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Register Number:
Name of the Candidate:

B.Sc. DEGREE EXAMINATION December 2014

(COMPUTER SCIENCE)

(FIRST YEAR)

140/130. SCIENTIFIC COMPUTING
(Common for B.Sc IT, B.C.A)

Time: Three hours Maximum: 100 marks

Answer any FIVE questions **(5× 20 = 100)**

1. a) Find the positive root of $x^3-x=1$ by bisection method.

   b) Using Newton –Raphson method solve the following equation x tan x=1.28

2. a) Solve for a positive root of $x^3-4x+1=0$ by Regular Falsi method.

   b) Solve to system by Gauss –elimination method 2x+3y-z=5; 4x+4y-3z=3; 2x-3y+2z=2

3. a) Solve by Crout's method.

   x+y+z=3, 2x-y+3z=16, 3x+y-z=-3

   b) Solve the following system of equation by using Gauss-Seidel method.

   8x-3y+2z=20, 4x+11y-z=33; 6x+3y+12z=35

4. a) From the following data find y(46)

x	45	50	55	60	65
y	114.84	96.16	83.32	74.48	68.48

   b) Use Lagrange's formula to fit a polynomial to the data

x	-1	0	2	3
y	-8	3	1	12

5. a) Evaluate $\int_0^1 \frac{dx}{1+x^2}$ using trapezoidal rule with h=0.2.

   b) Using Taylor series method. Find y(0.1) given $\frac{dy}{dx} = x^2 + y^2$ and y(0)=1

6. a) Apply the fourth order Runge –Kutta method to find y(0.2) given that y'=x+y, y(0)=1.

b) Given $\frac{dy}{dx}=\frac{1}{2}(1+x^2)y^2$, y(0)=1, y(0.1)=1.06 y(0.2)=1.12 and y(0.3)=1.21 evaluate y(0.4) by Milne's method.

7. a) Solve $y_{x+2}-5y_{x+1}+6y_x=x^2+x+1$

b) Fit a straight line to the following data

x	1	2	3	4	5	6
y	14	27	41	56	68	75

8. Solve $U_{xx}+U_{yy}=0$ over the square mesh of side 4 units satisfying the following boundary conditions.

i) u(0,y)=0 for $0 \le y \le 4$

ii) u(4,y)=12+y for $0 \le y \le 4$

iii) u(x,0)=3x for $0 \le x \le 4$

iv) $u(x,4)=x^2$ for $0 \le x \le 4$

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