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Daffodil International University

Faculty of Science & Information Technology
Department of Computer Science and Engineering
Mid Examination, Spring 2025
Course Code: MAT211, Course Title: Engineering Mathematics
Level: L2 Term: T1 Batch: 66

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)*	**Explain** the order and degree of a differential equation with examples.	[2]	**CO1**
	b)	**Outline** an ODE corresponding to the function: $y = Pe^{3x} + Qe^{2x} + Re^{-x}$.	[4]	
	c)	**Interpret** the solution to the Linear ODE: $x^2 \frac{dy}{dx} + 2xy = x^2 e^{2x}$.	[4]	
2.	*a)*	**Solve** the homogeneous first order first degree ODE: $y^2 dx - (xy + x^2)dy = 0$.	[4]	**CO2**
	b)	**Solve** the higher order ODE: $D^4y + 2D^3y + 8Dy + 16y = e^{-2x} + \sin 2x$.	[6]	
3.		**Solve** the following higher order ordinary differential equation (ODE) with constant coefficients $D^2y + 3Dy + 2y = f(x)$ where the function $f(x) = e^{2x} \sin^2 3x$.	[5]	**CO2**