morality
c) Post-conventional morality
d) Self-interest orientation

2) Which of the following is a key characteristic of Gilligan's moral development theory?
a) Emphasis on justice and rights
b) Focus on the value of relationships and care
c) Focus on maximizing personal gain
d) Belief that all moral issues are universal and objective

3) Which of the following models of professional roles emphasizes the engineer’s responsibility to society and the public welfare?
a) The Engineer as Technocrat
b) The Engineer as Contractor
c) The Engineer as Guardian
d) The Engineer as Entrepreneur

4) Which theory of moral development emphasizes the importance of care and relationships, particularly for women?
a) Kohlberg's theory b) Aristotle's virtue ethics
c) Gilligan's theory d) Rawls' theory of justice

5) Which model of professional role in engineering sees the engineer as a neutral expert, focused only on technical competence without concern for social values?

a) The Engineer as Guardian
b) The Engineer as Technocrat
c) The Engineer as Entrepreneur
d) The Engineer as Contractor

6) Which ethical theory suggests that individuals should act in ways that maximize their own happiness and well-being?

a) Deontological ethics b) Utilitarianism
c) Ethical egoism d) Virtue ethics

7) The concept of "professional ethics" in engineering involves: _____

a) The personal beliefs of engineers
b) The specific ethical standards and principles set by professional organizations
c) The opinions of senior management
d) The religious views of the engineers

8) In engineering ethics, a "conflict of interest" occurs when: _____

a) Engineers prioritize their personal interests over their professional duties
b) Engineers follow the orders of their superiors without question
c) Engineers act in ways that promote the well-being of society
d) Engineers make decisions based solely on technical expertise

9) In engineering ethics, what is the purpose of "risk assessment"?

a) To identify and mitigate potential dangers and harm to society
b) To increase profits and minimize costs
c) To ensure that engineers do not make mistakes
d) To promote the engineer's personal career advancement

10) What does "ethical responsibility" in engineering imply?

a) Only following orders from superiors
b) Making decisions that benefit only the company
c) Balancing technical, legal, and moral considerations to ensure public safety and well-being
d) Prioritizing efficiency over quality

11) Safety and risk primarily deal with: _____

a) Managing hazards and assessing potential harm
b) Legal contracts
c) Maximizing productivity
d) Reducing work hours

12) Risk-benefit analysis involves: _____
a) Estimating the cost of a project
b) Evaluating potential risks against possible benefits
c) Managing legal liabilities
d) Defining workplace responsibilities

13) The Chernobyl disaster is an example of: _____
a) A technological breakthrough
b) An ethical failure in managing risks
c) A successful safety protocol implementation
d) An engineering success

14) Which of the following is a key factor in assessing safety and risk?
a) The cost of implementation
b) The likelihood and impact of potential hazards
c) The speed of technology adoption
d) The market demand for a product

15) The Three Mile Island incident was caused by: _____
a) Technological failure
b) Natural disasters
c) Lack of training for engineers
d) Poor risk assessment and safety protocol failures

16) Collegiality in a professional setting refers to: _____
a) Loyalty to your employer
b) Cooperation and mutual respect among colleagues
c) Competing for individual success
d) Avoiding work conflicts

17) Professional loyalty involves: _____
a) Reporting colleagues' mistakes publicly
b) Protecting the interests of the team or organization
c) Ignoring safety violations to avoid
d) Disclosing confidential information for personal conflict gain

18) Employee rights include: _____
a) The right to work without discrimination
b) The right to disregard company policies
c) The right to personal opinion but not affecting work
d) The right to ignore workplace safety standards

19) Intellectual Property Rights (IPR) protect: _____
a) The financial interests of corporations
b) The ownership and use of creative ideas and inventions
c) The physical assets of a company
d) Workplace performance evaluations

20) *Risk assessment* is important because it helps in: _____
a) Evaluating the potential impact of hazards on health and safety
b) Minimizing workplace productivity
c) Defining job roles
d) Ignoring environmental issues

21) In risk management, mitigation strategies aim to: _____
a) Accept all risks in the workplace
b) Reduce or eliminate identified risks
c) Increase the likelihood of hazards
d) Focus only on maximizing profits

22) Which of the following is a potential consequence of *occupational crime*?
a) Increased workplace productivity
b) Legal consequences and loss of reputation
c) Improvement in company safety standards
d) Higher employee satisfaction

23) Risk reduction in engineering refers to: _____
a) Implementing measures to lower the chances of accidents
b) Increasing the number of hazards in the work environment
c) Ignoring potential risks
d) Cutting costs by removing safety measures

24) Public safety regulations are primarily designed to: _____
a) Ensure the safety of the company's assets
b) Protect the general public from potential harm
c) Increase revenue for the government
d) Focus only on preventing natural disasters

25) Multinational corporations (MNCs) are characterized by: _____
a) Operations in multiple countries with a centralized headquarters
b) Operating only in their home country
c) Limited influence on global markets
d) No responsibility toward environmental concerns

26) Environmental ethics primarily deals with: _____
a) Human responsibility to manage the environment and natural resources
b) Minimizing corporate profits
c) Technological advancements in engineering
d) Treating employees equally

27) Which of the following is NOT an example of environmental ethics?
a) Reducing pollution and waste
b) Maximizing resource use regardless of environmental impact
c) Preserving biodiversity
d) Sustainable development

28) Computer ethics involves: _____
a) Programming and coding without considering social consequences
b) Understanding the moral implications of computing technologies
c) Focusing only on technological innovation
d) Ignoring privacy issues

29) Weapons development ethics deals with: _____
a) The development of new technologies to enhance military capabilities
b) Restricting the use of all technological advancements
c) Focusing only on civilian safety
d) Only addressing the legal aspects of weapon development

30) Engineers as managers are expected to: _____
a) Focus solely on technical tasks
b) Lead teams, make strategic decisions, and manage projects
c) Ignore the business aspects of their work
d) Avoid taking responsibility for team outcomes

31) Consulting engineers are hired to: _____
a) Work on projects within the company they are employed
b) Provide expert advice on technical and engineering problems
c) Manage public relations for a company
d) Conduct legal investigations

32) Engineers acting as expert witnesses typically: _____
a) Present evidence and offer testimony in legal cases
b) Focus on public relations during a case
c) Manage engineering projects for legal firms
d) Directly represent the interests of a company in court

33) Sample Code of Ethics of professional organizations typically includes: _____
a) Guidelines for acceptable behavior and decision-making
b) Rules for maximizing profits at any cost
c) Detailed technical specifications for projects
d) Guidelines for political involvement in engineering

34) ASME stands for: _____
a) American Society of Mechanical Engineers
b) American Society of Management Engineers
c) Association of Safety and Mechanical Engineers
d) Association of Scientific and Mechanical Engineers

35) The ASCE Code of Ethics emphasizes: _____
a) Following only local regulations
b) Maintaining professional integrity and responsibility
c) Focusing on personal financial gain
d) Ignoring environmental impacts

36) **T**he IEEE Code of Ethics is primarily concerned with: _____
a) Fostering professional competence and integrity
b) Protecting corporate secrets
c) Maximizing technological advancements at any cost
d) Developing weapons for defense purposes

37) Global issues in engineering ethics include: _____
a) Cultural differences in engineering practices
b) Lack of understanding between technical and ethical concerns
c) Addressing both local and international engineering challenges
d) All of the above

38) A key challenge faced by multinational corporations is: _____
a) Balancing profits with social and environmental
b) Competing only within their home country responsibilities
c) Focusing solely on domestic issues
d) Ignoring corporate social responsibility

39) Empathy is the ability to: _____
a) Solve problems logically
b) Understand and share the feelings of others
c) Be indifferent to others' emotions
d) Only care about your own well-being

40) The quality of "caring" includes: _____
a) Showing concern for others' well-being
b) Ignoring the needs of others
c) Only helping family and friends
d) Seeking praise for helping others

41) The primary meaning of "ethics"?
a) Financial management
b) Principles governing the behavior of individuals
c) Rules for social interaction
d) Legal frameworks for business

42) The following is an example of a moral value?

a) Earning money b) Achieving fame
c) Helping others in need d) Increasing personal wealth

43) Integrity refers to: _____

a) Working hard at any cost
b) Being honest and having strong moral principles
c) Competing with others
d) Disregarding rules for personal gain

44) The concept of "work ethics" includes: _____

a) The right to leave work early
b) Consistently producing quality work
c) Avoiding all responsibilities
d) Expecting promotions without effort

45) The primary purpose of service learning is _____.

a) Earning money while volunteering
b) Acquiring knowledge through practical experiences
c) Participating in online courses
d) Building a professional career

46) Civic virtue is: _____

a) Attending religious services
b) Demonstrating good behavior and contributing to the welfare of society
c) Building personal wealth
d) Following family traditions

47) The following is an example of "respect for others" is _____.

a) Ignoring people's opinions
b) Listening attentively to others and valuing their viewpoints
c) Interrupting others in conversations
d) Arguing to prove your point

48) Living peacefully involves: _____

a) Suppressing all emotions
b) Treating others with kindness and understanding
c) Avoiding any conflict
d) Always agreeing with others

49) The value of "caring" means: _____

a) Always focusing on personal success
b) Showing concern and compassion for others
c) Ignoring the needs of others
d) Only helping when there is a reward

50) Honesty is best defined as: _____

a) Telling the truth regardless of the consequences
b) Saying only what others want to hear
c) Keeping secrets for friends
d) Telling lies to avoid conflict

SLR-BD-633

Seat No.		Set	S

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - II) (New) (CBCS) Examination: March/April-2025
COMPUTER SCIENCE AND ENGINEERING
Professional Ethics (VEC-02)

Day & Date: Wednesday, 11-06-2025 Max. Marks: 50
Time: 10:00 AM To 11:30 AM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) Consulting engineers are hired to: _____
a) Work on projects within the company they are employed
b) Provide expert advice on technical and engineering problems
c) Manage public relations for a company
d) Conduct legal investigations

2) Engineers acting as expert witnesses typically: _____
a) Present evidence and offer testimony in legal cases
b) Focus on public relations during a case
c) Manage engineering projects for legal firms
d) Directly represent the interests of a company in court

3) Sample Code of Ethics of professional organizations typically includes: _____
a) Guidelines for acceptable behavior and decision-making
b) Rules for maximizing profits at any cost
c) Detailed technical specifications for projects
d) Guidelines for political involvement in engineering

4) ASME stands for: _____
a) American Society of Mechanical Engineers
b) American Society of Management Engineers
c) Association of Safety and Mechanical Engineers
d) Association of Scientific and Mechanical Engineers

5) The ASCE Code of Ethics emphasizes: _____
a) Following only local regulations
b) Maintaining professional integrity and responsibility
c) Focusing on personal financial gain
d) Ignoring environmental impacts

6) **T**he IEEE Code of Ethics is primarily concerned with: _____
a) Fostering professional competence and integrity
b) Protecting corporate secrets
c) Maximizing technological advancements at any cost
d) Developing weapons for defense purposes

7) Global issues in engineering ethics include: _____
a) Cultural differences in engineering practices
b) Lack of understanding between technical and ethical concerns
c) Addressing both local and international engineering challenges
d) All of the above

8) A key challenge faced by multinational corporations is: _____
a) Balancing profits with social and environmental
b) Competing only within their home country responsibilities
c) Focusing solely on domestic issues
d) Ignoring corporate social responsibility

9) Empathy is the ability to: _____
a) Solve problems logically
b) Understand and share the feelings of others
c) Be indifferent to others' emotions
d) Only care about your own well-being

10) The quality of "caring" includes: _____
a) Showing concern for others' well-being
b) Ignoring the needs of others
c) Only helping family and friends
d) Seeking praise for helping others

11) The primary meaning of "ethics"?
a) Financial management
b) Principles governing the behavior of individuals
c) Rules for social interaction
d) Legal frameworks for business

12) The following is an example of a moral value?
a) Earning money
b) Achieving fame
c) Helping others in need
d) Increasing personal wealth

13) Integrity refers to: _____
a) Working hard at any cost
b) Being honest and having strong moral principles
c) Competing with others
d) Disregarding rules for personal gain

14) The concept of "work ethics" includes: _____
a) The right to leave work early
b) Consistently producing quality work
c) Avoiding all responsibilities
d) Expecting promotions without effort

15) The primary purpose of service learning is _____.
a) Earning money while volunteering
b) Acquiring knowledge through practical experiences
c) Participating in online courses
d) Building a professional career

16) Civic virtue is: _____
a) Attending religious services
b) Demonstrating good behavior and contributing to the welfare of society
c) Building personal wealth
d) Following family traditions

17) The following is an example of "respect for others" is _____.
a) Ignoring people's opinions
b) Listening attentively to others and valuing their viewpoints
c) Interrupting others in conversations
d) Arguing to prove your point

18) Living peacefully involves: _____
a) Suppressing all emotions
b) Treating others with kindness and understanding
c) Avoiding any conflict
d) Always agreeing with others

