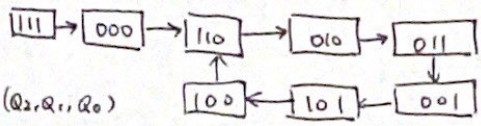
5.30 考虑具有如下逻辑图的计数器：



由此得：

	$Q_{0(n+1)}$				$Q_{1(n+1)}$				$Q_{2(n+1)}$			
$Q_{1n}Q_{0n}$ / Q_{2n}	00	01	11	10	00	01	11	10	00	01	11	10
0	0	1	1	1	0	1	0	0	1	1	0	0
1	0	0	0	0	1	1	0	0	1	1	0	0

$Q_{0(n+1)} = \overline{Q_{2n}} \cdot (Q_{0n}+Q_{1n})$　$Q_{1(n+1)} = \overline{Q_{0n}}$　$Q_{2(n+1)} = \overline{Q_{1n}}$

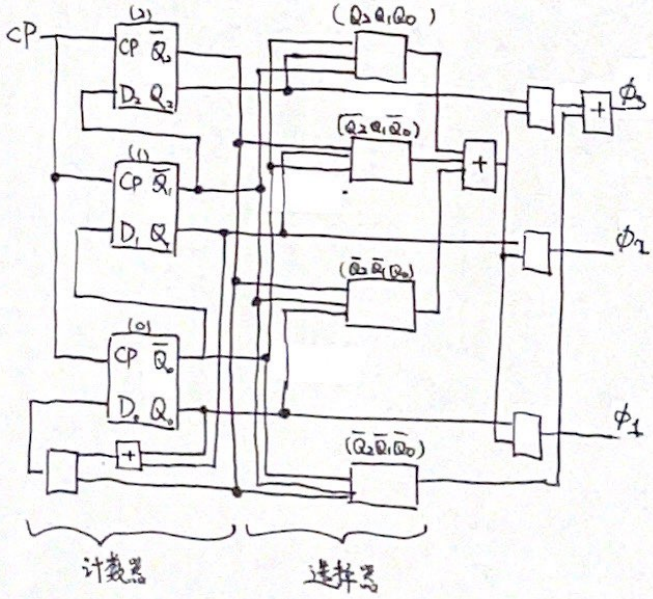
根据表达式可列出对应计数器：001 → 000 → 010

但需要注意，循环的进程应为：000 → 100 → 010

因此要把 110, 011, 101, 111 的新共映射至 000.

而 000 要变为 100，其余不变，故有：

（D触发器中 D=Q）



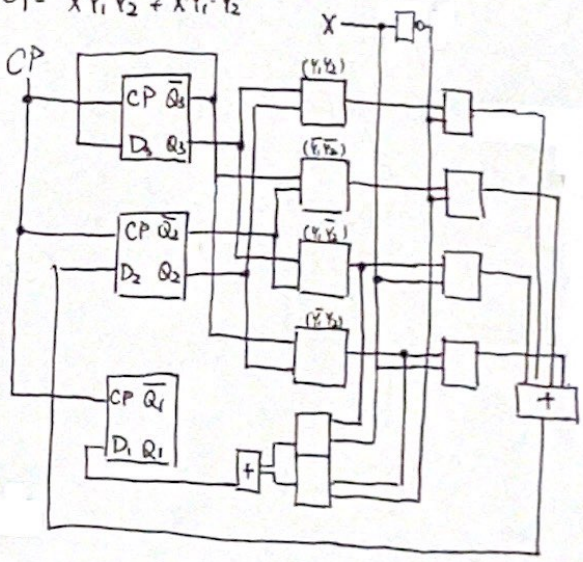
5.32 由状态表：（这里 $D_3=Y_{1,n+1}$，$D_2=Y_{2,n+1}$，$D_1=Z_{n+1}$）

