



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

Course Code: 0541-211  
Section: A ,B ,C,D,E,F  
Full Marks: 40

Course Title: Coordinate Geometry and vector analysis  
Level-Term: L1-T1  
Exam Date: December 19, 2024

Teacher's Initial: IJM  
Time: 2 Hours

**[Notes: Answer all the Questions]**

- Q1. (a) Interview about cross product of two vectors.** CO-3 [02]  
(C3)
- (b) Applying cross product , Recognize a unit vector perpendicular to the plane of  $A=2i-6j-3k$  and  $B=4i+3j-k$ .** CO-3 [03]  
(C3)
- Q2. (a) Select the direction in which directional derivative is maximum from the point  $(2,-1,3)$  and show the directional derivative of  $\psi(x, y, z) = x^2 + y^2 + xz$  at the point  $(2, -1, 3)$  in the direction of  $A = i + 2j + k$ .** CO-3 [05]  
(C3)
- (b) Evaluate the constant  $a$  so that the following vector is a solenoidal  $V=(3x-2y+3z)i+(-2x-3y+5z)j+(4x+3y+az)k$ .** CO-3 [03]  
(C3)
- Q3. (a) Identify the equation of the plane passing through the intersection of the planes  $x + 2y + 3z + 4 = 0$  and  $4x + 3y + 2z = 1$  through the point  $(1, 2, 3)$ .** CO-2 [06]  
(C2)
- (b) Identify the equation of the plane which is parallel to the plane  $4x-4y+7z-3=0$  and distance of 4 units from the points  $(3, 1,-2)$ .** CO-2 [06]  
(C2)
- Q4. Plane is drawn through the line of intersection of the planes  $x+2y+2z=1$ ,  $x+y-z+1=0$  and is at distance of unit from the point  $(4,-2, 1)$ . Demonstrate that there are two such planes and find their equations.** CO-2 [07]  
(C2)
- Q5. (a) Compute the value of the constants  $\alpha, \beta$  and  $\gamma$  so that  $V = (-4x - 3y + az)i + (\beta x + 3y + 5z)j + (4x + \gamma y + 3z)k$  is irrotational.** CO-3 [04]  
(C3)
- (b) Suppose  $A = i - 2j - 3k$ ,  $B = 2i + j - k$ ,  $C = i + 3j - 2k$ . Calculate the volume of the parallelepiped whose sides are denoted by the three vectors  $A, B$  and  $C$ .** [04]