



Daffodil International University

Faculty of Science & Information Technology
Department of Computer Science and Engineering
Midterm Examination, Fall 2024

Course Code: MAT211, Course Title: Engineering Mathematics

Level: L2 Term: T1 Batch: 65

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 conditions of the linear ODE with examples.	[2]	CO1
	b)	Demonstrate the ODE of the following equation $xy' = e^{2x}(A \sin x + B \cos x)$.	[3]	
	c)	Show the solution of the ODE $y - x \frac{dy}{dx} = a \left(y^2 + \frac{dy}{dx} \right)$ is $y = C(x+a)(1-ay)$.	[5]	
2.	a)	Solve the non-linear (Bernoulli's) ODE $y \frac{dy}{dx} - y^2 = xe^{3x}$.	[5]	CO2
	b)	Solve the first order first degree homogeneous ODE $xdy - \sqrt{x^2 + y^2} dx = ydx$.	[5]	
3.	a)	Solve the higher order ODE $D^3y - 2Dy + 4y = e^x \sin x$.	[5]	CO2