

15 20 5

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1. Podane so naslednje funkcije:

f_1 :

f_2 :

$f_3 = S_{0,2}(x_1, x_2, \bar{x}_3)$

	x_1			
x_2	1	0	1	0
	0	1	0	1
	x_3			

	x_1			
x_2	1	0	0	1
	0	1	0	1
	x_3			

25
 $w_1 = 2$
 $w_2 = -1$
 $w_3 = 1$

Kli je funkcija $f(x_1, x_2, x_3) = (f_1 \rightarrow f_2) \oplus f_3$ pragovna? Če je, določite prag in uteži (25%)

2. Zgradite popolni odštevalnik dveh enobitnih števil x in y :

- a) Z minimalnim številom NOR vrat
- b) Z multipleksorji z dvema izbirnimi vhodi

Dostopne so spremenljivke v negirani in nenegirani obliki

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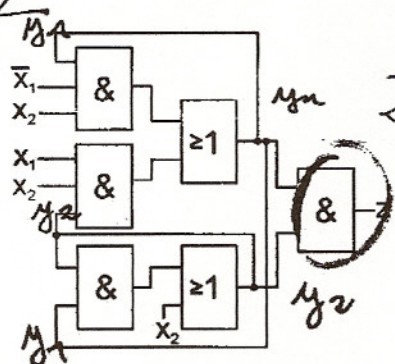
(25%)

3. Zgradite sinhronsko sekvenčno vezje, ki da na izhodu y enico, kadar se na vhodu x pojavi sekvenca 10110. Zapišite enačbe za minimalno realizacijo vezja z D pomnilnimi celicami (vezja ni potrebno risati). Kakšna bo sekvenca na izhodu, če se na vhodu pojavi naslednje zaporedje: $x = 10110110111010?$

10

(25%)

4. Analizirajte podano vezje. Zapišite enačbe za vzbujevalni spremenljivki in izhodno spremenljivko, določite stabilna stanja, narišite razširjeni diagram prehajanja stanj in zapišite vzbujevalno tabelo.



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25% + stabilna stanja + trestal

≥ 1

19.4.07

① $f_3(x_1, x_2, x_3) = (l_1 \rightarrow \bar{l}_3) \oplus l_2 \rightarrow$ ali je pragerna, ce je dobri prag in uteni?

$l_1:$

	x_1		
x_2	1	0	1
	1	1	0
			x_3

$l_2:$

	x_1		
x_2	1	0	1
	0	1	0
			x_3

$f_3 \equiv S_{0,2}(x_1, x_2, \bar{x}_3)$

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

$f_3 = \bar{x}_1\bar{x}_2x_3 + x_1x_2x_3 + x_1\bar{x}_2\bar{x}_3 + \bar{x}_1x_2\bar{x}_3$

$l_1 = x_1\bar{x}_3 + x_1\bar{x}_2 + \bar{x}_1x_2x_3$

$l_2 = x_2\bar{x}_3 + \bar{x}_1\bar{x}_3 + x_1\bar{x}_2x_3$

$l_1 \rightarrow \bar{l}_3 = \bar{l}_1 + \bar{l}_3$

$f:$

x_1	x_2	x_3	f	P_0
0	0	0	0	0
0	0	1	1	2
0	1	0	0	1
0	1	1	1	3
1	0	0	0	-1
1	0	1	0	-1
1	1	0	0	0
1	1	1	1	2

① $x_3 > 0$ } $w_3 = 2$
 ② $x_2 > 0$ } $w_2 = 1$
 ③ $x_3 > x_2$ } $w_1 = -1$
 ④ $x_1 < 0$

x_1	x_2	x_3	l_1	l_2	\bar{l}_1	\bar{l}_2	$\bar{l}_1\bar{l}_2$	l_2	f
0	0	0	0	0	1	1	1	1	0
1	0	1	0	1	1	0	1	0	1
2	0	1	0	1	1	0	1	1	0
3	0	1	1	0	0	1	1	0	1
4	1	0	1	1	0	0	0	0	0
5	1	0	1	0	0	1	1	1	0
6	1	1	0	1	0	0	1	1	0
7	1	1	1	0	1	0	1	0	1

$P = P_{\text{min}} \text{ pri } f(x) = 1$

$P > P_{\text{b}} \text{ pri } f(x) = 0$

$P = 2$
$w_1 = -1$
$w_2 = +1$
$w_3 = 2$

19. 04. 2007

popolni odvračalniki dvoeh vrednosti x in y

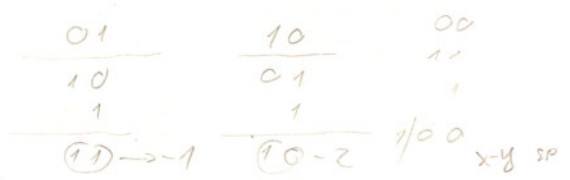
5/2

- a) MIN in NOR
b) MAX in /1

6732
4510

10	11	00	01
-2	-1	0	1

		MIN		MAX	
x	y	do	bo	do	bo
0	0	0	0	0	0
1	0	1	1	B _{inv}	B _{inv}
2	0	1	1	$\overline{B_{inv}}$	1
3	0	1	0	$\overline{B_{inv}}$	0
4	1	0	0	B _{inv}	0
5	1	0	1	B _{inv}	B _{inv}
6	1	1	0	B _{inv}	0
7	1	1	1	B _{inv}	B _{inv}



