

Duration: 50 min.

Max.Marks: 25

**Note: Attach the Question Paper with the Answer sheet.**

**Part - A : (3 x 4 = 12 marks)**

1. Find the sum and product of the eigen values of the

matrix  $A = \begin{bmatrix} 1 & 2 & -2 \\ 1 & 0 & 3 \\ -2 & -1 & -3 \end{bmatrix}$

2. Find the constant a and b such that the matrix

$\begin{bmatrix} a & 4 \\ 1 & b \end{bmatrix}$  has 3 & -2 as its Eigen values.

3. Use Cayley Hamilton theorem to find the inverse of

$A = \begin{bmatrix} 7 & 3 \\ 2 & 6 \end{bmatrix}$

**Part - B : (1x13 = 13 marks)**

4. Reduce the quadratic form

$2x_1^2 + x_2^2 + x_3^2 + 2x_1x_2 - 2x_1x_3 - 4x_2x_3$  to canonical form by an orthogonal transformation. Also find the rank, index, signature and nature of the quadratic form.