

Roll No.

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311104**Mar. 2022****BCA 1st SEMESTER****Logical Organization of Computer-I (BCA-17-104)**

Time : 90 Minutes]

[Max. Marks : 25

Instructions :

1. *It is compulsory to answer all the questions (1 mark each) of Part-A in short.*
2. *Answer any three questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART-A

1. (a) What do you understand by digital logic? (1)
- (b) What are multiplexers? State its importance in computer organization. (1)
- (c) What is duality principle in Boolean Logic? (1)
- (d) Give example of SOP and POS forms. (1)
- (e) What are Universal Gates? Why are they called so? (1)

- (f) Convert $(77.75)_{10}$ in Hexadecimal representation. (1)
- (g) Subtract $(11001111)_2$ from $(1111001001001)_2$ using 2's complement. (1)
- (h) What is a BCD adder? (1)
- (i) What is the meaning of Fixed-point and Floating point in data representation? (1)
- (j) Draw truth table of XOR Gate. (1)

PART-B

- 2. (a) What are error detection and correction codes? (2.5)
- (b) Explain use of Hamming codes in detail. (2.5)

- 3. (a) Design a full subtractor circuit. (2.5)
- (b) What is the difference between demultiplexer and a decoder? Support your answer with an example. (2.5)

- 4. (a) Minimize the four variable Logic Function:

$$F(A, B, C, D) = A B C' D + A' B C D + A' B' C' + A' B' D' + AC' + AB'C + B'$$
(3)
- (b) What do you mean by don't care conditions? Explain using an example. (2)

- 5. What do you understand by combinatorial logic? Discuss its design and analysis procedures along with its characteristics. (5)

 - 6. (a) What are code converters? (2)
 - (b) Design a BCD to seven segment decoder. (3)
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