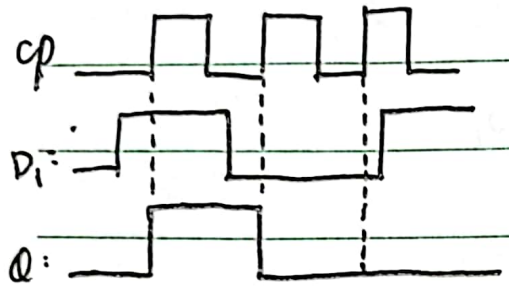
No:

Date:

3.2 解：D触发器的作用是当 ... 每来临一个 CLK 上升沿，$D=\overline{Q}D_1$

$D=\overline{Q}D_1$



$\overline{Q_0}\,\overline{Q_1}\,\overline{Q_2}$

3.3 解：$D_1=Q_1$　　$D_2=Q_2$　　$D_3=(Q_0\oplus Q_1)\oplus\overline{Q_1+Q_2}=\overline{Q}_0Q_1+Q_0\overline{Q}_1Q_2+$

状态输出：$D_1=Q_1^{n+1}\Rightarrow Q_1^{n+1}=Q_1$

$D_2=Q_2^{n+1}\Rightarrow Q_2^{n+1}=Q_2$

$D_3=Q_3^{n+1}\Rightarrow Q_3^{n+1}=\overline{Q}_0Q_1+Q_0\overline{Q}_1Q_2+\overline{Q}_0\overline{Q}_1\overline{Q}_2$

	$Q_2Q_1Q_0$	Q_1^{n+1}	Q_2^{n+1}	Q_3^{n+1}	Q^{n+1}
S_0	0 0 0	0	0	1	S_1
S_1	0 0 1	0	0	0	S_0
S_2	0 1 0	1	0	1	S_5
S_3	0 1 1	1	0	0	S_4
S_4	1 0 0	0	1	0	S_2
S_5	1 0 1	0	1	1	S_3
S_6	1 1 0	1	1	1	S_7
S_7	1 1 1	1	1	0	S_6

状态图：

No:

Date:

3.6 解: $J_1=1$ $K_1=1$ $Q_1^{n+1}=J_1\bar{Q}_1+\bar{K}_1Q_1=\bar{Q}_1$

$J_2=X\oplus Q_1$ $K_2=X\oplus Q_1$ $Q_2^{n+1}=J_2\bar{Q}_2+\bar{K}_2Q_2$

$Z=\bar{X}Q_1Q_2+X\bar{Q}_1\bar{Q}_2$

X	Q_1	Q_2	J_1	K_1	J_2	K_2	Z	Q_1^{n+1}	Q_2^{n+1}
0	0	0	1	1	0	0	0	1	0
0	0	1	1	1	0	0	0	1	1
0	1	0	1	1	1	1	0	0	1
0	1	1	1	1	1	1	1	0	0
1	0	0	1	1	1	1	1	1	1
1	0	1	1	1	1	1	0	1	0
1	1	0	1	1	0	0	0	0	0
1	1	1	1	1	0	0	0	0	1

3.解：$EN_1 = Y$　$EN_2 = \bar{X}YQ_1$

$Q_1^{n+1} = Y \oplus Q_1 = Y\bar{Q}_1 + \bar{Y}Q_1$　　$Q_2^{n+1} = EN_2 \oplus Q_2 = \bar{X}YQ_1\bar{Q}_2 + XQ_2 + \bar{Y}Q_2 + \bar{Q}_1Q_2$

$Z = \bar{X}\bar{Q}_2$

X	Y	Q_2	Q_1	EN_2	EN_1	Z	Q_2^{n+1}	Q_1^{n+1}
0	0	0	0	0	0	1	0	0
0	0	0	1	0	0	1	0	1
0	0	1	0	0	0	0	1	0
0	0	1	1	0	0	0	1	1
0	1	0	0	0	1	1	0	1
0	1	0	1	0	1	1	1	0
0	1	1	0	1	1	0	1	1
0	1	1	1	1	1	0	0	0
1	0	0	0	0	0	0	0	0
1	0	0	1	0	0	0	0	1
1	0	1	0	0	0	0	1	0
1	0	1	1	0	0	0	1	1
1	1	0	0	0	1	0	0	1
1	1	0	1	0	1	0	0	0
1	1	1	0	0	1	0	1	1
1	1	1	1	0	1	0	1	0

即有

Q_2Q_1 \ XY	00	01	10	11
S_0 00	00/S_0	01/S_1	00/S_0	01/S_1
S_1 01	01/S_1	10/S_2	01/S_1	00/S_0
S_2 10	10/S_2	11/S_3	10/S_2	11/S_3
S_3 11	11/S_3	00/S_4	11/S_3	10/S_2

