Laboratorio # 4

[01] ①

A	B	C	Y
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	0
1	1	1	1

C \ AB	00	01	11	10
0	1	1	0	1
1	0	0	1	1

$$Y = \overline{A}\overline{C} + AB + AC$$

IC ②

A	B	C	Y
0	0	0	1
0	0	1	X
0	1	0	0
0	1	1	0
1	0	0	X
1	0	1	1
1	1	0	0
1	1	1	0

C \ AB	00	01	11	10
0	1	0	0	X
1	X	0	0	1

$$Y = \overline{B}$$

③

A	B	C	D	Y
0	0	0	0	1
0	0	0	1	0
0	0	1	0	0
0	0	1	1	1
0	1	0	0	0
0	1	0	1	1
0	1	1	0	1
0	1	1	1	0
1	0	0	0	0
1	0	0	1	1
1	0	1	0	1
1	0	1	1	0
1	1	0	0	1
1	1	0	1	0
1	1	1	0	0
1	1	1	1	1

CD \ AB	00	01	11	10
00	1	0	1	0
01	0	1	0	1
11	1	0	1	0
10	0	1	0	1

$$Y = \bar{A}\bar{B}\bar{C}\bar{D} + A\bar{B}\bar{C}D + ABCD$$
$$+ A\bar{B}C\bar{D} + \bar{A}BCD + AB\bar{C}\bar{D}$$
$$+ \bar{A}B\bar{C}D + A\bar{B}C\bar{D}$$

④

A	B	C	D	Y
0	0	0	0	X
0	0	0	1	X
0	0	1	0	X
0	0	1	1	0
0	1	0	0	0
0	1	0	1	X
0	1	1	0	0
0	1	1	1	X
1	0	0	0	1
1	0	0	1	0
1	0	1	0	X
1	0	1	1	1
1	1	0	0	1
1	1	0	1	1
1	1	1	0	X
1	1	1	1	1

CD \ AB	00	01	11	10
00	X	0	1	1
01	X	X	1	0
11	0	X	1	1
10	X	0	X	X

$$Y = A\bar{D} + AC + AB$$

① $Y = ABC\bar{D} + \bar{A}\bar{B}\bar{C}\bar{D} + (\overline{AB+CD})$

reducida

A	B	C	D	Y
0	0	0	0	1
0	0	0	1	0
0	0	1	0	0
0	0	1	1	0
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	0
1	0	0	0	0
1	0	0	1	1
1	0	1	0	1
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

001X
01XX
10XX
110X

A	B	C	D	Y
0	0	0	0	X
0	0	0	1	0
0	0	1	X	0
0	1	X	X	0
1	0	X	X	1
1	1	0	?	1
1	1	1	0	1
1	1	1	1	0

CD \ AB	00	01	11	10
00	1	0	1	1
01	0	0	1	1
11	0	0	0	1
10	0	0	1	1

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

② $Y = \overline{A}BC + \overline{B}\,\overline{C} + BC$

A	B	C			Y		AB\C	00	01	11	10
0	0	0	0	1	0	1	0	1	0	1	1
0	0	1	0	1	0	1	1	1	1	1	1
0	1	0	0	0	0	0					
0	1	1	1	1	1	1					
1	0	0	0	1	0	1					
1	0	1	0	1	0	1					
1	1	0	0	0	0	1					
1	1	1	0	1	1	1					

$Y = \overline{B} + C + A$

A	B	C	Y
1	X	X	1
0	X	X	1
0	1	1	1
0	1	0	0

0	0	X	1
1	0	X	1
1	1	X	1
0	1	0	0
0	1	1	1

③ $Y = (\overline{A+B+C\cdot D}) + AD + B$

A	B	C	D	$\overline{A+B+C\cdot D}$	AD	Y
0	0	0	0	0	0	0
0	0	0	1	1	0	1
0	0	1	0	0	0	0
0	0	1	1	0	0	0
0	1	0	0	0	0	1
0	1	0	1	0	0	1
0	1	1	0	0	0	1
0	1	1	1	0	0	1
1	0	0	0	0	0	0
1	0	0	1	0	1	1
1	0	1	0	0	0	0
1	0	1	1	0	1	1
1	1	0	0	0	0	1
1	1	0	1	0	1	1
1	1	1	0	0	0	1
1	1	1	1	0	1	1