19) The value of "caring" means: _____
a) Always focusing on personal success
b) Showing concern and compassion for others
c) Ignoring the needs of others
d) Only helping when there is a reward

20) Honesty is best defined as: _____
a) Telling the truth regardless of the consequences
b) Saying only what others want to hear
c) Keeping secrets for friends
d) Telling lies to avoid conflict

21) According to Kohlberg's theory, the highest stage of moral development is: _____

a) Obedience and punishment orientation
b) Conventional morality
c) Post-conventional morality
d) Self-interest orientation

22) Which of the following is a key characteristic of Gilligan's moral development theory?

a) Emphasis on justice and rights
b) Focus on the value of relationships and care
c) Focus on maximizing personal gain
d) Belief that all moral issues are universal and objective

23) Which of the following models of professional roles emphasizes the engineer's responsibility to society and the public welfare?

a) The Engineer as Technocrat
b) The Engineer as Contractor
c) The Engineer as Guardian
d) The Engineer as Entrepreneur

24) Which theory of moral development emphasizes the importance of care and relationships, particularly for women?

a) Kohlberg's theory
b) Aristotle's virtue ethics
c) Gilligan's theory
d) Rawls' theory of justice

25) Which model of professional role in engineering sees the engineer as a neutral expert, focused only on technical competence without concern for social values?

a) The Engineer as Guardian
b) The Engineer as Technocrat
c) The Engineer as Entrepreneur
d) The Engineer as Contractor

26) Which ethical theory suggests that individuals should act in ways that maximize their own happiness and well-being?

a) Deontological ethics
b) Utilitarianism
c) Ethical egoism
d) Virtue ethics

27) The concept of "professional ethics" in engineering involves: _____

a) The personal beliefs of engineers
b) The specific ethical standards and principles set by professional organizations
c) The opinions of senior management
d) The religious views of the engineers

28) In engineering ethics, a "conflict of interest" occurs when: _____
a) Engineers prioritize their personal interests over their professional duties
b) Engineers follow the orders of their superiors without question
c) Engineers act in ways that promote the well-being of society
d) Engineers make decisions based solely on technical expertise

29) In engineering ethics, what is the purpose of "risk assessment"?
a) To identify and mitigate potential dangers and harm to society
b) To increase profits and minimize costs
c) To ensure that engineers do not make mistakes
d) To promote the engineer's personal career advancement

30) What does "ethical responsibility" in engineering imply?
a) Only following orders from superiors
b) Making decisions that benefit only the company
c) Balancing technical, legal, and moral considerations to ensure public safety and well-being
d) Prioritizing efficiency over quality

31) Safety and risk primarily deal with: _____
a) Managing hazards and assessing potential harm
b) Legal contracts
c) Maximizing productivity
d) Reducing work hours

32) Risk-benefit analysis involves: _____
a) Estimating the cost of a project
b) Evaluating potential risks against possible benefits
c) Managing legal liabilities
d) Defining workplace responsibilities

33) The Chernobyl disaster is an example of: _____
a) A technological breakthrough
b) An ethical failure in managing risks
c) A successful safety protocol implementation
d) An engineering success

34) Which of the following is a key factor in assessing safety and risk?
a) The cost of implementation
b) The likelihood and impact of potential hazards
c) The speed of technology adoption
d) The market demand for a product

35) The Three Mile Island incident was caused by: _____
a) Technological failure
b) Natural disasters
c) Lack of training for engineers
d) Poor risk assessment and safety protocol failures

36) Collegiality in a professional setting refers to: _____
a) Loyalty to your employer
b) Cooperation and mutual respect among colleagues
c) Competing for individual success
d) Avoiding work conflicts

37) Professional loyalty involves: _____
a) Reporting colleagues' mistakes publicly
b) Protecting the interests of the team or organization
c) Ignoring safety violations to avoid
d) Disclosing confidential information for personal conflict gain

38) Employee rights include: _____
a) The right to work without discrimination
b) The right to disregard company policies
c) The right to personal opinion but not affecting work
d) The right to ignore workplace safety standards

39) Intellectual Property Rights (IPR) protect: _____
a) The financial interests of corporations
b) The ownership and use of creative ideas and inventions
c) The physical assets of a company
d) Workplace performance evaluations

40) *Risk assessment* is important because it helps in: _____
a) Evaluating the potential impact of hazards on health and safety
b) Minimizing workplace productivity
c) Defining job roles
d) Ignoring environmental issues

41) In risk management, mitigation strategies aim to: _____
a) Accept all risks in the workplace
b) Reduce or eliminate identified risks
c) Increase the likelihood of hazards
d) Focus only on maximizing profits

42) Which of the following is a potential consequence of *occupational crime*?
a) Increased workplace productivity
b) Legal consequences and loss of reputation
c) Improvement in company safety standards
d) Higher employee satisfaction

43) Risk reduction in engineering refers to: _____
a) Implementing measures to lower the chances of accidents
b) Increasing the number of hazards in the work environment
c) Ignoring potential risks
d) Cutting costs by removing safety measures

44) Public safety regulations are primarily designed to: _____
a) Ensure the safety of the company's assets
b) Protect the general public from potential harm
c) Increase revenue for the government
d) Focus only on preventing natural disasters

45) Multinational corporations (MNCs) are characterized by: _____
a) Operations in multiple countries with a centralized headquarters
b) Operating only in their home country
c) Limited influence on global markets
d) No responsibility toward environmental concerns

46) Environmental ethics primarily deals with: _____
a) Human responsibility to manage the environment and natural resources
b) Minimizing corporate profits
c) Technological advancements in engineering
d) Treating employees equally

47) Which of the following is NOT an example of environmental ethics?
a) Reducing pollution and waste
b) Maximizing resource use regardless of environmental impact
c) Preserving biodiversity
d) Sustainable development

48) Computer ethics involves: _____
a) Programming and coding without considering social consequences
b) Understanding the moral implications of computing technologies
c) Focusing only on technological innovation
d) Ignoring privacy issues

49) Weapons development ethics deals with: _____
a) The development of new technologies to enhance military capabilities
b) Restricting the use of all technological advancements
c) Focusing only on civilian safety
d) Only addressing the legal aspects of weapon development

50) Engineers as managers are expected to: _____
a) Focus solely on technical tasks
b) Lead teams, make strategic decisions, and manage projects
c) Ignore the business aspects of their work
d) Avoid taking responsibility for team outcomes

SLR-BD-634

Seat No.		Set	P

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Professional Ethics (VEC-02)

Day & Date: Wednesday, 11-06-2025 Max. Marks: 50
Time: 10:00 AM To 11:30 AM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) The primary meaning of "ethics"?
a) Financial management
b) Principles governing the behavior of individuals
c) Rules for social interaction
d) Legal frameworks for business

2) The following is an example of a moral value?
a) Earning money b) Achieving fame
c) Helping others in need d) Increasing personal wealth

3) Integrity refers to: _____
a) Working hard at any cost
b) Being honest and having strong moral principles
c) Competing with others
d) Disregarding rules for personal gain

4) The concept of "work ethics" includes: _____
a) The right to leave work early
b) Consistently producing quality work
c) Avoiding all responsibilities
d) Expecting promotions without effort

5) The primary purpose of service learning is _____.
a) Earning money while volunteering
b) Acquiring knowledge through practical experiences
c) Participating in online courses
d) Building a professional career

6) Civic virtue is: _____
a) Attending religious services
b) Demonstrating good behavior and contributing to the welfare of society
c) Building personal wealth
d) Following family traditions

7) The following is an example of "respect for others" is _____.
a) Ignoring people's opinions
b) Listening attentively to others and valuing their viewpoints
c) Interrupting others in conversations
d) Arguing to prove your point

8) Living peacefully involves: _____
a) Suppressing all emotions
b) Treating others with kindness and understanding
c) Avoiding any conflict
d) Always agreeing with others

9) The value of "caring" means: _____
a) Always focusing on personal success
b) Showing concern and compassion for others
c) Ignoring the needs of others
d) Only helping when there is a reward

10) Honesty is best defined as: _____
a) Telling the truth regardless of the consequences
b) Saying only what others want to hear
c) Keeping secrets for friends
d) Telling lies to avoid conflict

11) According to Kohlberg's theory, the highest stage of moral development is: _____
a) Obedience and punishment orientation
b) Conventional morality
c) Post-conventional morality
d) Self-interest orientation

12) Which of the following is a key characteristic of Gilligan's moral development theory?
a) Emphasis on justice and rights
b) Focus on the value of relationships and care
c) Focus on maximizing personal gain
d) Belief that all moral issues are universal and objective

13) Which of the following models of professional roles emphasizes the engineer's responsibility to society and the public welfare?

a) The Engineer as Technocrat
b) The Engineer as Contractor
c) The Engineer as Guardian
d) The Engineer as Entrepreneur

14) Which theory of moral development emphasizes the importance of care and relationships, particularly for women?

a) Kohlberg's theory
b) Aristotle's virtue ethics
c) Gilligan's theory
d) Rawls' theory of justice

15) Which model of professional role in engineering sees the engineer as a neutral expert, focused only on technical competence without concern for social values?

a) The Engineer as Guardian
b) The Engineer as Technocrat
c) The Engineer as Entrepreneur
d) The Engineer as Contractor

16) Which ethical theory suggests that individuals should act in ways that maximize their own happiness and well-being?

a) Deontological ethics
b) Utilitarianism
c) Ethical egoism
d) Virtue ethics

17) The concept of "professional ethics" in engineering involves: _____

a) The personal beliefs of engineers
b) The specific ethical standards and principles set by professional organizations
c) The opinions of senior management
d) The religious views of the engineers

18) In engineering ethics, a "conflict of interest" occurs when: _____

a) Engineers prioritize their personal interests over their professional duties
b) Engineers follow the orders of their superiors without question
c) Engineers act in ways that promote the well-being of society
d) Engineers make decisions based solely on technical expertise

19) In engineering ethics, what is the purpose of "risk assessment"?

a) To identify and mitigate potential dangers and harm to society
b) To increase profits and minimize costs
c) To ensure that engineers do not make mistakes
d) To promote the engineer's personal career advancement

20) What does "ethical responsibility" in engineering imply?
a) Only following orders from superiors
b) Making decisions that benefit only the company
c) Balancing technical, legal, and moral considerations to ensure public safety and well-being
d) Prioritizing efficiency over quality

21) Safety and risk primarily deal with: _____
a) Managing hazards and assessing potential harm
b) Legal contracts
c) Maximizing productivity
d) Reducing work hours

22) Risk-benefit analysis involves: _____
a) Estimating the cost of a project
b) Evaluating potential risks against possible benefits
c) Managing legal liabilities
d) Defining workplace responsibilities

23) The Chernobyl disaster is an example of: _____
a) A technological breakthrough
b) An ethical failure in managing risks
c) A successful safety protocol implementation
d) An engineering success

24) Which of the following is a key factor in assessing safety and risk?
a) The cost of implementation
b) The likelihood and impact of potential hazards
c) The speed of technology adoption
d) The market demand for a product

25) The Three Mile Island incident was caused by: _____
a) Technological failure
b) Natural disasters
c) Lack of training for engineers
d) Poor risk assessment and safety protocol failures

26) Collegiality in a professional setting refers to: _____
a) Loyalty to your employer
b) Cooperation and mutual respect among colleagues
c) Competing for individual success
d) Avoiding work conflicts

27) Professional loyalty involves: _____
a) Reporting colleagues' mistakes publicly
b) Protecting the interests of the team or organization
c) Ignoring safety violations to avoid
d) Disclosing confidential information for personal conflict gain

28) Employee rights include: _____
a) The right to work without discrimination
b) The right to disregard company policies
c) The right to personal opinion but not affecting work
d) The right to ignore workplace safety standards

29) Intellectual Property Rights (IPR) protect: _____
a) The financial interests of corporations
b) The ownership and use of creative ideas and inventions
c) The physical assets of a company
d) Workplace performance evaluations

30) *Risk assessment* is important because it helps in: _____
a) Evaluating the potential impact of hazards on health and safety
b) Minimizing workplace productivity
c) Defining job roles
d) Ignoring environmental issues

31) In risk management, mitigation strategies aim to: _____
a) Accept all risks in the workplace
b) Reduce or eliminate identified risks
c) Increase the likelihood of hazards
d) Focus only on maximizing profits

32) Which of the following is a potential consequence of *occupational crime*?
a) Increased workplace productivity
b) Legal consequences and loss of reputation
c) Improvement in company safety standards
d) Higher employee satisfaction

33) Risk reduction in engineering refers to: _____
a) Implementing measures to lower the chances of accidents
b) Increasing the number of hazards in the work environment
c) Ignoring potential risks
d) Cutting costs by removing safety measures

34) Public safety regulations are primarily designed to: _____
a) Ensure the safety of the company's assets
b) Protect the general public from potential harm
c) Increase revenue for the government
d) Focus only on preventing natural disasters

35) Multinational corporations (MNCs) are characterized by: _____
a) Operations in multiple countries with a centralized headquarters
b) Operating only in their home country
c) Limited influence on global markets
d) No responsibility toward environmental concerns

