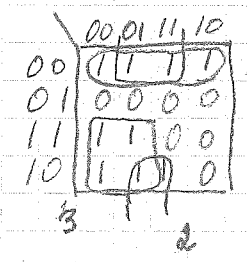
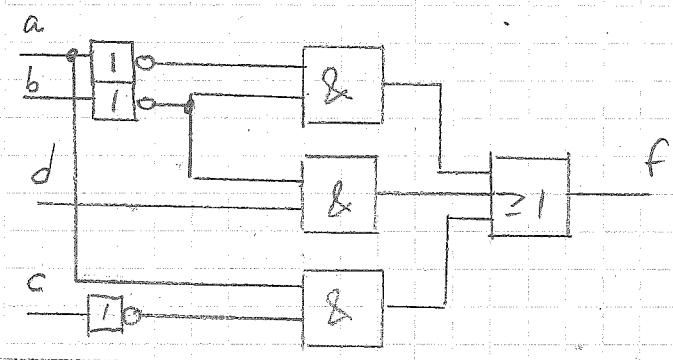
Tentamen 14/12 - 12 blad 1.

1/ f

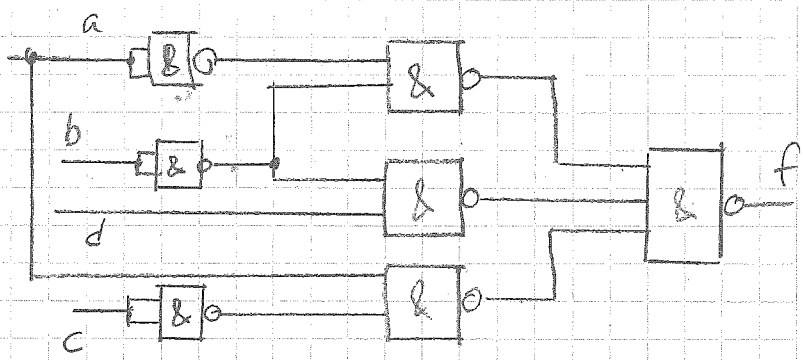


$$f = \bar{a}\cdot\bar{b} + \bar{b}\cdot d + a\cdot\bar{c}$$



5p

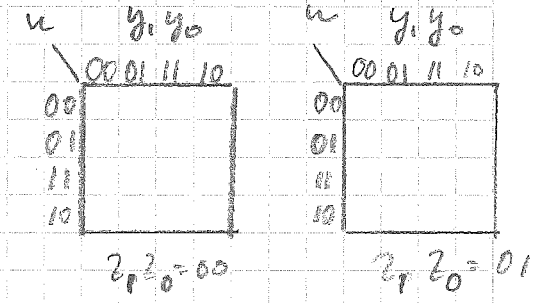
b) $f = \bar{a}\cdot\bar{b} + \bar{b}\cdot d + a\cdot\bar{c} = \overline{\bar{a}\cdot\bar{b}} \cdot \overline{\bar{b}\cdot d} \cdot \overline{a\cdot\bar{c}}$

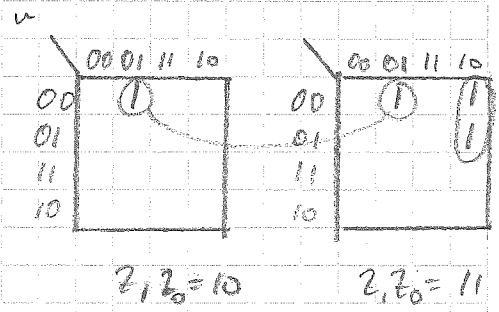


3p

2/

$x_1 x_0$	$y_1 y_0$	$z_1 z_0$	u
00	01	10	1
00	01	11	1
00	10	11	1
01	10	11	1





$$u = \bar{x}_1\cdot\bar{x}_0\cdot\bar{y}_1\cdot y_0\cdot z_1 + \bar{x}_1\cdot y_1\,\bar{y}_0\cdot z_1\cdot z_0$$

Tentamen 14/12-12 blad 2

3)

a) $93_{10} = 1\cdot64 + 0\cdot32 + 1\cdot16 + 1\cdot8 + 1\cdot4 + 0\cdot2 + 1\cdot1$

$= 101 | 1101_2$ (5 | D)

b) $93_{10} = 5D_{16}$

c) 2-komplement: 01011101 = 10100010 + 1 = 10100011

OBS! 8 bitar!

