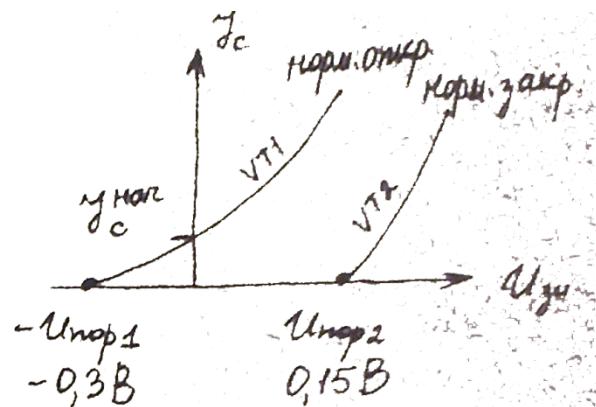


# Транзисторы на AsGa

(Полевые)

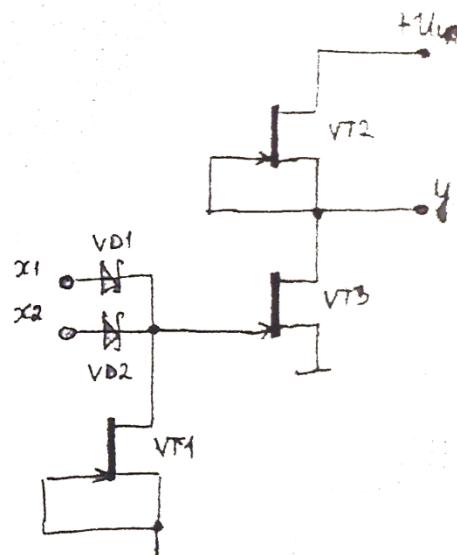
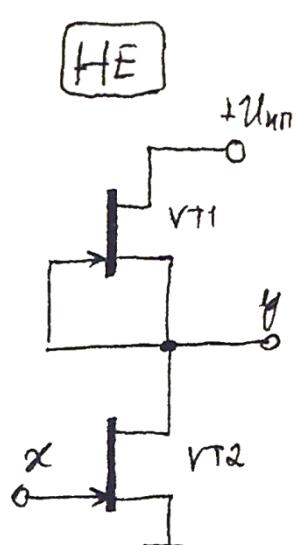
Сведения:



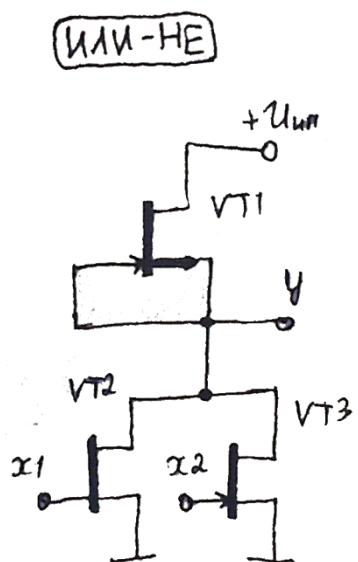
$$U^0 = 0,05 В$$

$$U^1 = 0,6 В$$

$$U_{ннр} = 1,5 В$$



И-НЕ



## Транзисторы и диоды шотки:

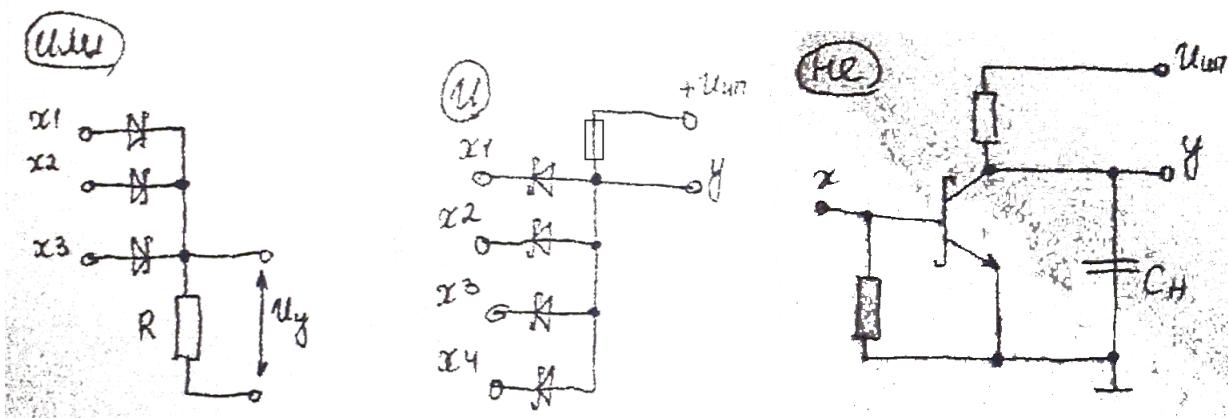
$$\begin{aligned} \text{(Берен 91)} \quad M^0 &= 0 \sim 0,5 B \\ \text{(Берен 3,4)} \quad M^1 &= 2,4 \sim 5 B \\ \text{Числ} &= 5 B \end{aligned}$$

$$U_{\text{ref}} = 0.25$$

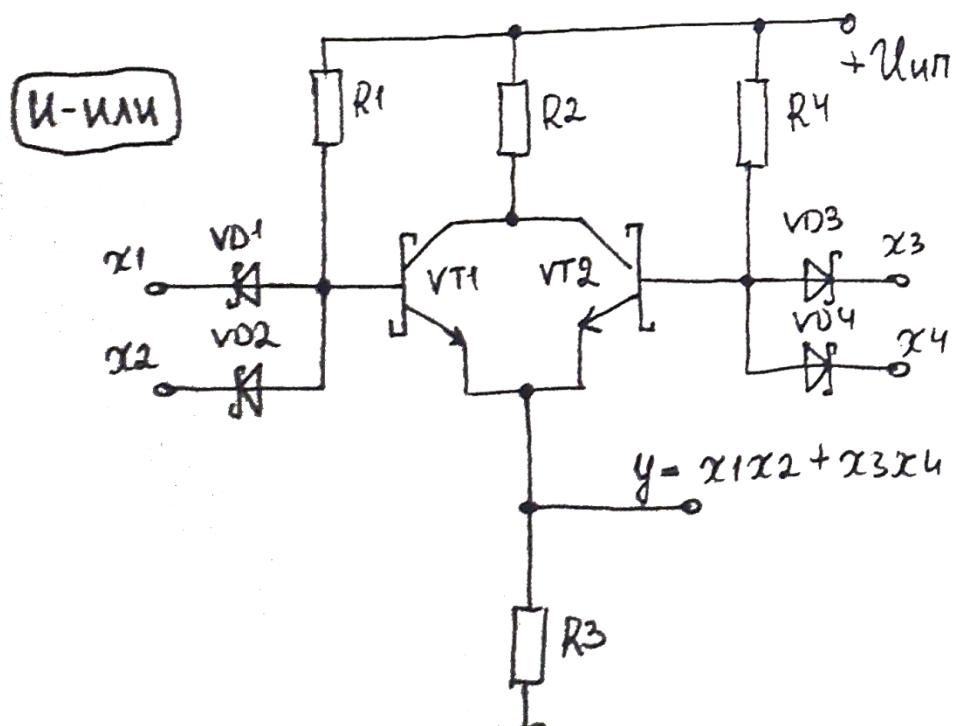
$$U_{\text{res}} = 0.4 B$$

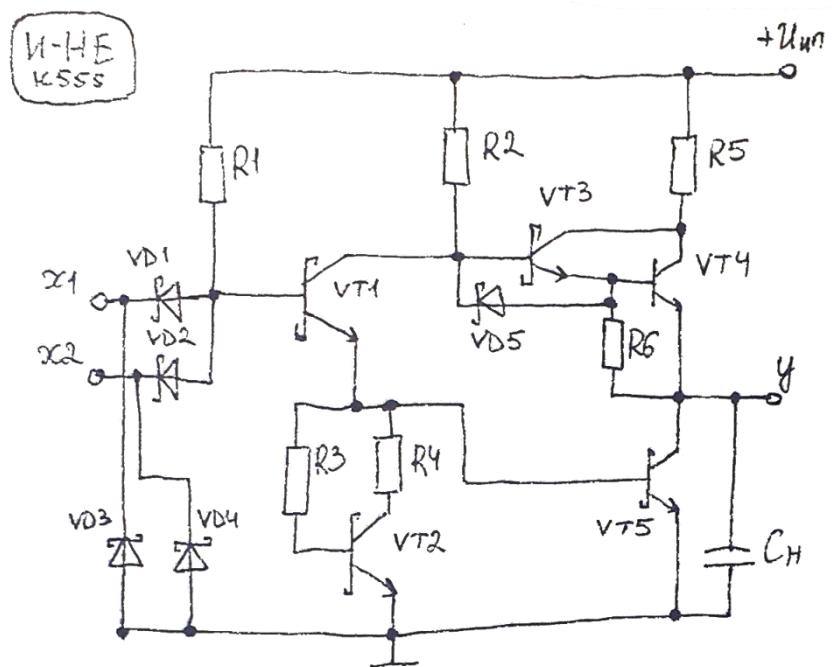
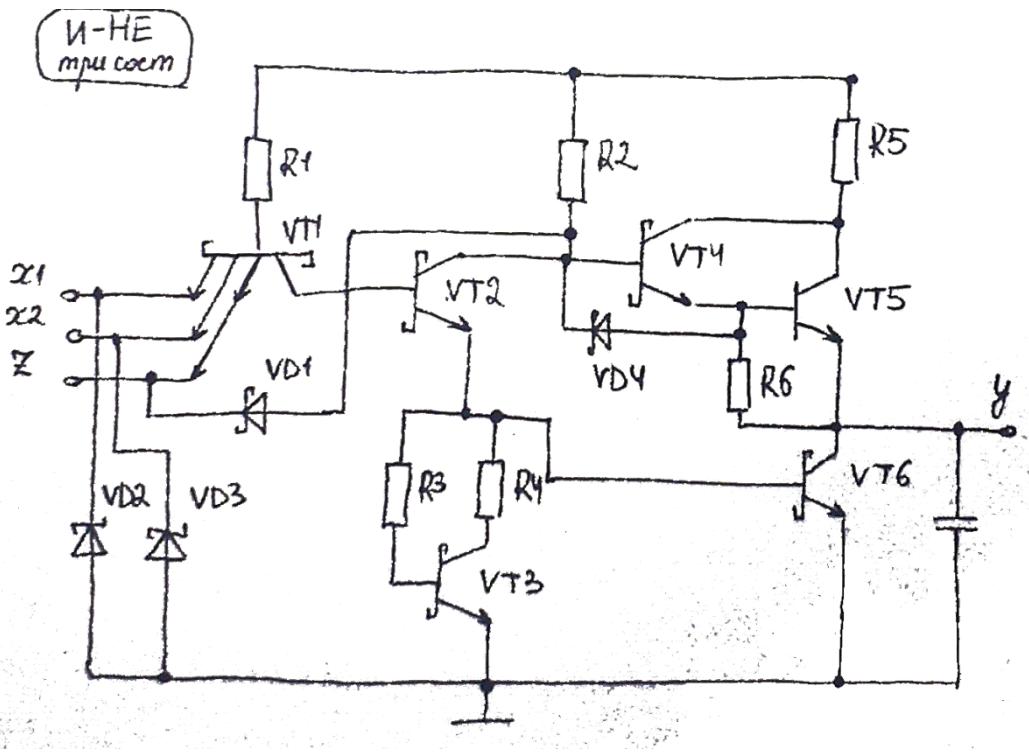
$$U_{pn} = 0,6 \text{ B}$$

