



Основи рачунарске технике
- 13E111OPT, 19E111OPT -

09.06.2021.

Индекс: _____ / _____
ГГГ 6666

Студент:			
1.	2.	3.	Укупно

Напомене за попуњавање свих задатака:

1. Коначне одговоре уписати у означена поља
2. Не морају бити искоришћене све Карноове карте нити сви редови и колоне у таблицама
3. Неискоришћене Карноове карте и поља у таблицама прецртати

1. [15]

а)

	x_1x_2				
	00	01	11	10	
x_3	0	1	1	b	$f(x_1, x_2, x_3) = x_1 + x_2 + x_3$
	0	1	1	1	$f(0) = \{000\} = \{0\}$
	1	1	1	1	$f(b) = \{4\}$

КНФ: $f(x_1, x_2, x_3) = (x_2 + x_3)$

б)

	x_1x_2					
	00	01	11	10		
x_3x_4	00	0	0	0	1	$f(x_1, x_2, x_3, x_4) = x_1\bar{x}_2 + x_2x_4 + \bar{x}_3x_4$
	01	1	1	1	1	$f(1) = \{10XX, X1X1, XX01\} = \{1000, 1001, 1010, 1011, 0101, 0111, 1101, 1111, 0001, 0101, 1001, 1101\}$
	11	0	1	1	1	$f(1) = \{8, 9, 10, 11, 5, 7, 13, 15, 1, 5, 9, 13\}$
	10	0	0	0	1	$f(1) = \{1, 5, 7, 8, 9, 10, 11, 13, 15\}$
						$f(0) = \{0, 2, 3, 4, 6, 12, 14\}$

КНФ: $f(x_1, x_2, x_3, x_4) = (x_1 + x_4)(\bar{x}_2 + x_4)(x_1 + x_2 + \bar{x}_3)$

в)

	x_2x_3					
	00	01	11	10		
x_4x_5	00	b	0	1	b	$f(0) = \{1, 4, 5, 6, 10, 20, 21, 22, 23, 27\}$
	01	0	0	1	b	$f(b) = \{0, 2, 8, 9, 25, 26, 29, 30\}$
	11	1	1	1	1	$f(1) = \{3, 7, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 28, 31\}$
	10	b	0	1	0	

$x_1 = 0$

	x_2x_3					
	00	01	11	10		
x_4x_5	00	1	0	1	1	
	01	1	0	b	b	
	11	1	0	1	0	
	10	1	0	b	b	

$x_1 = 1$

ДНФ: $f(x_1, x_2, x_3, x_4, x_5) = x_2x_3 + x_2\bar{x}_4 + \bar{x}_1x_4x_5 + x_1\bar{x}_2\bar{x}_3$

2. [15]

Комбинациона таблица:

X ₃	X ₂	X ₁	X ₀	Z ₁	Z ₂	Z ₃	Z ₄	Z ₅
0	0	0	0	0	0	0	0	0
0	0	0	1	0	0	0	0	0
0	0	1	0	0	0	0	0	0
0	0	1	1	0	0	0	0	0
0	1	0	0	0	0	0	0	0
0	1	0	1	0	0	0	0	0
0	1	1	0	0	0	0	0	0
0	1	1	1	b	b	b	b	b

X ₃	X ₂	X ₁	X ₀	Z ₁	Z ₂	Z ₃	Z ₄	Z ₅
1	0	0	0	0	0	0	0	0
1	0	0	1	1	0	0	1	0
1	0	1	0	0	0	1	0	1
1	0	1	1	0	1	0	0	1
1	1	0	0	0	1	0	1	0
1	1	0	1	0	1	0	1	1
1	1	1	0	1	1	0	1	1
1	1	1	1	b	b	b	b	b

Излазни сигнал Z₁:

		x ₃ x ₂			
		00	01	11	10
x ₁ x ₀	00	0	0	0	0
	01	0	0	0	1
	11	0	b	b	0
	10	0	0	1	0

Излазни сигнал Z₂:

		x ₃ x ₂			
		00	01	11	10
x ₁ x ₀	00	0	0	1	0
	01	0	0	1	0
	11	0	b	b	1
	10	0	0	1	0

Излазни сигнал Z₃:

		x ₃ x ₂			
		00	01	11	10
x ₁ x ₀	00	0	0	0	0
	01	0	0	0	0
	11	0	b	b	0
	10	0	0	0	1

ДНФ Z₁:

$$X_1X_2X_3 + X_0\bar{X}_1\bar{X}_2X_3 \xrightarrow{\text{факторисање}} X_3(X_1X_2 + X_0\bar{X}_1\bar{X}_2)$$

