

Unit - IV

8. (i) What is a parallel adder? Design a 4-bit parallel adder. 8
- (ii) What is a multiplexer? How does it work? What are its applications? Explain. 8
9. Explain the following: 8
- (i) Comparators 8
- (ii) BCD to seven-segment Decoder 8

B.C.A. 1st Semester Examination,
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LOGICAL ORGANIZATION OF COMPUTER-1
(BCA-104)

Time allowed : 3 hours] [Maximum marks : 80

Note : Question No. 1 is compulsory. Attempt four questions by selecting one question from each unit.

All questions carry equal marks.

1. Answer the following: 8 × 2 = 16
- (i) What is Duality Principle?
- (ii) What is Unicode? State its relevance.
- (iii) What are Venn Diagrams?
- (iv) What are De-multiplexers? State their importance.
- (v) What is a full-adder?
- (vi) What are digital signals? Explain.
- (vii) Which number system is followed in digital Computers and why?
- (viii) What is a normalized number? Outline its essence.

Unit - I

2. (i) Find out the values of X, Y and Z in the following:
 $(AB, C)_{16} = (XY)_2 = (Z)_{10}$ 12
- (ii) What do you understand by BCD codes? What is their significance? Illustrate. 4
3. Explain the following:
 (i) Error Detection and Correction Codes 8
 (ii) Character Codes 8

Unit - II

4. (i) Simplify the following Boolean expression using K-map:
 $F(x, y, z, w) = \sum (0, 1, 2, 4, 5, 6, 8, 9, 12, 13, 14)$
 and obtain the expression on SOP and POS 10
- (ii) What is De Morgan's Theorem? How is it useful? Illustrate its use with suitable examples. 6

5. Explain the following:
 (i) Standard forms of Boolean Functions 5
 (ii) Multilevel NAND and NOR circuits 5
 (iii) Boolean Algebra 6

Unit - III

6. (i) What are Universal Gates? Why these are named so? Justify. 6
 (ii) Design a combinational circuit that receives 4-bit binary input and produces its 1's complement. 10

7. (i) What is combinational circuit? What are its characteristics? Detail out the procedure for design of combinational circuit. 8
 (ii) What do you mean by multilevel NAND and NOR circuits? Illustrate. 4
 (iii) What are AND-OR-INVERT and OR-AND-INVERT implementations? Explain. 4