Roll No:
Date: __/__/____

St. Claret College

Autonomous, Bengaluru

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UG END SEMESTER EXAMINATION-NOVEMBER 2025
B.Sc. I SEMESTER
CS 124: PROBLEM SOLVING TECHNIQUE

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TIME: 3 hours. **MAX. MARKS: 80**

This paper contains TWO printed pages and FOUR parts

Instructions:
1. **Verify and ensure that the question paper is completely printed.**
2. **Any discrepancies or questions about the exam paper must be reported to the COE within 1 hour after the examination.**
3. **Students must check the course title and course code before answering the questions.**

PART-A

Answer ALL questions. Each answer carries ONE mark. **[10 x 1= 10]**

1. What is the primary purpose of an algorithm?
   a) To store data in memory b) To solve a problem step by step
   c) To compile a program d) To design a user interface
2. Which symbol is used to represent a decision in a flowchart?
   a) Oval b) Rectangle c) Diamond d) Triangle
3. The process of converting an algorithm into a computer program is called
   a) Debugging b) Coding c) Testing d) Compilation
4. In C programming, which header file is required for input/output functions?
   a) <math.h> b) <stdio.h> c) <stdlib.h> d) <string.h>
5. Which of the following is a selection statement in C?
   a) For loop b) If-else c) Goto d) Continue
6. Pointers in C are used to store
   a) Integer values b) Addresses of variables c) Characters d) Arrays only
7. Which built-in function is used to raise a number to a power?
   a) power() b)pow() c) exp() d) raise()
8. The full form of GCD is
   a) Greatest Common Division b) General Common Denominator
   c) Greatest Common Divisor d) General Computing Division
9. The sorting algorithm repeatedly swaps adjacent elements to sort the array.
   a) Selection Sort b) Bubble Sort c) Quick Sort d) Merge Sort

10. Linear search is also known as

a) Sequential search b) Random search c) Binary search d) Indexed search

PART-B

Answer any TEN questions. Each answer carries TWO marks. **[10 x 2= 20]**

11. Define algorithm.
12. What is a flowchart? Give two examples
13. What are time complexity and space complexity?
14. What is a variable? Write its syntax and give an example of declaring a variable in C.
15. What is an array? Mention the types of arrays.
16. What is Factorization?
17. How can duplicates be removed from an ordered array efficiently
18. What is a histogram?
19. Find the GCD of the numbers 12, 20, and 60.
20. What is Insertion Sort?
21. What are the two types of searching techniques in C?
22. What is meant by Text Line Editing?

PART-C

Answer any FOUR questions. Each answer carries FIVE marks. **[4 x 5 =20]**

23. Describe the symbols of a flowchart.
24. Explain the looping statement with an example.
25. What are identifiers? Explain the rules to create identifiers in C.
26. How can you efficiently compute the square root of a number without using built-in functions?
27. Develop an algorithm to find the maximum number in an array of n elements
28. Write an algorithm to find linear search.

PART-D

Answer any THREE questions. Each answer carries TEN marks. **[3 x 10 = 30]**

29. a) Write a program to swap two values in variables.
    b) Write an algorithm to find the factorial. [5+5]
30. Explain switch statements and if-else-if ladders with an example.
31. Explain the Arithmetic, Relational and Logical operators with examples.
32. Design an algorithm to sort an array using Insertion Sort and explain its best-case scenario
33. a) Develop a C program to perform bubble sort.
    b) Formulate the steps to sort the elements using selection sort.
    65, 57, 48, 39, 12, 92, 82, 33 [5+5]