

Proiectare logică 1

NOTARE

N_{t+1} din prezenta pentru toate

n cursuri - se acordă 1 p la nota finală

N_c - nota de la colocviu (lucrare scrisă la laborator)

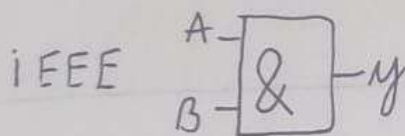
N_e - nota de la Examen (alegem să avem parțial sau nu)

$$N_e = \frac{N_p + N_{ef}}{2} \quad (\exists \text{ parțial})$$

$$N = N_e \cdot 0,7 + N_c \cdot 0,3$$

Porti logice fundamentale

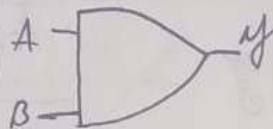
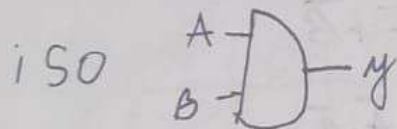
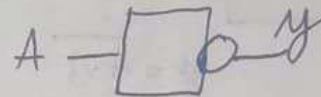
SI (AND)



SAU (OR)



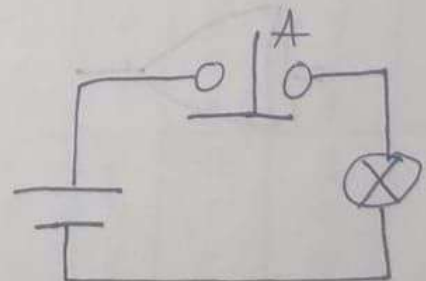
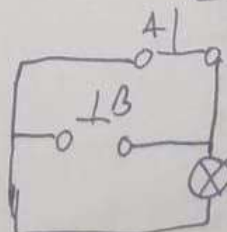
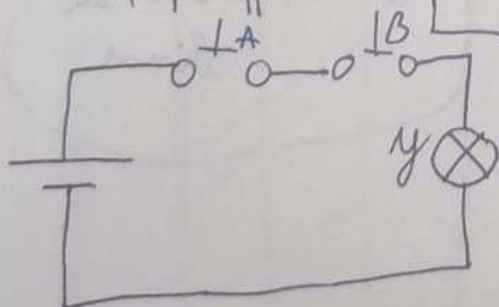
Poarta negată (NOT)



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

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

A	Y
0	1
1	0



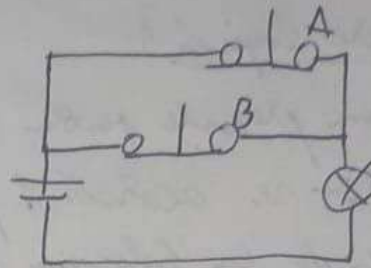
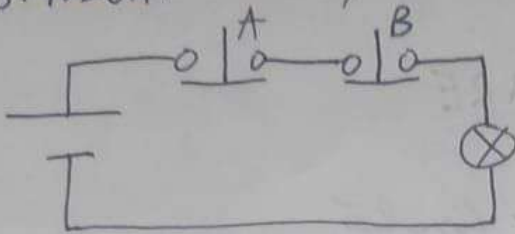
$$Y = A \cdot B$$

$$Y = A + B$$

$$Y = \bar{A}$$

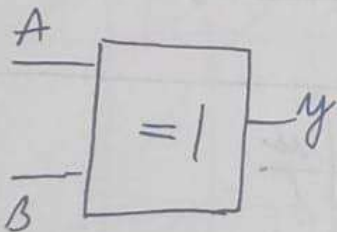
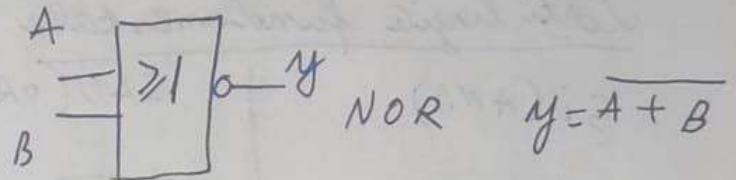
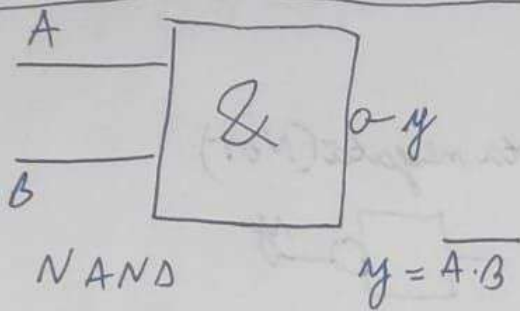
~~SI NEGAT (NAND)~~ NOR

