Logical Organisation of Computer-I

Time : Three Hours   Maximum Marks : 80

Note : Attempt *five* questions in all Selecft *one* question from each section. Question No. 1 is compulsory.

(COMPULSORY QUESTION)

1. (a) Write the full form :
         ASCII, EBCDIC, DRAM.   3
    (b) Make Truth tabe for 3 variable AND, NOR gate.   3
    (c) Prove that NAND is a universal gate.   3
    (d) State & prove Demogran'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 :
         $(7.3)_{10} ® ()_2$
         $(10.625)_{10} ® ()_8$
         $(X)_5 ® (1234)_{10}$
         $(AF3D) ® ()_2$
         $(117.6C) ® Octal.$ 10

    (b) Use 2's compliment to solve

-6	-42	-9
-8	$+30$	-4	6

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 :	

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

$$ABC + A\overline{B}C + AB\overline{C} + A\overline{B}\overline{C} = A \qquad 4$$

5.	(a)	Solve using K-map	

$$Z = \sum 0, 2, 3, 7, 9 + \sum 1, 4, 5, 11$$

$$Z = \pi \, 0, 2, 4, 6 \qquad\qquad 8$$

	(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 :	

$$\text{(i)} \quad X = (\overline{A}B + A\overline{B})CD + \overline{X}\overline{Y}Z$$

$$\text{(ii)} \quad P = (AB + \overline{AB})\,\overline{CD} + (\overline{A} + \overline{B})\,\overline{C}\overline{D} \qquad 4$$

7.	(a)	Write note on AND-OR-INERT using example.	8
	(b)	Explain Multilevel realization using NAND gates.	

UNIT-IV

8.	(a)	Explain 4 : 1 multiplexer.	
	(b)	Draw 10 to 4 Line Encoder.	16
9.	(a)	Explain 8421 to Cyclic code converter.	
	(b)	Make 7-segmen display unit.	16