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B.C.A. 1st Semester (Full & Re-appear) Examination,
November-2023

LOGICAL ORGANIZATION OF COMPUTER-I

Paper-BCA-104

Time allowed : 3 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 the examination.

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

1. (a) What is BCD?
- (b) What is EBCDIC?
- (c) Differentiate canonical and standard forms.
- (d) What is Boolean algebra?
- (e) What is universal gates?

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- (f) Define digital signal.
- (g) What is half adder?
- (h) What is code converter?

Unit-I

2. (a) What do you mean by number system? Explain different type of number system with example.
- (b) Determine the single error-correcting code for the message code (1011) for even parity.
3. (a) What is fixed point representation of number? Explain with example.
- (b) Perform the following conversions
 $(347)_{10} = ()_2 = ()_8 = ()_{16}$

Unit-II

4. Obtain the minimal POS expression for the function given below using a four variable K-Map

$$F(A, B, C, D) = \prod(3, 4, 6, 7, 11, 12, 13, 14, 15)$$

5. (a) State and prove De Morgan's Law.
- (b) Simplify the following Boolean expression :
- (i) $AB + ABC' + A'BC + ABC$

Unit-III

6. Realise the following logic operation using only NAND gates :
- (i) NOR
- (ii) XOR
- (iii) XNOR
- (iv) OR
7. (a) Explain :
- (i) AND-OR-INVERT
- (ii) OR-AND-INVERT
- (b) What are the characteristics of combinational logical circuit ?

Unit-IV

8. (a) What do you mean by comparator ? Explain.
- (b) Differentiate between Half Subtractor and Full Subtractor.
9. Differentiate between the following :
- (i) Encoder and decoder
- (ii) Multiplexer and demultiplexer

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