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Daffodil International University

Department of Electrical and Electronic Engineering

Faculty of Engineering

Final Examination, Fall – 2024

Course Code: 0541-123 | Course Title: Ordinary & Partial Differential Equations

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

Full Marks: 40 | Exam Date: December 28, 2024 | Time: 2 Hours

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[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 i) $\frac{dy}{dx}+\frac{y}{x}=x^3$. ii) $\frac{dy}{dx}+\frac{xy}{1-x^2}=xy^{\frac{1}{2}}$.	**CO-1 (C2)**	[6]
	(b) Evaluate the differential equation $\frac{dy}{dx}+\frac{2}{x}y=e^x$.	**CO-2 (C4)**	[4]
Q2.	**Solve** the following differential equations using the appropriate method: i) $\frac{dy}{dx}+ysecx=sinx$ ii) $\frac{dy}{dx}+2xy=xy^2$	**CO-2 (C4)**	[10]
Q3.	**(a) Solve** the following differential equations 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) $(y^2+z^2)p-xyq+xz=0$	**CO-2 (C4)**	[15]
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]

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