UNIT V: NUMERICAL METHODS

1 Use method of Bisection to find a root of equation, = ^{x}.
(4 iterations)

2 Use method of Regula Falsi to find a root of equation, $x^3 - 3 + 1 = 0$.
(4 iterations)

3 Use Secant method to find a root of equation, $x^3 - 3x + 1 = 0$.
(4 iterations)

4 Find value of $17^{\frac{1}{3}}$ by using Newton-Raphson method correct up to 3 decimal places.

5 Solve the equation $x^2 - 4x + 2 = 0$ using method of simple iterations.
(4 iterations)

6 Solve the following system of equation by using Gauss elimination method,

$$4x_1 + {}_2 + 4x_3 = 4$$
$$_1 + 4\ {}_2 - 2\ {}_3 = 4\ 3$$
$$x_1 + 2\ {}_2 - 4\ {}_3 = 6$$

7 Solve the system of equation by using L-U decomposition method

$$2x_1 + 2x_2 + 3x_3 = 4$$
$$4x_1 - 2x_2 + x_3 = 9$$
$$x_1 + 5x_2 + 4x_3 = 3$$

8 If $f(x) = x^2 - x - 2$ then for $\phi(x) = \frac{x+2}{x}$ with $x_0 = 1.5$, find four iteration $for\ x$

9 Solve the system of equation by using Gauss Seidel iteration method.

$$x_1 + 5x_2 + 2x_3 = -6$$
$$x_1 + 2x_2 + 3x_3 = -4$$
$$4x_1 + x_2 + x_3 = 2$$ (3 iteration)

10 Solve the system of equation by using Gauss Jacobi method.

$$x_1 + 2x_2 + x_3 = 8\ 2$$
$$x_1 + 3x_2 + 4x_3 = 20$$
$$4x_1 + 3x_2 + 2x_3 = 16$$

11 Using secant method , the first four approximation to a root of equation $x^3 - 5x - 7 = 0,$ if $x_0 = 2.5$ and $x_1 = 3$

12 By using Bisection method, solve equation, $x^3 - 3x + 1 = 0$ (given root belongs to interval [0,1])

13 Solve x = 0.24 sin (x + 0.5) correct tap to 4 decimals by using method of simple iteration

14 Use Newton's method to find the root of 2x – 3 cosx = 0 which is near to 0.9.

14 Use bisection method to find root of equation $x^4+2x^3-x-1=0$ lying in interval $[0,1]$ at end of 6th iteration.

15 Use Secant method to find root of equation $x^3-5x-7=0$ correct upto three decimal places.

16 Use Secant method to find root of equation $xe^x=cosx$ correct upto four decimal places.

17 Use Regula-Falsi method (method of false position) to find root of equation $x=e^{-x}$ correct to three decimal places with initial approximations 0.5 & 1

18 Use Regula-Falsi method (method of false position) to find root of equation $x\log_{10}x=1.2$ correct to three decimal places with initial approximations 0.5 & 1

19 Use Newton-Raphson method to find root of equation $x^3+2x-5=0$ at the end of fifth iteration.

20 Use Newton-Raphson method to find root of equation $x^2+4\sin x=0$ correct to four decimal places

21 Solve system of linear equations by using Gauss Elimination method

$$x+4y-z=-5$$
$$x+y-6z=-12$$
$$3x-y-z=4$$

22 Solve system of linear equations by using Triangular Factorization (LU decomposition) method

$$3x_1+x_2+x_3=4$$
$$x_1+2x_2+2x_3=3$$
$$2x_1+x_2+3x_3=4$$

23 Solve system of linear equations by using Cholesky method

$$4x_1-2x_2=0$$
$$-2x_1+4x_2-x_3=1$$
$$-x_2+4x_3=0$$

24 Solve system of linear equations by Jacobi's Iteration method

$$28x_1+4x_2-x_3=32$$
$$x_1+3x_2+10=24$$
$$2x_1+17x_2+4x_3=35$$

25 Solve system of linear equations by Gauss-Seidel Iteration method

$$28x_1+4x_2-x_3=32$$
$$x_1+3x_2+10=24$$
$$2x_1+17x_2+4x_3=35$$

26 Use method of Successive Approximation to find root of equation $8x^3-6x-1=0$ correct upto four decimal places considering initial value as 0.95