2017

MCA

2nd Semester Examination

COMPUTER ORIENTED NUMERICAL METHODS

PAPER—MCA-205

Full Marks : 70

Time : 3 Hours

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Answer any *five* questions

1. (a) What is the difference between rounding and chopping of a number.

   (b) What is the difference between accuracy and precision.

   (c) Convert the decimal numbers, 123.4 into IEEE 754 floating point standing single precision representation.

   (d) Define : Absolute precent Relative Error, and estimated absolute percent relative error.

                                        2+2+4+(3+3)

2. (a) Evaluate $\int_0^1 \dfrac{1}{1+x}\,dx$ with $h = \dfrac{1}{6}$ by Simpson's 1/3rd rule. Compare the results with the actual value.

(b) From the following table, find $f(7.5)$ 7+7

x :	1	2	3	4	5	6	7	8
$f(x)$:	1	8	27	64	125	216	343	512

3. (a) Solve the following system of equations.

$$10x + 2y + z = 18$$
$$x + 10y - z = -22$$
$$-2x + 3y + 10z = 22$$

by Gauss-Seidel interation method (take two iteration).   7

(b) Find a real root of the equation $f(x) = x^3 - 2x - 5 = 0$ by Regula False method. (Perform two iterations).

       7+7

4. (a) Use central difference Interpolations formulaa to evalute $f(1.22)$ given

x :	1.0	1.1	1.2	1.3
$f(x)$:	8.403	8.781	9.129	9.451

       (Continued)

(b) Apply Inverse Lagrange's method to find the value of x when $f(x) = 15$ from the given date.

x :	5	6	9	11
$f(x)$:	12	13	14	16

5. (a) Find the root of $f(x) = x^2 - 3$ using Bisection method where $E_{step} = 0.01$ and $E_{abs} = 0.01$ and start interval $[1,2]$.   7

(b) Estimate using Simpson's $1/3$ rule with $n = 6$ 7

$$\int_{-3}^{4} \sqrt{1 + x^3}\,dx$$

[Internal Assessment — 30 marks]

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