Svar: 10100011

d) $83_{10} = 01010011$

$83_{10} - 93_{10} \Rightarrow$ 01010011 + 10100011 = 11110110

Negativt! MSB teckenbit.

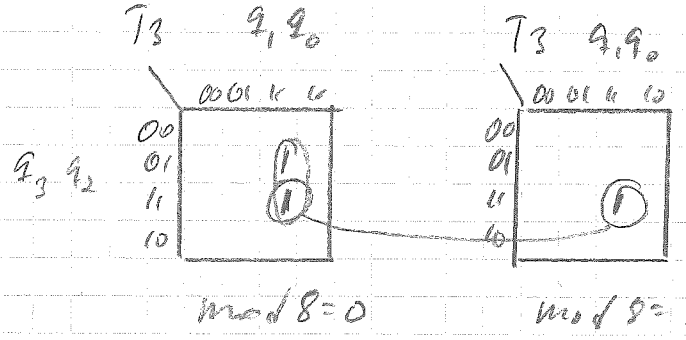
2-komplement: 11110110 = 00001001 + 1 = 00001010

Svar: $-00001010_2 = -10$

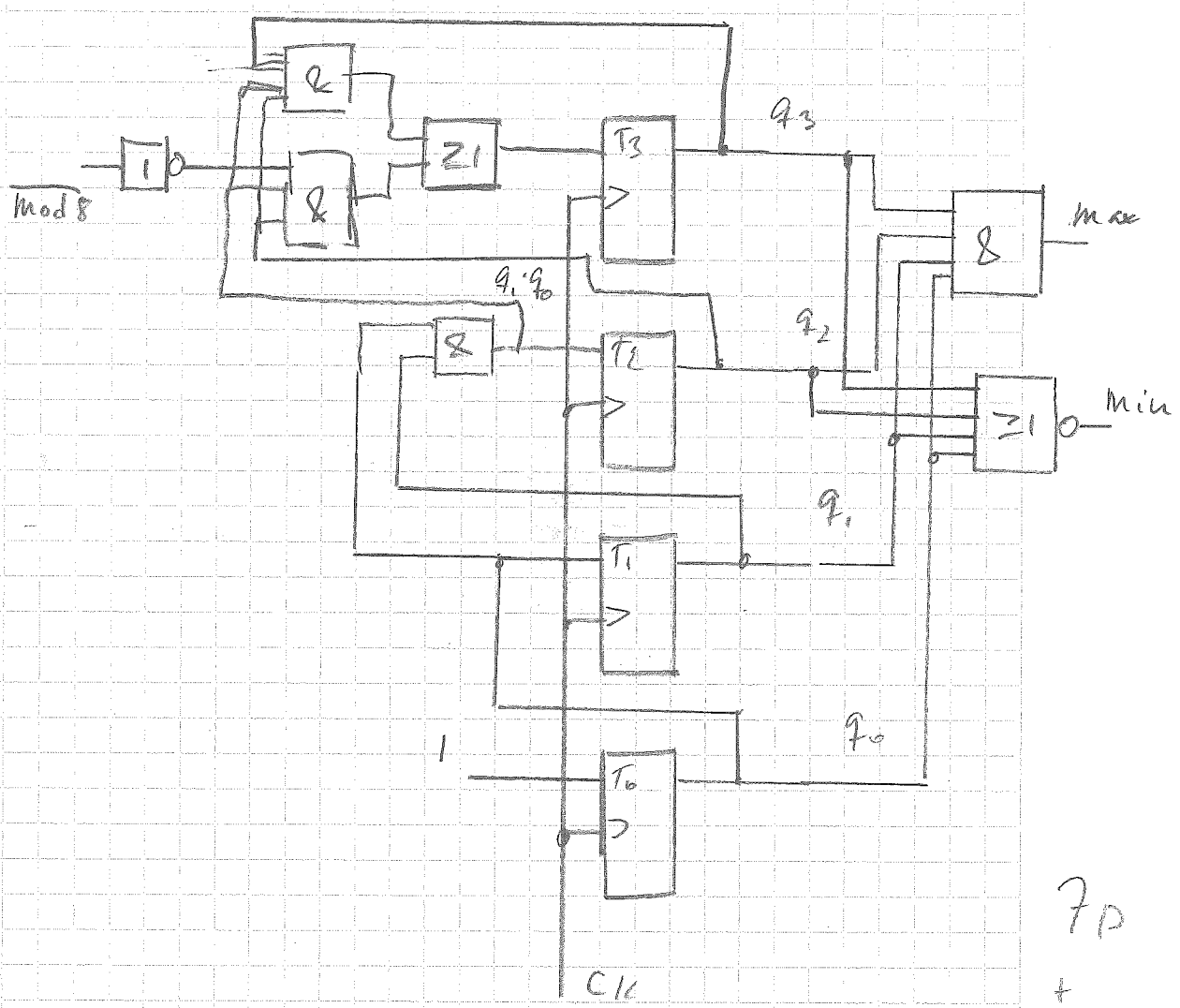
5)

