

Exercices sur le tableau de KARNAUGH

Exercice 1

1. Simplifiez les fonctions suivantes en utilisant les tableaux de karnaugh :

b	a	X
0	0	1
0	1	1
1	0	1
1	1	0

c	b	a	Y
0	0	0	1
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	1
1	1	1	1

d	c	b	a	Z
0	0	0	0	0
0	0	0	1	1
0	0	1	0	1
0	0	1	1	1
0	1	0	0	0
0	1	0	1	1
0	1	1	0	1
0	1	1	1	1
1	0	0	0	1
1	0	0	1	0
1	0	1	0	0
1	0	1	1	1
1	1	0	0	1
1	1	0	1	1
1	1	1	0	1
1	1	1	1	0

2. Donnez le logigramme de chaque fonction.

Exercice 2

Simplifiez les fonctions suivantes en utilisant les tableaux de karnaugh :

$$F1 = a.b.\bar{c} + \bar{a}.\bar{b}.c + a.\bar{b}.\bar{c} + a.\bar{b}.c$$

$$F2 = a.b.c + \bar{a}.b.c + \bar{a}.\bar{b}.c + a.b.\bar{c}$$

$$F3 = \bar{a}.\bar{b}.c.\bar{d} + \bar{a}.b.\bar{c}.\bar{d} + a.\bar{b}.c.\bar{d} + \bar{a}.\bar{b}.\bar{c}.\bar{d} + a.b.\bar{c}.\bar{d} + \bar{a}.b.c.d + a.\bar{b}.\bar{c}.\bar{d}$$

$$F4 = \bar{a}.\bar{b}.\bar{c}.\bar{d} + \bar{a}.\bar{b}.\bar{c}.d + \bar{a}.\bar{b}.c.\bar{d} + \bar{a}.\bar{b}.c.d + a.b.\bar{c}.\bar{d} + a.b.c.d + a.\bar{b}.\bar{c}.\bar{d} + a.\bar{b}.c.d + a.\bar{b}.\bar{c}.\bar{d}$$

$$F5 = \bar{a}.\bar{b}.\bar{c}.\bar{d} + \bar{a}.\bar{b}.c.\bar{d} + a.b.\bar{c}.\bar{d} + a.b.c.\bar{d} + a.\bar{b}.\bar{c}.\bar{d} + a.\bar{b}.c.\bar{d}$$

$$F6 = a\bar{b}c\bar{d} + ab\bar{d} + \bar{a}bc + bcd + b\bar{c}d + \bar{a}bc$$

$$F7 = \bar{b}c\bar{d} + abc + \bar{b}c + ac\bar{d}$$