No:
Date:

第三章第二次作业

3.16

① D触发器 $Q^{n+1}=D$

激励表

Q	Q^{n+1}	D
0	0	0
0	1	1
1	0	0
1	1	1

Q_1Q_0 \ X	0	1
00	0	1
01	1	0
11	0	0
10	0	1

D_1

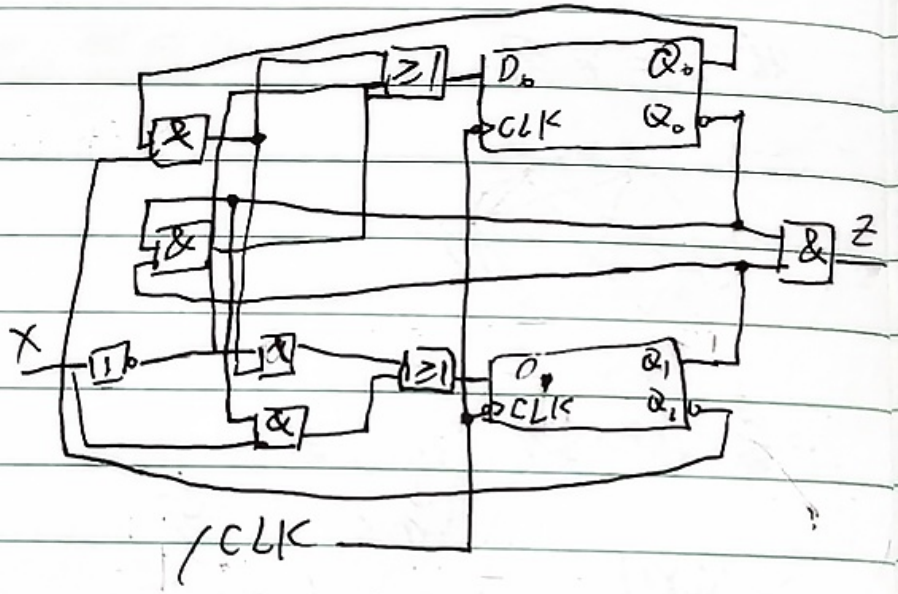
Q_1Q_0 \ X	0	1
00	1	0
01	1	1
11	1	0
10	1	1

