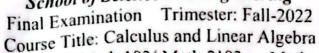
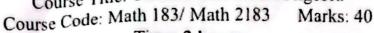
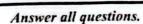
United International University School of Science and Engineering





Time: 2 hours



1. a) Solve the following system by the elementary row operation. 2x - 2y + 4z + 6q = 06x + 2y - 4z + 2q = 4-2x + 4y - 2z - 2q = -2[4]

b) Solve the homogeneous system of linear equation.

$$3x - 6y + 3z - 3w = 0$$

$$-3y + 2z + w = 0$$

$$6x - 2y + z - w = 0$$
[3]

c) Find the reduced row echelon form the matrix.

$$A = \begin{bmatrix} 0 & 1 & 1 \\ 2 & 4 & 1 \\ 3 & 2 & 0 \end{bmatrix}$$
 [3]

2. (a) Find the Eigenvalues and corresponding Eigenvector of [4+1] matrix $A = \begin{bmatrix} 1 & 2 \\ 4 & 3 \end{bmatrix}$. Also draw the Eigen-space in xy -plane.

b) i) Find the inverse of
$$A = \begin{bmatrix} -1 & 1 & 0 \\ 2 & -1 & 1 \\ 1 & 3 & 1 \end{bmatrix}$$
. [4]
ii) If $X = A^{-1}A$, what is X ?

3. Consider a Matrix $A = \begin{bmatrix} 1 & 5 \\ 2 & -3 \end{bmatrix}$ [3]

i) Find p(A) for $p(x) = x^2 - 2x + 3$. [2]

ii) Verify that $(A^T)^{-1} = (A^{-1})^T$. [2]

iii) Find x, Such that $tr(A) = x^2 + 2x$. [2]

iv) Find A^{-3} .

v) Find
$$AB$$
, where $B = \begin{bmatrix} 1 & 5 \\ 1 & 9 \\ 7 & 4 \end{bmatrix}$. [1]

(a) Solve
$$y'' - 8y' + 16y = e^{-4x} + \sin 4x - 2$$
. [6]

b) Solve the initial value problem
$$y'' - 6y' + 9y = 0$$
; $y(0) = -2$, $y'(0) = 1$ [4]