

**IMSc in IT DMVI (NEP) Sem.-3 Examination
MDC-DMVI-234T**

Mathematical Foundation of Computer Science

Time : 1.00 Hour]

December-2025

[Max.Marks : 25

Instructions:

- Figures to the right indicate Full Marks.
- Do not write anything on the question paper.
- Simple calculator is allowed. Do not use a scientific calculator.

Marks

Q.1 Answer the following question:

- (1) Find Inverse of matrix using adjoint method.

[05]

$$A = \begin{bmatrix} 5 & 4 & 4 \\ 3 & 1 & 2 \\ 2 & 2 & 4 \end{bmatrix}$$

- (2) Find Given Solution:

[05]

$$A = \begin{bmatrix} 1 & 0 & -2 \\ 3 & 7 & 5 \\ 5 & 4 & 0 \end{bmatrix} \quad B = \begin{bmatrix} -1 & 7 & 4 \\ 0 & 2 & -5 \\ 3 & 7 & 8 \end{bmatrix}$$

Find,

- 1) $A + 2B$
- 2) AB
- 3) $A - 4B$

OR

- (1) Find Rank of Matrix by elementary method.

[05]

$$X = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 4 \\ 3 & 5 & 7 \end{bmatrix}$$

- (2) Find inverse of matrix by elementary method.

[05]

$$A = \begin{bmatrix} 6 & -2 & 1 \\ -4 & 1 & -1 \\ 1 & 0 & 1 \end{bmatrix}$$

Q.2 Answer the following Question:

- (1) Find value of system of linear equation by Guess Elimination method:

[05]

$$\begin{aligned} x - y + 2z &= 3 \\ x + 2y + 3z &= 5 \\ 3x - 4y - 5z &= -13 \end{aligned}$$

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- (2) Find value of system of linear equation by L-U [05]
decomposition method:

$$6x + 18y + 3z = 3$$

$$2x + 12y + z = 19$$

$$4x + 15y + 3z = 0$$

OR

- (1) Find value of system of linear equation by Cramer's rule: [05]

$$x + 2y + 4z = 8$$

$$2x + 3y + 5z = 10$$

$$3x + 2y + 6z = 15$$

- (2) Find value of system of linear equation by L-U [05]
decomposition method:

$$x + 2y + 3z = 9$$

$$4x + 5y + 6z = 24$$

$$3x + y - 2z = 4$$

Q.3 Choose the correct option.

- 1 The order of the matrix with 3 row and 4 columns is? [05]
(a) $4 * 3$ [01]
(b) $1 * 7$
(c) $3 * 4$
(d) $7 * 1$
- 2 Find the determinant of matrix $\begin{bmatrix} 1 & -2 \\ 4 & -4 \end{bmatrix}$ [01]
(a) 2 (c) -4
(b) -2 (d) 4
- 3 The number of elements in $3 * 5$ matrix [01]
(a) 15 (c) 20
(b) 8 (d) 10
- 4 Which of the following matrices is skew - symmetric? [01]
(a) A matrix in which elements across the diagonal are equal
(b) A matrix in which all elements are equal
(c) A matrix where $A^T = -A$
(d) A matrix in which only diagonal elements are zero
- 5 A matrix with only one Column is called? [01]
(a) Row matrix (c) Square matrix
(b) Column matrix (d) Diagonal matrix

Best of Luck