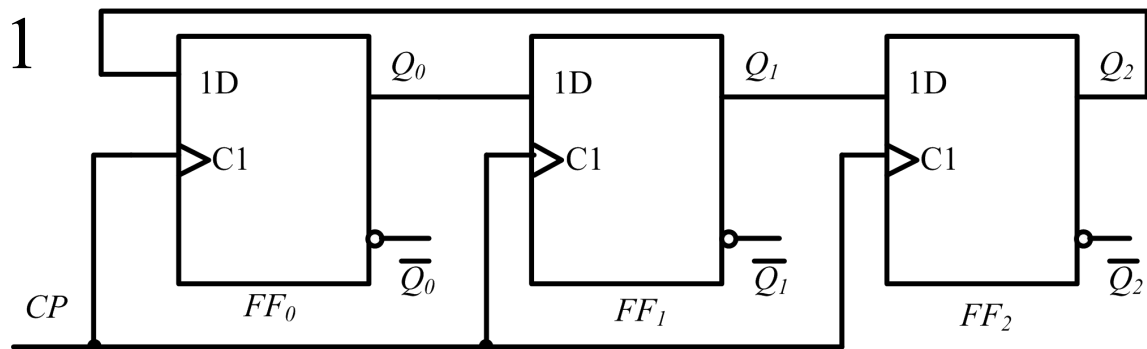


5.1



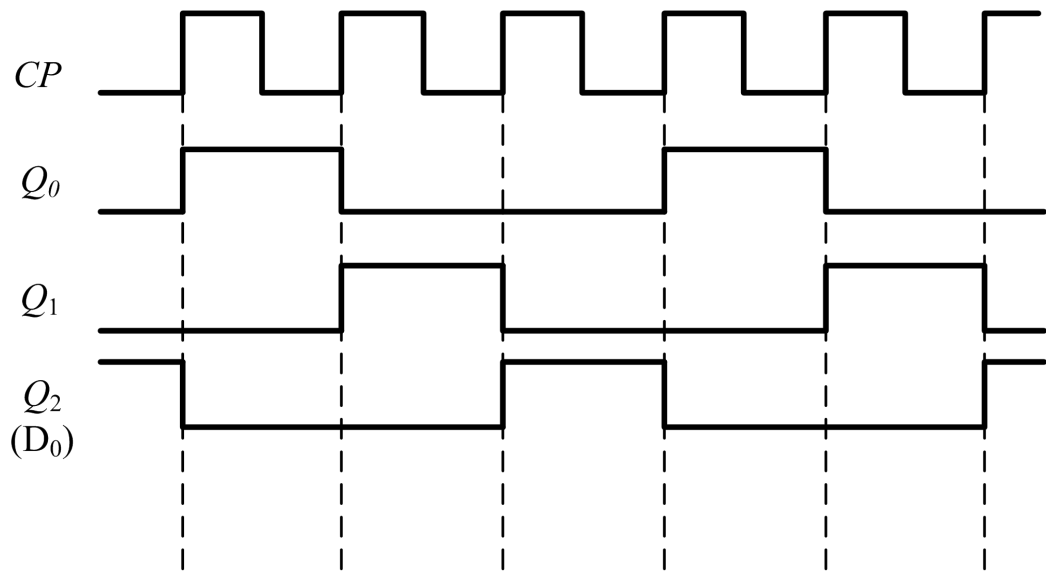
驱动方程

$$\begin{cases} D_0 = Q_2^n \\ D_1 = Q_0^n \\ D_2 = Q_1^n \end{cases}$$

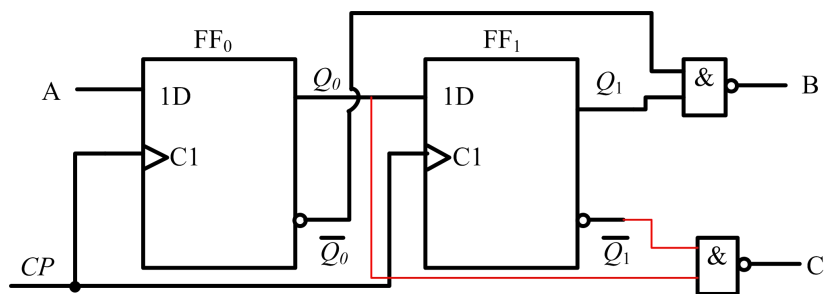
状态方程

$$\begin{cases} Q_0^{n+1} = D_0 = Q_2^n \\ Q_1^{n+1} = D_1 = Q_0^n \\ Q_2^{n+1} = D_2 = Q_1^n \end{cases}$$

