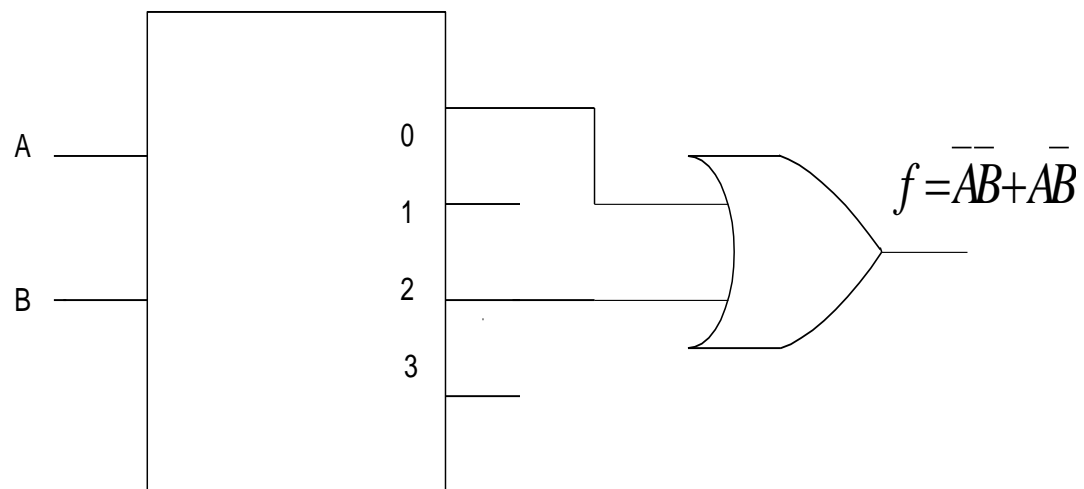


DIGITALNA LOGIKA

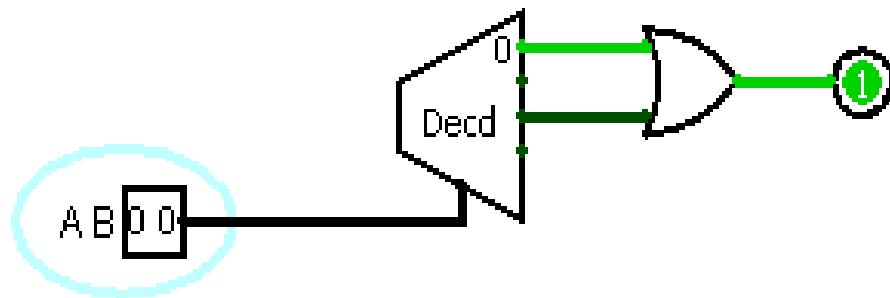
Kombinacijski sklopovi

Ostvarivanje logičkih funkcija dekoderom

Zadatak: Pomoću simbola dekodera ostvariti logičku funkciju zadanu tablicom stanja

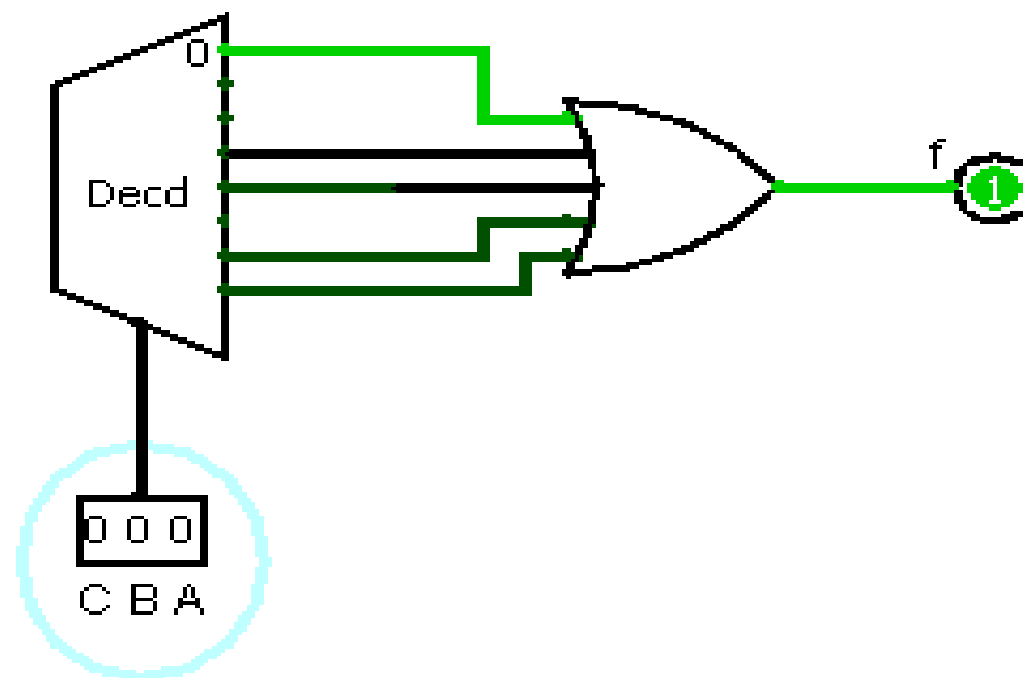


A	B	f
0	0	1
0	1	0
1	0	1
1	1	0



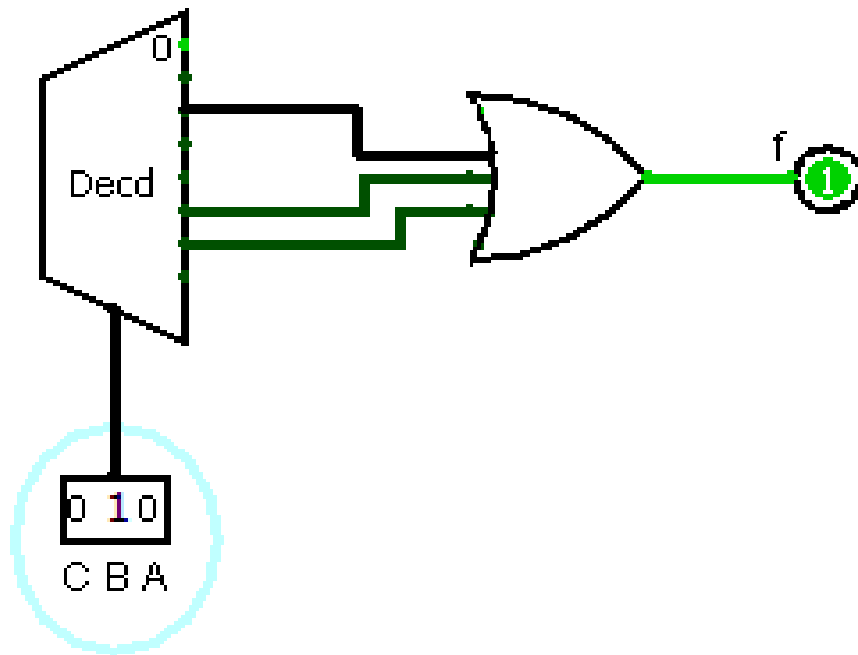
Zadatak: Pomoću simbola dekodera 3/8 ostvariti logičku funkciju $f = \Sigma (0,3,4,6,7)$

