22STU206N/ 22STU206

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2024
(Second Semester)

Branch - **STATISTICS**

MATHEMATICS - II FOR STATISTICS

Time: Three Hours | Maximum: 75 Marks

SECTION-A (10 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	A constant function is _____function. (a) an odd (b) an even (c) neither an odd nor an even (d) both (a) and (b)	K1	CO 1
	2	The Fourier coefficient a_0 for $f(x) = x\sin x$ in $(0,2\pi)$ is ___ (a) 0 (b) 1 (c) 2 (d) -2	K2	CO 1
2	3	The auxiliary equation of $Pp + Qq = R$ is _____ (a) $\frac{dx}{P} = \frac{dy}{Q}$ (b) $\frac{dx}{P} = \frac{dz}{R}$ (c) $\frac{dx}{p} = \frac{dy}{q} = \frac{dz}{R}$ (d) $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$	K1	CO 2
	4	The partial differential equation by eliminating the arbitrary constants a and b from $z = (x + a)(y + b)$ is _____ (a) $z = p + q$ (b) $z = p - q$ (c) $z = \frac{p}{q}$ (d) $z = pq$	K2	CO 2
3	5	Find the value of $L(\sinh 3t)$ = ____ (a) $\frac{s}{s^2+3}$ (b) $\frac{3}{s^2+3}$ (c) $\frac{s}{s^2-9}$ (d) $\frac{3}{s^2-9}$	K2	CO 3
	6	Find the value of $L(7)$ = ____ (a) $\frac{1}{s}$ (b) $\frac{7}{s}$ (c) s (d) 7s	K2	CO 3
4	7	The value of $L^{-1}(F(s + a))$ = _____ (a) $e^{ax}L^{-1}(f(s))$ (b) $e^{-ax}L^{-1}(f(s))$ (c) $af(\frac{s}{a})$ (d) $\frac{1}{a}f(\frac{s}{a})$	K2	CO 4
	8	Find the value of $L^{-1}\left(\frac{1}{s}\right)$ = ___ (a) 0 (b) 1 (c) t (d) -2t	K2	CO 4
5	9	The diagonally dominant matrix from the following matrices is _____. (a) $\begin{bmatrix}-2 & 1\\ 4 & -3\end{bmatrix}$ (b) $\begin{bmatrix}2 & 1\\ 1 & 3\end{bmatrix}$ (c) $\begin{bmatrix}0 & -1\\ 1 & 2\end{bmatrix}$ (d) $\begin{bmatrix}5 & -3\\ 1 & 0\end{bmatrix}$	K1	CO 5
	10	Convert the augmented matrix for the system of the equation $2x + 3y = 5; 3x - 2y = 2$ (a) $\left(\begin{pmatrix}2 & 3\\ 3 & -2\end{pmatrix}\middle|\begin{matrix}5\\ 2\end{matrix}\right)$ (b) $\begin{pmatrix}2 & 3\\ 3 & -1\end{pmatrix}\middle|\begin{matrix}-5\\ -2\end{matrix}$ (c) $\begin{pmatrix}2 & 3\\ 3 & -1\end{pmatrix}\middle|\begin{matrix}-5\\ 2\end{matrix}$ (d) $\begin{pmatrix}2 & 3\\ 3 & -1\end{pmatrix}\middle|\begin{matrix}5\\ -2\end{matrix}$	K2	CO 5

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SECTION - B (35 Marks)

Answer **ALL** questions
ALL questions carry **EQUAL** Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	If 'a' is neither zero nor an integer, find the Fourier series expansion of period 2π for the function $f(x) = \sin ax, -\pi \leq x \leq \pi$.	K4	CO 1
		(OR)		
	11.b.	Find the Fourier series for the function $f(x) = e^x$ defined in $(-\pi, \pi)$.		
2	12.a.	Form the partial differential equation by eliminating the arbitrary function from $z = f(x^2 - y^2)$.	K3	CO 2
		(OR)		
	12.b.	Solve $p^2 + q^2 = npq$.		
3	13.a.	Find $L(Cos^3 2t)$.	K3	CO 3
		(OR)		
	13.b.	Find$L(e^{-8t} + cosh2t + sin7t)$.		
4	14.a.	Evaluate $L^{-1}(\frac{s-3}{(s^2+4s+13)})$	K3	CO 4
		(OR)		
	14.b.	Evaluate $L^{-1}(\frac{3}{(s-3)^2+25})$		
5	15.a.	Solve by Gauss-elimination method for the following equations$2x + y + 4z = 12, 8x - 3y + 2z = 20, 4x + y - z = 33$.	K4	CO 5
		(OR)		
	15.b.	Solve by Gauss-Jordan method for the following equations $x + 2y + z = 3, 2x + 3y + 3z = 10, 3x - y + 2z = 13$.		

SECTION -C (30 Marks)

Answer **ANY THREE** questions
ALL questions carry **EQUAL** Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Find the Fourier series to represent the function $f(x) = \lvert sinx \rvert, -\pi < x < \pi$.	K3	CO 1
2	17	Solve $9pqz^4 = 4(1 + z^3)$.	K4	CO 2
3	18	Find$L(\frac{cos4tsin2t}{t})$.	K3	CO 3
4	19	Evaluate$L^{-1}(\frac{1}{s(s+1)(s+2)})$.	K3	CO 4
5	20	Solve, by Gauss-Jacobi method iteration method $27x + 6y - z = 85, 6x + 15y + 2z = 72, x + y + 54z = 110$.	K4	CO 5

Z-Z-Z END