

سوال ۷

$F(a,b,c,d) = \sum m(1,2,3,4,5,6,8,10) + d(11,12)$ (الف)

+6

ab \ cd	00	01	11	10
00	1	1	1	1
01	1	1		1
11				
10	1		1	1

PI: $\bar{b}\bar{d}, \bar{a}\bar{c}, \bar{a}\bar{b}, \bar{a}\bar{d}, \bar{c}\bar{d}, \bar{b}c$

EPI: $\bar{a}\bar{c}, \bar{a}\bar{d}$ +2

$F: \bar{a}\bar{c} + \bar{a}\bar{d} + \bar{b}c + \bar{b}\bar{d}$ +6

دسته بندی: $\bar{a}\bar{c} + \bar{a}\bar{d} + \bar{a}\bar{b} + \bar{b}\bar{d}$

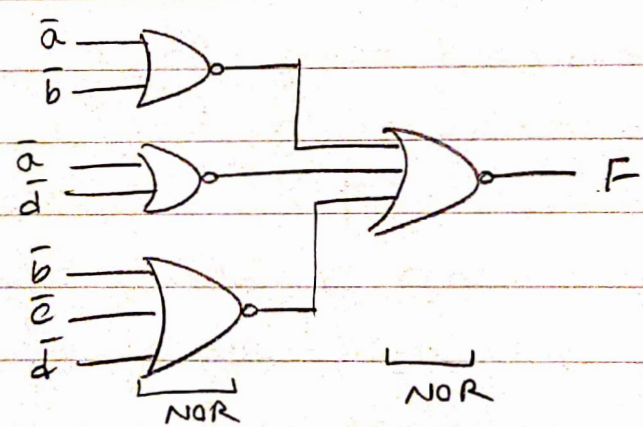
$\bar{a}\bar{c} + \bar{a}\bar{d} + \bar{c}\bar{d} + \bar{b}c$

NOR - NOR

(ب)

باید تابع بصورت POS ساده شود:

$\bar{F} = (\bar{a} + \bar{b})(\bar{a} + \bar{d})(\bar{b} + \bar{c} + \bar{d})$



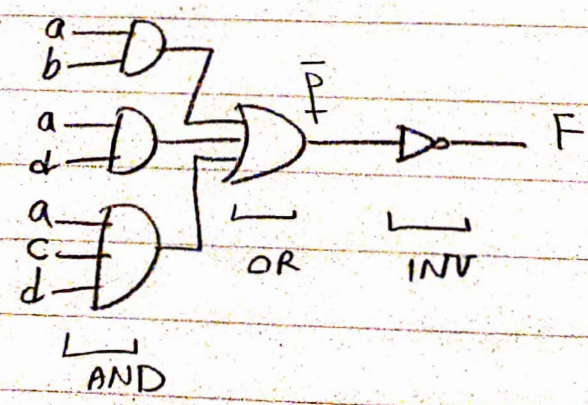
+5

AND - OR - INV

باید تابع \bar{F} بصورت SOM ساده شود:

$\bar{F} = ab + ad + acd$

-1 for mistake in $\sim F$



+4

$$F(a,b,c,d) = \sum m(0,1,2,3,4,7,8,9,10) + d(11,12)$$

✓ 0	✓ (0,1) 1	(0,1,2,3) (1,2) X
✓ 1	✓ (0,2) 2	(0,1,4,5) (1,4) X (2
✓ 2	✓ (0,4) 4	(0,2,7,3) (2,7)
✓ 4	✓ (0,8) 8	(0,2,4,6) (2,4) X
✓ 8	✓ (1,3) 2	(0,2,8,10) (2,8)
✓ 3	✓ (1,5) 4	(0,4,1,5) (4,1)
✓ 5	✓ (2,3) 1	(0,4,2,6) (4,2)
✓ 6	✓ (2,6) 4	(0,4,8,12) (4,8)
✓ 10	✓ (2,10) 8	(0,8,2,10) (8,2) X
✓ 12	✓ (4,5) 1	(0,8,4,12) (8,4) X
✓ 11	✓ (4,6) 2	(2,3,10,11) (1,8)
	✓ (4,12) 8	(2,10,3,11) (8,1) X
	✓ (8,10) 2	
	✓ (8,12) 4	
	✓ (3,11) 8	
	✓ (10,11) 1	