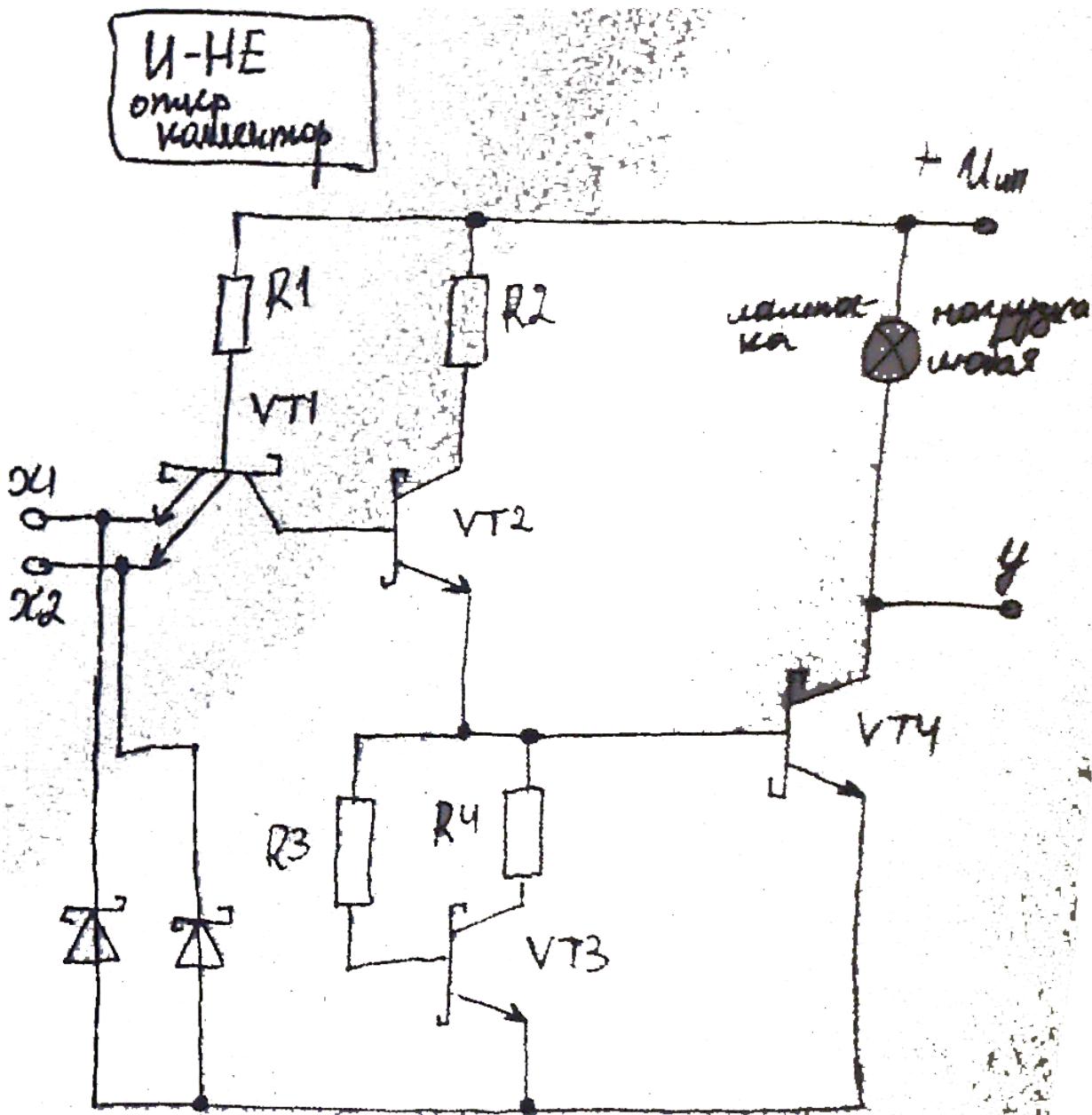
$$\frac{V7 \text{ монет}}{\text{Упаковка - 3 монет}} = 0,8 B$$



## И-ИЛИ







Интегрально-инжекционная логика

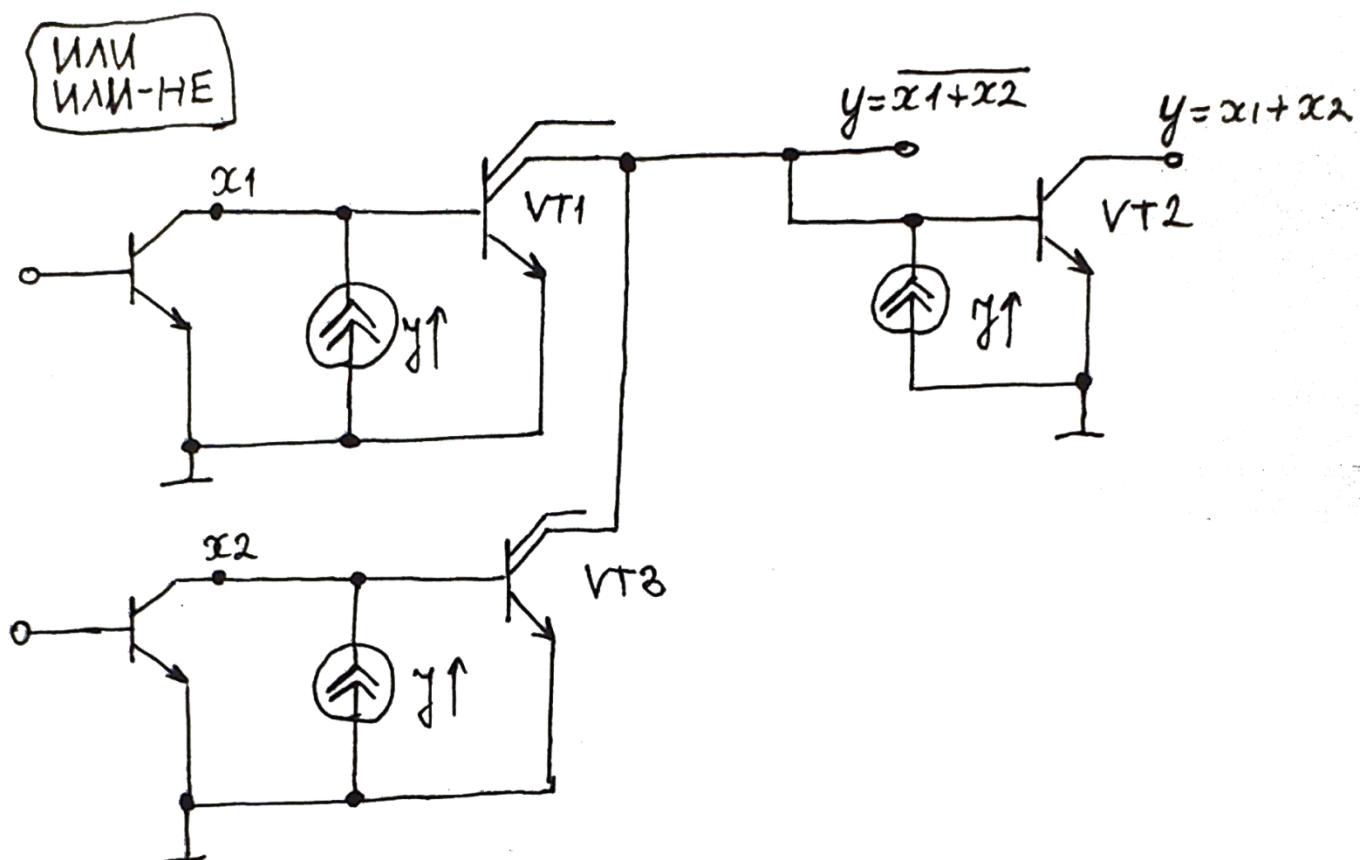
$$U_{\text{ип}} = 0,9 \sim 1,5 \text{ В}$$

