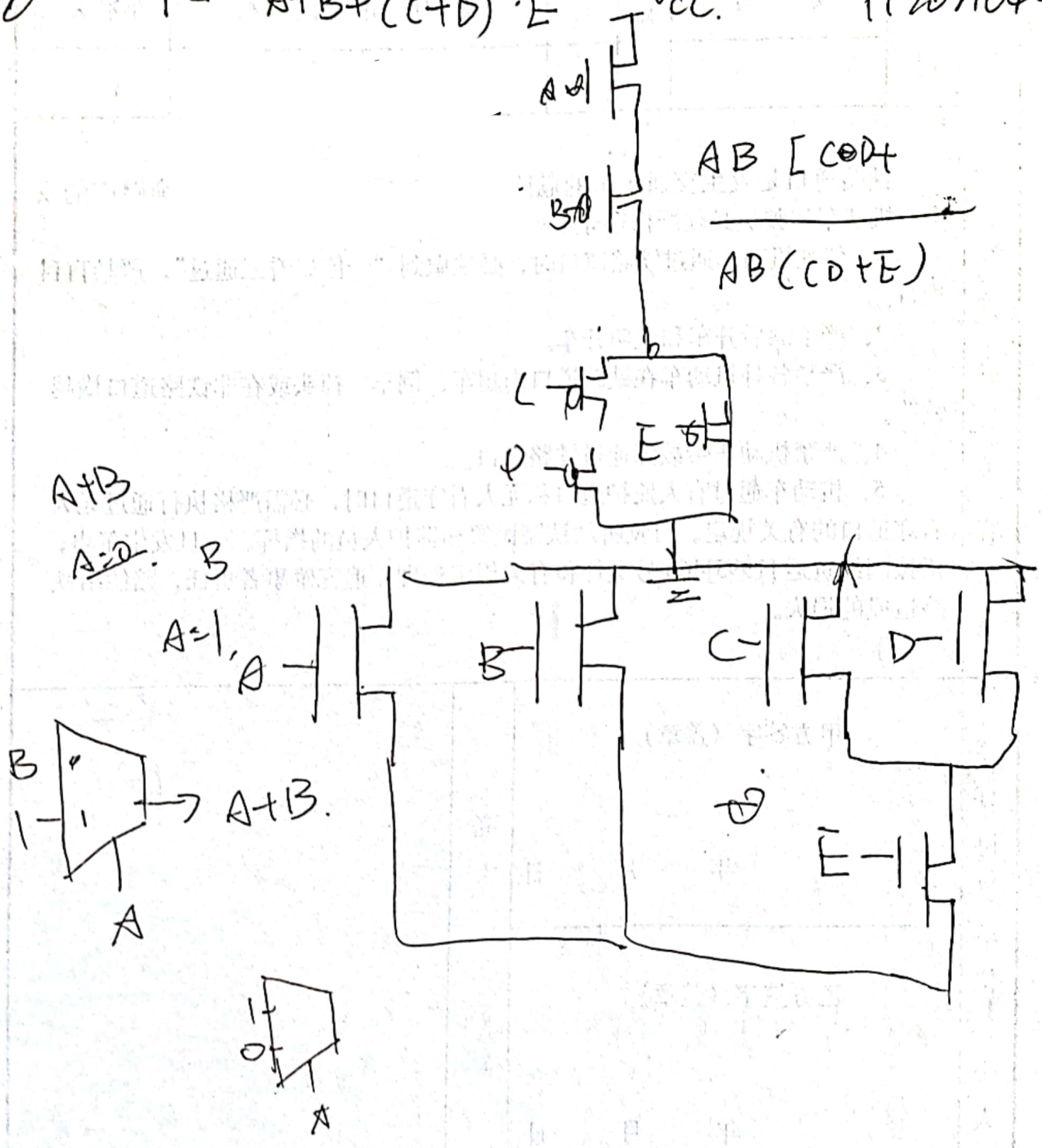
2022年级 数电，开卷 王子雄

b $Y = \overline{A+B+(C+D)\cdot E}$ 1120210446



$$\frac{AB\,[C\oplus D+}{AB(CD+E)}$$

				3 2 1 0	
0	0	0	0	0 0 0 0	0
0	0	0	1	0 0 0 0	1
0	0	1	0	0 0 0 0	2
0	0	1	1	0 0 0 0	3
0	1	0	0	0 0 0 0	4
0	1	0	1	0 0 0 1	5
0	1	1	0	0 0 1 0	6
0	1	1	1	0 0 1 1	7
1	0	0	0	0 0 0 0	8
1	0	0	1	0 0 1 0	9
1	0	1	0	0 1 0 0	10
1	0	1	1	0 1 1 0	11
1	1	0	0	0 0 0 0	12
1	1	0	1	0 0 1 1	13
1	1	1	0	0 1 1 0	14
