



ST. FRANCIS DE SALES COLLEGE

A FRANSALIAN INSTITUTE OF HIGHER EDUCATION **AUTONOMOUS**

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Electronics City P.O., Bengaluru - 560 100, Karnataka, INDIA ☎ (+91) 8088140679 ✉ pro@sfscollege.in 🌐 www.sfscollege.in

END SEMESTER EXAMINATION – NOV/DEC 2025

COMPUTER SCIENCE – I SEMESTER BCA

25BCA15: COMPUTER ARCHITECTURE

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. Convert 11011 to Gray Code.
2. Define UNICODE.
3. Define CMP instruction.
4. What is the purpose of the accumulator in the 8085 microprocessor?
5. Differentiate between Combinational and Sequential Circuits.
6. What is an Instruction Format in computer architecture?
7. Define the term 'Instruction Cycle' in a computer system.

SECTION - B

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

(6X5=30)

8. State and Prove De Morgan's Theorem.
9. Perform hexadecimal addition and subtraction for the given numbers: $4C9A_{16}$ and $2F3E_{16}$.
10. Explain instruction set classification based on size used in 8085 with suitable examples.
11. Illustrate the working of five different data transfer instructions of 8085 using examples.
12. Explain the clocked SR Flip-Flop circuit with truth table.
13. Draw the logic circuit of 3-8 decoder circuit. Also write the truth table and logic expressions.
14. Describe the different types of computer registers in a CPU.
15. Explain the working of the Control Unit with the help of the block diagram.

SECTION - C

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

(5X8=40)

16. Simplify the following Boolean function using a four-variable K-map. Also, draw the logic diagram of the simplified circuit: $F(A, B, C, D) = \sum (0, 2, 4, 6, 7, 8, 10, 13, 15)$.
17. Illustrate alphanumeric codes and explain their types with suitable examples.
18. Draw the pin diagram of 8085 microprocessor and briefly explain the functions of each pin.



19. Explain the architecture of 8085 in detail.
20. Explain the SR and T Flip-Flops with diagrams and truth tables.
21. Explain the design of a basic computer with a detailed block diagram and functional explanation.
22. Convert the following infix expression to postfix expression: $((5 + 2) * 3 - 8) / 2$. Evaluate the resulting postfix expression using a stack-based algorithm.