No:

Date:

利元: $D_4=Q_3$ $D_3=Q_2$ $D_2=Q_1$ $D_1=D_{11}D_{12}=\overline{Q_4}\overline{Q_3}+\overline{Q_4}Q_1$

$D_4^{n+1}=D_4=Q_3$ $D_3^{n+1}=Q_2$ $D_2^{n+1}=Q_1$ $D_1^{n+1}=\overline{Q_4}\overline{Q_3}+\overline{Q_4}Q_1$

作为真值表

Q_4	Q_3	Q_2	Q_1	Q_4^{n+1}	Q_3^{n+1}	Q_2^{n+1}	Q_1^{n+1}
0	0	0	0	0	0	0	1
0	0	0	1	0	0	1	1
0	0	1	0 x	0	1	0	1
0	0	1	1	0	1	1	1
* 0	1	0	0 x	1	0	0	0
0	1	0	1 x	1	0	1	1
* 0	1	1	0 x	1	1	0	0
0	1	1	1	1	1	1	1
1	0	0	0	0	0	0	0
* 1	0	0	1 x	0	0	1	0
1	0	1	0 x	0	1	0	0
* 1	0	1	1 x	0	1	1	0
1	1	0	0	1	0	0	0
1	1	0	1 x	1	0	1	0
1	1	1	0	1	1	0	0
1	1	1	1	1	1	1	0

无效序列为

0010 → 0101 → 1011 → 0110 → 1101 → 1010

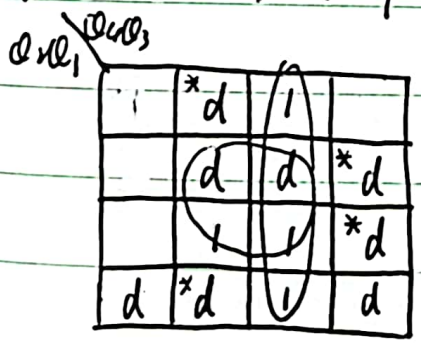
1001 ← 0100

有效序列为

0000 → 0001 → 0011 → 0111 → 1111 → 1110 → 1100 → 1000

改变 D_4 便得状可以改变初元效序列为

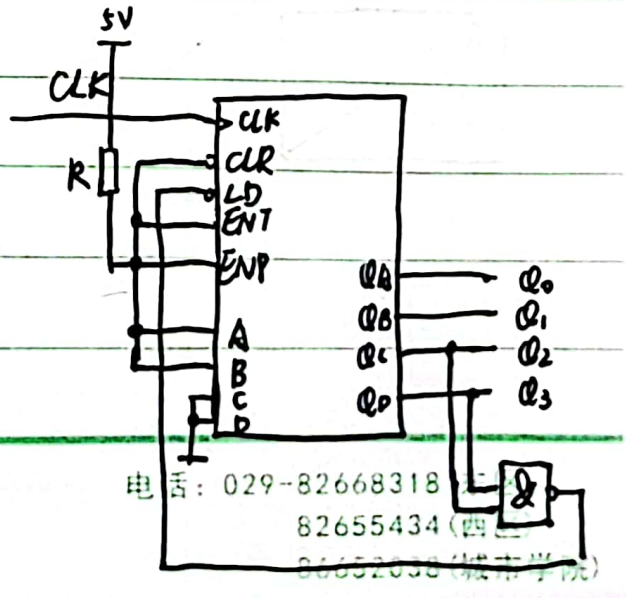
1011 → 0011　0110 → 1110　0100 → 1100　1001 → 0001



$Q_4^{n+1}=Q_3Q_1+Q_4Q_3$

3.9 解: 0011 → 0100 → 0101 → 0110 → 0111

1100 ← 1011 ← 1010 ← 1001 ← 1000



No:

Date:

