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Roll No.

ID—4039

B.C.A. EXAMINATION, 2022

(First Semester)

**LOGICAL ORGANIZATION OF
COMPUTER-I**

Code : BCA-104

Time : 3 Hours *Maximum Marks : 80*

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

Note : Attempt any *Five* questions. All questions carry equal marks.

Unit I

1. (a) Describe Truth Table.

- (b) Explain Multilevel NAND circuit.
- (c) Write a short note on Pallel Binary Adder.
- (d) What is Digital Signal ?
- (e) Explain Karnaugh Maps.
- (f) Describe Standard SOP form of Boolean function.
- (g) What is Unicode ? Describe it.
- (h) Describe Full Adder.

Unit II

- 2. (a) What are parity bits ? How are these relevant in error detection and correction code ? Explain with example.
- (b) Explain Floating point representation of number and character codes.
- 3. (a) Explain the BCD code in detail. Also explain why these codes are used.
- (b) Explain error detection and correction codes.

Unit III

4. (a) Simplify the following Boolean expression using K-Map :

$$F(a, b, c) = \Sigma(1, 4, 5, 6, 7)$$

and realize the same using NAND gates.

- (b) What do you mean by canonical and standard form of Boolean function ? Explain.
5. Explain the following :
- (a) SOP_S and POS_S
- (b) Venn Diagram and Boolean Algebra.

Unit IV

6. (a) What are AND-OR-INVERT and OR-AND-INVERT implementation ? Explain.
- (b) What is combinational circuit ? What are its characteristics ? Detail out the procedure for design of combinational circuit.

7. Explain the following :

- (a) Design a combinational circuit that receives 2-bit binary input and produce its square at the output.
- (b) What is Universal Gate ? Why are these named so ? Justify.

Unit V

8. (a) What is a multiplexer ? How does it work ? What are its applications ? Explain.
- (b) What is Half adder and Full adder ? Design a full adder and implement the same using gates.
9. (a) What is the principle of encoder and decoder ? How is an encoder different from a decoder ?
- (b) What are Comparators ? Where are comparators used ? Describe its types.