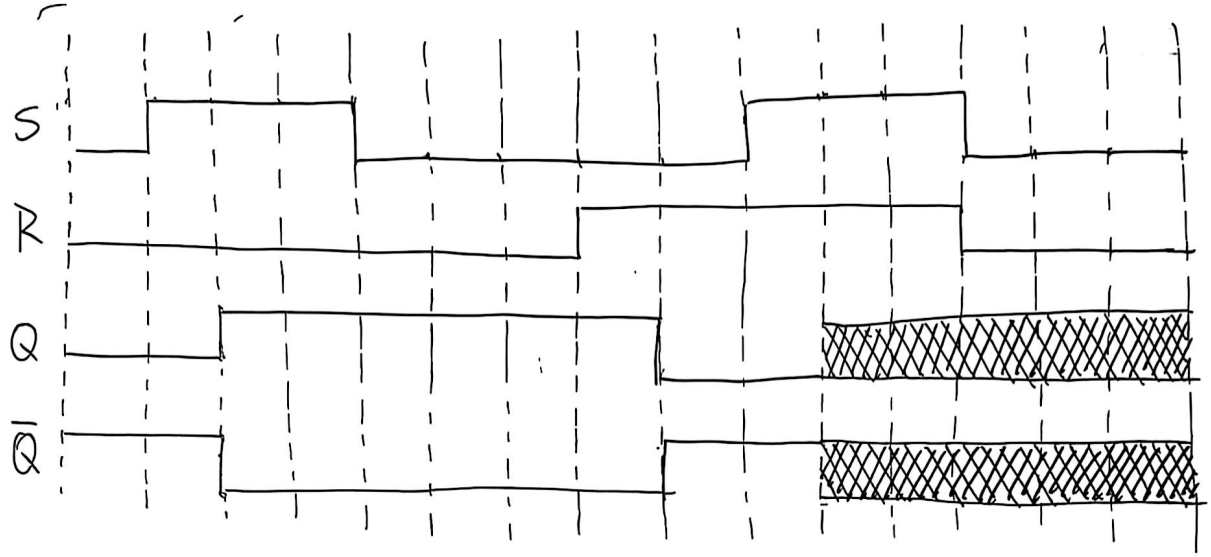
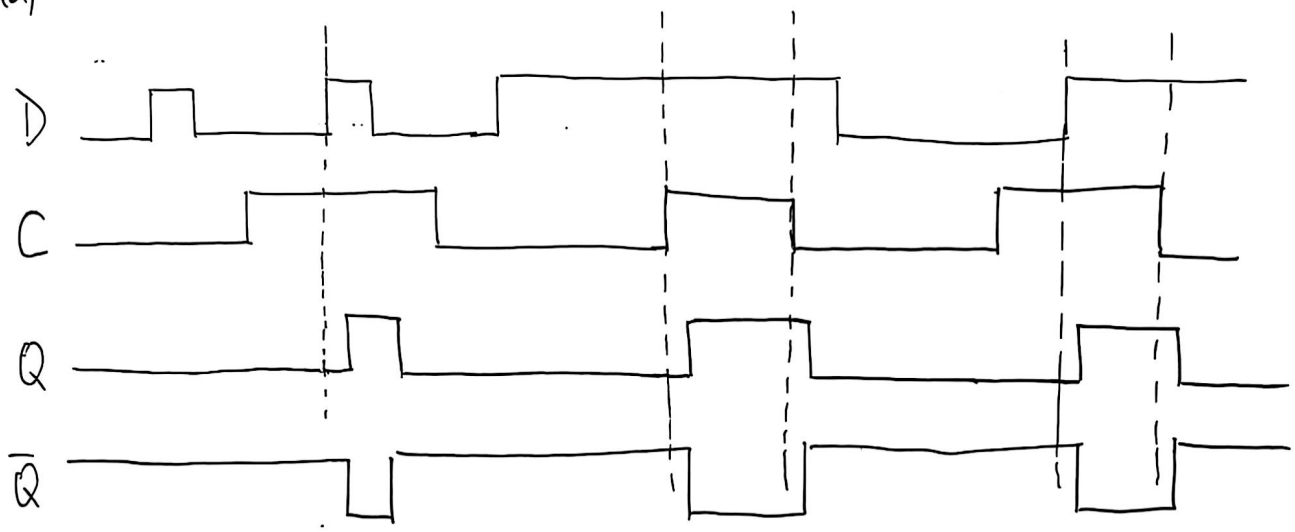
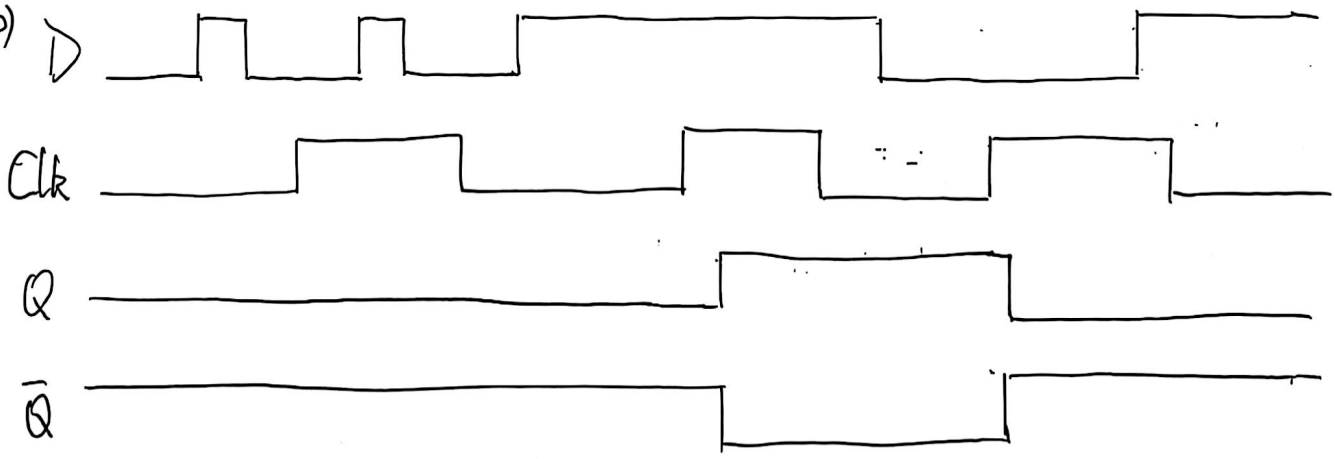
4.



