

97664

BCA 1st Semester (Full & Re-appear)

Examination, December-2024

Logical Organization of Computers-I

Paper : BCA-104

Time allowed : 3 hours]

[Maximum marks : 80

Note : Question No. 1 is compulsory. Attempt other four questions by selecting one question from each unit All questions carry equal marks.

1.
 - (a) What are Boolean Theorems?
 - (b) What are code converters?
 - (c) What are DeMorgan's Laws?
 - (d) What do you mean by digital logic? Explain.
 - (e) What are Demultiplexers? State its importance.
 - (f) What is Unicode? State its relevance.
 - (g) What is the smallest and largest integer number represented in a 32-bit computer?
 - (h) What are encoders?

8×2=16

97664-P-4-Q-9(24)

[P.T.O.]

Unit-I

2. (a) What are BCD codes? What is their significance? Discuss. 4
- (b) Find out the values of X, Y and Z in the following : 12
- $$(FA.C)_{16} = (X)_2 = (Y)_8 = (Z)_{10}$$
3. Explain the following :
- (a) Character Codes 8
- (b) Error detection and correction codes 8

Unit-II

4. (a) What is principle of Duality? Illustrate. 4
- (b) Simplify the following Boolean expression using K-map : 12
- $$F(a, b, c, d) = \sum (1, 3, 4, 6, 7, 9, 11, 12, 13, 14)$$
- and obtain the expression in both SOP and POS.

5. Explain the following :

- (a) Canonical form of Boolean Functions 5
- (b) Venn diagrams 5
- (c) De-Morgan's Law 6

Unit-III

6. (a) What are Universal Gates? Why these are named so? Justify. 6
- (b) What do you mean by multilevel NAND and NOR circuits? Illustrate. 5
- (c) What are AND-OR-INVERT and OR-AND-INVERT implementation? Explain. 5
7. (a) What is combinational circuit? What are its characteristics? Detail out the procedure for design of combinational circuit. 8
- (b) Design a combinational circuit that receives 2-bit binary input and produces its square at the output. 8

Unit-IV

8. (a) What is a full-subtractor? Design a full-subtractor and implement the same using gates. 8
- (b) What is a BCD to seven-segment Decoder? Design and implement it. 8
9. Explain the following :
- (a) Multiplexer 8
- (b) Magnitude Comparators 8