

Sistemas Digitales

Minimización (Parte II)

Prof. Luis Araujo

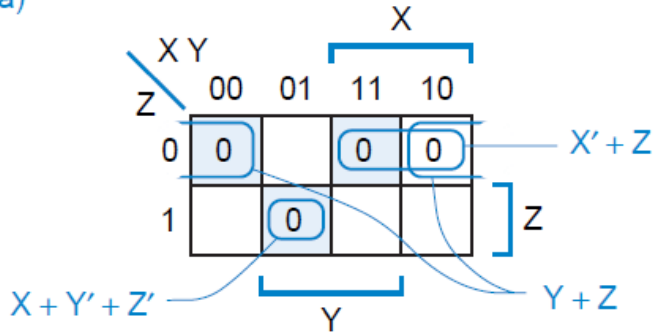
Escuela de Ingeniería Eléctrica



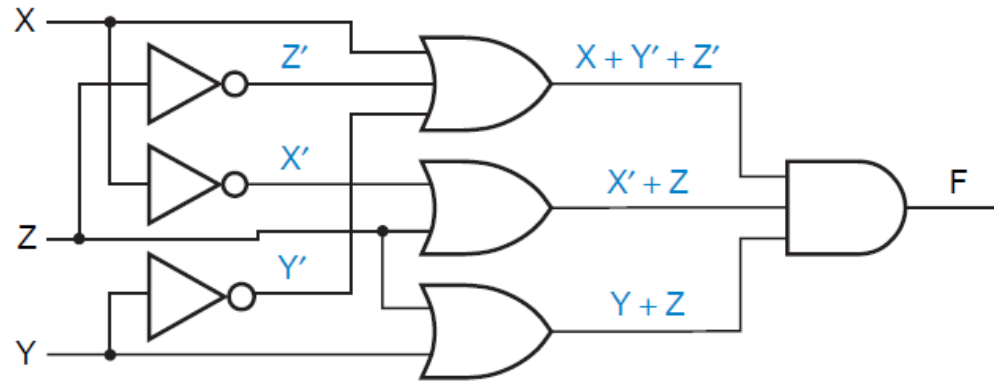
Solución en P.O.S.

$$F = \sum_{X,Y,Z} (1,2,5,7) = \prod_{X,Y,Z} (0,3,4,6)$$

(a)

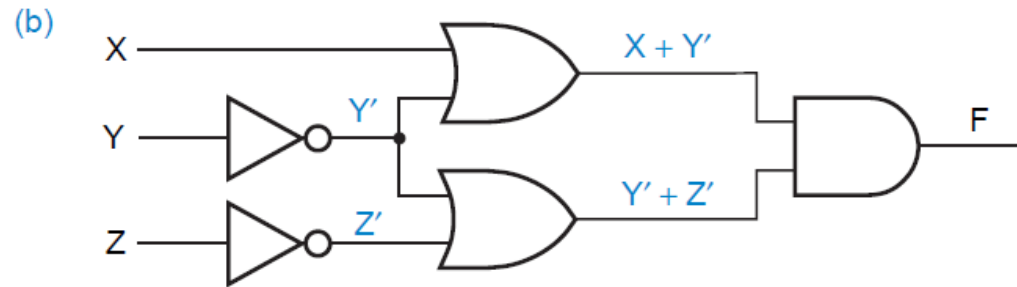
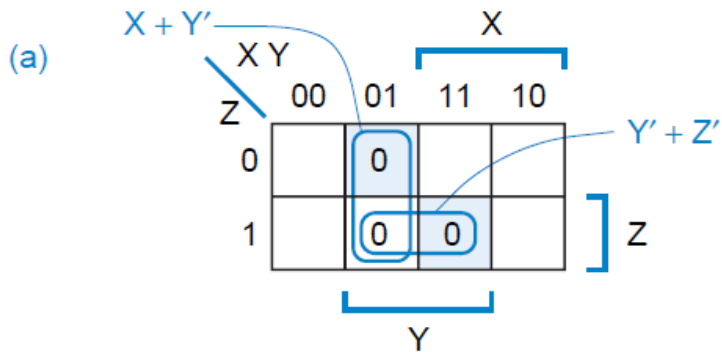


(b)



Solución en P.O.S.

$$F = \sum_{X,Y,Z} (0,1,4,5,6) = \prod_{X,Y,Z} (2,3,7)$$



Solución en P.O.S.

