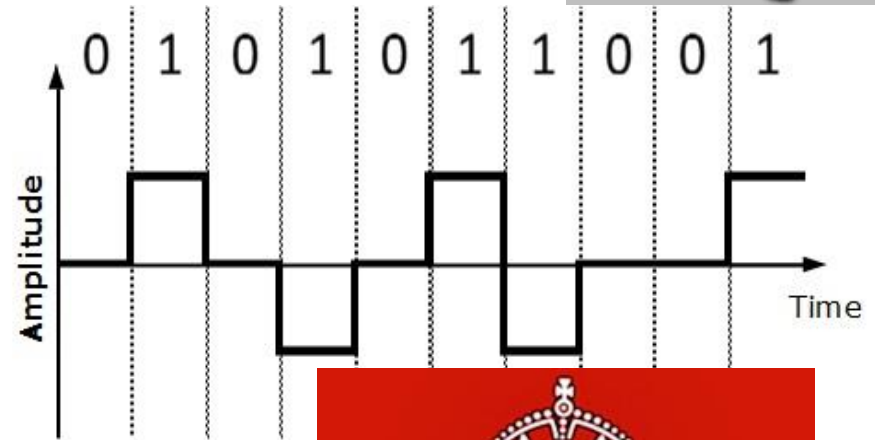
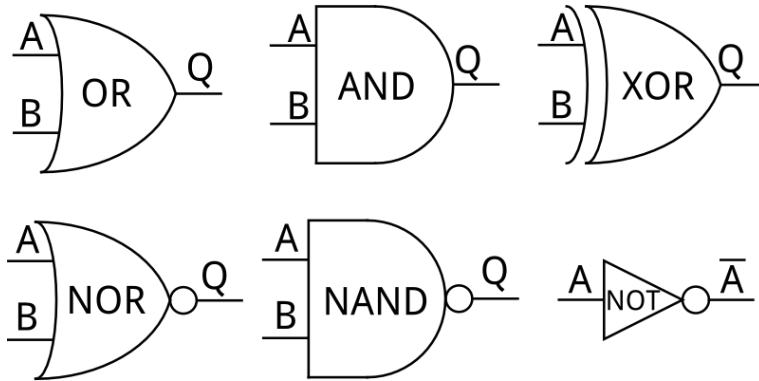


Proiectare Logica

Digital Logic Design

cnic.ro




**KEEP
CALM
AND
LOVE
BOOLEAN
ALGEBRA**

Subiectul 101

- [1] Convertiti numarul 1010000101101 din baza 2 in baza 16. (1p)
- [2] Care sunt primele 7 cifre dupa virgula ale numarului 0.2475 (in baza 10) in baza 4 ? (1p)
- [3] Scrieti tabela de adevar a functiei $F(A,B,C,D)=A.C'+B.C+D'+A.B.C$. Gasiti mintermenii acestei functii si scrieti FCD. (2p)
- [4] Functia f cu patru variabile are mintermenii (11,2,0,12,3,1,7,8,13,5,10,14). Minimizati aceasta functie folosind diagramele Veitch. (3p)
- [5] Gasiti reprezentarea in binary64 a numarului 2.404296875 (in baza 10) (bit semn, exponent si primii 10 biti mantisa). (2p)

Subiectul 102

- [1] Convertiti numarul bac din baza 16 in baza 2. (1p)
- [2] Care sunt primele 12 cifre dupa virgula ale numarului 0.6791 (in baza 10) in baza 2 ? (1p)
- [3] Scrieti tabela de adevar a functiei $F(A,B,C,D)=A.B.C+A.B+A.B'.C.D+C$. Gasiti mintermenii acestei functii si scrieti FCD. (2p)
- [4] Functia f cu patru variabile are maxtermenii (15,6,1,0,10,13,3,4,11,8,12,14). Minimizati aceasta functie folosind diagramele Veitch. (3p)
- [5] Gasiti reprezentarea in binary64 a numarului 2.8671875 (in baza 10) (bit semn, exponent si primii 10 biti mantisa). (2p)

Subiectul 103

- [1] Convertiti numarul 1000111111110 din baza 2 in baza 16. (1p)
- [2] Care sunt primele 7 cifre dupa virgula ale numarului 0.3501 (in baza 10) in baza 4 ? (1p)
- [3] Scrieti tabela de adevar a functiei
 $F(A,B,C,D)=D+A.B.C'.D'+B'.C'.D+A'.B'.D'$. Gasiti maxtermenii acestei functii si scrieti FCC. (2p)
- [4] Functia f cu patru variabile are mintermenii (15,7,13,4,8,1,5,14,2,3,6,0). Minimizati aceasta functie folosind diagramele Veitch. (3p)
- [5] Gasiti reprezentarea in binary64 a numarului - 2.50509994150459e-19 (in baza 10) (bit semn, exponent si primii 10 biti mantisa) folosind metoda cu logaritm. (2p)

