GALGOTIAS UNIVERSITY

ADMISSION NUMBER												

School of University Polytechnic

Diploma in Computer Science and Engineering
Summer Term Examination – July - August 2024

Duration : 180 Minutes
Max Marks : 100

Sem III - N1DF301T - MATD2001 - Applied Mathematics-III

General Instructions
Answer to the specific question asked
Draw neat, labelled diagrams wherever necessary
Approved data hand books are allowed subject to verification by the Invigilator

1)	Find $A^2 - I$, where $A = \begin{bmatrix} 1 & 2 \\ -2 & 1 \end{bmatrix}$.	K1 (2)
2)	Illustrate the general solution of a differential equation.	K2 (4)
3)	Show that $L(t^3 e^{-3t}) = \frac{6}{(s+3)^4}$.	K2 (6)
4)	Solve the equation $2X + 3Y = \begin{bmatrix} 2 & 3 \\ 4 & 0 \end{bmatrix}$ and $3X + 2Y = \begin{bmatrix} 2 & -2 \\ 1 & 5 \end{bmatrix}$.	K3 (9)
5)	Solve the differential equation $\frac{dy}{dx} = e^{x-y} + x^2 e^{-y}$.	K3 (9)
6)	Prove that $\int_0^\infty \frac{sint}{t} dt = 0$, using Laplace transform.	K5 (10)
7)	Discover the Laplace transform of $\frac{\cos(at) - \cos(bt)}{t}$.	K4 (12)
8)	Determine the Eigen values of matrix $A = \begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$.	K5 (15)
9)	Evaluate the solution of the differential equation Solve: $\frac{d^3y}{dx^3} - \frac{d^2y}{dx^2} + \frac{dy}{dx} - 6y = e^{-x} sinx$.	K5 (15)
10)	Test for what value of $\lambda \& \mu$ the system of equation $x + y + z = 6, x + 2y + 3z = 10, x + 2y + \lambda z = \mu$ have i) No solution ii) Unique solution iii) infinite solution.	K6 (18)