

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- 1.a) Give the comparison of different iterative methods of solving an equation.
b) Using Bisection method, solve the equation $\sin x = 1 - x$. [15]

2. For the following data interpolate at $x = 3.5$ and $x = 8.0$. [15]

x	1	3	4	5	7	10
f(x)	3	31	69	13	351	1011

3. Solve the following system of linear equations by Gauss Jordan method. [15]

$$2x_1 + 4x_2 - 6x_3 = -4$$

$$x_1 + 5x_2 + 3x_3 = 10$$

$$x_1 + 3x_2 + 2x_3 = 5$$

4. Use the method of least squares to fit the curve $f(x) = C_0x + (C_1/\sqrt{x})$ for the following data: [15]

x	0.2	0.3	0.5	1	2
f(x)	16	14	11	6	3

- 5.a) Obtain the error function for Trapezoidal rule.

- b) Evaluate the integral $I = \int_0^1 \frac{dx}{1+x}$ using Trapezoidal rule. [15]

6. Find the largest Eigen value of the matrix $A = \begin{bmatrix} 2 & 1 & 1 & 0 \\ 1 & 1 & 0 & 1 \\ 1 & 0 & 1 & 1 \\ 0 & 1 & 1 & 2 \end{bmatrix}$ using Power method. [15]

7. Use the Euler method to solve numerically the initial value problem $u' = -2 + u^2$, $u(0) = 1$ with $h = 0.2, 0.1$ and 0.05 on the interval $[0, 1]$. [15]

8. Write short notes on:

- a) Laplace equations
b) Parabola equations. [15]