Codification et Représentation de l’Information (CRI)

MI – USTHB – TD

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Exercice 1

1- Etablir les tables de vérité des fonctions suivantes :

F1 = (X +Y)($\bar{X}$ +Y + Z)

F2 = ($\bar{X}$Y + X$\bar{Y}$) $\bar{Z}$ + ($\bar{X}$ $\bar{Y}$ + XY)Z

2- Démontrer à l'aide de tables de vérité les équivalences suivantes :

X + YZ= (X+Y)(X+Z)

$(\bar{X} + Y)(X + Z)(Y + Z) = (\bar{X} + Y)(X +$

X	Y	Z	$\bar{X}$	X+Y	$\bar{X}$+Y+Z	F1
0	0	0	1	0	1	0
0	0	1	1	0	1	0
0	1	0	1	1	1	1
0	1	1	1	1	1	1
1	0	0	0	1	0	0
1	0	1	0	1	1	1
1	1	0	0	1	1	1
1	1	1	0	1	1	1

Exercice 1

1- Etablir les tables de vérité des fonctions suivantes :

$F1 = (X + Y)(\bar{X} + Y + Z)$

$F2 = (\bar{X}Y + X\bar{Y})\,\bar{Z} + (\bar{X}\,\bar{Y} + XY)Z$

X	Y	Z	$\bar{X}$	$\bar{Y}$	$\bar{Z}$	$\bar{X}Y$	$X\bar{Y}$	$\bar{X}Y+X\bar{Y}$	$(\bar{X}Y+X\bar{Y})\bar{Z}$	$\bar{X}\bar{Y}$	XY	$\bar{X}\bar{Y}$+XY	$(\bar{X}\bar{Y}+XY)Z$	F2
0	0	0	1	1	1	0	0	0	0	1	0	1	0	0
0	0	1	1	1	0	0	0	0	0	1	0	1	1	1
0	1	0	1	0	1	1	0	1	1	0	0	0	0	1
0	1	1	1	0	0	1	0	1	0	0	0	0	0	0
1	0	0	0	1	1	0	1	1	1	0	0	0	0	1
1	0	1	0	1	0	0	1	1	0	0	0	0	0	0
1	1	0	0	0	1	0	0	0	0	0	1	1	0	0
1	1	1	0	0	0	0	0	0	0	0	1	1	1	1

Exercice 1

2- Démontrer à l'aide de tables de vérité les équivalences suivantes :

X + YZ = (X+Y)(X+Z)

$$(\bar{X} + Y)(X + Z)(Y + Z) = (\bar{X} + Y)(X + Z)$$

X	Y	Z	YZ	$X + YZ$	$X + Y$	$X + Z$	$(X + Y)(X + Z)$	
0	0	0	0	0	0	0	0	
0	0	1	0	0	0	1	0	
0	1	0	0	0	1	0	0	
0	1	1	1	1	1	1	1	
1	0	0	0	1	1	1	1	
1	0	1	0	1	1	1	1	
1	1	0	0	1	1	1	1	
1	1	1	1	1	1	1	1	

Exercice 1

2- Démontrer à l'aide de tables de vérité les équivalences suivantes :

X + YZ= (X+Y)(X+Z)

$(\bar{X}+Y)(X+Z)(Y+Z)=(\bar{X}+Y)(X+Z)$

PG = $(\bar{X}+Y)(X+Z)(Y+Z)$ $PD=(\bar{X}+Y)(X+Z)$

X	Y	Z	$\bar{X}$	$\bar{X}+Y$	X+Z	$Y+Z$	PG	$(\bar{X}+Y)$	PD
0	0	0	1	1	0	0	0	1	0
0	0	1	1	1	1	1	1	1	1
0	1	0	1	1	0	1	0	1	0
0	1	1	1	1	1	1	1	1	1
1	0	0	0	0	1	0	0	0	0
1	0	1	0	0	1	1	0	0	0
1	1	0	0	1	1	1	1	1	1
1	1	1	0	1	1	1	1	1	1

Exercice 2

Simplifier algébriquement les expressions suivantes :

$(x + \bar{y} + x\bar{y})(xy + \bar{x}z + yz)$

$(x + y + z)(\bar{x} + y + z) + xy + yz$

$abcd + abchg + \bar{d}hg + abcdefh.$

$a\bar{c}de + \bar{d} + \bar{e} + c$

Démontrer algébriquement les égalités suivantes :

$A\bar{B} + \bar{A}\bar{C}\bar{D} + \bar{A}\bar{B}D + \bar{A}\bar{B}C\bar{D} = \bar{A}\bar{C}\bar{D} + \bar{B}$

$A.B + \bar{A}.C + B.C = A.B + \bar{A}.C$

$AB + ACD + \bar{B}D = AB + \bar{B}D$

$AB + \bar{B}C = (A + \bar{B})(B + C)$

Exercice 2

Simplifier algébriquement les expressions suivantes :

1- (x+ $\bar{y}$ + x $\bar{y}$)(xy + $\bar{x}$ z + yz)   ///   yz = yz(x+/x)

// xy + x z + yz = xy+$\bar{x}$z + ~~xyz~~ + ~~yz$\bar{x}$~~ = xy+$\bar{x}$z

= $(x(\cancel{1+\bar{y}}) + \bar{y})$(xy + □x z)

= $xxy + x\bar{x}z + xy\bar{y} + \bar{x}\bar{y}z$

= $xy + \cancel{x\bar{x}z + xy\bar{y}} + \bar{x}\bar{y}z$

= $xy + \bar{x}\bar{y}z$

Exercice 2

Simplifier algébriquement les expressions suivantes :

2- $(\underbrace{x}_{\boxed{b}} + \underbrace{y + z}_{\boxed{a}})(\underbrace{\bar{x}}_{\boxed{c}} + \underbrace{y + z}_{\boxed{a}}) + xy + yz$ $\quad\quad$ $//(a+b)(a+c) = a+(b.c)$

$= ((y+z)+\cancel{(x\bar{x}))+}xy+yz$

$= y+z + xy + yz$

$= y(1+x+z) + z$

$= y + z$

Exercice 2

Simplifier algébriquement les expressions suivantes :

abcd + abchg + $\bar{d}$hg+abcdefh.

= abcd~~(1+efh)~~ + abchg + $\bar{d}$hg

= abcd + abchg + $\bar{d}$hg /// abchg(d+/d)

= abcd + abchgd + abchg$\bar{d}$ + $\bar{d}$hg

= abcd~~(1+hg)~~ + hg$\bar{d}$~~(1+abc)~~

= abcd + $\bar{d}$hg

Exercice 2

Simplifier algébriquement les expressions suivantes : // $a + \bar{a}\,b = a + b$

$a\bar{c}de + \bar{d} + \bar{e} + c$

$= c + \bar{c}\,ade + \bar{d} + \bar{e}$ // $c + \bar{c}\,ade = c + ade$

$= c + ade + \bar{d} + \bar{e}$

$= \bar{d} + d\,ae + c + \bar{e}$ // $\bar{d} + d\,ae = \bar{d} + ae$

$= \bar{d} + ae + c + \bar{e}$

$= \bar{e} + e\,a + c + \bar{d}$ // $\bar{e} + e\,a = \bar{e} + a$

$= \bar{e} + a + c + \bar{d}$

Exercice 2

Démontrer algébriquement les égalités suivantes :

$A\bar{B} + \bar{A}\,\bar{C}\,\bar{D} + \bar{A}\,\bar{B}D + \bar{A}\,\bar{B}C\,\bar{D} = \bar{A}\,\bar{C}\,\bar{D} + \bar{B}$

$A.B+\bar{A}.C + B.C = A.B+\bar{A}.C$

$AB + ACD + \bar{B}D = AB + \bar{B}D$

$AB + \bar{B}C = (A + \bar{B})(B + C)$

Exercice 2

Démontrer algébriquement les égalités suivantes :

$$A\bar{B} + \bar{A}\bar{C}\bar{D} + \bar{A}\bar{B}D + \bar{A}\bar{B}C\bar{D} = \bar{A}\bar{C}\bar{D} + \bar{B}$$

$$= A\bar{B} + \bar{A}\bar{C}\bar{D}\,(B+\bar{B}) + \bar{A}\bar{B}D + \bar{A}\bar{B}C\bar{D}$$

$$= \mathbf{A\bar{B}} + \bar{A}\bar{C}\bar{D}B + \mathbf{A\bar{C}\bar{D}\bar{B}} + \mathbf{\bar{A}\bar{B}D} + \mathbf{\bar{A}\bar{B}C\bar{D}}$$

$$= \bar{B}\,(A + \bar{A}\bar{C}\bar{D} + \bar{A}D + \bar{A}C\bar{D}) + \bar{A}\bar{C}\bar{D}B$$

$$= \bar{B}\,(A + \cancel{\bar{A}}\bar{C}\bar{D} + \cancel{\bar{A}}D + \cancel{\bar{A}}C\bar{D}) + \bar{A}\bar{C}\bar{D}B$$

$$= \bar{B}\,(A + \bar{C}\cancel{\bar{D}} + D + C\cancel{\bar{D}}) + \bar{A}\bar{C}\bar{D}B$$

$$= \bar{B}\,(A + \bar{C} + D + C) + \bar{A}\bar{C}\bar{D}B$$

$$= \bar{B}\,(A + D + 1) + \bar{A}\bar{C}\bar{D}B$$

$$= \bar{B} + \bar{A}\bar{C}\bar{D}B$$

$$= \bar{B} + \bar{A}\bar{C}\bar{D}$$

Exercice 2

Démontrer algébriquement les égalités suivantes :