$$U^1 = 0,75 \text{ В}$$

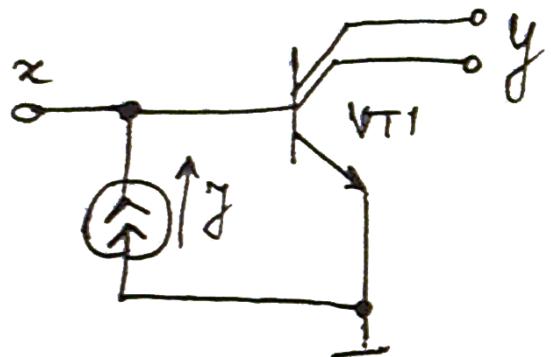
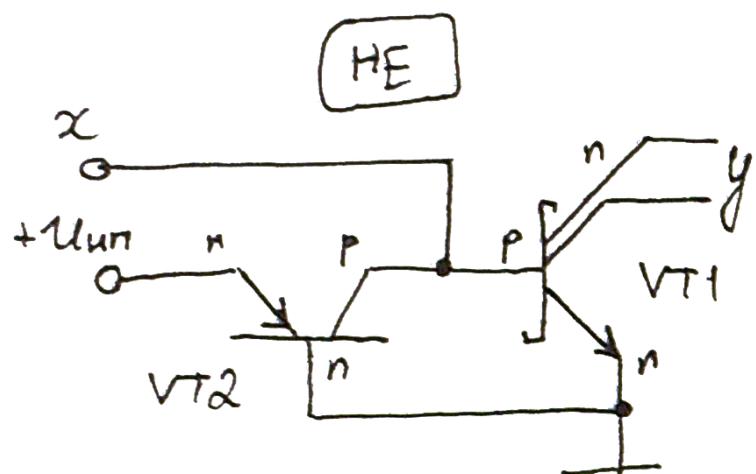
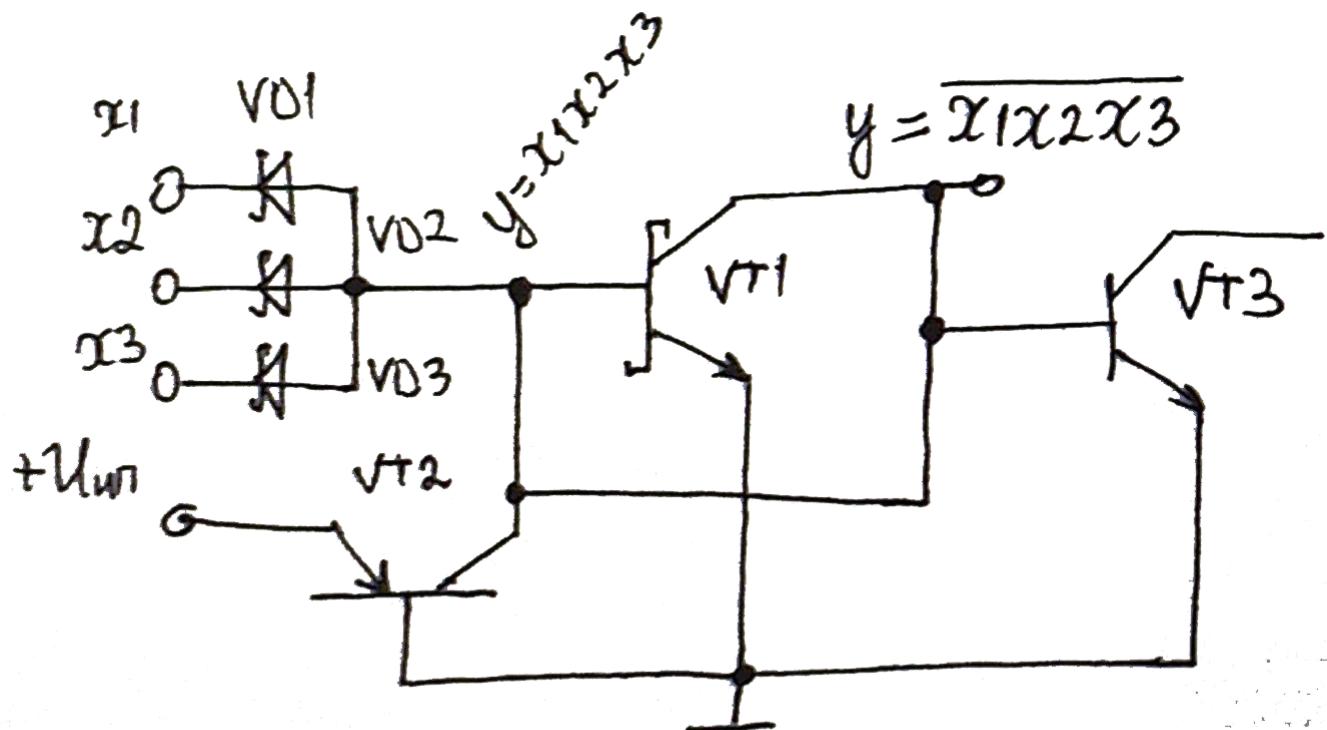
$$U^0 = 0,05 \text{ В}$$

$$U_{VT}^{\text{пор}} = 0,6 \text{ В}$$

$$U_{VT}^{\text{нпор}} = 0,05 \text{ В}$$



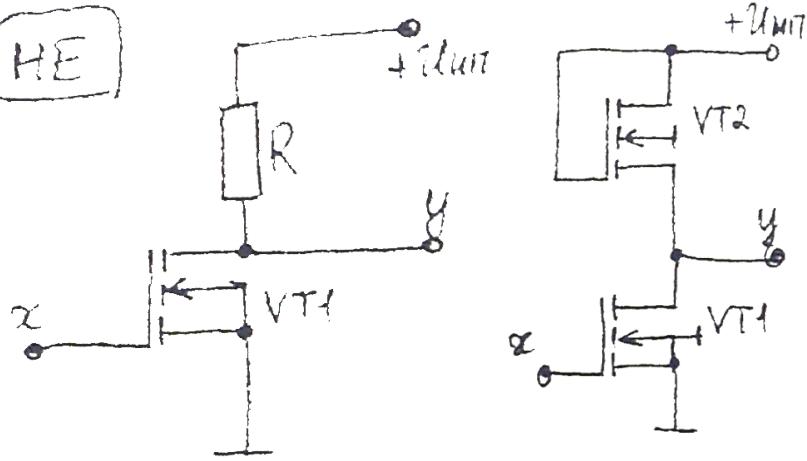
И-НЕ



$$\text{МДП } U^1=5 \text{ } U^0=0 \text{ } U_{\text{зи пор}}=0$$

НЕ

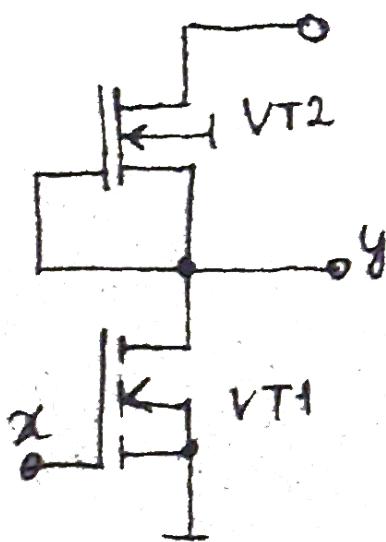
НЕ



линейная

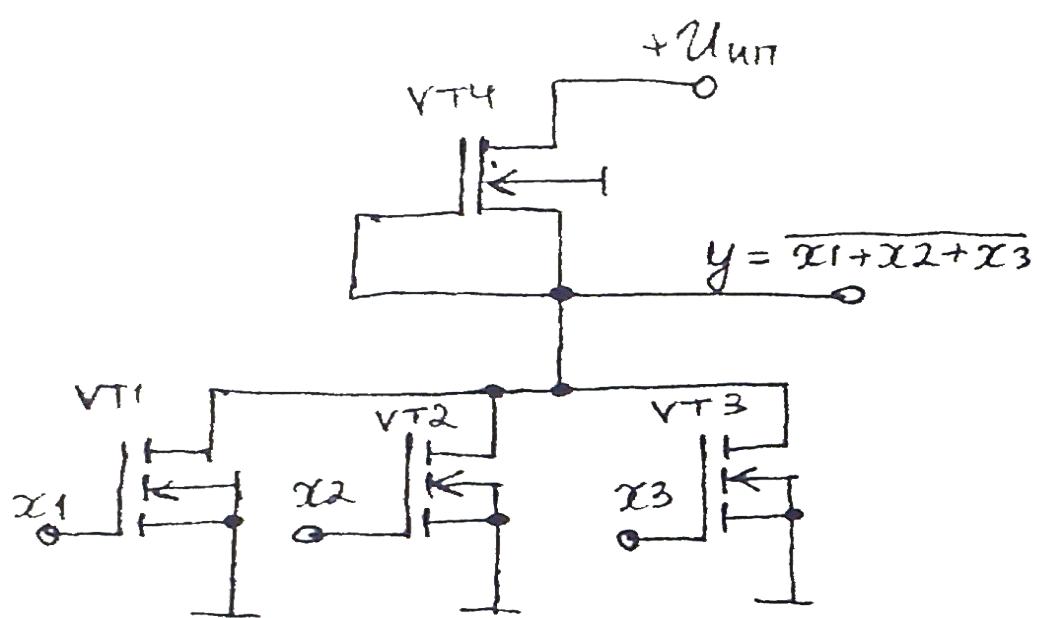
нелин

$+U_{\text{ИП}}$



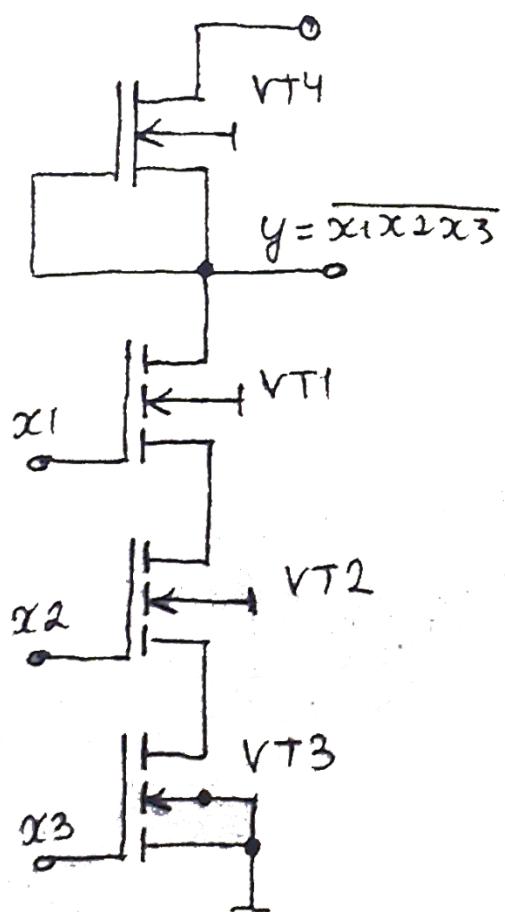
токостабилизирующая

$+U_{\text{ИП}}$

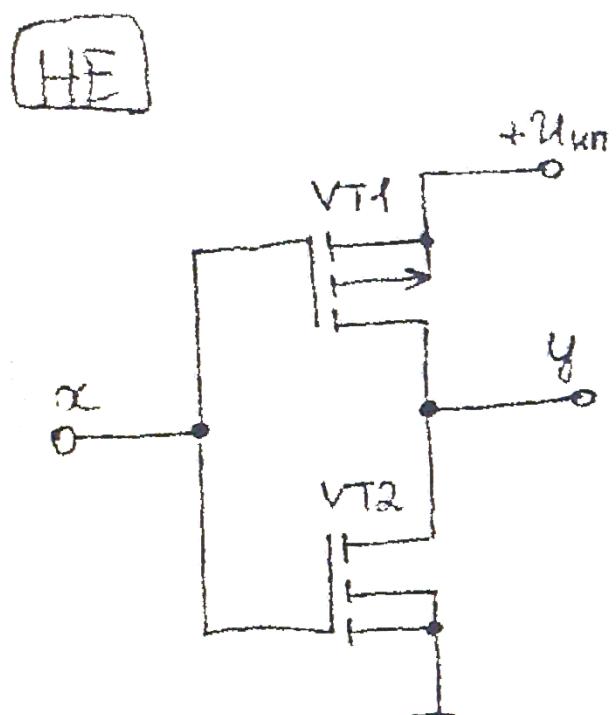
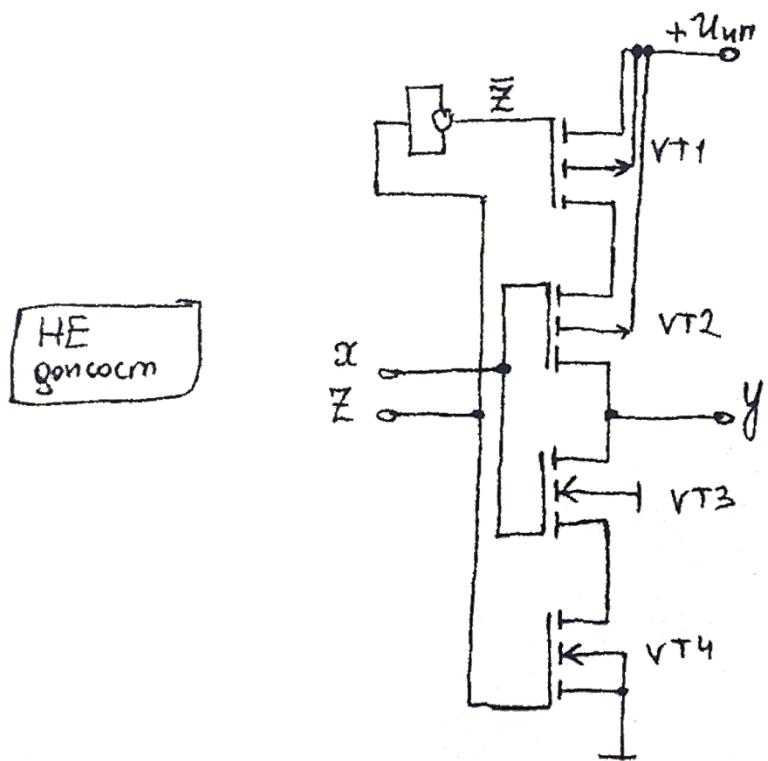


