2316

Class – BCA/B.Sc.(IT) 2nd Sem.

Subject – Principles of Digital Electronics

Paper – II (BCA), III (B.Sc. IT)

Time Allowed : 3 Hours   Maximum Marks : 75

Note:– Non- Programmable and Non-storage type calculator is allowed.

Attempt any 5 questions.

1. Perform the following :–

   (a) $(1 AF)_{16}$ to $()_8$ 5

   (b) $(521.63)_8 \rightarrow (?)_{10}$ 5

   (c) Subtract $(3)_{10}$ from $(4)_{10}$ using 2's complement   2

   (d) Construct the truth table for $z = xy + \bar{x}\,\bar{y}$ 3

2. Write a Note on :–

   (i)   De - Morgan's Law   5

   (ii) Duality Theorem   5

   (iii) Importance of K-Map   5

3. Minimize the following Boolean Expression and also design circuit for each

   (i) $Y = \overline{ABCD} + \overline{ABCD}\ ABCD + ABC\overline{D} + \overline{ABC} + A\overline{BC}$

   (ii) $Y = \bar{A}B + \bar{B}C + \bar{C}D + \bar{D}A + AB + BC + CD + DA$ 3×5=15

   (iii) Explain 2 : 4 Line Decoder

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2   1

4. Explain–

   (i) Priority Encoder

   (ii) Convert F (A,B,C) = (A' + B) (B' +C) in product of maxterms.

   (iii) Find canonical SOP form of F = AB + BC + $\bar{A}$

   $3 \times 5 = 15$

5. Explain Minterms and Maxterms. Minimize the following using K-Map and also draw the circuit

   (i) F (A,B,C, D) = πM (2, 3, 8, 9, 12, 13, 15)

   (ii) F = Σm (0, 1, 5, 9, 13, 14, 15) + d (3, 4, 7, 10, 11)

   (iii) Y (A, B, C) = Σm (0, 2, 3, 4) + d (6) $3 \times 5 = 15$

6. What do you mean by combinational circuits? Implement Full Adder using two Half Adders. Write down the truth table of a Full Adder.   15

7. What do you mean by Multiplexer? Design 16:1 Mux using 4:1 Mux. Also show its truth table.   15

8. What do you mean by Universal Gates? Explain how NAND is a Universal Gate.   15

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