$q_3 q_2 q_1 q_0$	mod8=0 $q_3^+ q_2^+ q_1^+ q_0^+$	mod8=1 $q_3^+ q_2^+ q_1^+ q_0^+$	mod8=0 $T_3 T_2 T_1 T_0$	mod8=1 $T_3 T_2 T_1 T_0$
0000	0001	0001	0001	0001
0001	0010	0010	0011	0011
0010	0011	0011	0001	0001
0011	0100	0100	0111	0111
0100	0101	0101	0001	0001
0101	0110	0110	0011	0011
0110	0111	0111	0001	0001
0111	1000	0000	1111	0111
1000	1001	1001	0001	0001
1001	1010	1010	0011	0011
1010	1011	1011	0001	0001
1011	1100	1100	0111	0111
1100	1101	1101	0001	0001
1101	1110	1110	0011	0011
1110	1111	1111	0001	0001
1111	0000	0000	1111	1111

5/ Forts! $T_0 = 1$ $T_1 = q_0$ $T_2 = q_2 \cdot q_1$



$T_3 = \overline{mod\,8} \cdot q_2 \cdot q_1 \cdot q_0 + q_3 \cdot q_2 \cdot q_1 \cdot q_0$

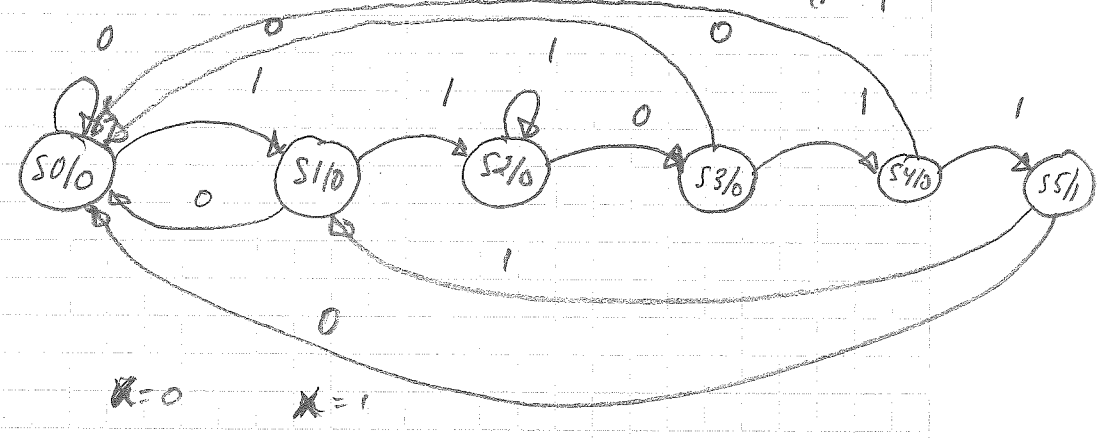


$max = q_3 \cdot q_2 \cdot q_1 \cdot q_0$

$min = \overline{q_3} \cdot \overline{q_2} \cdot \overline{q_1} \cdot \overline{q_0} = \overline{q_3 + q_2 + q_1 + q_0}$

7p + 3p

7)



