



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

Mid-Term Examination, Summer – 2026

Course Code: 0541-113
Section: A, B, C, D, E, F
Full Marks: 25

Course Title: Linear Algebra and Complex Variable
Level-Term: L1-T1
Date: June 29, 2026

Teacher's Initial: HRP, SS
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-Hermitian Matrix (ii) Consistent SLE
b) Identify whether the following system of linear equations is consistent or inconsistent. CO-1 [3]
(C2)

$$\begin{aligned}x + y - 2z + s + 3t &= 1 \\2x - y + 2z + 2s + 6t &= 2 \\3x + 2y - 4z - 3s - 9t &= 3\end{aligned}$$

- Q2.** a) Using only elementary row transformations to reduce Q to I, identify the inverse of Q when CO-1 [5]
(C2)

$$Q = \begin{pmatrix} -1 & 2 & -3 \\ 2 & 1 & 0 \\ 4 & -2 & 5 \end{pmatrix}$$

- b) Identify the echelon form, row reduced echelon form and normal form of the following matrix CO-1 [5]
(C2)

$$M = \begin{pmatrix} 1 & 2 & 3 & 0 \\ 2 & 4 & 3 & 2 \\ 3 & 2 & 1 & 3 \\ 6 & 8 & 7 & 5 \end{pmatrix}$$

- Q3.** a) Categorize the values of 'δ' for which the following system of linear equations has CO-1 [5]
(C2)
i) No solution
ii) Infinitely many solutions
iii) Unique solution

$$\begin{aligned}u + v - w &= 1 \\2u + 3v + \delta w &= 3 \\u + \delta v + 3w &= 2\end{aligned}$$

- b) Express W as the sum of symmetric matrix and skew-symmetric matrix, CO-1 [5]
(C2)

where $W = \begin{pmatrix} \tan 45^\circ & \frac{d}{dt}(t^2 + 4t)\big|_{t=2} & e^0 \\ \ln e^2 & \left| \begin{pmatrix} 2 & 1 \\ 4 & 3 \end{pmatrix}^T \right| & \lim_{t \rightarrow 2} (t+3) \\ |-5| & \frac{4!}{3!} & \sqrt{16} \end{pmatrix}$