A	B	C	f
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	1



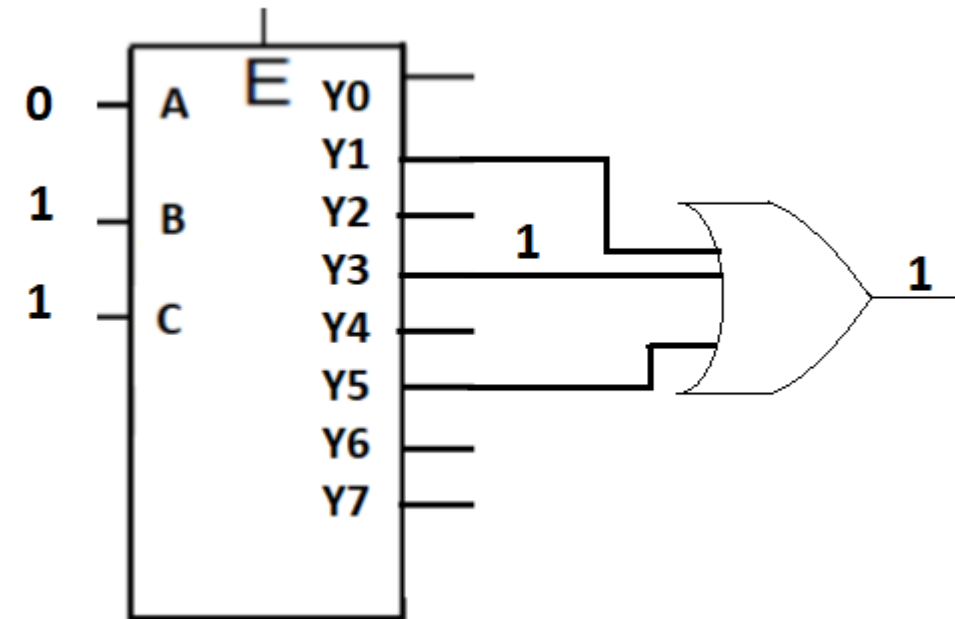
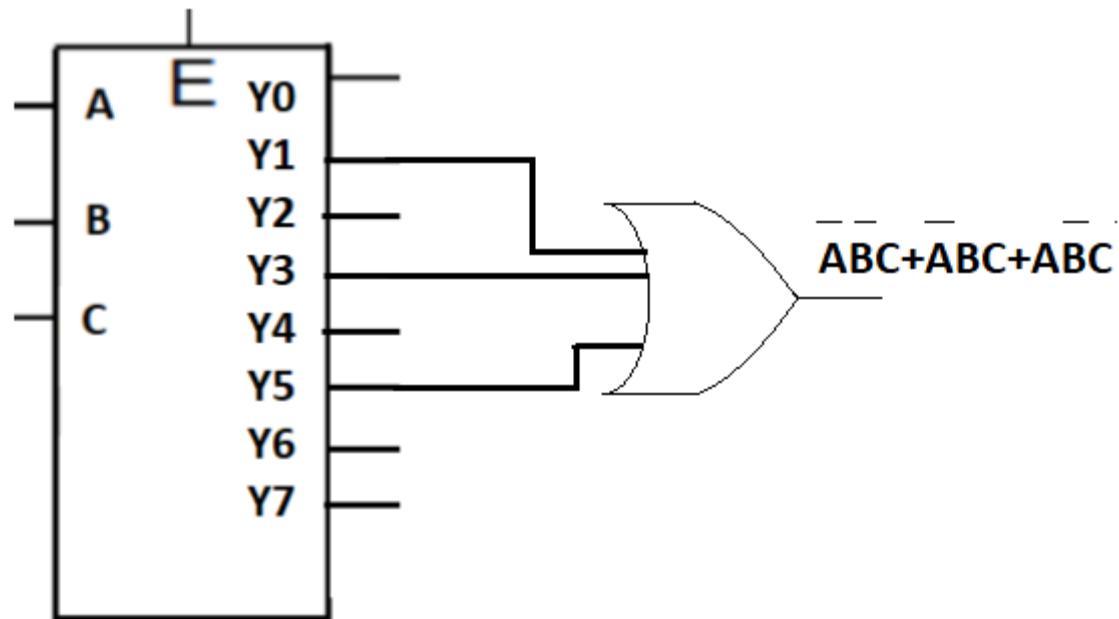
Zadatak: Koristeći simbol dekodera 3/8 realizirati funkciju

$$f = \overline{A}\overline{B}\overline{C} + A\overline{B}C + AB\overline{C}$$



$$f = \Sigma (2, 5, 6)$$

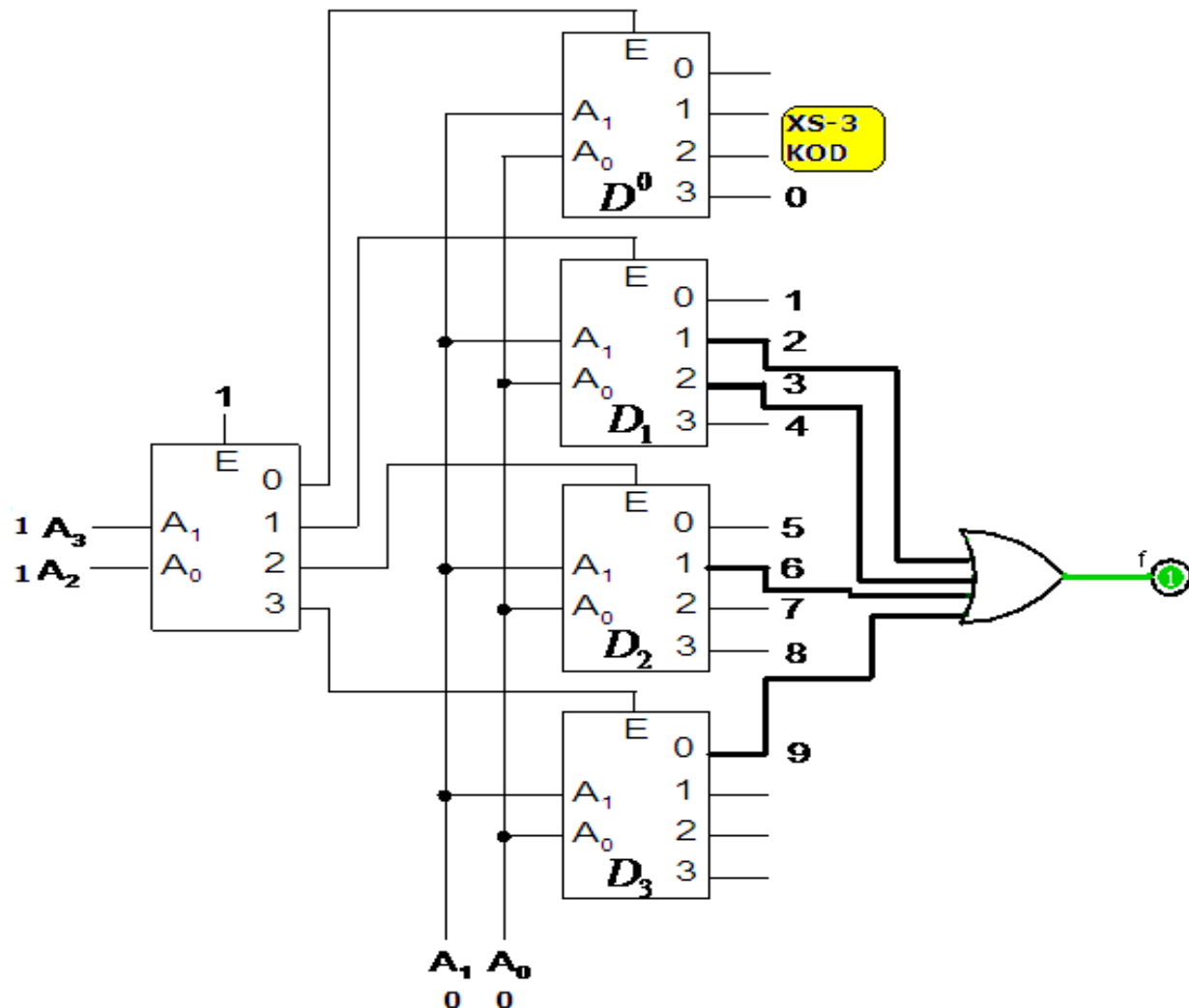
Zadatak: Realizirati funkciju koja na svom izlazu daje jedinicu za binarne kombinacije dekadskih brojeva 1,3,5. Napisati funkciju u kanonskom obliku.



