M06301

Reg:.....
Name:.....

THIRD SEMESTER MCA DEGREE EXAMINATION – JUNE 2006
MCA 2K 301 – NUMERICAL ANLYSIS & OPTIMIZATION TECHNIQUES

Time : 3 Hours **Marks:100**

Answer any *five* Questions

1.

a. Using Regula–Falsi method, find the positive root of the equation $x^3+2x^2+10x-20=0$, correct to three places of decimals.

b. Solve by Crout's triangularisation method, the system of equations
$x+y+2z=7$, $3x+2y+4z=13$, $4x+3y+2z=8$

2.

a. Find the values of y at x=21 and x=28 from the following table

x	20	23	26	29
y	0.3420	0.3907	0.4384	0.4848

b. Using Lagrange's interpolation formula find y (6) from the following data

x	1	2	7	8
y	4	5	6	7

3.

a. Find dy/dx and d^2y/dx^2 at x=0, from the following data

x	0	1	2	3	4
y	4	8	15	7	6

b. Evaluate $_0\int^1 e^{-x^2}\,dx$, using Simpson's rule and by dividing the range of integration in to 4 equal parts.

4.

a. Using Taylor's series method, solve the equation $dy/dx=x^2+y^2$, given y=1, when x=0 and get y (0.1).

b. Use Euler's method to solve the equation $dy/dx=xy$ given y (0) =1 and find y (0.4).

5.

Using Runge-Kutta method, solve the equations $dy/dx=y-x$, given y (0) = 2 and taking h= 0.1 and get the value of y (0.2) in two steps.

6.

Using Simplex method, solve the LPP
Maximize $z=5x_1+3x_2$ subject to the constraints
$x_1+x_2<=2$, $5x_1+2x_2<=10$, $3x_1+8x_2<=12$ $x_1,x_2>=0$

PTO