Ngày . . No.

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(Q1)

* We have truth table: $I = 6 \Rightarrow (C)_{10} = 8$

n_3	n_2	n_1	n_0	m_3	m_2	m_1	m_0
0	0	0	0	1	0	0	0
0	0	0	1	1	0	0	0
0	0	1	0	1	0	0	1
0	0	1	1	1	0	0	1
0	1	0	0	1	0	1	0
0	1	0	1	1	0	1	0
0	1	1	0	1	0	1	1
0	1	1	1	1	0	1	1
1	0	0	0	1	1	0	0
1	0	0	1	1	1	0	0

* Karnaugh table:

m_0:

n_3n_2 \ n_1n_0	00	01	11	10
00	0	0	1	1
01	0	0	1	1
11	x	x	x	x
10	0	0	x	x

$\rightarrow m_0 = n_1$

m_1

$n_3 n_2$ \ $n_1 n_0$	00	01	11	10
00	0	0	0	0
01	1	1	1	1
11	x	x	x	x
10	0	0	x	x

$\rightarrow m_1 = n_2$

m_2

$n_3 n_2$ \ $n_1 n_0$	00	01	11	10
00	0	0	0	0
01	0	0	0	0
11	x	x	x	x
10	1	1	x	x

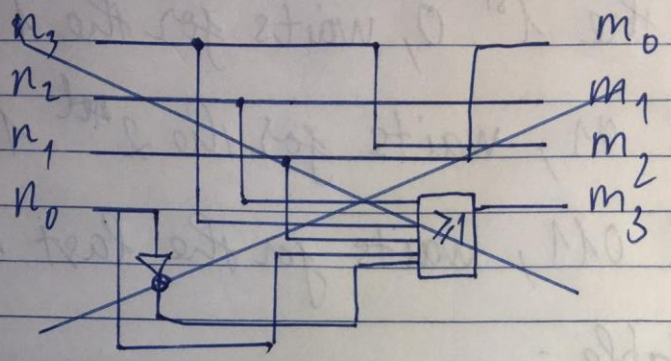
$\rightarrow m_2 = n_3$

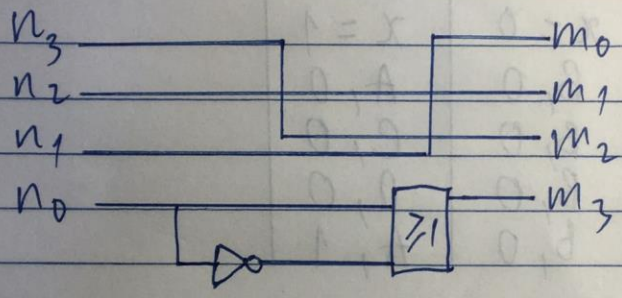
m_3 :

$n_3 n_2$ \ $n_1 n_0$	00	01	11	10
00	1	1	1	1
01	1	1	1	1
11	x	x	x	x
10	1	1	x	x

$\rightarrow m_3 = 1$

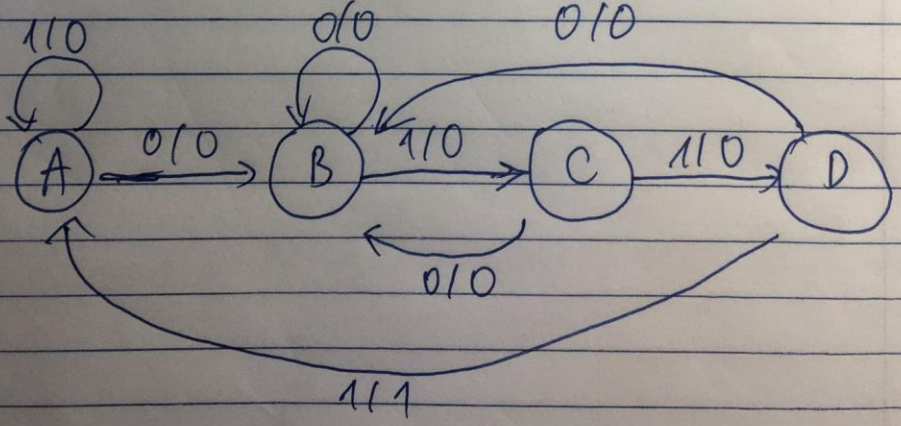
* Design combinatorial circuit:





(Q2) $I = 6 \rightarrow (N)_2 = 0111$

* State table and state diagram



A waits for the 1st 0

B had the 1st 0, waits for the 1st 1

C had 01, waits for the 2nd 1

D had 011, waits for the last 1.

State table:

	NS	
PS	x = 0	x = 1
A	B, 0	A, 0
B	B, 0	C, 0
C	B, 0	D, 0
D	B, 0	A, 1