X = 0 X = 1

$q_2\ q_1\ q_0$	$q_2^+\ q_1^+\ q_0^+$	$\bar{q}_2^+\ \bar{q}_1^+\ \bar{q}_0^+$	u
0 0 0	0 0 0	0 0 1	0
0 0 1	0 0 0	0 1 0	0
0 1 0	0 1 1	0 1 0	0
0 1 1	0 0 0	1 0 0	0
1 0 0	0 0 0	1 0 1	0
1 0 1	0 0 0	0 0 1	1

q_2^+ $q_0 X$

$q_2 q_1$ \ $q_0 X$	00	01	11	10
00	0	0	0	0
01	0	0	1	0
11	–	–	–	–
10	0	1	0	0

q_1^+ $q_0 X$

$q_2 q_1$ \ $q_0 X$	00	01	11	10
00	0	0	1	0
01	1	1	0	0
11	–	–	–	–
10	0	0	0	0

q_0^+ $q_0 X$

$q_2 q_1$ \ $q_0 X$	00	01	11	10
00	0	1	0	0
01	1	0	0	0
11	–	–	–	–
10	0	1	1	0

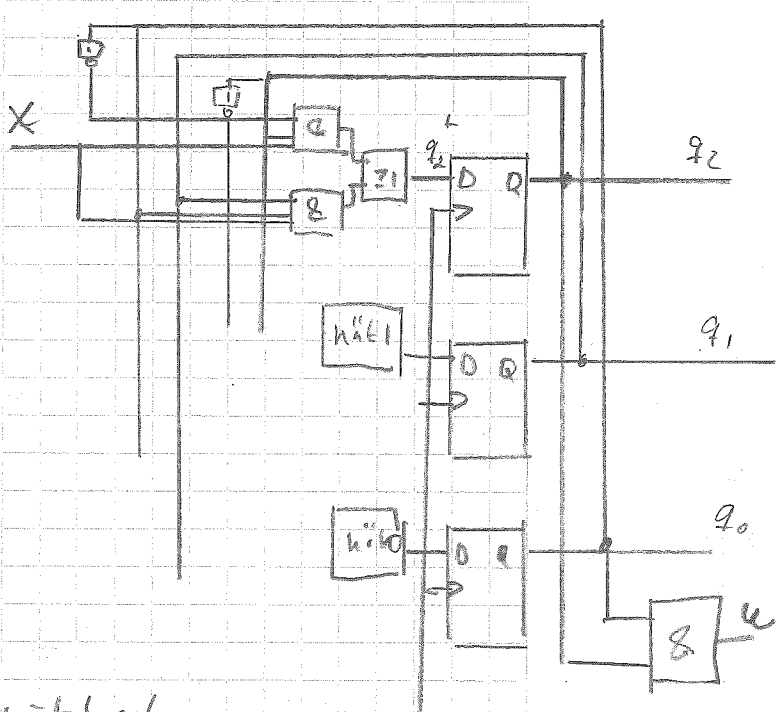
7+2 p

$$q_2^+ = q_2 \cdot \bar{q}_0 \cdot X + \bar{q}_1 \cdot q_0 \cdot X$$

$$q_1^+ = q_1 \cdot \bar{q}_0 + \bar{q}_2 \cdot \bar{q}_1 \cdot q_0 \cdot X$$

$$q_0^+ = q_2 \cdot X + q_1 \cdot \bar{q}_0 \cdot \bar{X}$$

$$u = \underline{q_2 \cdot q_0} + \bar{q}_1 \cdot q_0 X$$

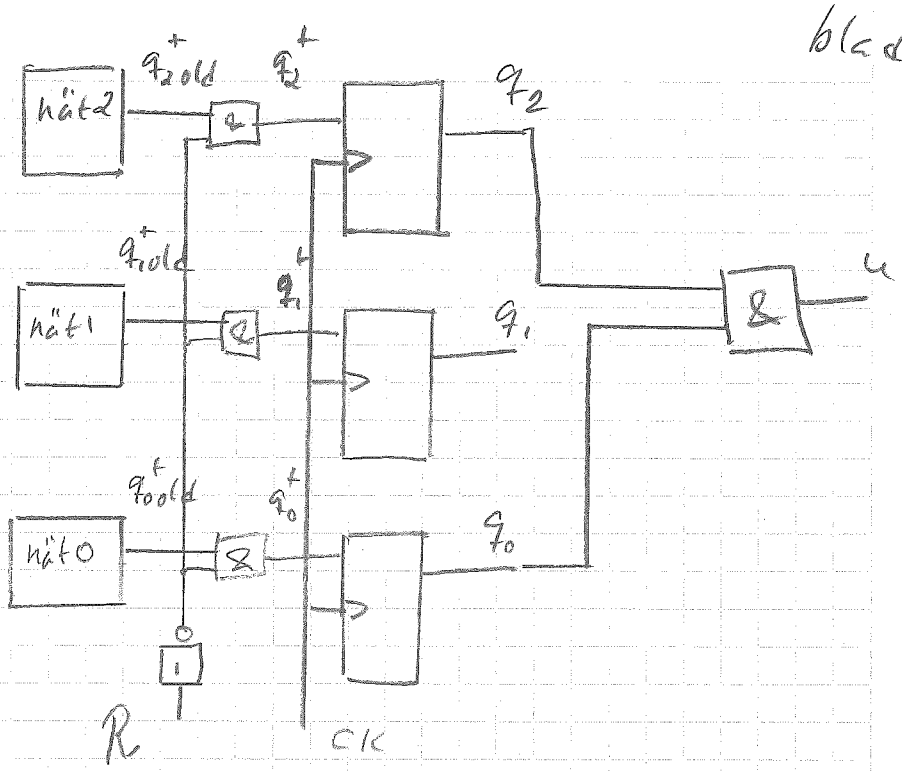


insignaler till nät 1 och nät 0 är q_2, q_1, q_0 och u.

CK

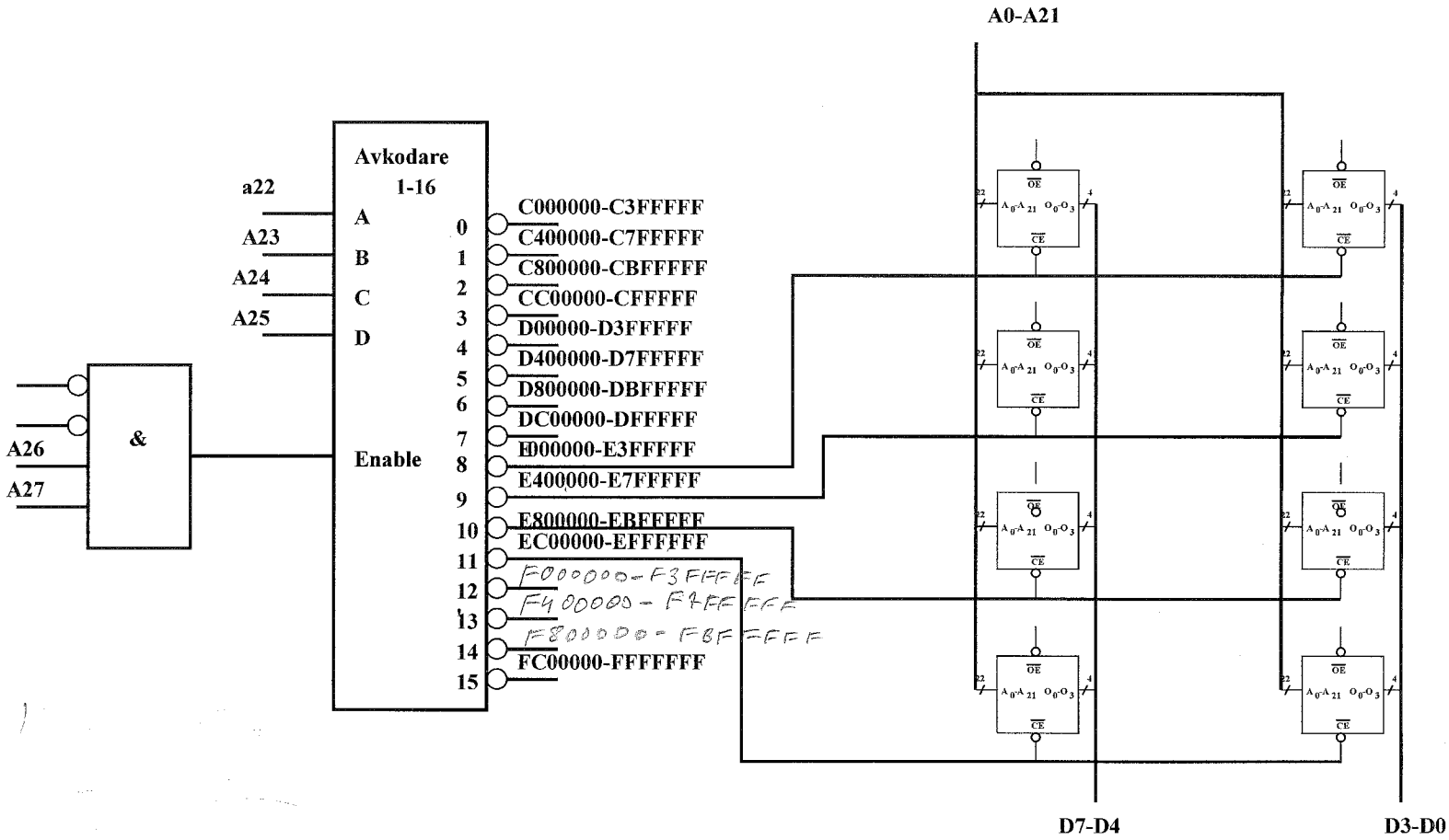
7b)

blatt 5.