(a)

Y Z		W X			
		00	01	11	10
Y	00	0 0	4	12 0	8 0
	01	1 0	5	13	9 0
	11	3	7	15	11
	10	2	6	14 0	10 0

Diagram (a) shows a 4x4 Karnaugh map for a function of three variables W, X, and Z. The variables W and X are grouped horizontally, and Y and Z are grouped vertically. The map contains 1s in cells (0,0), (0,1), (1,0), (1,1), (2,0), (2,1), (3,0), and (3,1) in a 0-indexed grid.

$$F = \prod_{W,X,Y,Z}(0,1,8,9,10,12,14)$$

(b)

Y Z		W X			
		00	01	11	10
Y	00	0		0	0
	01	0			0
	11				
	10			0	0

Diagram (b) shows the same Karnaugh map with the 0s circled. The circled 0s are at (0,0), (0,1), (0,3), (1,3), and (3,2), (3,3) in a 0-indexed grid. The expression $X + Y$ is indicated by a bracket covering the top two rows, and $W' + Z$ is indicated by a bracket covering the last two columns.

$$F = (W' + Z) \cdot (X + Y)$$

Condiciones No Importa

(a)

		N ₃				
		00	01	11	10	
N ₁	N ₃ N ₂ 00	0	4	12 d	8	N ₀
	01	1 1	5 1	13 d	9	
	11	3 1	7 1	15 d	11 d	
	10	2 1	6	14 d	10 d	
		N ₂				

$$F = \sum_{N_3, N_2, N_1, N_0} (1, 2, 3, 5, 7) + d(10, 11, 12, 13, 14, 15)$$

(b)

		N ₃				
		00	01	11	10	
N ₁	N ₃ N ₂ 00			d		N ₀
	01	1	1	d		
	11	1	1	d	d	
	10	1		d	d	
		N ₂				

$$F = N_3' \cdot N_0 + N_2' \cdot N_1$$

Condiciones No Importa

(a)

		W X				
		00	01	W		
Y Z	00	0	4 1	12	8	Z
	01	1	5 1	13 1	9 d	
	11	3 d	7 d	15 1	11	
	10	2 d	6	14 d	10	
	X					
		Y				
		00	01	11	10	

$$F = \sum_{W,X,Y,Z}(4,5,13,15) + d(2,3,7,9,14)$$

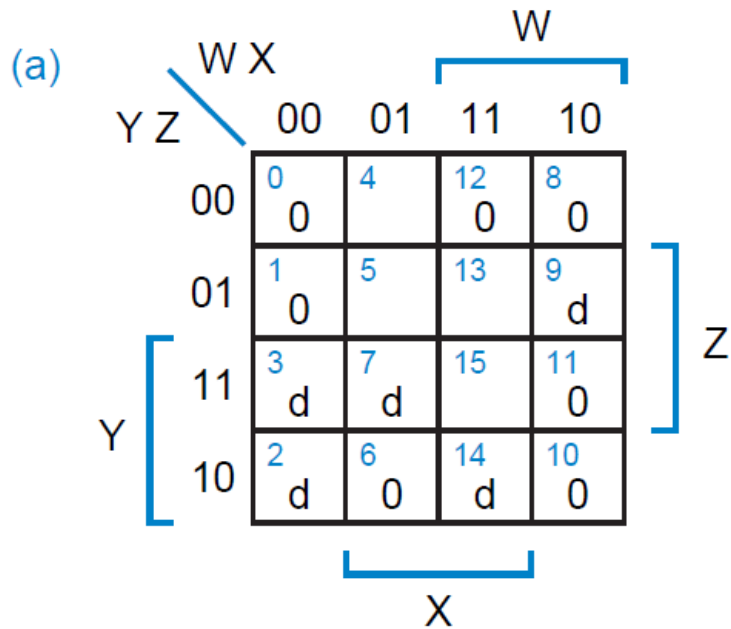
(b)

		W X					
		00	01	W			11
Y Z	00		1			W · Y' · Z	
	01		1	1	d	Z	
	11	d	d	1			
	10	d		d			W · X · Y
	X						
		Y					
		00	01	11	10		