D_0

$\therefore D_1=\overline{Q}_0X+\overline{Q}_1Q_0\overline{X}$

$D_0=\overline{X}+\overline{Q}_1Q_0+Q_1\overline{Q}_0$

$Z=Q_1\overline{Q}_0$



② JK触发器

$Q^{n+1} = J\overline{Q} + \overline{K}Q$

激励表

Q	Q^{n+1}	J	K
0	0	0	d
0	1	1	d
1	0	d	1
1	1	d	0

Q_1Q_0 \ X	0	1
00	0	1
01	1	0
11	d	d
10	d	d

J_1

Q_1Q_0 \ X	0	1
00	d	d
01	d	d
11	1	1
10	1	0

Q_1

Q_1Q_0 \ X	0	1
00	1	0
01	d	d
11	d	d
10	1d	1

J_0

Q_1Q_0 \ X	0	1
00	d	d
01	0	0
11	0	1
10	d	d

Q_0

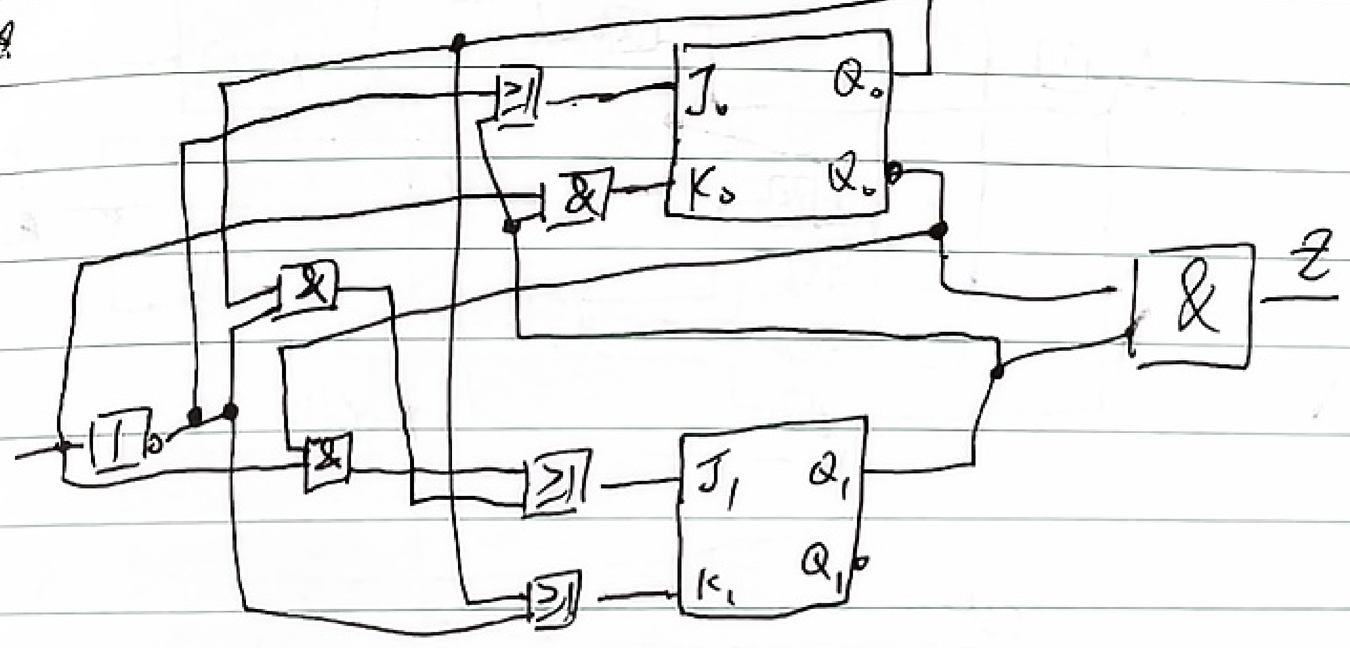
$\therefore J_1 = X\overline{Q_0} + \overline{X}Q_0$

$K_1 = \overline{X} + Q_0$

$J_0 = \overline{X} + Q_1$

$K_0 = XQ_1$

$Z = Q_1\overline{Q_0}$



No:

Date:

③ T触发器 $Q^{n+1} = T\bar{Q} + \bar{T}Q$

特性表

Q	Q^{n+1}	T
0	0	0
0	1	1
1	0	1
1	1	0

Q_1Q_0 \ X	0	1
00	0	1
01	1	0
11	1	1
10	1	0

T_1

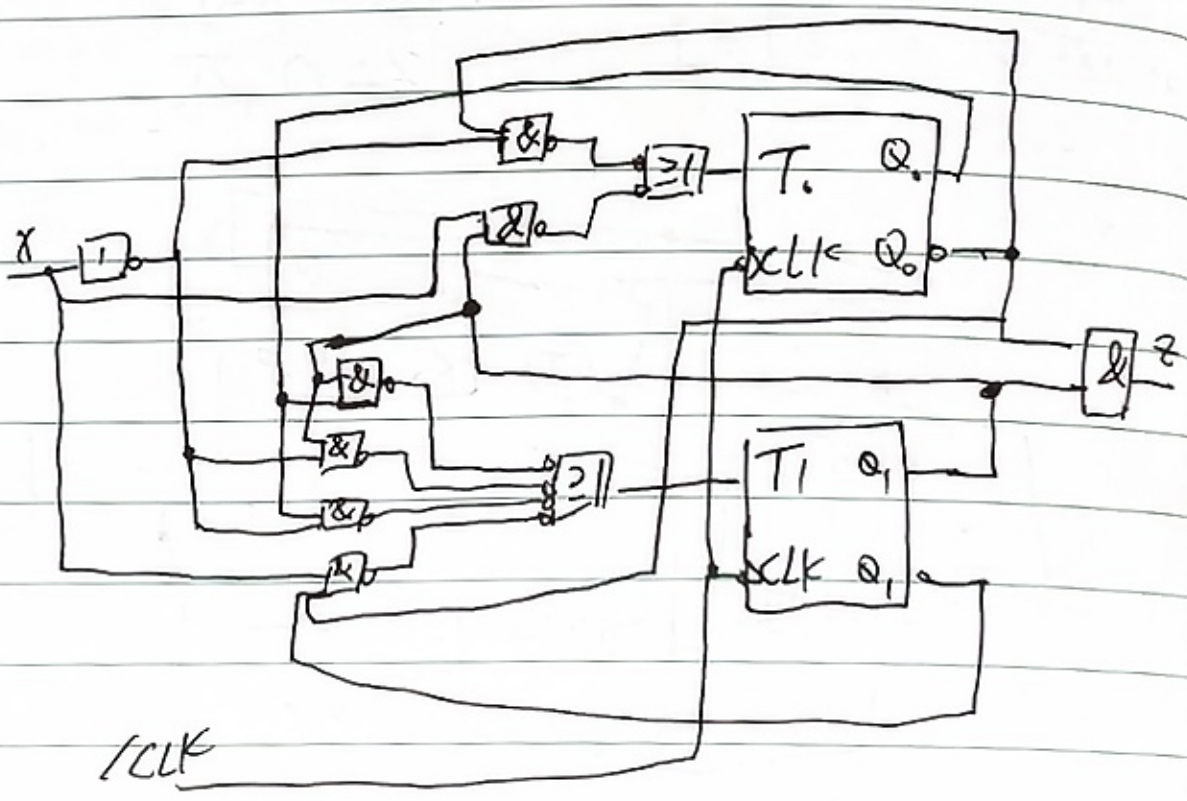
Q_1Q_0 \ X	0	1
00	1	0
01	0	0
11	0	1
10	1	1