$A.B+\bar{A}.C + B.C = A.B+\bar{A}.C$

$= AB+\bar{A}C + BC\,(A+\bar{A})$

$= AB+\bar{A}C + ABC+\bar{A}CB$ // $a + ab = a$

$= AB\,(1+C) + \bar{A}C(1+B)$

$= A.B+\bar{A}.C$

Exercice 2

Démontrer algébriquement les égalités suivantes :

$AB + ACD + \bar{B}D = AB + \bar{B}D$

$= AB + ACD(B+\bar{B}) + \bar{B}D$

$= AB + ACDB + ACD\bar{B} + \bar{B}D$ // $a + ab = a$

$= AB + \bar{B}D$

Exercice 2

Démontrer algébriquement les égalités suivantes :

$AB + \bar{B}C = (A + \bar{B})(B + C)$

$(A + \bar{B})(B + C) = AB+AC+\cancel{B\bar{B}} + \bar{B}C$

$= AB+AC(B+\bar{B}) + \bar{B}C$

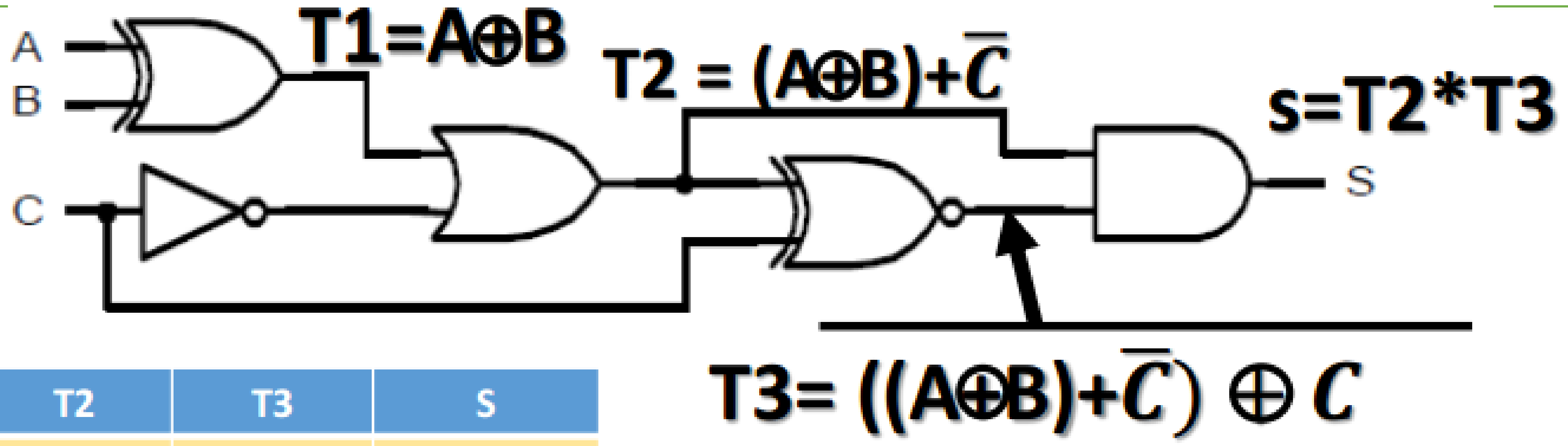
$= AB+ACB+AC\bar{B} + \bar{B}C$

$= AB\cancel{(1+C)}+\bar{B}C\cancel{(1+A)}$

$= AB + \bar{B}C$

Exercice 4

Exercice 4 :



A	B	C	$T1$	T2	T3	S
0	0	0	0	1	0	0
0	0	1	0	0	0	0
0	1	0	1	1	0	0
0	1	1	1	1	1	1
1	0	0	1	1	0	0
1	0	1	1	1	1	1
1	1	0	0	1	0	0
1	1	1	0	0	0	0

F(a,b,c) = /abc + a/bc

/F(a,b,c) = /a/b/c + /a/bc +.....

Exo 5 - 1

ab / cd	00	01	11	10
00	1	1	1	
01		1	1	
11		1	1	
10	1	1	1	1

$F(a,b,c,d) = \overline{a}\,\overline{d} + b + c\overline{d}$ La forme disjonctive

Exo 5 - 1

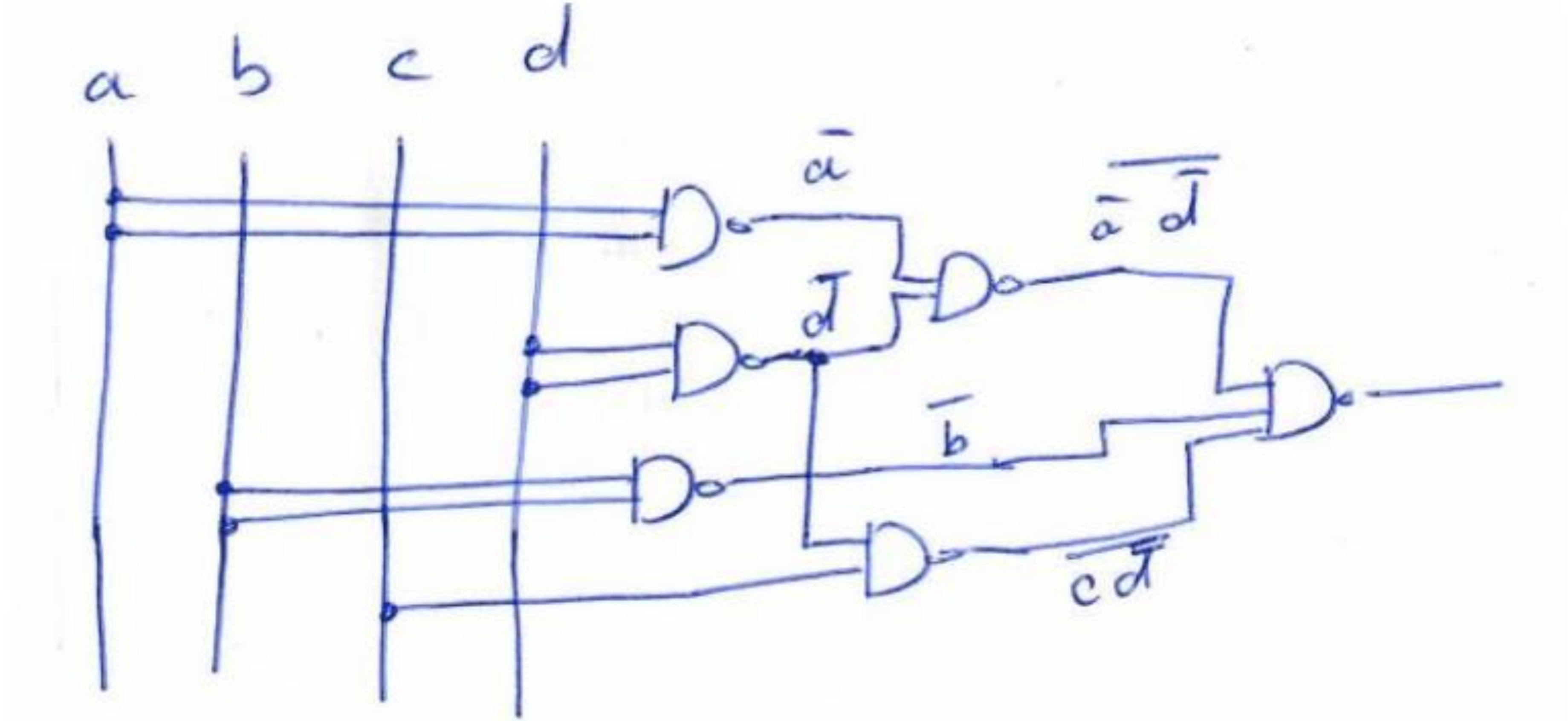
$$F(a,b,c,d) = \bar{a}\bar{d} + b + c\bar{d}$$

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

$$F(a,b,c,d) = \overline{\overline{\bar{a}\bar{d}} \cdot \bar{b} \cdot \overline{c\bar{d}}}$$

Exo 5 - 1

F(a,b,c,d) =$\overline{\overline{\bar{a}\bar{d}}\ .\ \bar{b}\,.\,\overline{c\bar{d}}}$



