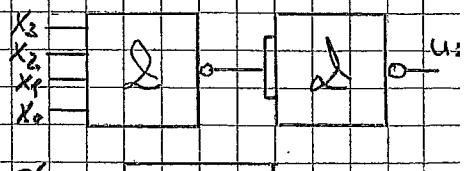
DIGITÁLNÍ ELEKTRONIKA 2010-03-18

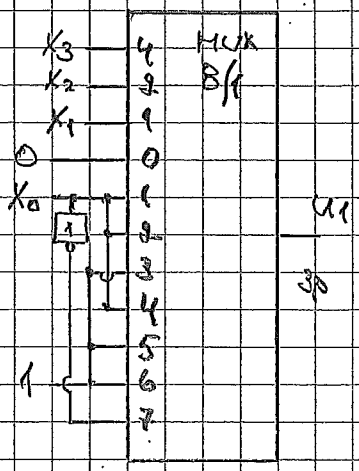
1.

X_3	X_2	X_1	X_0	U_2	U_1	U_0	MUX
0	0	0	0	0	0	0	0
0	0	0	1	0	0	1	
0	0	1	0	0	0	1	X_0
0	0	1	1	0	1	0	
0	1	0	0	0	0	1	X_0
0	1	0	1	0	1	0	
0	1	1	0	0	1	0	1
0	1	1	1	0	1	1	
1	0	0	0	0	0	1	X_0
1	0	0	1	0	1	0	
1	0	1	0	0	1	0	1
1	0	1	1	0	1	1	
1	1	0	0	0	1	0	1
1	1	0	1	0	1	1	
1	1	1	0	0	1	1	X_0'
1	1	1	1	1	0	0	

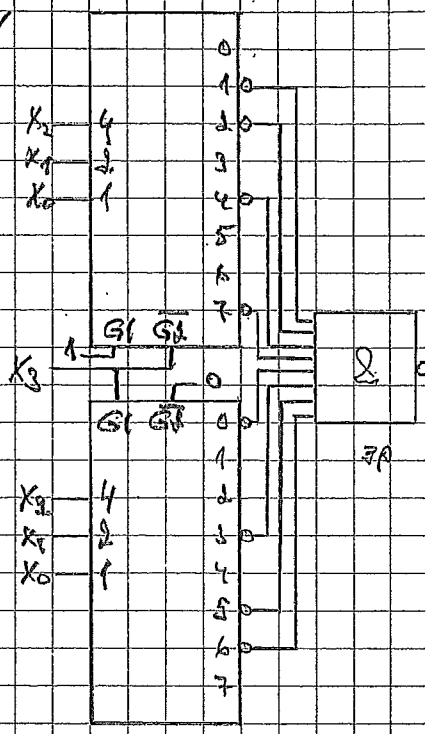
a) $U_2 = X_3 \cdot X_2 \cdot X_1 \cdot X_0$



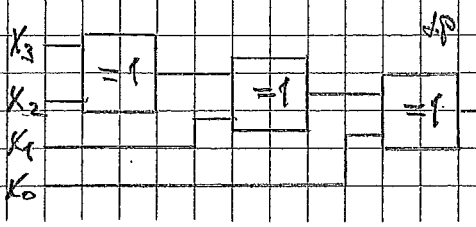
b)



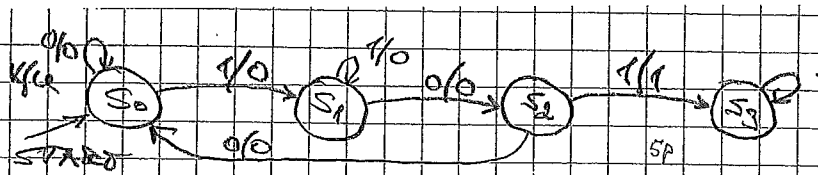
c)



d) $U_0 = X_3 \oplus X_2 \oplus X_1 \oplus X_0$



2.



q_1 q_0	X=0	X=1	U
S_0 0 0	00	01	0
S_1 0 1	10	01	0
S_2 1 1	11	11	1
S_3 1 0	00	11	0

$q_1^+ q_0^+$

$q_1 q_0$ \ X	0	1
00	0	0
01	1	0
11	1	1
10	0	1

q_1^+

q_1 \ X	0	1
0	0	1
0	1	
1	1	
0	1	

q_0^+

$$\begin{cases} q_1^+ = q_0 \cdot X' + q_1 \cdot X \\ q_0^+ = X + q_1 \cdot q_0 \end{cases}$$

