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Paper Code : BCAC 102 Digital Electronics

UPID : 100048

Time Allotted : 3 Hours *Full Marks :70*

The Figures in the margin indicate full marks.
Candidate are required to give their answers in their own words as far as practicable

Group-A (Very Short Answer Type Question)

[1 x 10 = 10]

1. Answer any ten of the following :
   (I) x • (y + z) = (x • y) + (x • z). (this equation represents which boolean property
   (II) _____ is formed by multiplying(AND operation) the sum terms
   (III) simplify : Y=A'B' + A'B+AB (using K map)
   (IV) Draw the block diagram of half adder
   (V) convert $(30)_{10}$ to its equivalent BCD
   (VI) The other name of bistable-multivibrators is
   (VII) y = A.B The dot identifies
   (VIII) proof that yx + x = x
   (IX) SOP is formed by considering all the minterms, whose output is _____
   (X) According to DE Morgan's law, Inverting the inputs of the AND gate convert it into_____gate
   (XI) Assume number is using 32-bit format which reserve 1 bit for the sign, 15 bits for the integer part and 16 bits for the fractional part.
   Then, -43.625 is represented in fixed point representation as
   (XII) Y = (A.B)' represents which gate

Group-B (Short Answer Type Question)

Answer any three of the following [5 x 3 = 15]

2. What is Floating-Point Representation ? Give example [5]
3. Write the three basic gates [5]
4. Discuss the two universal gates [5]
5. Define de morgan's law ? with example [5]
6. Define duality principle with example [5]

Group-C (Long Answer Type Question)

Answer any three of the following [15 x 3 = 45]

7. (a) Define the two universal gate with proper symbol and truth table [8]
   (b) Write the two special gate with proper symbol and truth table [7]
8. (a) Explain the following Axioms [8]
   a)Closure Property
   b)Identity element
   c)Commutative property
   d)Cardinality Bound.
   (b) Discuss the following axioms and show that it is true [7]
   a) Distributive Property
   b) Complement Element
9. (a) Write any two non weighted code in details [8]
   (b) Discuss BCD code and any two alphnumeric codes [7]
10. (a) Implement OR , AND, NOT and NOR using NAND gate [8]
    (b) Implement EX-NOR and NAND using NOR gate [7]

11. Simplify the following expression using K-map method

a) $y = m_1+m_5 + m_{10} + m_{11} + m_{12} + m_{13} + m_{15}$

b) y ABCD + AB'C'D' + AB'C +AB