Exo 5 - 1

ab / cd	00	01	11	10
00	1	1	1	0
01	0	1	1	0
11	0	1	1	0
10	1	1	1	1

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

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

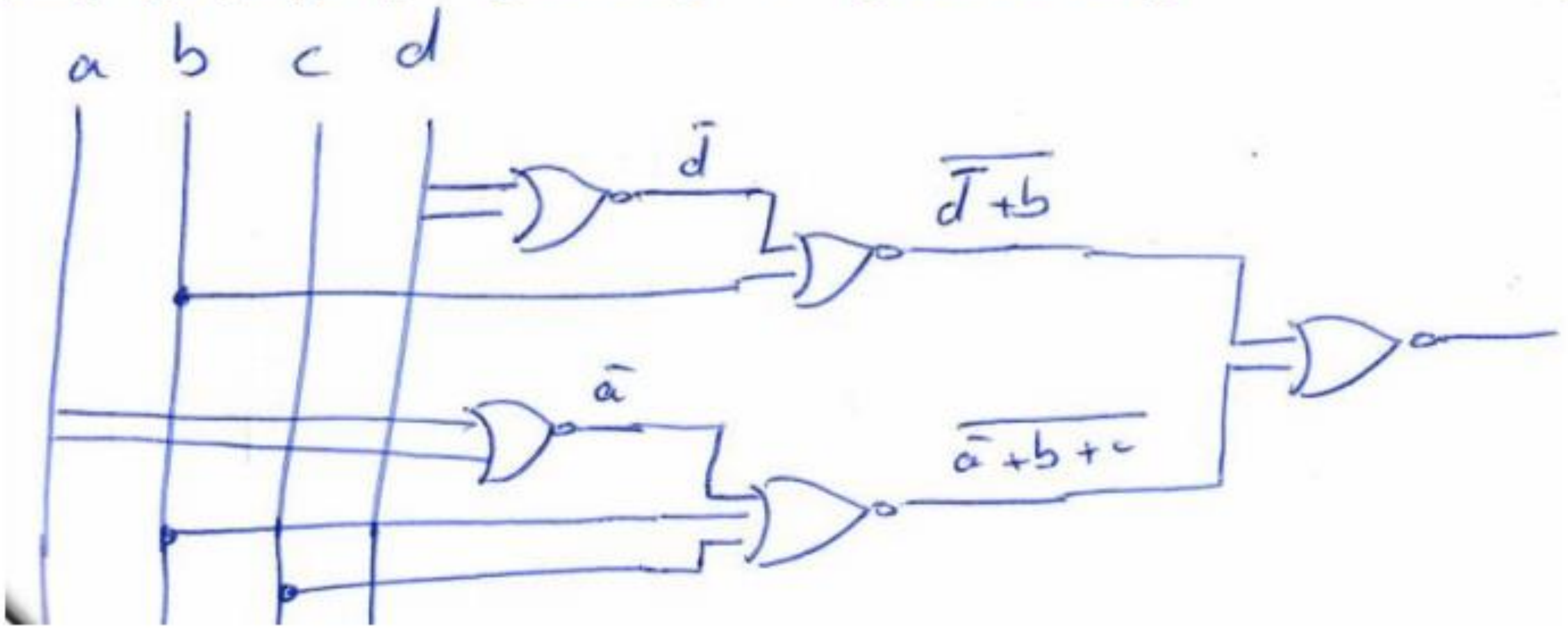
La forme conjonctive

Exo 5 - 1

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

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

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



Exo 5 - 2

ab / cd	00	01	11	10
00	1			1
01		1	1	
11		1	1	
10	1			1

$F(a,b,c,d) = bd + \overline{b}\,\overline{d}$

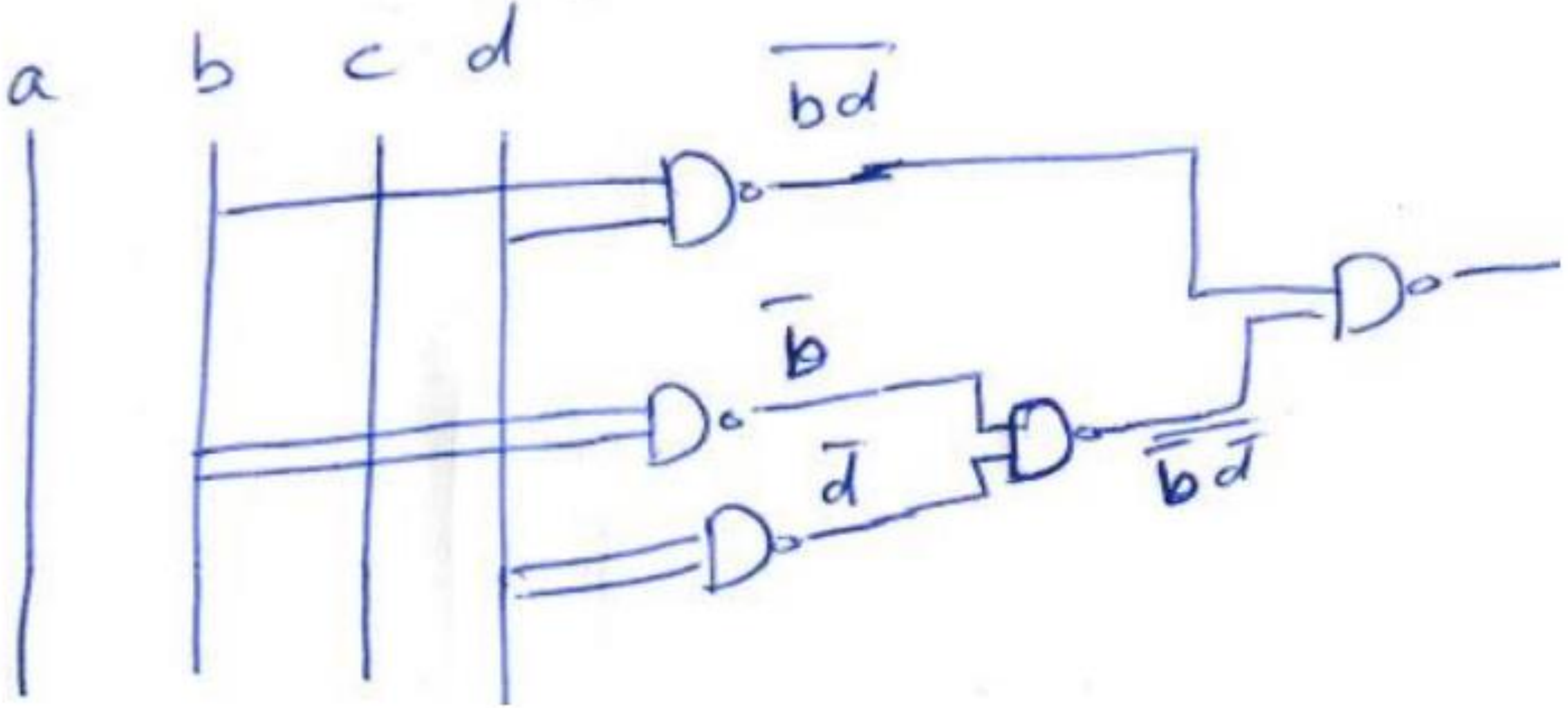
La forme disjonctive

Exo 5 - 2

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

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

$$F(a,b,c,d) = \overline{\overline{bd} \cdot \overline{\bar{b}\bar{d}}}$$



Exo 5 - 2

ab cd ,	00	01	11	10
00	1	0	0	1
01	0	1	1	0
11	0	1	1	0
10	1	0	0	1

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

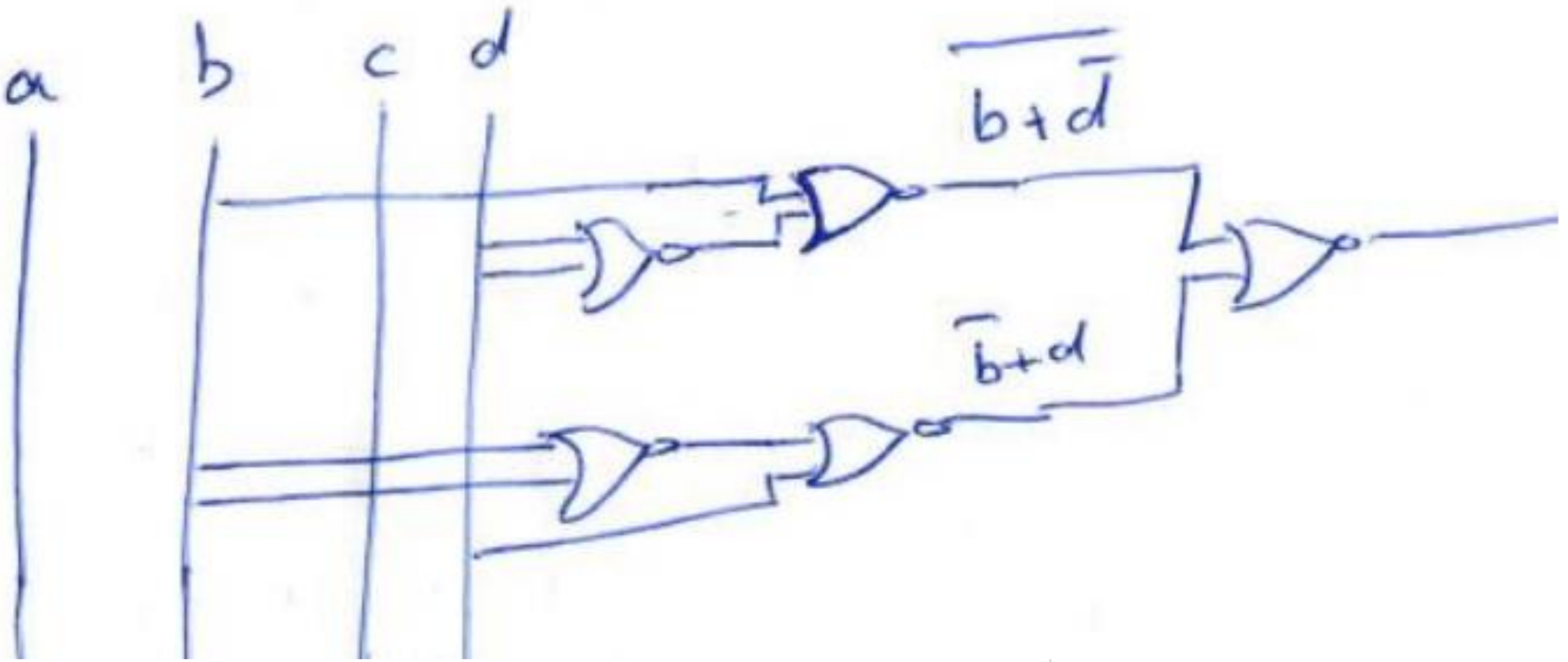
$$F(a,b,c,d) = (b + \overline{d})(\overline{b} + d)$$