1	1	1	1	1 0 0 1	15

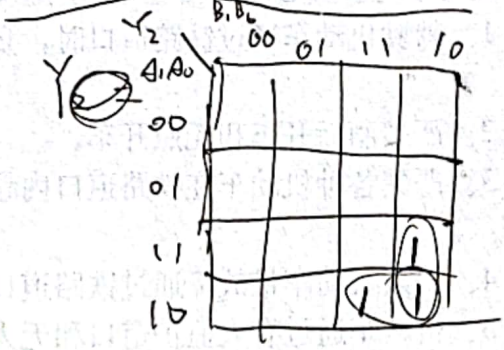
$Y_3 = \Sigma m(15)$.

$Y_2 = \Sigma m(10, 11, 14)$

$Y_1 = \Sigma m(6, 7, 9, 11, 13, 14)$.

$Y_0 = \Sigma m(5, 7, 13, 15)$

$Y_3 = A_1 A_0 B_1 B_0$.



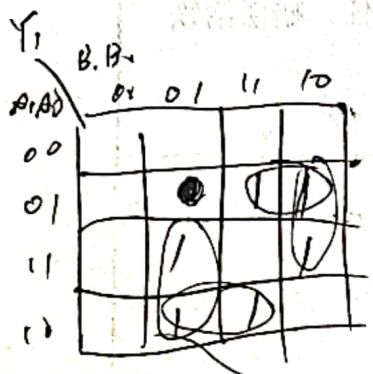
$Y_2 = \overline{A_1 A_0} A_1 \overline{A_0} B_1 + A_1 B_1 \overline{B_0}$

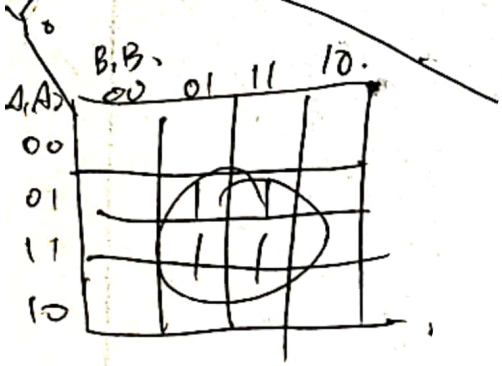
$= A_1 B_1 (\overline{A_0} + \overline{B_0})$

