

1. Simplify using Boolean laws:

a) $a'b'c' + ab'c' + ab'c$

b) $abc + ab'c + a'$

c) $ABC + A'B + AC'$

d) $xyz + x'y + xyz'$

e) $ABC + A'B + AC'$

f) $A'C' + ABC + AC'$

1a) Implement the Boolean function : $F = xy + x'y' + y'z$ (i) With AND, OR, and inverter gates (ii) With NAND and inverter gates

2. Explain the decoder. Draw the logic diagram, truth table for 3 to 8 line decoder

3. Simplify using K-Map

a) $F(w,x,y,z) = m(1,4,5,6,12,14,15)$

b) $F(w,x,y,z) = m(0,1,4,5,6) + d(2,3,7)$

3. Simplify using K-Map

i. $F(A, B, C, D) = \sum(2, 3, 6, 7, 12, 13, 14)$

ii. $F(A, B, C, D) = \sum(0, 2, 4, 5, 6, 7, 8, 10, 13, 15)$

4. Define Multiplexer. Design a 4-to-1 multiplexer circuit using basic logic gates. Draw the logic diagram, truth table

3. Design logic design for BCD to Excess 3. Write truth table and simply using truth table.

4. Write a structural model for Two-to-Four-Line Decoder

5. Implement the following function using 8 to 1 multiplexer

6. $F(A, B, C, D) = \sum(1, 3, 4, 11, 12, 13, 14, 15)$

7. Describe three state buffer with an example.

8. Design logic design for BCD to Excess 3. Write truth table and simply using truth table.

9. Write a Data flow model for Two-to-Four-Line Decoder

10. Design a combinational circuit that converts a four-bit Gray code to a bit four binary number.

(a)* Implement the circuit with exclusive-OR gates