

## COMPUTATIONAL AND NUMERICAL METHODS

### Lab-2

Date: 22-08-2016

Q.1) Perform 4 iterations of the Newton's method to solve the following system of equations:

$$x^2 + xy + y^2 = 7;$$

$$x^3 + y^3 = 9;$$

Take initial values:  $x_0 = 1.5$

$$y_0 = 0.5$$

Q.2) Solve the following system of equations

$$4x_1 + 4x_2 + x_4 = 2;$$

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

$$x_2 + 4x_3 + x_4 = 2;$$

$$x_1 + x_3 + 4x_4 = -2;$$

By using Jacobi iteration method, starting with the initial  $X_0 = [0 \ 0 \ 0 \ 0]^T$ . Perform 4 iterations.

Q.3) Solve the following system of linear equations using Gauss elimination method:

$$10x_1 - x_2 + 2x_3 = 4;$$

$$x_1 + 10x_2 - x_3 = 3;$$

$$2x_1 + 3x_2 + 20x_3 = 7;$$