

数字电路与数字系统

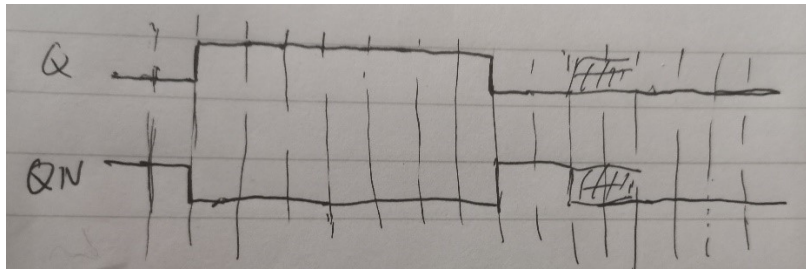
第七章作业

姓名:

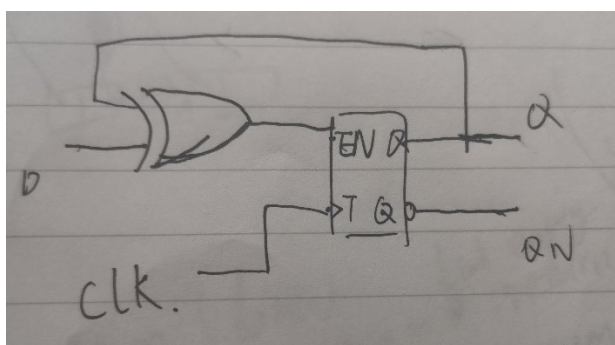
学号:

邮箱:

4.



6.



8.

??? 不会???

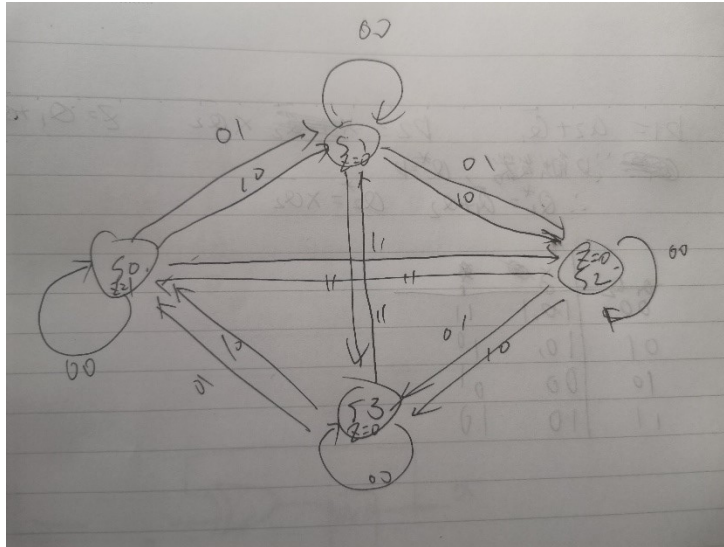
R 接 PR_L, S 接 CLR_L, 但是 S, R 都为 0 的时候出错...

12.

$D_1 = Q_2 + \bar{Q}_1$ $D_2 = \bar{Q}_2 \times Q_2$ $Z = Q_1 + Q_2$
 1. D 触发器, $Q^* = D$
 $\therefore Q_1^* = Q_2 + Q_1$ $Q_2^* = \bar{Q}_2 \times Q_2$

$Q_1 Q_2$	Q_1^*	Q_2^*	A	B	C	D	Z
00	10, 1	11, 1	A	C	D	1	1
01	10, 0	10, 0	B	C	C	0	0
10	00, 1	01, 0	C	A	B	1	1
11	10, 1	10, 1	P	C	C	1	1

15.



18.

$$D_0 = Q_1, D_1 = Q_2, D_2 = (Q_0 \oplus Q_1) \oplus (Q_1 \oplus Q_2)$$

$$= (Q_0 \oplus Q_1) \oplus (Q_1 \oplus Q_2)$$

$Q_2 Q_1 Q_0$	$(Q_2 Q_1 Q_0)^*$	S	S^*
0 0 0	1 0 0	A	E
0 0 1	0 0 0	B	A
0 1 0	1 0 1	C	F
0 1 1	0 0 1	D	B
1 0 0	0 1 0	E	C
1 0 1	1 1 0	F	G
1 1 0	1 1 1	G	H
1 1 1	0 1 1	H	D

19.