36) Environmental ethics primarily deals with: _____
a) Human responsibility to manage the environment and natural resources
b) Minimizing corporate profits
c) Technological advancements in engineering
d) Treating employees equally

37) Which of the following is NOT an example of environmental ethics?
a) Reducing pollution and waste
b) Maximizing resource use regardless of environmental impact
c) Preserving biodiversity
d) Sustainable development

38) Computer ethics involves: _____
a) Programming and coding without considering social consequences
b) Understanding the moral implications of computing technologies
c) Focusing only on technological innovation
d) Ignoring privacy issues

39) Weapons development ethics deals with: _____
a) The development of new technologies to enhance military capabilities
b) Restricting the use of all technological advancements
c) Focusing only on civilian safety
d) Only addressing the legal aspects of weapon development

40) Engineers as managers are expected to: _____
a) Focus solely on technical tasks
b) Lead teams, make strategic decisions, and manage projects
c) Ignore the business aspects of their work
d) Avoid taking responsibility for team outcomes

41) Consulting engineers are hired to: _____
a) Work on projects within the company they are employed
b) Provide expert advice on technical and engineering problems
c) Manage public relations for a company
d) Conduct legal investigations

42) Engineers acting as expert witnesses typically: _____
a) Present evidence and offer testimony in legal cases
b) Focus on public relations during a case
c) Manage engineering projects for legal firms
d) Directly represent the interests of a company in court

43) Sample Code of Ethics of professional organizations typically includes: _____
a) Guidelines for acceptable behavior and decision-making
b) Rules for maximizing profits at any cost
c) Detailed technical specifications for projects
d) Guidelines for political involvement in engineering

44) ASME stands for: _____
a) American Society of Mechanical Engineers
b) American Society of Management Engineers
c) Association of Safety and Mechanical Engineers
d) Association of Scientific and Mechanical Engineers

45) The ASCE Code of Ethics emphasizes: _____
a) Following only local regulations
b) Maintaining professional integrity and responsibility
c) Focusing on personal financial gain
d) Ignoring environmental impacts

46) **T**he IEEE Code of Ethics is primarily concerned with: _____
a) Fostering professional competence and integrity
b) Protecting corporate secrets
c) Maximizing technological advancements at any cost
d) Developing weapons for defense purposes

47) Global issues in engineering ethics include: _____
a) Cultural differences in engineering practices
b) Lack of understanding between technical and ethical concerns
c) Addressing both local and international engineering challenges
d) All of the above

48) A key challenge faced by multinational corporations is: _____
a) Balancing profits with social and environmental
b) Competing only within their home country responsibilities
c) Focusing solely on domestic issues
d) Ignoring corporate social responsibility

49) Empathy is the ability to: _____
a) Solve problems logically
b) Understand and share the feelings of others
c) Be indifferent to others' emotions
d) Only care about your own well-being

50) The quality of "caring" includes: _____
a) Showing concern for others' well-being
b) Ignoring the needs of others
c) Only helping family and friends
d) Seeking praise for helping others

SLR-BD-634

Seat No.		Set	Q

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Professional Ethics (VEC-02)

Day & Date: Wednesday, 11-06-2025 Max. Marks: 50
Time: 10:00 AM To 11:30 AM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) In risk management, mitigation strategies aim to: _____
a) Accept all risks in the workplace
b) Reduce or eliminate identified risks
c) Increase the likelihood of hazards
d) Focus only on maximizing profits

2) Which of the following is a potential consequence of *occupational crime*?
a) Increased workplace productivity
b) Legal consequences and loss of reputation
c) Improvement in company safety standards
d) Higher employee satisfaction

3) Risk reduction in engineering refers to: _____
a) Implementing measures to lower the chances of accidents
b) Increasing the number of hazards in the work environment
c) Ignoring potential risks
d) Cutting costs by removing safety measures

4) Public safety regulations are primarily designed to: _____
a) Ensure the safety of the company's assets
b) Protect the general public from potential harm
c) Increase revenue for the government
d) Focus only on preventing natural disasters

5) Multinational corporations (MNCs) are characterized by: _____
a) Operations in multiple countries with a centralized headquarters
b) Operating only in their home country
c) Limited influence on global markets
d) No responsibility toward environmental concerns

6) Environmental ethics primarily deals with: _____
a) Human responsibility to manage the environment and natural resources
b) Minimizing corporate profits
c) Technological advancements in engineering
d) Treating employees equally

7) Which of the following is NOT an example of environmental ethics?
a) Reducing pollution and waste
b) Maximizing resource use regardless of environmental impact
c) Preserving biodiversity
d) Sustainable development

8) Computer ethics involves: _____
a) Programming and coding without considering social consequences
b) Understanding the moral implications of computing technologies
c) Focusing only on technological innovation
d) Ignoring privacy issues

9) Weapons development ethics deals with: _____
a) The development of new technologies to enhance military capabilities
b) Restricting the use of all technological advancements
c) Focusing only on civilian safety
d) Only addressing the legal aspects of weapon development

10) Engineers as managers are expected to: _____
a) Focus solely on technical tasks
b) Lead teams, make strategic decisions, and manage projects
c) Ignore the business aspects of their work
d) Avoid taking responsibility for team outcomes

11) Consulting engineers are hired to: _____
a) Work on projects within the company they are employed
b) Provide expert advice on technical and engineering problems
c) Manage public relations for a company
d) Conduct legal investigations

12) Engineers acting as expert witnesses typically: _____
a) Present evidence and offer testimony in legal cases
b) Focus on public relations during a case
c) Manage engineering projects for legal firms
d) Directly represent the interests of a company in court

13) Sample Code of Ethics of professional organizations typically includes: _____
a) Guidelines for acceptable behavior and decision-making
b) Rules for maximizing profits at any cost
c) Detailed technical specifications for projects
d) Guidelines for political involvement in engineering

14) ASME stands for: _____
a) American Society of Mechanical Engineers
b) American Society of Management Engineers
c) Association of Safety and Mechanical Engineers
d) Association of Scientific and Mechanical Engineers

15) The ASCE Code of Ethics emphasizes: _____
a) Following only local regulations
b) Maintaining professional integrity and responsibility
c) Focusing on personal financial gain
d) Ignoring environmental impacts

16) **T**he IEEE Code of Ethics is primarily concerned with: _____
a) Fostering professional competence and integrity
b) Protecting corporate secrets
c) Maximizing technological advancements at any cost
d) Developing weapons for defense purposes

17) Global issues in engineering ethics include: _____
a) Cultural differences in engineering practices
b) Lack of understanding between technical and ethical concerns
c) Addressing both local and international engineering challenges
d) All of the above

18) A key challenge faced by multinational corporations is: _____
a) Balancing profits with social and environmental
b) Competing only within their home country responsibilities
c) Focusing solely on domestic issues
d) Ignoring corporate social responsibility

19) Empathy is the ability to: _____
a) Solve problems logically
b) Understand and share the feelings of others
c) Be indifferent to others' emotions
d) Only care about your own well-being

20) The quality of "caring" includes: _____
a) Showing concern for others' well-being
b) Ignoring the needs of others
c) Only helping family and friends
d) Seeking praise for helping others

21) The primary meaning of "ethics"?
a) Financial management
b) Principles governing the behavior of individuals
c) Rules for social interaction
d) Legal frameworks for business

22) The following is an example of a moral value?
a) Earning money
b) Achieving fame
c) Helping others in need
d) Increasing personal wealth

23) Integrity refers to: _____
a) Working hard at any cost
b) Being honest and having strong moral principles
c) Competing with others
d) Disregarding rules for personal gain

24) The concept of "work ethics" includes: _____
a) The right to leave work early
b) Consistently producing quality work
c) Avoiding all responsibilities
d) Expecting promotions without effort

25) The primary purpose of service learning is _____.
a) Earning money while volunteering
b) Acquiring knowledge through practical experiences
c) Participating in online courses
d) Building a professional career

26) Civic virtue is: _____
a) Attending religious services
b) Demonstrating good behavior and contributing to the welfare of society
c) Building personal wealth
d) Following family traditions

27) The following is an example of "respect for others" is _____.
a) Ignoring people's opinions
b) Listening attentively to others and valuing their viewpoints
c) Interrupting others in conversations
d) Arguing to prove your point

28) Living peacefully involves: _____
a) Suppressing all emotions
b) Treating others with kindness and understanding
c) Avoiding any conflict
d) Always agreeing with others

29) The value of "caring" means: _____
a) Always focusing on personal success
b) Showing concern and compassion for others
c) Ignoring the needs of others
d) Only helping when there is a reward

30) Honesty is best defined as: _____
a) Telling the truth regardless of the consequences
b) Saying only what others want to hear
c) Keeping secrets for friends
d) Telling lies to avoid conflict

31) According to Kohlberg's theory, the highest stage of moral development is: _____
a) Obedience and punishment orientation
b) Conventional morality
c) Post-conventional morality
d) Self-interest orientation

32) Which of the following is a key characteristic of Gilligan's moral development theory?
a) Emphasis on justice and rights
b) Focus on the value of relationships and care
c) Focus on maximizing personal gain
d) Belief that all moral issues are universal and objective

33) Which of the following models of professional roles emphasizes the engineer's responsibility to society and the public welfare?
a) The Engineer as Technocrat
b) The Engineer as Contractor
c) The Engineer as Guardian
d) The Engineer as Entrepreneur

34) Which theory of moral development emphasizes the importance of care and relationships, particularly for women?
a) Kohlberg's theory
b) Aristotle's virtue ethics
c) Gilligan's theory
d) Rawls' theory of justice

35) Which model of professional role in engineering sees the engineer as a neutral expert, focused only on technical competence without concern for social values?
a) The Engineer as Guardian
b) The Engineer as Technocrat
c) The Engineer as Entrepreneur
d) The Engineer as Contractor

36) Which ethical theory suggests that individuals should act in ways that maximize their own happiness and well-being?

a) Deontological ethics b) Utilitarianism
c) Ethical egoism d) Virtue ethics

37) The concept of "professional ethics" in engineering involves: _____

a) The personal beliefs of engineers
b) The specific ethical standards and principles set by professional organizations
c) The opinions of senior management
d) The religious views of the engineers

38) In engineering ethics, a "conflict of interest" occurs when: _____

a) Engineers prioritize their personal interests over their professional duties
b) Engineers follow the orders of their superiors without question
c) Engineers act in ways that promote the well-being of society
d) Engineers make decisions based solely on technical expertise

39) In engineering ethics, what is the purpose of "risk assessment"?

a) To identify and mitigate potential dangers and harm to society
b) To increase profits and minimize costs
c) To ensure that engineers do not make mistakes
d) To promote the engineer's personal career advancement

40) What does "ethical responsibility" in engineering imply?

a) Only following orders from superiors
b) Making decisions that benefit only the company
c) Balancing technical, legal, and moral considerations to ensure public safety and well-being
d) Prioritizing efficiency over quality

41) Safety and risk primarily deal with: _____

a) Managing hazards and assessing potential harm
b) Legal contracts
c) Maximizing productivity
d) Reducing work hours

42) Risk-benefit analysis involves: _____

a) Estimating the cost of a project
b) Evaluating potential risks against possible benefits
c) Managing legal liabilities
d) Defining workplace responsibilities

43) The Chernobyl disaster is an example of: _____

a) A technological breakthrough
b) An ethical failure in managing risks
c) A successful safety protocol implementation
d) An engineering success

44) Which of the following is a key factor in assessing safety and risk?
a) The cost of implementation
b) The likelihood and impact of potential hazards
c) The speed of technology adoption
d) The market demand for a product

45) The Three Mile Island incident was caused by: _____
a) Technological failure
b) Natural disasters
c) Lack of training for engineers
d) Poor risk assessment and safety protocol failures

46) Collegiality in a professional setting refers to: _____
a) Loyalty to your employer
b) Cooperation and mutual respect among colleagues
c) Competing for individual success
d) Avoiding work conflicts

47) Professional loyalty involves: _____
a) Reporting colleagues' mistakes publicly
b) Protecting the interests of the team or organization
c) Ignoring safety violations to avoid
d) Disclosing confidential information for personal conflict gain

48) Employee rights include: _____
a) The right to work without discrimination
b) The right to disregard company policies
c) The right to personal opinion but not affecting work
d) The right to ignore workplace safety standards

49) Intellectual Property Rights (IPR) protect: _____
a) The financial interests of corporations
b) The ownership and use of creative ideas and inventions
c) The physical assets of a company
d) Workplace performance evaluations

50) *Risk assessment* is important because it helps in: _____
a) Evaluating the potential impact of hazards on health and safety
b) Minimizing workplace productivity
c) Defining job roles
d) Ignoring environmental issues

SLR-BD-634

Seat No.		Set	R

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Professional Ethics (VEC-02)

Day & Date: Wednesday, 11-06-2025 Max. Marks: 50
Time: 10:00 AM To 11:30 AM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) According to Kohlberg's theory, the highest stage of moral development is: _____
a) Obedience and punishment orientation
b) Conventional morality
c) Post-conventional morality
d) Self-interest orientation