Subiectul 104

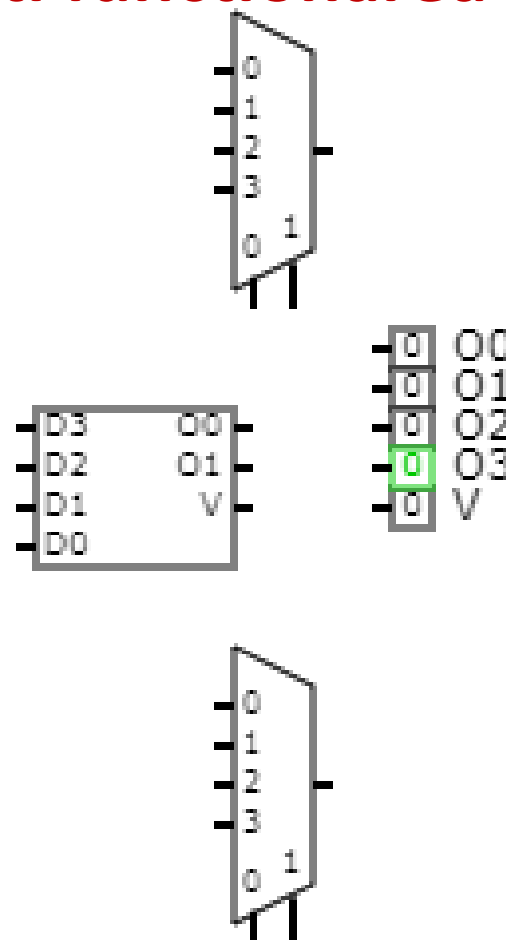
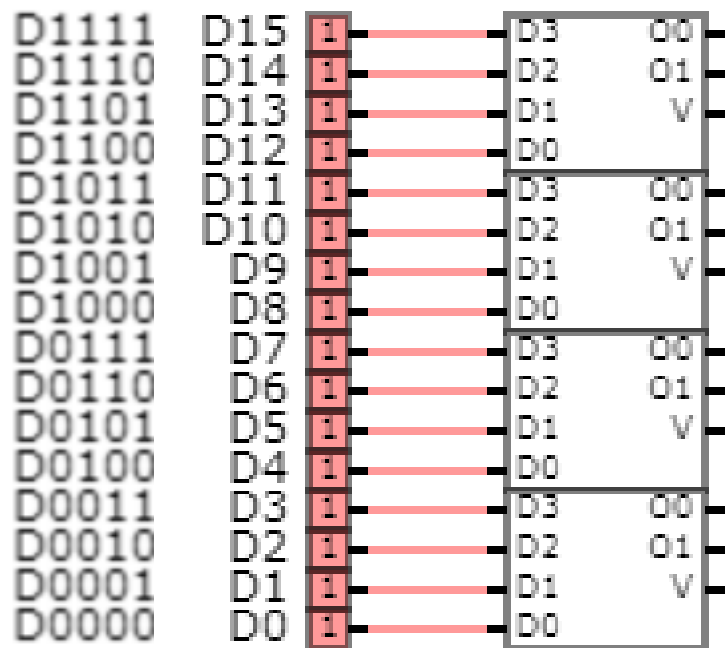
- [1] Convertiti numarul 4335 din baza 10 in baza 16. (1p)
- [2] Care sunt primele 5 cifre dupa virgula ale numarului 0.4849 (in baza 10) in baza 16 ? (1p)
- [3] Scrieti tabela de adevar a functiei $F(A,B,C,D)=A.D'+C.D+A.B'.C'+A'$. Gasiti maxtermenii acestei functii si scrieti FCC. (2p)
- [4] Functia f cu patru variabile are maxtermenii (11,3,7,6,2,9,10,5,8,0,12,4). Minimizati aceasta functie folosind diagramele Veitch. (3p)
- [5] Gasiti reprezentarea in binary64 a numarului 3.734375 (in baza 10) (bit semn, exponent si primii 10 biti mantisa). (2p)

Subiectul 105

- [1] Convertiti numarul 3053 din baza 8 in baza 10. (1p)
- [2] Care sunt primele 7 cifre dupa virgula ale numarului 0.1804 (in baza 10) in baza 4 ? (1p)
- [3] Scrieti tabela de adevar a functiei
 $F(A,B,C,D)=A'.B.D'+A.B.C'.D'+A.B'.C'+A.D$. Gasiti mintermenii acestei functii si scrieti FCD. (2p)
- [4] Functia f cu patru variabile are maxtermenii (15,7,3,4,5,14,12,8,0,6,9,13). Minimizati aceasta functie folosind diagramele Veitch. (3p)
- [5] Gasiti reprezentarea in binary64 a numarului 2.185546875 (in baza 10) (bit semn, exponent si primii 10 biti mantisa). (2p)

Tema acasa: PE 16-4

- Folosind 5 * PE 4-2 , 2* MUX-uri 4-1 implementati un PE 16-4.
- Folosind un DEMUX 1-16 verificati functionarea corecta a PE 16-4.



