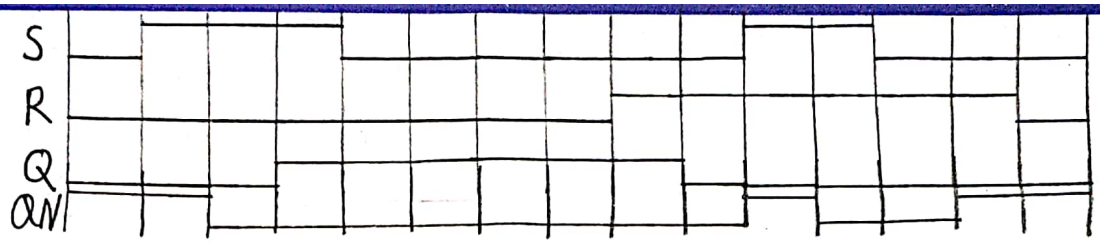
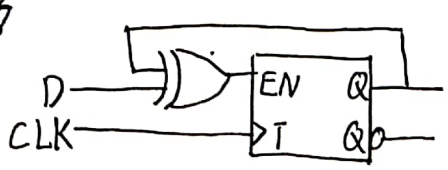
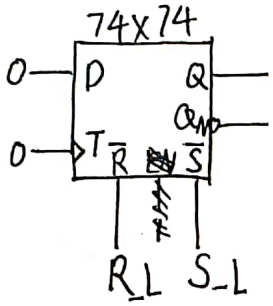
7.4



7.6



7.8



7.12 激励方程：$D_1 = \overline{Q_1} + Q_2$，$D_2 = X \cdot \overline{Q_2}$

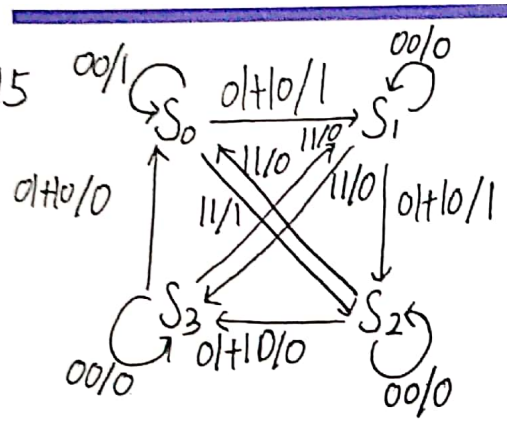
激励/转移表：

现态	X=0	X=1
A	C	D
B	C	C
C	A	B
D	C	C
	$Q_1^* Q_2^*$	

状态/输出表：$Z = Q_1 + \overline{Q_2}$

现态	输出
A	1
B	0
C	1
D	1

7.15



7.18 激励方程：$D_2 = \overline{Q_1+Q_2} \oplus (Q_1 \oplus Q_0)$

$D_1 = Q_2$

$D_0 = Q_1$

激励状态转移表：

现态 $(Q_2Q_1Q_0)$	次态 $(Q_2^*Q_1^*Q_0^*)$
000	100
001	000
010	101
011	001
100	010
101	110
110	111
111	011

状态转输出表：

现态 $(Q_2Q_1Q_0)$	转输出 $(Q_2Q_1Q_0)$
A	B
B	C
C	D
D	E
E	F
F	G
G	H
H	D

7.19. 激励方程：$D_1 = X$

$D_2 = (Q_1 + Y) \cdot \overline{Q_3}$

$D_3 = (\overline{Q_2} \cdot Y) + \overline{Q_1}$

激励/转移表：

现态 $(Q_1Q_2Q_3)$	次态 $(Q_1^*Q_2^*Q_3^*)$ XY			
	00	01	10	11
000	001	011	101	111
001	001	001	101	101
010	001	011	101	111
011	001	001	101	101
100	010	011	110	111
101	000	001	100	101
110	010	010	110	110
111	000	000	100	100
	次态 $(Q_1^* Q_2^* Q_3^*)$			

状态/输出表

现态 $(Q_1Q_2Q_3)$	输出 $(Q_1Q_2Q_3)$
A	A
B	B
C	C
D	D
E	E
F	F
G	G
H	H

7.20 激励方程：$EN_1 = Y$

$EN_2 = \overline{X} \cdot Y \cdot Q_1$

激励转移表：

转移方程为 $Q_1^* = EN_1 \cdot \overline{Q_1} + \overline{EN_1} \cdot Q_1 = Y \cdot \overline{Q_1} + \overline{Y} \cdot Q_1$