ИЛИ-НЕ

U-HE

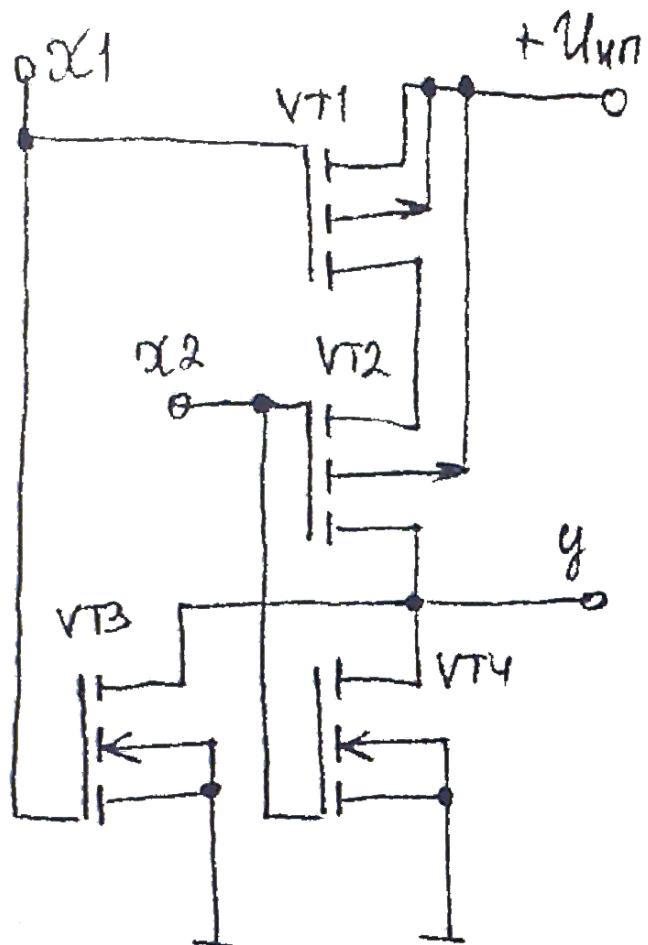
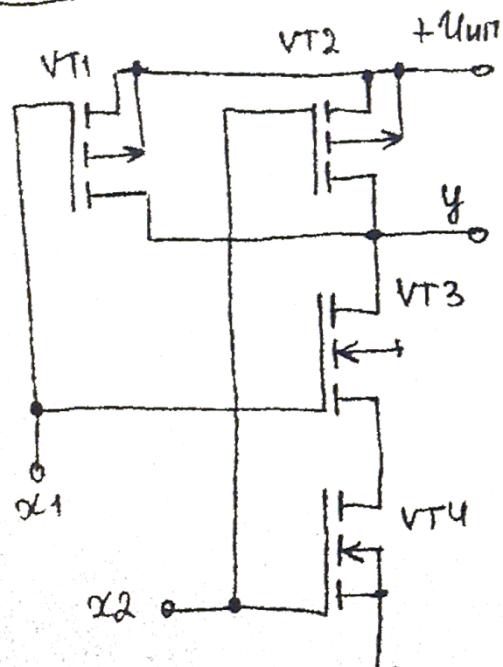


## КМДП



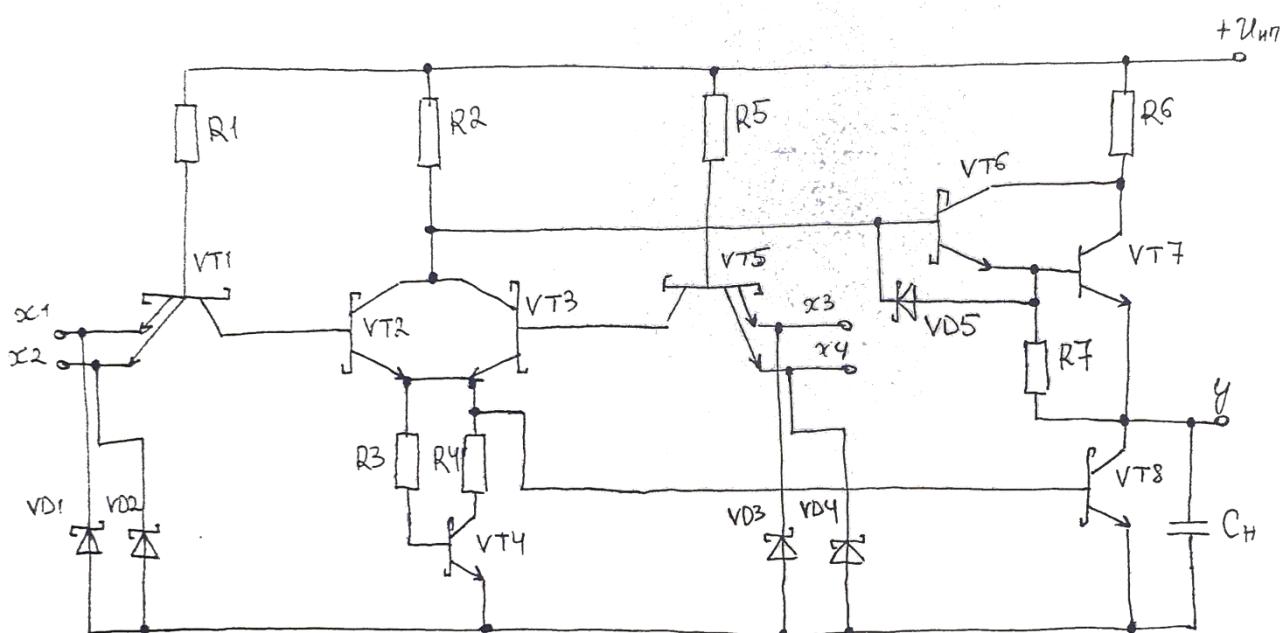
(ИЛИ-НЕ)

И-НЕ



ТТЛШ И-ИЛИ-НЕ

$$y = \overline{x_1x_2 + x_3x_4}$$



## ЭСЛ ИЛИ-НЕ

(ESL)