La forme conjonctive

Exo 5 - 2

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

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



Exercice 5

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

F(a,b,c,d) = /b/c + /b/d + /abd + abc

Exercice 5

Exo 5 - 3

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

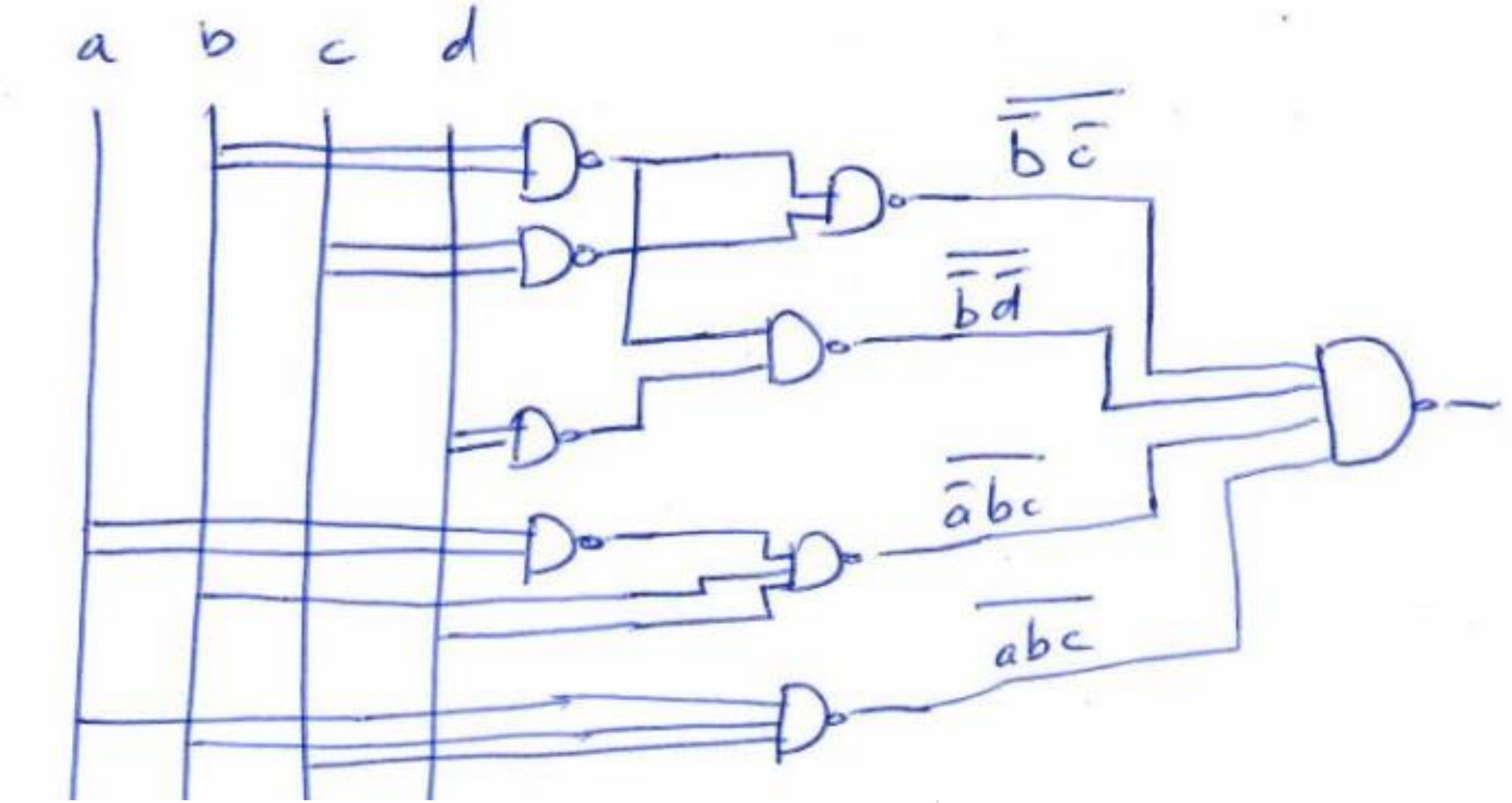
$$F(a,b,c,d) = \overline{\overline{\bar{b}\bar{c} + \bar{b}\bar{d} + \bar{a}bd + abc}}$$

$$F(a,b,c,d) = \overline{\overline{\bar{b}\bar{c}} \, . \, \overline{\bar{b}\bar{d}} \, . \, \overline{\bar{a}bd} . \, \overline{abc}}$$

Exercice 5

Exo 5 - 3

$$F(a,b,c,d) = \overline{\overline{\bar{b}\bar{c}} \,.\, \overline{\bar{b}\bar{d}} \,.\, \overline{\bar{a}bd} \,.\, \overline{abc}}$$



Exercice 5

cd \ ab	00	01	11	10
00	1	0	0	1
01	1	1	0	1
11	0	1	1	0
10	1	0	1	1

$$\overline{F}(a,b,c,d) = ab\overline{c} + \overline{a}b\overline{d} + \overline{b}cd$$

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

Exo 5 - 3

$$\overline{F(a,b,c,d)} = \bar{b}cd + \bar{a}b\bar{d} + ab\bar{c}$$

La forme conjonctive

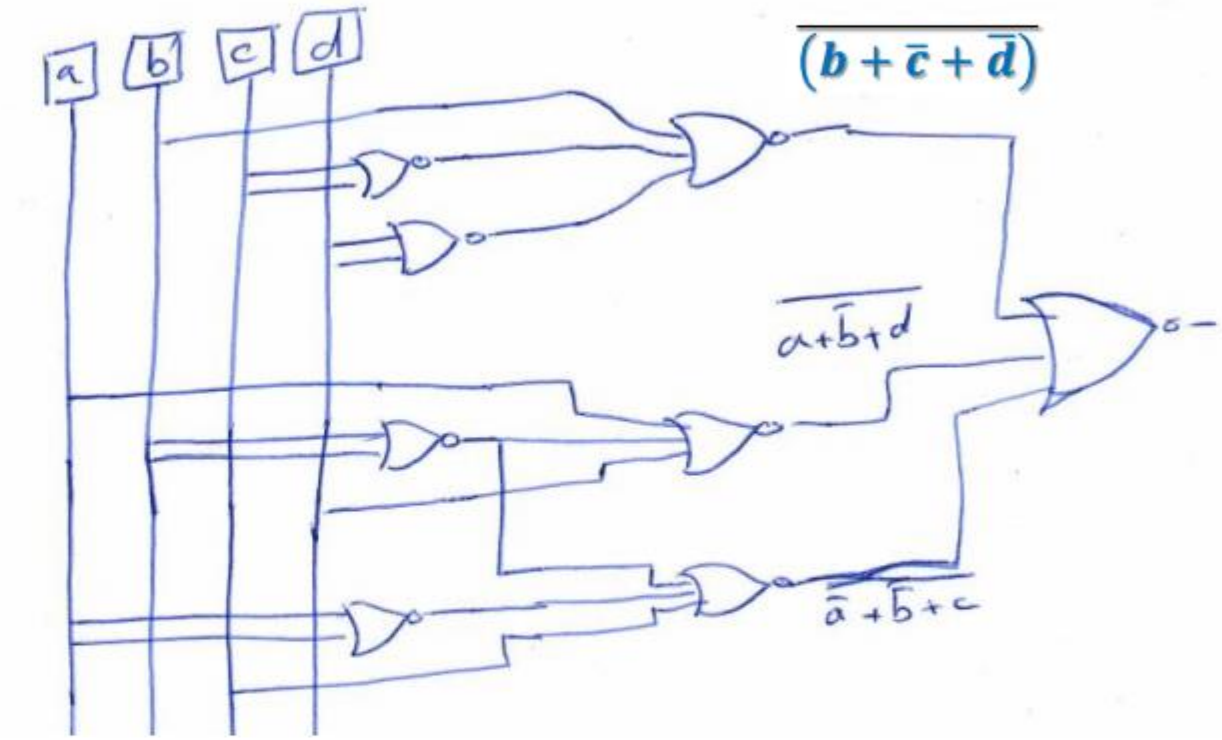
$$F(a,b,c,d) = (b + \bar{c} + \bar{d})(a + \bar{b} + d)(\bar{a} + \bar{b} + c)$$

