ज्ञानेन प्रकाशते जगत्
INDUS UNIVERSITY

# Digital Electronics (EC0319)

## *(Boolean Algebra Question Bank)*

1. Reduce the expression: [(A+B') (C+D')]'
2. Reduce the expression :[(AB)'+A'+AB]'
3. Prove that AB +A'C+BC = AB +A'C
4. Prove that (A+B) (A'+C) (B+C) = (A+B) (A'+C)
5. Prove that AB +A'C =(A+C ) (A'+B)
6. Reduce the expression f= A+B [AC+(B+C')D]
7. Reduce the expression f=A[B+C'(AB+AC')']
8. Reduce Expression f= [A+(BC)']' (AB'+ABC)
9. Using Boolean Algebra solve the expression: (B+BC) (B+B'C) (B+D)
10. Show that AB+AB'C+BC' =AC+BC'
11. Prove that AB'C +B+BD'+ABD'+A'C = B+C
12. Prove the following Boolean Expression
    i. ABCD'+A+ABD'+D'(A'B'C') =A+B'C'D'
    ii. A'B (D'+C'D) + B (A+A'CD) = B
    iii. (A'+C) (A'+C') (A'+B+C'D) =A'
13. Simplify following Boolean Expression :X [Y+Z (XY+YZ)']
14. Prove that A+B [AC+(B+C')D] =A+BD
15. Prove that X'YZ+XZ+X'Z = Z
16. Simplify the following Boolean Expression

    (a) (BC'+A'D) (AB'+CD')
    (b) (X'YZ+XZ+X'Z)
    (c) (X+Y)' (X'+Y')
    (d) XY+XY'+X'Y
    (e) Y=(AB+C)(AB+D)

17. Simplify following Boolean expression (using Demorgan's theorem)
    i. [(A+C') (B+C')]' [CD]'
    ii. [[A'BC+ D (AB+C)] A']'

18. Draw Logic Diagram using only NAND Gate to Implement following
    i. F=(AB+A'B') ( CD'+C'D)
    ii. F=(A+B') (CD+E')

19. Simplify the following Expression and Implement them with NAND gate Circuits.
    **i.** F=AB'+ABD+ABD'+A'C'D'+A'BC'
    **ii.** F=BD+BCD'+AB'C'D'

20. 20.Draw Logic Diagram using only NOR Gate to Implement following function **OR** Implement following function using only NOR Gate :
    i. F=(AB+A'B') ( CD'+C'D)
    ii. F=(A+B') (CD+E')

21. Simplify the following Expression and Implement them with NOR gate Circuits.
    **i.** F=AB'+ABD+ABD'+A'C'D'+A'BC'
    ii. F=BD+BCD'+AB'C'D'

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