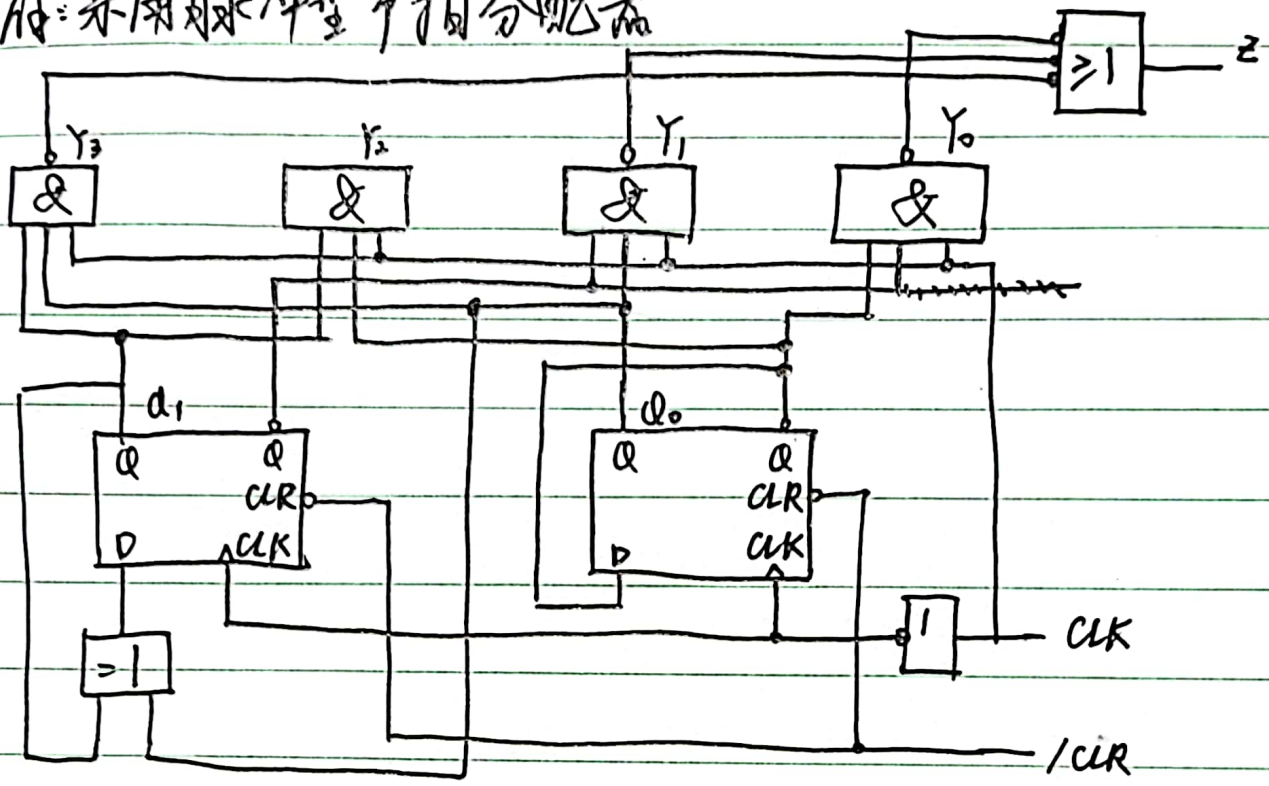
3.10 解：1000 ~ 1111 为加一计数　0111 ~ 0000 为减一计数

电路为模16计数器

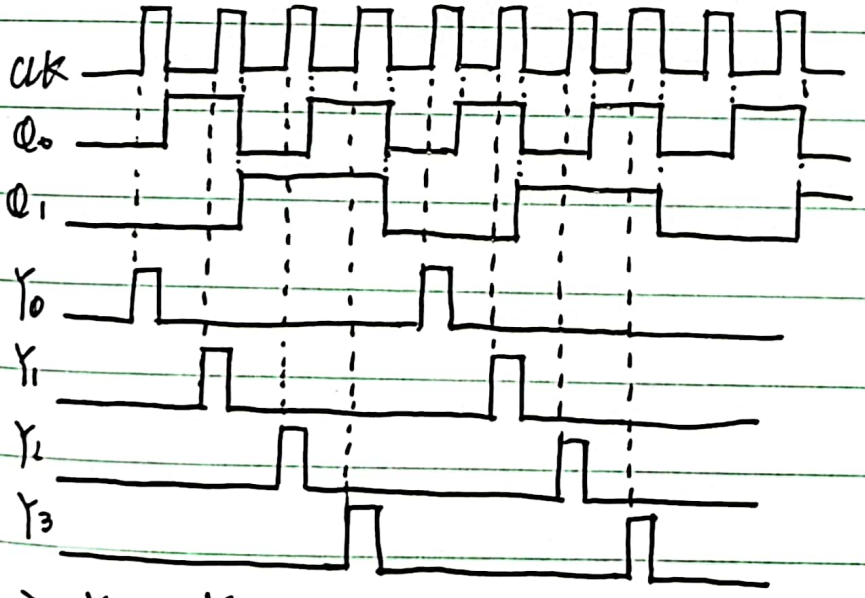
NO:

Date:

3.12 解：采用脉冲型节拍分配器



后沿触发 Q_0、Q_1为节拍脉冲 Y_0~Y_3为和CLK同频节拍



$Z = Y_0 + Y_1 + Y_3$