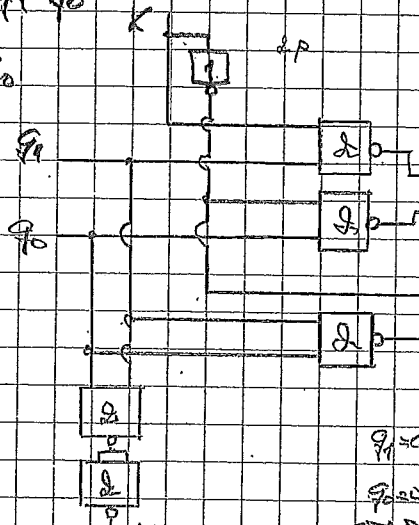
$U = q_1 \cdot q_0$

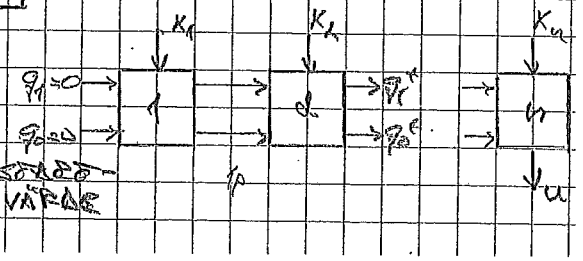
CELL 1: $q_1 = q_0 = 0 \Rightarrow$

$$\begin{cases} q_1^+ = 0 \\ q_0^+ = X \end{cases}$$

CELL 0: $q_1^+ = q_0 \cdot X'$

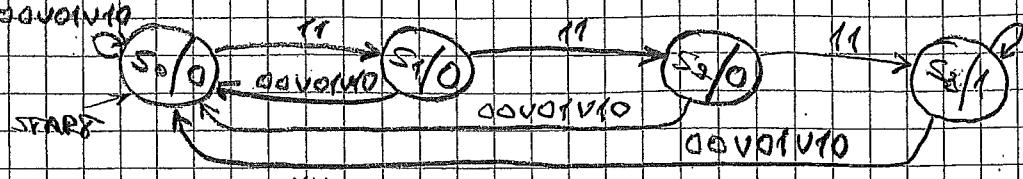
4p $q_0^+ = X$





MARS-10

3.



q_1q_0	xy 00	01	11	10	U
S_0 00	00	00	01	00	0
S_1 01	00	00	10	00	0
S_3 11	00	00	11	00	1
S_2 10	00	00	11	00	0

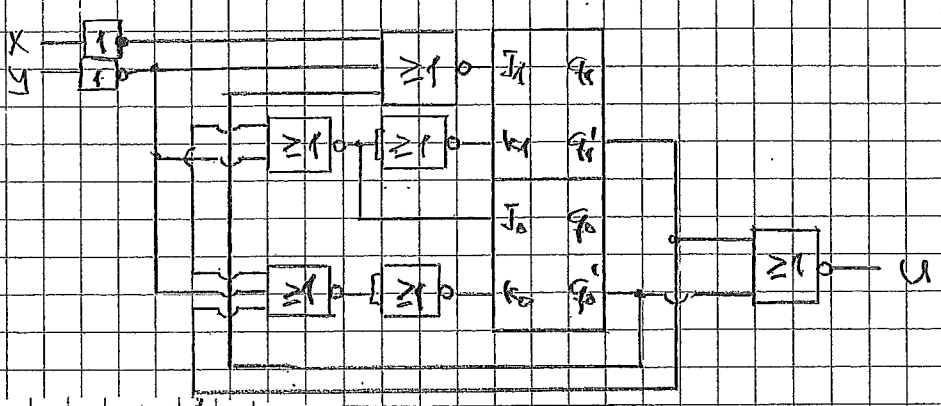
q_1	q_0	x	y	q_1^+	J_1	K_1	q_0^+	J_0	K_0
0	0	0	0	0	0	-	0	0	-
0	0	0	1	0	0	-	0	0	-
0	0	1	0	0	0	-	1	1	-
0	0	1	1	0	0	-	1	1	-
0	1	0	0	0	0	-	0	0	-
0	1	0	1	0	0	-	0	0	-
0	1	1	0	1	1	-	0	0	-
0	1	1	1	1	1	-	0	0	-
1	0	0	0	1	-	0	1	-	0
1	0	0	1	1	-	0	1	-	0
1	0	1	0	1	-	0	1	-	0
1	0	1	1	1	-	0	1	-	0
1	1	0	0	1	-	0	0	-	1
1	1	0	1	1	-	0	0	-	1
1	1	1	0	0	-	1	0	-	1
1	1	1	1	0	-	1	0	-	1

