O.P.Code: 20HS0834	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech II Year I Semester Regular & Supplementary Examinations December-2023
NUMERICAL METHODS AND TRANSFORMS
(Electronics and Communication Engineering)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Find a positive root of the equation $x^3 - x - 1 = 0$ by Bisection method.	CO1	L3	8M
	b	hat is the algorithm for the bisection method.	CO1	L1	4M
		OR			
2	a	Estimate a real root of the equation $xe^X - cosx = 0$ by using Newton – Raphson method.	CO1	L4	10M
	b	Write formula for Regula-falsi method.	CO1	L2	2M
		UNIT-II			
3	a	Tabulate $y(0.1)$ and $y(0.2)$ using Taylor's series method given that $y' = y^2 + 1$ and $y(0) = 1$.	CO2	L1	10M
	b	State Taylor's series formula for first order differential equation.	CO2	L1	2M
		OR			
4		Using modified Euler's method find $y(0.2)$ *and* $y(0.4)$, $gi\, y' = y + e^x, y(0) = 0$.	CO2	L3	12M
		UNIT-III			
5	a	Find the Laplace transform of $f(t) = (\sqrt{t} + \frac{1}{\sqrt{t}})^3$.	CO3	L3	6M
	b	Find the Laplace transform of $f(t) = cosh\, at\, sin\, bt$	CO3	L3	6M
		OR			
6	a	Find $L^{-1}\{\frac{3s-2}{s^2-4s+20}\}$ by using first shifting theorem.	CO3	L3	6M
	b	Using Convolution theorem, Find $L^{-1}\{\frac{1}{(s+a)(s+b)}\}$.	CO3	L3	6M
		UNIT-IV			
7	a	Using Laplace transform method to solve $y' - y = t,\ y(0) = 1$.	CO4	L3	6M
	b	Find the Fourier series for the function $f(x) = x$; in $-\pi < x < \pi$.	CO4	L1	6M
		OR			
8	a	Expand $f(x) = e^{-x}$ as a fourier series in the interval $(-1,1)$.	CO4	L2	6M
	b	Expand $f(x) = \lvert x \rvert$ as a fourier series in the interval $(-2,2)$.	CO4	L2	6M
		UNIT-V			
9	a	Find the Fourier transform of $f(x) = e^{\frac{-x^2}{2}}$, $-\infty < x < \infty$	CO5	L1	6M
	b	If $F(p)$ is the complex Fourier transform of $f(x)$, then prove that the complex Fourier transform of $f(x) = cosax$ is $\frac{1}{2}[F(p + a) + F(p - a)]$	CO5	L5	6M
		OR			
10		Find the finite Fourier sine and cosine transform of $f(x)$ defined by $f(x) = 2x$ *where* $0 < x < 2\pi$.	CO5	L1	12M

*** END ***