+8

$$(0,1,2,3) (2,1) \quad 0000 = \bar{a}\bar{b}$$

$$(0,2,8,10) (2,8) \quad 0000 = \bar{b}\bar{d}$$

$$(0,1,4,5) (1,4) \quad 0000 = \bar{a}\bar{c}$$

$$(0,2,4,6) (2,4) \quad 0000 = \bar{a}\bar{d}$$

$$(0,4,8,12) (4,8) \quad 0000 = \bar{c}\bar{d}$$

$$(2,3,10,11) (1,8) \quad 0010 = \bar{b}c$$

+6

0 1 2 3 4 5 6 7 8 9 10

$\bar{a}\bar{b}$ x x x x

$\bar{b}\bar{d}$ x x x x

$\bar{a}\bar{c}$ x x x x

$\bar{a}\bar{d}$ x x x x

$\bar{c}\bar{d}$ x x x x

$\bar{b}c$ x x x x

$$F = \bar{a}\bar{c} + \bar{a}\bar{d} + \left\{ \begin{array}{l} \bar{a}\bar{b} + \bar{b}\bar{d} \\ \bar{a}\bar{b} + \bar{c}\bar{d} + \bar{b}c \\ \bar{b}\bar{d} + \bar{c}\bar{d} \\ \bar{b}\bar{d} + \bar{b}c \\ \bar{c}\bar{d} + \bar{b}c \end{array} \right\} \quad +6$$

cd \ ab	00	01	11	10
00	1	1	1	1
01	1	1		1
11				
10	1			1

$$F = \bar{b}\bar{d} + \bar{a}\bar{b} + \bar{a}\bar{c} + \bar{a}\bar{d} \quad (9)$$

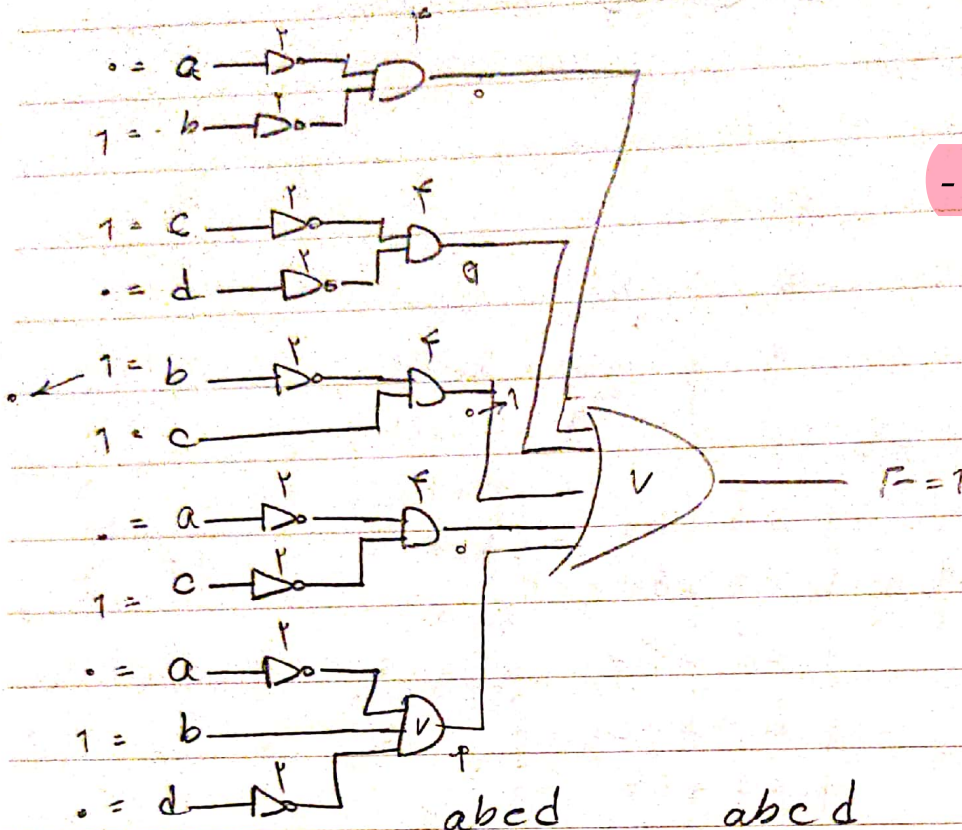
+6

cd \ ab	00	01	11	10
00	1	1	1	1
01	1	1		1
11				
10	1			1

$$\bar{a}\bar{b} + \bar{c}\bar{d} + \bar{b}c + \bar{a}\bar{c} + \bar{a}\bar{b}\bar{d} \quad (10)$$

$$F = \bar{a}\bar{b} + \bar{c}\bar{d} + \bar{b}c + \bar{a}c + \bar{a}bd$$

-12



$$\begin{array}{r} \text{عشره‌ها} \\ \hline abcd \quad abcd \\ (13) \quad 1000 \quad \longleftrightarrow \quad 1010 \quad (11) \end{array}$$

$$13 - 11 = 2$$

هزاره‌ها /
عشره‌ها

$$\begin{array}{r} \text{هزاره‌ها} \\ \hline abcd \quad abcd \\ (14) \quad 0110 \quad \longleftrightarrow \quad 0010 \quad (11) \end{array}$$

$$14 - 11 = 3$$

هزاره‌ها /
هزاره‌ها