$Y_1 = \overline{A_1} A_0 B_1 + A_0 B_1 \overline{B_0}$

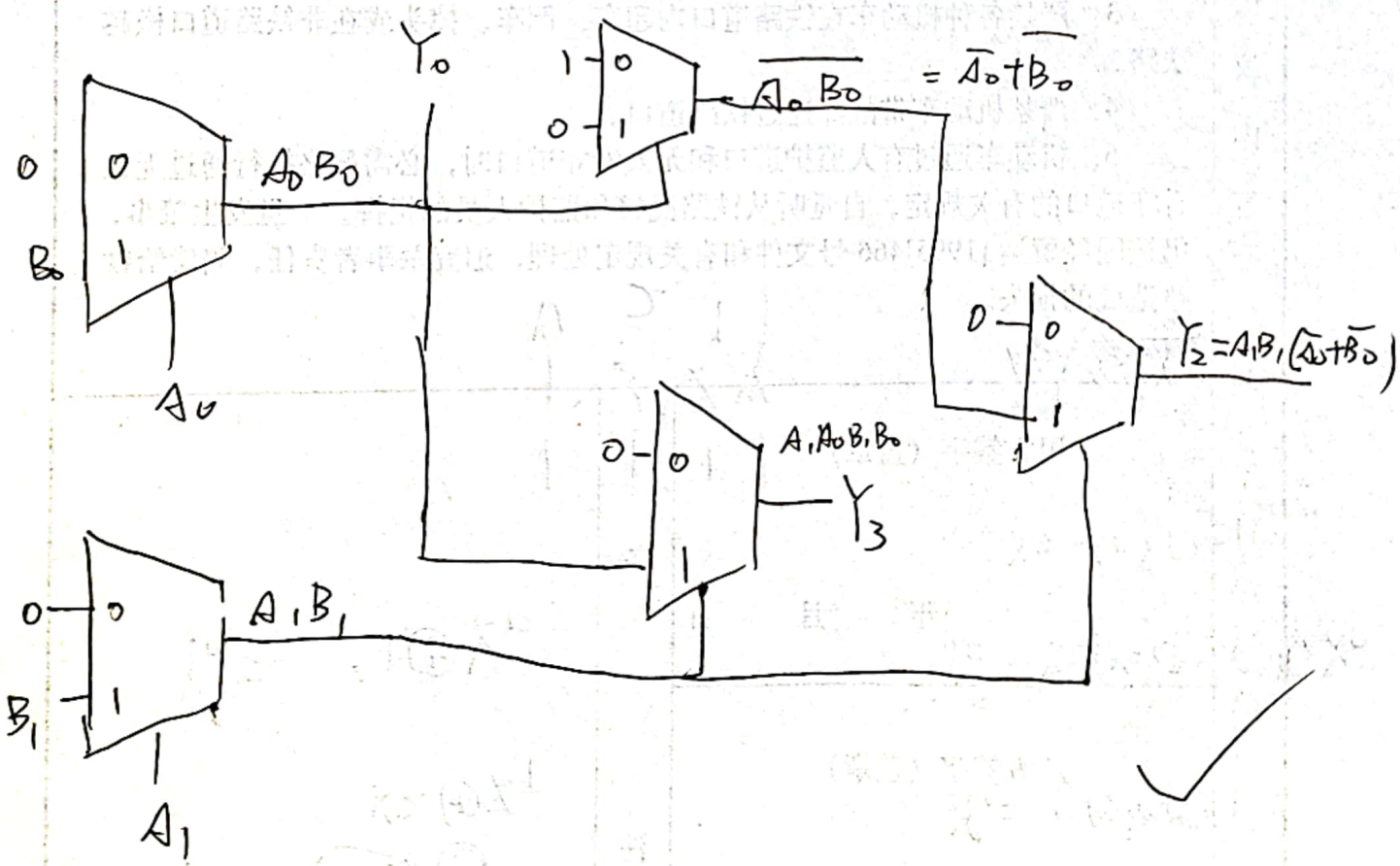
$+ A_1 A_0 B_0 + A_1 \overline{B_1} B_0$

$Y_0 = A_0 B_0$.





$\bar{A}_0 + \bar{B}_0 = \overline{A_0 B_0}$



3.