A	B	C	D	Y
X	1	X	X	1
1	0	X	1	1
0	0	0	1	1

CD\AB	00	01	11	10
00	0	1	1	0
01	1	1	1	1
11	0	1	1	0
10	0	1	1	0

$Y = B + \overline{C}D + AD$

④ $Y = BC + \bar{A}\bar{B}\bar{C} + B\bar{C}$

A	B	C	BC	$\bar{A}\bar{B}\bar{C}$	$B\bar{C}$	Y
0	0	0	0	1	0	1
0	0	1	0	0	0	0
0	1	0	0	0	1	1
0	1	1	1	0	0	1
1	0	0	0	0	0	0
1	0	1	0	0	0	0
1	1	0	0	0	1	1
1	1	1	1	0	0	1

X	1	X				1
0	0	0				1
0	0	1				0
1	0	X				0

K-map (AB columns: 00, 01, 11, 10; C rows: 0, 1)

	00	01	11	10
0	1	1	1	0
1	0	1	1	0

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

A	B	C	Y
X	1	X	1
0	0	0	1
0	0	1	0
1	0	X	0

Ejercicio 01

1

2

4

Tjercicio 02

1

2
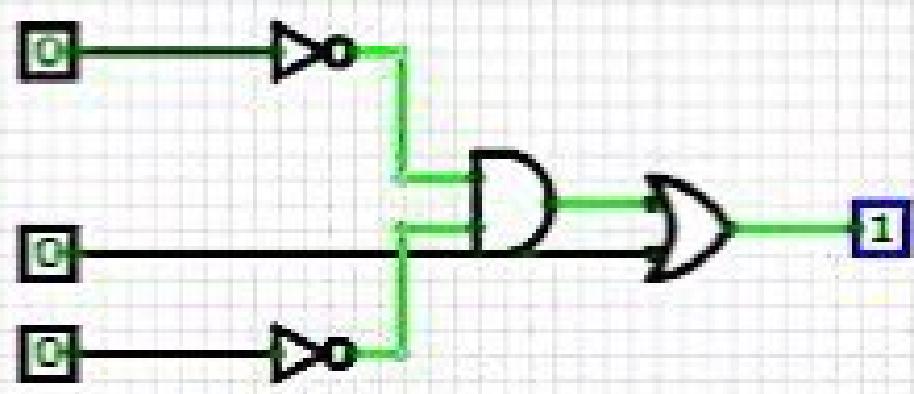
3

4
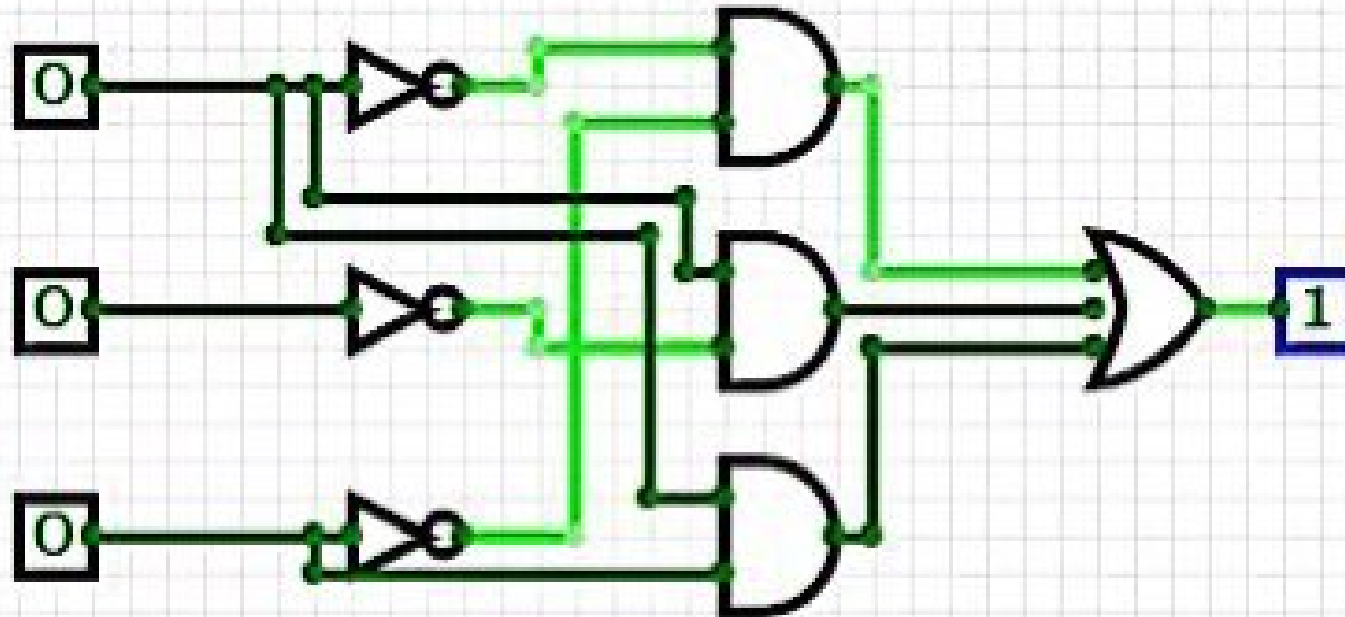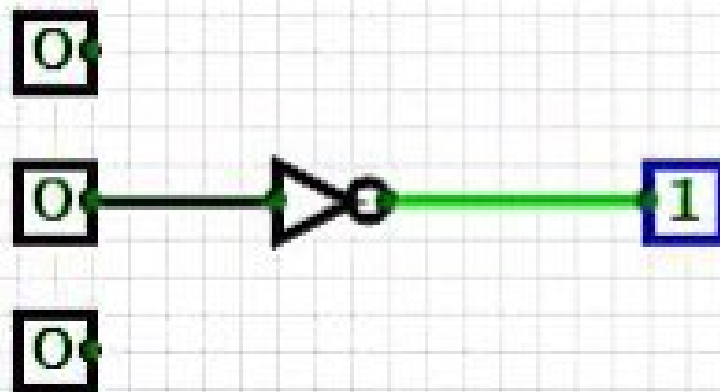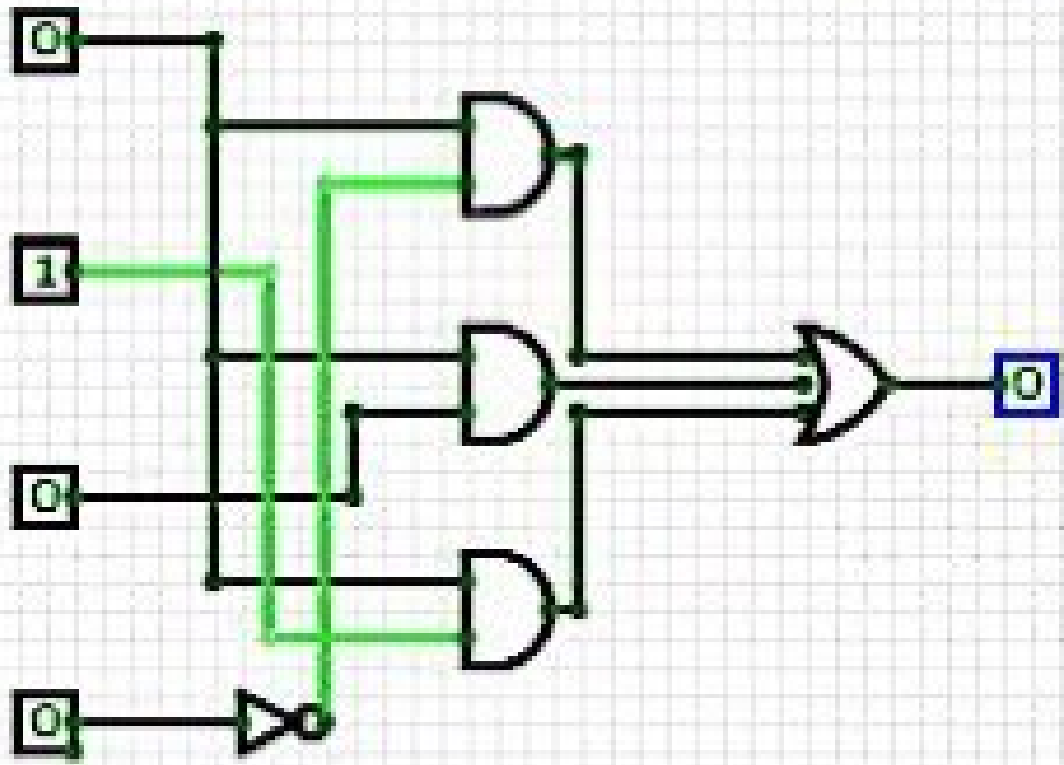