Zadatak: Realizirati dekodler koji će dekodirati znamenke 2,3,6,9 prikazane XS-3 kodom

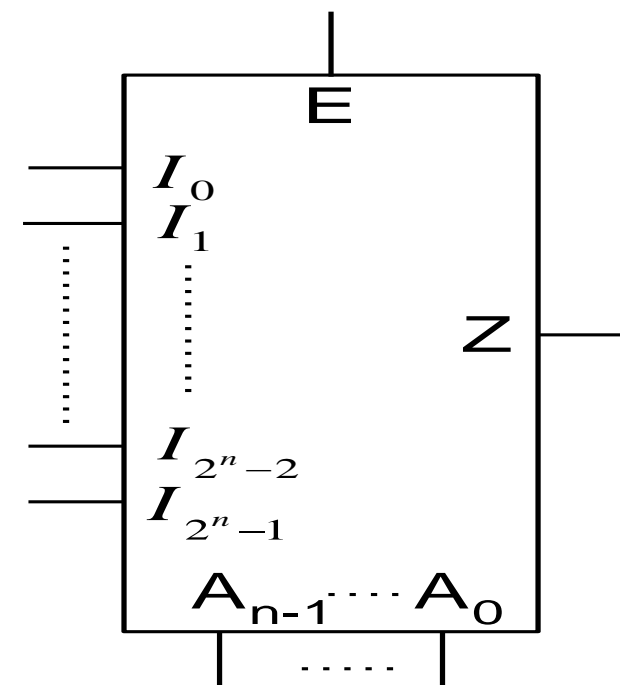
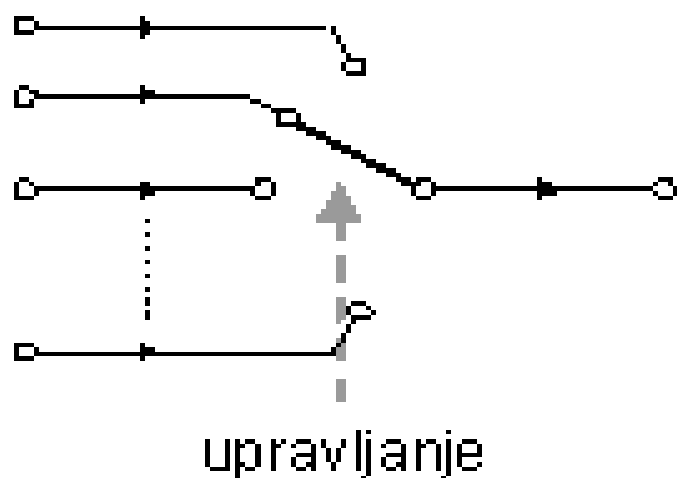
- Koristimo dekodler 2/4

A	B	C	D	f
A	A	A	A	
3	2	1	0	
0	1	0	1	1
0	1	1	0	1
1	0	0	1	1
1	1	0	0	1

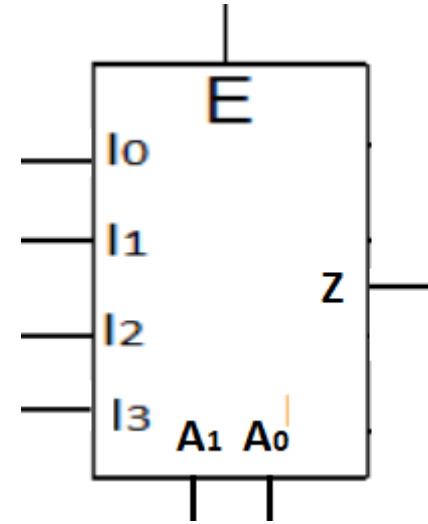
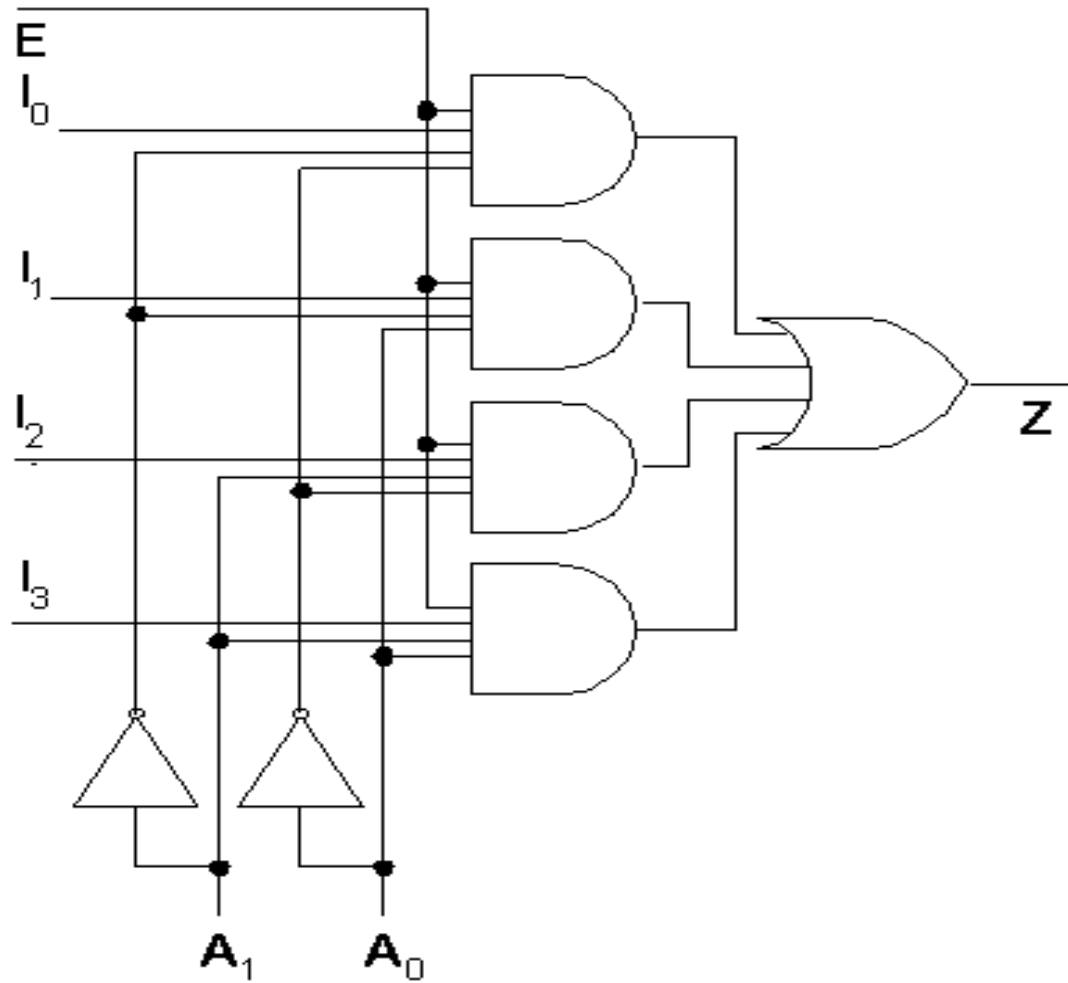


Multipleksor-selektor podataka

- sklop povezuje jedan od 2^n ulaza s *jedinim* izlazom
- bira jedan od ulaza
- posebni ulazi za upravljanje: *adrese*
 n adresnih linija za 2^n (informacijskih) ulaza



