(c) What do you mean by multilevel NAND and NOR circuits ? Illustrate. 4,8 4

## Unit–IV

8. (a) What is a Multiplexer ? How does it work ? What are its applications ? Explain.

(b) What is a Parallel Adder ? Design a 4-bit parallel adder. 8,8

9. Explain the following :

(a) BCD to seven-segment Decoder

(b) Comparators 8,8

# 97664

**BCA 1st Semester (New)**
**(Full & Reappear)**
**Examination, March–2021**

## LOGICAL ORGANISATION OF COMPUTER-I
Paper–BCA-104

Time : *Three Hours ]* *[ Maximum Marks : 80*

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

**Note** :– Attempt *five* questions in all, selecting *one* question from each Unit. Question No. **1** is compulsory. All questions carry equal marks.

1. (a) What is Unicode ? State its relevance.

(b) What is a Full-adder ?

(c) What is Duality principle ?

(d) What are Digital Signals ? Explain.

(e) What are Venn Diagrams ?

(f) Which number system is followed in digital computers and why ?

(g) What is a Normalized Number ? Outline its essence.

(h) What are Demultiplexers ? State their importance. 2×8=16

**Unit–I**

2. (a) Find out the values of X, Y and Z in the following :

$$(AA.C)_{16} = (X)_2 = (Y)_8 = (Z)_{10}$$

(b) What do you understand by BCD Codes ? What is their significance ? Illustrate. 12,4

3. Explain the following :

(a) Character Codes

(b) Error Detection and Correction Codes 8,8

**Unit–II**

4. Explain the following :

(a) Multilevel NAND and NOR Circuits

(b) Boolean Algebra

(c) Standard forms of Boolean Functions 5,6,5

5. (a) What is De Morgan's Theorem ? How is it useful ? Illustrate its use with suitable examples.

(b) Simplify the following Boolean expression using K-map :

$$F (a, b, c, d) = \Sigma (0, 1, 2, 4, 5, 6, 8, 9,$$
$$10, 12, 13, 14)$$

and obtain the expression in SOP and POS. 6,10

**Unit–III**

6. (a) What are AND-OR-INVERT and OR-AND-INVERT implementation ? Explain.

(b) Design a combinational circuit that receives 4-bit binary input and produces its 2's complement. 6,10

7. (a) What are Universal Gates ? Why are these named so ? Justify.

(b) What is Combinational Circuit ? What are its characteristics ? Detail out the procedure for design of combinational circuit.