(1) $Y_3 = X_3$

$Y_2 = X_2 \oplus X_3 = \overline{X_2} X_3 + \overline{X_3} X_2$

$Y_1 = \overline{n X_2} \oplus \overline{\bar{n} Y_2} \oplus X_1$

$= (n X_2 + \bar{n} Y_2) \oplus X_1$

$= [n X_2 + \bar{n} (X_2 \oplus X_3)] \oplus X_1$

$Y_0 = \overline{n X_1} \cdot \overline{\bar{n} Y_1} \oplus X_0$

$= (n X_1 + \bar{n} Y_1) \oplus X_0$

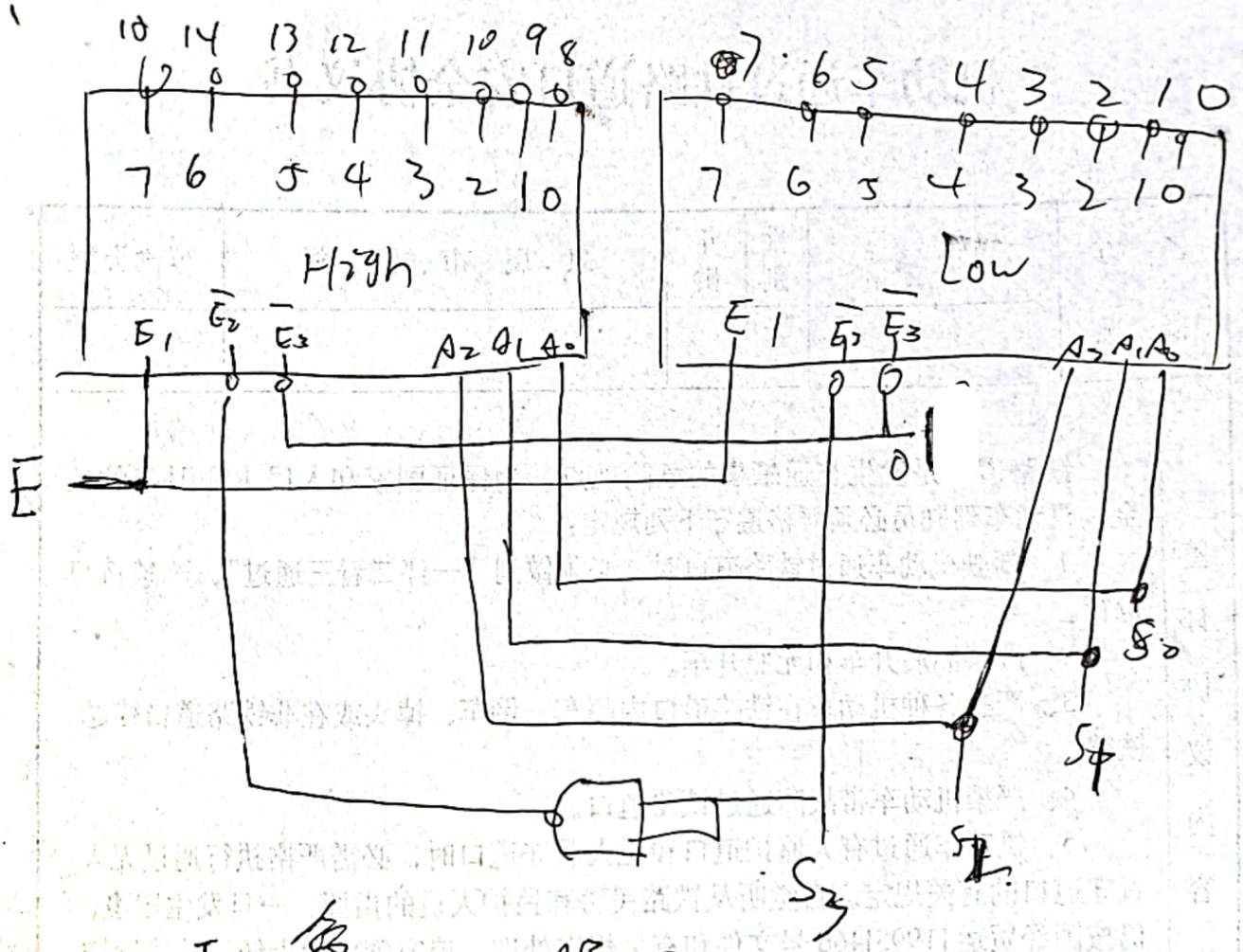
$= [n X_1 + \bar{n} [n X_2 + \bar{n} (X_2 \oplus X_3)]] \oplus X_0$

(2) $n=1$ 时，将 $X_3 X_2 X_1 X_0$ 转为格雷码.