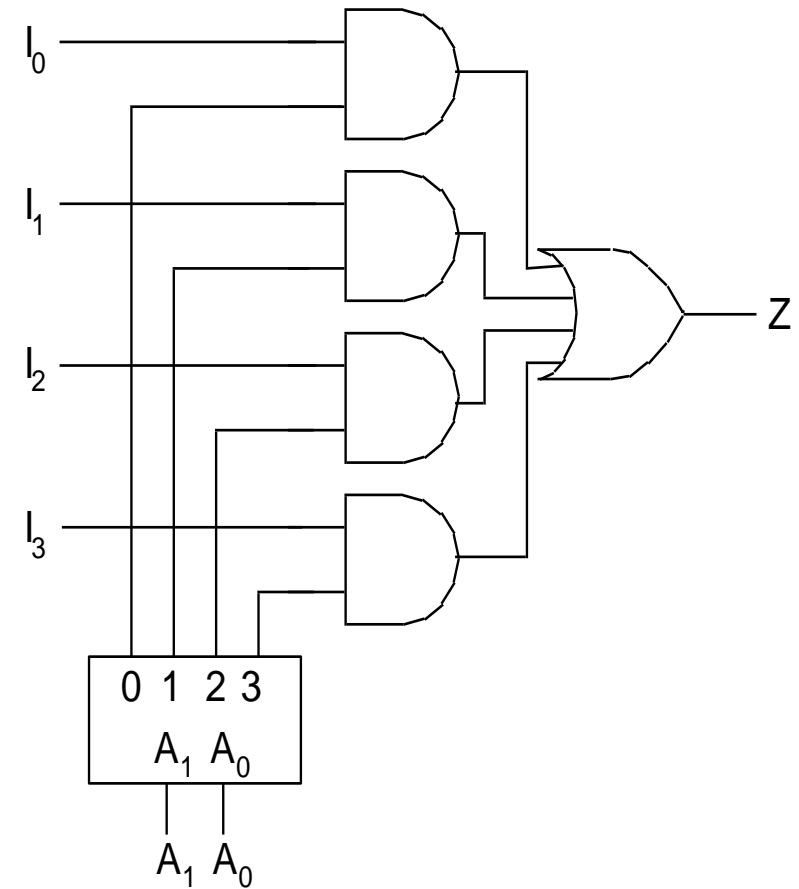
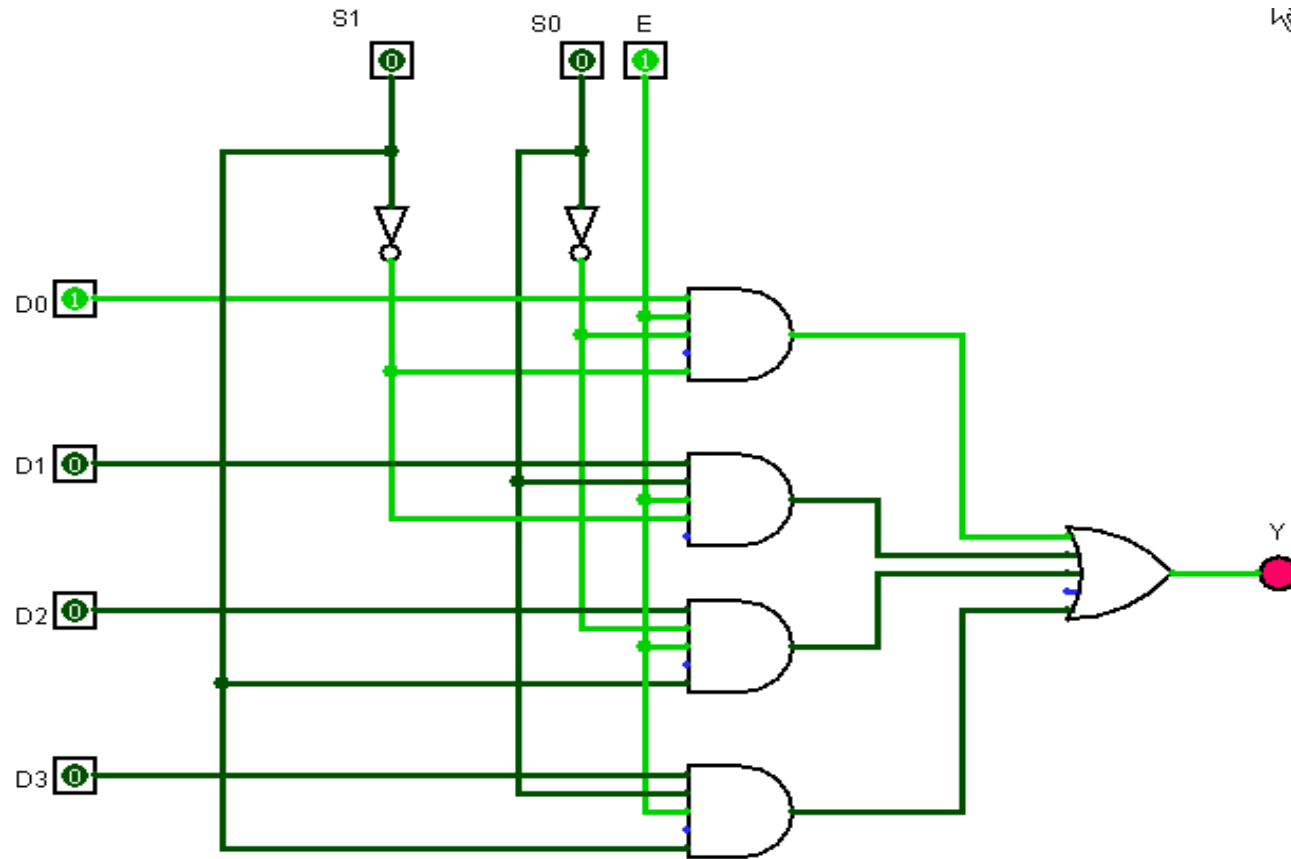
Multiplexsor 4/1



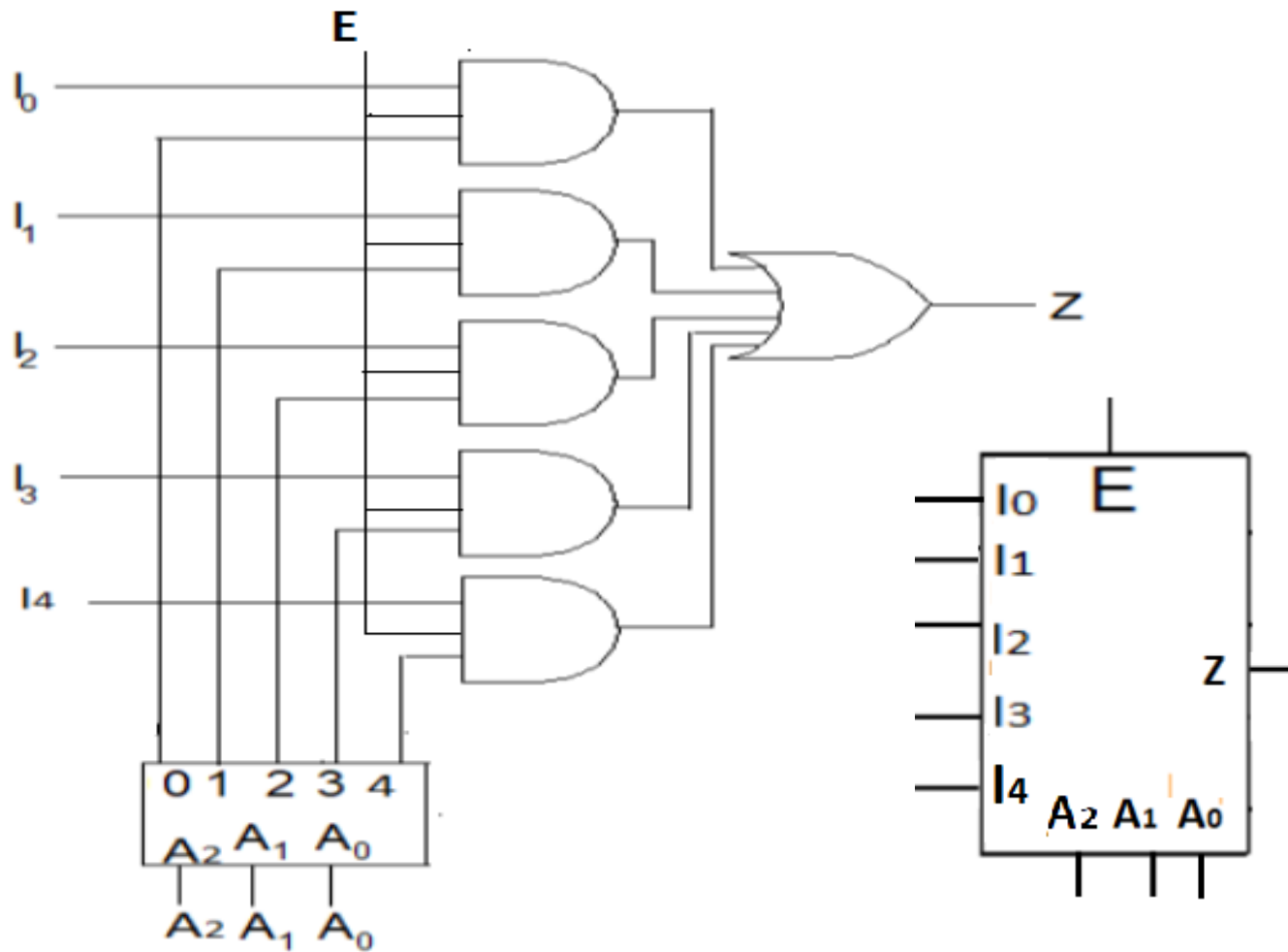
A_1	A_0	E	z
x	x	0	0
0	0	1	I_0
0	1	1	I_1
1	0	1	I_2
1	1	1	I_3

Logička shema-izraz

$$Z = \bar{A}_1 \bar{A}_0 I_0 E + \bar{A}_1 A_0 I_1 E + A_1 \bar{A}_0 I_2 E + A_1 A_0 I_3 E$$