$Q_2^* = EN_2 \cdot \overline{Q_2} + \overline{EN_2} \cdot Q_2$

$= \overline{X} \cdot Y \cdot Q_1 \cdot \overline{Q_2} + (X + \overline{Y} + \overline{Q_1}) \cdot Q_2$

现态 (Q_1Q_2)	XY 00	01	10	11
00	00	10	00	10
01	01	11	01	11
10	10	01	10	00
11	11	00	11	01
	次态 $(Q_1^*Q_2^*)$			

状态/输出表：

输出方程：$Z = \overline{X} \cdot \overline{Q_2}$

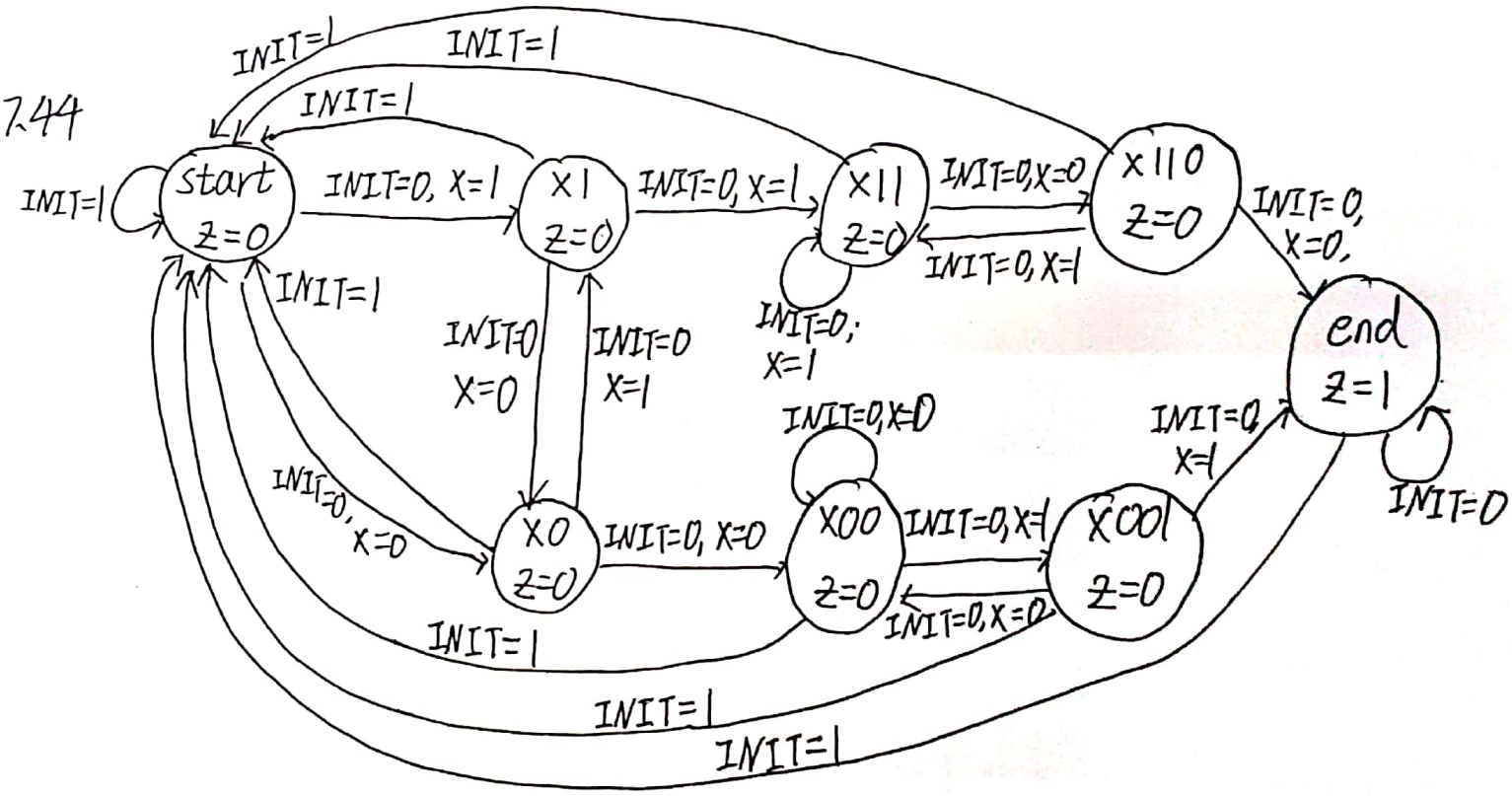
状态 (Q_1Q_2)	X 0	1
A	1	0
B	0	0
C	1	0
D	0	0
	输出 (Z)	

