



K. K. Wagh Institute of Engineering Education & Research, Nashik
(An Autonomous Institute From A.Y. 2022-23)

InSem Examination-I Winter2024	
Exam Seat No.:	
Academic Year:2024-2025	Semester:III
Class:SY	Program:B.Tech
Branch Code:ROB	Pattern:2023
Name of Course:Applied Mathematics III	Course Code:2300201D
Max. Marks:30	Duration:1:15 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains 2 pages.
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. Use of non programmable scientific calculator is allowed.

Marks CO

Question No. 1

- 1 a) Find Laplace transform of $f(t)=(2t+3)^3$ (3) CO1
- 1 b) Find Fourier cosine transform of $f(x) = \begin{cases} x; & 0 \leq x \leq a \\ 0; & x > a \end{cases}$ (4) CO1

Question No. 2

- 2 a) Evaluate Laplace transform of $f(t)=(t+2)^2 e^{4t}$ (4) CO3
- 2 b) Find Fourier transform of $f(x) = \begin{cases} 1; & x > 0 \\ 0; & x < 0 \end{cases}$ (4) CO3

OR

- 2 c) Evaluate inverse laplace transform of $\log\left(\frac{s+b}{s+a}\right)$ (4) CO3
- 2 d) Solve the integral equation (4) CO3

$$\int_0^\infty f(x) \cos \lambda x dx = e^{-\lambda}, \quad \lambda > 0$$

Question No. 3

- 3 a) Find particular integral of $(D^2+1)y=\sin x$ (3) CO2
- 3 b) Solve $\frac{d^2 y}{dx^2} - 4 \frac{dy}{dx} + 4y = e^{2x} \sin 3x$ (4) CO2

Question No. 4

- 4 a) Solve $\frac{dx}{x(y^2-z^2)} = \frac{dy}{-y(z^2+x^2)} = \frac{dz}{z(x^2+y^2)}$ (4) CO4
- 4 b) Solve $x^2 \frac{d^2 y}{dx^2} + x \frac{dy}{dx} - 4y = x^3$ (4) CO2

OR

4 d) Solve $(1+x)^2 \frac{d^2 y}{dx^2} + (1+x) \frac{dy}{dx} + y = 2\cos[\log(1+x)]$ (4) CO2

..... End of question paper.....