Tema acasa: PE 16-4

V-urile de la primele 4 PE4-2 $\rightarrow$ la al 5-lea PE4-2

V-ul de la al 5-lea PE4-2 $\rightarrow$ V

Bitii 0 si 1 e la al 5-lea PE4-2 $\rightarrow$ O2 si O3

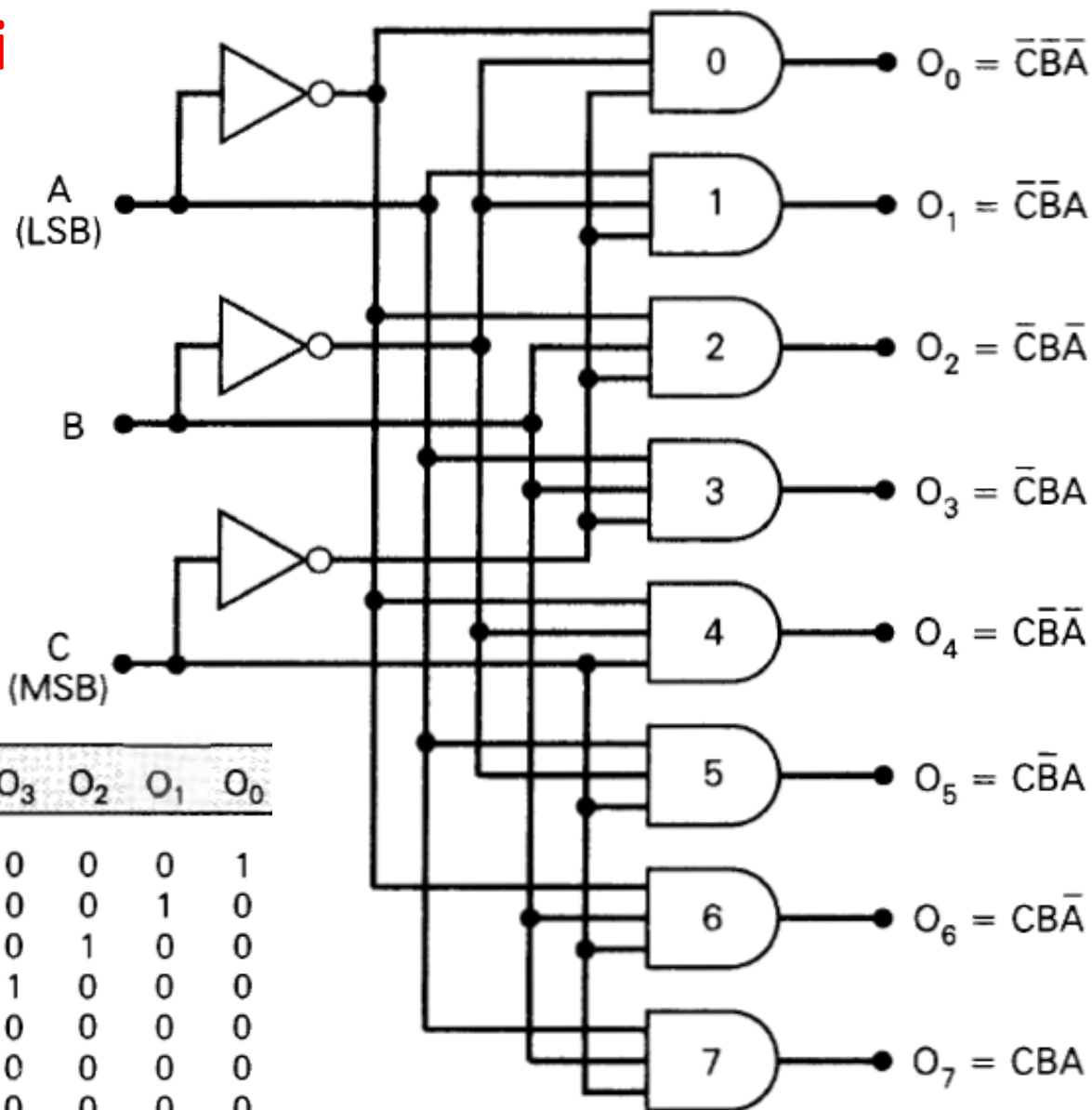
MUX-ul de sus multiplexeaza bitii 0 de la primii 4 PE4-2 $\rightarrow$ O0

MUX-ul de jos multiplexeaza bitii 1 de la primii 4 PE4-2 $\rightarrow$ O1

Decodificatorul 3-8

Simulati si verificati
in wronex!

Are **3** intrari si
 $2^3=8$ iesiri.