7.43 $t_{Fmax} + 2\cdot\max\{t_{CQmax}, t_{DQmax}\} \leq t_H + t_L$

$t_{setup} < \min\{t_L, t_H\}$

$t_{hold} < \min\{t_L, t_H\}$

7.44



7.46. 卡诺图:

Q_1^*

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

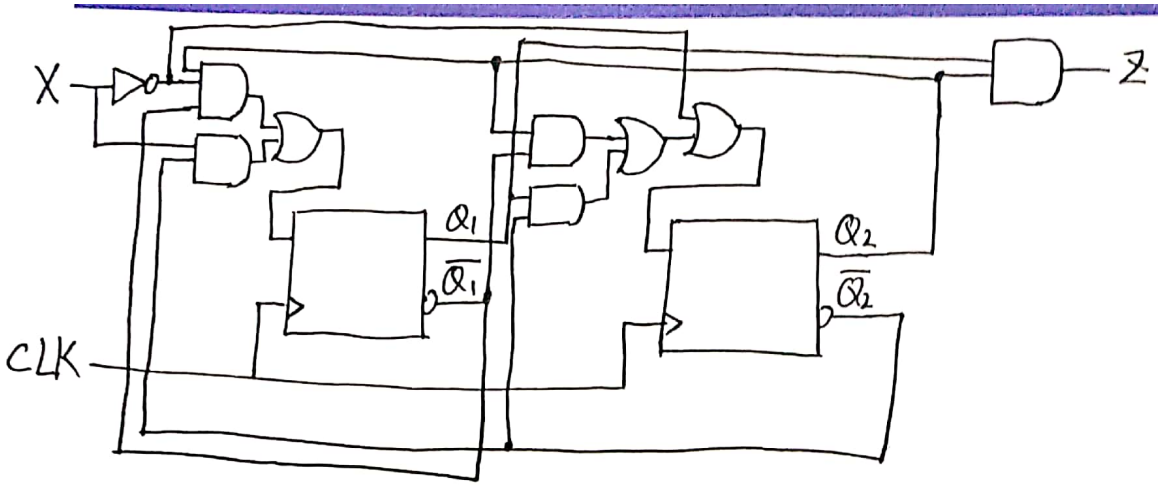
Q_2^*

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

Z

Q_1 \ Q_2	0	1
0	0	0
1	0	1

$D_1 = X\cdot\overline{Q_2} + \overline{X}\cdot\overline{Q_1}\cdot Q_2$ $D_2 = \overline{X} + \overline{Q_1}\cdot Q_2 + Q_1\cdot\overline{Q_2}$ $Z = Q_1\cdot Q_2$



7.47.

$Q_1Q_2Q_3$ \ S	AB = 00	01	11	10	Z
000	001	001	010	010	0
001	011	011	010	010	0
010	001	001	100	100	0
011	011	011	100	010	1
100	001	011	100	100	1

$S^*(Q_1^*Q_2^*Q_3^*)$

D_1:

AB \ $Q_1Q_2Q_3$	000	001	011	010	110	111	101	100
00	0	0	0	0	d	d	d	0
01	0	0	0	0	d	d	d	0
11	0	0	1	1	d	d	d	1
10	0	0	1	0	d	d	d	1

$D_1 = A\cdot\overline{Q_1}\cdot Q_2\cdot Q_3 + A\cdot B\cdot\overline{Q_1}\cdot Q_2 + A\cdot Q_1\cdot\overline{Q_2}\cdot\overline{Q_3}$

D_2:

AB \ $Q_1Q_2Q_3$	000	001	011	010	110	111	101	100
00	0	1	0	1	d	d	d	0
01	0	1	0	1	d	d	d	1
11	1	1	0	0	d	d	d	0
10	1	1	0	1	d	d	d	0

$D_2 = \overline{Q_2}\cdot Q_3 + A\cdot\overline{Q_1}\cdot\overline{Q_2} + \overline{A}\cdot Q_2\cdot\overline{Q_3} + \overline{B}\cdot Q_2\cdot\overline{Q_3} + \overline{A}\cdot B\cdot Q_1$

P_3:

$Q_1Q_2Q_3$ / AB	000	001	011	010	110	111	101	100
00	1	1	1	1	d	d	d	1
01	1	1	1	1	d	d	d	1
11	0	0	0	0	d	d	d	0
10	0	0	0	0	d	d	d	0