5. (a)



(b)



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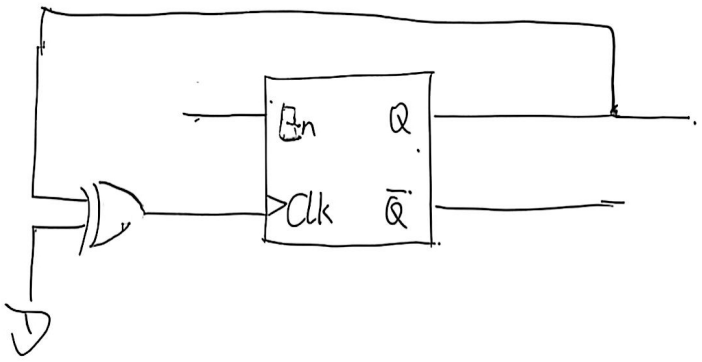
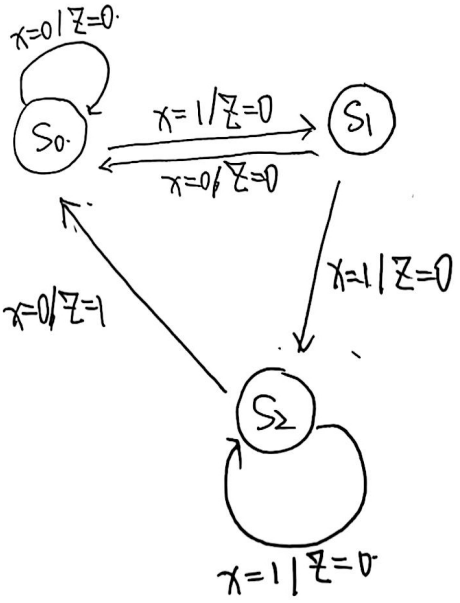
6.

$Q_{next} = T \oplus Q$.

$T = D \oplus Q$.



7.