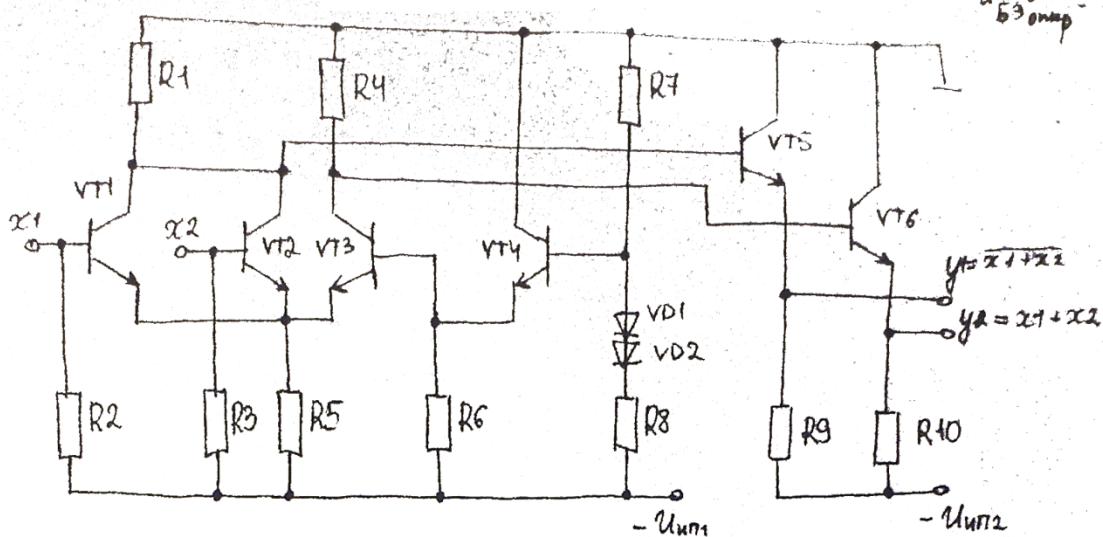
$$U_{ИП1} = -5V$$

$$U_{ИП2} = -2V$$

$$U^1 = -0.9V$$

$$U^0 = -1.7V$$

$$U_{011} = -1.3V$$



$$U_{C3}^{max} = -0.75V$$

$$U_{VT5-6}^{max} = -0.8V$$

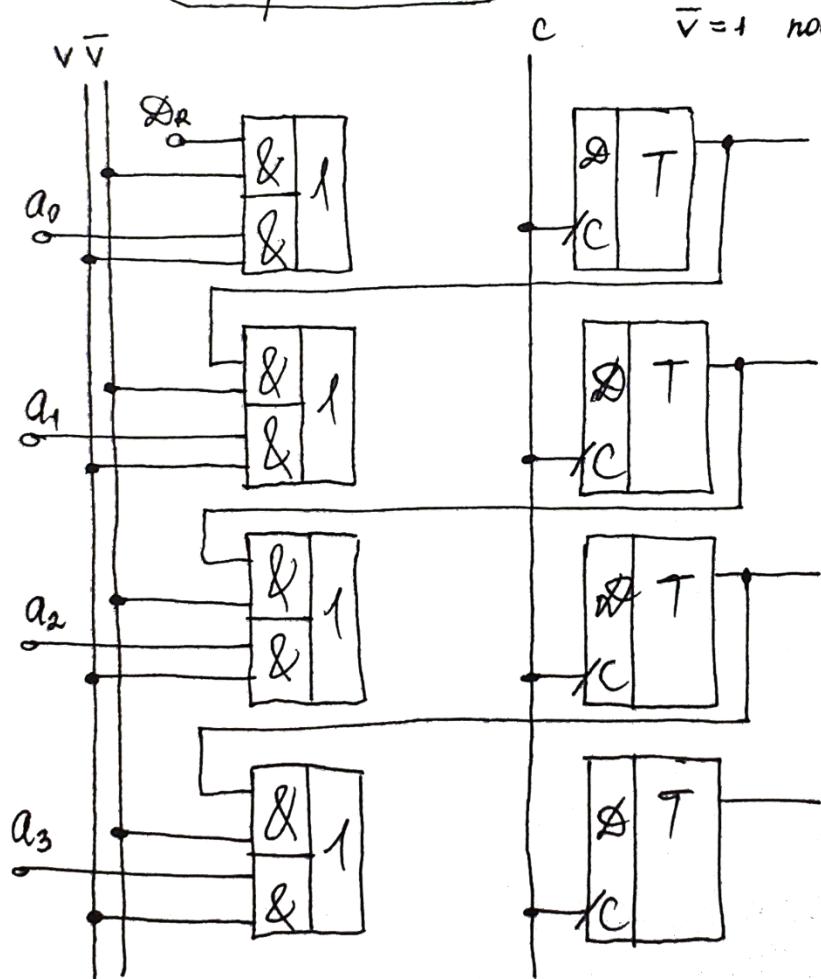
$$y_1 = \overline{x_1 + x_2}$$

$$y_2 = x_1 + x_2$$

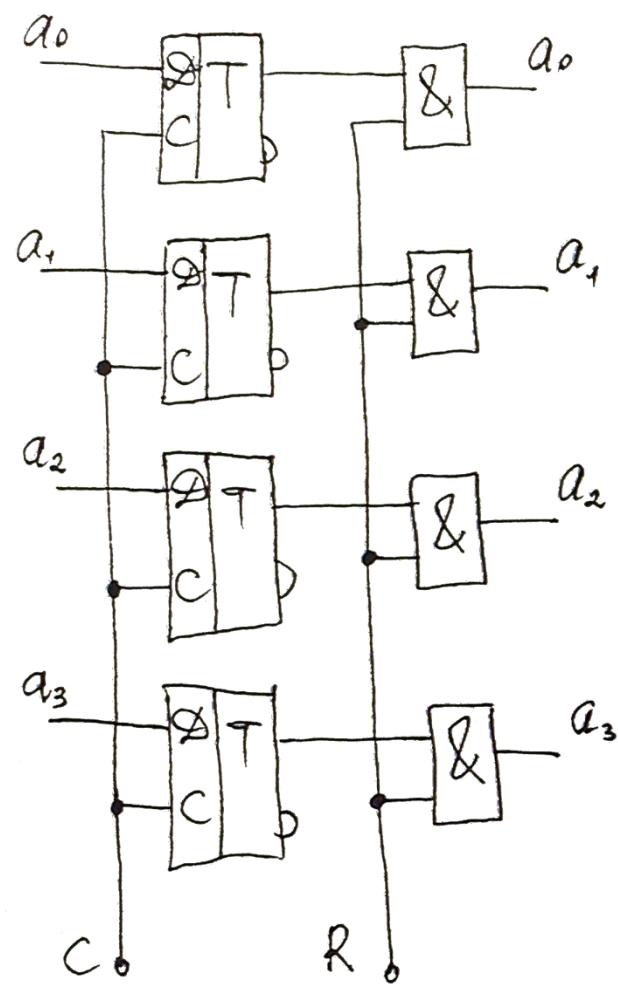
## Регистры

(Реверсивный)

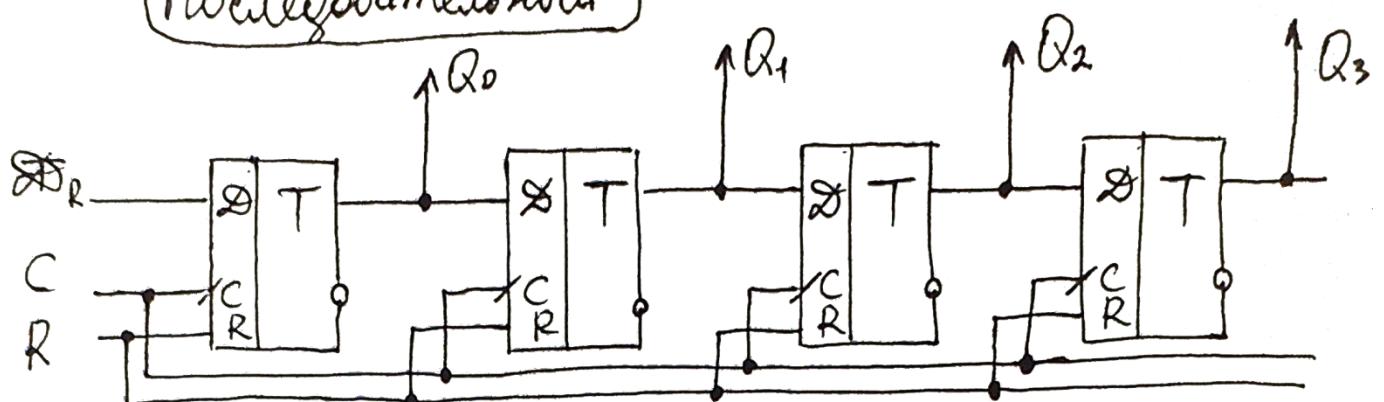
$V=1$  паралл. прием.  
 $\bar{V}=1$  послед. прием.