~~SAU NEGAT NAND~~



A	B	y	\bar{y}
0	0	1	0
0	1	0	1
1	0	0	1
1	1	0	1

A	B	y	\bar{y}
0	0	1	0
0	1	1	0
1	0	1	0
1	1	0	1

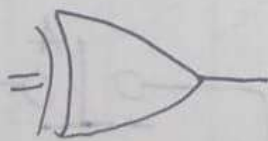


A	B	y
0	0	0
0	1	1
1	0	1
1	1	0

$$\overline{AB} = \bar{A} + \bar{B}$$

$$\overline{A+B} = \bar{A} \cdot \bar{B}$$

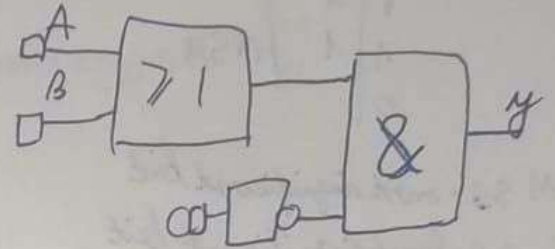
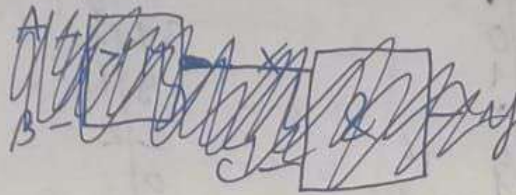
XOR



$$y = A \oplus B$$

\oplus - adunare în binar

Deci plouă sau e prognoză de ploaie și nu iau mazăre, atunci
iau umbrela.
 y



$$y = f: N^3 \rightarrow N$$

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

A	B	C	y	A+B	\bar{C}
0	0	0	0	0	1
0	0	1	0	0	0
0	1	0	1	1	1
0	1	1	0	1	0
1	0	0	1	1	1
1	0	1	0	1	0
1	1	0	1	1	1
1	1	1	0	1	0

Baze de numerație

#	A	B	C	D	hex
0					
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

A	B	C	D	#	hex
0	0	0	0	0	0
0	0	0	1	1	1
0	0	1	0	2	2
0	0	1	1	3	3
0	1	0	0	4	4
0	1	0	1	5	5
0	1	1	0	6	6
0	1	1	1	7	7
1	0	0	0	8	8
1	0	0	1	9	9
1	0	1	0	10	A
1	0	1	1	11	B
1	1	0	0	12	C
1	1	0	1	13	D
1	1	1	0	14	E
1	1	1	1	15	F

12	2	0
6		0
3		1
1		1
0		

↑ LSB
MSB

MSB - most significant bit
LSB - least significant bit

12	4	0
3		3
0		

12	8	4
1		1
0		

$$12_{(10)} = 1100_{(2)} = 30_{(4)} = 14_{(8)} = C_{(16)}$$

$$37_{(10)} = 32 + 4 + 1 = 100101_{(2)} = 211_{(4)} = 45_{(8)} = 25_{(16)}$$

37	2	1
18		0
9		1
4		0
2		0
1		1
0		

16
12 12
0

37	4	1
9		1
2		2
0		

base	
2	1100
4	3...0
8	14

100101 (2) =	10 01 01
2 ²	↓ ↓ ↓
2 ³	2 1 1 (4)
2 ¹⁶	100 101
	↓ ↓
	4 5 (8)
	10 101
	↓ ↓
	2 5 (16)

$$(\forall) m \in \mathbb{R}, m = \sum_i a_i b^i \quad \textcircled{F}$$

$$\sum \frac{1}{a_i b^m}$$

$$12,0625_{(10)} \rightarrow 1100,0001$$

0,0625 · 2 = 0,1250	→ 0
0,125 · 2 = 0,250	→ 0
0,250 · 2 = 0,5	→ 0
0,5 · 2 = 1,0	→ 1

↑ MSB
↓ LSB

numerele au virgula

$$11\ 0000\ 01(2) \rightarrow 30,01(4)$$

$$\underbrace{00\ 11\ 00\ 000\ 100(2)} \rightarrow 14,04(8)$$

$$1100,0001(2) \rightarrow C,1(16)$$

$$0,835(10) = 0,110101011 \dots \Rightarrow 0,05(16) \Rightarrow 0,652(8) \Rightarrow 0,3111(4)$$

$0,835 \cdot 2 = 1,670$	$\rightarrow 1$
$0,670 \cdot 2 = 1,34$	$\rightarrow 1$
$0,34 \cdot 2 = 0,68$	$\rightarrow 0$
$0,68 \cdot 2 = 1,36$	$\rightarrow 1$
$0,36 \cdot 2 = 0,72$	$\rightarrow 0$
$0,72 \cdot 2 = 1,44$	$\rightarrow 1$
$0,44 \cdot 2 = 0,88$	$\rightarrow 0$
$0,88 \cdot 2 = 1,76$	$\rightarrow 1$
$0,76 \cdot 2 = 1,52$	$\rightarrow 1$