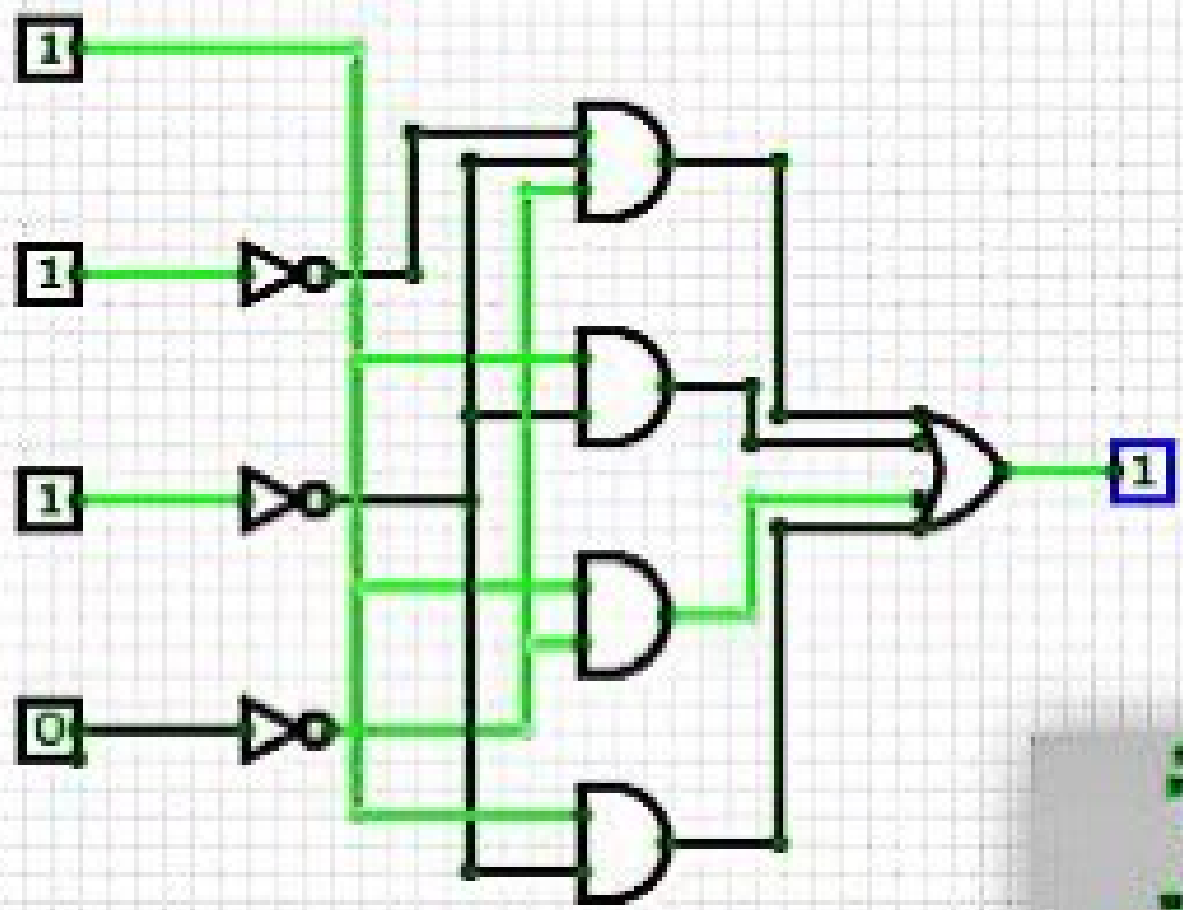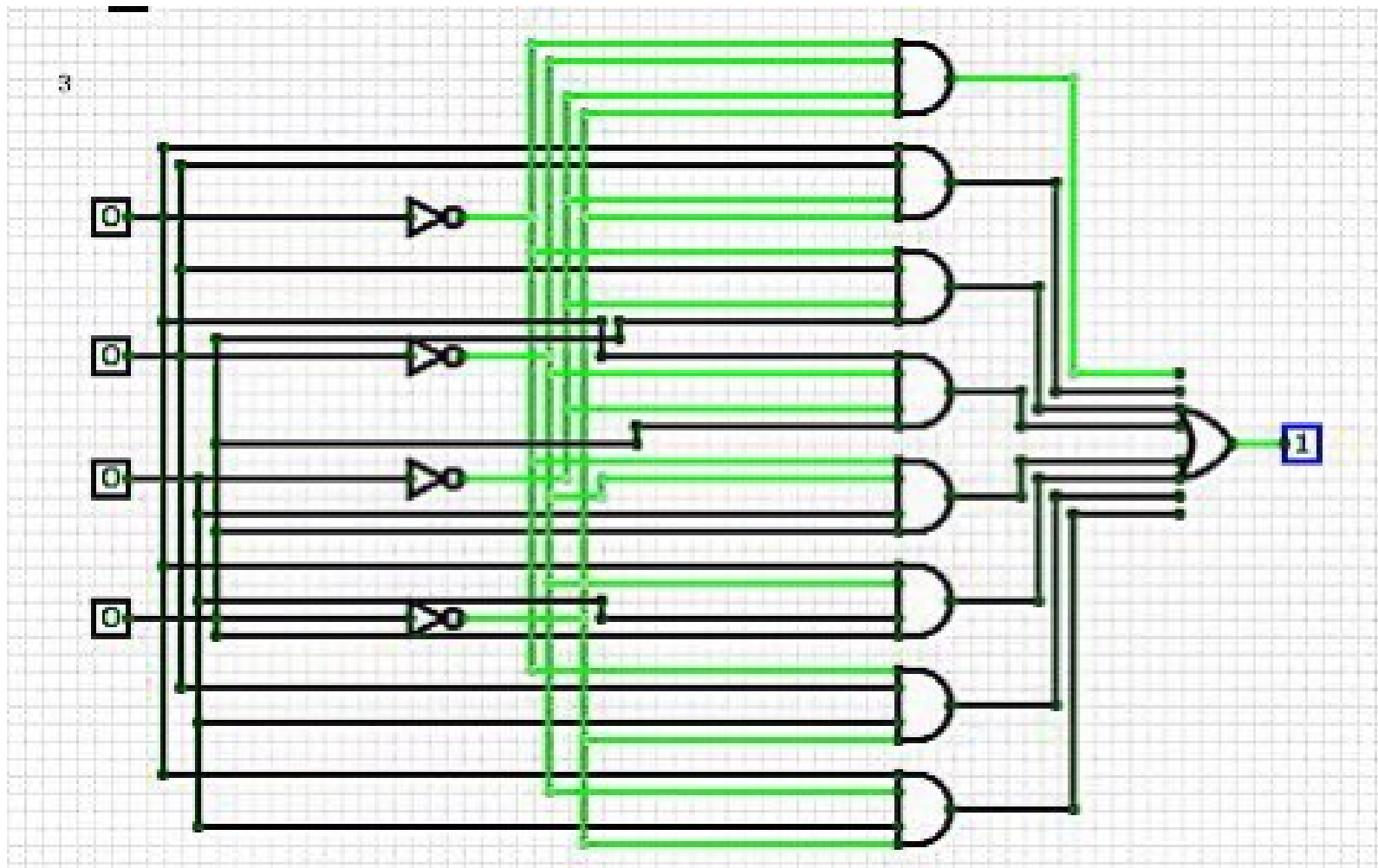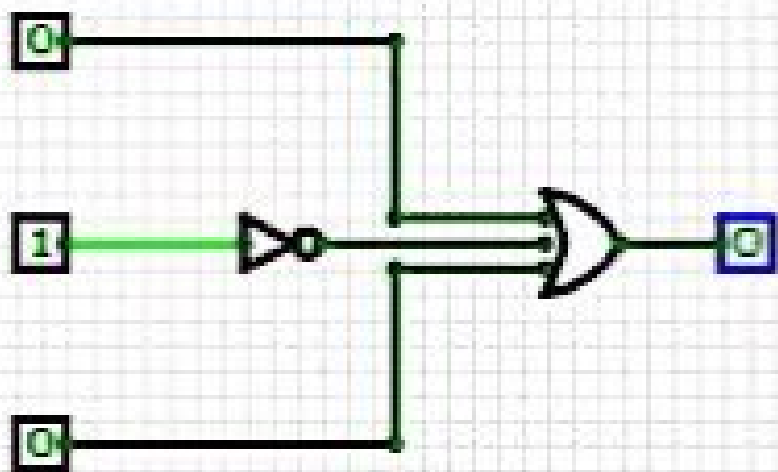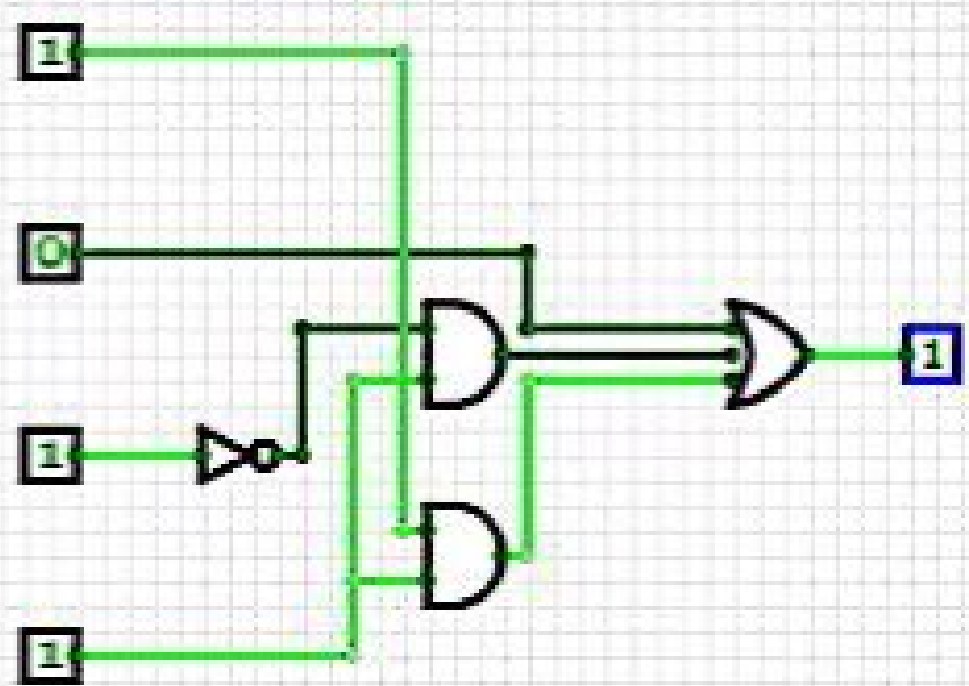
→ Si: Sistema alarma √, pendiente los sensore