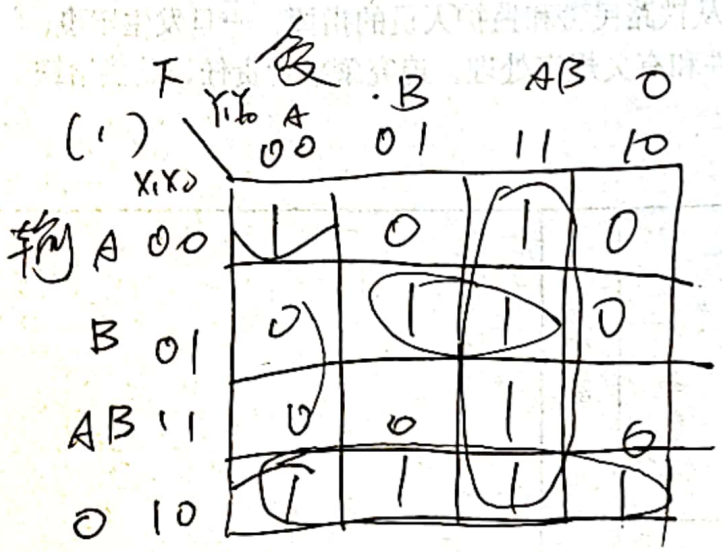
即 $X_3 X_2 X_1 X_0$ 的格雷码为 $Y_3 Y_2 Y_1 Y_0$.

$n=0$ 时，将 $X_3 X_2 X_1 X_0$ 转为二进制码，即解格雷码，即四格雷码 $X_3 X_2 X_1 X_0$ 的二进制码为 $Y_3 Y_2 Y_1 Y_0$.

4、



5、



$F=\sum m($

$F=\sum m(0,3,5,7$

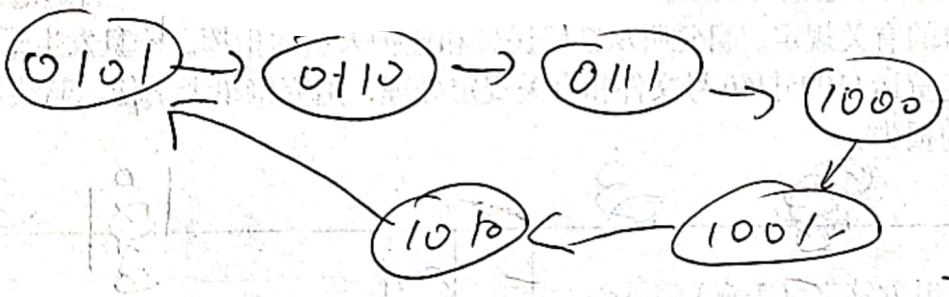
$8,9,10,11,N)$

X_1X_0 \ Y_1Y_0	00	01	11	10
00	1	0	1	0
01	0	1	1	0
11	0	0	1	0
10	1	1	1	1

$$F = (\bar{Y}_0 + \bar{Y}_0)(\bar{X}_1 + \bar{X}_0 + \bar{Y}_1)(X_1 + \bar{Y}_1 + Y_0)$$

$$F = \overline{\bar{X}_0 + Y_0 + \bar{Y}_1 + \bar{X}_0 + Y_1 + X_1 + \bar{Y}_1 + Y_0 + X_1 + X_0 + Y_1 + \bar{Y}_0}$$

