



ST. FRANCIS DE SALES COLLEGE

A FRANSALIAN INSTITUTE OF HIGHER EDUCATION **AUTONOMOUS**

NAAC A GRADE • AFFILIATED TO BANGALORE UNIVERSITY • AICTE APPROVED • 2(F) & 12 (B) RECOGNITION OF UGC • ISO 9001:2015 CERTIFIED
📍 Electronics City P.O., Bengaluru - 560 100, Karnataka, INDIA 📞 (+91) 8088140679 📧 pro@sfscollge.in 🌐 www.sfscollge.in

END SEMESTER EXAMINATION –NOV/DEC 2025

COMPUTER SCIENCE – I SEMESTER BCA

25BCA14: PROBLEM SOLVING TECHNIQUES

Time: 3 Hours

Max. Marks: 80

Instruction: Answer should be written completely in English.

SECTION - A

Answer any **FIVE** questions. Each question carries **TWO** marks.

(5X2=10)

1. List the characteristics of an algorithm.
2. What is time complexity and space complexity of an algorithm.
3. Define a variable in C with example.
4. Write a C statement to find the remainder when $x = 10$ is divided by 3.
5. How to get and display array elements in C.
6. Write the steps to find the smallest divisor of 45 greater than 1.
7. What is sorting? Mention different sorting methods.

SECTION - B

Answer any **SIX** questions. Each question carries **FIVE** marks.

(6X5=30)

8. Write an algorithm and flowchart to find the factorial of a number.
9. Write an algorithm to find largest number among three different numbers.
10. Distinguish structure and union with an example.
11. Write a C program to check the given number is positive, negative or zero.
12. Create a user-defined function in C to raise a number to a large power.
13. Design a C program using arrays to remove duplicate elements from a sorted array.
14. Write a C-program to sort n-numbers using bubble sort.
15. Write a C program to search for an element using Linear Search.

SECTION - C

Answer any **FIVE** questions. Each question carries **EIGHT** marks.

(5X8=40)

16. Explain in detail about flowcharts and draw a flowchart to swap two numbers.
17. Explain loop control structures in C with a general syntax for each loop and example.
18. Explain various operators available in C with examples.



19. Create a function-based C program that calculates the area of different geometric shapes (circle, rectangle, triangle) based on user input. Use separate functions for each shape and demonstrate parameter passing.
20. Design a C program to multiply two matrices of user-defined size.
21. Describe the process of binary search and illustrate it with a dry run on a sorted array of integers.
22. Explain the working of insertion sort with a step-by-step example.

