Computer Oriented Numerical Methods
Paper – CSM-354 Semester -V
(Syll-Dec-2019)

Time: 02:00 hours

Marks: 30

Note: Students need to attempt any four questions in all. All questions will carry equal marks.

Section – A

I.
   a. Explain the number system and binary representation of numbers. Also write the rules regarding binary numbers.
   b. Convert the binary number 100100001.1101 to Octal System.

II.
   a. Explain intermediate value property and rate of convergence.
   b. Explain Bisection Method, also give its graphical representation.

III.   Explain Newton Raphson Method formula. Also develop a recurrence formula for finding the square root of N using Newton Raphson Formula and hence compute $\sqrt{32}$

IV.   Prove that the rate of convergence of Secant Method is 1.6.

Section – B

V.   Explain the system of simultaneous linear and algebraic equations.
            Also explain the Gauss Elimination Method.

VI.
   a. Explain Iterative method to improve accuracy of an ill-conditioned system of equations.
   b. An approximate solution of the system of equations:
$$x + 2y + z = 8$$
$$2x - y + 2z = 6$$
$$3x + 2y - z = 4$$
is given by x=1, y=1.8, z=2.8. Improve this solution by using the above iterative method.

VII.
   a. Define the concept of interpolation and extrapolation with suitable examples.
   b. Find the value of e^{2x} at x=0.03 from the following table:

x	0.00	0.10	1.20	1.30	0.40
y=e^{2x}	1.0000	1.2214	1.4918	1.8221	2.2550

VIII.   State and prove Newton's Divided Difference Formula.

Section – C

IX.
   a. What is the rate of convergence of Bisection Method
   b. Find the formula for Δ [f(x).g(x)] and hence find the Δ [x.e^{2x}]
   c. Show that the divided difference operator $\triangle$ is linear
   d. Define exact numbers and approximate numbers.

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