



SE – 257

I Semester B.C.A. (Full Stack Development) (AI and ML) (Data Science)
Examination, January/February 2026
(SEP 2024 – 25)

COMPUTER APPLICATIONS
24BCA13 : Computer Architecture

Time : 3 Hours

Max. Marks : 80

Instruction : Answer **all** Sections.

SECTION – A

Answer **any 8** of the following :

(8×2=16)

1. Convert $(2F)_{16}$ into binary.
2. Define ASCII and EBCDIC codes.
3. What are universal gates ?
4. Write the block diagram of 4-to-1 multiplexer.
5. Define Full Adder.
6. What is the difference between combinational and sequential circuits ?
7. What is instruction cycle ?
8. What are registers in digital systems ?
9. Define addressing mode with example.
10. List any two functions of the accumulator in 8085.

SECTION – B

Answer **any 4** of the following :

(4×6=24)

11. Explain r 's and $(r - 1)$'s complement with suitable examples.
12. Explain the logic circuit and truth table for D and T Flip-Flop.
13. Describe 3-to-8 line decoder and octal-to-binary encoder with diagrams.

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14. Write the differences between CISC and RISC.
15. Explain the timing and control unit in a basic computer.
16. Write short notes on data transfer and manipulation instructions in 8085.

SECTION – C

Answer **any 5** questions :

(5×8=40)

17. Simplify the following boolean function using K-map :
$$F(A, B, C, D) = \sum m(1, 3, 4, 6, 8, 9, 11, 13, 15) + \sum d(0, 2, 14).$$
 18. Explain realization of basic gates using NAND gate.
 19. Explain the working and truth tables of SR and JK Flip-Flops.
 20. Explain the design and working of a 4-bit register with parallel load.
 21. Explain computer registers and instruction code format in basic computer design.
 22. Explain instruction classification of 8085 based on word length and function.
 23. Write an assembly language program to find the largest number in a set of data.
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