DELHI TECHNICAL CAMPUS

B.TECH SEM - I (Assignment No. 3)

APPLIED MATHEMATICS-I Paper Code: BS- 111

1.The matrix A= $\begin{bmatrix} 2 & 0 & -1 \\ 5 & 1 & 0 \\ 0 & 1 & 3 \end{bmatrix}$ satisfies the matrix equation

$A^3 - 6A^2 + 11A - I = 0$, *where I is an identity matrix of order* 3. *Find* A^{-1}

2. Examine the following vectors for linear dependence and find the relation between them, if possible: $X_1 = (1, 1, -1, 1), X_2 = (1, -1, -2, -1), X_3 = (3, 1, 0, 1)$.

3. Reduce the matrix A to its normal form where A=

0	4	2	1
0	1	2	2
3	-2	6	1

4. Find for what value of A, B the system of linear equation:

$x + y + z = 6$

$x + 2y + 5z = 10$

$2x + 3y + BZ = A$

has (i) A unique solution (ii) No solution (iii) Infinite solution.

5. Find the Eigenvalues and Eigenvectors of the following matrix A:

1	0	-1
2	2	2
1	1	2

10. For the matrix $A = \begin{bmatrix} 4 & 1 & 0 \\ 1 & 4 & 1 \\ 0 & 1 & 4 \end{bmatrix}$, determine a matrix P such that P^{-1}AP is a diagonal matrix.