SUBJECT: ENGINEERING MATHEMATICS (BAS 103)
UNIT-I

Assignment -2

Date of Issue: 26/09/2024   Date of Submission:

1.a)Use Cayley –Hamilton Theoram to find the inverse of the matrix

$$\begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$$

b)Show that the vectors x_1=(0,1,a), x_2=(1,a,1)and (a,1,0) are linearly dependent ,then find the value of a.

c)Solve the system of homogenous equation .

$$x_1 + x_2 + x_3 + x_4 = 0, x_1 + 3x_2 + 2x_3 + 4x_4 = 0, 2x_1 + x_2 - x_3 = 0$$

d)Two Eigen Values of the matrix A=$\begin{bmatrix} 2 & 2 & 1 \\ 1 & 3 & 1 \\ 1 & 2 & 2 \end{bmatrix}$ are equal to 1 .Find the eigen values of A^{-1}

2.a)Find the Eigen Values and Eigen Vector of the matrix

$$\begin{bmatrix} 1 & 1 & 0 \\ 0 & 1 & 1 \\ 1 & 0 & 1 \end{bmatrix}$$

b)Also find the eigen values of A^{-1},det of A

3. Using Cayley –Hamilton theorem ,find the inverse of the matrix

A=$\begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 5 \\ 3 & 5 & 6 \end{bmatrix}$

B=$A^8 - 11A^7 - 4A^6 + A^5 + A^4 - 11A^3 - 3A^2 + 2A + I$ as a quadratic polynomial in A and hence find B.

4. Find for what Value of α and β, *the system* of linear equations

x+y+z=6,x+2y+5z=10,2x+3y+$\alpha z = \beta$ has no solution and also find the solution when $\alpha = 2 and \beta = 10$