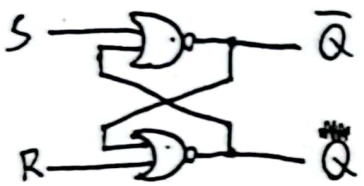
习题 P95 3.1 SR → Q

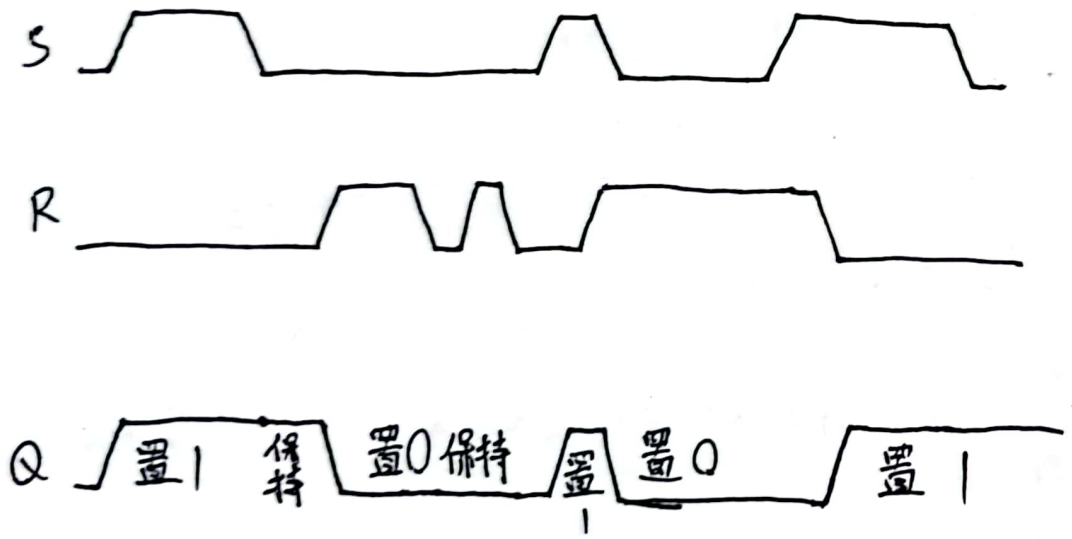


SR	Q^{n+1}	$\bar{Q}^{n+1}$
00	Q^n	$\bar{Q}^n$
01	0	1
10	1	0
11	0	0

无效

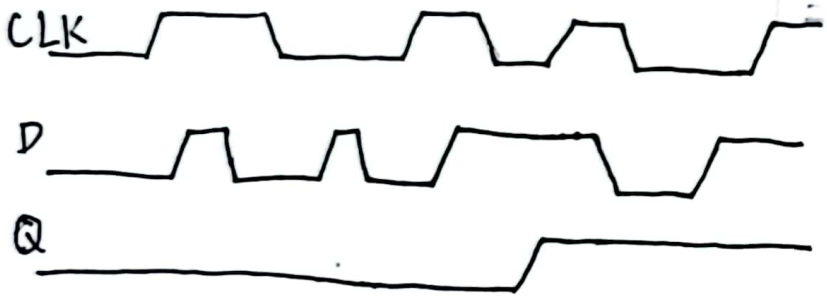
$Q^{n+1} = S + \bar{R}Q^n$

且 $\bar{S} + \bar{R} = 1$



5

3.4. D 触发器的输出 Q



CLK 由 0 → 1 时：

Q 置为 D

CLK 由 1 → 0 时：

stay static

3.3 D 锁存器

D	C	Q	$\hat{Q}$
0	0	X	X
0	1	0	1
1	0	X	X
1	1	1	0

3.10. JK:

CLK	J	K	Q^{n+1}	
↑	0	0	Q^n	保持
↑	1	0	1	
↑	0	1	0	
↑	1	1	$\overline{Q^n}$	翻转

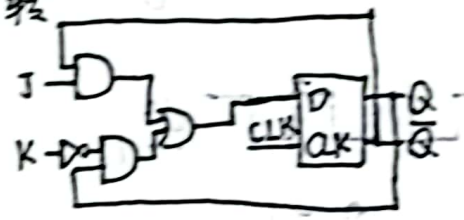
$Q^{n+1} = J\overline{Q^n} + \overline{K}Q^n$

D:

CLK	D	Q^{n+1}
↑	1	1
↑	0	0

$Q^{n+1} = D$

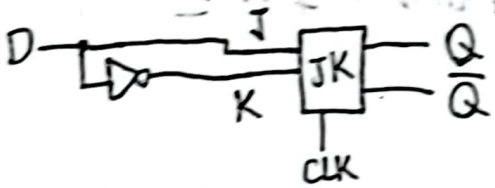
① D trigger 构造 JK trigger:



$Q^{n+1} = D = J\overline{Q^n} + \overline{K}Q^n$

$J\overline{Q^n} + \overline{K}Q^n$ 传入 D. 实现.

② JK trigger 构造 D trigger:



$J = D,\ K = \overline{D}$

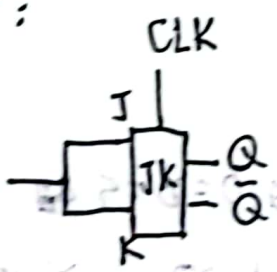
if $D=1$: $J=1, K=0$, $Q^{n+1}=1$

else: $J=0, K=1$, $Q^{n+1}=0$

$\therefore Q^{n+1} = D$. 实现.