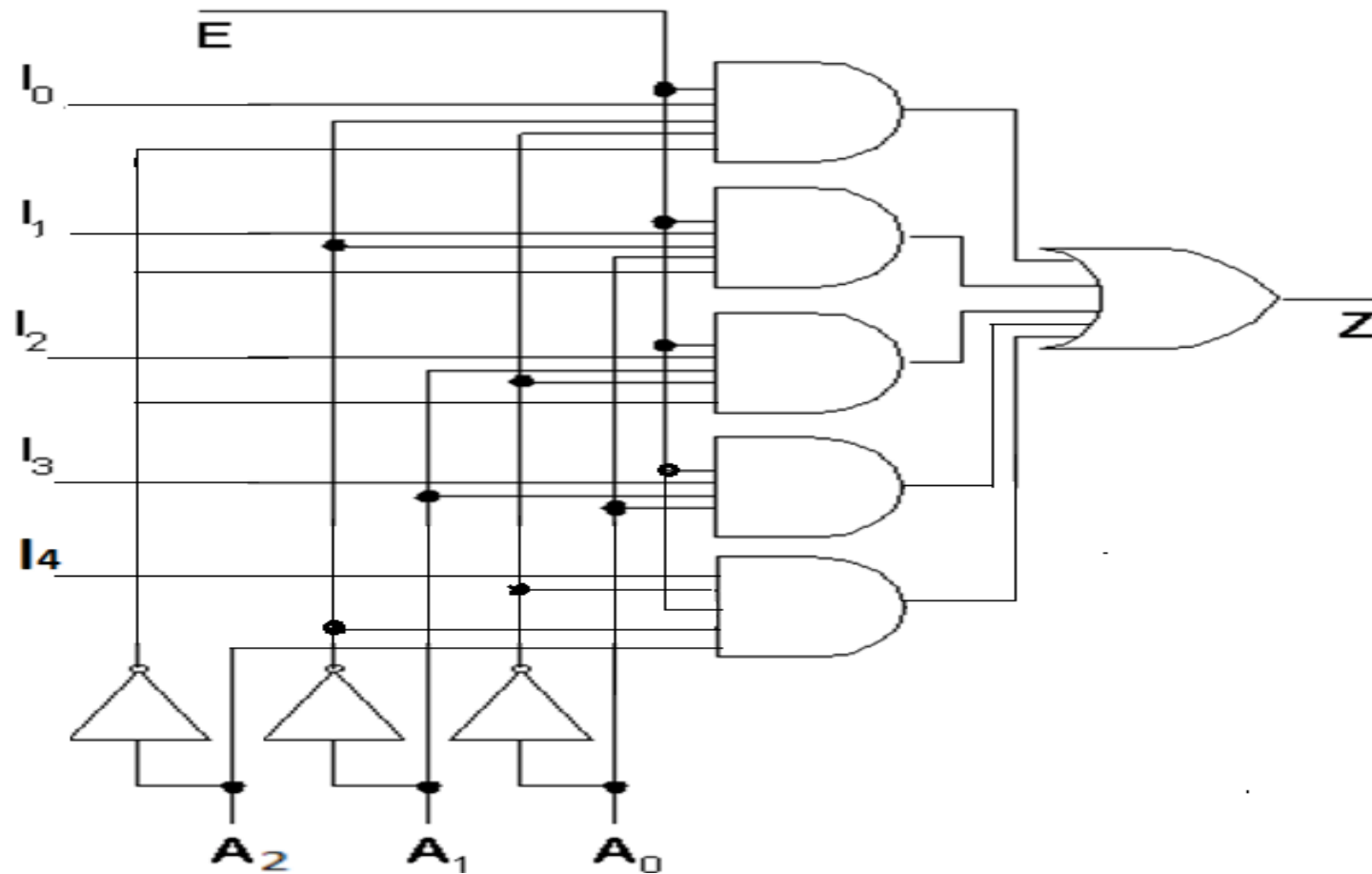


Zadatak: Realizirati multipleksor sa 5 ulaza



A_2	A_1	A_0	E	z
x	x	x	0	0
0	0	0	1	I_0
0	0	1	1	I_1
0	1	0	1	I_2
0	1	1	1	I_3
1	0	0	1	I_4