触发器的初始状态 $Q_0Q_1Q_2=001$



5.4



触发器的初始状态 $Q_0Q_1=00$

驱动方程

$$D_0 = A$$

$$D_1 = Q_0^n$$

状态方程

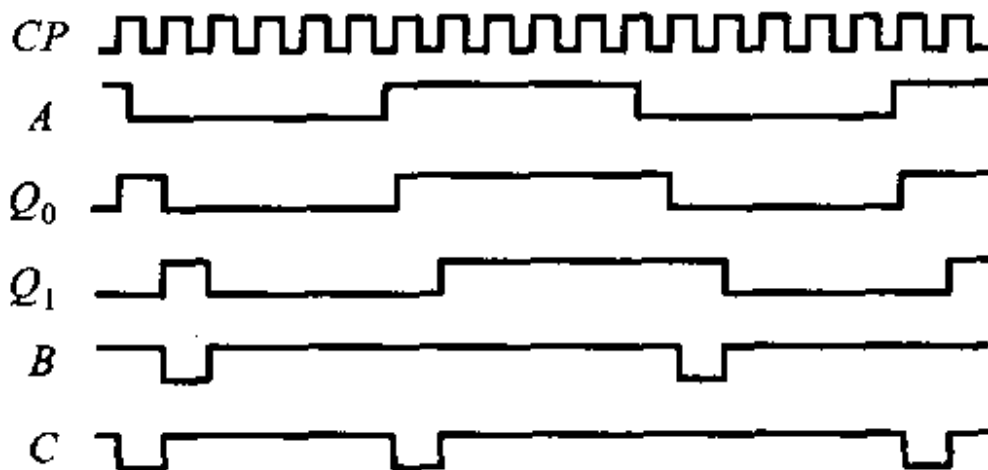
$$Q_0^{n+1} = D_0 = A$$

$$Q_1^{n+1} = D_1 = Q_0^n$$

输出方程

$$B = \overline{\overline{Q_0^n Q_1^n}}$$

$$C = \overline{\overline{Q_0^n Q_1^n}}$$



C

图 5 - 31

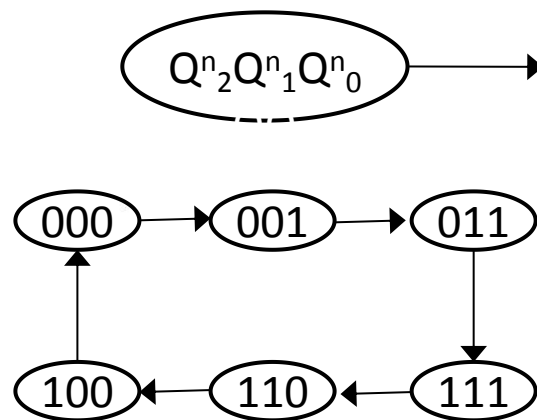
5.8 试用下降沿触发的JK触发器设计一个同步时序电路，其要求如下图。

(1) 状态方程如图 5-37 所示。

$Q_1^n Q_0^n$					
Q_2^n		00	01	11	10
	0	001	011	111	×××
	1	000	×××	110	100

$$\begin{aligned} Q_2^{n+1} &= Q_1^n \\ Q_1^{n+1} &= Q_0^n \\ Q_0^{n+1} &= \bar{Q}_2^n \end{aligned}$$

图 5-37



(2) 驱动方程

$$Q_2^{n+1} = Q_1^n (\bar{Q}_2^n + Q_2^n) = Q_1^n \bar{Q}_2^n + Q_1^n Q_2^n$$

$$J_2 = Q_1^n, \quad K_2 = \bar{Q}_1^n$$

$$Q_1^{n+1} = Q_0^n (\bar{Q}_1^n + Q_1^n) = Q_0^n \bar{Q}_1^n + Q_0^n Q_1^n$$

$$J_1 = Q_0^n, \quad K_1 = \bar{Q}_0^n$$

$$Q_0^{n+1} = \bar{Q}_2^n (\bar{Q}_0^n + Q_0^n) = \bar{Q}_2^n \bar{Q}_0^n + \bar{Q}_2^n Q_0^n$$