2) Which of the following is a key characteristic of Gilligan's moral development theory?
a) Emphasis on justice and rights
b) Focus on the value of relationships and care
c) Focus on maximizing personal gain
d) Belief that all moral issues are universal and objective

3) Which of the following models of professional roles emphasizes the engineer’s responsibility to society and the public welfare?
a) The Engineer as Technocrat
b) The Engineer as Contractor
c) The Engineer as Guardian
d) The Engineer as Entrepreneur

4) Which theory of moral development emphasizes the importance of care and relationships, particularly for women?
a) Kohlberg's theory b) Aristotle's virtue ethics
c) Gilligan's theory d) Rawls' theory of justice

5) Which model of professional role in engineering sees the engineer as a neutral expert, focused only on technical competence without concern for social values?

a) The Engineer as Guardian
b) The Engineer as Technocrat
c) The Engineer as Entrepreneur
d) The Engineer as Contractor

6) Which ethical theory suggests that individuals should act in ways that maximize their own happiness and well-being?

a) Deontological ethics b) Utilitarianism
c) Ethical egoism d) Virtue ethics

7) The concept of "professional ethics" in engineering involves: _____

a) The personal beliefs of engineers
b) The specific ethical standards and principles set by professional organizations
c) The opinions of senior management
d) The religious views of the engineers

8) In engineering ethics, a "conflict of interest" occurs when: _____

a) Engineers prioritize their personal interests over their professional duties
b) Engineers follow the orders of their superiors without question
c) Engineers act in ways that promote the well-being of society
d) Engineers make decisions based solely on technical expertise

9) In engineering ethics, what is the purpose of "risk assessment"?

a) To identify and mitigate potential dangers and harm to society
b) To increase profits and minimize costs
c) To ensure that engineers do not make mistakes
d) To promote the engineer's personal career advancement

10) What does "ethical responsibility" in engineering imply?

a) Only following orders from superiors
b) Making decisions that benefit only the company
c) Balancing technical, legal, and moral considerations to ensure public safety and well-being
d) Prioritizing efficiency over quality

11) Safety and risk primarily deal with: _____

a) Managing hazards and assessing potential harm
b) Legal contracts
c) Maximizing productivity
d) Reducing work hours

12) Risk-benefit analysis involves: _____
a) Estimating the cost of a project
b) Evaluating potential risks against possible benefits
c) Managing legal liabilities
d) Defining workplace responsibilities

13) The Chernobyl disaster is an example of: _____
a) A technological breakthrough
b) An ethical failure in managing risks
c) A successful safety protocol implementation
d) An engineering success

14) Which of the following is a key factor in assessing safety and risk?
a) The cost of implementation
b) The likelihood and impact of potential hazards
c) The speed of technology adoption
d) The market demand for a product

15) The Three Mile Island incident was caused by: _____
a) Technological failure
b) Natural disasters
c) Lack of training for engineers
d) Poor risk assessment and safety protocol failures

16) Collegiality in a professional setting refers to: _____
a) Loyalty to your employer
b) Cooperation and mutual respect among colleagues
c) Competing for individual success
d) Avoiding work conflicts

17) Professional loyalty involves: _____
a) Reporting colleagues' mistakes publicly
b) Protecting the interests of the team or organization
c) Ignoring safety violations to avoid
d) Disclosing confidential information for personal conflict gain

18) Employee rights include: _____
a) The right to work without discrimination
b) The right to disregard company policies
c) The right to personal opinion but not affecting work
d) The right to ignore workplace safety standards

19) Intellectual Property Rights (IPR) protect: _____
a) The financial interests of corporations
b) The ownership and use of creative ideas and inventions
c) The physical assets of a company
d) Workplace performance evaluations

20) *Risk assessment* is important because it helps in: _____
a) Evaluating the potential impact of hazards on health and safety
b) Minimizing workplace productivity
c) Defining job roles
d) Ignoring environmental issues

21) In risk management, mitigation strategies aim to: _____
a) Accept all risks in the workplace
b) Reduce or eliminate identified risks
c) Increase the likelihood of hazards
d) Focus only on maximizing profits

22) Which of the following is a potential consequence of *occupational crime*?
a) Increased workplace productivity
b) Legal consequences and loss of reputation
c) Improvement in company safety standards
d) Higher employee satisfaction

23) Risk reduction in engineering refers to: _____
a) Implementing measures to lower the chances of accidents
b) Increasing the number of hazards in the work environment
c) Ignoring potential risks
d) Cutting costs by removing safety measures

24) Public safety regulations are primarily designed to: _____
a) Ensure the safety of the company's assets
b) Protect the general public from potential harm
c) Increase revenue for the government
d) Focus only on preventing natural disasters

25) Multinational corporations (MNCs) are characterized by: _____
a) Operations in multiple countries with a centralized headquarters
b) Operating only in their home country
c) Limited influence on global markets
d) No responsibility toward environmental concerns

26) Environmental ethics primarily deals with: _____
a) Human responsibility to manage the environment and natural resources
b) Minimizing corporate profits
c) Technological advancements in engineering
d) Treating employees equally

27) Which of the following is NOT an example of environmental ethics?
a) Reducing pollution and waste
b) Maximizing resource use regardless of environmental impact
c) Preserving biodiversity
d) Sustainable development

28) Computer ethics involves: _____
a) Programming and coding without considering social consequences
b) Understanding the moral implications of computing technologies
c) Focusing only on technological innovation
d) Ignoring privacy issues

29) Weapons development ethics deals with: _____
a) The development of new technologies to enhance military capabilities
b) Restricting the use of all technological advancements
c) Focusing only on civilian safety
d) Only addressing the legal aspects of weapon development

30) Engineers as managers are expected to: _____
a) Focus solely on technical tasks
b) Lead teams, make strategic decisions, and manage projects
c) Ignore the business aspects of their work
d) Avoid taking responsibility for team outcomes

31) Consulting engineers are hired to: _____
a) Work on projects within the company they are employed
b) Provide expert advice on technical and engineering problems
c) Manage public relations for a company
d) Conduct legal investigations

32) Engineers acting as expert witnesses typically: _____
a) Present evidence and offer testimony in legal cases
b) Focus on public relations during a case
c) Manage engineering projects for legal firms
d) Directly represent the interests of a company in court

33) Sample Code of Ethics of professional organizations typically includes: _____
a) Guidelines for acceptable behavior and decision-making
b) Rules for maximizing profits at any cost
c) Detailed technical specifications for projects
d) Guidelines for political involvement in engineering

34) ASME stands for: _____
a) American Society of Mechanical Engineers
b) American Society of Management Engineers
c) Association of Safety and Mechanical Engineers
d) Association of Scientific and Mechanical Engineers

35) The ASCE Code of Ethics emphasizes: _____
a) Following only local regulations
b) Maintaining professional integrity and responsibility
c) Focusing on personal financial gain
d) Ignoring environmental impacts

36) **T**he IEEE Code of Ethics is primarily concerned with: _____
a) Fostering professional competence and integrity
b) Protecting corporate secrets
c) Maximizing technological advancements at any cost
d) Developing weapons for defense purposes

37) Global issues in engineering ethics include: _____
a) Cultural differences in engineering practices
b) Lack of understanding between technical and ethical concerns
c) Addressing both local and international engineering challenges
d) All of the above

38) A key challenge faced by multinational corporations is: _____
a) Balancing profits with social and environmental
b) Competing only within their home country responsibilities
c) Focusing solely on domestic issues
d) Ignoring corporate social responsibility

39) Empathy is the ability to: _____
a) Solve problems logically
b) Understand and share the feelings of others
c) Be indifferent to others' emotions
d) Only care about your own well-being

40) The quality of "caring" includes: _____
a) Showing concern for others' well-being
b) Ignoring the needs of others
c) Only helping family and friends
d) Seeking praise for helping others

41) The primary meaning of "ethics"?
a) Financial management
b) Principles governing the behavior of individuals
c) Rules for social interaction
d) Legal frameworks for business

42) The following is an example of a moral value?
a) Earning money b) Achieving fame
c) Helping others in need d) Increasing personal wealth

43) Integrity refers to: _____
a) Working hard at any cost
b) Being honest and having strong moral principles
c) Competing with others
d) Disregarding rules for personal gain

44) The concept of "work ethics" includes: _____
a) The right to leave work early
b) Consistently producing quality work
c) Avoiding all responsibilities
d) Expecting promotions without effort

45) The primary purpose of service learning is _____.
a) Earning money while volunteering
b) Acquiring knowledge through practical experiences
c) Participating in online courses
d) Building a professional career

46) Civic virtue is: _____
a) Attending religious services
b) Demonstrating good behavior and contributing to the welfare of society
c) Building personal wealth
d) Following family traditions

47) The following is an example of "respect for others" is _____.
a) Ignoring people's opinions
b) Listening attentively to others and valuing their viewpoints
c) Interrupting others in conversations
d) Arguing to prove your point

48) Living peacefully involves: _____
a) Suppressing all emotions
b) Treating others with kindness and understanding
c) Avoiding any conflict
d) Always agreeing with others

49) The value of "caring" means: _____
a) Always focusing on personal success
b) Showing concern and compassion for others
c) Ignoring the needs of others
d) Only helping when there is a reward

50) Honesty is best defined as: _____

a) Telling the truth regardless of the consequences
b) Saying only what others want to hear
c) Keeping secrets for friends
d) Telling lies to avoid conflict

SLR-BD-634

Seat No.		Set	S

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRONICS & TELECOMMUNICATION ENGINEERING
Professional Ethics (VEC-02)

Day & Date: Wednesday, 11-06-2025 Max. Marks: 50
Time: 10:00 AM To 11:30 AM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) Consulting engineers are hired to: _____
a) Work on projects within the company they are employed
b) Provide expert advice on technical and engineering problems
c) Manage public relations for a company
d) Conduct legal investigations

2) Engineers acting as expert witnesses typically: _____
a) Present evidence and offer testimony in legal cases
b) Focus on public relations during a case
c) Manage engineering projects for legal firms
d) Directly represent the interests of a company in court

3) Sample Code of Ethics of professional organizations typically includes: _____
a) Guidelines for acceptable behavior and decision-making
b) Rules for maximizing profits at any cost
c) Detailed technical specifications for projects
d) Guidelines for political involvement in engineering

4) ASME stands for: _____
a) American Society of Mechanical Engineers
b) American Society of Management Engineers
c) Association of Safety and Mechanical Engineers
d) Association of Scientific and Mechanical Engineers

5) The ASCE Code of Ethics emphasizes: _____
a) Following only local regulations
b) Maintaining professional integrity and responsibility
c) Focusing on personal financial gain
d) Ignoring environmental impacts

6) **T**he IEEE Code of Ethics is primarily concerned with: _____
a) Fostering professional competence and integrity
b) Protecting corporate secrets
c) Maximizing technological advancements at any cost
d) Developing weapons for defense purposes

7) Global issues in engineering ethics include: _____
a) Cultural differences in engineering practices
b) Lack of understanding between technical and ethical concerns
c) Addressing both local and international engineering challenges
d) All of the above

8) A key challenge faced by multinational corporations is: _____
a) Balancing profits with social and environmental
b) Competing only within their home country responsibilities
c) Focusing solely on domestic issues
d) Ignoring corporate social responsibility

9) Empathy is the ability to: _____
a) Solve problems logically
b) Understand and share the feelings of others
c) Be indifferent to others' emotions
d) Only care about your own well-being

10) The quality of "caring" includes: _____
a) Showing concern for others' well-being
b) Ignoring the needs of others
c) Only helping family and friends
d) Seeking praise for helping others

11) The primary meaning of "ethics"?
a) Financial management
b) Principles governing the behavior of individuals
c) Rules for social interaction
d) Legal frameworks for business

12) The following is an example of a moral value?
a) Earning money
b) Achieving fame
c) Helping others in need
d) Increasing personal wealth

13) Integrity refers to: _____
a) Working hard at any cost
b) Being honest and having strong moral principles
c) Competing with others
d) Disregarding rules for personal gain

14) The concept of "work ethics" includes: _____
a) The right to leave work early
b) Consistently producing quality work
c) Avoiding all responsibilities
d) Expecting promotions without effort

15) The primary purpose of service learning is _____.
a) Earning money while volunteering
b) Acquiring knowledge through practical experiences
c) Participating in online courses
d) Building a professional career

16) Civic virtue is: _____
a) Attending religious services
b) Demonstrating good behavior and contributing to the welfare of society
c) Building personal wealth
d) Following family traditions

17) The following is an example of "respect for others" is _____.
a) Ignoring people's opinions
b) Listening attentively to others and valuing their viewpoints
c) Interrupting others in conversations
d) Arguing to prove your point

18) Living peacefully involves: _____
a) Suppressing all emotions
b) Treating others with kindness and understanding
c) Avoiding any conflict
d) Always agreeing with others

