**Lab Experiment no. 5**

**Initial Value Problem (Euler's Method)**

Matlab Code

% f(t,y) = y-t^2+1 , intial value= 0.5 , point (0,2), N=10

clc

format short

z=input('enter the function: ','s')

f=inline(z)

y0=input('enter the initial value: ')

a=input('Enter the start-point: ')

b=input('Enter the end-point: ')

N=input('Enter the step size: ')

h=(b-a)/N

t=[a:h:b];

w(1)=y0;

disp(' i , t(i) , w(i)')

for i=1:(N+1)

w(i+1)=w(i)+h.\*f(t(i),w(i));

disp([i,t(i),w(i)])%if wrote (i-1) queue start(0-10)

end

**Initial Value Problem (Runge-Kutta Method)**

Matlab Code

% f(t,y) = y-t^2+1 , intial value= 0.5 , point (0,2), N=10

clc

format short

z=input('enter the function: ','s')

f=inline(z)

y0=input('enter the initial value: ')

a=input('Enter the start-point: ')

b=input('Enter the end-point: ')

N=input('Enter the step size: ')

h=(b-a)/N

t=[a:h:b];

w(1)=y0;

disp(' i , t(i) , w(i)')

for i=1:(N+1)

k1=h.\*f(t(i),w(i));

k2=h.\*f(t(i)+h/2,w(i)+k1/2);

k3=h.\*f(t(i)+h/2,w(i)+k2/2);

k4=h.\*f(t(i)+h,w(i)+k3);

w(i+1)=w(i)+(k1+2\*k2+2\*k3+k4)/6;

disp([i,t(i),w(i)])%if wrote (i-1) queue start(0-10)

end