Roll No. ....

Total Pages : 3

GSE/D-21

1193

LOGICAL ORGANIZATION OF COMPUTER-I

Time : Three Hours]

[Maximum Marks : 80

Note : A candidate will be required to answer *five* questions in all, selecting *one* question from each unit in addition to compulsory question no. 1. All questions carry equal marks.

Compulsory Question

1. (a) Why do Digital Computer use Binary Number System?

   (b) Give Comparison between 1's and 2's Complement.

   (c) Differentiate between Boolean Alzebra and Ordinary Alzebra.

   (d) Explain Minterm and Maxterm.

   (e) Explain XOR Gate.

   (f) What are the characteristics of Logic gate ?

   (g) Differentiate between Encoder and Decoder ?

   (h) Explain 7-Segment Display.   (8×2=16)

UNIT–I

2. Write the Binary Coding for the word BOY in :

   (a) BCD.

   (b) ASCII-7.

[P.T.O.

(c) ASCII-8.

(d) EBCDIC.   16

3. (a) Solve the following Complements Representation of Numbers by using Suitable Example :

   (i) True Complement.

   (ii) Radix-Minus-One Complement.   8

   (b) Solve the following :

   (A) $(1101.1)_2 \times (111.01)_2 = (?)_2$.

   (B) $(1100)_2 - (11)_2 = (?)_2$.   8

UNIT–II

4. Examine the validity of the following Boolean Functions

   (a) $(A + B + C)(A + B + \bar{C}) = A + B$.

   (b) $Z\bar{X} + ZXY = ZX$.   16

5. What do you mean by K-Map ? Simplify the following Expression by K-Map :

   (a) $\bar{A}B\bar{C} + AB\bar{C} + A\bar{B}\bar{C}$.

   (b) $A\bar{B}C + AB\bar{C} + \bar{A}BC + ABC + A\bar{B}\bar{C} + \bar{A}B\bar{C}$.   16

UNIT–III

6. Implement the following Boolean functions

   $F = (\bar{A} + B).(A + \bar{C}).(AB + D)$ using NAND gate.

   $F = \bar{A}\bar{B}C + \bar{A}B\bar{C} + A\bar{B}\bar{C} + ABC$.   16

7. Design the circuit to realize the Boolean functions :

(a) $Y = \overline{A}\overline{B} + \overline{A}C + AB$.

(b) $F = ABCD + A\overline{B}CD + ABC\overline{D} + \overline{A}BC\overline{D} + A\overline{B}CD$

$+ A\overline{B}C\overline{D} + A\overline{B}\overline{C}\overline{D}$.   16

UNIT–IV

8. (a) What is Code Convertor? Explain its Working.   8

(b) What do you mean by Combinational Circuit? Design the Half Adder using NAND Gate.   8

9. (a) Explain the working of Comparator.   8

(b) What is Decoder? Explain and design BCD to Decimal Decoder.   8

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