Register No. | | | | | | | | | | | | |

SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

AN AUTONOMOUS INSTITUTION

Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai

INTERNAL ASSESSMENT EXAMINATION-III

Second Semester

B.E-Mechanical Engineering

(Common to B.E-Mechanical and Mechatronics Engineering (Additive Manufacturing), B.E-Electronics and Communication Engineering, B.E-Electrical and Electronic Engineering, B.Tech- Information Technology, B.Tech Artificial Intelligence and Data Science, B.E Computer Science and Engineering, B.E Computer Science and Design, B.E Computer Science and Technology, B.E Computer Science and Engineering (Internet of Things))

23MAT102 – Complex Analysis and Laplace Transforms

Regulations 2023

Date : 26.05.2025 **Session : FN**

Duration : 1 Hour 30 Minutes **Maximum Marks : 50**

Answer ALL questions

PART A - (5 X 2 = 10 marks)

	M	CO	BL	Company Name / GATE Year
1. Find $L[\frac{1}{\sqrt{t}}]$.	2	CO-4	L -1	GATE 2019
2. State and prove first shifting theorem.	2	CO-4	L -1	
3. State initial and final value theorem of Laplace transform.	2	CO-4	L -2	GATE 2012
4. Evaluate $L^{-1}\left[\frac{1}{s^2-6s+5}\right]$	2	CO-5	L -2	GATE 2015
5. Find the inverse Laplace of $\frac{s}{(s+2)^2}$	2	CO-5	L -2	

PART B - (2 X 13 = 26 marks)

6.	(a)	Find $L[\frac{\cos at - \cos bt}{t}]$.	13	CO-4	L-3	GATE 2018
		OR				
	(b)	Using Laplace transform prove that $\int_0^\infty \frac{1-\cos 2t}{t^2} dt = \pi$.	13	CO-4	L-3	
7.	(a)	Using convolution theorem, find (i) $L^{-1}\left[\frac{1}{(s+a)(s+b)}\right]$	7	CO-5	L-3	GATE 2014
		(ii) $L^{-1}\left(\frac{s}{(s^2+a^2)^2}\right)$.	6	CO-5	L-3	
		OR				
	(b)	Using partial fraction, find inverse Laplace transform of $\left[\frac{2}{(s+1)(s^2+4)}\right]$.	13	CO-5	L-3	

PART C – (1 x 14 = 14 Marks)

8.	(a)	Find L(f(t)) if the periodic function is given by $f(t) = \begin{cases} t, & 0 \le t \le a \\ 2a - t, & if \quad a \le t \le 2a \end{cases}$ and f(t+2a) = f(t).	14	CO-4	L-3	GATE 2016
		OR				
	(b)	Solve $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + 2y = 0$, given that $y = \frac{dy}{dx} = 1$ at x=0 using Laplace transform method.	14	CO-5	L-3	GATE 2017

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COURSE COORDINATOR **HOD** **PRINCIPAL**