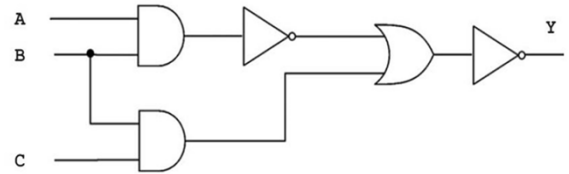


Logički sklopovi - VJEŽBA

1

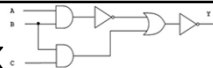
Zadatak 1

- Napisati izraz za ovaj logički sklop, a potom popuniti tablicu stanja.



2

R - ZADATAK



$$Y = \overline{Y_2 + Y_3}$$

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

$$Y = (\overline{A \cdot B}) \cdot (\overline{B \cdot C})$$

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

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

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

3

R - ZADATAK 1

A	B	C	Y1=A•B	Y2=B•C	Y3=¬Y1	Y4=Y3+Y2	Y=¬Y4
0	0	0	0	0	1	1	0
0	0	1	0	0	1	1	0
0	1	0	0	0	1	1	0
0	1	1	0	1	1	1	0
1	0	0	0	0	1	1	0
1	0	1	0	0	1	1	0
1	1	0	1	0	0	0	1
1	1	1	1	1	0	1	0

4

Zadatak 2

- Minimizirati logički izraz:

$$\overline{A} \cdot (\overline{B + C}) + (A + \overline{B \cdot C})$$

5

R - ZADATAK 2

$$\overline{A} \cdot (\overline{B + C}) + (A + \overline{B \cdot C})$$

$$\overline{A} + (\overline{B + C}) + (A + \overline{B \cdot C})$$

$$A + (\overline{B \cdot C}) + A + \overline{B \cdot C}$$

$$A + B \cdot C + \overline{B \cdot C}$$

$$A + 1 = 1$$

6

ZADATAK 3

- Na osnovu tablice stanja napisati logički izraz te nacrtati pripadajući sklop.

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

7

R - ZADATAK 3

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

$\bar{A} \cdot \bar{B} \cdot C$
$A \cdot \bar{B} \cdot \bar{C}$
$A \cdot \bar{B} \cdot C$

8

R - ZADATAK 3

$$\bar{A} \cdot \bar{B} \cdot C + A \cdot \bar{B} \cdot \bar{C} + A \cdot \bar{B} \cdot C$$

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

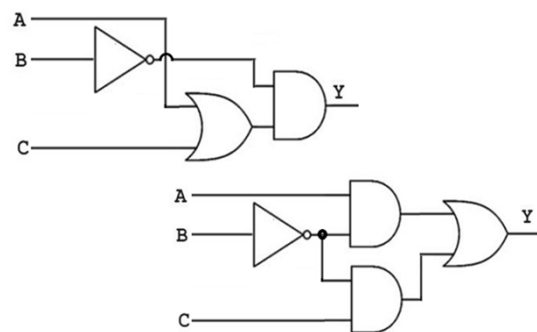
$$\bar{B} \cdot C + A \cdot \bar{B} \cdot \bar{C}$$

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

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

9

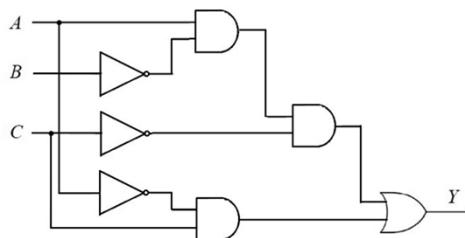
R - ZADATAK 3



10

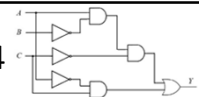
Zadatak 4

- Napisati izraz za ovaj logički sklop, a potom popuniti tablicu stanja.



11

R - ZADATAK 4



$$Y = Y6 + Y5 = (Y4 \cdot Y2) + (Y3 \cdot C)$$

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

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

12

R – ZADATAK 4

A	B	C	Y1=B	Y2=C	Y3=A	Y4=A•Y1	Y5=Y3•C	Y6=Y4•Y2	Y=Y6+Y5
0	0	0	1	1	1	0	0	0	0
0	0	1	1	0	1	0	1	0	1
0	1	0	0	1	1	0	0	0	0
0	1	1	0	0	1	0	1	0	1
1	0	0	1	1	0	1	0	1	1
1	0	1	1	0	0	1	0	0	0
1	1	0	0	1	0	0	0	0	0
1	1	1	0	0	0	0	0	0	0

13

Zadatak 5

- Izraz zapisati tako da se koriste samo operacije konjunkcije i negacije.

