



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

	InSem Examination-I Winter 2023		
	Exam Seat No.:		
	Academic Year: 2023-2024	Semester: III	
	Name of Programme: Electrical Engineering	Pattern: 2022	
	Name of Course: Applied Mathematics-III	Course Code: SMH222601	
	Max. Marks: 30	Duration: 1 Hr	

	<p>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.</p> <ol style="list-style-type: none">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. The last column indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question	
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Question No. 1 Attempt following Question

a) Solve: $(D^2 - 2D + 1)y = e^x x \sin x$ (5) CO1

OR

b) Solve: $(D^3 - 3D^2 + 3D - 1)y = e^x \sqrt{x}$ (5) CO1

c) Solve: $\frac{d^2 y}{dx^2} + y = \sec x \bullet \tan x$ (5) CO3

OR

d) Solve: $x^2 \frac{d^2 y}{dx^2} - x \frac{dy}{dx} + y = x \log x$ (5) CO3

e) Solve By MVP: $(D^2 + 4)y = \sec 2x$ (5) CO3

OR

f) Solve: $\frac{dx}{dt} + 5x - 2y = 0$, $\frac{dy}{dt} + 3x - 2y = 0$ (5) CO3

Question No. 2 Attempt following Question

a) Find Laplace Transform of: $f(t) = e^{-4t} t \sin 3t$ (5) CO1

OR

b) Evaluate: $\int_0^{\infty} \frac{e^{-2t} - e^{-3t}}{t} dt$ (5) CO1

c) Find Inverse Laplace Transform of: $F(s) = \cot^{-1}\left(\frac{s-3}{2}\right)$ (5) CO3

OR

d) Find Inverse Laplace Transform using convolution theorem
of: $\frac{1}{s(s+4)}$ (5) CO3

e) Solve the differential equation using Laplace Transform: $y' + 4y = te^{-4t}$, $y(0) = 0$ (5) CO3

OR

f) Solve the differential equation using Laplace Transform:
 $y'' - 16y' + 64y = te^{3t}$, $y(0) = 0, y'(0) = -3$ (5) CO3