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

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

Exo 5 - 3

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



Exercice 5

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

F(a,b,c,d) = b + a/c

Exo 5 - 4

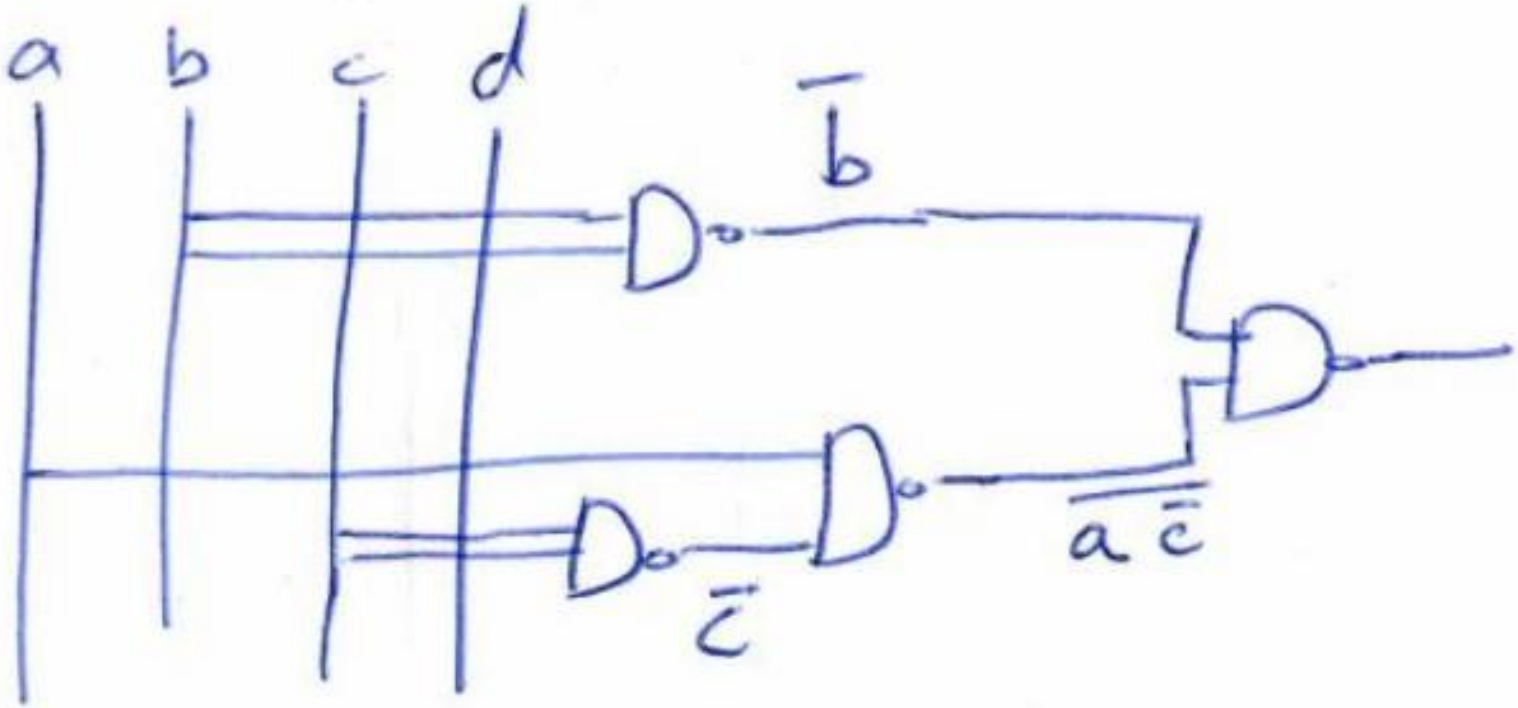
$$F(a,b,c,d) = b + a\bar{c}$$

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

$$F(a,b,c,d) = \overline{\bar{b}\ .\ \overline{a\bar{c}}}$$

Exo 5 - 4

$$F(a,b,c,d) = \overline{\overline{b} \cdot \overline{a\overline{c}}}$$



Exercice 5

ab / cd	00	01	11	10
00	0	x	x	1
01	0	1	1	1
11	0	1	1	0
10	0	1	1	0

/F(a,b,c,d) = /a/b + /bc

/F(a,b,c,d) = (a+b) (b+/c)