$D_3 = A$

z

Q_1 / Q_2Q_3	0	1
00	0	1
01	0	d
11	1	d
10	0	d

$z = Q_1 + Q_2Q_3$

除P_3的激励方程外，成本都要比74194给出的成本要高

整体上成本也要高于74194给出的方程

74148

$Q_1Q_2Q_3Q_4$	AB 00	01	11	10	z
0000	0001	0001	0010	0010	0
0001	0100	0100	0010	0010	0
0010	0001	0001	1000	1000	0
0100	0100	0100	1000	0010	1
1000	0001	0100	1000	1000	1
	$Q_1^*Q_2^*Q_3^*Q_4^*$				

D_1:

$Q_1Q_2Q_3Q_4$ \ AB	00	01	11	10
0000	0	0	0	0
0001	0	0	0	0
0011	d	d	d	d
0010	0	0	1	1
0110	d	d	d	d
0111	d	d	d	d
0101	d	d	d	d
0100	0	0	1	0
1100	d	d	d	d
1101	d	d	d	d
1111	d	d	d	d
1110	d	d	d	d
1010	d	d	d	d
1011	d	d	d	d
1001	d	d	d	d
1000	0	0	1	1

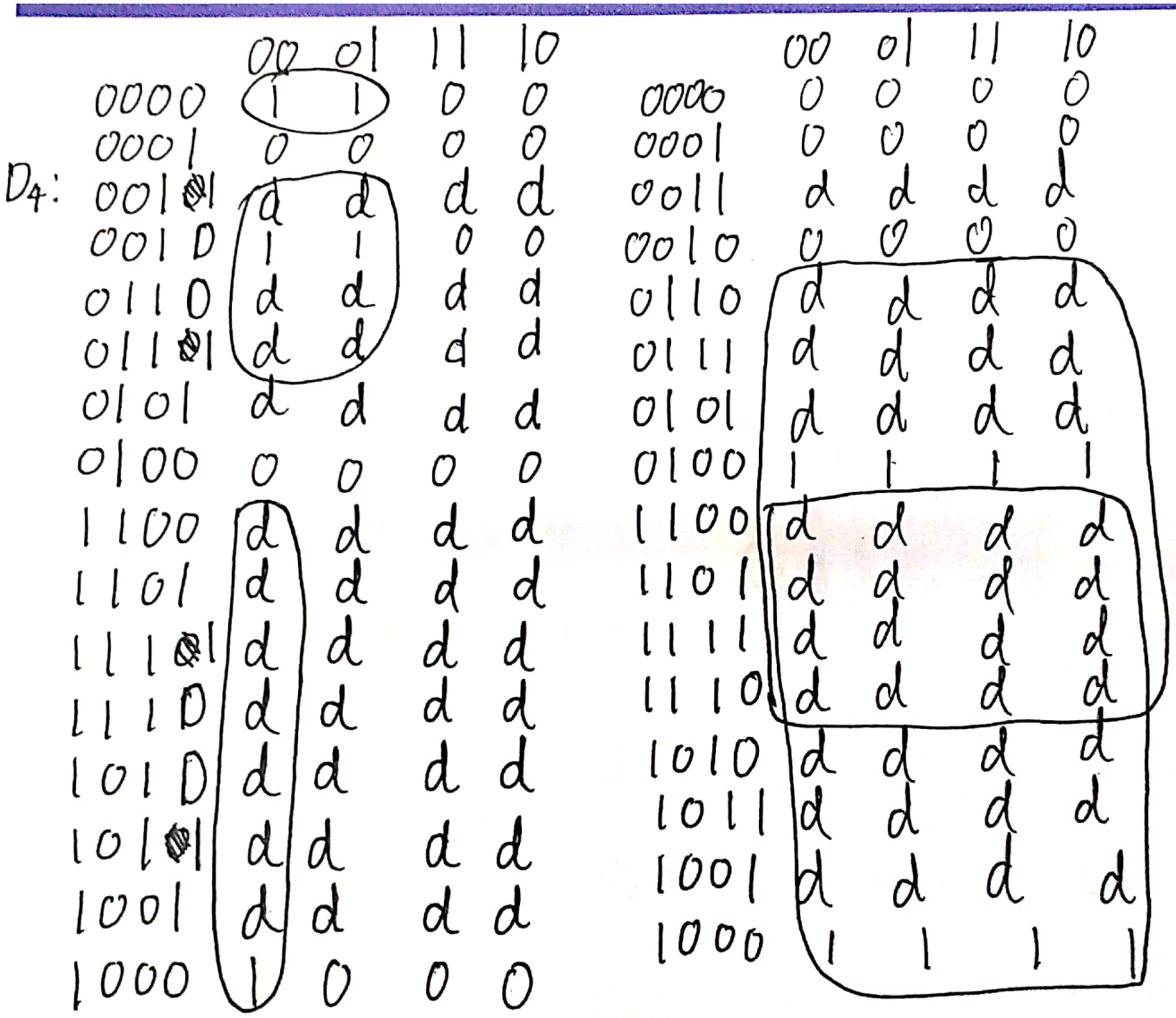
$$D_1 = A\cdot\overline{Q_1}\cdot Q_3 + A\cdot B\cdot Q_2 + A\cdot Q_4$$