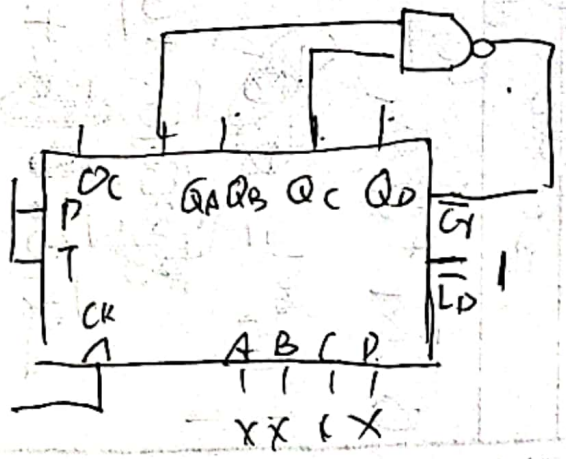
6.



$M = 6$

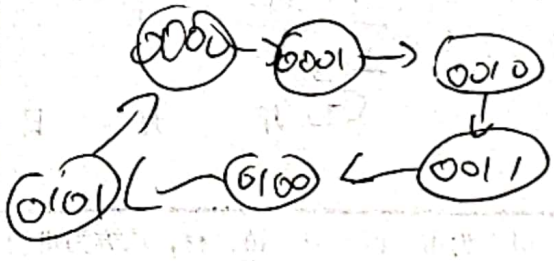
(1) 1010

5, 6, 7, 8, 9, 10. $M = 6$.

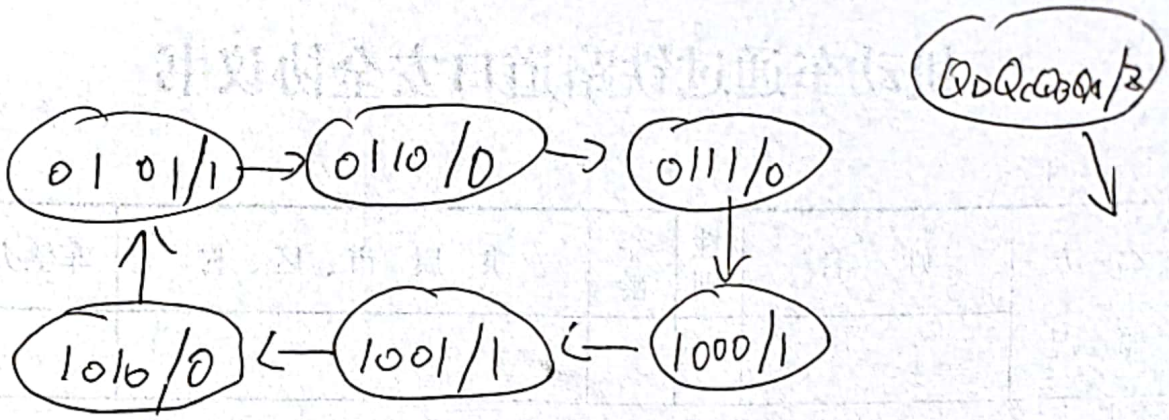


0 – 5

0 1 2 3 4 5 ✓



(2)