$$J_0 = \bar{Q}_2^n, \quad K_0 = Q_2^n$$

(3) 逻辑图如图 5-38 所示。

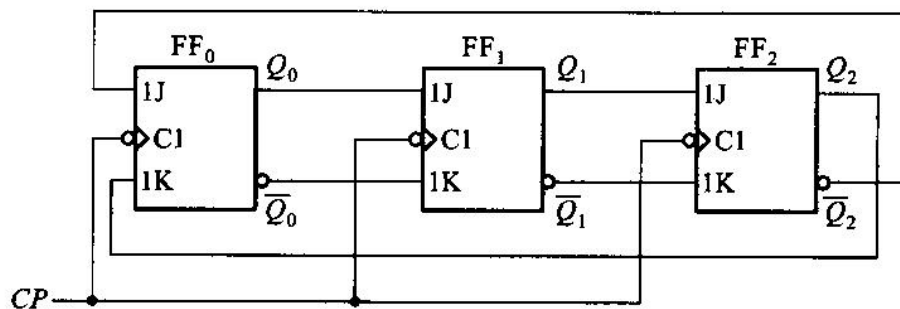


图 5-38

74161的状态表

输 入									输 出					注
\overline{CR}	\overline{LD}	CT_P	CT_T	CP	D_3	D_2	D_1	D_0	Q_3^{n+1}	Q_2^{n+1}	Q_1^{n+1}	Q_0^{n+1}	CO	
0	x	x	x	x	x	x	x	x	0	0	0	0	0	清零 置数
1	0	x	x	\uparrow	d_3	d_2	d_1	d_0	d_3	d_2	d_1	d_0		
1	1	1	1	\uparrow	x	x	x	x	计 数					
1	1	0	x	x	x	x	x	x	保 持					
1	1	x	0	x	x	x	x	x	保 持				0	

$\overline{CR}=1, \overline{LD}=1, CP\uparrow, CT_P=CT_T=1$ 二进制同步加法计数

$\overline{CR}=1, \overline{LD}=1, CT_PCT_T=0$ 保持

若 $CT_T=0$ $CO=0$

若 $CT_T=1$ $CO=Q_3^n Q_2^n Q_1^n Q_0^n$

【题 5-16】 解：

$$(1) S_N = 1010, \quad \overline{CR} = \overline{Q_3 Q_1} \quad S_{N-1} = 1001, \quad \overline{LD} = \overline{Q_3 Q_0}$$

