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