现态Y	次态Y*/输出Z	
	x=0	x=1
S_0(初态)	S_0/Z=0	S_1(Z=0)
S_1(接收到1)	S_0(Z=0)	S_2(Z=0)
S_2(接收到11)	S_0(Z=1)	S_1(Z=0)

Y_1Y_0	$Y_1^*Y_0^*$/Z	
	x=0	x=1
00	00/Z=0	01/Z=0
01	00/Z=0	11/Z=0
11	00/Z=1	01/Z=0

$Y_1^* = \overline{Y_1} \cdot Y_0 \cdot X$

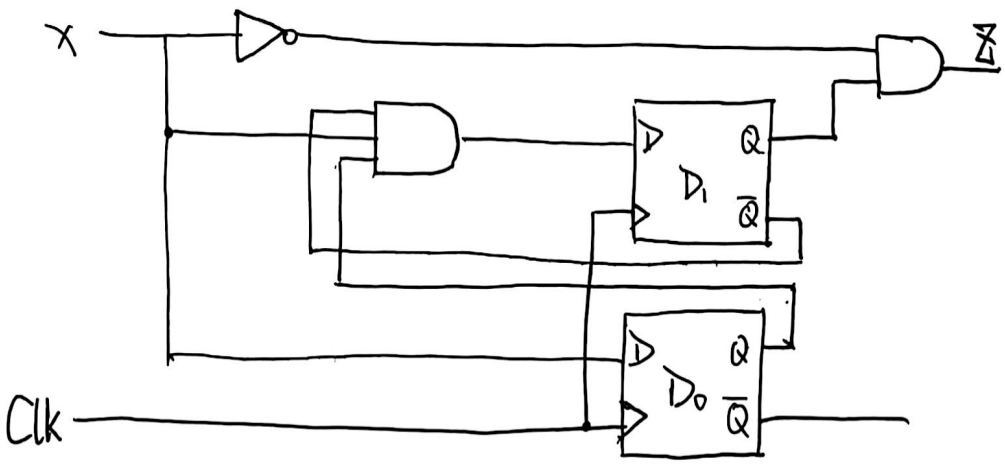
$Y_0^* = X$

$Z = Y_1 \cdot \overline{X}$

$D_1 = \overline{Y_1} \cdot Y_0 \cdot X$

$D_0 = X$

$Z = Y_1 \cdot \overline{X}$



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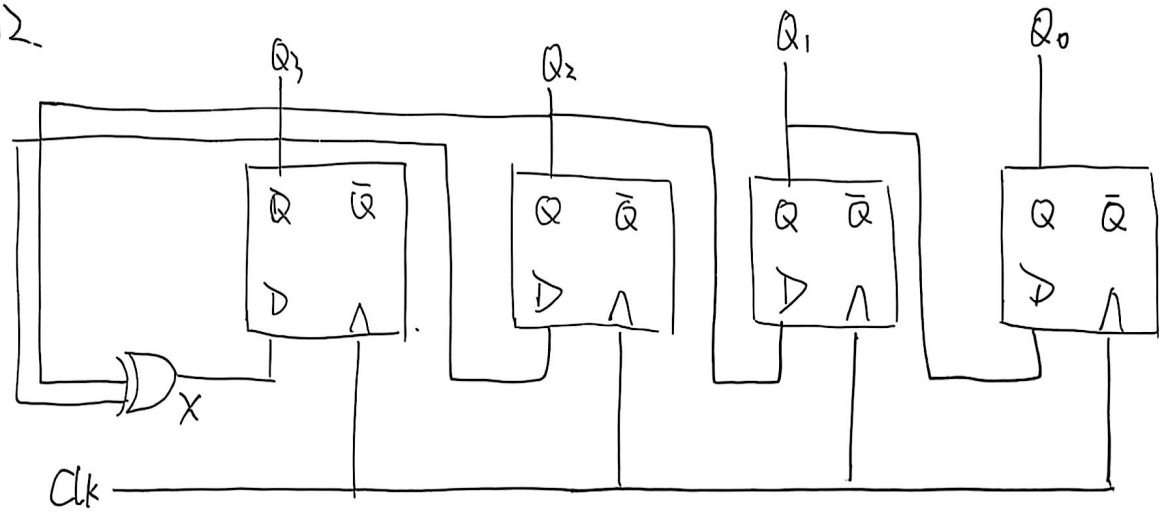
11. $t_{clk} \geq T_{tq} + T_{and} + T_{setup}$

12.



Clk	X	$Q_3Q_2Q_1Q_0$	Clk	X	$Q_3Q_2Q_1Q_0$
t_0	1	1000	t_4	0	1101
t_1	0	1100	t_5	1	0110
t_2	1	0110	t_6	1	1011
t_3	1	1011	t_7	0	1101

经过3个时钟周期，$Q_3Q_2Q_1Q_0$的输出复原。