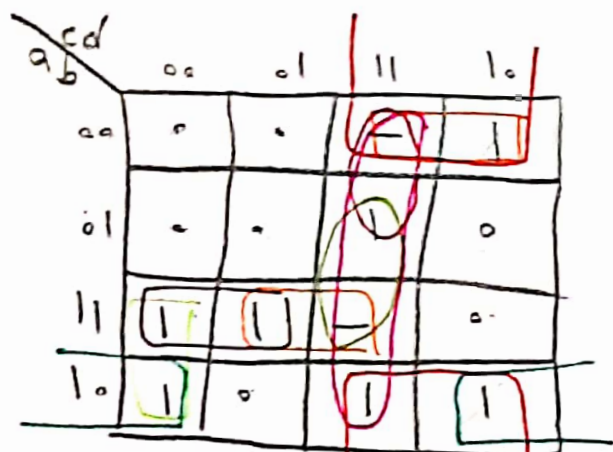


$$f(a, b, c, d) = \sum m(2, 7, 8, 10, 11, 12, 13) + d(3, 15)$$



$$E_p I \rightarrow -2$$

(الف)

$$P I \rightarrow \text{sop} \rightarrow \bar{b}c + \bar{a}\bar{b}c + a\bar{b}\bar{d} + cd + a\bar{c}\bar{d} + ab\bar{c} +$$

+4.5

$$abd + bcd + \bar{a}cd$$

-1.5 for surplus PIs

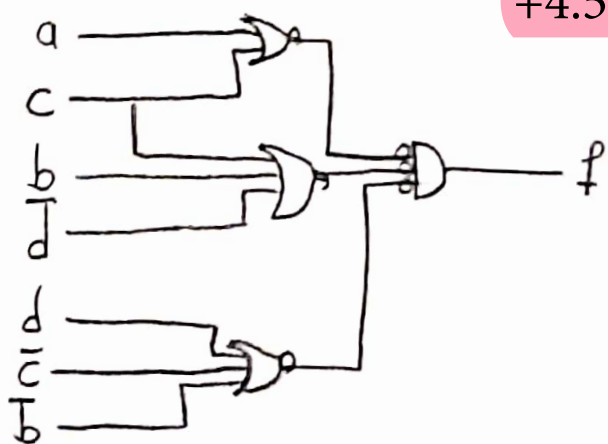
$$f \rightarrow \text{sop} : \bar{b}c + cd + abd + a\bar{c}\bar{d} +2$$

$$cd + a\bar{b}\bar{d} + \bar{a}\bar{b}c + ab\bar{c} -4$$

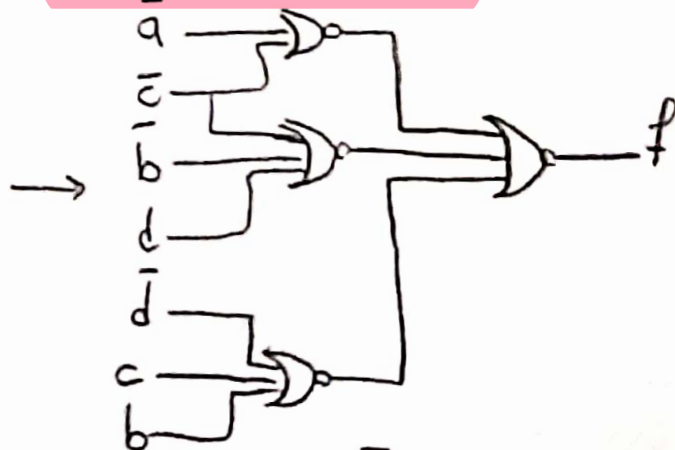
Nor-nor

$$\rightarrow \text{pos} : (a+c)(\bar{b}+\bar{c}+d)(b+c+\bar{d})$$

ب

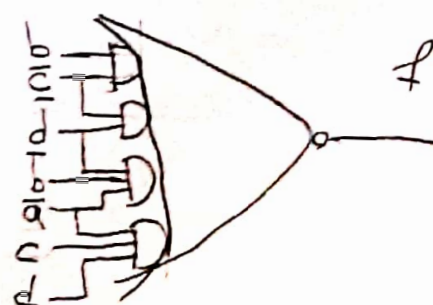
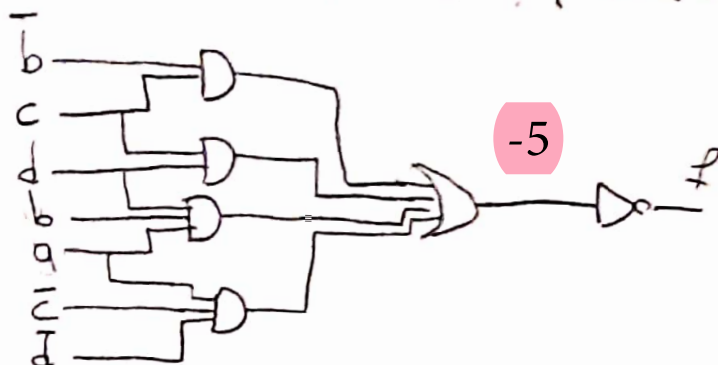