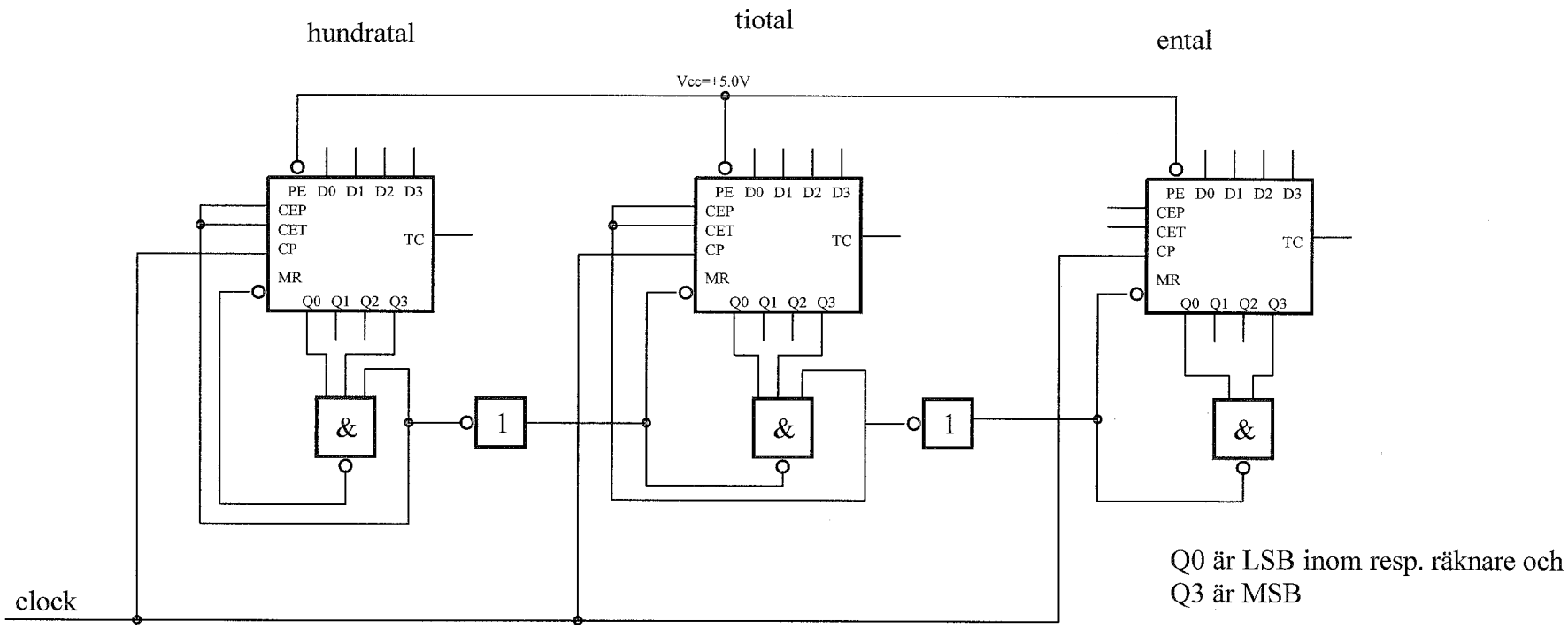


6)

ble 15


A0-A21
Avkodare
1-16
a22
A23
A24
A25
A
B
C
D
Enable
A26
A27
&
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
C000000-C3FFFFF
C400000-C7FFFFF
C800000-CBFFFFF
CC00000-CFFFFF
D00000-D3FFFFF
D400000-D7FFFFF
D800000-DBFFFFF
DC00000-DFFFFF
E000000-E3FFFFF
E400000-E7FFFFF
E800000-EBFFFFF
EC00000-EFFFFFF
F000000-F3FFFFF
F400000-F7FFFFF
F800000-FBFFFFF
FC00000-FFFFFFF
D7-D4
D3-D0

8p



Q0 är LSB inom resp. räknare och
Q3 är MSB