$$\begin{cases} J_1 = q_0 \cdot x \cdot y \\ K_1 = x' + y' \end{cases} \qquad \begin{cases} J_0 = x \cdot y \\ K_0 = q_1' + x' + y' \end{cases}$$

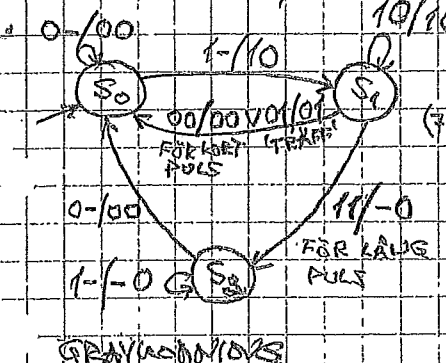
$$\begin{cases} J_1 = (q_0' + x' + y')' \\ K_1 = [(x' + y')']' \end{cases} \qquad J_0 = (x' + y')' \qquad K_0 = [(q_1' + x' + y')]$$

$$U = q_1 \cdot q_0$$

$$U = (q_1' + q_0')'$$



4. INSIGN.: IN, RCO
UTSIGN.: L, UT



q_1q_0	IN, RCO 00	01	11	10
S_0 00	00/00	00/00	01/10	01/10
S_1 01	00/00	00/01	11/-0	01/10
S_2 11	00/00	00/00	11/-0	11/-0
- 10	-/-	-/-	-/-	-/-

$q_2^+ q_1^+ / L, UT$

q_1	q_0	IN	RCO	L
0	0	0	0	0
0	0	0	1	0
0	0	1	0	1
0	0	1	1	1
0	1	0	0	0
0	1	0	1	1
0	1	1	0	1
0	1	1	1	1
1	0	0	0	0
1	0	0	1	0
1	0	1	0	0
1	0	1	1	0
1	1	0	0	0
1	1	0	1	0
1	1	1	0	0
1	1	1	1	0

q_1	q_0	IN	RCO	UT
0	0	0	0	0
0	0	0	1	0
0	0	1	0	0
0	0	1	1	0
0	1	0	0	0
0	1	0	1	0
0	1	1	0	0
0	1	1	1	0
1	0	0	0	0
1	0	0	1	0
1	0	1	0	0
1	0	1	1	0
1	1	0	0	0
1	1	0	1	0
1	1	1	0	0
1	1	1	1	1

$$\begin{cases} J_1 = q_1 \cdot IN \cdot RCO \\ K_1 = IN' \end{cases}$$

$$\begin{cases} J_1 = IN \\ K_1 = K_0 = IN' \end{cases}$$

$$\begin{cases} L = IN \\ UT = q_1' \cdot q_0 \cdot IN' \cdot RCO \end{cases}$$

q_1q_0	IN 00	01	11	10
00	0	0	0	0
01	0	0	1	0
11	0	0	1	1
10	-	-	-	-

q_2^+

q_1	q_0	IN	J_1	K_1
0	0	0	0	-
0	0	1	0	-
0	1	0	1	-
0	1	1	1	-
1	0	0	-	1
1	0	1	-	1
1	1	0	-	0
1	1	1	-	0

q_1q_0	IN 00	01	11	10
00	0	0	1	1
01	0	0	1	1
11	0	0	1	1
10	-	-	-	-

q_1^+

q_1	q_0	IN	J_1	K_1
0	0	0	0	-
0	0	1	1	-
0	1	0	1	-
0	1	1	1	-
1	0	0	-	1
1	0	1	-	1
1	1	0	-	0
1	1	1	-	0

J_1 K_1

$$\begin{cases} q_2^+ = q_2 \cdot IN \vee q_1 \cdot IN \cdot RCO \\ q_1^+ = IN \end{cases} \quad (2p)$$