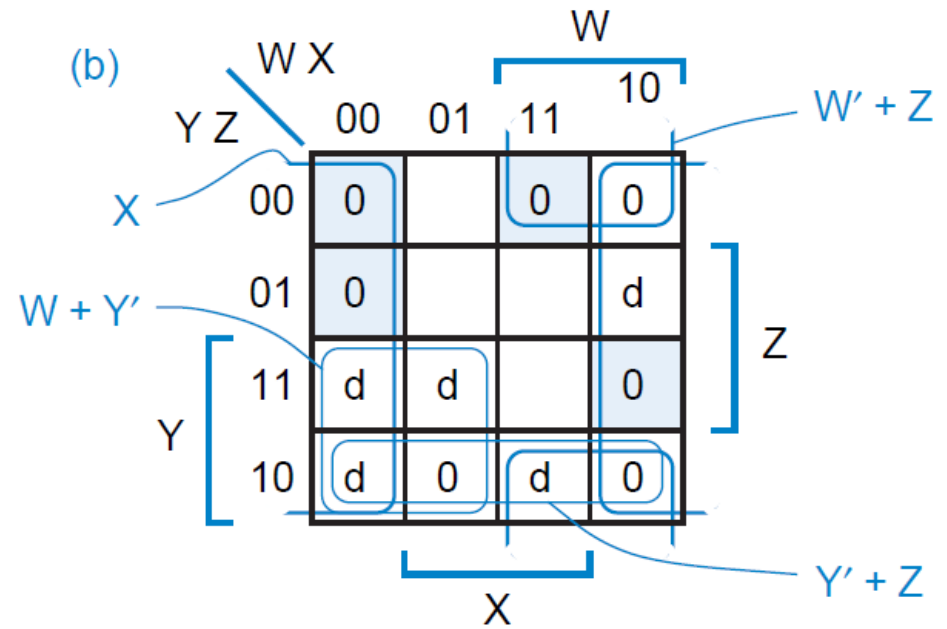
$W' \cdot X \cdot Y'$ (points to cell 01,00)
 $X \cdot Z$ (points to cell 01,01)
 $W \cdot X \cdot Y$ (points to cell 10,11)

$$F(W,X,Y,Z) = W' \cdot X \cdot Y' + X \cdot Z$$

Condiciones No Importa



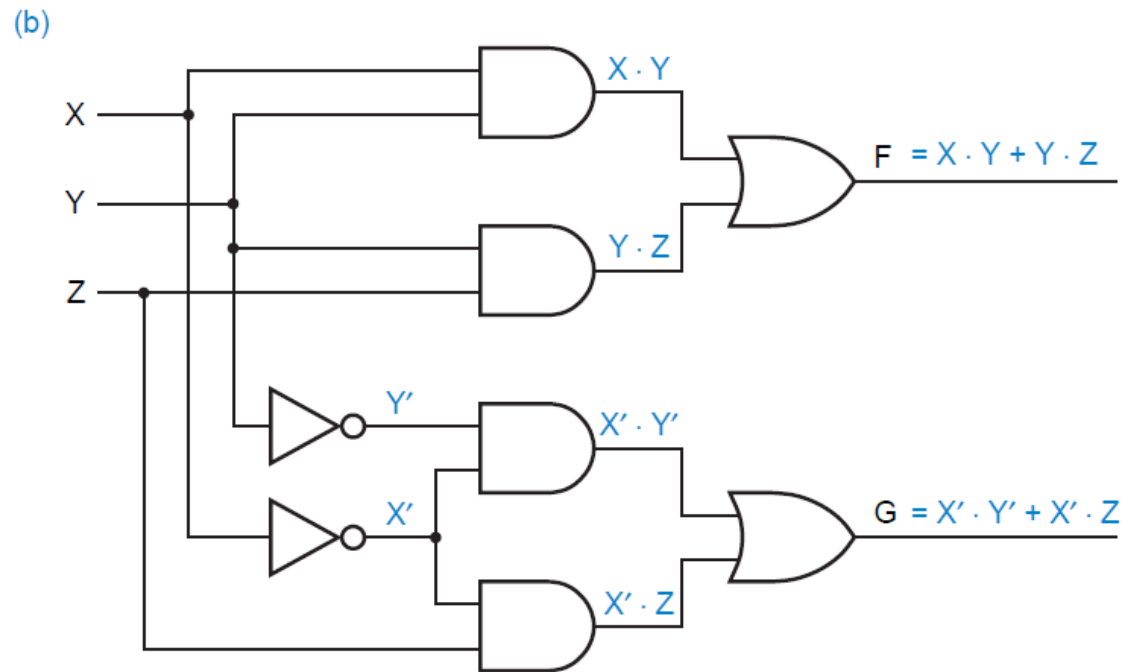
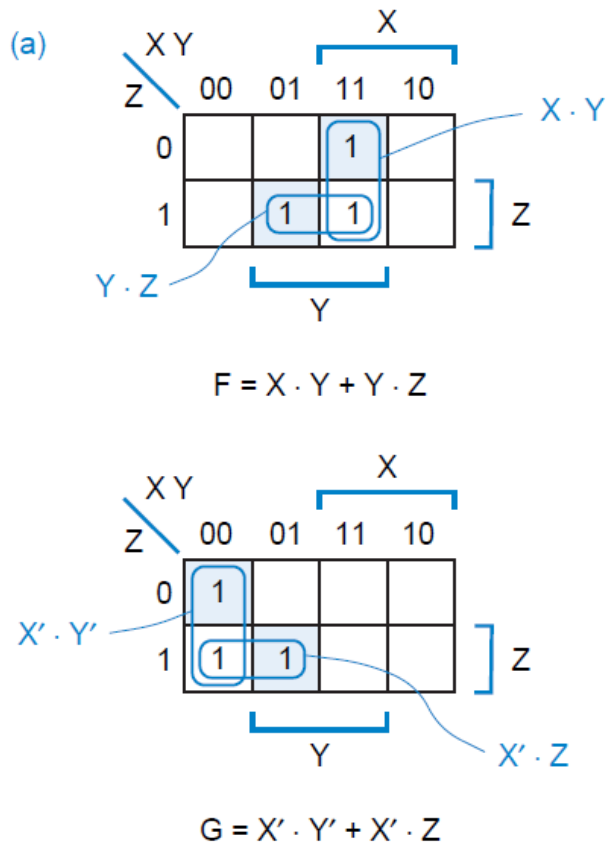
$$F = \sum_{W,X,Y,Z}(4,5,13,15) + d(2,3,7,9,14)$$



