

(4)

- (b) Solve the following linear system using matrix inversion method: 5

$$3x + 2y + 3z = 16$$

$$x + 6y + 2z = 11$$

$$2x + 4y + z = 9$$

4. (a) Find the root of the equation $x^5 - 3x^2 = 100$ correct upto three decimal place using : 3 + 4

(i) Bisection Method

(ii) Newton-Raphson Method.

- (b) Give the geometrical significant of Newton-Raphson Method. 3

5. (a) Discuss the solution of Partial differential equation by Finite-Difference method. 5

- (b) Solve the Laplace equation for square region with boundary condition shown below in the figure. 5

0			
1		u_4	u_3
	u_1	u_2	
2			
3			

(5)

6. (a) Fit the following data set using : 7

(i) Linear fit

(ii) Quadratic fit

x	1	3	5	7	9
y	4	6.5	8.7	10	11

- (b) Construct the Lagrange interpolated polynomial using above data. 3

7. (a) Using Runge-Kutta method, find out y at $x = 0.4$ from the following differential equations using $h = 0.2$ with initial values at $x = 0, y = 1$ and $dy/dx = 0$.

$$\frac{d^2y}{dx^2} = xy + 1 \quad 6$$

- (b) Discuss how to solve Schrödinger equation for linear one dimensional Harmonic Oscillator potential (explain the boundary conditions). 4

8. (a) Derive the n th differences of a polynomial and discuss the results. 4

- (b) Derive the Newton's Backward formula of interpolation. 6