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

14

R - ZADATAK 5

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

$$\bar{A} \cdot B + \bar{A} \cdot \bar{C} + \bar{B} \cdot \bar{A} + \bar{B} \cdot C + \bar{C} \cdot A + \bar{C} \cdot \bar{B}$$

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

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

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

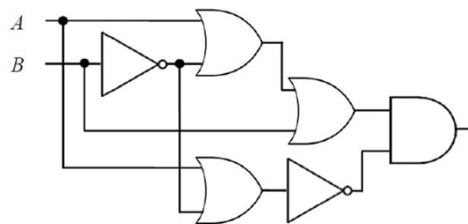
$$\bar{A} + \bar{B} \cdot \bar{C}$$

$$\bar{A} \cdot B \cdot C$$

15

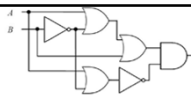
ZADATAK 6

- Napisati izraz za ovaj logički sklop. Potom izraz minimizirati, pa nacrtati pojednostavljeni sklop.



16

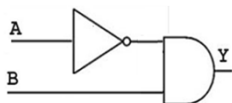
R - ZADATAK 6



$$(A + \bar{B} + B) \cdot (\bar{A} + \bar{B})$$

$$1 \cdot (\bar{A} \cdot \bar{B})$$

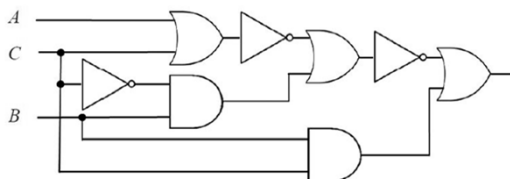
$$\bar{A} \cdot B$$



17

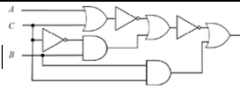
ZADATAK 7

- Napisati izraz za ovaj logički sklop. Potom izraz minimizirati.



18

R - ZADATAK 1



$\overline{\overline{(A + C) + (B \cdot \overline{C}) + (C \cdot B)}}$
$\overline{\overline{(A + C) \cdot (B \cdot \overline{C}) + (C \cdot B)}}$
$(A + C) \cdot (\overline{B + C}) + (C \cdot B)$
$(A \cdot \overline{B} + A \cdot C + C \cdot \overline{B} + C \cdot C) + C \cdot B$
$A \cdot \overline{B} + C \cdot (A + \overline{B} + B + 1)$
$A \cdot \overline{B} + C$

19

Zadatak 8

- Izraz zapisati tako da se koriste samo operacije disjunkcije i negacije.

$$\overline{A \cdot B} \cdot (A + \overline{B}) \cdot (\overline{A + B})$$

20

R - ZADATAK 8

$\overline{A \cdot B} \cdot (A + \overline{B}) \cdot (\overline{A + B})$
$(\overline{A + B}) \cdot (A + \overline{B}) \cdot (\overline{\overline{A} \cdot \overline{B}})$
$(\overline{A \cdot A + A \cdot \overline{B} + \overline{B} \cdot A + \overline{B} \cdot \overline{B}}) \cdot (A \cdot \overline{B})$
$(\overline{A \cdot \overline{B} + \overline{B} \cdot A + \overline{B}}) \cdot (A \cdot \overline{B})$
$\overline{B} \cdot (\overline{A + A + 1}) \cdot (A \cdot \overline{B})$
$\overline{B} \cdot A \cdot \overline{B}$
$A \cdot \overline{B}$

21

R - ZADATAK 8

$$A \cdot \overline{B}$$

$$\overline{\overline{A \cdot B}}$$

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

22

ZADATAK 9

- Na osnovu tablice stanja napisati logički izraz te nacrtati pripadajući sklop.

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

23

R - ZADATAK 9

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

$\overline{A \cdot B \cdot C}$
$\overline{A \cdot \overline{B} \cdot C}$
$A \cdot B \cdot \overline{C}$

24

R - ZADATAK 9

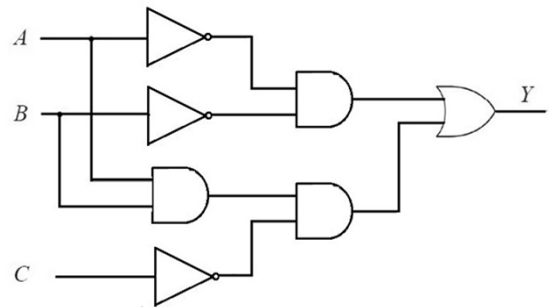
$$\overline{A} \cdot \overline{B} \cdot \overline{C} + \overline{A} \cdot \overline{B} \cdot C + A \cdot B \cdot \overline{C}$$

$$\overline{A} \cdot \overline{B} \cdot (\overline{C} + C) + A \cdot B \cdot \overline{C}$$

$$\overline{A} \cdot \overline{B} + A \cdot B \cdot \overline{C}$$

25

R - ZADATAK 9



26

Zadatak 10

- Minimizirati logički izraz:

$$\overline{A} \cdot B + C + B + (A + \overline{B})$$

27

ZADATAK 10

$$\overline{A} \cdot B + C + B + (A + \overline{B})$$

$$(\overline{A} \cdot B) + C + B + (A + \overline{B})$$

$$(((\overline{A} \cdot B) + C) + B) \cdot (\overline{A} \cdot \overline{B})$$

$$(((\overline{A} \cdot B) \cdot \overline{C}) + B) \cdot (\overline{A} \cdot B)$$

$$(((\overline{A} + B) \cdot \overline{C}) + B) \cdot (\overline{A} \cdot B)$$

28

R - ZADATAK 10

$$(((A + \overline{B}) \cdot \overline{C}) + B) \cdot (\overline{A} \cdot B)$$

$$(A \cdot \overline{C} + \overline{B} \cdot \overline{C} + B) \cdot (\overline{A} \cdot B)$$

$$(A \cdot \overline{C} \cdot \overline{A} \cdot B + \overline{B} \cdot \overline{C} \cdot \overline{A} \cdot B + B \cdot \overline{A} \cdot B)$$

$$B \cdot \overline{A}$$

29

ZADATAK 11

- Na osnovu tablice stanja napisati logički izraz te nacrtati pripadajući sklop.

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

30

R - ZADATAK 11

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

$$\bar{A} \cdot \bar{B} \cdot C$$

$$A \cdot \bar{B} \cdot C$$

$$A \cdot B \cdot \bar{C}$$

$$A \cdot B \cdot C$$

31

R - ZADATAK 11

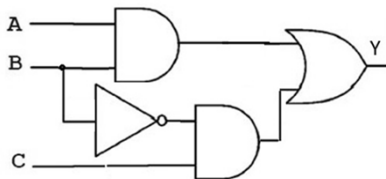
$$\bar{A} \cdot \bar{B} \cdot C + A \cdot \bar{B} \cdot C + A \cdot B \cdot \bar{C} + A \cdot B \cdot C$$

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

$$\bar{B} \cdot C + A \cdot B$$

32

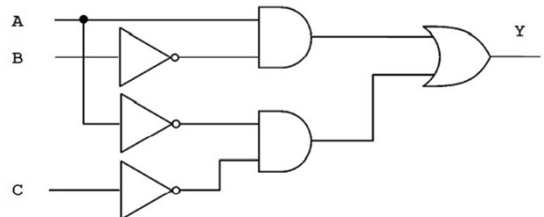
R - ZADATAK 11



33

ZADATAK 12

- Napisati izraz za ovaj logički sklop, a potom popuniti tablicu stanja.



34

R - ZADATAK

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	0

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

35

ZADATAK 13

- Za koju je trojku ulaznih varijabli izraz istinit (prvo minimiziraj!)?

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

36

R - ZADATAK 13

$$\overline{A \cdot (B+C) \cdot (A+B \cdot C)}$$

$$\overline{A + (B+C) \cdot (A \cdot B \cdot C)}$$

$$\overline{(A+B+C) \cdot (A \cdot B \cdot C)}$$

$$\overline{A \cdot A \cdot B \cdot C + B \cdot \overline{A} \cdot B \cdot C + C \cdot \overline{A} \cdot B \cdot C}$$

$$\overline{A \cdot B \cdot C}$$

37

R - ZADATAK 13

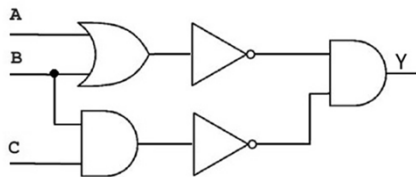
A	B	C	$\overline{A}$	Y
0	0	0	1	0
0	0	1	1	0
0	1	0	1	0
0	1	1	1	1
1	0	0	0	0
1	0	1	0	0
1	1	0	0	0
1	1	1	0	0

$$\overline{A \cdot B \cdot C}$$

38

ZADATAK 14

- Za koje je trojke ulaznih varijabli izraz istinit (prvo minimiziraj!)?



39

R - ZADATAK 14

A	B	C	$\overline{A}$	$\overline{B}$	Y
0	0	0	1	1	1
0	0	1	1	1	1
0	1	0	1	0	0
0	1	1	1	0	0
1	0	0	0	1	0
1	0	1	0	1	0
1	1	0	0	0	0
1	1	1	0	0	0

$$\overline{A + B \cdot B \cdot C}$$

$$\overline{A \cdot B \cdot (B+C)}$$

$$\overline{A \cdot B \cdot B + A \cdot B \cdot C}$$

$$\overline{A \cdot B + A \cdot B \cdot C}$$

$$\overline{A \cdot B \cdot (1+C)}$$

$$\overline{A \cdot B}$$

40