

**KOLHAPUR INSTITUTE OF TECHNOLOGY'S,
COLLEGE OF ENGINEERING (AUTONOMOUS), KOLHAPUR**

Tutorial No-2

Title: Advanced linear algebra.

Course Name: Computational Mathematics.

Class: S.Y.B.Tech (CSE- B)

Date-28/09/2022

Q 1) Determine the largest eigen values and the corresponding eigen vector of the matrix using power method.

✓ a) $A = \begin{bmatrix} 4 & 1 \\ 1 & 3 \end{bmatrix}$ Taking initial eigen vector $X = \begin{bmatrix} 0 \\ 1 \end{bmatrix}$

✓ b) $A = \begin{bmatrix} 1 & -3 & 2 \\ 4 & 4 & -1 \\ 6 & 3 & 5 \end{bmatrix}$ Taking initial eigen vector $X = \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix}$

✓ c) $A = \begin{bmatrix} 2 & -1 & 0 \\ -1 & 2 & 5 \\ 3 & 2 & 9 \end{bmatrix}$ Taking initial eigen vector $X = \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix}$

✓ d) $A = \begin{bmatrix} 1 & 6 & 1 \\ 1 & 2 & 0 \\ 0 & 0 & 3 \end{bmatrix}$ Taking initial eigen vector $X = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$

Q 2) Solve the following system of nonlinear equations

i) $x^2 + y = 11, y^2 + x = 7$ with initial approximation $x_0 = 3.5$ and $y_0 = -1.8$.

ii) $x + y^2 = 5, x^2 + y = 11$ with initial approximation $x_0 = 1$ and $y_0 = 2$

iii) $x^2 - y^2 = 4, x^2 + y^2 = 16$ with initial approximation $x_0 = y_0 = 2.828$

iv) $2x^2 + 3xy + y^2 = 3, 4x^2 + 2xy + y^2 = 30$ with initial approximation $x_0 = -3$ and $y_0 = 2$