

## Faculty of Computer & Information Sciences Ain Shams University

## CHW 261: Logic Design

Tutorial Sheets 2020-2021

Dr. Manal Tantawi & Dr. Mirvat Al-Qutt



## **Tutorial 4**

1) Simplify the following Functions using K-Map

a. 
$$F(x, y, z) = \sum (2, 5, 6, 7)$$

b. 
$$F(A,B,C) = \sum (0,2,6,7)$$

c. 
$$F(A,B,C) = \sum (0,1,2,3,7)$$

d. 
$$F(A,B,C) = \sum (1,6,7)$$

e. 
$$F(w, x, y, z) = \sum (1, 4, 5, 6, 12, 14, 15)$$

- f.  $F(A, B, C, D) = \sum (0.1, 5, 8, 9)$
- 2) Simplify the following Functions using K-Map

a. 
$$F(A, B, C) = \prod (2,3,4,6)$$

b. 
$$F(A, B, C, D) = \prod (0,2,8,10)$$

3) Find the minterms of the following Boolean expressions by first plotting each function in a map:

a. 
$$F(x,y,z) = xy + yz + xy'z$$

b. 
$$F(w,x,y,z) = wyz + w'x' + wxz'$$

4) Simplify the following Functions using K-Map

a. 
$$F(A, B, C, D) = ABC + CD + BC'D + B'C$$

b. 
$$F(A, B, C, D) = A'B'C'D' + AC'D' + B'CD' + A'BCD + BC'D$$

c. 
$$F(w, x, y, z) = x'z + w'xy' + w(x'y + xy')$$

5) Find a Simplified expression of the **complement** of the following Functions using K-Map

a. 
$$F(w, x, y, z) = \sum_{x} (0,1,4,5,6,7,8,9)$$

6) Simplify the following Functions together with the don't care conditions

a. 
$$F(w, x, y, z) = \sum (2, 3, 4, 5, 12, 13), d(w, x, y, z) = \sum (1, 9, 10, 11)$$

7) Simplify the following Function in product of sum form

a. 
$$F(w, x, y, z) = x'y' + y'z' + yz' + xy$$