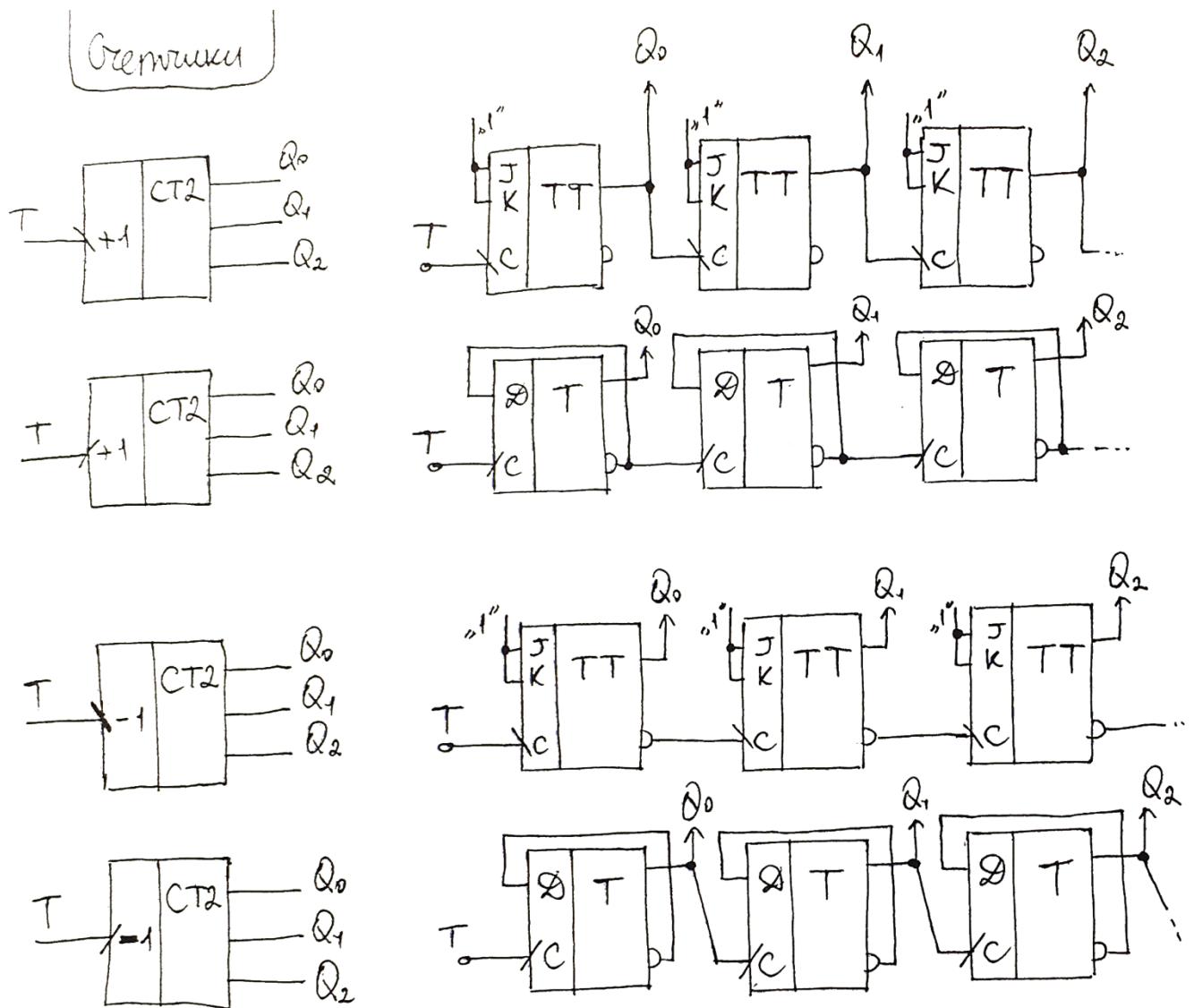
Параллельной



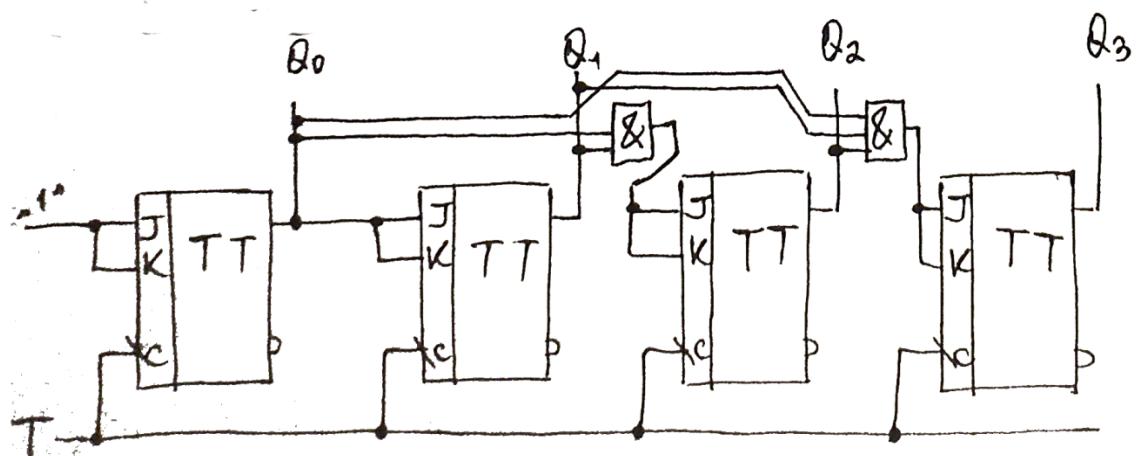
Последовательной



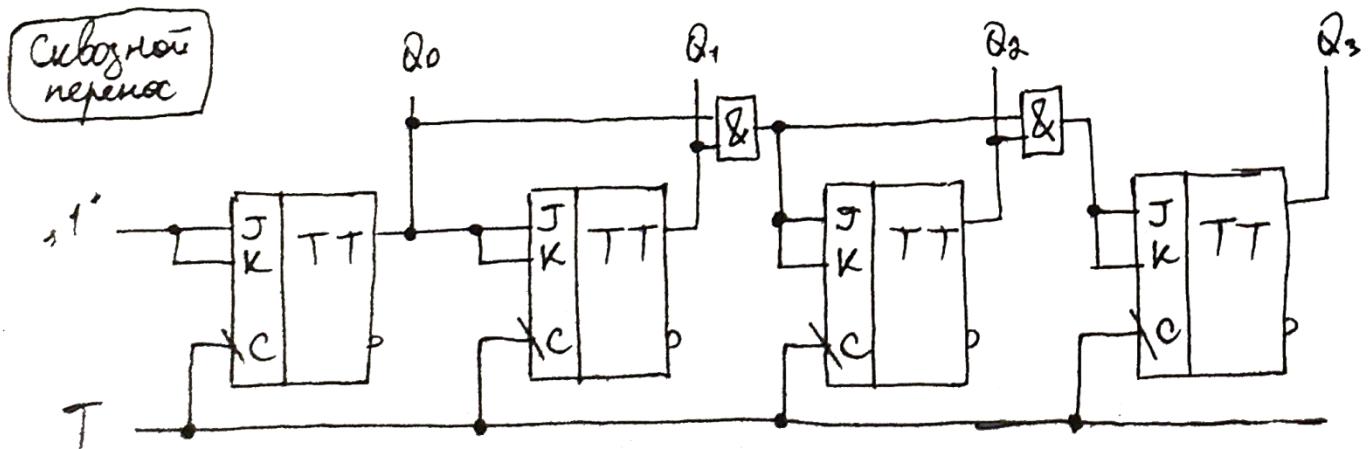
## Счетчики

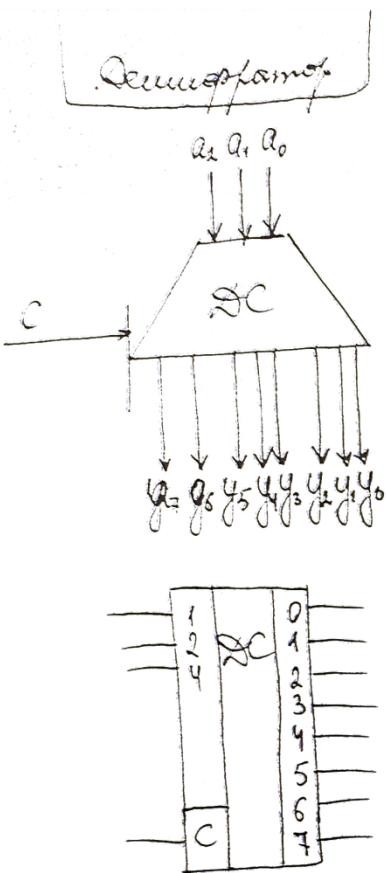


## Параллельный перенос



## Сквозной перенос





$$y_0 = \bar{a}_0 \bar{a}_1 \bar{a}_2$$

$$y_1 = a_0 \bar{a}_1 \bar{a}_2$$

$$y_2 = \bar{a}_0 a_1 \bar{a}_2$$

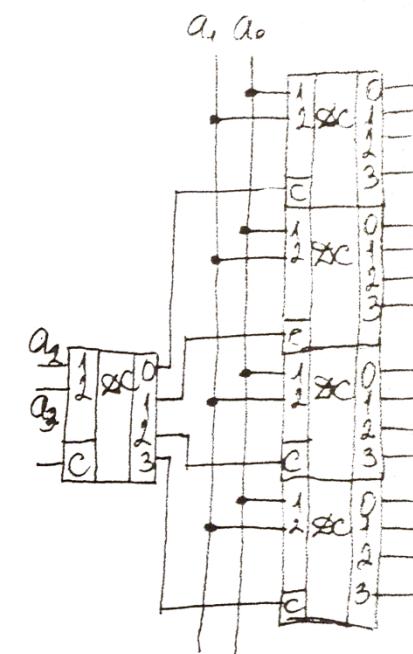
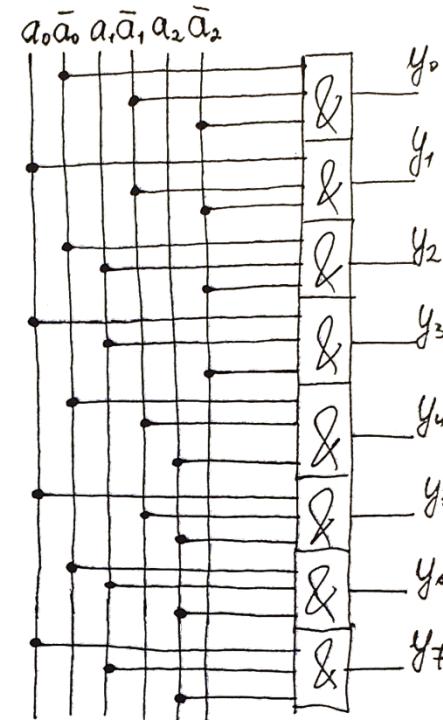
$$y_3 = a_0 a_1 \bar{a}_2$$

$$y_4 = \bar{a}_0 \bar{a}_1 a_2$$

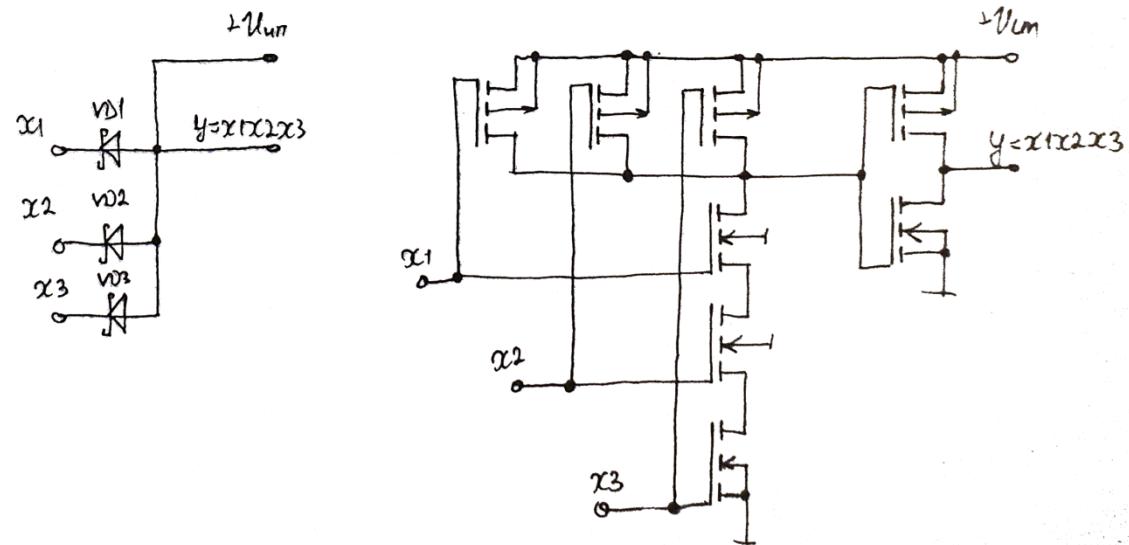
$$y_5 = a_0 \bar{a}_1 a_2$$

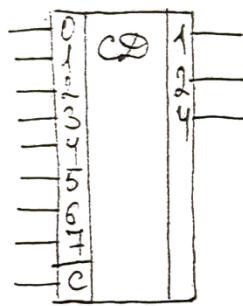
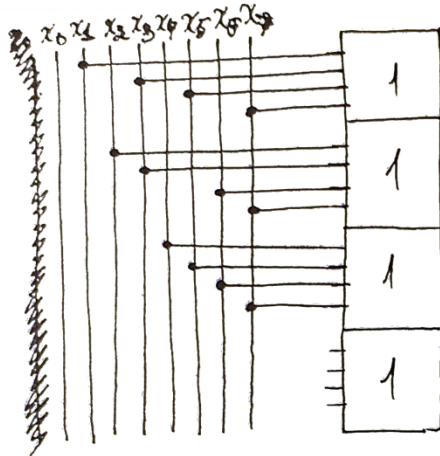
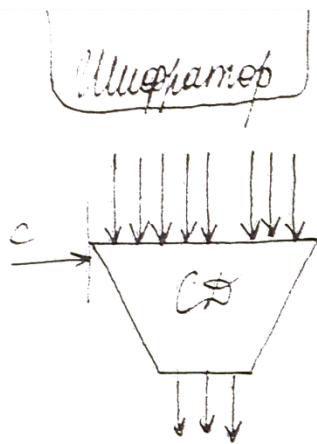
$$y_6 = \bar{a}_0 a_1 a_2$$

$$y_7 = a_0 a_1 a_2$$



$a_2, a_1, a_0$	$y_0$	$y_1$	$y_2$	$y_3$	$y_4$	$y_5$	$y_6$	$y_7$
000	1							
001		1						
010			1					
011				1				
100					1			
101						1		
110							1	
111								1



