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Daffodil International University

Department of Electrical and Electronic Engineering

Faculty of Engineering

Mid Term Examination, Fall – 2024

Course Code: EEE 0541-123 Course Title: Ordinary and Partial Differential Equation

Section: A,B,C Level-Term: L1-T2 Teacher's Initial: TRS

Full Marks: 25 Exam Date: October 02, 2024 Time: 1.5 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 ordinary and partial differential equations with an example.	**CO-1**	[2]
	(b) **Identify** the order and degree of the following differential equations	**(C2)**	[3]
	i) $y = x\left(\frac{dy}{dx}\right) + a\left\{1 + \left(\frac{dy}{dx}\right)^2\right\}^{\frac{1}{2}}$ ii) $\left\{y + x\left(\frac{dy}{dx}\right)^2\right\}^{\frac{4}{3}} = x\left(\frac{d^2y}{dx^2}\right)$		
	iii) $\left(\frac{d^2y}{dx^2} + 1\right)^{\frac{2}{3}} = \left(\frac{dy}{dx}\right)^{\frac{1}{3}}$		
Q2.	**Illustrate** an ordinary differential equation corresponding to the equation $a(y + a)^2 = x^3$ And **identify** the obtain differential equation is either linear or nonlinear and if nonlinear then why?	**CO-1** **(C2)**	[5]
Q3.	**Illustrate** the differential equation of a family of circles that touches the y-axis at origin.	**CO-1** **(C2)**	[5]
Q4.	**Analyze** the following differential equation $(x - 2y + 3)dx = (2x - y + 4)dy$	**CO-2** **(C4)**	[5]
Q5.	**Analyze** the following differential equations i) $(x^2 - 2xy - y^2)dx - (x + y)^2dy = 0$ ii) $(x^3 - 2y^2)dx + 2xydy = 0$	**CO-2** **(C4)**	[5]