Exo 5 - 4

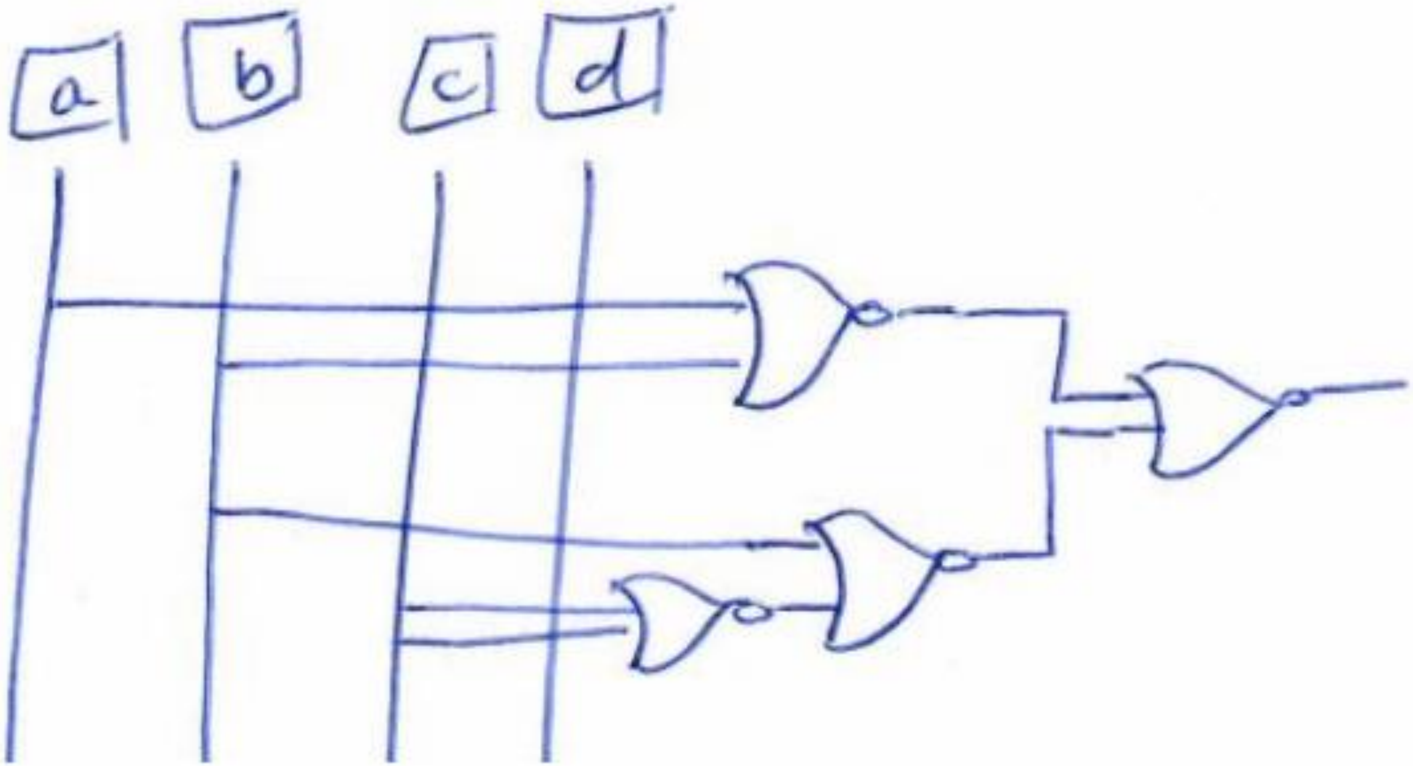
$$F(a,b,c,d) = (a+b)(b+\overline{c})$$

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

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

Exo 5 - 4

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



Exercice 5

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

F(a,b,c,d) = d + /b/c

Exo 5 - 5

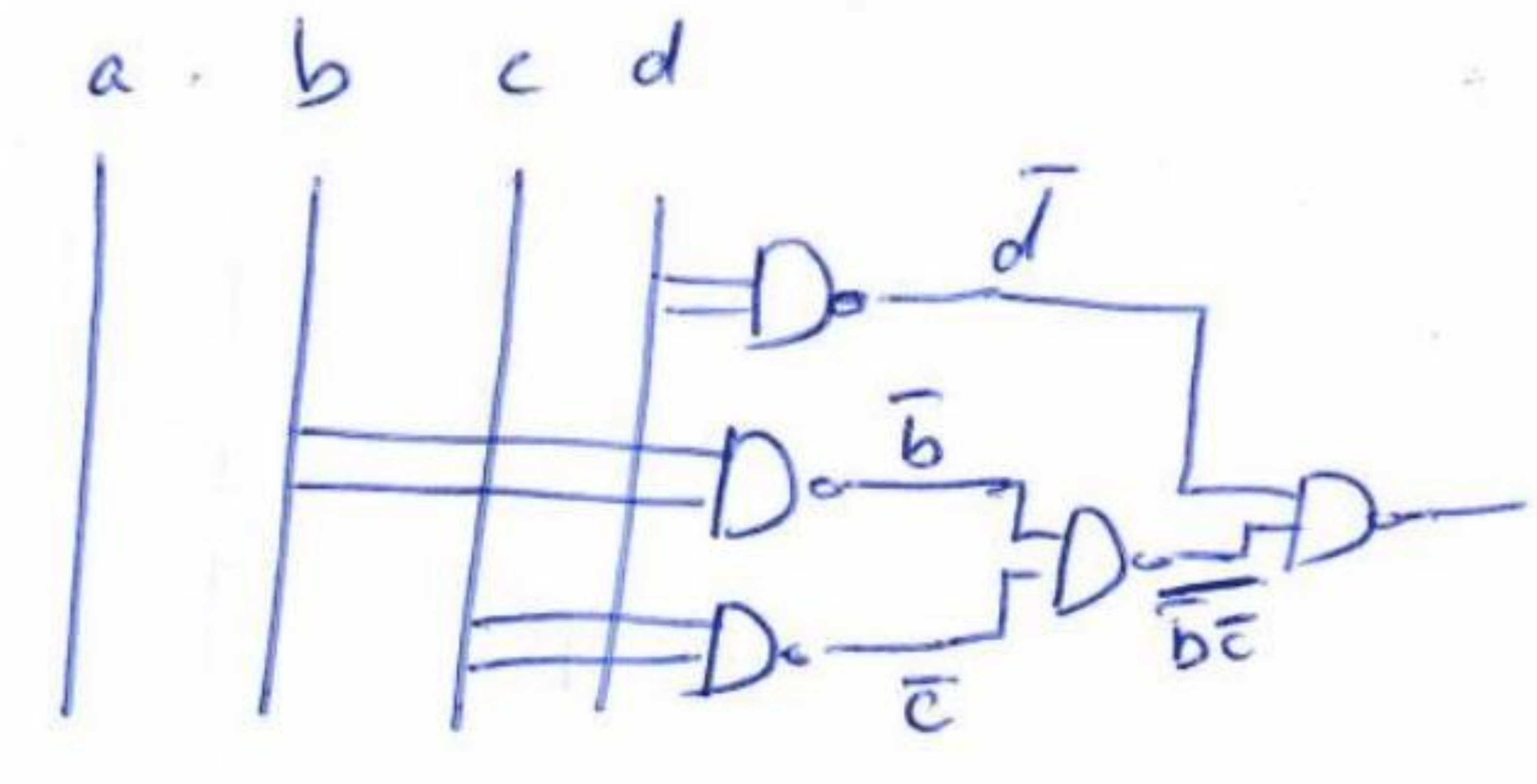
$$F(a,b,c,d) = d + \bar{b}\bar{c}$$

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

$$F(a,b,c,d) = \overline{\bar{d} \, . \, \overline{\bar{b}\bar{c}}}$$

Exo 5 - 5

$$F(a,b,c,d) = \overline{\bar{d}\ .\ \overline{\bar{b}\bar{c}}}$$



Exercice 5

cd \ ab	00	01	11	10
00	1	0	0	1
01	X	1	1	1
11	X	1	1	x
10	x	0	0	0

$$/F(a,b,c,d) = c/d + b/d$$

$$F(a,b,c,d) = (/c+d)(/b+d)$$

Exo 5 - 5

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

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

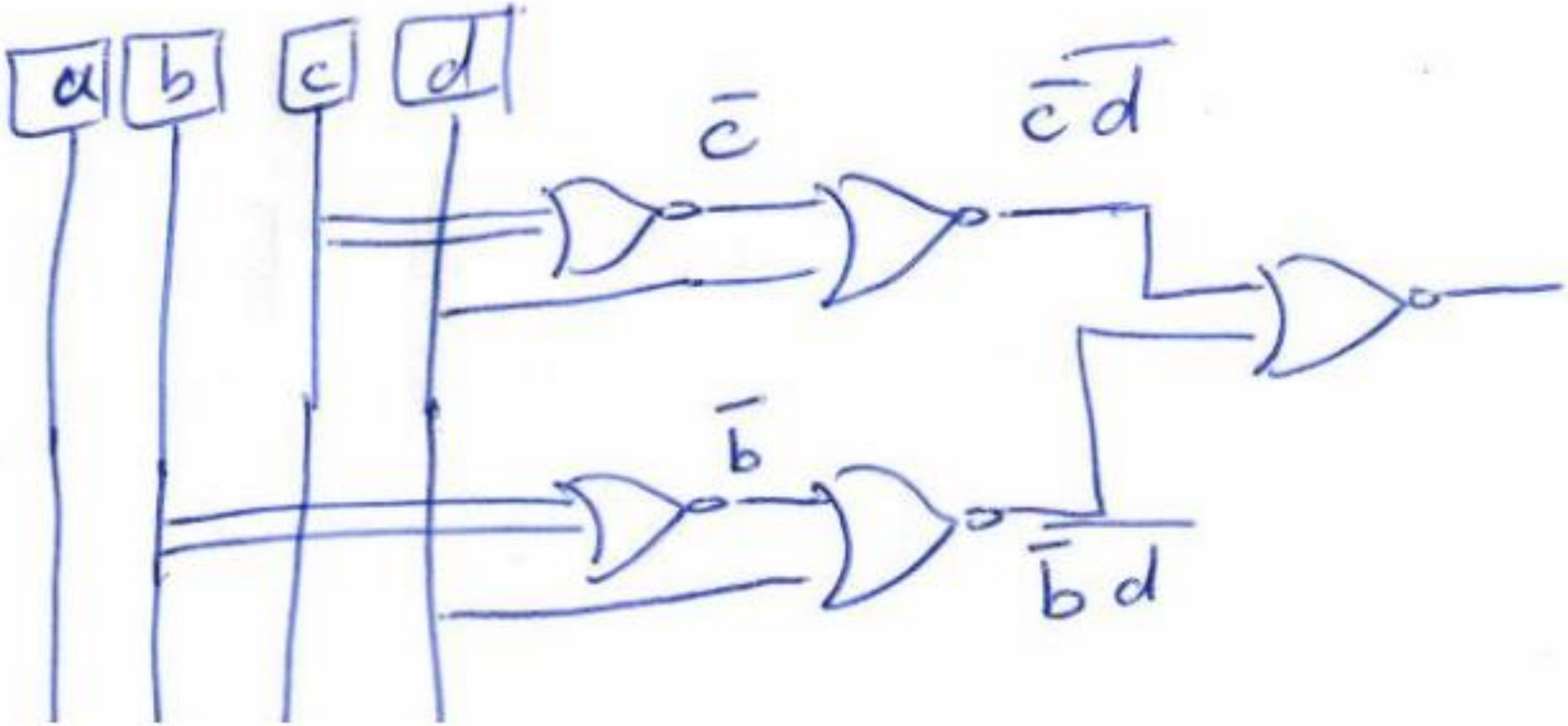
La forme conjonctiv

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

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

Exo 5 - 5

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



Exercice 5

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

$$F(a,b,c,d) = /a + /b/c + /bd$$

Exo 5 - 6

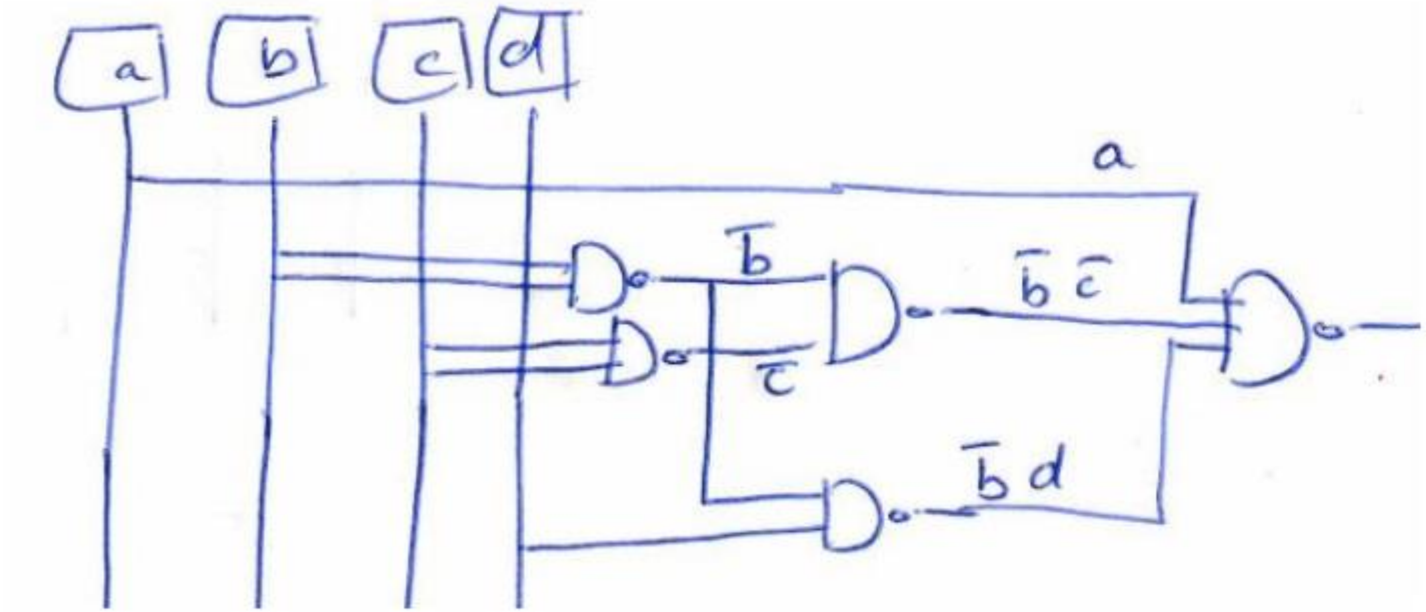
$$F(a,b,c,d) = \overline{a} + \overline{b}\,\overline{c} + \overline{b}d$$

