

- Q.1. Write a short note on Rutishauser method
- Q.2. Define and illustrate diagonally dominant matrix
- Q.3. $A = \begin{bmatrix} 1 & 2 \\ 3 & 2 \end{bmatrix}$ find E.V of A & A^{-1}
- Q.4. Explain pivoting process.
- Q.5. Find multiplicity of root $\xi = 2$ of eqⁿ
 $x^4 - 5x^3 + 6x^2 + 4x - 8 = 0$ by synthetic division method.
- Q.6. Write Newton Raphson formula for multiple roots of $f(x)$.
- Q.7. If eqⁿ $f(x) = 0$ is of form $x = \phi(x)$ explain one point iteration method and its convergence.
- Q.8. Explain Decomposition method.
- Q.9. What is difference between jacobi & given's method?
- Q.10. Find E.V & Eigen vectors of Matrix
 $A = \begin{bmatrix} 1 & 2 & 3 \\ 0 & 2 & 3 \\ 0 & 0 & 2 \end{bmatrix}$
- Q.11. Write initial approximation to find the quadratic factor of $f(x) = x^3 - 2x^2 + x - 2$ by lim-bairstow method.

- Q.12. Define Sturm sequence.
- Q.13. Define with illustration ill conditioned and well conditioned linear system of simultaneous eqⁿ.
- Q.14. Obtain complex root of eqⁿ $z^3 + 1 = 0$
- Q.15. Define iteration method.
- Q.16. Derive Muller's method for computation of root of $f(x) = 0$
- Q.17. Explain relaxation method
- Q.18. Define Aitken Δ^2 method.
- Q.19. Explain power method.
- Q.20. Write a short note on numerical computation of E-values of a Hermitian matrix.

- Q.1 Find root of eqⁿ $x^4 - x - 10 = 0$ correct upto six decimal places by chebyshev third order method.
- Q.2. Solve following system of non linear eqⁿ

$$x^2 + y = 11$$

$$x + y^2 = 7$$
 using iterative method
- Q.3. Find complex roots of eqⁿ $z^4 + z^3 + 5z^2 + 4z + 4 = 0$ using newton raphson method taking $z_0 = -1 + i$
- Q.4. Using synthetic division and applying birge-vieta method find smallest root of eqⁿ $2x^3 - 5x + 1 = 0$. Also find deflated polynomial.
- Q.5. Use bairstow method to resolve into quadratic factors of polynomial $x^4 - 5.7x^3 + 26.7x^2 - 42.21x + 69.2$ and find all zeroes.
- Q.6. Using graeffe's squaring root method, find ~~of~~ roots of eqⁿ $x^3 - 4x^2 + 3x + 1 = 0$
- Q.7. Locate roots of eqⁿ $2x^4 + 7x^3 - 4x^2 + 29x + 14 = 0$ using sturm sequence.

Q.8. Find inverse of matrix $A = \begin{bmatrix} 1 & -1 & 3 \\ 3 & 0 & 1 \\ 1 & 0 & 2 \end{bmatrix}$ using Gauss Jordan method.

Q.9. Solve system of linear eqⁿ

$$x + 2y + 3z = 5$$

$$2x + 8y + 2z = 6$$

$$3x + 22y + 8z = -10 \text{ using Chebysky method}$$

Q.10. using crout's method solve

$$6x_1 - x_2 = 3$$

$$-x_1 + 6x_2 - x_3 = 4$$

$$-x_2 + 6x_3 = 3$$

Q.11. Solve $4x - 3y = 14$

$$2x + 2y + 3z = 9$$

$$6x + y - 6z = -8$$

using Doolittle's method.

Q.12. Solve $8x_1 + x_2 - x_3 = 8$

$$2x_1 + x_2 + 9x_3 = 12$$

$$x_1 - 7x_2 + 2x_3 = -1$$

by relaxation method.

Q.13. Solve system of linear eqⁿ by Jacobi and Gauss Seidel method. In how many iterations, the exact solution $x_1 = 2$, $x_2 = 1$, $x_3 = 1$ is achieved?

$$6x_1 - 2x_2 + x_3 = 11$$

$$x_1 + 2x_2 - 5x_3 = -1$$

$$-2x_1 + 7x_2 + 2x_3 = 5$$

Q.14. Find E.V. of following Hermitian matrix

$$\begin{bmatrix} 2 & -i & 0 \\ i & 2 & 0 \\ 0 & 0 & 3 \end{bmatrix}$$

Q.15. Using Given's method, transform matrix to tridiagonal form and compute largest E.V.

$$\begin{bmatrix} 1 & 2 & 2 \\ 1 & 2 & 2 \\ 2 & 2 & 1 \end{bmatrix}$$

Q.16. Find E.V of matrix using reitishauser method

$$\begin{bmatrix} 6 & 4 & 4 & 1 \\ 4 & 6 & 1 & 4 \\ 4 & 1 & 6 & 4 \\ 1 & 4 & 4 & 6 \end{bmatrix}$$

Q.17. Find all E.V. and corresponding Eigen vectors of matrix

$$\begin{bmatrix} 1 & \sqrt{2} & 2 \\ \sqrt{2} & 3 & \sqrt{2} \\ 2 & \sqrt{2} & 1 \end{bmatrix} \text{ using Jacobi method.}$$

Q.18. Obtain dominant E.V and Eigen vectors of

matrix $\begin{bmatrix} 2 & 3 & 2 \\ 4 & 3 & 5 \\ 3 & 2 & 9 \end{bmatrix}$ using power method.

Q.19. Discuss rate of convergence of iteration method.