19) The value of "caring" means: _____
a) Always focusing on personal success
b) Showing concern and compassion for others
c) Ignoring the needs of others
d) Only helping when there is a reward

20) Honesty is best defined as: _____
a) Telling the truth regardless of the consequences
b) Saying only what others want to hear
c) Keeping secrets for friends
d) Telling lies to avoid conflict

21) According to Kohlberg's theory, the highest stage of moral development is: _____

a) Obedience and punishment orientation
b) Conventional morality
c) Post-conventional morality
d) Self-interest orientation

22) Which of the following is a key characteristic of Gilligan's moral development theory?

a) Emphasis on justice and rights
b) Focus on the value of relationships and care
c) Focus on maximizing personal gain
d) Belief that all moral issues are universal and objective

23) Which of the following models of professional roles emphasizes the engineer's responsibility to society and the public welfare?

a) The Engineer as Technocrat
b) The Engineer as Contractor
c) The Engineer as Guardian
d) The Engineer as Entrepreneur

24) Which theory of moral development emphasizes the importance of care and relationships, particularly for women?

a) Kohlberg's theory
b) Aristotle's virtue ethics
c) Gilligan's theory
d) Rawls' theory of justice

25) Which model of professional role in engineering sees the engineer as a neutral expert, focused only on technical competence without concern for social values?

a) The Engineer as Guardian
b) The Engineer as Technocrat
c) The Engineer as Entrepreneur
d) The Engineer as Contractor

26) Which ethical theory suggests that individuals should act in ways that maximize their own happiness and well-being?

a) Deontological ethics
b) Utilitarianism
c) Ethical egoism
d) Virtue ethics

27) The concept of "professional ethics" in engineering involves: _____

a) The personal beliefs of engineers
b) The specific ethical standards and principles set by professional organizations
c) The opinions of senior management
d) The religious views of the engineers

28) In engineering ethics, a "conflict of interest" occurs when: _____
a) Engineers prioritize their personal interests over their professional duties
b) Engineers follow the orders of their superiors without question
c) Engineers act in ways that promote the well-being of society
d) Engineers make decisions based solely on technical expertise

29) In engineering ethics, what is the purpose of "risk assessment"?
a) To identify and mitigate potential dangers and harm to society
b) To increase profits and minimize costs
c) To ensure that engineers do not make mistakes
d) To promote the engineer's personal career advancement

30) What does "ethical responsibility" in engineering imply?
a) Only following orders from superiors
b) Making decisions that benefit only the company
c) Balancing technical, legal, and moral considerations to ensure public safety and well-being
d) Prioritizing efficiency over quality

31) Safety and risk primarily deal with: _____
a) Managing hazards and assessing potential harm
b) Legal contracts
c) Maximizing productivity
d) Reducing work hours

32) Risk-benefit analysis involves: _____
a) Estimating the cost of a project
b) Evaluating potential risks against possible benefits
c) Managing legal liabilities
d) Defining workplace responsibilities

33) The Chernobyl disaster is an example of: _____
a) A technological breakthrough
b) An ethical failure in managing risks
c) A successful safety protocol implementation
d) An engineering success

34) Which of the following is a key factor in assessing safety and risk?
a) The cost of implementation
b) The likelihood and impact of potential hazards
c) The speed of technology adoption
d) The market demand for a product

35) The Three Mile Island incident was caused by: _____
a) Technological failure
b) Natural disasters
c) Lack of training for engineers
d) Poor risk assessment and safety protocol failures

36) Collegiality in a professional setting refers to: _____
a) Loyalty to your employer
b) Cooperation and mutual respect among colleagues
c) Competing for individual success
d) Avoiding work conflicts

37) Professional loyalty involves: _____
a) Reporting colleagues' mistakes publicly
b) Protecting the interests of the team or organization
c) Ignoring safety violations to avoid
d) Disclosing confidential information for personal conflict gain

38) Employee rights include: _____
a) The right to work without discrimination
b) The right to disregard company policies
c) The right to personal opinion but not affecting work
d) The right to ignore workplace safety standards

39) Intellectual Property Rights (IPR) protect: _____
a) The financial interests of corporations
b) The ownership and use of creative ideas and inventions
c) The physical assets of a company
d) Workplace performance evaluations

40) *Risk assessment* is important because it helps in: _____
a) Evaluating the potential impact of hazards on health and safety
b) Minimizing workplace productivity
c) Defining job roles
d) Ignoring environmental issues

41) In risk management, mitigation strategies aim to: _____
a) Accept all risks in the workplace
b) Reduce or eliminate identified risks
c) Increase the likelihood of hazards
d) Focus only on maximizing profits

42) Which of the following is a potential consequence of *occupational crime*?
a) Increased workplace productivity
b) Legal consequences and loss of reputation
c) Improvement in company safety standards
d) Higher employee satisfaction

43) Risk reduction in engineering refers to: _____
a) Implementing measures to lower the chances of accidents
b) Increasing the number of hazards in the work environment
c) Ignoring potential risks
d) Cutting costs by removing safety measures

44) Public safety regulations are primarily designed to: _____
a) Ensure the safety of the company's assets
b) Protect the general public from potential harm
c) Increase revenue for the government
d) Focus only on preventing natural disasters

45) Multinational corporations (MNCs) are characterized by: _____
a) Operations in multiple countries with a centralized headquarters
b) Operating only in their home country
c) Limited influence on global markets
d) No responsibility toward environmental concerns

46) Environmental ethics primarily deals with: _____
a) Human responsibility to manage the environment and natural resources
b) Minimizing corporate profits
c) Technological advancements in engineering
d) Treating employees equally

47) Which of the following is NOT an example of environmental ethics?
a) Reducing pollution and waste
b) Maximizing resource use regardless of environmental impact
c) Preserving biodiversity
d) Sustainable development

48) Computer ethics involves: _____
a) Programming and coding without considering social consequences
b) Understanding the moral implications of computing technologies
c) Focusing only on technological innovation
d) Ignoring privacy issues

49) Weapons development ethics deals with: _____
a) The development of new technologies to enhance military capabilities
b) Restricting the use of all technological advancements
c) Focusing only on civilian safety
d) Only addressing the legal aspects of weapon development

50) Engineers as managers are expected to: _____
a) Focus solely on technical tasks
b) Lead teams, make strategic decisions, and manage projects
c) Ignore the business aspects of their work
d) Avoid taking responsibility for team outcomes

SLR-BD-635

Seat No.		Set	P

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Professional Ethics (VEC-02)

Day & Date: Wednesday, 11-06-2025 Max. Marks: 50
Time: 10:00 AM To 11:30 AM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) The primary meaning of "ethics"?
a) Financial management
b) Principles governing the behavior of individuals
c) Rules for social interaction
d) Legal frameworks for business

2) The following is an example of a moral value?
a) Earning money b) Achieving fame
c) Helping others in need d) Increasing personal wealth

3) Integrity refers to: _____
a) Working hard at any cost
b) Being honest and having strong moral principles
c) Competing with others
d) Disregarding rules for personal gain

4) The concept of "work ethics" includes: _____
a) The right to leave work early
b) Consistently producing quality work
c) Avoiding all responsibilities
d) Expecting promotions without effort

5) The primary purpose of service learning is _____.
a) Earning money while volunteering
b) Acquiring knowledge through practical experiences
c) Participating in online courses
d) Building a professional career

6) Civic virtue is: _____
a) Attending religious services
b) Demonstrating good behavior and contributing to the welfare of society
c) Building personal wealth
d) Following family traditions

7) The following is an example of "respect for others" is _____.
a) Ignoring people's opinions
b) Listening attentively to others and valuing their viewpoints
c) Interrupting others in conversations
d) Arguing to prove your point

8) Living peacefully involves: _____
a) Suppressing all emotions
b) Treating others with kindness and understanding
c) Avoiding any conflict
d) Always agreeing with others

9) The value of "caring" means: _____
a) Always focusing on personal success
b) Showing concern and compassion for others
c) Ignoring the needs of others
d) Only helping when there is a reward

10) Honesty is best defined as: _____
a) Telling the truth regardless of the consequences
b) Saying only what others want to hear
c) Keeping secrets for friends
d) Telling lies to avoid conflict

11) According to Kohlberg's theory, the highest stage of moral development is: _____
a) Obedience and punishment orientation
b) Conventional morality
c) Post-conventional morality
d) Self-interest orientation

12) Which of the following is a key characteristic of Gilligan's moral development theory?
a) Emphasis on justice and rights
b) Focus on the value of relationships and care
c) Focus on maximizing personal gain
d) Belief that all moral issues are universal and objective

13) Which of the following models of professional roles emphasizes the engineer's responsibility to society and the public welfare?

a) The Engineer as Technocrat
b) The Engineer as Contractor
c) The Engineer as Guardian
d) The Engineer as Entrepreneur

14) Which theory of moral development emphasizes the importance of care and relationships, particularly for women?

a) Kohlberg's theory
b) Aristotle's virtue ethics
c) Gilligan's theory
d) Rawls' theory of justice

15) Which model of professional role in engineering sees the engineer as a neutral expert, focused only on technical competence without concern for social values?

a) The Engineer as Guardian
b) The Engineer as Technocrat
c) The Engineer as Entrepreneur
d) The Engineer as Contractor

16) Which ethical theory suggests that individuals should act in ways that maximize their own happiness and well-being?

a) Deontological ethics
b) Utilitarianism
c) Ethical egoism
d) Virtue ethics

17) The concept of "professional ethics" in engineering involves: _____

a) The personal beliefs of engineers
b) The specific ethical standards and principles set by professional organizations
c) The opinions of senior management
d) The religious views of the engineers

18) In engineering ethics, a "conflict of interest" occurs when: _____

a) Engineers prioritize their personal interests over their professional duties
b) Engineers follow the orders of their superiors without question
c) Engineers act in ways that promote the well-being of society
d) Engineers make decisions based solely on technical expertise

19) In engineering ethics, what is the purpose of "risk assessment"?

a) To identify and mitigate potential dangers and harm to society
b) To increase profits and minimize costs
c) To ensure that engineers do not make mistakes
d) To promote the engineer's personal career advancement

20) What does "ethical responsibility" in engineering imply?
a) Only following orders from superiors
b) Making decisions that benefit only the company
c) Balancing technical, legal, and moral considerations to ensure public safety and well-being
d) Prioritizing efficiency over quality

21) Safety and risk primarily deal with: _____
a) Managing hazards and assessing potential harm
b) Legal contracts
c) Maximizing productivity
d) Reducing work hours

22) Risk-benefit analysis involves: _____
a) Estimating the cost of a project
b) Evaluating potential risks against possible benefits
c) Managing legal liabilities
d) Defining workplace responsibilities

23) The Chernobyl disaster is an example of: _____
a) A technological breakthrough
b) An ethical failure in managing risks
c) A successful safety protocol implementation
d) An engineering success

24) Which of the following is a key factor in assessing safety and risk?
a) The cost of implementation
b) The likelihood and impact of potential hazards
c) The speed of technology adoption
d) The market demand for a product

25) The Three Mile Island incident was caused by: _____
a) Technological failure
b) Natural disasters
c) Lack of training for engineers
d) Poor risk assessment and safety protocol failures

26) Collegiality in a professional setting refers to: _____
a) Loyalty to your employer
b) Cooperation and mutual respect among colleagues
c) Competing for individual success
d) Avoiding work conflicts

27) Professional loyalty involves: _____
a) Reporting colleagues' mistakes publicly
b) Protecting the interests of the team or organization
c) Ignoring safety violations to avoid
d) Disclosing confidential information for personal conflict gain

28) Employee rights include: _____
a) The right to work without discrimination
b) The right to disregard company policies
c) The right to personal opinion but not affecting work
d) The right to ignore workplace safety standards

29) Intellectual Property Rights (IPR) protect: _____
a) The financial interests of corporations
b) The ownership and use of creative ideas and inventions
c) The physical assets of a company
d) Workplace performance evaluations

30) *Risk assessment* is important because it helps in: _____
a) Evaluating the potential impact of hazards on health and safety
b) Minimizing workplace productivity
c) Defining job roles
d) Ignoring environmental issues

31) In risk management, mitigation strategies aim to: _____
a) Accept all risks in the workplace
b) Reduce or eliminate identified risks
c) Increase the likelihood of hazards
d) Focus only on maximizing profits

32) Which of the following is a potential consequence of *occupational crime*?
a) Increased workplace productivity
b) Legal consequences and loss of reputation
c) Improvement in company safety standards
d) Higher employee satisfaction

33) Risk reduction in engineering refers to: _____
a) Implementing measures to lower the chances of accidents
b) Increasing the number of hazards in the work environment
c) Ignoring potential risks
d) Cutting costs by removing safety measures

34) Public safety regulations are primarily designed to: _____
a) Ensure the safety of the company's assets
b) Protect the general public from potential harm
c) Increase revenue for the government
d) Focus only on preventing natural disasters

35) Multinational corporations (MNCs) are characterized by: _____
a) Operations in multiple countries with a centralized headquarters
b) Operating only in their home country
c) Limited influence on global markets
d) No responsibility toward environmental concerns