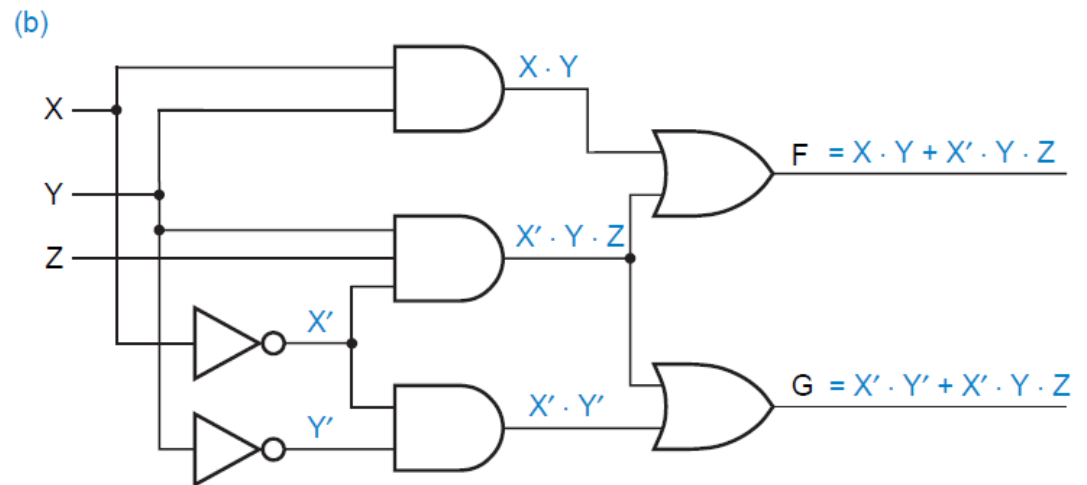
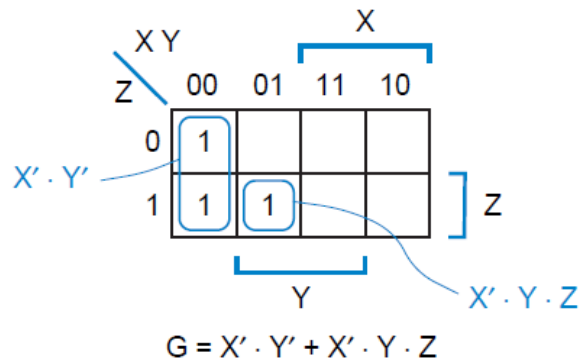
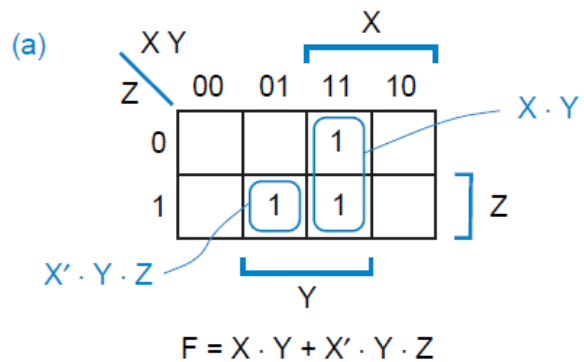
$$F(W,X,Y,Z) = X \cdot (W' + Z) \cdot (Y' + Z)$$

or $X \cdot (W' + Z) \cdot (W + Y')$

Minimización de Salida Múltiple



Minimización de Salida Múltiple



Minimización de Salida Múltiple