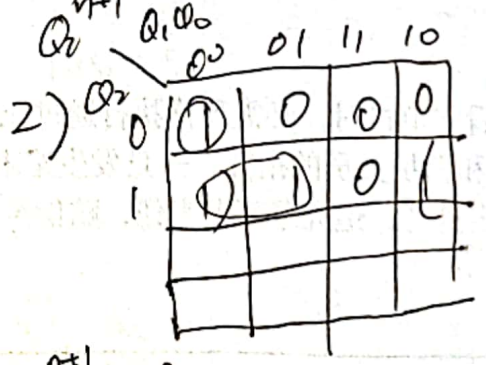


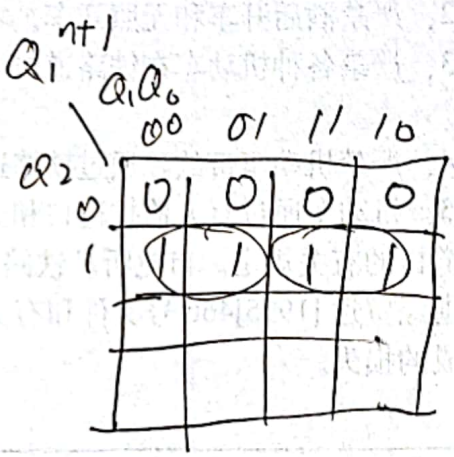
(3) 100 110

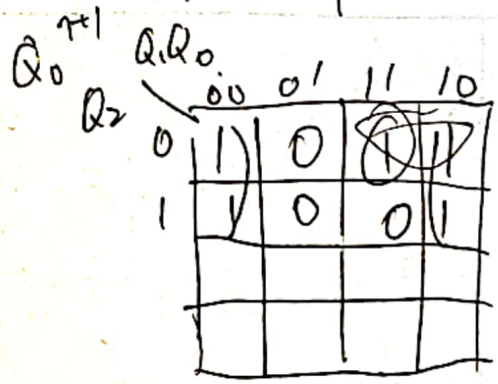
(4) 3

7. 1) b

2)