36) Environmental ethics primarily deals with: _____
a) Human responsibility to manage the environment and natural resources
b) Minimizing corporate profits
c) Technological advancements in engineering
d) Treating employees equally

37) Which of the following is NOT an example of environmental ethics?
a) Reducing pollution and waste
b) Maximizing resource use regardless of environmental impact
c) Preserving biodiversity
d) Sustainable development

38) Computer ethics involves: _____
a) Programming and coding without considering social consequences
b) Understanding the moral implications of computing technologies
c) Focusing only on technological innovation
d) Ignoring privacy issues

39) Weapons development ethics deals with: _____
a) The development of new technologies to enhance military capabilities
b) Restricting the use of all technological advancements
c) Focusing only on civilian safety
d) Only addressing the legal aspects of weapon development

40) Engineers as managers are expected to: _____
a) Focus solely on technical tasks
b) Lead teams, make strategic decisions, and manage projects
c) Ignore the business aspects of their work
d) Avoid taking responsibility for team outcomes

41) Consulting engineers are hired to: _____
a) Work on projects within the company they are employed
b) Provide expert advice on technical and engineering problems
c) Manage public relations for a company
d) Conduct legal investigations

42) Engineers acting as expert witnesses typically: _____
a) Present evidence and offer testimony in legal cases
b) Focus on public relations during a case
c) Manage engineering projects for legal firms
d) Directly represent the interests of a company in court

43) Sample Code of Ethics of professional organizations typically includes: _____
a) Guidelines for acceptable behavior and decision-making
b) Rules for maximizing profits at any cost
c) Detailed technical specifications for projects
d) Guidelines for political involvement in engineering

44) ASME stands for: _____
a) American Society of Mechanical Engineers
b) American Society of Management Engineers
c) Association of Safety and Mechanical Engineers
d) Association of Scientific and Mechanical Engineers

45) The ASCE Code of Ethics emphasizes: _____
a) Following only local regulations
b) Maintaining professional integrity and responsibility
c) Focusing on personal financial gain
d) Ignoring environmental impacts

46) **T**he IEEE Code of Ethics is primarily concerned with: _____
a) Fostering professional competence and integrity
b) Protecting corporate secrets
c) Maximizing technological advancements at any cost
d) Developing weapons for defense purposes

47) Global issues in engineering ethics include: _____
a) Cultural differences in engineering practices
b) Lack of understanding between technical and ethical concerns
c) Addressing both local and international engineering challenges
d) All of the above

48) A key challenge faced by multinational corporations is: _____
a) Balancing profits with social and environmental
b) Competing only within their home country responsibilities
c) Focusing solely on domestic issues
d) Ignoring corporate social responsibility

49) Empathy is the ability to: _____
a) Solve problems logically
b) Understand and share the feelings of others
c) Be indifferent to others' emotions
d) Only care about your own well-being

50) The quality of "caring" includes: _____
a) Showing concern for others' well-being
b) Ignoring the needs of others
c) Only helping family and friends
d) Seeking praise for helping others

SLR-BD-635

Seat No.		Set	Q

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Professional Ethics (VEC-02)

Day & Date: Wednesday, 11-06-2025 Max. Marks: 50
Time: 10:00 AM To 11:30 AM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) In risk management, mitigation strategies aim to: _____
a) Accept all risks in the workplace
b) Reduce or eliminate identified risks
c) Increase the likelihood of hazards
d) Focus only on maximizing profits

2) Which of the following is a potential consequence of *occupational crime*?
a) Increased workplace productivity
b) Legal consequences and loss of reputation
c) Improvement in company safety standards
d) Higher employee satisfaction

3) Risk reduction in engineering refers to: _____
a) Implementing measures to lower the chances of accidents
b) Increasing the number of hazards in the work environment
c) Ignoring potential risks
d) Cutting costs by removing safety measures

4) Public safety regulations are primarily designed to: _____
a) Ensure the safety of the company's assets
b) Protect the general public from potential harm
c) Increase revenue for the government
d) Focus only on preventing natural disasters

5) Multinational corporations (MNCs) are characterized by: _____
a) Operations in multiple countries with a centralized headquarters
b) Operating only in their home country
c) Limited influence on global markets
d) No responsibility toward environmental concerns

6) Environmental ethics primarily deals with: _____
a) Human responsibility to manage the environment and natural resources
b) Minimizing corporate profits
c) Technological advancements in engineering
d) Treating employees equally

7) Which of the following is NOT an example of environmental ethics?
a) Reducing pollution and waste
b) Maximizing resource use regardless of environmental impact
c) Preserving biodiversity
d) Sustainable development

8) Computer ethics involves: _____
a) Programming and coding without considering social consequences
b) Understanding the moral implications of computing technologies
c) Focusing only on technological innovation
d) Ignoring privacy issues

9) Weapons development ethics deals with: _____
a) The development of new technologies to enhance military capabilities
b) Restricting the use of all technological advancements
c) Focusing only on civilian safety
d) Only addressing the legal aspects of weapon development

10) Engineers as managers are expected to: _____
a) Focus solely on technical tasks
b) Lead teams, make strategic decisions, and manage projects
c) Ignore the business aspects of their work
d) Avoid taking responsibility for team outcomes

11) Consulting engineers are hired to: _____
a) Work on projects within the company they are employed
b) Provide expert advice on technical and engineering problems
c) Manage public relations for a company
d) Conduct legal investigations

12) Engineers acting as expert witnesses typically: _____
a) Present evidence and offer testimony in legal cases
b) Focus on public relations during a case
c) Manage engineering projects for legal firms
d) Directly represent the interests of a company in court

13) Sample Code of Ethics of professional organizations typically includes: _____
a) Guidelines for acceptable behavior and decision-making
b) Rules for maximizing profits at any cost
c) Detailed technical specifications for projects
d) Guidelines for political involvement in engineering

14) ASME stands for: _____
a) American Society of Mechanical Engineers
b) American Society of Management Engineers
c) Association of Safety and Mechanical Engineers
d) Association of Scientific and Mechanical Engineers

15) The ASCE Code of Ethics emphasizes: _____
a) Following only local regulations
b) Maintaining professional integrity and responsibility
c) Focusing on personal financial gain
d) Ignoring environmental impacts

16) **T**he IEEE Code of Ethics is primarily concerned with: _____
a) Fostering professional competence and integrity
b) Protecting corporate secrets
c) Maximizing technological advancements at any cost
d) Developing weapons for defense purposes

17) Global issues in engineering ethics include: _____
a) Cultural differences in engineering practices
b) Lack of understanding between technical and ethical concerns
c) Addressing both local and international engineering challenges
d) All of the above

18) A key challenge faced by multinational corporations is: _____
a) Balancing profits with social and environmental
b) Competing only within their home country responsibilities
c) Focusing solely on domestic issues
d) Ignoring corporate social responsibility

19) Empathy is the ability to: _____
a) Solve problems logically
b) Understand and share the feelings of others
c) Be indifferent to others' emotions
d) Only care about your own well-being

20) The quality of "caring" includes: _____
a) Showing concern for others' well-being
b) Ignoring the needs of others
c) Only helping family and friends
d) Seeking praise for helping others

21) The primary meaning of "ethics"?
a) Financial management
b) Principles governing the behavior of individuals
c) Rules for social interaction
d) Legal frameworks for business

22) The following is an example of a moral value?
a) Earning money
b) Achieving fame
c) Helping others in need
d) Increasing personal wealth

23) Integrity refers to: _____
a) Working hard at any cost
b) Being honest and having strong moral principles
c) Competing with others
d) Disregarding rules for personal gain

24) The concept of "work ethics" includes: _____
a) The right to leave work early
b) Consistently producing quality work
c) Avoiding all responsibilities
d) Expecting promotions without effort

25) The primary purpose of service learning is _____.
a) Earning money while volunteering
b) Acquiring knowledge through practical experiences
c) Participating in online courses
d) Building a professional career

26) Civic virtue is: _____
a) Attending religious services
b) Demonstrating good behavior and contributing to the welfare of society
c) Building personal wealth
d) Following family traditions

27) The following is an example of "respect for others" is _____.
a) Ignoring people's opinions
b) Listening attentively to others and valuing their viewpoints
c) Interrupting others in conversations
d) Arguing to prove your point

28) Living peacefully involves: _____
a) Suppressing all emotions
b) Treating others with kindness and understanding
c) Avoiding any conflict
d) Always agreeing with others

29) The value of "caring" means: _____
a) Always focusing on personal success
b) Showing concern and compassion for others
c) Ignoring the needs of others
d) Only helping when there is a reward

30) Honesty is best defined as: _____
a) Telling the truth regardless of the consequences
b) Saying only what others want to hear
c) Keeping secrets for friends
d) Telling lies to avoid conflict

31) According to Kohlberg's theory, the highest stage of moral development is: _____
a) Obedience and punishment orientation
b) Conventional morality
c) Post-conventional morality
d) Self-interest orientation

32) Which of the following is a key characteristic of Gilligan's moral development theory?
a) Emphasis on justice and rights
b) Focus on the value of relationships and care
c) Focus on maximizing personal gain
d) Belief that all moral issues are universal and objective

33) Which of the following models of professional roles emphasizes the engineer's responsibility to society and the public welfare?
a) The Engineer as Technocrat
b) The Engineer as Contractor
c) The Engineer as Guardian
d) The Engineer as Entrepreneur

34) Which theory of moral development emphasizes the importance of care and relationships, particularly for women?
a) Kohlberg's theory
b) Aristotle's virtue ethics
c) Gilligan's theory
d) Rawls' theory of justice

35) Which model of professional role in engineering sees the engineer as a neutral expert, focused only on technical competence without concern for social values?
a) The Engineer as Guardian
b) The Engineer as Technocrat
c) The Engineer as Entrepreneur
d) The Engineer as Contractor

36) Which ethical theory suggests that individuals should act in ways that maximize their own happiness and well-being?

a) Deontological ethics b) Utilitarianism
c) Ethical egoism d) Virtue ethics

37) The concept of "professional ethics" in engineering involves: _____

a) The personal beliefs of engineers
b) The specific ethical standards and principles set by professional organizations
c) The opinions of senior management
d) The religious views of the engineers

38) In engineering ethics, a "conflict of interest" occurs when: _____

a) Engineers prioritize their personal interests over their professional duties
b) Engineers follow the orders of their superiors without question
c) Engineers act in ways that promote the well-being of society
d) Engineers make decisions based solely on technical expertise

39) In engineering ethics, what is the purpose of "risk assessment"?

a) To identify and mitigate potential dangers and harm to society
b) To increase profits and minimize costs
c) To ensure that engineers do not make mistakes
d) To promote the engineer's personal career advancement

40) What does "ethical responsibility" in engineering imply?

a) Only following orders from superiors
b) Making decisions that benefit only the company
c) Balancing technical, legal, and moral considerations to ensure public safety and well-being
d) Prioritizing efficiency over quality

41) Safety and risk primarily deal with: _____

a) Managing hazards and assessing potential harm
b) Legal contracts
c) Maximizing productivity
d) Reducing work hours

42) Risk-benefit analysis involves: _____

a) Estimating the cost of a project
b) Evaluating potential risks against possible benefits
c) Managing legal liabilities
d) Defining workplace responsibilities

43) The Chernobyl disaster is an example of: _____

a) A technological breakthrough
b) An ethical failure in managing risks
c) A successful safety protocol implementation
d) An engineering success

44) Which of the following is a key factor in assessing safety and risk?
a) The cost of implementation
b) The likelihood and impact of potential hazards
c) The speed of technology adoption
d) The market demand for a product

45) The Three Mile Island incident was caused by: _____
a) Technological failure
b) Natural disasters
c) Lack of training for engineers
d) Poor risk assessment and safety protocol failures

46) Collegiality in a professional setting refers to: _____
a) Loyalty to your employer
b) Cooperation and mutual respect among colleagues
c) Competing for individual success
d) Avoiding work conflicts

47) Professional loyalty involves: _____
a) Reporting colleagues' mistakes publicly
b) Protecting the interests of the team or organization
c) Ignoring safety violations to avoid
d) Disclosing confidential information for personal conflict gain

48) Employee rights include: _____
a) The right to work without discrimination
b) The right to disregard company policies
c) The right to personal opinion but not affecting work
d) The right to ignore workplace safety standards

49) Intellectual Property Rights (IPR) protect: _____
a) The financial interests of corporations
b) The ownership and use of creative ideas and inventions
c) The physical assets of a company
d) Workplace performance evaluations

50) *Risk assessment* is important because it helps in: _____
a) Evaluating the potential impact of hazards on health and safety
b) Minimizing workplace productivity
c) Defining job roles
d) Ignoring environmental issues

SLR-BD-635

Seat No.		Set	R

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Professional Ethics (VEC-02)

Day & Date: Wednesday, 11-06-2025 Max. Marks: 50
Time: 10:00 AM To 11:30 AM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) According to Kohlberg's theory, the highest stage of moral development is: _____
a) Obedience and punishment orientation
b) Conventional morality
c) Post-conventional morality
d) Self-interest orientation

