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Roll No. ..... Total Pages : 3

BCA/D-12 **896**

LOGICAL ORGANIZATION OF COMPUTER–I

Paper : BCA–114

Time : Three Hours] [Maximum Marks : 80

Note : Attempt *five* questions in all. Select *one* question from each unit. Q. No. 1 is compulsory.

(Compulsory Question)

1. (a) Write the full form :
   ASCII, EBCDIC, DRAM. 3
   (b) Make Truth table for 3 variable AND, NOR gate. 3
   (c) Prove that NAND is a universal gate. 3
   (d) State & prove Demorgan's law. 3
   (e) Make Venn diagram for OR, AND, NOR gates. 3
   (f) Define Duality principle. 1

UNIT–I

2. (a) Convert as directed :
   $(7.3)_{10} \rightarrow (\ )_2$
   $(10.625)_{10} \rightarrow (\ )_8$
   $(X)_5 \rightarrow (1234)_{10}$
   $(AF3D) \rightarrow (\ )_2$
   $(117.6C) \rightarrow$ Octal. 10
   (b) Use 2's compliment to solve

–6	–42	–9
–8	+30	–4

6

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3. (a) Explain Floating point representation. 8
   (b) Write a note on 2421, cyclic code. 4
   (c) Perform BCD addition for 9 + 6. 4

UNIT–II

4. (a) Define Boolean Algebra & write its postulates. 8
   (b) Solve using Boolean Algebra :

   $$XY + \bar{X}Z + YZ = XY + \bar{X}Z$$

   $$ABC + A\bar{B}C + AB\bar{C} + A\bar{B}\bar{C} = A.$$ 4
   (c) Solve Full Adder. 4
5. (a) Solve using K-map

   $$Z = \Sigma 0, 2, 3, 7, 9 + \underset{\varphi}{\Sigma} 1, 4, 5, 11$$

   $$Z = \pi\, 0, 2, 4, 6.$$ 8
   (b) Prove using Truth table 4
   $A \oplus (B \oplus C) = (A \oplus B) \oplus C.$
   (c) Draw and label 4 variable K-map. 4

UNIT–III

6. (a) Define Logic and explain NAND, XOR, OR gates. 8
   (b) Draw circuits http://www.kuonline.in
   (i) $X = (\bar{A}B + A\bar{B})\,CD + \bar{X}\bar{Y}Z$
   (ii) $P = (AB + \overline{AB})\,\overline{CD} + (\bar{A} + \bar{B})\,\bar{C}\bar{D}.$ 4
   (c) Draw circuit for Half Adder. 4
7. (a) Write note on AND-OR-INERT using example. 8
   (b) Explain Multilevel realization using NAND gates. 8

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UNIT–IV

8. (a) Explain 4 : 1 multiplexer.

   (b) Draw 10 to 4 Line Encoder. 16

9. (a) Explain 8421 to Cyclic code convertor.

   (b) Make 7-segment display unit. 16

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