Course Code: 1940003 **Roll No:** **MLRS- R19**

MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
Accredited by NBA and NAAC with 'A' Grade & Recognized Under Section2(f) & 12(B)of the UGC act,1956

II B.Tech II Sem Supply End Examination, March 2022

Laplace Transforms, Numerical Methods and Complex Variables

(EEE & ECE)

Time: 3 Hours. **Max. Marks: 70**

Note: 1. Answer any FIVEquestions.
2. Each question carries 14 marks and may have a, b as sub questions.

1	a)	Find inverse Laplace transform of the function $\frac{1}{s^2(s+3)}$.	7M	CO1	BI
	b)	Evaluate $L\left\{\int_0^t e^{-t}\cos t\, dt\right\}$.	7M	CO1	BI
2		Using Laplace transform, solve $(D^2+1)x = t\cos 2t$ given $x = 0, \frac{dx}{dt} = 0$ at $t = 0$.	14M	CO1	BI
3	a)	By using method false position, find the root of the equation cos$x$- xe^x = 0.	7M	CO2	BI
	b)	Given $\sin 45^o = 0.7071, \sin 50^o = 0.7660, \sin 55^o = 0.8192$ and $\sin 60^o = 0.8660$. Find $\sin 52^o$ using Newton's interpolation formula.	7M	CO2	BI
4	a)	Show$\Delta^2 x^{(m)} = m(m-1)x^{(m-2)}$, m is a positive integer and $h = 1$.	7M	CO2	BI
	b)	Evaluate the integral $\int_0^1 \frac{dx}{3+2x}$ using trapezoidal rule.	7M	CO3	BI
5		Use Runge-Kutta method of order four to find y when $x = 0.6$ given that $\frac{dy}{dx} = 1+y^2, y(0) = 0$.	14M	CO3	BI
6	a)	Find the conjugate harmonic function of the harmonic function U = x^2-y^2-x.	7M	CO4	BL
	b)	Show that xy^2 cannot be real part of an analytic function	7M	CO4	BL
7	a)	Find the general value of $\log(1+i)$	7M	CO4	BL
	b)	Evaluate $\int_c \frac{z\,secz}{(1-z^2)}\, dz$ where c is the ellipse $4x^2 + 9y^2 = 9$.	7M	CO5	BL
8	a)	Find Laurent expansion of $\frac{1}{z^2-4z+3}$ for $1 < \lvert z\rvert < 3$.	7M	CO5	BL
	b)	Find the residue of *1/(z-1)(z-2).*	7M	CO5	BL

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