Course Code: MS424/MI310 Course title: Computer Lab Assignment-III, Date: 15.05.2015

Students are advised to study following algorithms and make proper C codes to execute properly. You are advised to complete and submit this assignment within 20.05.2020.

RUNGEKUTTA SECOND ORDER METHOD

Solve dy/dx=x+y at x=0.4 in four steps given y(0)=1 using Rungekutta second order method.

ALGORITHM:

Step 1: Read x1,y1, initial values Step 2: Read a, value at which function value is to be found Step 3: Read n, the number of subintervals Step 4: count=0 Step 5: h=(a-x1)/n Step 6: write x1,y1 Step 7: k1=h*f(x1,y1) Step 8: k2=h*f(x1+h,y1+k1) Step 9: y2=y1+(k1+k2)/2 Step 10: x2=x1+h Step 11: write x2,y2 Step 12: count=count+1 Step 13: If count<n Then x1=x2y1=y2 Go to Step 7 Endif Step 14: write x2,y2 Step 15: Stop

RUNGE-KUTTA FOURTH ORDER METHOD

Solve dy/dx = x+y at x = 0.4 in 4 steps given y(0)=1 using Runge Kutta fourth order method.

ALGORITHM:

Step 1: Read x1,y1 initial values. Step 2: Read a, value at which function value is to be found. Step 3: Read n, the number of steps. Step 4: count=0 Step 5: h=(a-x1)/n Step 6: write x1,y1 Step 7: s1=f(x1,y1) Step 8: s2=f(x1+h/2,y1+s1*h/2) Step 9: s3=f(x1+h/2,y1+s2*h/2) Step 10: s4=f(x1+h,y1+s3*h) Step 11: y2=y1+(s1+2*s2+2*s3+s4)*h/6 Step 12: x2=x1+h Step 13: write x2,y2 Step 14: count=count+1 Step 15: If count<n . then x1=x2 y1=y2 go to step step 7 endif Step 16: write x2,y2 Step 17: Stop