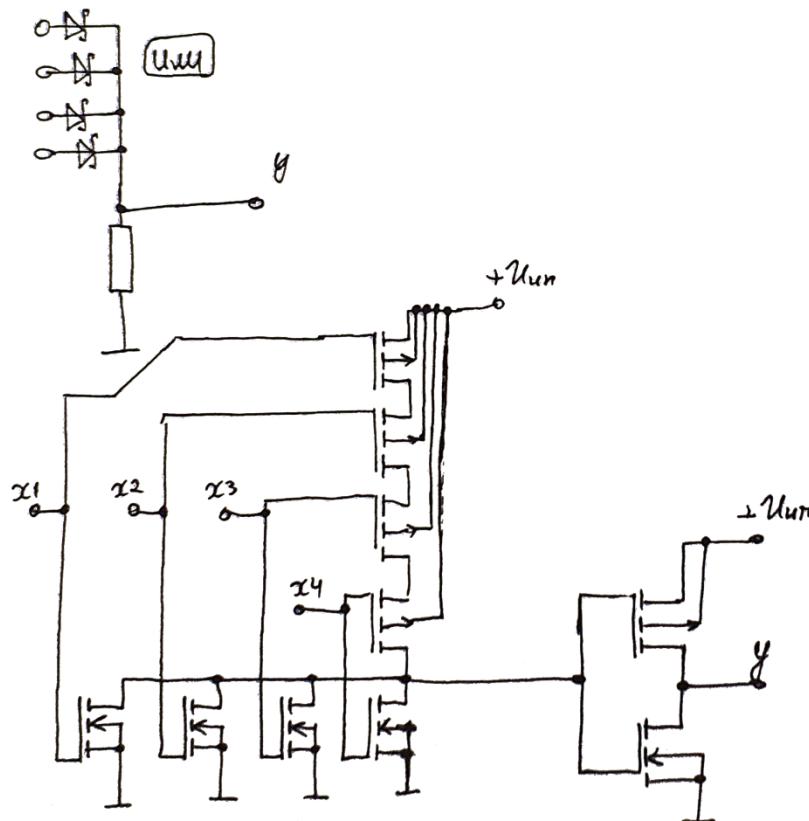


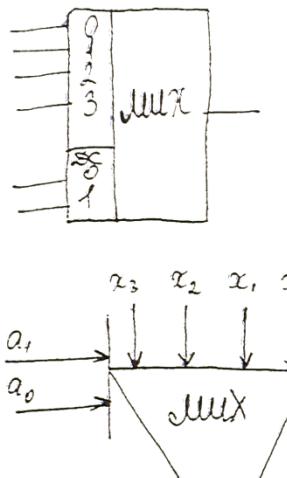
$x_i$	$a_2$	$a_1$	$a_0$
0	0	0	0
1	0	0	1
2	0	1	0
3	0	1	1
4	1	0	0
5	1	0	1
6	1	1	0
7	1	1	1

$$a_0 = (x_1 + x_3 + x_5 + x_7)$$

$$a_1 = (x_2 + x_3 + x_6 + x_7)$$

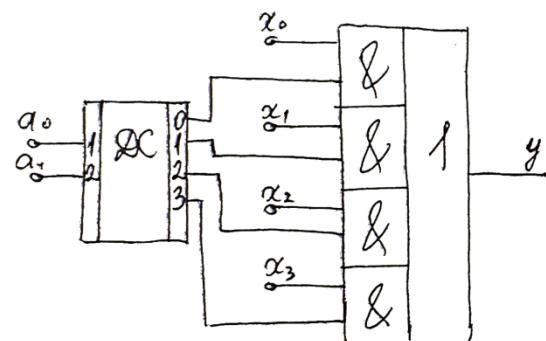
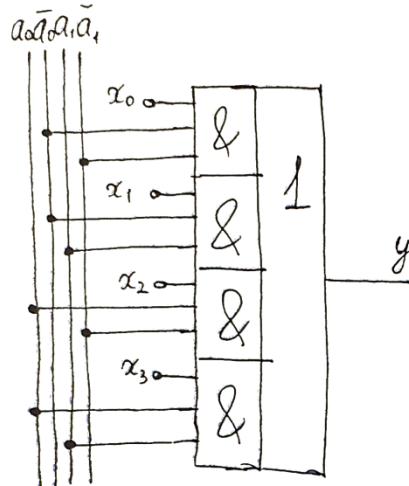
$$a_2 = (x_4 + x_5 + x_6 + x_7)$$





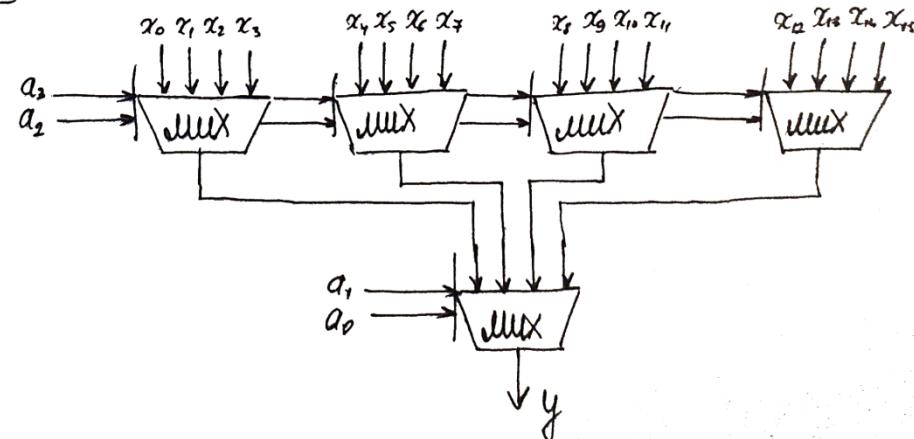
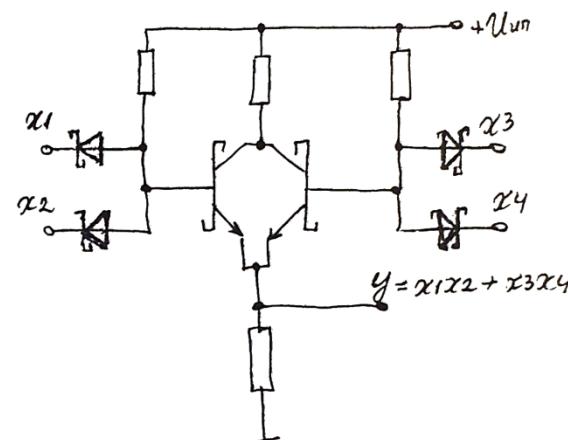
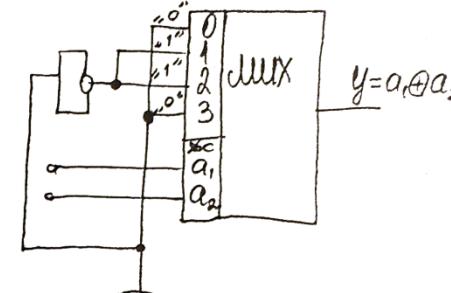
$a_0\bar{a}_1$	$y$
00	$x_0$
01	$x_1$
10	$x_2$
11	$x_3$

$$y = \bar{a}_0\bar{a}_1 x_0 + \bar{a}_0a_1 x_1 + \\ + a_0\bar{a}_1 x_2 + a_0a_1 x_3$$

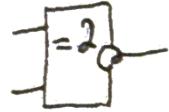


$$y = a_1 \oplus a_2$$

$a_1 a_2$	$y$
00	0
01	1
10	1
11	0



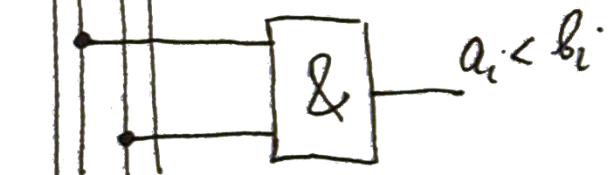
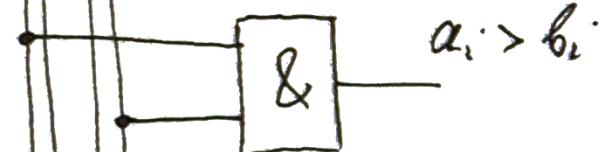
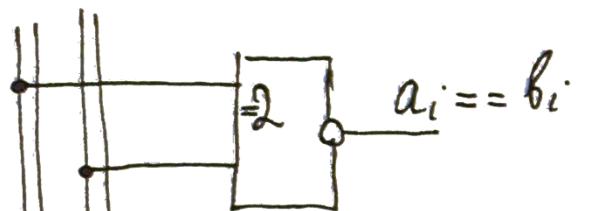
Конкурент



$$y(a_i = b_i) = \overline{a_i \oplus b_i}$$

$$y(a_i > b_i) = a_i \bar{b}_i$$

$$y(a_i < b_i) = \bar{a}_i b_i$$



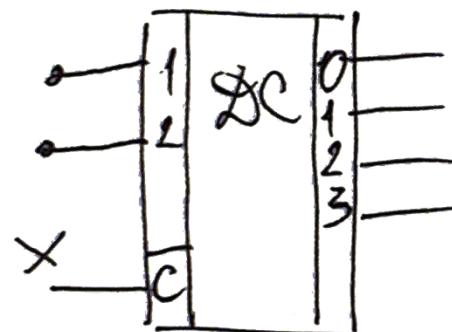
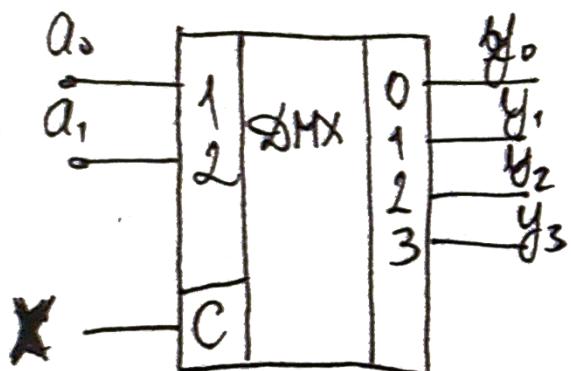
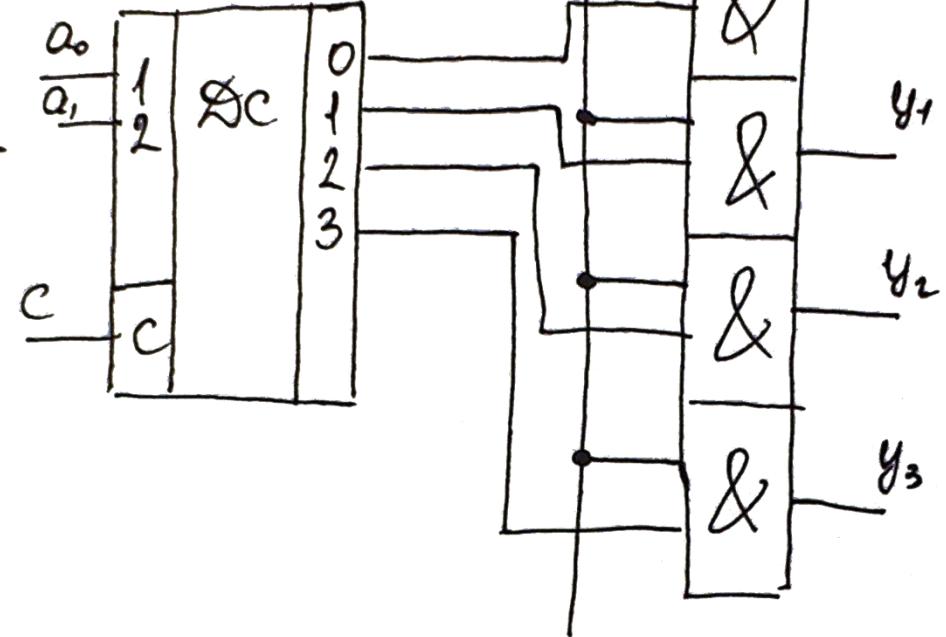
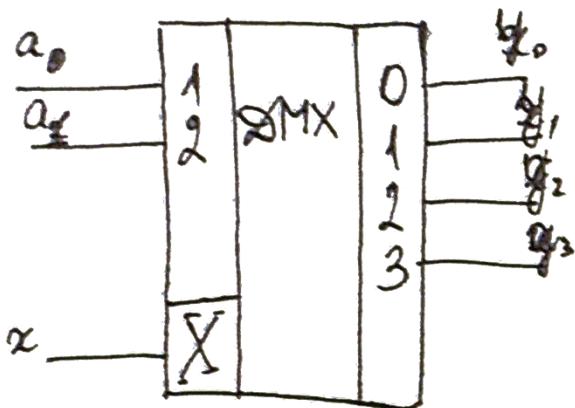
$$a_i \bar{a}_i \bar{b}_i \bar{b}_i$$