T_0

$T_1 = X\bar{Q}_1\bar{Q}_0 + Q_1Q_0 + \bar{X}Q_1 + \bar{X}Q_0$

$T_0 = \bar{X}\bar{Q}_0 + XQ_1$

$Z = Q_1\bar{Q}_0$



No:

Date:

3.19 ① 由题知：

二进制状态表：

$Q_2Q_1Q_0$	X=0	X=1
000	100	001
001	000	010
010	001	011
011	010	100
100	011	000

采用D触发器

激励表

Q	Q^{n+1}	D
0	0	0
0	1	1
1	0	0
1	1	1

Q_2Q_1 \ Q_0X	00	01	11	10
00	1	0	0	0
01	0	0	1	0
11	d	d	d	d
10	0	0	d	d

D_2

Q_2Q_1 \ Q_0X	00	01	11	10
00	0	0	1	0
01	0	1	0	1
11	d	d	d	d
10	1	0	d	d

D_1

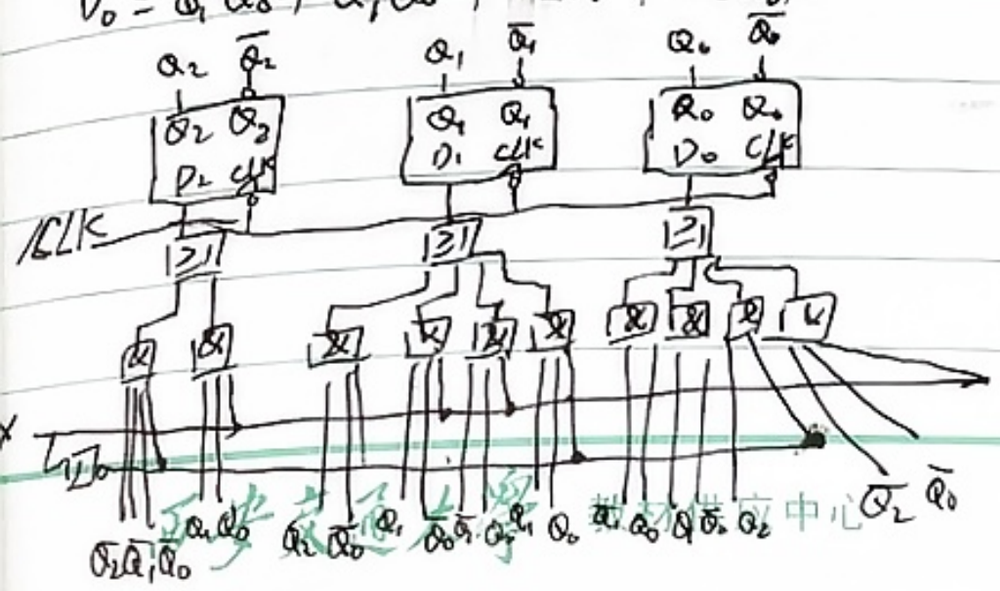
Q_2Q_1 \ Q_0X	00	01	11	10
00	0	1	1	1
01	1	1	0	0
11	d	d	d	d
10	1	0	d	d

D_0

$\therefore D_2 = \bar{Q}_2\bar{Q}_1\bar{Q}_0\bar{X} + Q_1Q_0X$

$D_1 = Q_2\bar{Q}_0\bar{X} + Q_1\bar{Q}_0X + \bar{Q}_1Q_0X + Q_1Q_0\bar{X}$

$D_0 = \bar{Q}_1Q_0 + Q_1\bar{Q}_0 + Q_2\bar{X} + \bar{Q}_2\bar{Q}_0X$



No:

Date:

3.21 ① $D_1 = \overline{y_1}$ $D_2 = \overline{y_1}$ $Z = x \cdot y_1 \cdot y_2$

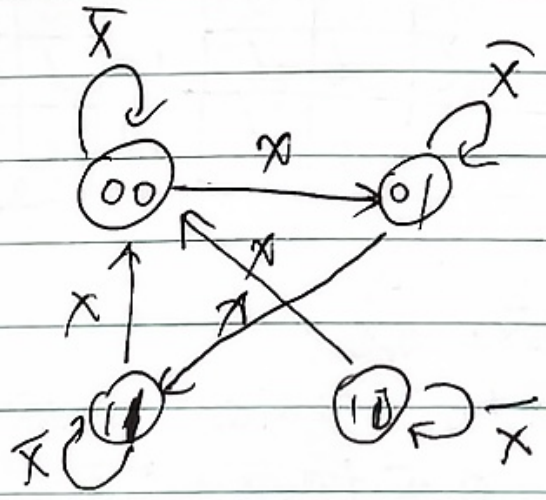
$CLK_1 = x(y_1 + y_2)$ $CLK_2 = x(y_2 + \overline{y_1})$

② 状态表：状态激励转移表

现态 $y_1 y_2$	输入 x	CLK_1	CLK_2	D_1	D_2	Z	次态 $y_1^{n+1} y_2^{n+1}$
0 0	1	0	1	1	1	0	0 1
0 1	1	1	1	1	1	0	1 1
1 0	1	1	0	0	0	0	0 0
1 1	1	1	1	0	0	1	0 0

状态表

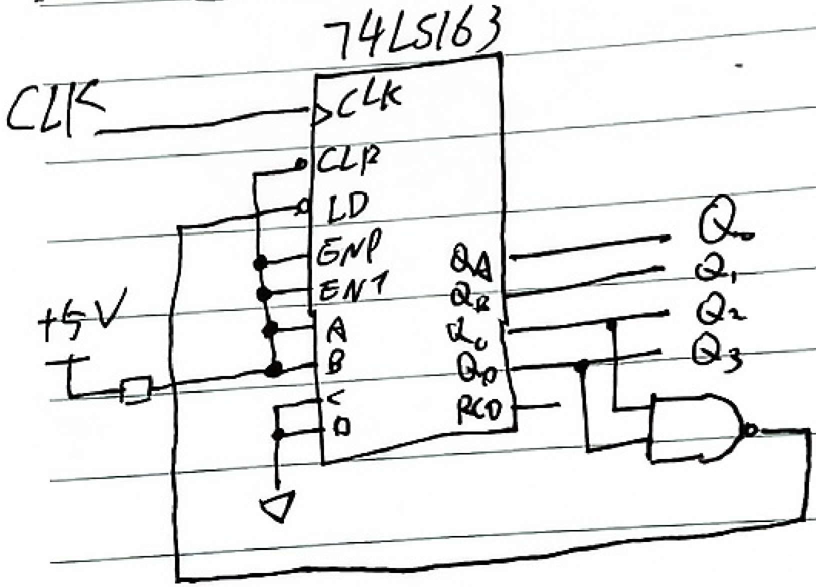
$y_1 y_2$ \ x	0	1
0 0	0 0	0 1
0 1	0 1	1 1
1 1	1 1	0 0
1 0	1 0	0 0



No:

Date:

3.9 由题知 电路为余3码



3.10

1110 → 1111 → 0111 → 0110 → 0101 → 0100 → 0011 → 0001

↑ ↓

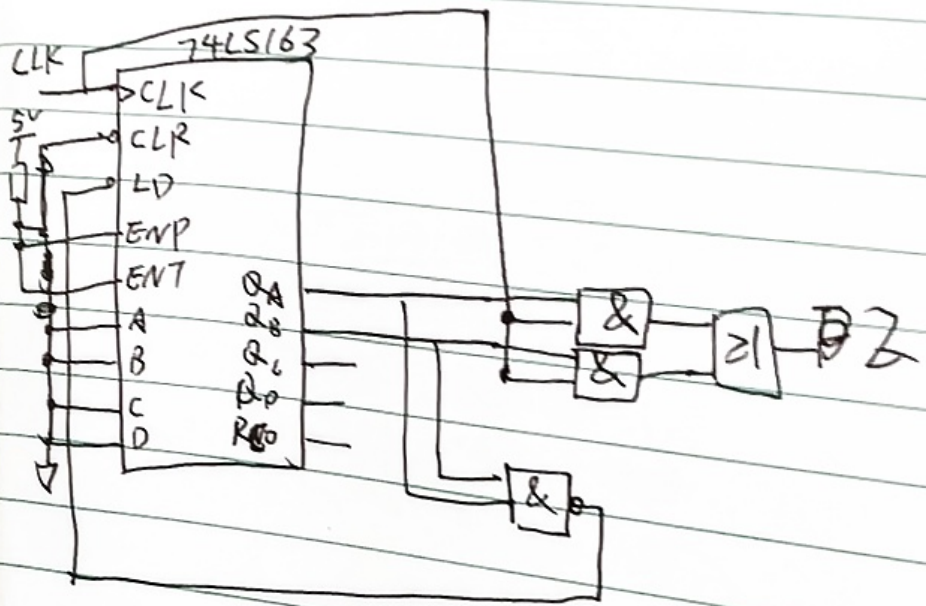
1101 ← 1100 ← 1011 ← 1010 ← 1001 ← 1000 ← 0000