连线如图 5-55 所示。

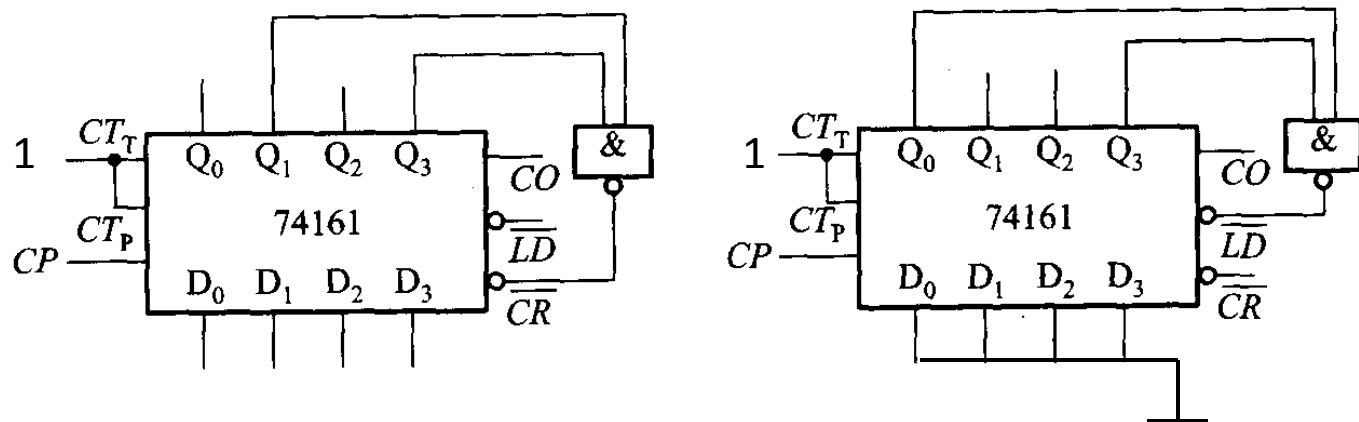


图 5-55

$$(2) S_N = 00111100, \quad \overline{CR} = \overline{Q_5 Q_4 Q_3 Q_2}$$

连线如图 5-56 所示。

$$S_{N-1} = 00111011, \quad \overline{LD} = \overline{Q_5 Q_4 Q_3 Q_1 Q_0}$$

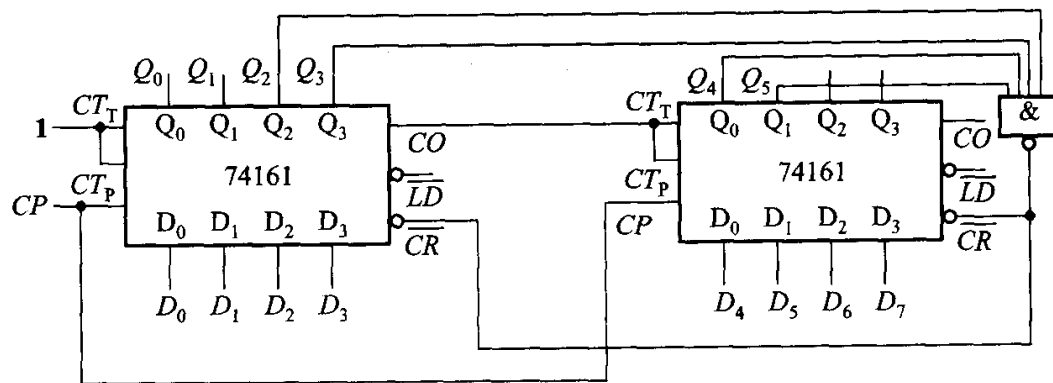


图 5-56

连线如图 5-57 所示。

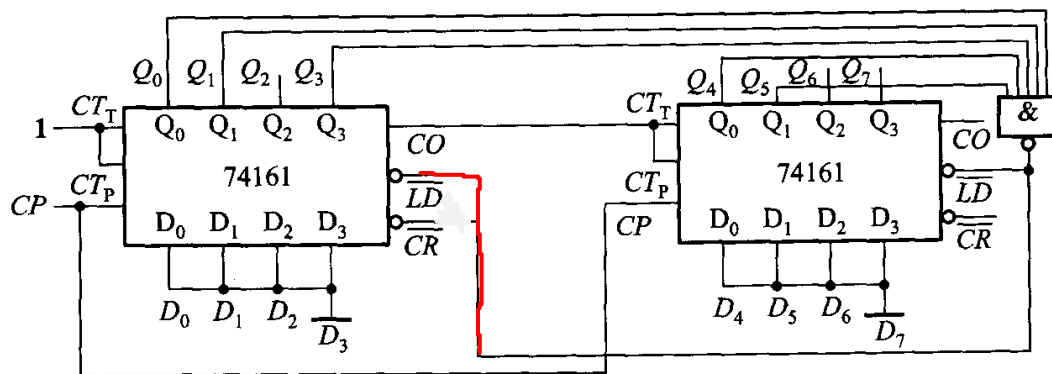


图 5-57

(3) $S_N = 01100100$ 、 $\overline{CR} = \overline{Q_6 Q_5 Q_2}$

连线如图 5-58 所示。

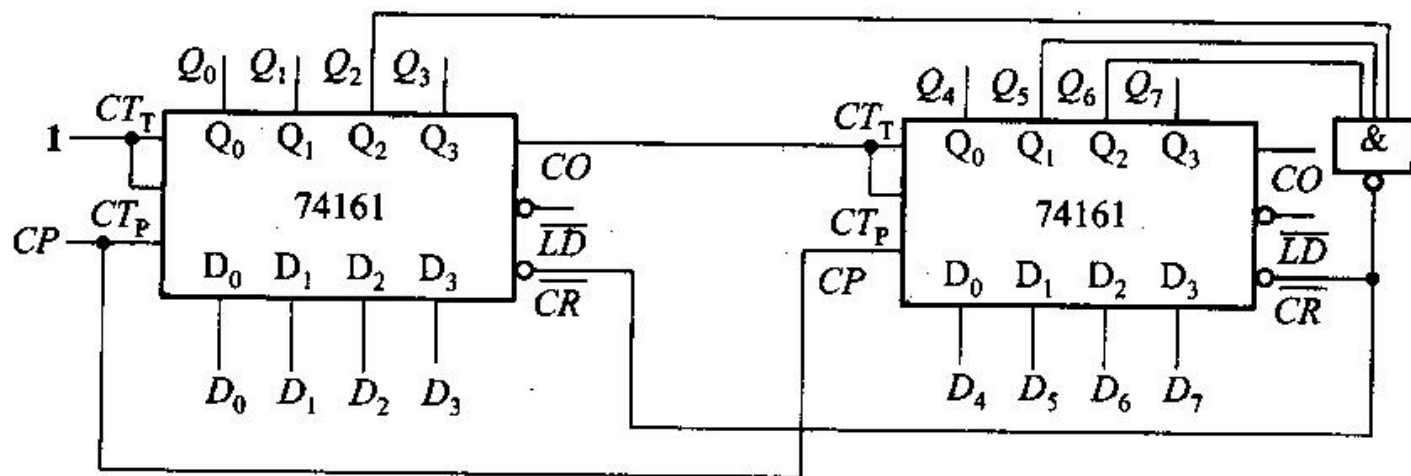


图 5-58

