**Boolean Algebra Full Marks –30**

1. Perform the following conversions/operations: [6 x 1 = 6]
2. (10110.101)₂ = (?)₈
3. (CAFE89)₁₆ = (?)₂
4. (27.125)₁₀ = (?)₂
5. Divide (1001110)₂ by (100)₂
6. (1AB2)₁₆ + (2198)₁₆
7. (2304)₈ - (1065)₈
8. **Verify by using truth Table. [2]**

X + X’Y = X + Y

1. Draw a Logic Circuit diagram for the following Boolean expression: [2 x 2 = 4]
2. (X+Y).(X’+Z’).(Y+Z)
3. A’B’C’D + AB’C’D + ABC’D +ABCD’
4. Derive the Boolean expression for the following logic circuits. [2 x 2 = 4]

A black line drawing of a circuit board

Description automatically generated with medium confidence

A diagram of a block

Description automatically generated

1. Solve the following Boolean expression algebraically also write each law while using it in any step. [4 x 2 = 8]
2. X.Y + Y.Z +Y’.Z = X.Y+Z
3. (X.Y)’ + X’ + XY = X’ +XY +Y’
4. X’.Y’Z’ + X’.Y.Z’ + X.Y’.Z’ + X.Y.Z’ = Z’
5. X’Y’Z’ + X’Y’Z + X’YZ + X’YZ’ + XY’Z’ + XY’Z = X’ + Y’
6. Verify if : (a => b) V (b => a) = 1 [2]
7. Solve the expression F(X,Y,Z) = X’Y + YZ’ + XY’Z’.Also design a gate diagram for this. [4]

OR

Solve the following Boolean expression using Truth Table. . [2 x 2 = 4]

1. XY’(Z + YZ’) + Z’
2. (C+D)’ + A’CD’ +AB’C +ACD’