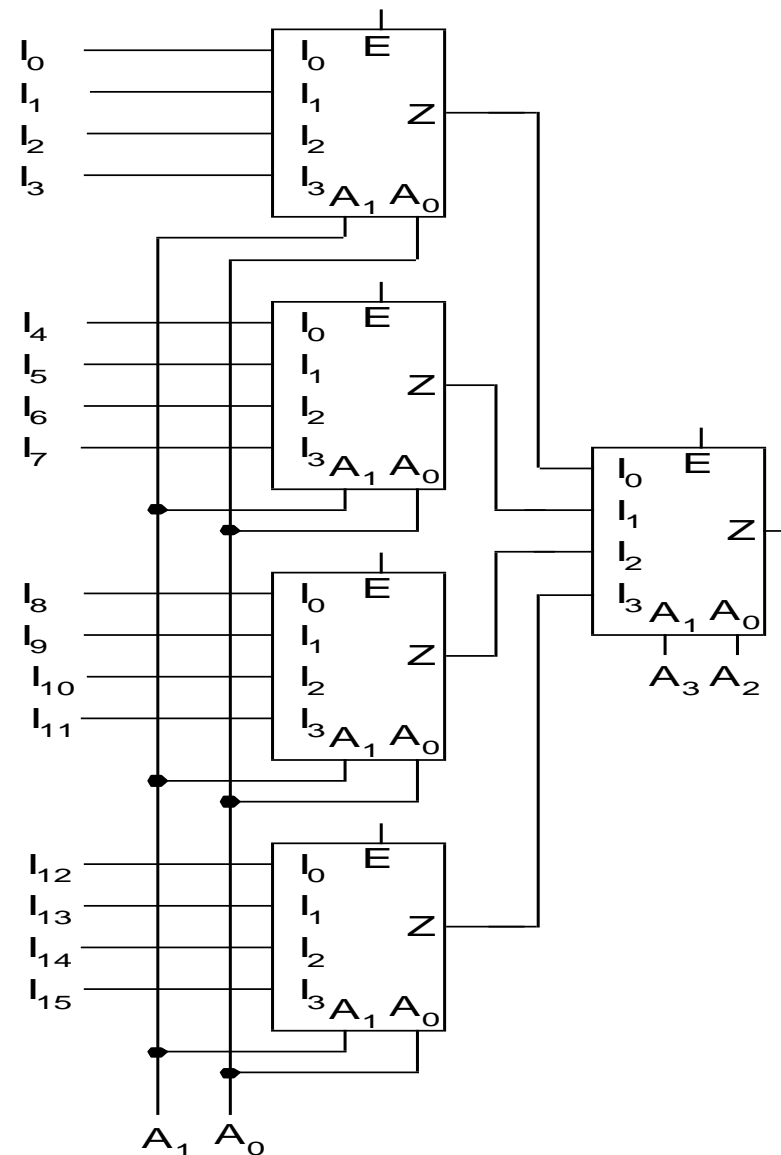
Logička shema MUX 5/1

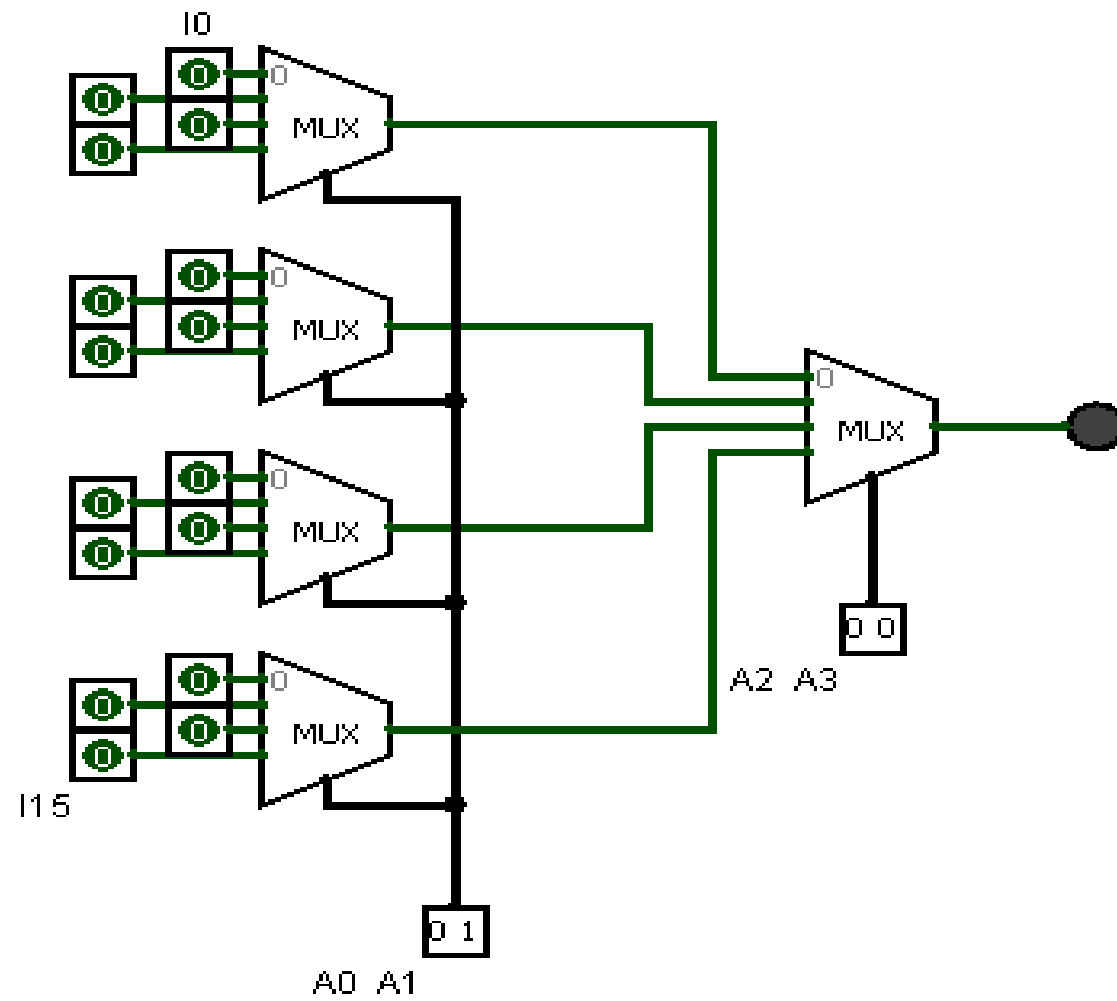


$$Z = \bar{A}_2 \bar{A}_1 \bar{A}_0 E I_0 + \bar{A}_2 \bar{A}_1 A_0 E I_1 + \bar{A}_2 A_1 \bar{A}_0 E I_2 + \bar{A}_2 A_1 A_0 E I_3 + A_2 \bar{A}_1 \bar{A}_0 E I_4$$

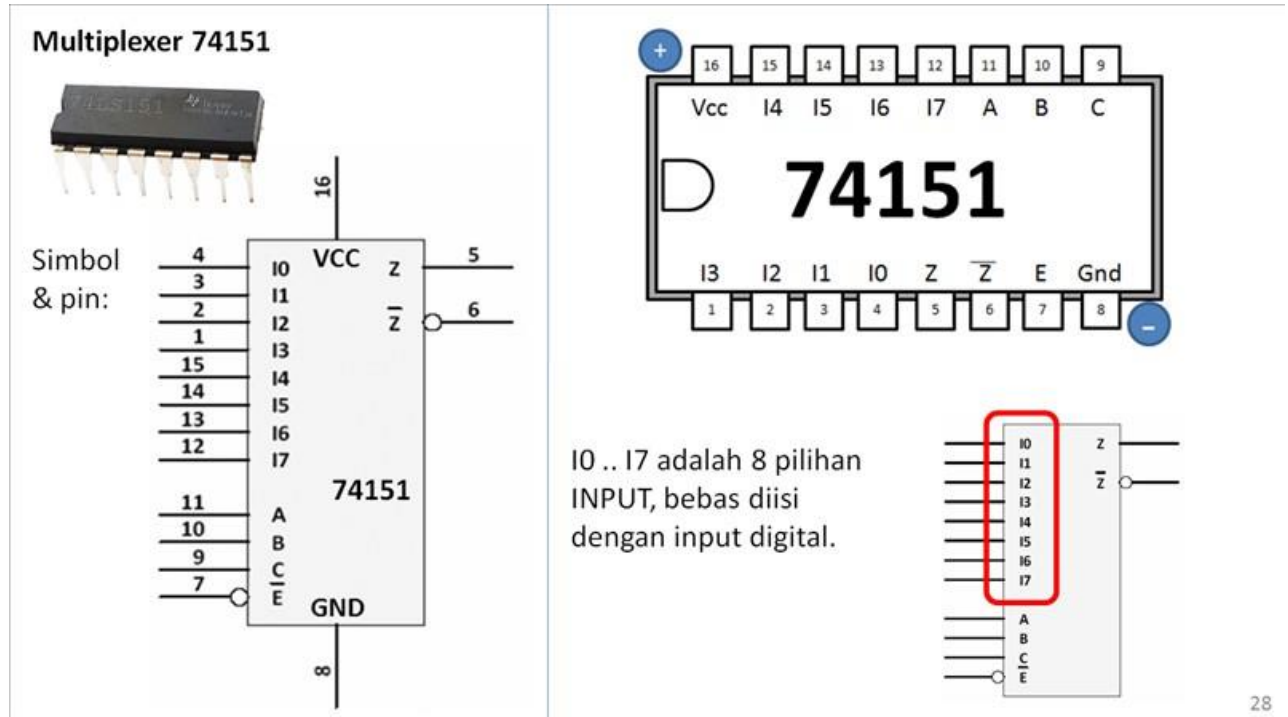
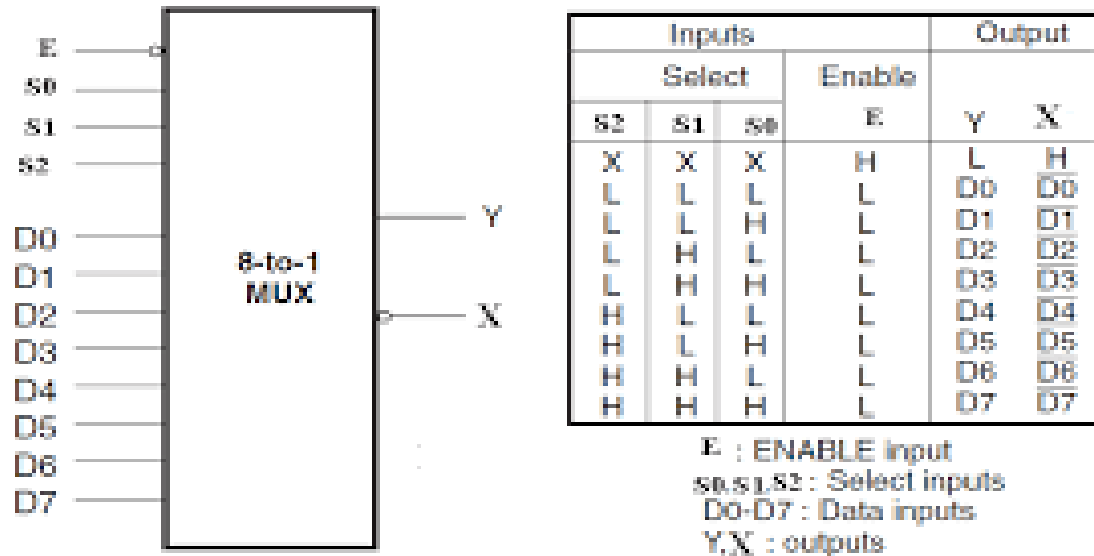
Multipleksorsko stablo