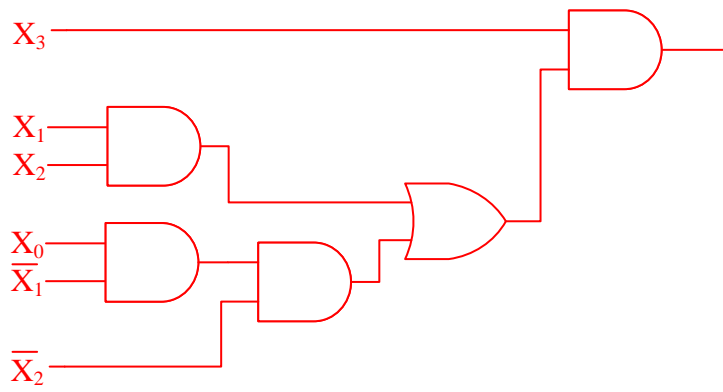
ДНФ Z₂:

$$X_2X_3 + X_0X_1X_3 \xrightarrow{\text{факторисање}} X_3(X_2 + X_0X_1)$$

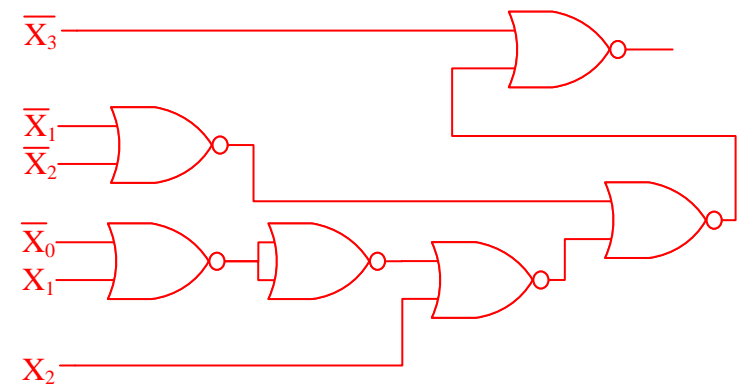
ДНФ Z₃:

$$\bar{X}_0X_1\bar{X}_2X_3$$

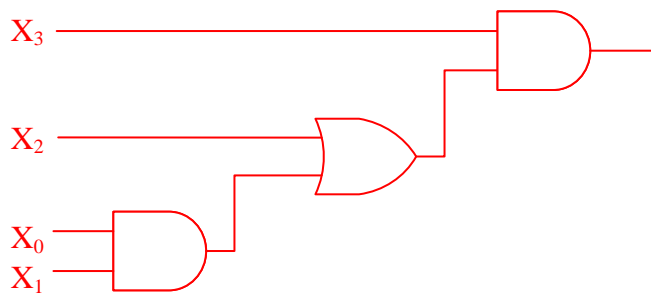
Шема Z_1 (И, ИЛИ)



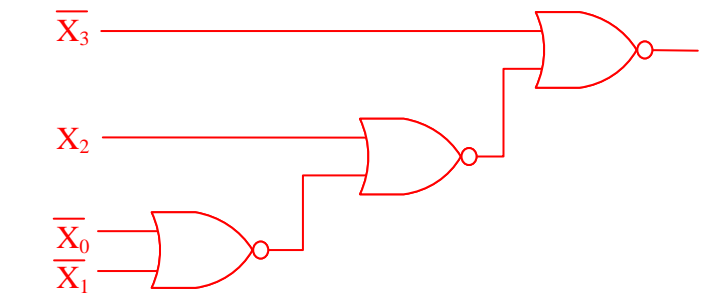
Шема Z_1 (НИЛИ)



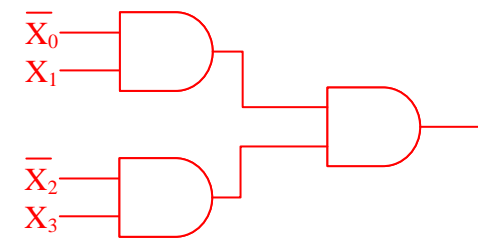
Шема Z_2 (И, ИЛИ)



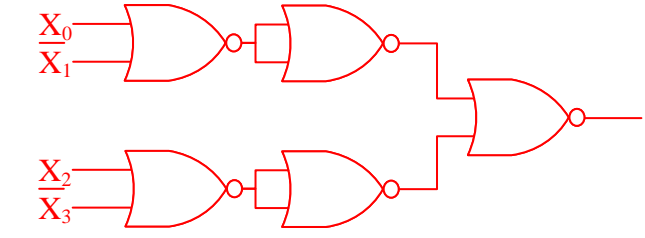
Шема Z_2 (НИЛИ)



Шема Z_3 (И, ИЛИ)



Шема Z_3 (НИЛИ)



Напомена: За сваки сигнал попунити само потребне Карноове карте из реда, вишак прецртати

	00	01	11	10
00				
01				
11				
10				

	00	01	11	10
00				
01				
11				
10				

		xQ_1		
Q_2	00	01	11	10
0	1	0	1	1
1	1	b	b	0

ДНФ: $T_1 = \bar{x}\bar{Q}_1 + x\bar{Q}_2$

	00	01	11	10
00				
01				
11				
10				

	00	01	11	10
00				
01				
11				
10				

		xQ_1		
Q_2	00	01	11	10
0	1	0	1	0
1	0	b	b	0

ДНФ: $T_2 = xQ_1 + \bar{x}\bar{Q}_1\bar{Q}_2$

	00	01	11	10
00				
01				
11				
10				

	00	01	11	10
00				
01				
11				
10				

	00	01	11	10
0				
1				

ДНФ:

	00	01	11	10
00				
01				
11				
10				

	00	01	11	10
00				
01				
11				
10				

	00	01	11	10
0				
1				

ДНФ:

Шема:

