

TRABAJO PRÁCTICO N° 4

ALGEBRA DE BOOLE, RESPUESTAS

- 1.- a) $F(abc) = \overline{abc}$
 b) $F(abc) = a(b + c)$
 c) $F(abc) = 0$
 d) $F(abcd) = \overline{ab}$
 e) $F(abcd) = \overline{bc}$
 f) $F(abc) = ac + b$
 g) $F(abc) = a + \overline{b} + \overline{c}$

2.-

a	b	c	d		Fa	Fb	Fc	Fd	Fe	Ff	Fg
0	0	0	0		1	0	0	0	0	0	1
0	0	0	1		1	0	0	0	0	0	1
0	0	1	0		1	0	0	0	1	1	1
0	0	1	1		1	0	0	0	1	1	0
0	1	0	0		1	0	0	0	0	0	1
0	1	0	1		1	1	0	0	0	1	1
0	1	1	0		1	1	0	0	0	1	1
0	1	1	1		0	1	0	0	0	1	1
1	0	0	0					1	0		
1	0	0	1					1	0		
1	0	1	0					1	1		
1	0	1	1					1	1		
1	1	0	0					0	0		
1	1	0	1					0	0		
1	1	1	0					0	0		
1	1	1	1					0	0		

a)	$F(abc) = \sum m(0,1,2,3,4,5,6) = \prod M(7)$
b)	$F(abc) = \sum m(5,6,7) = \prod M(0,1,2,3,4)$
c)	$F(abc) = \sum = \prod M(0,1,2,3,4,5,6,7)$
d)	$F(abcd) = \sum = \prod M(0,1,2,3,4,5,6,7,12,13,14,15) = \sum m(8,9,10,11)$
e)	$F(abcd) = \sum = \prod M(0,1,2,4,5,6,7,8,9,12,13,14,15) = \sum m(2,3,10,11)$
f)	$F(abc) = \sum m(2,3,5,6,7) = \prod M(0,1,4)$
g)	$F(abc) = \sum m(0,1,2,4,5,6,7) = \prod M(3)$

3.-

Funciones	mintérminos	Maxtérminos	Simplificación
F ₁	$\sum m(0,2,3,4)$	$\prod M(1,5,6,7)$	$F(abc) = \overline{ab} + \overline{bc}$
F ₂	$\sum m(2,4)$	$\prod M(0,1,3,5,6,7)$	$F(abc) = (a + b)(\overline{a} + \overline{b})\overline{c}$
F ₃	$\sum m(0,1,2,5,6,7)$	$\prod M(3,4)$	$F(abc) = ab + \overline{bc} + \overline{ac}$
F ₄	$\sum m(0,2,4,6)$	$\prod M(1,3,5,7)$	$F(abc) = \overline{c}$
F ₅	$\sum m(1,3,4,5,6)$	$\prod M(0,2,7)$	$F(abc) = \overline{ac} + \overline{bc} + \overline{ac}$

4.- $F(abcd) = \sum = \prod M(1,3,7,9,15) = \sum m(0,2,4,5,6,8,10,11,12,13,14)$

$$F(abcd) = \overline{a}bc + b\overline{c} + \overline{d}$$

5.- a) Una compuerta OR EXCLUSIVA de 2 entradas $F(abc) = a \oplus b$

b) Una compuerta AND de 3 entradas $F(abc) = \overline{a}bc$

6.-

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

$$F(abcd) = a(\overline{\overline{b} + c}) + \overline{cd}$$

$$F(abcd) = \overline{c} + \overline{d}$$

7.-

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

$$F(abc) = \sum m(3,4,5,6,7) = \prod M(0,1,2)$$

$$F(abc) = a + bc$$

8.-

incisos	Simplificación
a)	$F(abc) = ab + bc + \overline{a}\overline{b}\overline{c}$
b)	$F(abc) = ac + \overline{a}\overline{c} + \overline{b}$

c)	$F(abcd) = \bar{a}b + \bar{a}\bar{c} + a\bar{b}d$
d)	$F(abcd) = \bar{a}b + \bar{a}d + ac + bd$
e)	$F(abcd) = ac + bc + bd + \bar{b}\bar{c}\bar{d}$