



2025

3rd Semester Examination (CCFUP : NEP)

BCA

Paper : MJ 3-T (Single Core Major)

[Computer Organization and Architecture]

Full Marks : 40

Time : Two Hours

*The figures in the margin indicate full marks.
Candidates are required to give their answers
in their own words as far as practicable.*

Group - A

Answer any *five* questions : $2 \times 5 = 10$

1. What is universal gate? Give example.
2. What is virtual memory?
3. What is K-Map?
4. What is interrupt?
5. What is three-state buffer?
6. What is microprogramme?
7. Write down the difference between main and cache memory.
8. What is underflow?

P.T.O.

(2)



Group - B

Answer any *four* questions : 5×4=20

9. State and prove De Morgan's theorem and explain with suitable example.
- ✓10. What do you mean by addressing mode? Discuss two addressing instructions. 2+3
- ✓11. Draw the block diagram of 4-bit arithmetic circuit.
- ✓12. Simplify the Boolean function in sum-of-products form using K-maps $F(A, B, C, D) = \sum(0, 1, 2, 5, 8, 9, 10)$.
13. Discuss Associative Mapping technique with an example.
- ✓14. What is Full adder? Design a full-adder using NAND gates only. 2+3

Group - C

Answer any *one* question : 10×1=10

15. Write short notes (any *two*) : 5×2=10

- ✓(a) Combinational circuit
- ✓(b) Flip-flops
- (c) Stack organization machine
- ✓(d) Instruction set

(3)

16. A digital computer has a common bus system for k -registers of n -bits each. The bus is constructed with MUXs.

(a) What sizes of MUXs are needed?

(b) How many MUXs are there in bus? Draw a block-diagram and discuss.

3+7

