

## ADE Assignment - 1

1. List and Explain K-Maps Rules of Simplification

2. Using K-Map method, simplify

a)  $f(a, b) = \sum m(0, 1, 2)$

b)  $f(x, y) = \bar{x}\bar{y} + x\bar{y}$

c)  $f(A, B, C) = \sum m(0, 1, 2, 3, 4, 6)$

d)  $f(x, y, z) = \bar{x}\bar{y} + xyz + \bar{x}yz + xy\bar{z}$

e)  $f(A, B, C, D) = \sum m(0, 1, 2, 4, 5, 6, 8, 9, 10, 12, 13)$

f)  $f(A, B, C, D) = \sum m(3, 4, 5, 7, 9, 13, 14, 15)$

3. Using K-Map method, simplify

a)  $f(A, B, C, D) = \sum m(0, 2, 8, 9) + d(1, 4, 5, 10)$

b)  $f(x, y, z) = \sum m(0, 1, 4) + d(2, 3, 5, 6)$

4. Using Quine-McCluskey Method, simplify

a)  $f(A, B, C, D) = \sum m(3, 4, 5, 7, 9, 13, 14, 15)$

b)  $f(x, y, z) = \sum m(0, 1, 4) + d(2, 3, 5, 6)$

5. Using Petrick's Method, simplify

a)  $f(A, B, C, D) = \sum m(0, 1, 2, 4, 5, 6, 8, 9, 10, 12, 13)$

b)  $f(A, B, C, D) = \sum m(0, 2, 8, 9) + d(1, 4, 5, 10)$

6. Using the method of map-entered variables, use three variable maps to find a minimum sum-of-products expression for

$$a) f(A, B, C, D) = \sum m(3, 4, 5, 7, 9, 13, 14, 15)$$

$$b) f(A, B, C, D) = \sum m(0, 2, 8, 9) + d(1, 4, 5, 10)$$

7. Realize  $f(A, B, C) = \sum m(0, 1, 4, 7)$  using 4-to-1 Mux

8. Realize a full adder using a 1-to-8 Demux

9. Explain Priority Encoder with example.

10. Realize a full subtractor using a 3-to-8 line decoder and two OR gates.