→ Si sensor ventana/puerta roto, suena alarma/luces √

→ Si sensor movimiento dispara, suena alarma luces √

— ¿Cuáles son entradas y cuáles son salidas? —

Entradas   Salidas

- Alarma   (A)   - Pendiente
- Ventana/Puerta (V)   - Luces/Alarma
- Sensor Movimiento (S)   - Luces/Alarma

A	V	S	L
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	0
1	1	1	1

minterm Maxterm

$\bar{A}\,\bar{V}\,\bar{S}$ $A+V+S$ m_0 M_0

$\bar{A}\,\bar{V}\,S$ $A+V+\bar{S}$ m_1 M_1

$\bar{A}\,V\,\bar{S}$ $A+\bar{V}+S$ m_2 M_2

$\bar{A}\,V\,S$ $A+\bar{V}+\bar{S}$ m_3 M_3

$A\,\bar{V}\,\bar{S}$ $\bar{A}+V+S$ m_4 M_4

$A\,\bar{V}\,S$ $\bar{A}+V+\bar{S}$ m_5 M_5

$A\,V\,\bar{S}$ $\bar{A}+\bar{V}+S$ m_6 M_6

$A\,V\,S$ $\bar{A}+\bar{V}+\bar{S}$ m_7 M_7

SOP: $A\bar{V}\bar{S} + A\bar{V}S + AVS$

POS: $(A+V+S)(A+V+\bar{S})(A+\bar{V}+S)(A+\bar{V}+\bar{S})(\bar{A}+\bar{V}+S)$

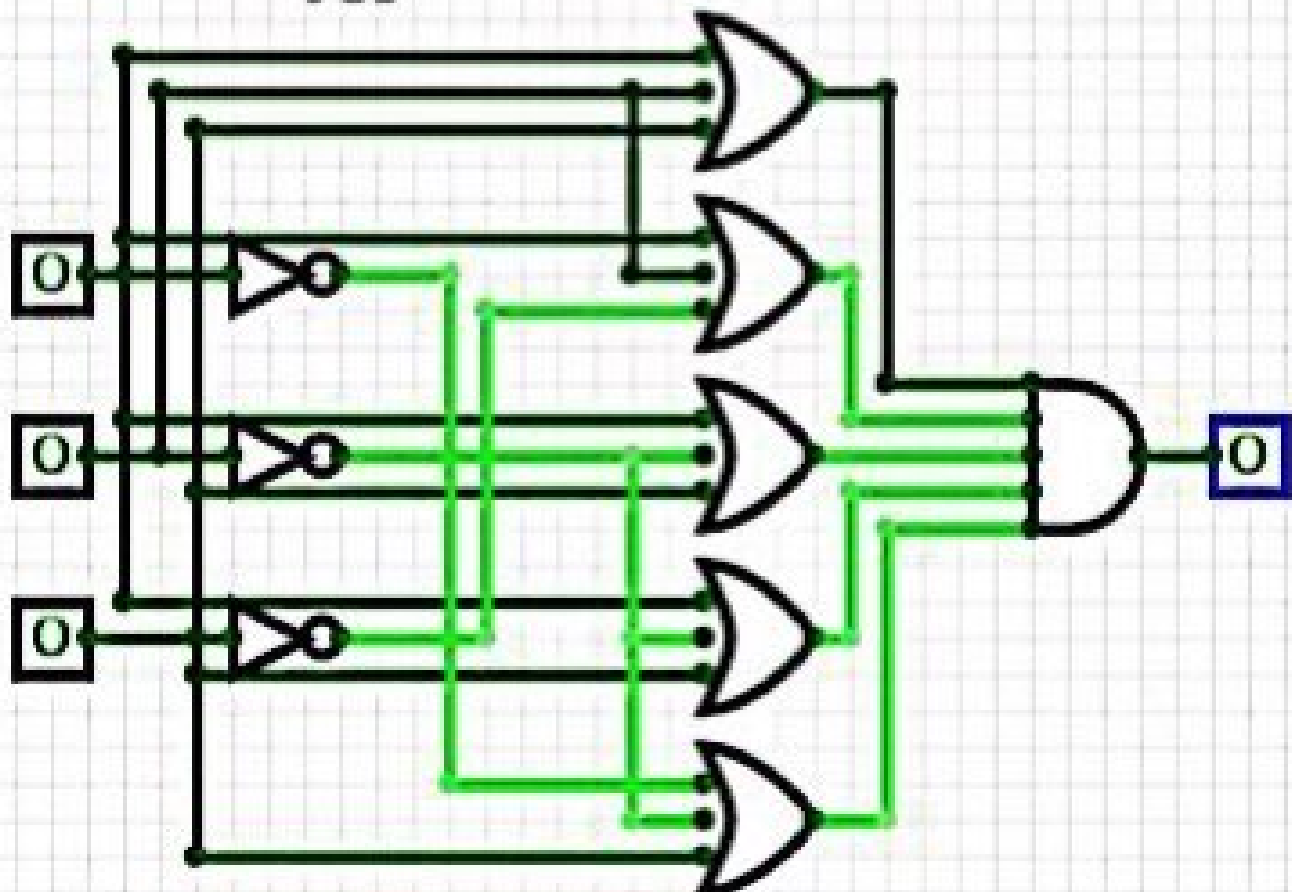| S\AV	00	01	11	10
0	0	0	0	1
1	0	0	1	1

$= A\bar{V} + AS$

Ejercicio 5

SOP

POS

SOLUCION