X	Y_{1n}	Y_{2n}	Z_n	$Y_{1,n+1}$	$Y_{2,n+1}$	Z_{n+1}	D_3	D_2	D_1
0	0	0	0	1	1	0	1	1	0
0	1	1	0	0	1	0	0	1	0
0	0	1	0	1	0	1	1	0	1
0	1	0	1	0	0	0	0	0	0
1	0	0	0	1	0	0	1	0	0
1	1	0	0	0	1	1	0	1	1
1	0	1	1	1	1	0	1	1	0
1	1	1	0	0	0	0	0	0	0

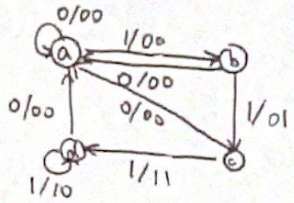
得到激励函数：

$D_3 = \overline{Y_1}$，$D_2 = \overline{X}Y_1Y_2 + \overline{X}\overline{Y_1}\overline{Y_2} + X\overline{Y_1}\overline{Y_2} + X\overline{Y_1}Y_2$

$D_1 = \overline{X}\overline{Y_1}Y_2 + XY_1\overline{Y_2}$



5.33 (1) 最简状态图：



(2) 状态表

Q_n \ X	0	1
a	a,00	b,00
b	a,00	c,01
c	a,00	d,11
d	a,00	d,10

(3) a→00，b→01，c→11，d→10 (Q_1Q_0)

(4)

X	$Q_{1,n}$	$Q_{0,n}$	$Q_{1,n+1}$ (D_1)	$Q_{0,n+1}$ (D_0)	Z	W
0	0	0	0	0	0	0
0	0	1	0	0	0	0
0	1	1	0	0	0	0
0	1	0	0	0	0	0
1	0	0	0	1	0	0
1	0	1	1	1	0	1
1	1	1	1	0	1	1
1	1	0	1	0	1	0

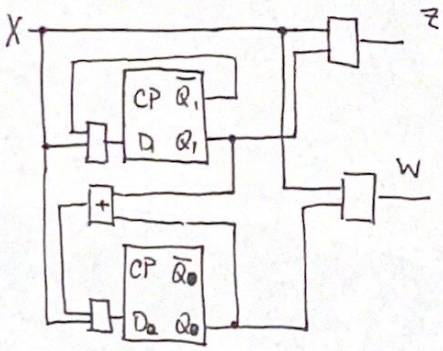
状态方程：$Q_{1,n+1} = X(Q_{1,n} + Q_{0,n})$

$Q_{0,n+1} = X\overline{Q_{1,n}}$

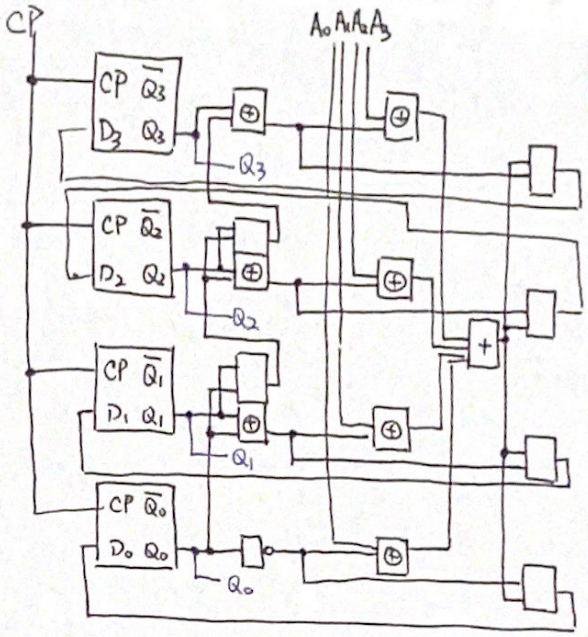
输出方程：$Z = XQ_{1,n}$

$W = XQ_{0,n}$

(5)



D触发器可变模数计数器：（记模数为 $A_3A_2A_1A_0$）



JK触发器可变模数计数器：