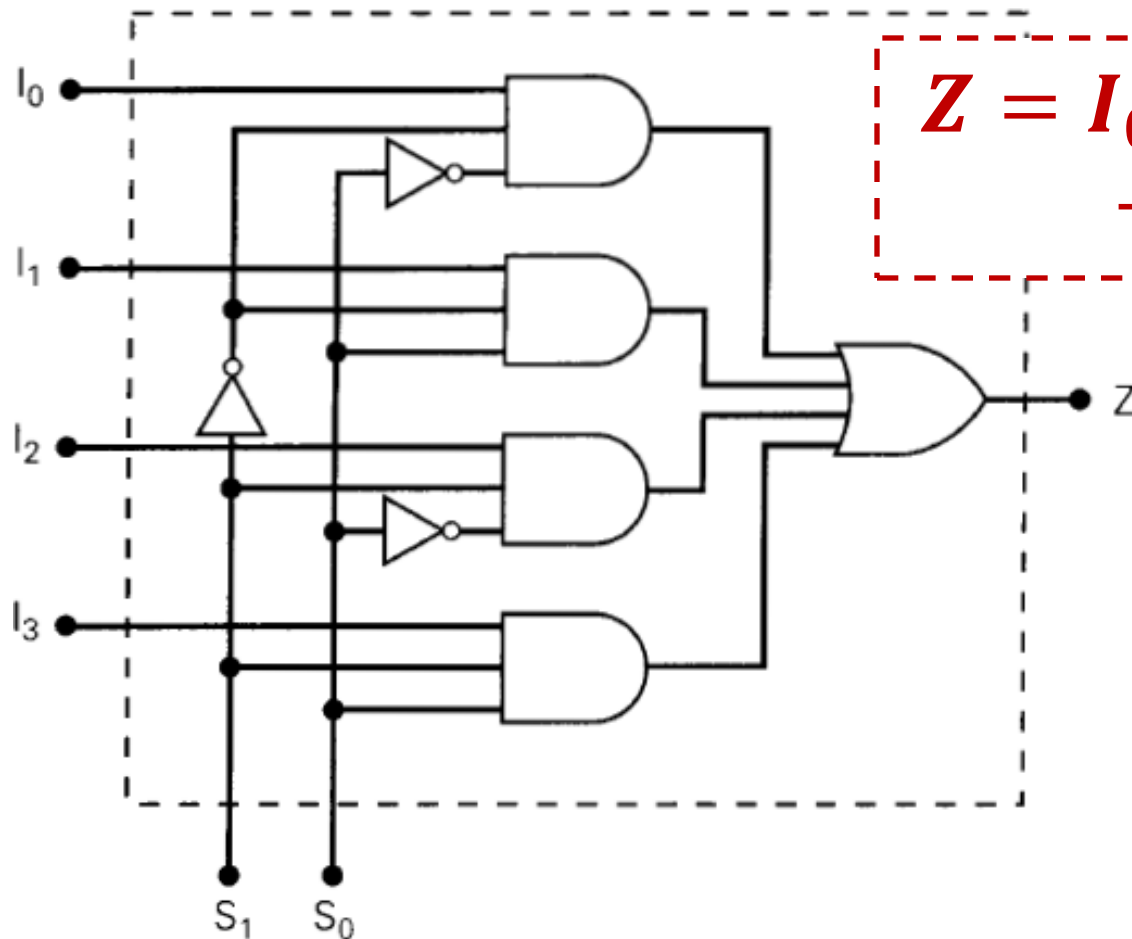


C	B	A	O_7	O_6	O_5	O_4	O_3	O_2	O_1	O_0
0	0	0	0	0	0	0	0	0	0	1
0	0	1	0	0	0	0	0	0	1	0
0	1	0	0	0	0	0	0	1	0	0
0	1	1	0	0	0	0	1	0	0	0
1	0	0	0	0	0	1	0	0	0	0
1	0	1	0	0	1	0	0	0	0	0
1	1	0	0	1	0	0	0	0	0	0
1	1	1	1	0	0	0	0	0	0	0

MUX cu patru intrari

• Simulati si verificati in wronex!

• Formula de functionare este:

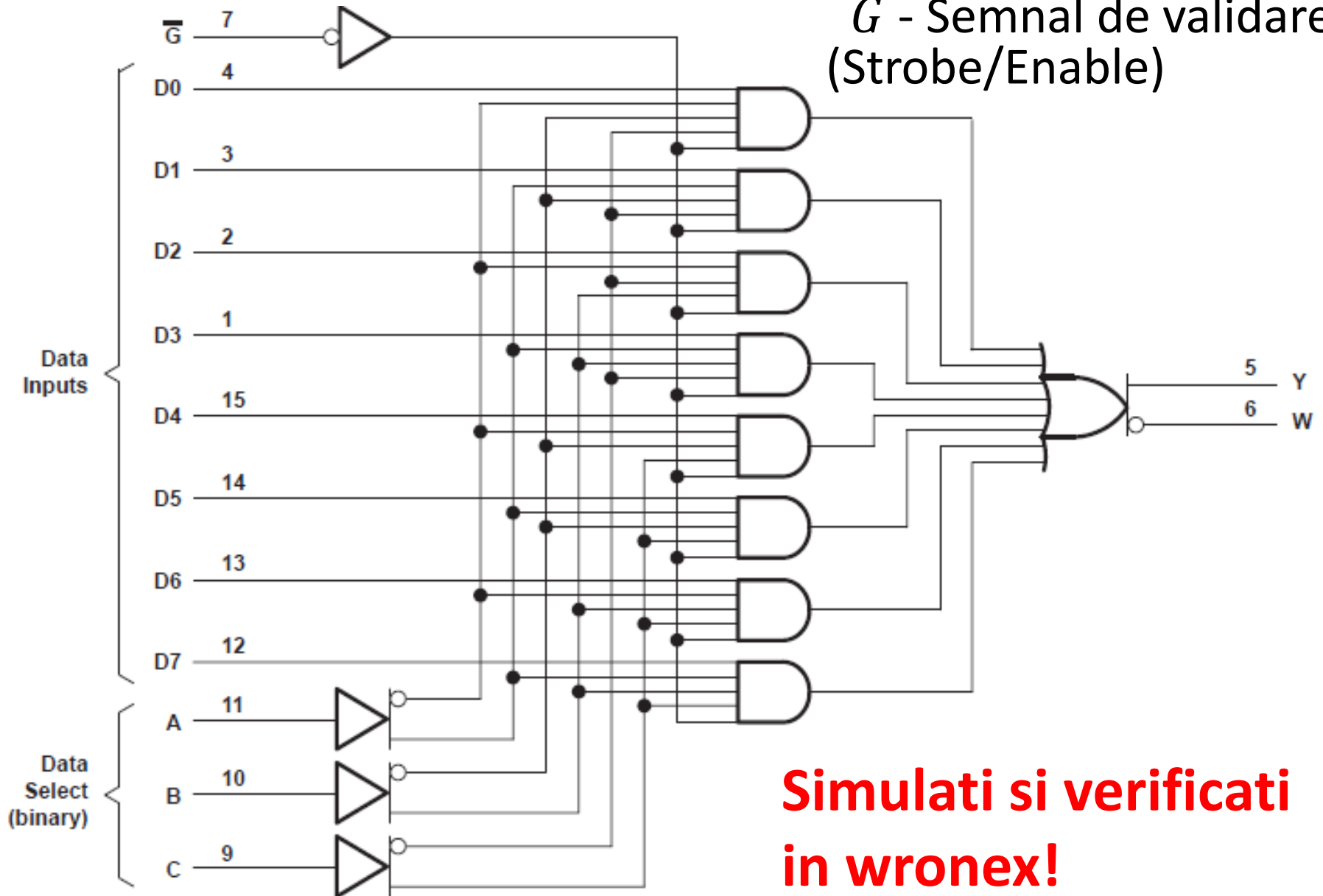


$$Z = I_0 \overline{S_0} \overline{S_1} + I_1 \overline{S_0} S_1 + I_2 S_0 \overline{S_1} + I_3 S_0 S_1$$

S_0	S_1	iesire
0	0	$Z = I_0$
0	1	$Z = I_1$
1	0	$Z = I_2$
1	1	$Z = I_3$

MUX cu opt intrari - 74ALS151

$\bar{G}$ - Semnal de validare
(Strobe/Enable)

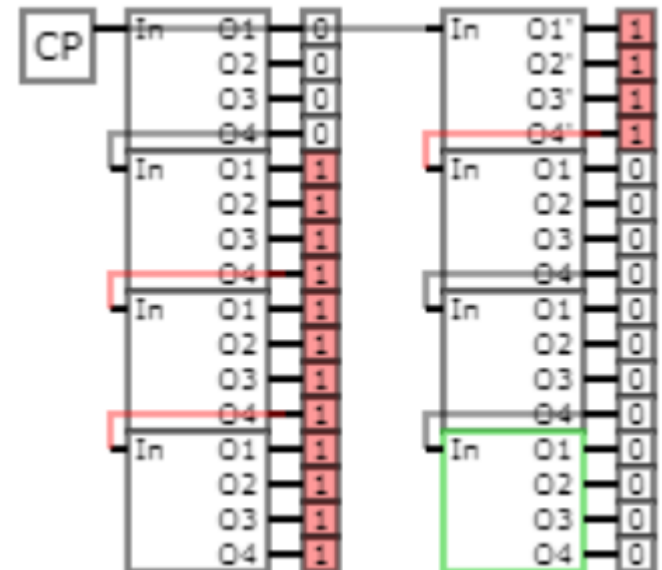
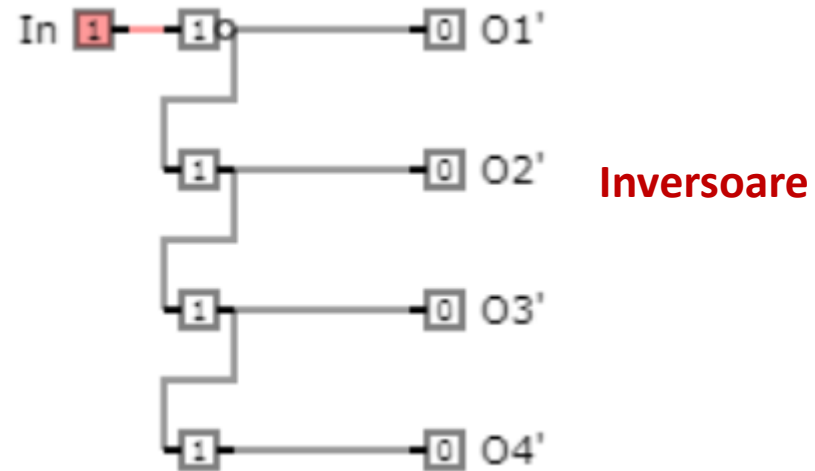
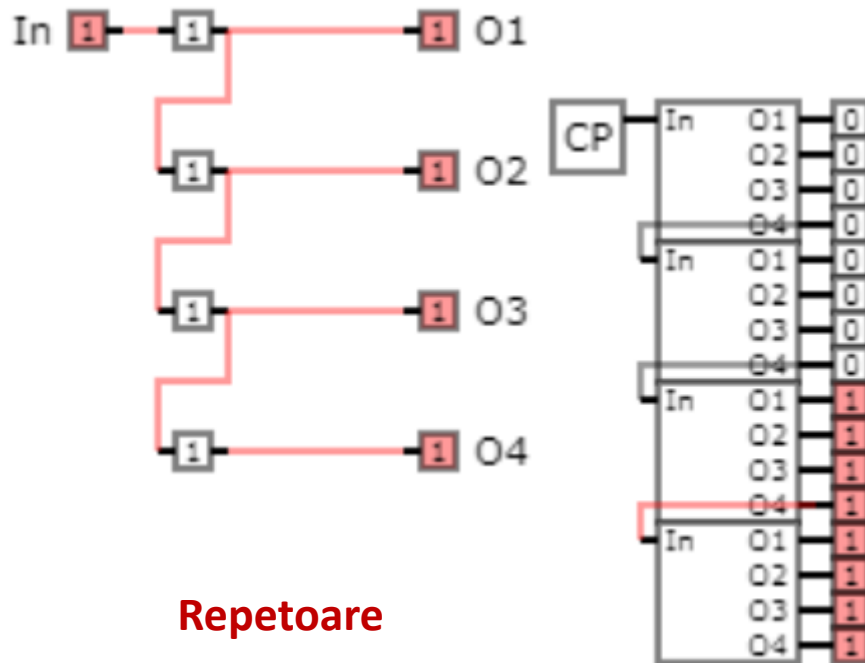