	00	01	11	10
0000	0	0	1	1
0001	0	0	1	1
0011	d	d	d	d
0010	0	0	0	0
0110	d	d	d	d
0111	d	d	d	d
0101	d	d	d	d
0100	0	0	0	1
1100	d	d	d	d
1101	d	d	d	d
1111	d	d	d	d
1110	d	d	d	d
1010	d	d	d	d
1011	d	d	d	d
1001	d	d	d	d
1000	0	0	0	0

$$D_3 = A\cdot\overline{Q_1}\cdot\overline{Q_2}\cdot\overline{Q_3} + A\overline{B}\cdot Q_2$$

	00	01	11	10
0000	0	0	0	0
0001	1	1	0	0
0011	d	d	d	d
0010	0	0	0	0
0110	d	d	d	d
0111	d	d	d	d
0101	d	d	d	d
0100	1	1	0	0
1100	d	d	d	d
1101	d	d	d	d
1111	d	d	d	d
1110	d	d	d	d
1010	d	d	d	d
1011	d	d	d	d
1001	d	d	d	d
1000	0	1	0	0

$$D_2 = \overline{A}\cdot\overline{B}\cdot\overline{Q_2}\cdot\overline{Q_4} + \overline{A}\cdot\overline{B}\cdot Q_2 + \overline{A}\cdot B\cdot Q_1$$



$$D_4=\overline{A}\cdot\overline{Q}_1\overline{Q}_2\overline{Q}_3\overline{Q}_4+\overline{A}\cdot\overline{Q}_1\cdot Q_3+\overline{A}\cdot\overline{B}\cdot Q_1$$

$$Z=Q_1+Q_2$$

与74.4节相比，输出逻辑成本不变

激励逻辑成本较高

7.54

$Q_1Q_2Q_3$	X=0	X=1
A 000	001, 01	000, 00
B 001	001, 00	011, 01
C 011	001, 00	010, 01
D 010	110, 01	000, 00
E 110	001, 00	111, 01
F 111	001, 00	101, 01
G 101	110, 00	100, 01
H 100	001, 00	000, 00

$Q_1^*Q_2^*Q_3^*$, UNLK, HINT

D_3 卡诺图（Q_1Q_2 \ Q_3X）：

Q_1Q_2 \ Q_3X	00	01	11	10
00	1	0	1	1
01	0	0	0	1
11	1	1	1	1
10	1	0	0	0

$$D_3 = Q_1Q_2 + \bar{X}\cdot\bar{Q_2}\cdot\bar{Q_3} + \bar{Q_1}\bar{Q_2}Q_3 + \bar{X}\cdot\bar{Q_1}\cdot Q_3$$

D_1 卡诺图（Q_1Q_2 \ Q_3X）：

Q_1Q_2 \ Q_3X	00	01	11	10
00	0	0	0	0
01	1	0	0	0
11	0	1	1	0
10	0	0	1	1

$$D_1 = \bar{X}\cdot\bar{Q_1}Q_2\cdot\bar{Q_3} + X\cdot Q_1Q_2 + Q_1\bar{Q_2}\cdot Q_3$$

与课本相比：

D_1 成本相同

D_2 成本升高

D_3 成本节约低

整体成本与课本方案要高

D_2 卡诺图（Q_1Q_2 \ Q_3X）：

Q_1Q_2 \ Q_3X	00	01	11	10
00	0	0	1	0
01	1	0	1	0
11	0	1	0	0
10	0	0	0	1

$$D_2 = \bar{X}\cdot\bar{Q_1}Q_2\cdot\bar{Q_3} + X\cdot Q_1Q_2\bar{Q_3} + \bar{X}\cdot Q_1\bar{Q_2}\cdot Q_3 + X\cdot\bar{Q_1}Q_3$$