为模16计数器

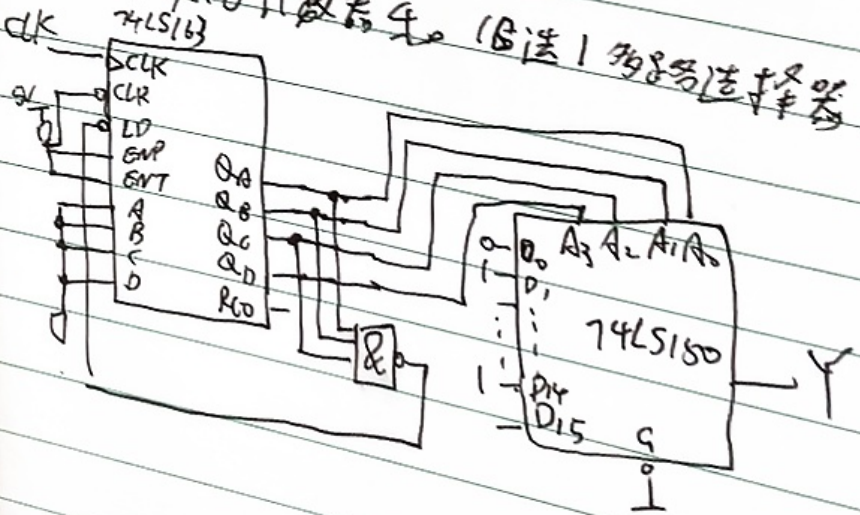
No:

Date:

3.12 由题意可



3.22. 用模16 jt数器生。16选1为多选择器



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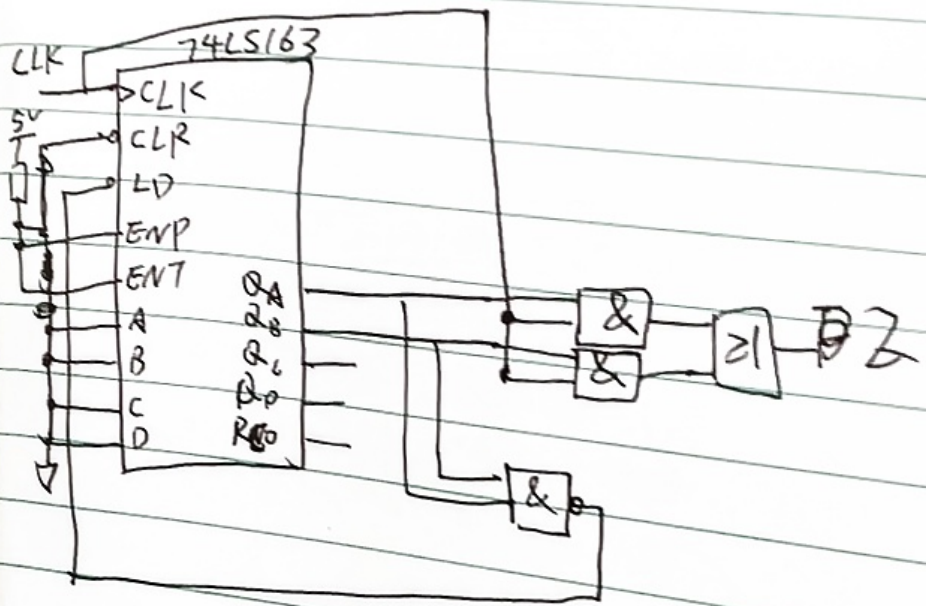
3.12 由题意可



3.22. 用模16 jt数器生。16选1为多选择器