УГО

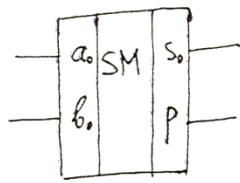
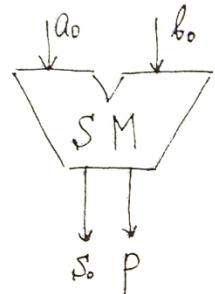
K555CM2

$a_0$	0	=	
$a_1$	1	=	
$a_2$	2	=	
$a_3$	3	=	
	$\bar{a} > \bar{b}$	$\bar{a} < \bar{b}$	$\bar{a} = \bar{b}$
	$\bar{a} > b$	$\bar{a} < b$	$\bar{a} = b$
$b_0$	0		
$b_1$	1		
$b_2$	2		
$b_3$	3		

Демультиплексор



Файлът (1)  
съмнения

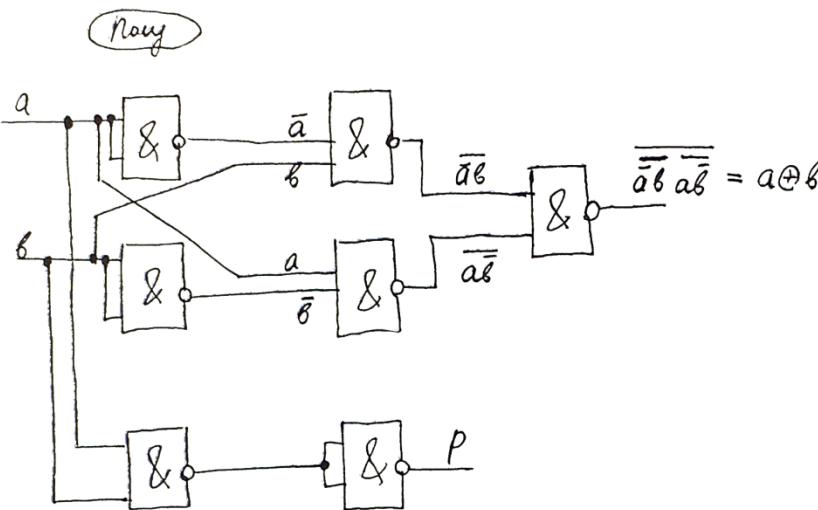


$a_0 \ b_0$	$s_0 \ p$
00	00
01	10
10	10
11	01

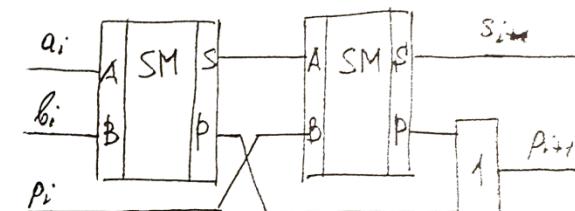
$$s_0 = a_0 \oplus b_0 = \bar{a}b + a\bar{b}$$

$$p = a_0 b_0$$

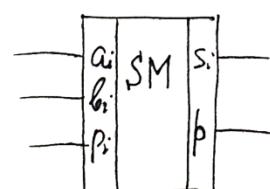
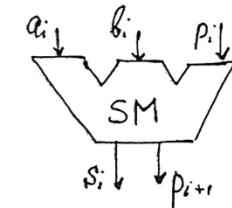
Нагъл



Поминък



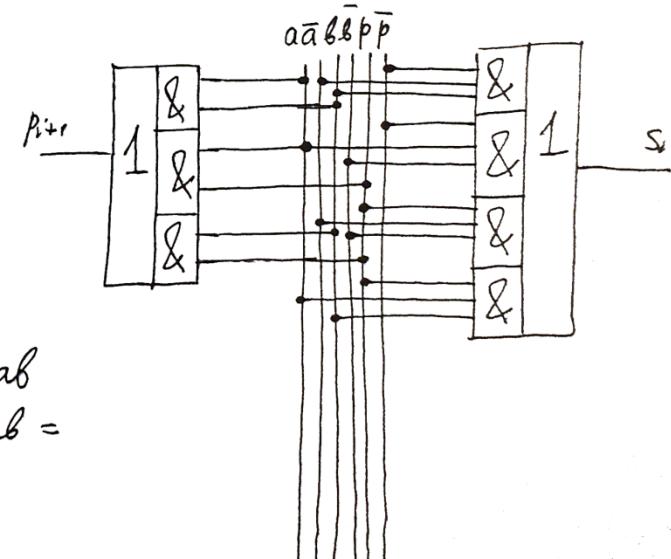
Поминък



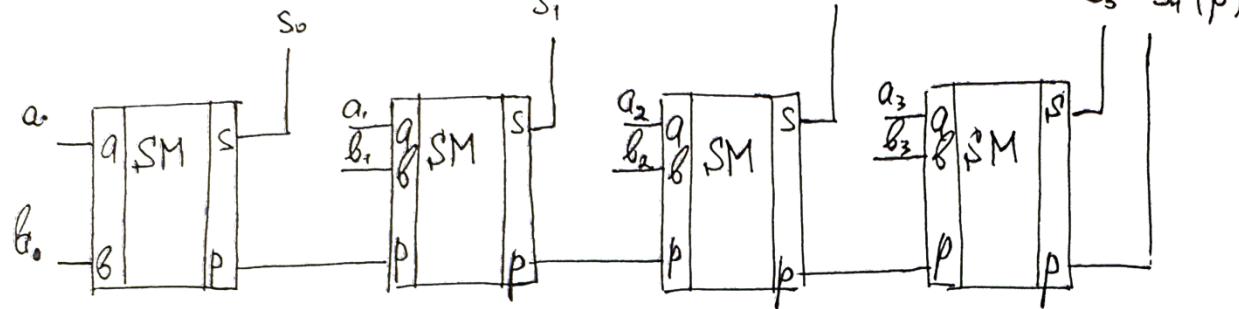
$p_i \ a_i \ b_i$	$s_i \ p_{i+1}$
000	00
001	10
010	10
011	01
100	10
101	01
110	01
111	11

$$s_i = \bar{p}_i \bar{a}_i \bar{b}_i + \bar{p}_i \bar{a}_i b_i + \bar{p}_i a_i \bar{b}_i + p_i a_i b_i$$

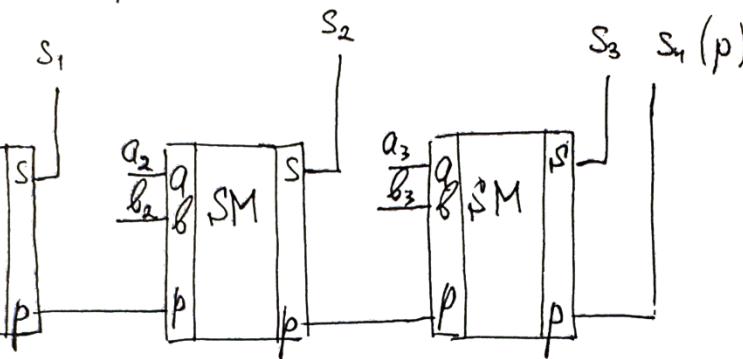
$$p_i = \bar{p}_i \bar{a}_i \bar{b}_i + \bar{p}_i \bar{a}_i b_i + \bar{p}_i a_i \bar{b}_i + p_i a_i b_i = a_i b_i + p_i \bar{a}_i + p_i \bar{b}_i$$



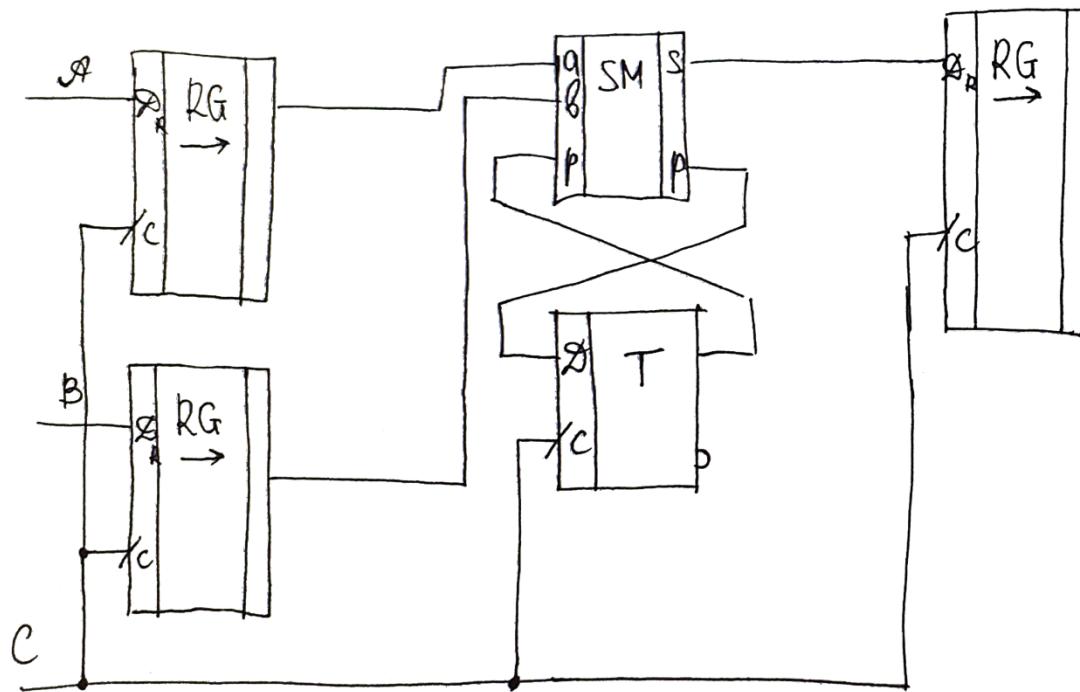
Довр. синх.  
импульсный



Ночн. reference



Ночн. генератор



034

