Parul Institute of Engineering & Technology

Electronics & Communication Engineering Department

ASSIGNMENT-2

Subject Name: DIGITAL ELECTRONICS

Subject Code: 203105201

(Chapter-2- Minimization Techniques)

1. Given Boolean function
   F= x y + x′ y′ + y′ z
   a. Implement it with only OR & NOT gates
   b. Implement it with only AND & NOT gates

2. Express following Function in Product of Maxterms
   F(x,y,z)= (xy + z) (y + xz)

3. Explain briefly : SOP & POS , minterm & maxterm , canonical form , (05)
   propagation delay, fan out

4. What is the principle of Duality Theorem?
5. Explain briefly: standard SOP and POS forms.
6. What are Minterms and Maxterms?
7. Define: Noise margin , Propagation delay

8. Reduce the expression:
   a. A+B(AC+(B+C')D) b. (A+(BC)')'(AB'+ABC)

9. Define : Integrated Circuit and briefly explain SSI, MSI, LSI and VLSI

10. Draw the logic symbol and construct the truth table for each of the .
    [1] Two input NAND gate [2] Three input OR gate
    [3] Three input EX-NOR gate [4] NOT gate

11. Give classification of Logic Families and compare CMOS and TTL
    Families

12. Demonstrate by means of truth tables the validity of the following Theorems of Boolean algebra
    (i) De Morgan's theorems for three variables
    (ii) The Distributive law of + over-

13. Express the following functions in sum of min terms and product of max terms:

    a. F(A,B,C,D) = D(A'+B) + B'D

    b. F(A,B,C) = (A'+B) (B'+C)

    c. F(x,y,z) = 1