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**Roll No. -----**

## **BCA-01**

### **Computer Fundamental and Introduction to Digital Logic**

**Bachelor of Computer Application  
(BCA-11/16/17)**

**1<sup>st</sup> Semester Examination June 2022**

**Time: 2 Hours**

**Max. Marks: 80**

**Note :** This paper is of Eighty (80) marks divided into two (02) Sections A and B. Attempt the questions contained in these sections according to the detailed instructions given therein.

#### **Section – A**

**(Long Answer – type questions)**

**Note:** Section 'A' contains Five (05) long-answer-type questions of Twenty (20) marks each. Learners are required to answer any two (02) questions only.

**[2 x 20 = 40]**

**Q.1.** Short note on any five from the following.

- (i) Multiplexer
- (ii) De multiplexer
- (iii) Fixed Point Representation
- (iv) Gray Code
- (v) Buses
- (vi) Encoder

**P.T.O.**

Q.2. Implement the following expression using single 4:1 Mux.

$$f = (A, B, C, D) = \sum m (0, 1, 2, 4, 6, 9, 12, 14)$$

Q.3. Calculate the following:

- (i) Convert  $(126)_{10}$  to Octal.
- (ii) Convert  $(214.32)_{10}$  to binary.
- (iii) Perform binary subtracting using 2's complement for  $(62)_{10}$ .
- (iv) Find the one's complement and two's complement of  $(57)_{10}$ .
- (v) Subtract 011011 from 110111.

Q.4. Prove the following using rules of Boolean algebra, Or simplify.

- (i)  $A + BC = (A+B)(A+C)$
- (ii)  $A+AB = A(A+B) = A$
- (iii)  $A+AB = A+B$

Q.5. Draw logic diagram for following Boolean expression.

- (i)  $Y = AB+(B+C)$
- (ii)  $Y = (A+B)(B+C)$
- (iii)  $Y = ABC+ABC+ABC+ABC$

P.T.O.

**Section – B**  
**(Short-answer-type questions)**

Note: Section 'B' contains Eight (08) short-answer-type questions of Ten (10) marks each. Learners are required to answer any Four (04) questions only.

[4 x 10 = 40]

- Q.1. "Generation of Computer are irrelevant due to fast growing technology". Justify this statement according to your own words.
- Q.2. What are don't care conditions?
- Q.3. What is the difference between a Primary memory and Secondary memory? Discuss the various secondary storage devices.
- Q.4. What is Number System? Explain 1's complement and 2's complement with example.
- Q.5. What are multiplexers? Design and explain the working of 16 to 1 line multiplexer.
- Q.6. Use two 2-4 line decoder to make a 3-8 line decoder and explain its working.

P.T.O.

Q.7. Minimize the expression:

$$\bar{Y} = \bar{A}\bar{B}\bar{C}\bar{D} + \bar{A}\bar{B}\bar{C}D + A\bar{B}\bar{C}\bar{D} + A\bar{B}\bar{C}D + A\bar{B}C\bar{D} + A\bar{B}CD$$

Q.8. What are Half-Adder and Full Adder? Explain briefly.

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