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Daffodil International University

Department of Electrical and Electronic Engineering

Faculty of Engineering

Mid Term Examination Spring- 2025

Course Code: EEE :0541-211
Section: A,B,C,D,E
Full Marks: 25

Course Title: Coordinate Geometry and Vector Analysis
Level-Term: L1-T1
Exam Date:19/3/2025

Teacher's Initial: IJM
Time: 1.5 Hours

[Notes: Answer all the following questions
CO's represent one of the learning outcome of the course Figures on the right hand side indicate marks allocated for the questions]

Q1. (a) **Explain** general equation of second degree and **identify** the nature of the equation $x^2 + 2xy + y^2 + 2x - 1 = 0$. **CO-1 (C2)** [3]

Q2. (a) **Discuss** the diagram of 3-D coordinates systems. **CO-1 (C2)** [2]

(b) **Identify** the cylindrical coordinates $(5, \frac{4\pi}{3}, -4)$ to rectangular coordinates. [2]

Q3. (a) **Generalise** the equation of the plane through the point (2,−1,−4) and perpendicular to the plane $3x + 4y - 5z + 6 = 0$ and $x - 2y + 2z + 1 = 0$. **CO-1 (C2)** [3]

(b) **Identify** the constant k so that the planes $x-2y+kz=0$ and $2x+5y-z=0$ are at right angles ;find in that case the plane through the point (1,-1,-1) and perpendicular to both the given planes [4]

Q4. **Estimate** the standard form of the following equation **CO-1 (C2)** [7]

$$32x^2 + 52xy - 72y^2 - 64x - 52y - 148 = 0$$

Q5. A quadratic equation $3x^2 + 7xy - 15y^2 = 0$. **CO-1 (C2)** [4]

(a) **Interpret** the lines represented by the equation.

(b) **Identify** the angle between the lines $3x^2 + 7xy - 5y^2 = 0$.