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

$$F(a,b,c,d) = \overline{\overline{\overline{a}} \,.\, \overline{\overline{b}\,\overline{c}} \,.\, \overline{\overline{b}d}}$$

Exo 5 - 6

$$F(a,b,c,d) = \overline{\overline{\overline{a}} \,.\, \overline{\overline{b\overline{c}}} \,.\, \overline{\overline{b}}d}$$



Exercice 5

cd \ ab	00	01	11	10
00	1	1	0	1
01	1	1	X	1
11	1	1	0	1
10	x	x	0	0

$/F(a,b,c,d) = ab + c/d$

$F(a,b,c,d) = (/a+/b)\ (/c+d)$

Exo 5 - 6

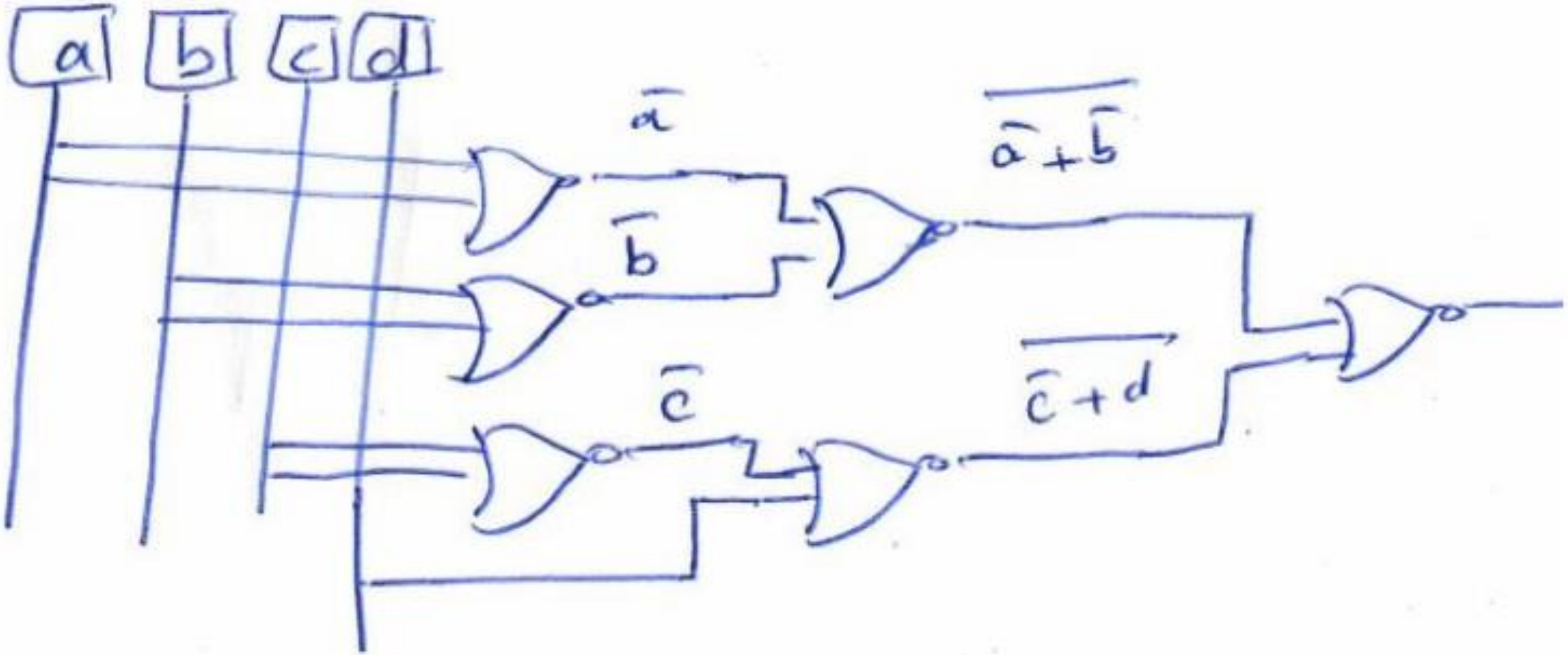
$$F(a,b,c,d) = (\overline{a} + \overline{b})(\overline{c} + d)$$

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

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

Exo 5 - 6

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



Simplifier à l’aide du Tableau de Karnaugh les fonctions suivantes

puis réaliser les circuits correspondants à l’aide de portes NOR ou NAND.

$F(a, b, c)= \pi(0, 1, 2, 3, 4, 7)$

$G(a, b, c, d)=\sum(2, 6, 7, 10, 11, 12, 14)$

F(a, b, c)= π(0, 1, 2, 3, 4, 7)

//positions de 0

G(a, b, c, d)=∑(2, 6, 7, 10, 11, 12, 14)

// positions de 1

	a	b	c	F
0	0	0	0	0
1	0	0	1	0
2	0	1	0	0
3	0	1	1	0
4	1	0	0	0
5	1	0	1	1
6	1	1	0	1
7	1	1	1	0

	a	b	c	d	G
0	0	0	0	0	0
1	0	0	0	1	1
2	0	0	1	0	0
3	0	0	1	1	0
4	0	1	0	0	0
5	0	1	0	1	0
6	0	1	1	0	1
7	0	1	1	1	1
8	1	0	0	0	0
9	1	0	0	1	0
10	1	0	1	0	1
11	1	0	1	1	1
12	1	1	0	0	1
13	1	1	0	1	0
14	1	1	1	0	1
15	1	1	1	1	0

$F(a, b, c) = \pi(0, 1, 2, 3, 4, 7)$

	a	*b*	*c*	F
0	0	0	0	0
1	0	0	1	0
2	0	1	0	0
3	0	1	1	0
4	1	0	0	0
5	1	0	1	1
6	1	1	0	1
7	1	1	1	0

ab c ,	00	01	11	10
0	0	0		0
1	0	0	0	

F(a,b,c) = ab/c + a/bc

/F(a,b,c) = /a + /b/c + bc

F(a,b,c) = a (b+c) (/b+/c)

Exo 6

$F(a, b, c) = \pi(0, 1, 2, 3, 4, 7)$

$$F(a,b,c) = \overline{\overline{ab\bar{c} + a\bar{b}c}}$$

$$F(a,b,c) = \overline{\overline{ab\bar{c}} \cdot \overline{a\bar{b}c}}$$

$\overline{F(a,b,c)} = \bar{a} + bc + \bar{b}\bar{c}$ $F(a,b,c) = a\,(b+c)\,(\bar{b}+\bar{c})$

Exo 6

$F(a, b, c) = \pi(0, 1, 2, 3, 4, 7)$

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

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

G(a, b, c, d)=∑(2, 6, 7, 10, 11, 12, 14)

cd \ ab	00	01	11	10
00	0	0	1	0
01	0	0	0	0
11	0	1	0	1
10	1	1	1	1

G(a,b,c,d) = c/d + ab/d + /abc + a/bc

	a	b	c	d	G
0	0	0	0	0	0
1	0	0	0	1	0
2	0	0	1	0	1
3	0	0	1	1	0
4	0	1	0	0	0
5	0	1	0	1	0
6	0	1	1	0	1
7	0	1	1	1	1
8	1	0	0	0	0
9	1	0	0	1	0
10	1	0	1	0	1
11	1	0	1	1	1
[illegible]	[illegible]	1	0	0	1
13	[illegible]	1	0	1	0
14	1	1	1	0	1

G(a, b, c, d)=∑(2, 6, 7, 10, 11, 12, 14)

cd \ ab	00	01	11	10
00	0	0	1	0
01	0	0	0	0
11	0	1	0	1
10	1	1	1	1

	a	b	c	d	G
0	0	0	0	0	0
1	0	0	0	1	0
2	0	0	1	0	1
3	0	0	1	1	0
4	0	1	0	0	0
5	0	1	0	1	0
6	0	1	1	0	1
7	0	1	1	1	1
8	1	0	0	0	0
9	1	0	0	1	0
10	1	0	1	0	1
[illegible]	[illegible]	[illegible]	1	1	1
12	1	1	0	0	1
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1
15	1	1	1	1	0