$S_{N-1} = 01100011$ 、 $\overline{CR} = \overline{Q_6 Q_5 Q_1 Q_0}$

连线如图 5-59 所示。

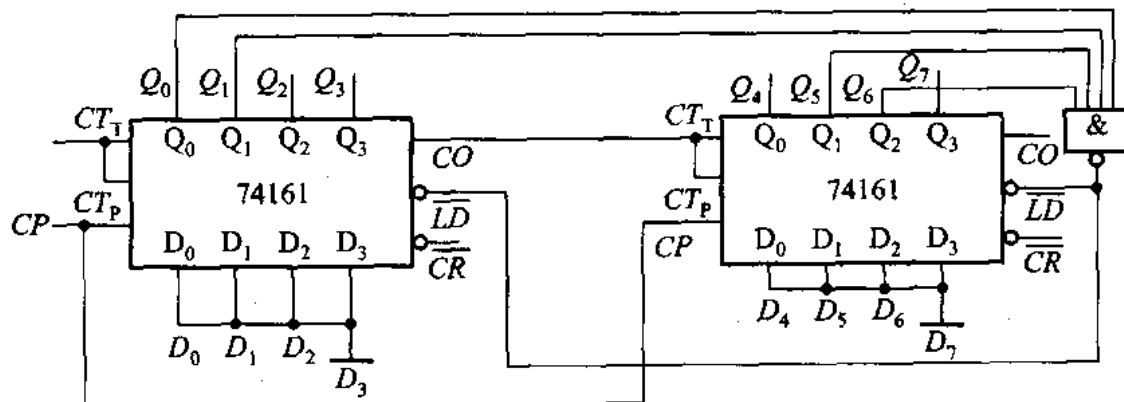
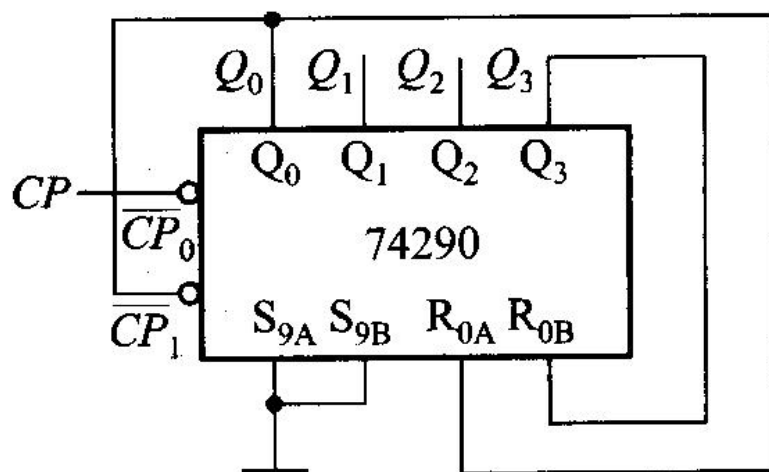


图 5-59

【题 5-17】 解：

$$(1) S_N = S_9 = 1001, \quad R_{0A} R_{0B} = Q_3 Q_0$$

连线如图 5-62 所示。



输入			输出				注
$R_{0A} \cdot R_{0B}$	$S_{9A} \cdot S_{9B}$	CP	Q_3	Q_2	Q_1	Q_0	
1	0	×	0	0	0	0	清零 置9
×	1	×	1	0	0	1	
0	0	↓	计数				CP ₀ =C P CP ₁ =Q ₀

$$(3) \quad S_N = S_{88} = 10001000, \quad R_{0A}R_{0B} = Q_7Q_3$$

连线如图 5-64 所示。

