

B.Sc(H) 5th Semester Examination, 2020 (CBCS)
Paper Name: Numerical Methods Paper Code: DSE-2
Subject: Computer Science

F.M: 40

Time: 2Hrs.

Answer any eight Questions:

5 × 8 = 40

1. Write an algorithm for solving equation $f(x)=0$ using Newton-Raphson method.
2. Discuss Newton's forward Interpolation method.
3. Estimate the value of $F(1)$ using Lagrange's formula corresponds to the following data:

X	:	-1	0	2	5
F(x)	:	9	5	3	15

4. Find the positive roots of the equation $x^3-3x+1.06=0$, by method of bisection, correct to three decimal places.
5. Estimate the missing term in the following table:

x	:	0	1	2	3	4
F(x)	:	1	3	9	---	81

6. Evaluate the integral $\int_0^5 dx/(x^2 + 1)$, using Trapezoidal Rule, taking $h=0.2$
7. Find the root of $x^3-8x-4=0$, which lies between 3 and 4, by Bisection method, correct to three decimal places.
8. Use Gauss-Seidel iteration method to solve the following system, correct to 3-significant figures.

$$5x_1 + 3x_2 + x_3 = 2$$

$$4x_1 + 10x_2 + 4x_3 = -4$$

$$2x_1 + 3x_2 + 8x_3 = 20$$

9. Use Gauss-elimination method to solve the following systems:

$$x + 3y + 2z = 5$$

$$2x - y + z = -1$$

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

10. Briefly explain Regula-Falsi method.

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Paper Name: Systems Programming Paper Code: DSE-2
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Answer any *eight* Questions:

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- (a) What is a Loader? Discuss and illustrate the various types of Loaders.
- (b) Discuss Pass-1 Assembler.
- (c) Write down different phases of compiler with diagram.
- (d) What are Lexemes? Draw the state transition diagram for recognizing unsigned numbers with decimals.
- (e) Write down the differences between Top-down parsing and Bottom-up parsing with the help of an example?
- (f) What is LR parsing technique? Illustrate with an example.
- (g) Illustrate Synthesized and Inherited attributes in the context of Syntax Directed Translation.
- (h) Discuss Triples and Indirect Triples in 3-address code representation?
- (i) Discuss some machine independent Code Optimization techniques.
- (j) What is Directed Acyclic Graph (DAG)? Give Example.