



Daffodil International University
Department of Electrical and Electronic Engineering
Faculty of Engineering

Mid-Term Examination, Spring – 2026

Course Code: 0541-121

Course Title: Linear Algebra and Complex Variable

Section: A, B, C, D, E, F, G

Level-Term: L1-T2

Teacher's Initial: HRP, SS

Full Marks: 25

Date: February 26, 2026

Time: 1.5 Hours

[Answer all the following questions]

[The second right-most column indicates the COs with the respective Bloom's level]

[The right-most column indicates the assigned marks]

- Q1.** a) Explain the following with example CO-1 [2]
(C2)
- i) Skew-Symmetric Matrix ii) Inconsistent SLE
iii) Hermitian Matrix iv) Homogeneous System
- b) Show that the following system of linear equations is not consistent. CO-1 [3]
(C2)
- $$\begin{aligned} x + y + z &= -3 \\ 3x + y - 2z &= -2 \\ 2x + 4y + 7z &= 7 \end{aligned}$$
- Q2.** a) Express A as the sum of symmetric matrix and skew-symmetric matrix, CO-1 [5]
(C2)
- where $A = \begin{pmatrix} \sin 90^\circ & \frac{d}{dx}(x^2 - x)|_{x=2} & e^0 \\ \ln 1 & \int_0^2 \int_0^1 (x+y) dy dx & -2 \\ |-3| & \underbrace{-\frac{3}{4}}_{-3/4} & 3! \end{pmatrix}$
- b) Identify the echelon form, row reduced echelon form and normal form of the following matrix CO-1 [5]
(C2)
- $$W = \begin{pmatrix} -2 & 1 & 3 & 4 \\ 5 & 0 & -1 & -1 \\ 3 & 1 & 2 & 3 \\ 1 & 0 & 1 & 3 \end{pmatrix}$$
- Q3.** a) Categorize the values of ' β ' so that the following SLE has (i) No solution CO-1 [5]
(C2)
(ii) Infinitely many solutions (iii) Unique solution
- $$\begin{aligned} x + 2y - z &= 3 \\ 3x - y + 2z &= 3 \\ 4x + y + (\beta^2 - 8)z &= \beta + 3 \end{aligned}$$
- b) Using only elementary row transformations to reduce P to I, identify the inverse of P when CO-1 [5]
(C2)
- $$P = \begin{pmatrix} 3 & -3 & 4 \\ 2 & -3 & 4 \\ 0 & -1 & 1 \end{pmatrix}$$