**Simulati si verificati
in wronex!**

Exercitiul 1

Implementati, incapsulati si testati in wronex:

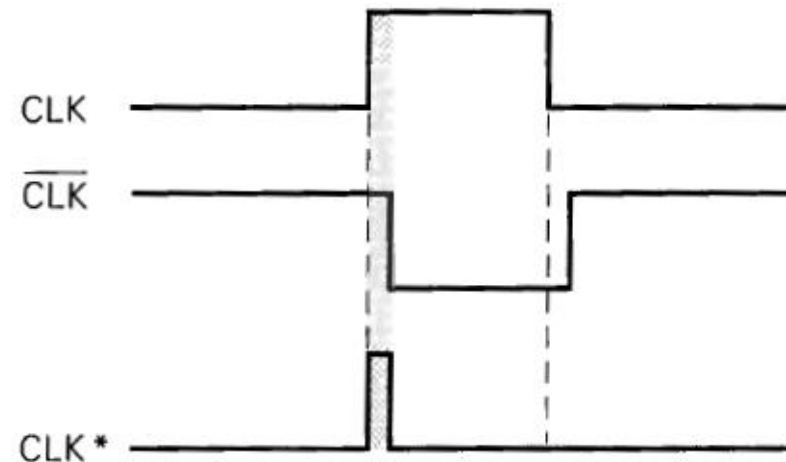
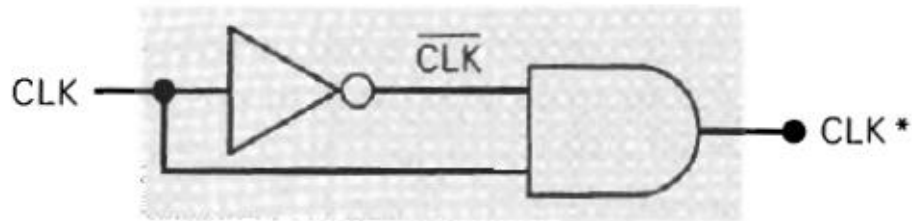
- Liniile de intarziere
- Incercati si alte efecte!



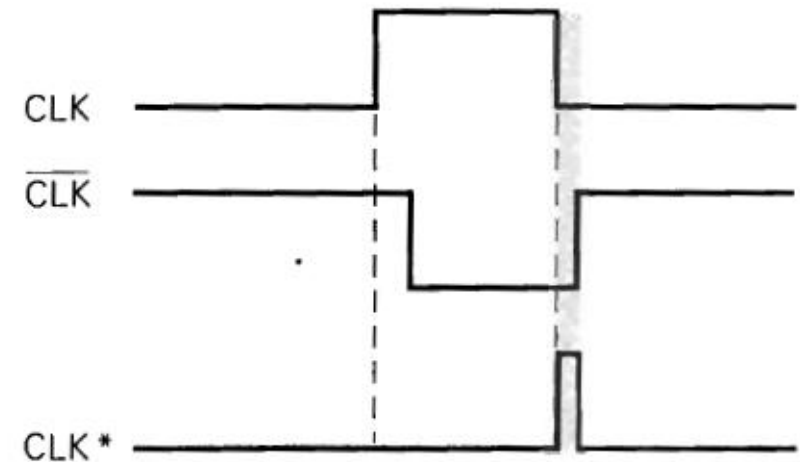
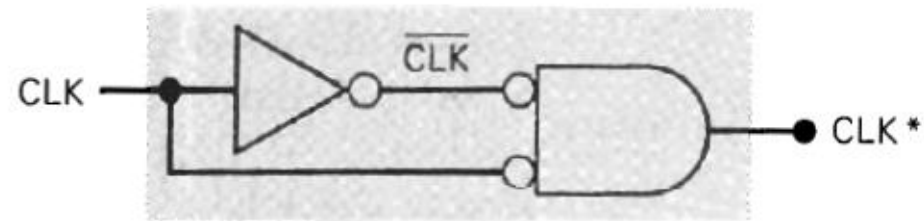
Exercitiul 2

Implementati, incapsulati si testati in wronex:

- Folosind diferitele liniiile de intarziere de la ex 1 implementati detectoarele de front



Detector de front pozitiv



Detector de front negativ

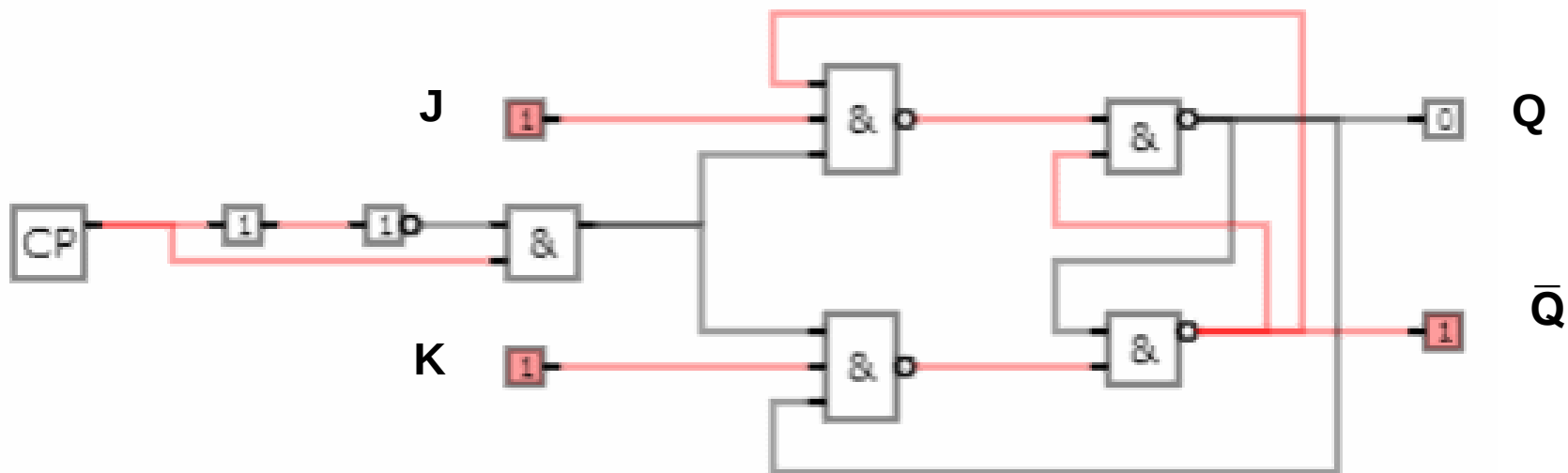
Exercitiul 3

- Implementati in wronex un MUX de 8-1 folosind MUX-uri de 4-1 si alte circuite necesare

Exercitiul 4

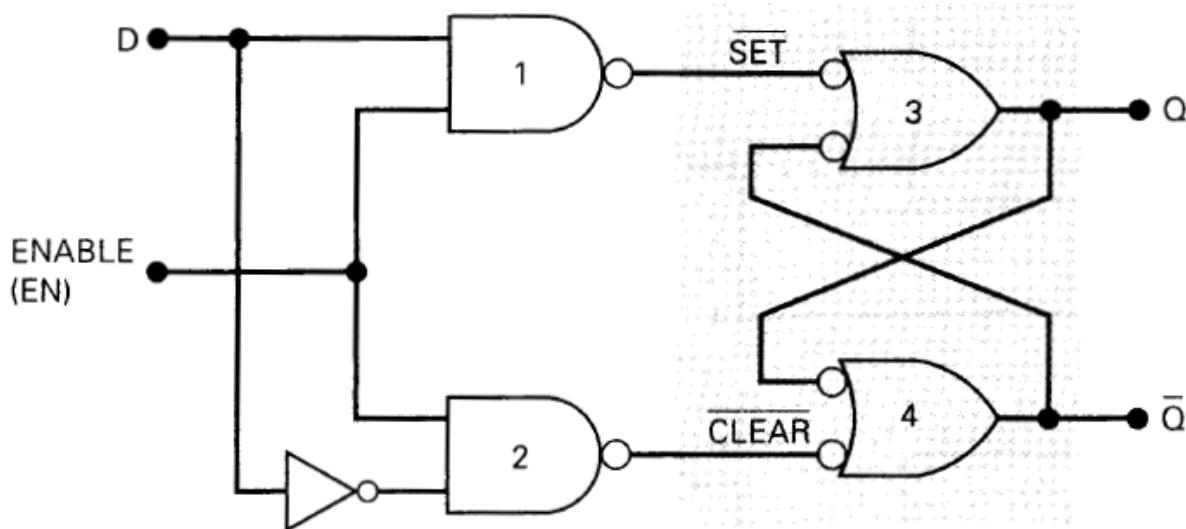
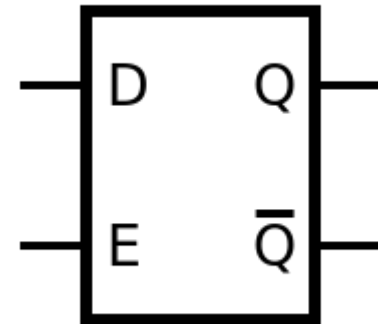
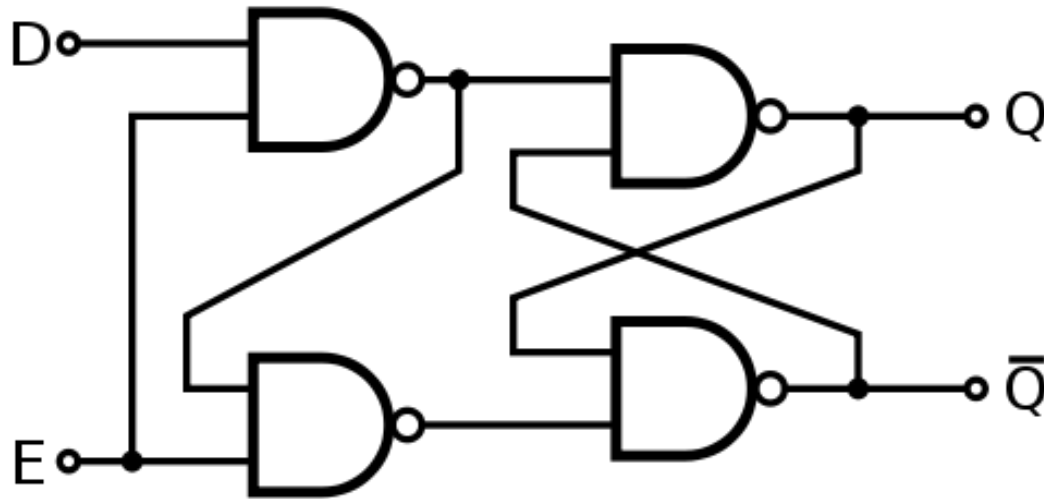
Implementati si incapsulati in wronex:

- Bistabilul de tip JK
- Incercati sa intelegeti de ce in anumite situatii acest circuit oscileaza folosind NAN-uri urmate de linii de intarziere



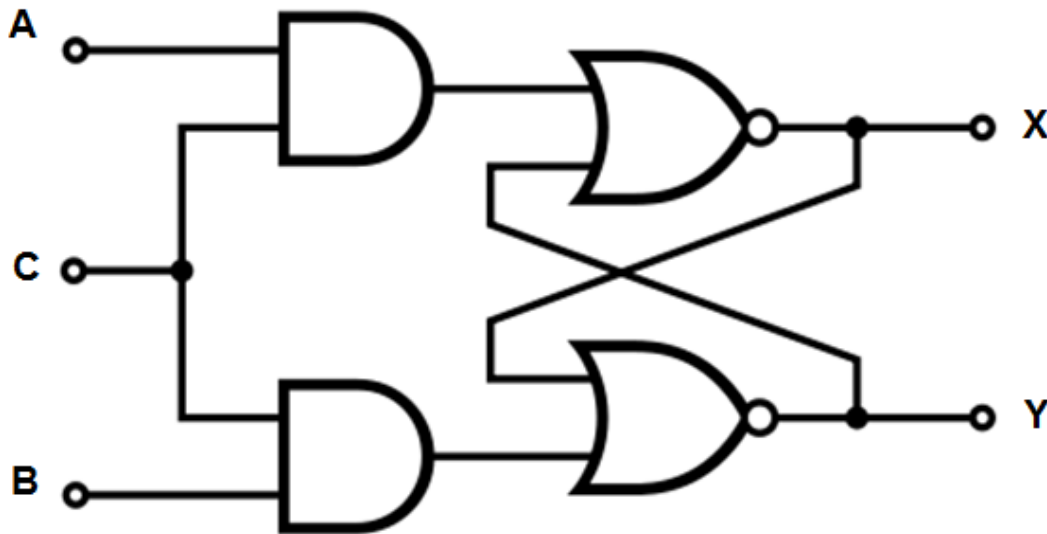
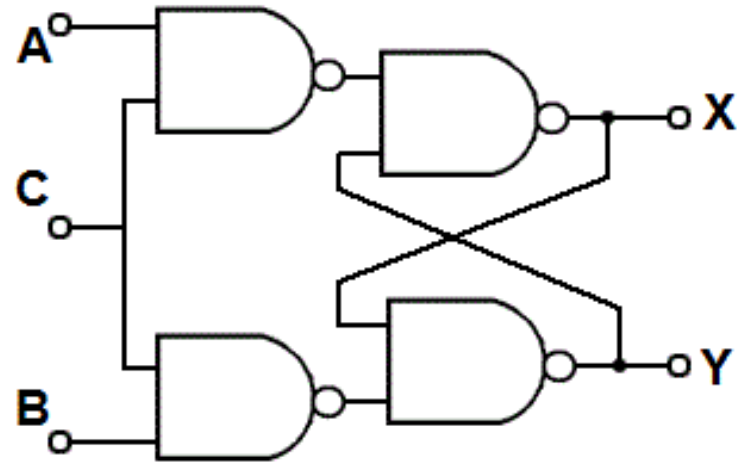
Exercitiul 5

Comparati functionarea celor 2 LATCH-uri folosind linii de intarziere



Implementati in wronex

- Scrieti tabela de adevar.
- Scrieti functiile analitice ce descriu functionarea circuitelor.



Implementati in wronex

- Scrieti tabela de adevar
- Scrieti functiile analitice ce descriu functionarea