povećava broj ulaza
kaskadiranje



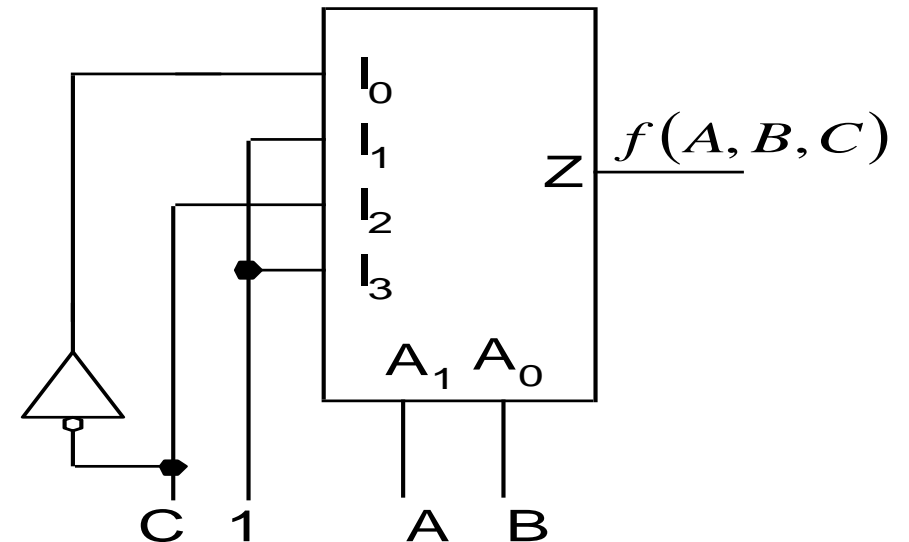
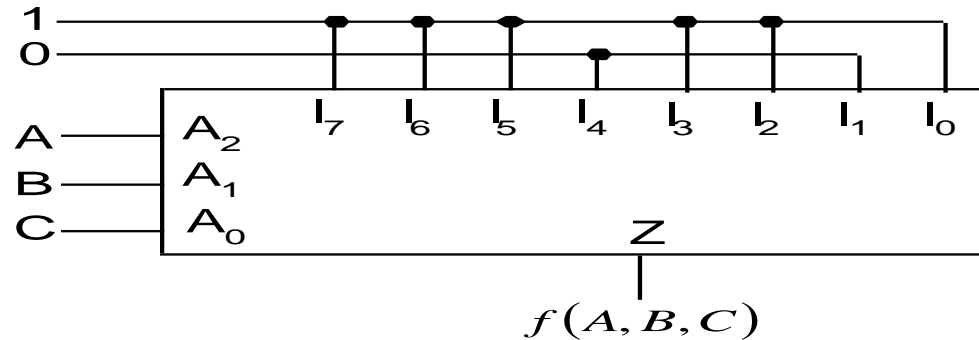


74151-integrirani multipleksor



Ostvarivanje logičkih funkcija pomoću multipleksora

- Dvije metode:
- **Direktna metoda**
- Odvajanje jedne ulazne varijable

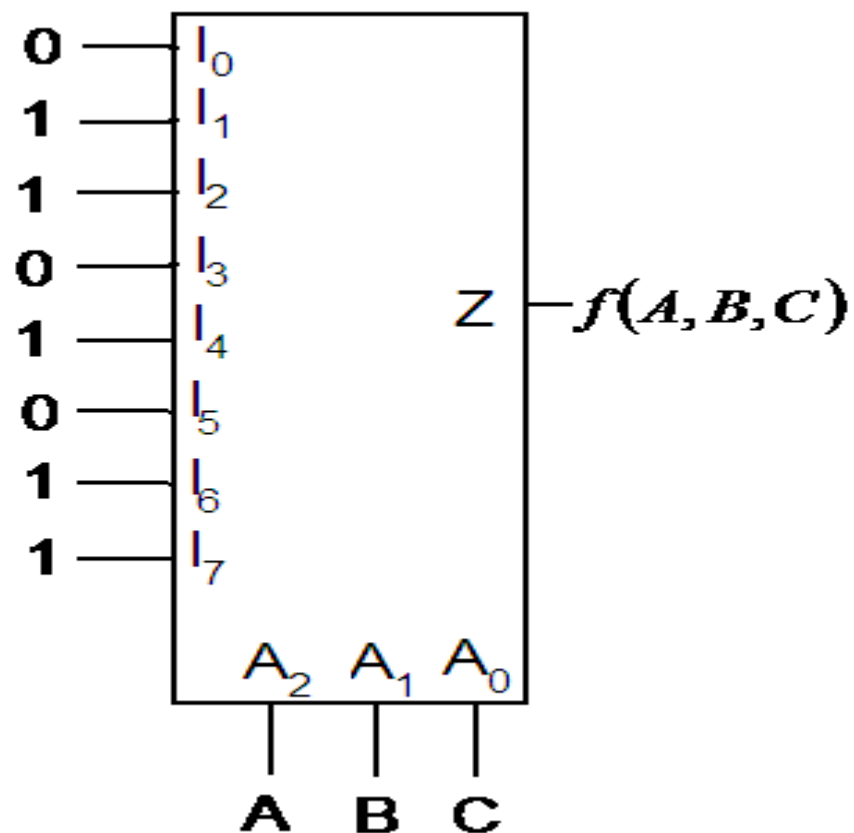


Zadatak: Zadanu logičku funkciju realizirati pomoću 8/1 multipleksora—DIREKTNA METODA

• $f = \Sigma(1, 2, 4, 6, 7)$

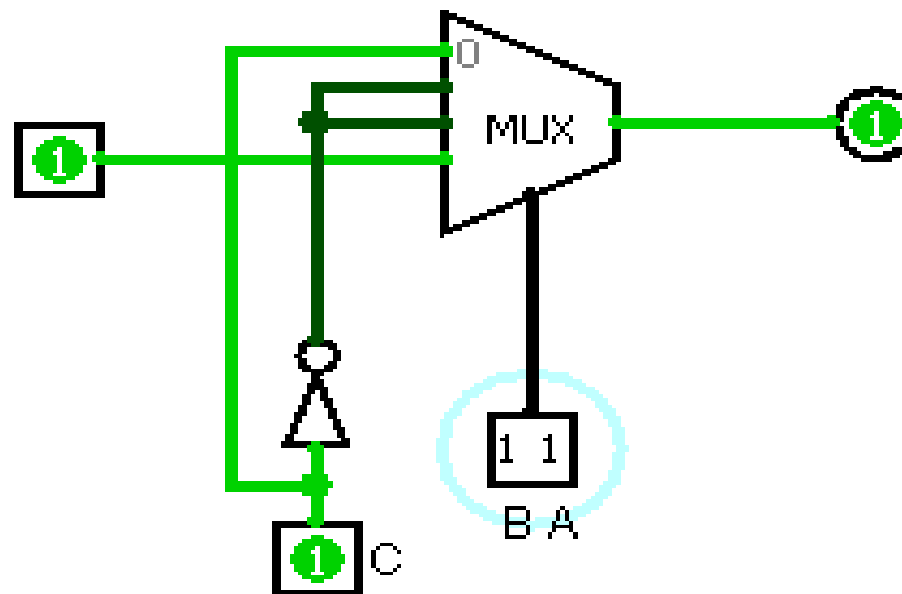
A	B	C	f
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	1

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



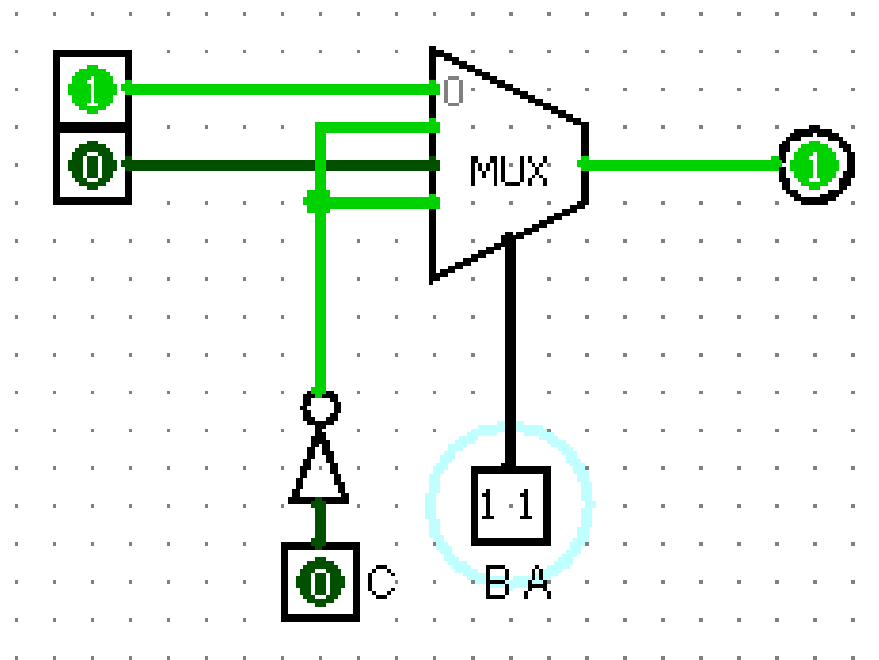
Zadatak: Primjenom multipleksora 4/1 i osnovnih logičkih sklopova ostvarite logičku funkciju $f = \Sigma(1,2,4,6,7)$

