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BCA-401

Roll No.

BACHELOR OF COMPUTER APPLICATIONS
FOURTH SEMESTER END TERM EXAMINATION
APRIL, 2010

COMPUTER ORIENTED NUMERICAL METHODS

Time : 3 Hrs.

Maximum Marks : 70

SECTION - A (30 Marks)

Attempt any 5 questions.

Each question carries 6 marks.

1. By using Regula Falsi method, find the approximate root of the equation

$$2x - \log(x) = 6$$

up to four decimal places.

2. Using Gauss Elimination Method solve the following simultaneous algebraic equations

$$2x + 2y + z = 12$$

$$3x + 2y + 2z = 8$$

$$5x + 10y - 8z = 10$$

P.T.O.

3. What are errors? Explain different types of errors with example. Calculate relative and percentage error if 64.239 is rounded off to three significant figures.
4. Given $dy/dx = (y-x)/(y+x)$ with initial condition $y = 1$ at $x = 0$; find y for $x = 0.1$ by Euler's method.
5. Evaluate

$$\int_0^n dx/1+x^2$$

By using Simpson's 1/3 rule and compare the results with the actual value.

6. From the following table estimate the number of students who obtained marks between 40 and 45

Marks	30-40	40-50	50-60	60-70	70-80
No. of students	31	42	51	35	31

SECTION - B (20 Marks)

Attempt any 2 questions.

Each question carries 10 marks.

7. Perform the following arithmetic operations with Normalized Floating Point numbers :

(a) $.4546 E 5 \quad + \quad .5433 E 7$

- (b) $.5452 \text{ E } -99$ $-$ $.5424 \text{ E } -99$
 (c) $.1111 \text{ E } 51$ $*$ $.4444 \text{ E } 50$
 (d) $.1000 \text{ E } 5$ $/$ $.9999 \text{ E } 3$

8. Find the roots of the equation up to four decimal places

$$x^4 + x^3 - 7x^2 - x + 5 = 0$$

using Newton Raphson Method

9. The following table gives the viscosity of an oil as a function of temperature. Use Lagrange's formula to find viscosity of oil at a temperature of 140°

Temp $^\circ$	110	130	160	190
Viscosity	10.8	8.1	5.5	4.8

SECTION - C (20 Marks)
(Compulsory)

10. (a) Find the cubic polynomial which takes the following values :

x	0	1	2	3
f(x)	1	2	1	10

Hence or otherwise evaluate $f(4)$.

(b) Given that

x	1.0	1.1	1.2	1.3	1.4	1.5	1.6
y	7.989	8.403	8.781	9.129	9.451	9.750	10.031

Find dy/dx and d^2y/dx^2 .