$D1 = X$, $D2 = Q_3'(Q_1 + Y)$, $D3 = (Y \cdot Q_2') + Q_1'$

$Q_3 Q_2 Q_1$	$Q_3^* Q_2^* Q_1^*$	$Q_3^* Q_2^* Q_1^*$	$Q_3^* Q_2^* Q_1^*$	$Q_3^* Q_2^* Q_1^*$
000	100	110	101	111
001	010	110	011	111
010	100	110	101	111
011	010	010	011	011
100	100	100	101	101
101	000	100	001	101
110	100	100	101	101
111	000	000	001	001

$Q_3 Q_2 Q_1$	$Q_3^* Q_2^* Q_1^*$	$Q_3^* Q_2^* Q_1^*$	$Q_3^* Q_2^* Q_1^*$	$Q_3^* Q_2^* Q_1^*$
A	E	G	F	H
B	C	G	D	H
C	E	G	F	H
D	C	C	D	D
E	E	E	F	F
F	A	E	B	F
G	E	E	F	F
H	A	A	B	B

20.

$EN1 = Y$, $EN2 = Y \cdot Q_1 \cdot X'$, $Z = X' \cdot Q_2'$
 触发器: $Q_i^* = EN \bar{Q}_i + \bar{EN} \cdot Q_i$
 $Q_1^* = Y \cdot Q_1' + Y' \cdot Q_1$
 $Q_2^* = X' Y Q_1 Q_2' + (X Y Q_1)' Q_2$

$Q_2 Q_1$	$Q_2^* Q_1^*$	$Q_2^* Q_1^*$	$Q_2^* Q_1^*$	$Q_2^* Q_1^*$
00	00,1	01,1	00,0	01,0
01	01,1	10,1	01,0	00,0
10	10,0	11,0	10,0	11,0
11	11,0	00,0	11,0	10,0

S	S^*	S^*	S^*	S^*
A	A,1	C,1	A,0	C,0
B	B,0	D,0	B,0	D,0
C	C,1	B,1	C,0	A,0
D	D,0	A,0	D,0	B,0

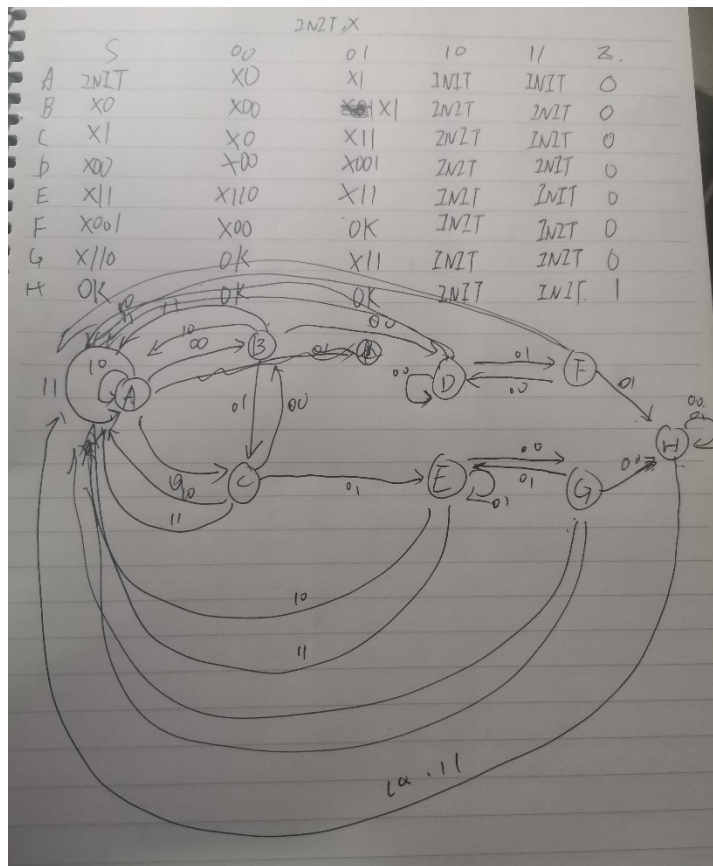
43.