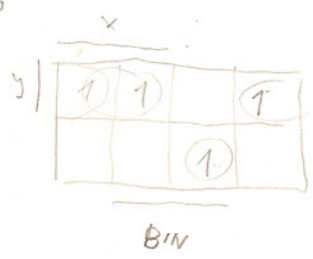
x	y	b	a
0	0	0	0
0	1	1	1
1	0	1	0
1	1	0	0

polovinski

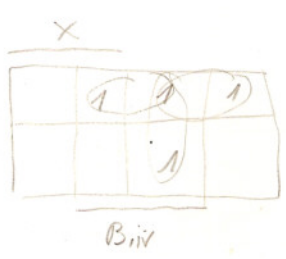
$$do = xy + y\overline{B_{inv}} + \overline{x}y B_{inv}$$

$$bo = yB_{inv} + \overline{x}B_{inv} + \overline{x}y$$

do



bo

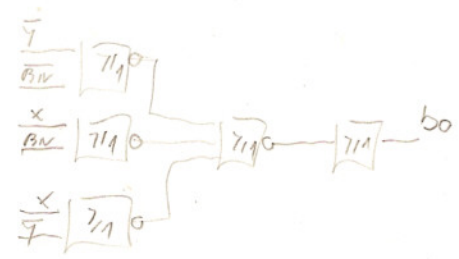
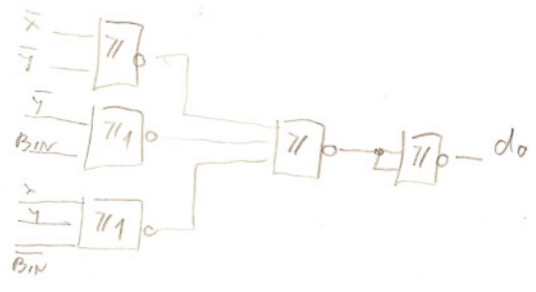
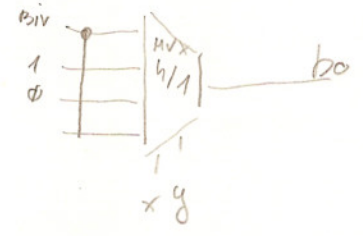
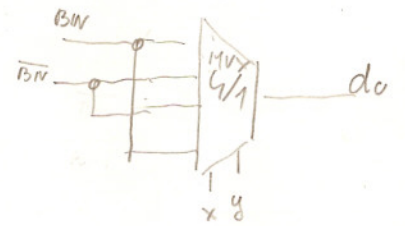


a) **NOR**

MAX

$$do = \overline{\overline{x+y} + \overline{y+B_{inv}} + \overline{x+y+B_{inv}}}$$