-0.5 for use ~a instead of a



And-or-inv

$$\rightarrow \text{sop} : \bar{b}c + cd + abd + a\bar{c}\bar{d}$$



$$f = \sum m(2, 7, 8, 10, 11, 12, 13) + d(3, 15)$$

مريم پيرجاست

99444142

(2)

2	(2,3) 1 ✓	(2,3,10,11) (1,8)
8	(2,10) 2 ✓	(2,10,11,3) (8,1)
3	(8,10) 2	
10	(8,12) 4	(3,11,7,15) (8,4)
12	(3,7) 4 ✓	(3,7,11,15) (4,8)
7	(3,11) 8 ✓	
11	(10,11) 1 ✓	
13	(12,13) 1	
15	(2,15) 8	
	(11,15) 4 ✓	
	(13,12) 2	

+8

$$2 \rightarrow x \cdot 1 \cdot x \rightarrow \bar{b}c$$

$$3 \rightarrow x \cdot 1 \cdot 1 \rightarrow cd$$

$$12 \rightarrow 1 \cdot 1 \cdot x \rightarrow ab\bar{d} \quad -1 \quad +5$$

$$12 \rightarrow 1 \cdot 1 \cdot x \rightarrow ab\bar{c}$$

$$12 \rightarrow 1 \cdot x \cdot 0 \rightarrow a\bar{c}d$$

$$10 \rightarrow 1 \cdot x \cdot 0 \rightarrow a\bar{b}d$$

	2	7	8	10	11	12	13
$\bar{b}c$	✓			✓	✓		
cd		✓			✓		
$ab\bar{d}$						✓	✓
$ab\bar{c}$						✓	✓
$a\bar{c}d$			✓			✓	
$a\bar{b}d$			✓	✓			

+4

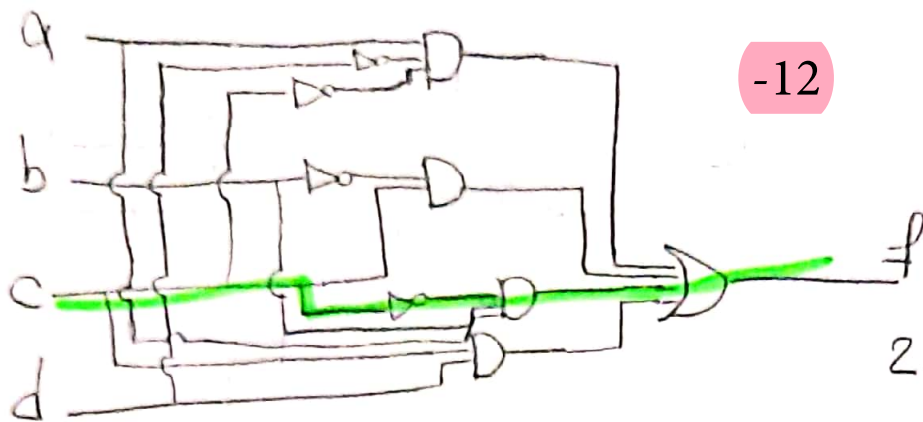
$$\bar{b}c + cd + \begin{cases} a\bar{c}d + ab\bar{c} \\ a\bar{b}d + ab\bar{c} \end{cases}$$

-2

$$\begin{cases} a\bar{b}d + ab\bar{c} \end{cases}$$

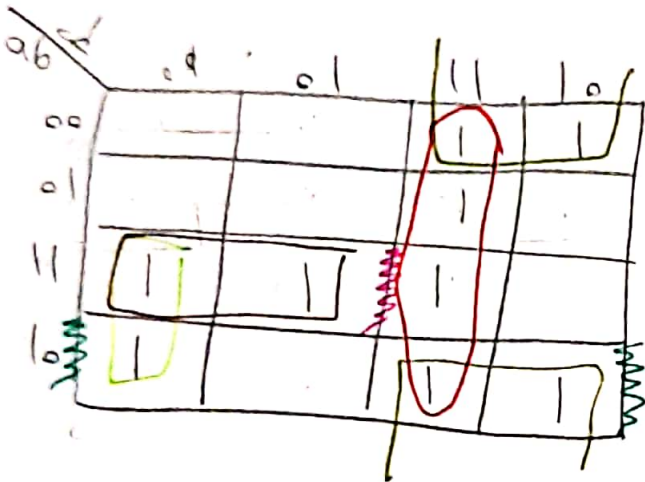
$$f = \bar{b}c + cd + a\bar{c}d + ab\bar{c}$$

<>



-12

$$2 + 4 + 7 = 13$$



+6

$1000 \leftrightarrow 1010$
 $1101 \leftrightarrow 1111$

} potential static hazard

←

در این قسمت باید ها زادی که logic شده به f اضافه کرد

-6