2) Which of the following is a key characteristic of Gilligan's moral development theory?
a) Emphasis on justice and rights
b) Focus on the value of relationships and care
c) Focus on maximizing personal gain
d) Belief that all moral issues are universal and objective

3) Which of the following models of professional roles emphasizes the engineer’s responsibility to society and the public welfare?
a) The Engineer as Technocrat
b) The Engineer as Contractor
c) The Engineer as Guardian
d) The Engineer as Entrepreneur

4) Which theory of moral development emphasizes the importance of care and relationships, particularly for women?
a) Kohlberg's theory b) Aristotle's virtue ethics
c) Gilligan's theory d) Rawls' theory of justice

5) Which model of professional role in engineering sees the engineer as a neutral expert, focused only on technical competence without concern for social values?

a) The Engineer as Guardian
b) The Engineer as Technocrat
c) The Engineer as Entrepreneur
d) The Engineer as Contractor

6) Which ethical theory suggests that individuals should act in ways that maximize their own happiness and well-being?

a) Deontological ethics b) Utilitarianism
c) Ethical egoism d) Virtue ethics

7) The concept of "professional ethics" in engineering involves: _____

a) The personal beliefs of engineers
b) The specific ethical standards and principles set by professional organizations
c) The opinions of senior management
d) The religious views of the engineers

8) In engineering ethics, a "conflict of interest" occurs when: _____

a) Engineers prioritize their personal interests over their professional duties
b) Engineers follow the orders of their superiors without question
c) Engineers act in ways that promote the well-being of society
d) Engineers make decisions based solely on technical expertise

9) In engineering ethics, what is the purpose of "risk assessment"?

a) To identify and mitigate potential dangers and harm to society
b) To increase profits and minimize costs
c) To ensure that engineers do not make mistakes
d) To promote the engineer's personal career advancement

10) What does "ethical responsibility" in engineering imply?

a) Only following orders from superiors
b) Making decisions that benefit only the company
c) Balancing technical, legal, and moral considerations to ensure public safety and well-being
d) Prioritizing efficiency over quality

11) Safety and risk primarily deal with: _____

a) Managing hazards and assessing potential harm
b) Legal contracts
c) Maximizing productivity
d) Reducing work hours

12) Risk-benefit analysis involves: _____
a) Estimating the cost of a project
b) Evaluating potential risks against possible benefits
c) Managing legal liabilities
d) Defining workplace responsibilities

13) The Chernobyl disaster is an example of: _____
a) A technological breakthrough
b) An ethical failure in managing risks
c) A successful safety protocol implementation
d) An engineering success

14) Which of the following is a key factor in assessing safety and risk?
a) The cost of implementation
b) The likelihood and impact of potential hazards
c) The speed of technology adoption
d) The market demand for a product

15) The Three Mile Island incident was caused by: _____
a) Technological failure
b) Natural disasters
c) Lack of training for engineers
d) Poor risk assessment and safety protocol failures

16) Collegiality in a professional setting refers to: _____
a) Loyalty to your employer
b) Cooperation and mutual respect among colleagues
c) Competing for individual success
d) Avoiding work conflicts

17) Professional loyalty involves: _____
a) Reporting colleagues' mistakes publicly
b) Protecting the interests of the team or organization
c) Ignoring safety violations to avoid
d) Disclosing confidential information for personal conflict gain

18) Employee rights include: _____
a) The right to work without discrimination
b) The right to disregard company policies
c) The right to personal opinion but not affecting work
d) The right to ignore workplace safety standards

19) Intellectual Property Rights (IPR) protect: _____
a) The financial interests of corporations
b) The ownership and use of creative ideas and inventions
c) The physical assets of a company
d) Workplace performance evaluations

20) *Risk assessment* is important because it helps in: _____
a) Evaluating the potential impact of hazards on health and safety
b) Minimizing workplace productivity
c) Defining job roles
d) Ignoring environmental issues

21) In risk management, mitigation strategies aim to: _____
a) Accept all risks in the workplace
b) Reduce or eliminate identified risks
c) Increase the likelihood of hazards
d) Focus only on maximizing profits

22) Which of the following is a potential consequence of *occupational crime*?
a) Increased workplace productivity
b) Legal consequences and loss of reputation
c) Improvement in company safety standards
d) Higher employee satisfaction

23) Risk reduction in engineering refers to: _____
a) Implementing measures to lower the chances of accidents
b) Increasing the number of hazards in the work environment
c) Ignoring potential risks
d) Cutting costs by removing safety measures

24) Public safety regulations are primarily designed to: _____
a) Ensure the safety of the company's assets
b) Protect the general public from potential harm
c) Increase revenue for the government
d) Focus only on preventing natural disasters

25) Multinational corporations (MNCs) are characterized by: _____
a) Operations in multiple countries with a centralized headquarters
b) Operating only in their home country
c) Limited influence on global markets
d) No responsibility toward environmental concerns

26) Environmental ethics primarily deals with: _____
a) Human responsibility to manage the environment and natural resources
b) Minimizing corporate profits
c) Technological advancements in engineering
d) Treating employees equally

27) Which of the following is NOT an example of environmental ethics?
a) Reducing pollution and waste
b) Maximizing resource use regardless of environmental impact
c) Preserving biodiversity
d) Sustainable development

28) Computer ethics involves: _____
a) Programming and coding without considering social consequences
b) Understanding the moral implications of computing technologies
c) Focusing only on technological innovation
d) Ignoring privacy issues

29) Weapons development ethics deals with: _____
a) The development of new technologies to enhance military capabilities
b) Restricting the use of all technological advancements
c) Focusing only on civilian safety
d) Only addressing the legal aspects of weapon development

30) Engineers as managers are expected to: _____
a) Focus solely on technical tasks
b) Lead teams, make strategic decisions, and manage projects
c) Ignore the business aspects of their work
d) Avoid taking responsibility for team outcomes

31) Consulting engineers are hired to: _____
a) Work on projects within the company they are employed
b) Provide expert advice on technical and engineering problems
c) Manage public relations for a company
d) Conduct legal investigations

32) Engineers acting as expert witnesses typically: _____
a) Present evidence and offer testimony in legal cases
b) Focus on public relations during a case
c) Manage engineering projects for legal firms
d) Directly represent the interests of a company in court

33) Sample Code of Ethics of professional organizations typically includes: _____
a) Guidelines for acceptable behavior and decision-making
b) Rules for maximizing profits at any cost
c) Detailed technical specifications for projects
d) Guidelines for political involvement in engineering

34) ASME stands for: _____
a) American Society of Mechanical Engineers
b) American Society of Management Engineers
c) Association of Safety and Mechanical Engineers
d) Association of Scientific and Mechanical Engineers

35) The ASCE Code of Ethics emphasizes: _____
a) Following only local regulations
b) Maintaining professional integrity and responsibility
c) Focusing on personal financial gain
d) Ignoring environmental impacts

36) **T**he IEEE Code of Ethics is primarily concerned with: _____
a) Fostering professional competence and integrity
b) Protecting corporate secrets
c) Maximizing technological advancements at any cost
d) Developing weapons for defense purposes

37) Global issues in engineering ethics include: _____
a) Cultural differences in engineering practices
b) Lack of understanding between technical and ethical concerns
c) Addressing both local and international engineering challenges
d) All of the above

38) A key challenge faced by multinational corporations is: _____
a) Balancing profits with social and environmental
b) Competing only within their home country responsibilities
c) Focusing solely on domestic issues
d) Ignoring corporate social responsibility

39) Empathy is the ability to: _____
a) Solve problems logically
b) Understand and share the feelings of others
c) Be indifferent to others' emotions
d) Only care about your own well-being

40) The quality of "caring" includes: _____
a) Showing concern for others' well-being
b) Ignoring the needs of others
c) Only helping family and friends
d) Seeking praise for helping others

41) The primary meaning of "ethics"?
a) Financial management
b) Principles governing the behavior of individuals
c) Rules for social interaction
d) Legal frameworks for business

42) The following is an example of a moral value?
a) Earning money
b) Achieving fame
c) Helping others in need
d) Increasing personal wealth

43) Integrity refers to: _____
a) Working hard at any cost
b) Being honest and having strong moral principles
c) Competing with others
d) Disregarding rules for personal gain

44) The concept of "work ethics" includes: _____
a) The right to leave work early
b) Consistently producing quality work
c) Avoiding all responsibilities
d) Expecting promotions without effort

45) The primary purpose of service learning is _____.
a) Earning money while volunteering
b) Acquiring knowledge through practical experiences
c) Participating in online courses
d) Building a professional career

46) Civic virtue is: _____
a) Attending religious services
b) Demonstrating good behavior and contributing to the welfare of society
c) Building personal wealth
d) Following family traditions

47) The following is an example of "respect for others" is _____.
a) Ignoring people's opinions
b) Listening attentively to others and valuing their viewpoints
c) Interrupting others in conversations
d) Arguing to prove your point

48) Living peacefully involves: _____
a) Suppressing all emotions
b) Treating others with kindness and understanding
c) Avoiding any conflict
d) Always agreeing with others

49) The value of "caring" means: _____
a) Always focusing on personal success
b) Showing concern and compassion for others
c) Ignoring the needs of others
d) Only helping when there is a reward

50) Honesty is best defined as: _____

a) Telling the truth regardless of the consequences
b) Saying only what others want to hear
c) Keeping secrets for friends
d) Telling lies to avoid conflict

SLR-BD-635

Seat No.		Set	S

Marks Obtained		Signature of Examiner		Signature of Junior Supervisor	

S. Y. (B.Tech.) (Sem - II) (New)(NEP CBCS) Examination: March/April-2025
ELECTRICAL ENGINEERING
Professional Ethics (VEC-02)

Day & Date: Wednesday, 11-06-2025 Max. Marks: 50
Time: 10:00 AM To 11:30 AM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Mention Question Paper Set (P/Q/R/S) on Top of Page.

Answer

Q.1 Choose the correct alternatives from the options.

1) Consulting engineers are hired to: _____
a) Work on projects within the company they are employed
b) Provide expert advice on technical and engineering problems
c) Manage public relations for a company
d) Conduct legal investigations

2) Engineers acting as expert witnesses typically: _____
a) Present evidence and offer testimony in legal cases
b) Focus on public relations during a case
c) Manage engineering projects for legal firms
d) Directly represent the interests of a company in court

3) Sample Code of Ethics of professional organizations typically includes: _____
a) Guidelines for acceptable behavior and decision-making
b) Rules for maximizing profits at any cost
c) Detailed technical specifications for projects
d) Guidelines for political involvement in engineering

4) ASME stands for: _____
a) American Society of Mechanical Engineers
b) American Society of Management Engineers
c) Association of Safety and Mechanical Engineers
d) Association of Scientific and Mechanical Engineers

5) The ASCE Code of Ethics emphasizes: _____
a) Following only local regulations
b) Maintaining professional integrity and responsibility
c) Focusing on personal financial gain
d) Ignoring environmental impacts

6) **T**he IEEE Code of Ethics is primarily concerned with: _____
a) Fostering professional competence and integrity
b) Protecting corporate secrets
c) Maximizing technological advancements at any cost
d) Developing weapons for defense purposes

7) Global issues in engineering ethics include: _____
a) Cultural differences in engineering practices
b) Lack of understanding between technical and ethical concerns
c) Addressing both local and international engineering challenges
d) All of the above

8) A key challenge faced by multinational corporations is: _____
a) Balancing profits with social and environmental
b) Competing only within their home country responsibilities
c) Focusing solely on domestic issues
d) Ignoring corporate social responsibility

9) Empathy is the ability to: _____
a) Solve problems logically
b) Understand and share the feelings of others
c) Be indifferent to others' emotions
d) Only care about your own well-being

10) The quality of "caring" includes: _____
a) Showing concern for others' well-being
b) Ignoring the needs of others
c) Only helping family and friends
d) Seeking praise for helping others

11) The primary meaning of "ethics"?
a) Financial management
b) Principles governing the behavior of individuals
c) Rules for social interaction
d) Legal frameworks for business

12) The following is an example of a moral value?
a) Earning money
b) Achieving fame
c) Helping others in need
d) Increasing personal wealth

13) Integrity refers to: _____
a) Working hard at any cost
b) Being honest and having strong moral principles
c) Competing with others
d) Disregarding rules for personal gain

14) The concept of "work ethics" includes: _____
a) The right to leave work early
b) Consistently producing quality work
c) Avoiding all responsibilities
d) Expecting promotions without effort

15) The primary purpose of service learning is _____.
a) Earning money while volunteering
b) Acquiring knowledge through practical experiences
c) Participating in online courses
d) Building a professional career

16) Civic virtue is: _____
a) Attending religious services
b) Demonstrating good behavior and contributing to the welfare of society
c) Building personal wealth
d) Following family traditions