$$bo = \overline{\overline{y+B_{inv}} + \overline{x+B_{inv}} + \overline{x+y}}$$



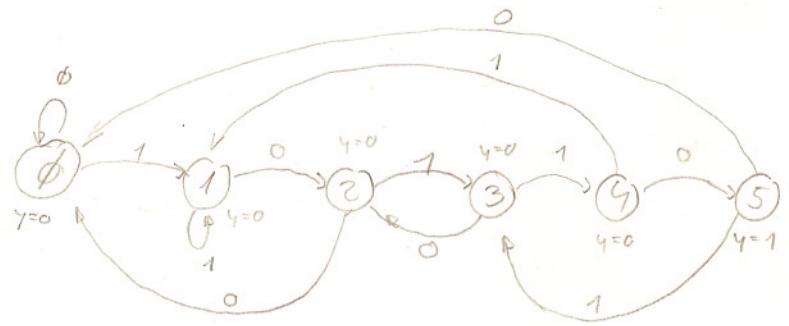
3.) $y=1$ pri sekvenca

10110

1 0 0 0
 0 0 1 1 1 1 0
 1 0 1 0
 1 0 1 1
 1 0 1 1 1
 1 0 1 1 0 1

novi skema

$x = 1011011011010$



A

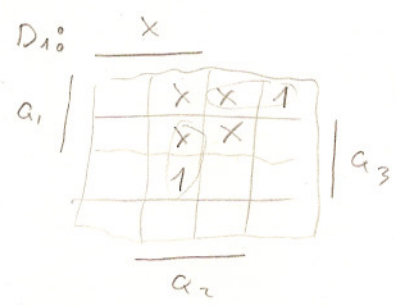
12	14	6	4
13	15	7	5
8	11	3	1
8	10	2	0

B

C

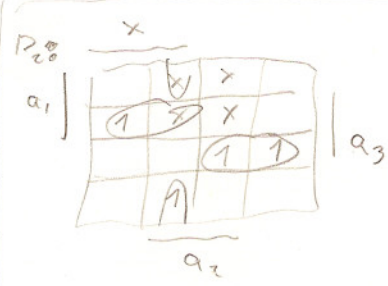
q_1, q_2, q_3	$x=0$	$x=1$	y
000	0	1	0
001	1	1	0
010	2	3	0
011	3	4	0
100	4	1	0
101	5	3	1

h, n, m, D	D
00	0
01	1
10	0
11	1

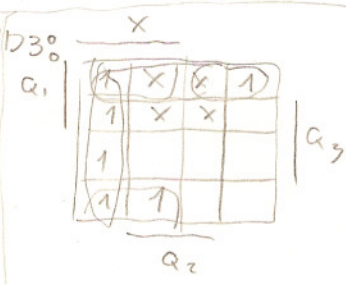


$D_1 = \bar{x} a_1 \bar{a}_3 + x a_2 a_3$

n	h, n, m	D_1	D_2	D_3
0	0000	0	0	0
1	0001	0	1	0
2	0010	0	0	0
3	0011	0	1	0
4	0100	1	0	1
5	0101	0	0	0
6	0110	x	x	x
7	0111	x	x	x
8	1000	0	0	1
9	1001	0	0	1
10	1010	0	1	1
11	1011	1	0	0
12	1100	0	0	1
13	1101	0	1	1
14	1110	x	x	x
15	1111	x	x	x



$D_2 = x a_2 \bar{a}_3 + x a_1 a_3 + \bar{x} \bar{a}_1 a_3$



$D_3 = x \bar{a}_3 + x \bar{a}_2 + a_1 \bar{a}_3$

$x = 1011011011010$
 $y = 00001001100100$

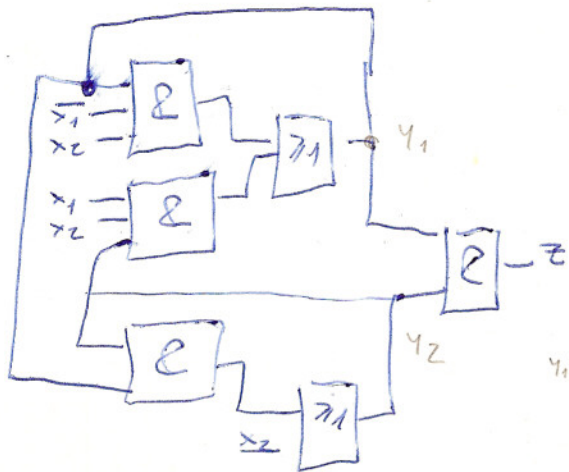
4.

→ enačla na vsakega spremen.

→ STABILNA STANJA

→ RAZŠIREN DIAGRAM PREHATANJA STANJ

→ VZPUJEVALNO TABELO



Y_1

$x_1 x_2$

$y_1 y_2$	00	01	11	10
00	0	0	0	0
01	0	0	1	0
11	0	1	1	0
10	0	1	0	0

Z

$x_1 x_2$

$y_1 y_2$	00	01	11	10
00				
01				
11	1	1	1	1
10				

$Z = g_1 g_2$

$Y_1 = g_1 \bar{x}_1 x_2 + x_1 x_2 g_2$

$Y_2 = g_2 g_1 + x_2$

Y_2

$x_1 x_2$

$y_1 g_2$	00	01	11	10
00	0	1	1	0
01	0	1	1	0
11	1	1	1	1
10	0	1	1	0

		$x_1 x_2$			
	$y_1 g_2$	00	01	11	10
A	00	00	01	01	00
B	01	00	01	11	00
C	11	01	11	11	01
D	10	00	11	01	00

		$x_1 x_2$			
		00	01	11	10
A	A	B	B	A	
B	A	B	C	A	
C	B	C	C	B	
D	A	C	B	A	

založba stanj

operativna tabela

x_1	x_2	y_1	y_2	Y_1	Y_2	Z
0	0	0	0	0	0	0
0	0	0	1	0	0	0
0	0	1	0	0	0	0
0	0	1	1	0	1	0
0	1	0	0	0	1	0
0	1	0	1	0	1	0
0	1	1	0	1	1	1
0	1	1	1	1	1	1
1	0	0	0	0	0	0
1	0	0	1	0	0	0
1	0	1	0	0	0	0
1	0	1	1	0	1	1
1	1	0	0	0	1	0
1	1	0	1	1	1	1
1	1	1	0	0	1	0
1	1	1	1	1	1	1

razširjen diagram

