



Daffodil International University
Department of Electrical and Electronic Engineering
Faculty of Engineering
Final Examination, Fall – 2024

Course Code: 0541-123
Section: A,B,C
Full Marks: 40

Course Title: Ordinary & Partial Differential Equations
Level-Term: L1-T2
Exam Date: December 28, 2024

Teacher's Initial: TRS
Time: 2 Hours

[Notes: Answer all the following questions

CO's represent one of the learning outcomes of the course.

Figures on the right hand side indicate marks allocated for the questions.]

		Marks
Q1. (a) Discuss the standard form of the linear & Bernoulli's differential equation. Also identify the following differential equations whether they are linear or Bernoulli after transforming the corresponding standard form	CO-1 (C2)	[6]
i) $\frac{dy}{dx} + \frac{y}{x} = x^3$.	CO-2 (C4)	
ii) $\frac{dy}{dx} + \frac{xy}{1-x^2} = xy^{\frac{1}{2}}$.		
(b) Evaluate the differential equation $\frac{dy}{dx} + \frac{2}{x}y = e^x$.		[4]
Q2. Solve the following differential equations using the appropriate method:	CO-2 (C4)	[10]
i) $\frac{dy}{dx} + y \sec x = \sin x$		
ii) $\frac{dy}{dx} + 2xy = xy^2$		
Q3. (a) Solve the following differential equations	CO-2 (C4)	[15]
i) $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + 3y = x^2$		
ii) $x^2 \frac{d^2y}{dx^2} - 3x \frac{dy}{dx} + 4y = 2x^2$		
iii) $(y^2 + z^2)p - xyq + xz = 0$		
Q4. Compute the general solutions of the differential equation from the following Initial Value Problem: $(D^2 + 2D + 2)y = 0, y(0) = 0, y'(0) = 1$	CO-3 (C3)	[5]