17) The following is an example of "respect for others" is _____.
a) Ignoring people's opinions
b) Listening attentively to others and valuing their viewpoints
c) Interrupting others in conversations
d) Arguing to prove your point

18) Living peacefully involves: _____
a) Suppressing all emotions
b) Treating others with kindness and understanding
c) Avoiding any conflict
d) Always agreeing with others

19) The value of "caring" means: _____
a) Always focusing on personal success
b) Showing concern and compassion for others
c) Ignoring the needs of others
d) Only helping when there is a reward

20) Honesty is best defined as: _____
a) Telling the truth regardless of the consequences
b) Saying only what others want to hear
c) Keeping secrets for friends
d) Telling lies to avoid conflict

21) According to Kohlberg's theory, the highest stage of moral development is: _____

a) Obedience and punishment orientation
b) Conventional morality
c) Post-conventional morality
d) Self-interest orientation

22) Which of the following is a key characteristic of Gilligan's moral development theory?

a) Emphasis on justice and rights
b) Focus on the value of relationships and care
c) Focus on maximizing personal gain
d) Belief that all moral issues are universal and objective

23) Which of the following models of professional roles emphasizes the engineer's responsibility to society and the public welfare?

a) The Engineer as Technocrat
b) The Engineer as Contractor
c) The Engineer as Guardian
d) The Engineer as Entrepreneur

24) Which theory of moral development emphasizes the importance of care and relationships, particularly for women?

a) Kohlberg's theory
b) Aristotle's virtue ethics
c) Gilligan's theory
d) Rawls' theory of justice

25) Which model of professional role in engineering sees the engineer as a neutral expert, focused only on technical competence without concern for social values?

a) The Engineer as Guardian
b) The Engineer as Technocrat
c) The Engineer as Entrepreneur
d) The Engineer as Contractor

26) Which ethical theory suggests that individuals should act in ways that maximize their own happiness and well-being?

a) Deontological ethics
b) Utilitarianism
c) Ethical egoism
d) Virtue ethics

27) The concept of "professional ethics" in engineering involves: _____

a) The personal beliefs of engineers
b) The specific ethical standards and principles set by professional organizations
c) The opinions of senior management
d) The religious views of the engineers

28) In engineering ethics, a "conflict of interest" occurs when: _____
a) Engineers prioritize their personal interests over their professional duties
b) Engineers follow the orders of their superiors without question
c) Engineers act in ways that promote the well-being of society
d) Engineers make decisions based solely on technical expertise

29) In engineering ethics, what is the purpose of "risk assessment"?
a) To identify and mitigate potential dangers and harm to society
b) To increase profits and minimize costs
c) To ensure that engineers do not make mistakes
d) To promote the engineer's personal career advancement

30) What does "ethical responsibility" in engineering imply?
a) Only following orders from superiors
b) Making decisions that benefit only the company
c) Balancing technical, legal, and moral considerations to ensure public safety and well-being
d) Prioritizing efficiency over quality

31) Safety and risk primarily deal with: _____
a) Managing hazards and assessing potential harm
b) Legal contracts
c) Maximizing productivity
d) Reducing work hours

32) Risk-benefit analysis involves: _____
a) Estimating the cost of a project
b) Evaluating potential risks against possible benefits
c) Managing legal liabilities
d) Defining workplace responsibilities

33) The Chernobyl disaster is an example of: _____
a) A technological breakthrough
b) An ethical failure in managing risks
c) A successful safety protocol implementation
d) An engineering success

34) Which of the following is a key factor in assessing safety and risk?
a) The cost of implementation
b) The likelihood and impact of potential hazards
c) The speed of technology adoption
d) The market demand for a product

35) The Three Mile Island incident was caused by: _____
a) Technological failure
b) Natural disasters
c) Lack of training for engineers
d) Poor risk assessment and safety protocol failures

36) Collegiality in a professional setting refers to: _____
a) Loyalty to your employer
b) Cooperation and mutual respect among colleagues
c) Competing for individual success
d) Avoiding work conflicts

37) Professional loyalty involves: _____
a) Reporting colleagues' mistakes publicly
b) Protecting the interests of the team or organization
c) Ignoring safety violations to avoid
d) Disclosing confidential information for personal conflict gain

38) Employee rights include: _____
a) The right to work without discrimination
b) The right to disregard company policies
c) The right to personal opinion but not affecting work
d) The right to ignore workplace safety standards

39) Intellectual Property Rights (IPR) protect: _____
a) The financial interests of corporations
b) The ownership and use of creative ideas and inventions
c) The physical assets of a company
d) Workplace performance evaluations

40) *Risk assessment* is important because it helps in: _____
a) Evaluating the potential impact of hazards on health and safety
b) Minimizing workplace productivity
c) Defining job roles
d) Ignoring environmental issues

41) In risk management, mitigation strategies aim to: _____
a) Accept all risks in the workplace
b) Reduce or eliminate identified risks
c) Increase the likelihood of hazards
d) Focus only on maximizing profits

42) Which of the following is a potential consequence of *occupational crime*?
a) Increased workplace productivity
b) Legal consequences and loss of reputation
c) Improvement in company safety standards
d) Higher employee satisfaction

43) Risk reduction in engineering refers to: _____
a) Implementing measures to lower the chances of accidents
b) Increasing the number of hazards in the work environment
c) Ignoring potential risks
d) Cutting costs by removing safety measures

44) Public safety regulations are primarily designed to: _____
a) Ensure the safety of the company's assets
b) Protect the general public from potential harm
c) Increase revenue for the government
d) Focus only on preventing natural disasters

45) Multinational corporations (MNCs) are characterized by: _____
a) Operations in multiple countries with a centralized headquarters
b) Operating only in their home country
c) Limited influence on global markets
d) No responsibility toward environmental concerns

46) Environmental ethics primarily deals with: _____
a) Human responsibility to manage the environment and natural resources
b) Minimizing corporate profits
c) Technological advancements in engineering
d) Treating employees equally

47) Which of the following is NOT an example of environmental ethics?
a) Reducing pollution and waste
b) Maximizing resource use regardless of environmental impact
c) Preserving biodiversity
d) Sustainable development

48) Computer ethics involves: _____
a) Programming and coding without considering social consequences
b) Understanding the moral implications of computing technologies
c) Focusing only on technological innovation
d) Ignoring privacy issues

49) Weapons development ethics deals with: _____
a) The development of new technologies to enhance military capabilities
b) Restricting the use of all technological advancements
c) Focusing only on civilian safety
d) Only addressing the legal aspects of weapon development

50) Engineers as managers are expected to: _____
a) Focus solely on technical tasks
b) Lead teams, make strategic decisions, and manage projects
c) Ignore the business aspects of their work
d) Avoid taking responsibility for team outcomes

SLR-BD-636

Seat No.	

Set P

F.Y. (B.Tech.) (Sem - II) (CBCS) Examination: March/April-2025
Engineering Graphics & CAD (BTN10206)

Day & Date: Tuesday, 17-06-2025 Max. Marks: 70
Time: 03:00 PM To 07:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicates full marks.
3) Retain all construction lines.
4) Assume suitable dimensions, wherever required and mention it clearly.
5) All dimensions are in 'mm'.

Note: Objective type question paper must be returned after first 40 minutes strictly.

Section – I

Duration:40 Minutes **Marks:14**

Q.1 Solve any four objective type question from the following. **14**

1. Attempt any two questions from a) to d)
2. Questions e) & f) are compulsory.

a) **Refer Fig. (a):** Find out distance between parallel lines AB & CD **03**

b) **Refer Fig. (b):** Find out the shortest (perpendicular) distance between point C and given line AB. **03**

c) **Refer Fig. (c):** Complete projection of line PQ and find its true length if **03**
1) Grade is +70% w.r.to 'P'
2) Bearing is S 60 E w.r.to 'P'
3) Top view of line measures 60 mm.

d) R**efer Fig. (d):** Find out grade and bearing of line PQ, if **03**
1) Its inclination with horizontal plane is 30^0
2) Inclination of the line with VP is 60^0
3) True length is 70 mm.

e) **Refer Fig. (e):** Complete projections of plane ABC, if it strikes S45E w.r.to A and dips 30^0 North Easterly. **04**

f) **Refer Fig. (f):** Find the strike and Dip of given Plane ABC. **04**

Q.2 Solve the following

a) A line AB has its front view length of 50 mm with a true length of 70 mm. The inclination with horizontal reference plane is 45^0. Draw the projections of AB & find its true inclination with frontal reference plane. Consider point A 20 mm above horizontal reference plane and 20 mm in front of vertical plane. **04**

b) A line AB has front view length (FVL) of 50 mm and apparent inclination of 45^0 with HRP. The line carries a true inclination of 30^0 with FRP(VP). Complete the projections of the line and determine the true inclination with horizontal reference plane. Consider point A 20 mm above horizontal reference plane and 20 mm in front of vertical plane. **03**

c) A rectangle ABCD of sides 50 mm and 80 mm long has its shorter side in the frontal reference plane (VP). It is inclined to VP (FRP) such that is FV (Elevation) appears as a square. Complete the projections & find inclination of the plane with VP. **04**

Q.3 A pentagon of 30 mm side has its side AB in horizontal reference plane (HP). The surface of the plane makes an angle of 45^0 with the horizontal reference plane and the resting edge makes 30^0 to frontal reference plane (VP). Complete the projections of the plane. **07**

Q.4 A square prism, side of base 40 mm & axis 70 mm long, has a corner of base in Horizontal reference plane (HP) and the axis is inclined at 45^0 to horizontal reference plane. The loner edge through the resting corner makes 30^0 to vertical reference plane (VP). Complete its projections. **10**

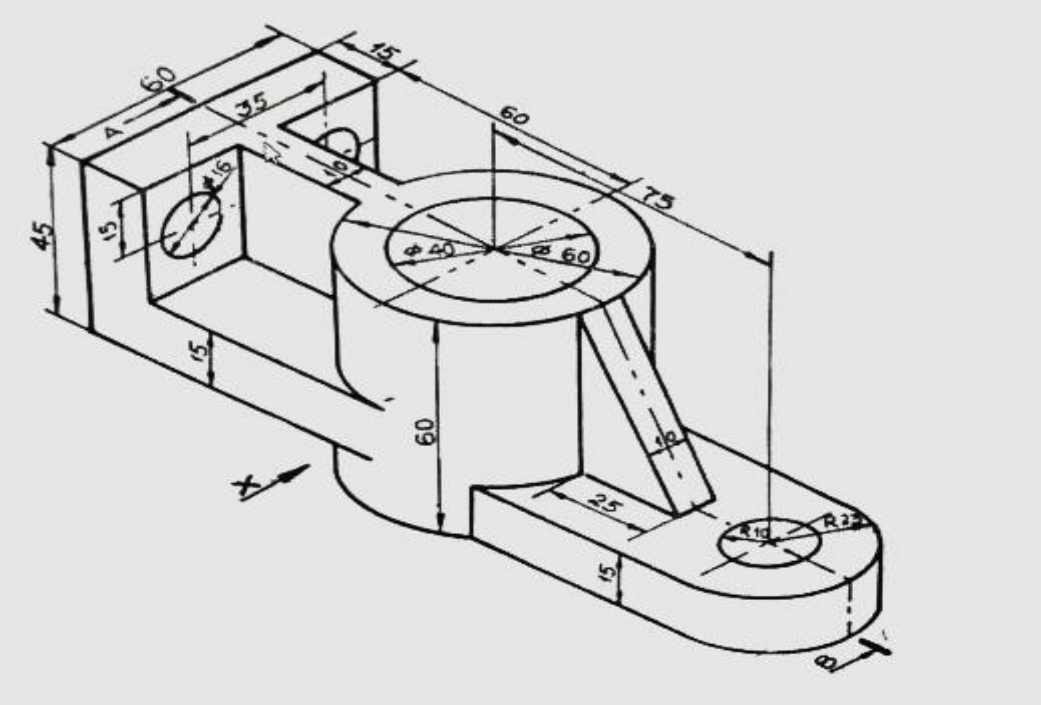
OR

A pentagonal pyramid, base 40 mm side & axis 70 mm long, has side of base in horizontal reference plane & inclined at 30^0 to vertical reference plane. The axis of the pyramid is inclined at 45^0 to horizontal reference plane. Complete its projections, when the apex is nearer to observer.

Section – II

Q.5 Figure shows isometric view of machine component, draw the following views: **18**

a) Sectional F. V. along A-A looking in the direction X
b) Right hand side view
c) Top View



Q.6 A square pyramid, base 30 mm side and axis 60 mm long, stands vertically on the ground (HP) with all the base edges equally inclined to vertical plane. It is cut by a section plane perpendicular to vertical reference plane and inclined at 45^0 to horizontal reference plane which passing through a point on axis 20 mm from apex. Draw the front view, sectional top view and true shape of section. **10**

OR

A cylinder, diameter of base 60 mm & height 80 mm has its base in horizontal reference plane. It is cut by an auxiliary inclined plane in such a way that true shape of section is an ellipse with maximum possible size. Draw front view, sectional top view and true shape of section.