

# King Saud University Electrical Engineering Department

EE\_208: Quiz #1

10

Name:

Number:

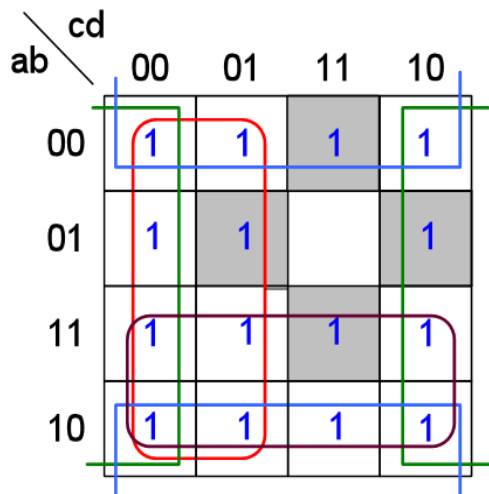
Date: 3-March-2013

- 1- Use **K-map** to simplify the Boolean function **F** to **SOP** form ( 7 marks )
- 2- Draw the **simplified function** using **two- AND, three- OR, two- XOR** and **one NAND-gate**, each gate has two inputs only. **DO NOT USE** complemented inputs ( 3 marks )

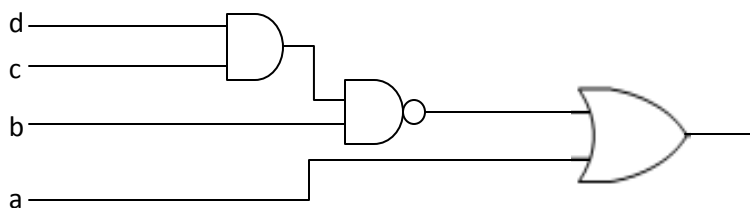
(Hint: you don't need all these gates, some are not used)

$$F(a,b,c,d) = a(b' + bd) + (ad + bcd)'$$

$$\begin{aligned} F &= ab' + abd + (a' + d')(b' + c' + d') \\ &= ab' + abd + a'b' + a'c' + a'd' + b'd' + c'd' + d' \end{aligned}$$



$$F = a + b' + c' + d'$$



Other solution for drawing

Use NAND and XOR to get the complement

(b) NAND (b) = b'

(c) XOR (1) = c'

a	b	c	d	F
0	0	0	0	1
0	0	0	1	1
0	0	1	0	1
0	0	1	1	1
0	1	0	0	1
0	1	0	1	1
0	1	1	0	1
0	1	1	1	0
1	0	0	0	1
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	1