$$t_H < t_{CQmin} + t_{Fmin} - t_{hold}$$

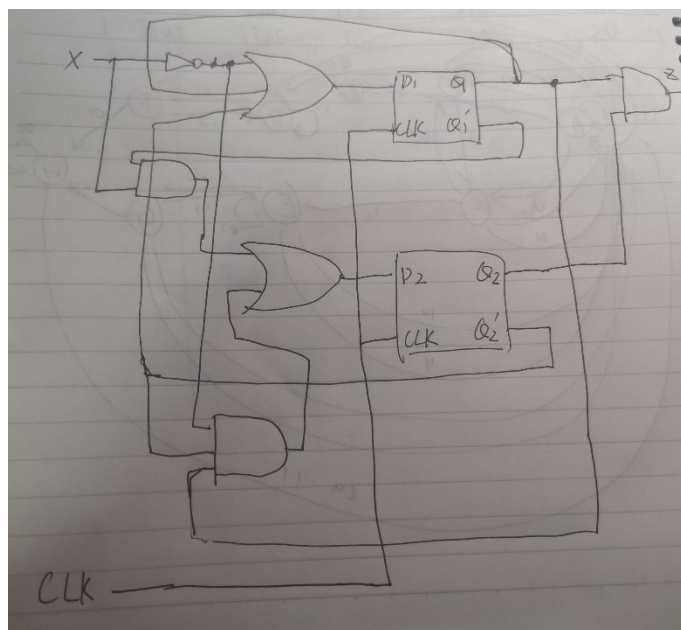
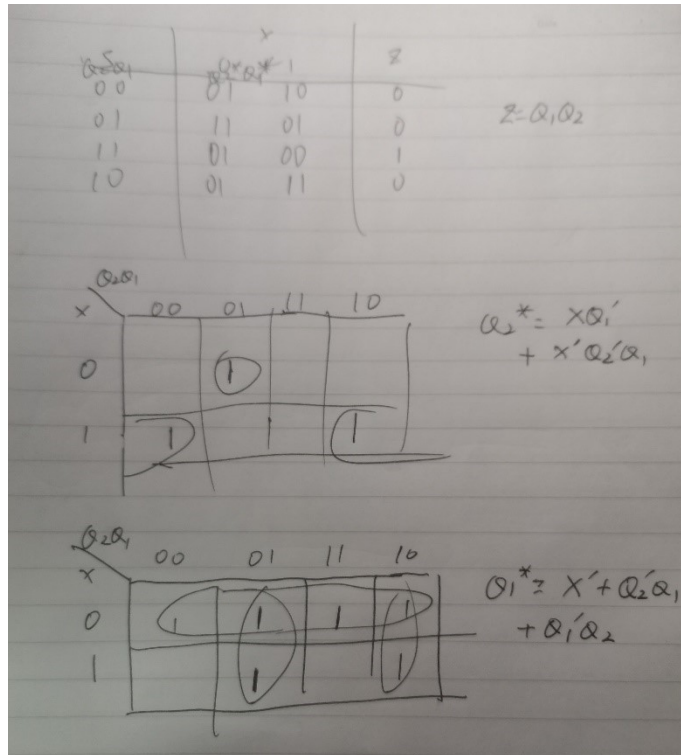
$$\max\{t_{CQmax}, t_{DQmax}\} + t_{Fmax} < t_H + t_L$$

$$t_H > t_{setup}$$

44.



46.



47.

$Q_1 Q_2 Q_3$	00	01	11	10
100	0	0	1	1
000	0	0	0	0
001	0	0	0	0
011	0	0	1	0
010	0	0	1	0

$$Q_1^* = Q_3 A + Q_1' Q_2 A B$$

	00	01	11	10
100	0	1	0	0
000	0	0	1	1
001	1	1	1	1
011	1	1	0	0
010	0	0	0	0

$$Q_2^* = Q_1 Q_2' Q_3' A B + Q_1' Q_2 Q_3 A B' + Q_1' Q_3 A' + Q_1' Q_2' A$$

	00	01	11	10
100	1	1	0	0
000	1	1	0	0
001	1	1	0	0
011	1	1	0	0
010	1	1	0	0

$$Q_3^* = Q_2' Q_3' A' + A' Q_1' Q_3 + A' Q_1' Q_2 Q_3'$$

48.

S	00	01	11	10
0000	0001	0001	0010	0010
0001	0100	0100	0110	0110
0010	0001	0001	1000	1000
0100	0100	0100	1000	1000
1000	0001	0100	1000	1000

54.

S	X	
	0	1
000	001,01	000,00
001	001,00	011,01
011	001,00	010,01
010	110,01	000,00
110	001,00	111,01
111	001,00	101,01
101	110,00	100,01
100	001,11	000,00

$$V_1 = a_1 a_2' a_3 + x a_1 a_2 + x' a_1' a_2 a_3'$$

$$V_2 = x' a_1' a_2 a_3' + x a_1 a_2 a_3' + x a_1 a_2' a_3$$

$$+ x a_1' a_3$$

$$V_3 = a_1 a_2 + x' a_1' a_3 + x' a_2' a_3' + a_1' a_2' a_3$$