$J_2 = \bar{Q}_1\bar{Q}_0$

$\bar{K}_2 = \bar{Q}_1 + \bar{Q}_0$

$\Rightarrow K_2 = Q_1Q_0$

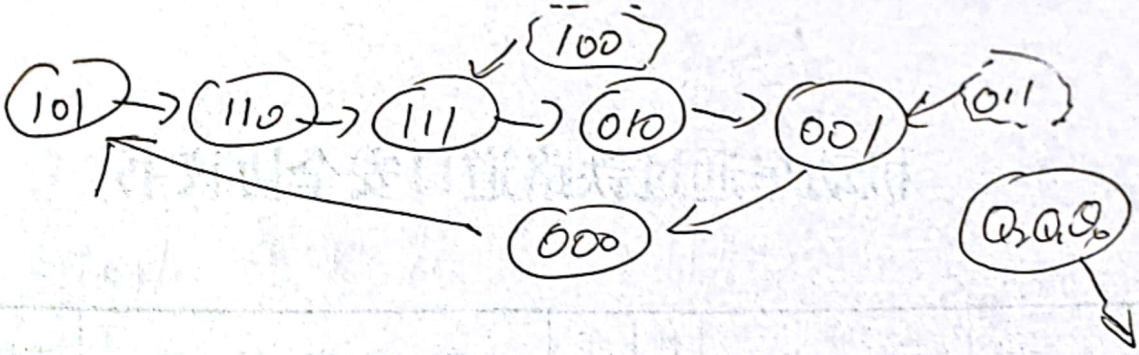
$J_1 = Q_2$

$\bar{K}_1 = Q_2 \Rightarrow K_1 = \bar{Q}_2$

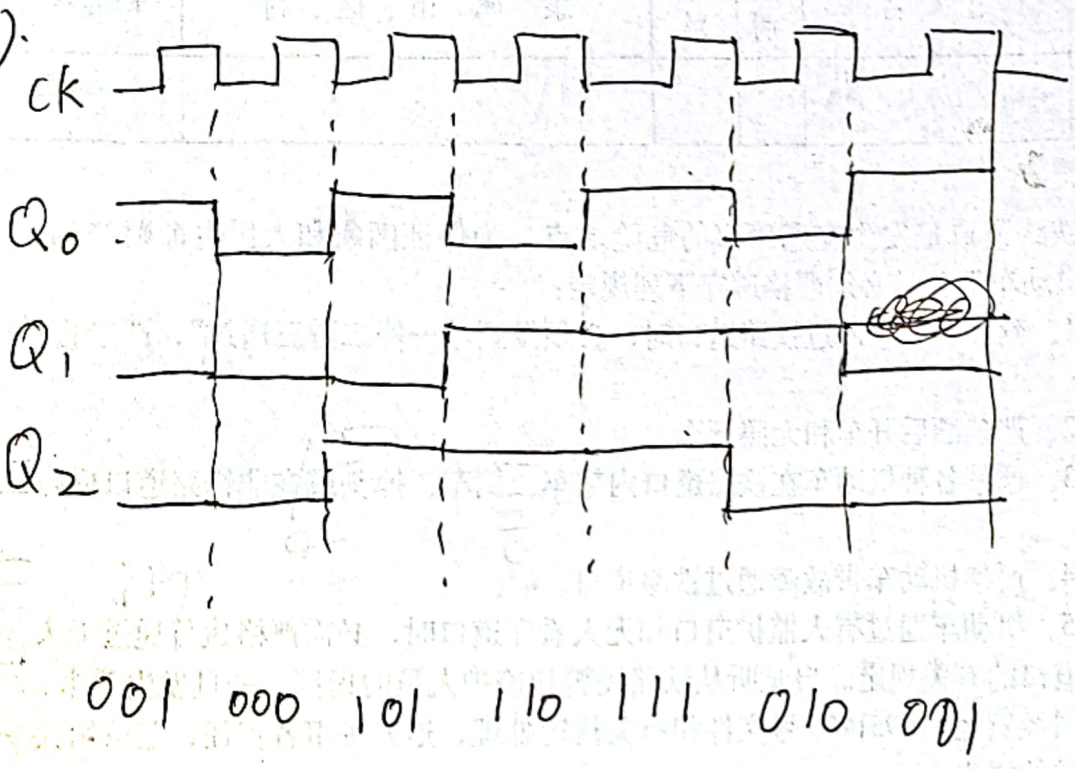
$J_0 = 1$

$\bar{K}_0 = \bar{Q}_2Q_1 \Rightarrow K_0 = Q_2 + \bar{Q}_1$

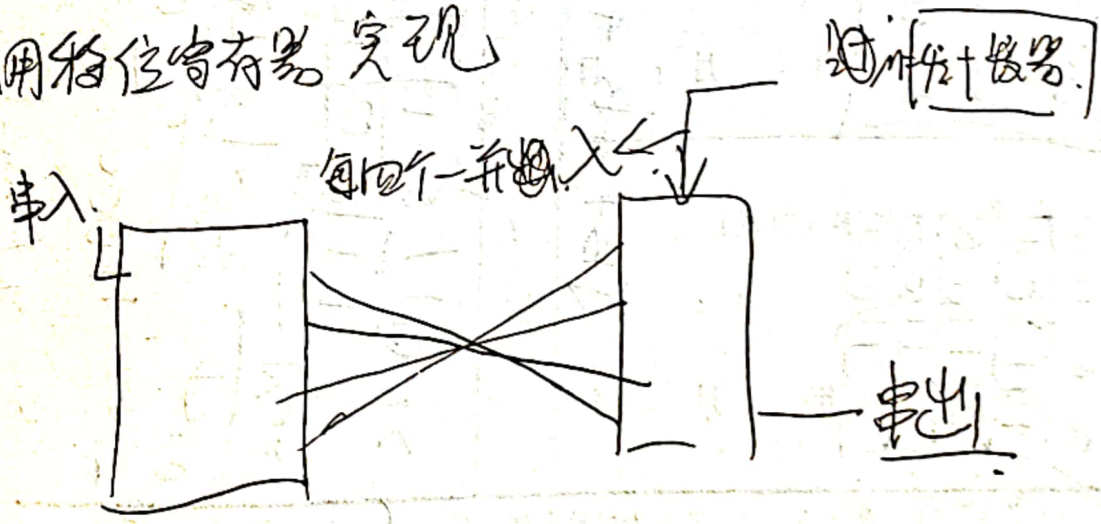
3)



(4)



(5) Q_0 二分频. Q_1, Q_2 三分频

8. 思路：每次存满4个的钟的数据，再反向输出

可以用移位寄存器实现