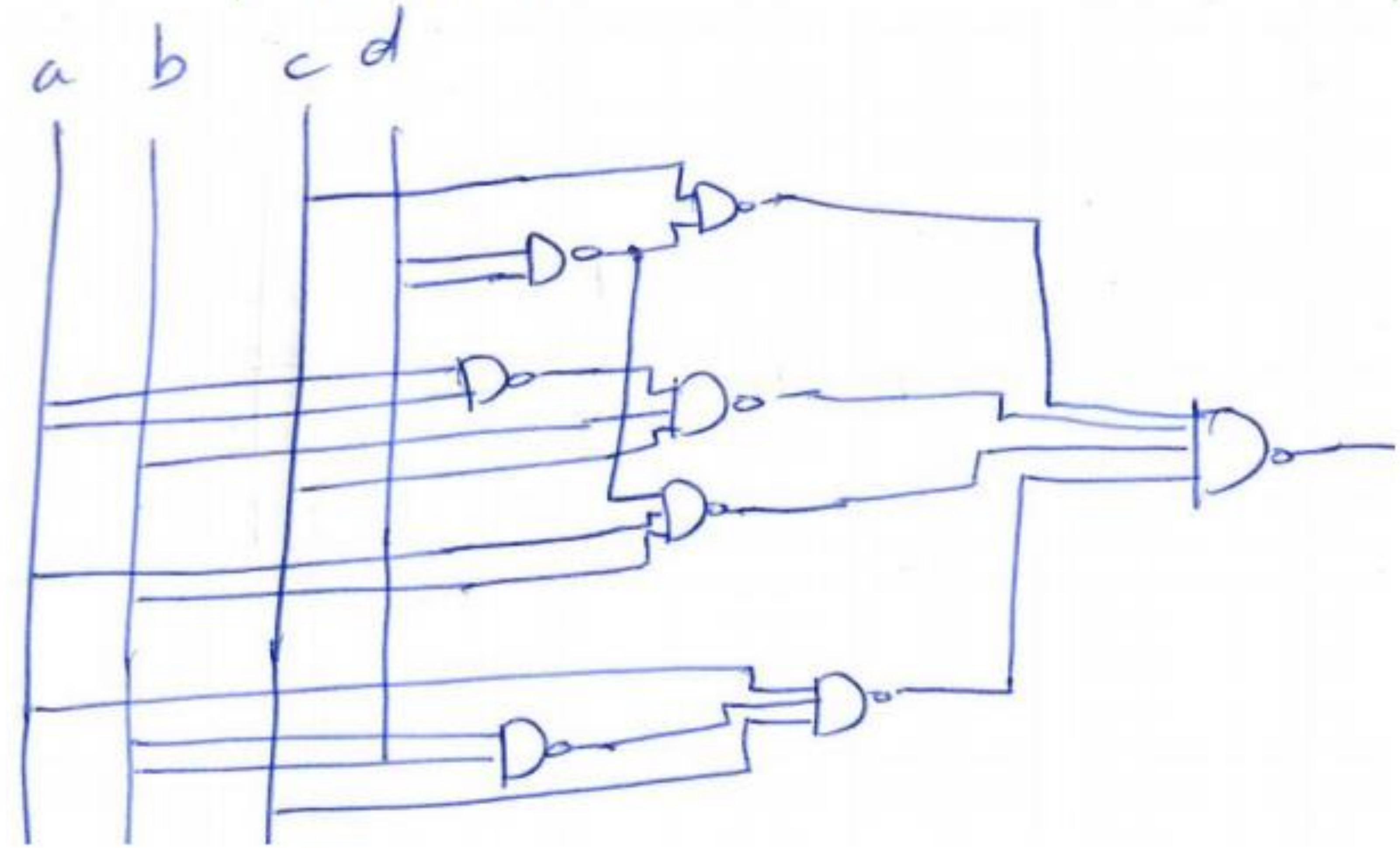
/G(a,b,c,d) = /a/c + /b/c + /a/bd +abd

G(a,b,c,d) = (a+c)(b+c)(a+b+/d)(/a+/b+/d)

Exo 6

$$G(a,b,c,d) = c\bar{d} + \bar{a}bc + ab\bar{d} + a\bar{b}c$$

$$G(a,b,c,d) = \overline{\overline{c\bar{d}} \cdot \overline{\bar{a}bc} \cdot \overline{ab\bar{d}} \cdot \overline{a\bar{b}c}}$$

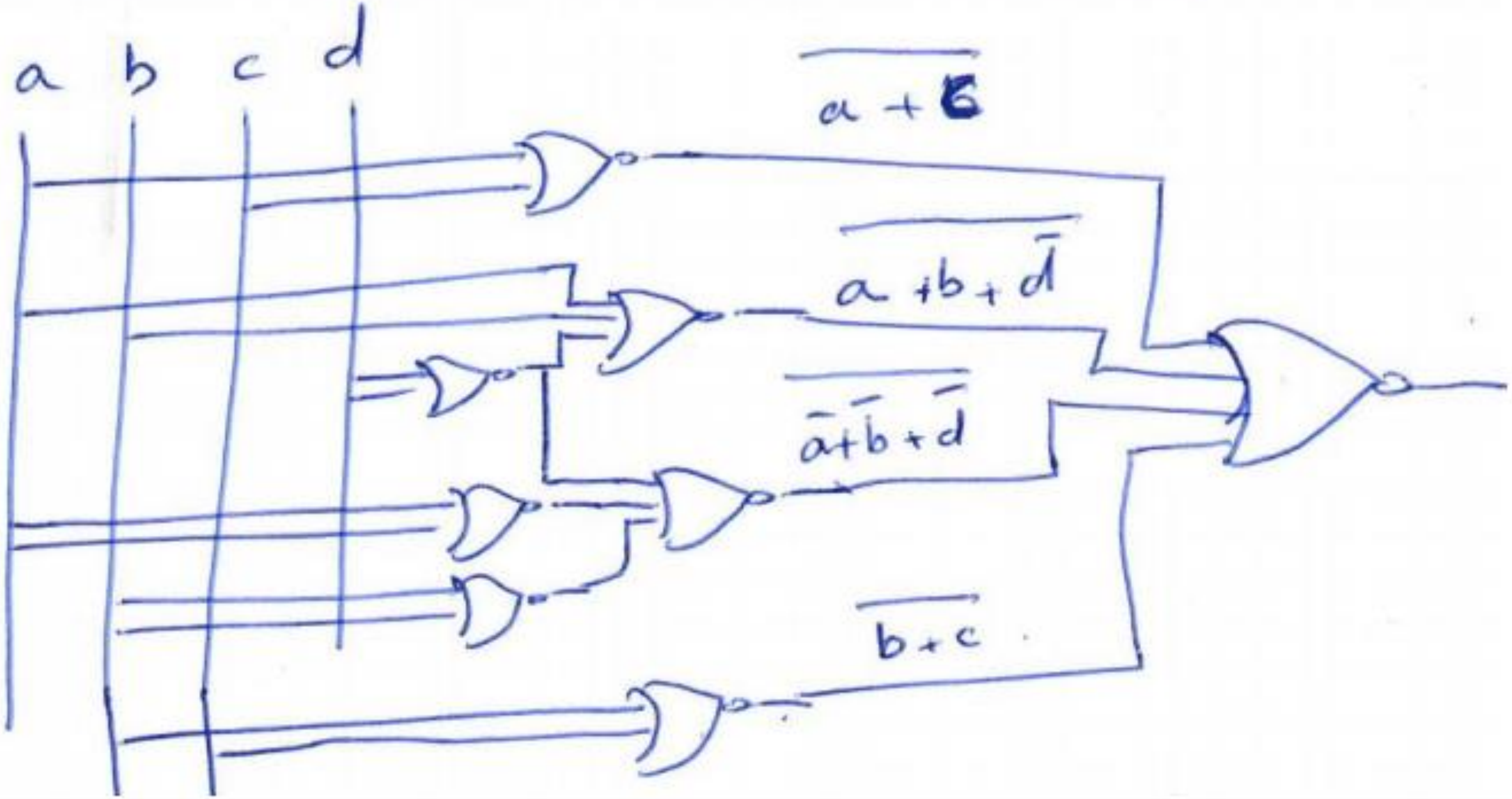


Exo 6

$$\overline{G(a,b,c,d)}= \bar{a}\bar{c} + \bar{a}\bar{b}d + abd + \bar{b}\bar{c}$$

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

$$G(a,b,c,d)=\overline{\overline{(a+c)}}+\overline{\overline{(a+b+\bar{d})}}+\overline{\overline{(\bar{a}+\bar{b}+\bar{d})}}+\overline{\overline{(b+c)}}$$



Exo 7

$$F= \overline{\overline{(x+y+z)} + (\,\overline{x+y+\bar{z}}) + \overline{\bar{x}+y+z)}}$$

$$F = \overline{\overline{(x+y+z)}}\;\overline{(\,\overline{x+y+\bar{z}})}\;\;\overline{\overline{\bar{x}+y+z)}}$$

$$F = (x+y+z)(x+y+\bar{z})(\bar{x}+y+z)$$

x	y	z	$x+y+z$	$x+y+\bar{z}$	$\bar{x}+y+z$	F
0	0	0				
0	0	1				
0	1	0				
0	1	1				
1	0	0				
1	0	1				
1	1	0				
1	1	1				

ab c ,	00	01	11	10
0				
1				

F =

F =

x	*y*	*z*	F
0	0	0	0
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	1

Exo 7

Soit la fonction F(A,B,C) définie comme suit:

F(A,B,C) = 1 si $(ABC)_2$ comporte un nombre impair de 1;

F(A,B,C) = 0 sinon.

Etablir la table de vérité de F

A	B	C	F
0	0	0	
0	0	1	
0	1	0	
0	1	1	
1	0	0	
1	0	1	
1	1	0	
1	1	1	

F =

F =

F =