A	B	C	f	
0	0	0	0	$f=C$
0	0	1	1	$D_0=f=C$
0	1	0	1	$f=\overline{C}$
0	1	1	0	$D_1=f=\overline{C}$
1	0	0	1	$f=\overline{C}$
1	0	1	0	$D_2=f=\overline{C}$
1	1	0	1	$f=1$
1	1	1	1	$D_3=f=1$



Zadatak: Primjenom multipleksora 4/1 i osnovnih logičkih sklopova ostvarite logičku funkciju $f = \Sigma(0, 1, 2, 6)$

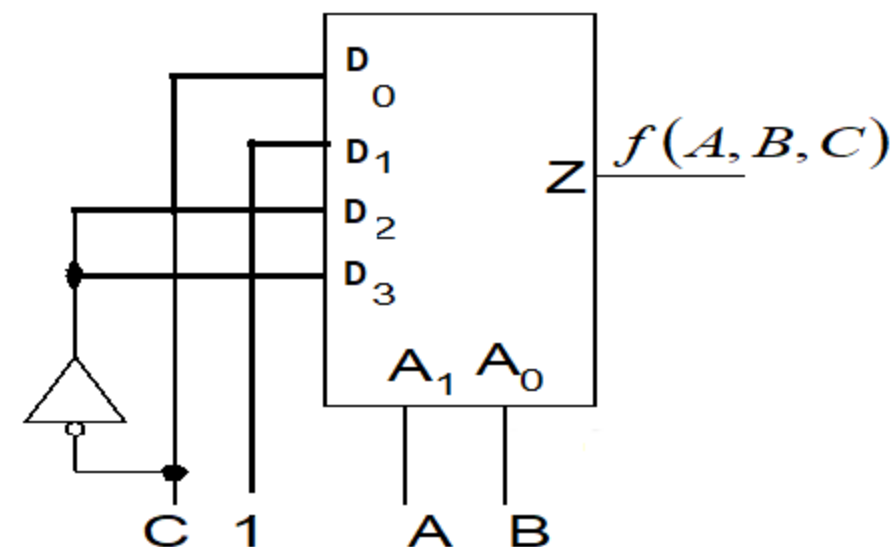
A	B	C	f	
0	0	0	1	$f=1$
0	0	1	1	$D_0=f=1$
0	1	0	1	$f=\overline{C}$
0	1	1	0	$D_1=f=\overline{C}$
1	0	0	0	$f=0$
1	0	1	0	$D_2=f=0$
1	1	0	1	$f=\overline{C}$
1	1	1	0	$D_3=f=\overline{C}$



Zadatak: Zadanu logičku funkciju realizirati pomoću 4/1 multipleksora i potrebnog logičkog sklopa

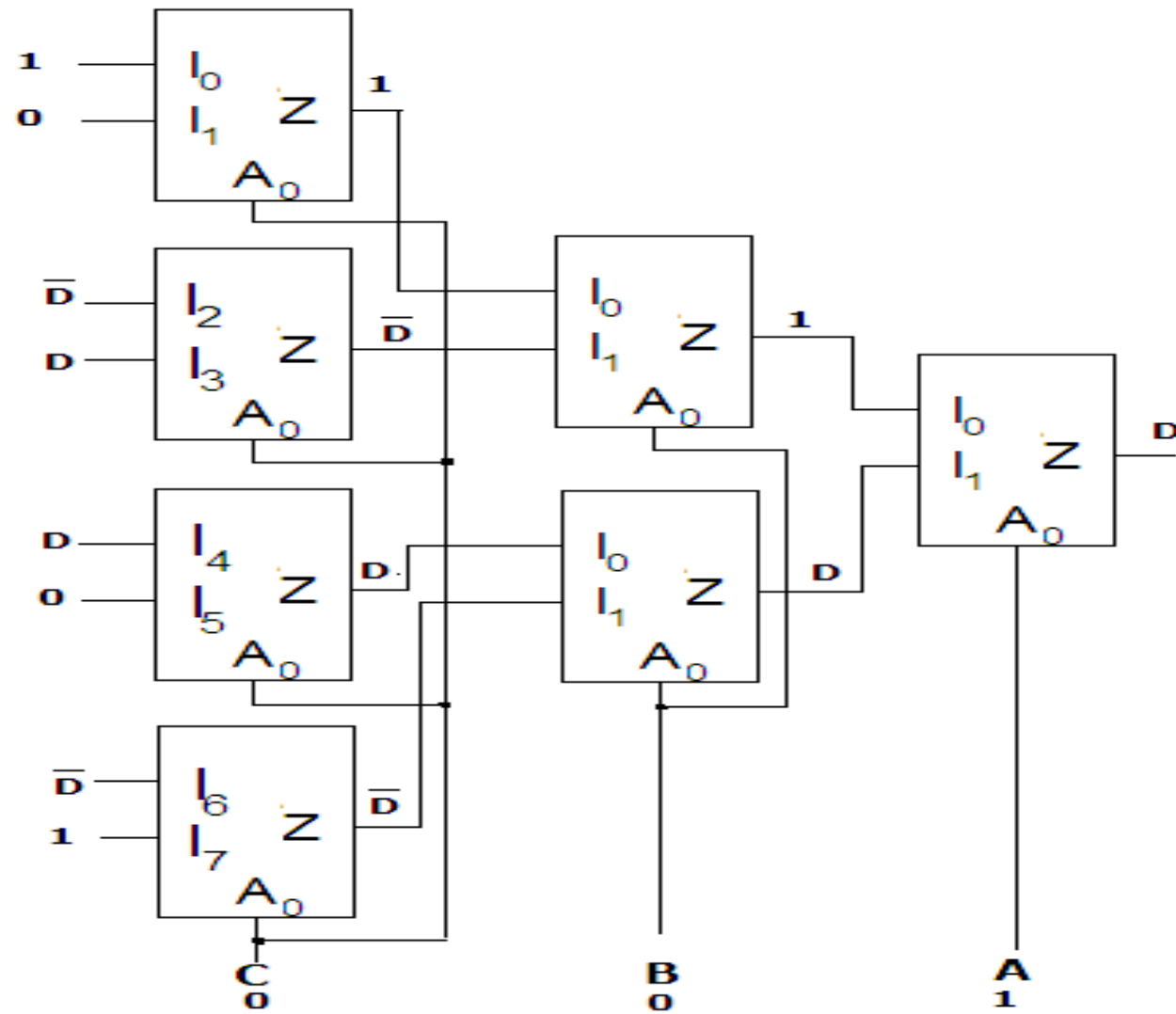
$$f(A,B,C)=\overline{A}\overline{B}C+\overline{A}B\overline{C}+A\overline{B}\overline{C}+AB$$

A	B	C	f	
0	0	0	0	$f=C$
0	0	1	1	$D_0=f=C$
0	1	0	1	$f=1$
0	1	1	1	$D_1=f=1$
1	0	0	1	$f=\overline{C}$
1	0	1	0	$D_2=f=\overline{C}$
1	1	0	1	$f=\overline{C}$
1	1	1	0	$D_3=f=\overline{C}$



Zadatak: Pomoću MUX 2/1 treba realizirati funkciju
 $f(A,B,C,D) = \Sigma(0,1,4,7,9,12,14,15)$

A	B	C	D	f	I
0	0	0	0	1	$I_0=1$
0	0	0	1	1	
0	0	1	0	0	$I_1=0$
0	0	1	1	0	
0	1	0	0	1	$I_2=\overline{D}$
0	1	0	1	0	
0	1	1	0	0	$I_3=D$
0	1	1	1	1	
1	0	0	0	0	$I_4=D$
1	0	0	1	1	
1	0	1	0	0	$I_5=0$
1	0	1	1	0	
1	1	0	0	1	$I_6=\overline{D}$
1	1	0	1	0	
1	1	1	0	1	$I_7=1$
1	1	1	1	1	



Povezanost kombinacijskih sklopova

- Paralelno –serijska pretvorba podataka