③ JK trigger 构造 T trigger:

T	Q^{n+1}	
0	Q^n	保持
1	$\overline{Q^n}$	翻转

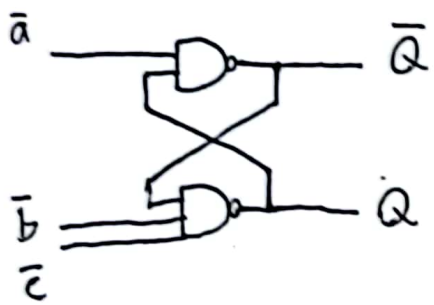


$J = K = T$

if $T=0$: $J=K=0$, 保持.

else: $J=K=1$, 翻转.

2.



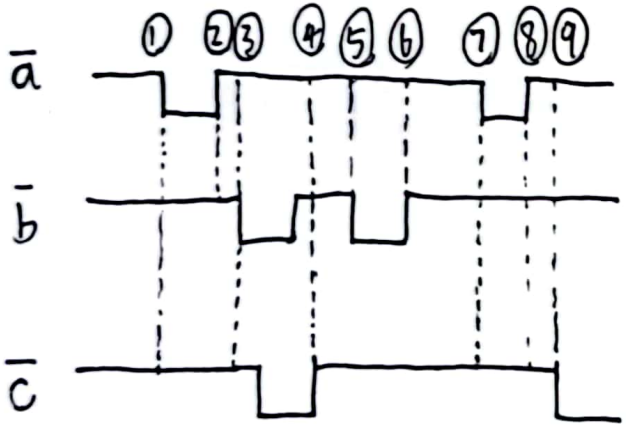
$\bar{a}\bar{b}\bar{c}$	Q^{n+1}	$\overline{Q^{n+1}}$	
000	1	1	无效
001	1	1	
010	1	1	
011	0	1	置0
100	1	0	置1
101	1	0	
110	1	0	
111	Q^n	$\overline{Q^n}$	保持

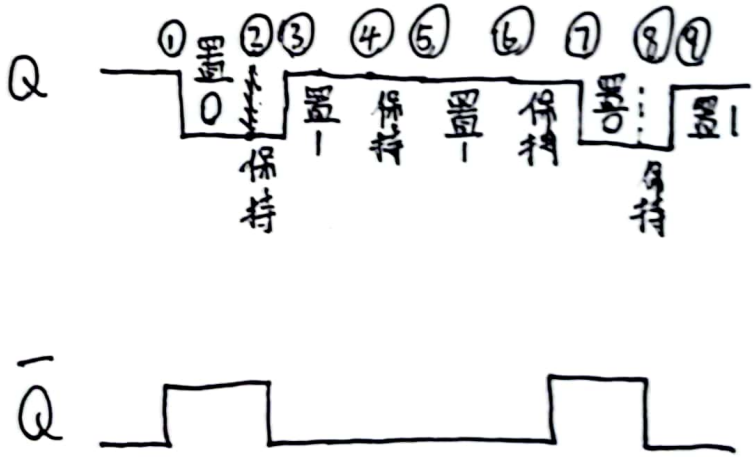
特征方程：

$Q^{n+1} = b + c + \bar{a}Q^n$

约束条件：~~$\bar{a}\bar{b}\bar{c} = 1$~~

$\bar{a} + \bar{b}\bar{c} = 1$

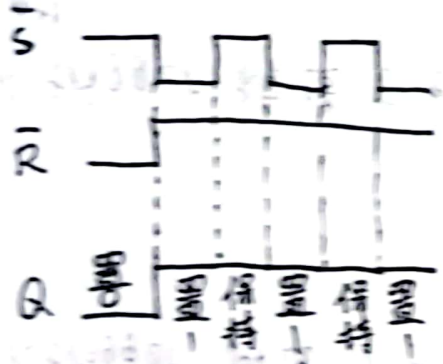




3. $\overline{S}\overline{R}$ 锁存器：$Q^{n+1} = \overline{\overline{Q^n} \cdot \overline{S}} = Q^n + S$

$\overline{Q^{n+1}} = \overline{Q^n \cdot \overline{R}} = \overline{Q^n} + R$

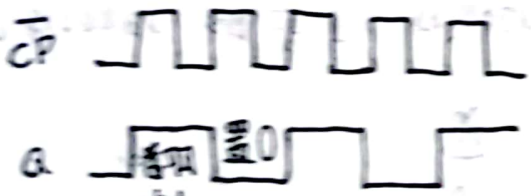
工作原理：在 $\overline{S} = \overline{R} = 1$，即 $S = R = 0$ 时：$Q^{n+1} = Q^n$，$\overline{Q^{n+1}} = \overline{Q^n}$，保持稳定，防抖动。



→ 去抖动结果。

4. JK：$\overline{CP}$ 仅在上升沿有作用。

①初时 $Q=0$ $\overline{Q}=1$，翻转

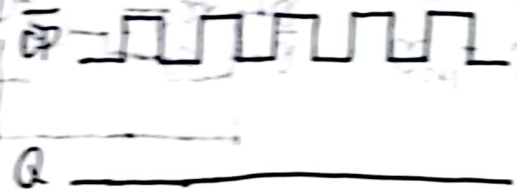


②JK = 01 置0

③JK = 11，翻转

$\overline{CP}$ 仅在上升沿起作用。

$J = Q^n$



① $Q=0$，JK = 01，置0

一直置0。