



Daffodil International University

Department of Computer Science and Engineering

Faculty of Science & Information Technology

Midterm Examination, Spring 2024

Course Code: MAT211, Course Title: Engineering Mathematics

Level: L2 Term: T1 Batch: 64

Time: 01:30 Hrs

Marks: 25

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.	a) Show an ODE for $\sqrt{1-x^2} + \sqrt{1-y^2} = a(x-y)$.	[5]	CO1
	b) Show the solution of the homogeneous ODE $\frac{dy}{dx} = \frac{-x^2 + xy + y^2}{xy}$.	[5]	
2.	a) Solve the ODE $\frac{dy}{dx} = \frac{6x-4y+1}{3x-2y+3}$ by using reducible to variable separable method.	[6]	CO2
	b) Solve the ODE $D^4y - 7D^2y - 18Dy = e^x$.	[6]	
3.	a) Identify y_p for $(D^2 - 4)y = x^3$	[3]	CO2



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Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.	✓ a) Find a differential equation by eliminating arbitrary constants from $y = ae^{3x} + be^{-2x}$. [3]	CO1
	ⓑ) Find the solution of the ODE $\frac{dy}{dx} = \frac{x^2 + y^2}{2xy}$. [5]	
2.	✓ a) Solve the ODE $\frac{dy}{dx} - xy = xy^2$ by using appropriate method. [4]	CO2
	ⓑ) Solve the ODE $D^3y - 8D^2y + 19Dy - 12y = \sin x$. [5]	
3.	✓ a) Determine y_p for $(D^2 - 1)y = e^x \sin x$ [2]	CO2
	✓ b) Evaluate the solution of $x^3 \frac{d^3y}{dx^3} + 5x^2 \frac{d^2y}{dx^2} + 7x \frac{dy}{dx} + 8y = x^2$ [6]	



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Midterm Examination, Fall 2022

Course Code: MAT211, Course Title: Engineering Mathematics

Level: L2 Term: T1, Section: A,B,C,D,E,F,G,Old-A Batch: 60

Time: 01:30 Hrs

Marks: 25

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.	a)	Define Order and Degree of Differential Equations (D. Es.)	2	CO1
	b)	Develop the D.E. corresponding to the equation $y = ax + bx^2$	3	
2.	a)	Describe how can you verify the Homogeneous D.E.?	1	CO2
	b)	Solve the Homogeneous D.E. $(x^2 + y^2)dx + 2xy dy = 0$	4	
3.	a)	Solve the D.E. using appropriate method $(3x - 2y + 1)dy = (6x - 4y + 3)dx$	2	CO3
	b)	Solve the D.E. $(D^3 + D^2 + D + 1)y = \cos x$	3	
4.	a)	Define Integrating Factor (I.F.)	1	CO2
	b)	Calculate the solution of the D.E. using suitable method $x \frac{dy}{dx} + 2y = x^2 \log x$	4	
5.		Solve the Bernoulli's D.E. $2 \frac{dy}{dx} - \frac{y}{x} = \frac{y^2}{x^2}$	5	CO3