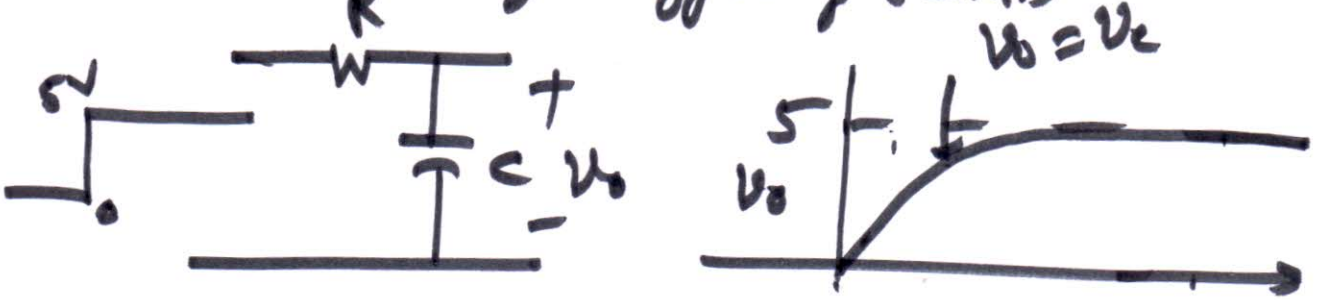
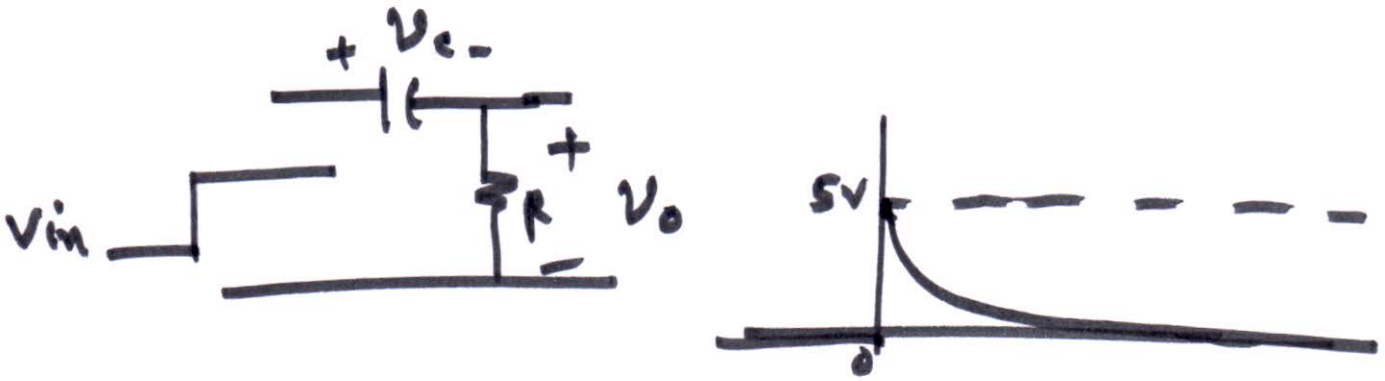
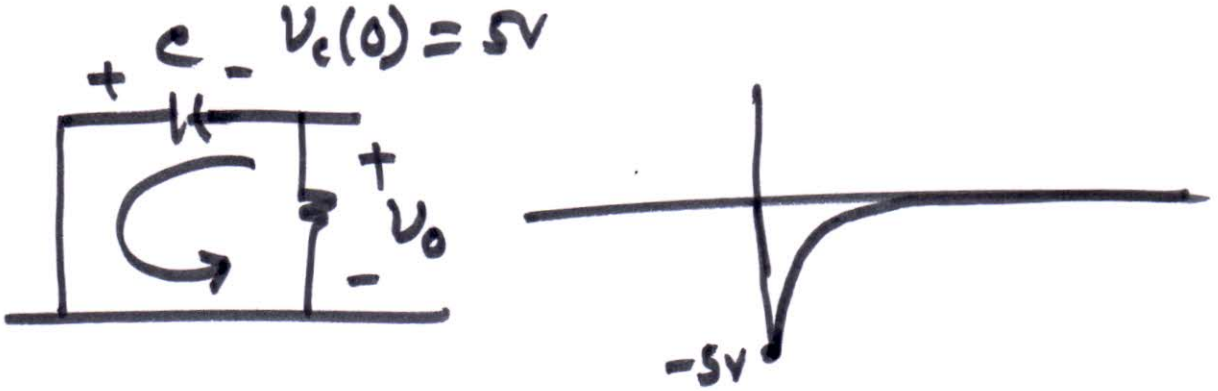
Edge Triggering (Cont.)



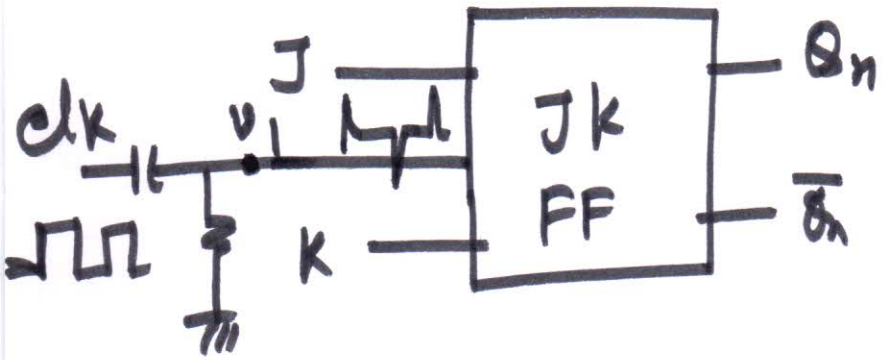


$$v_o = V_{in} - v_c$$

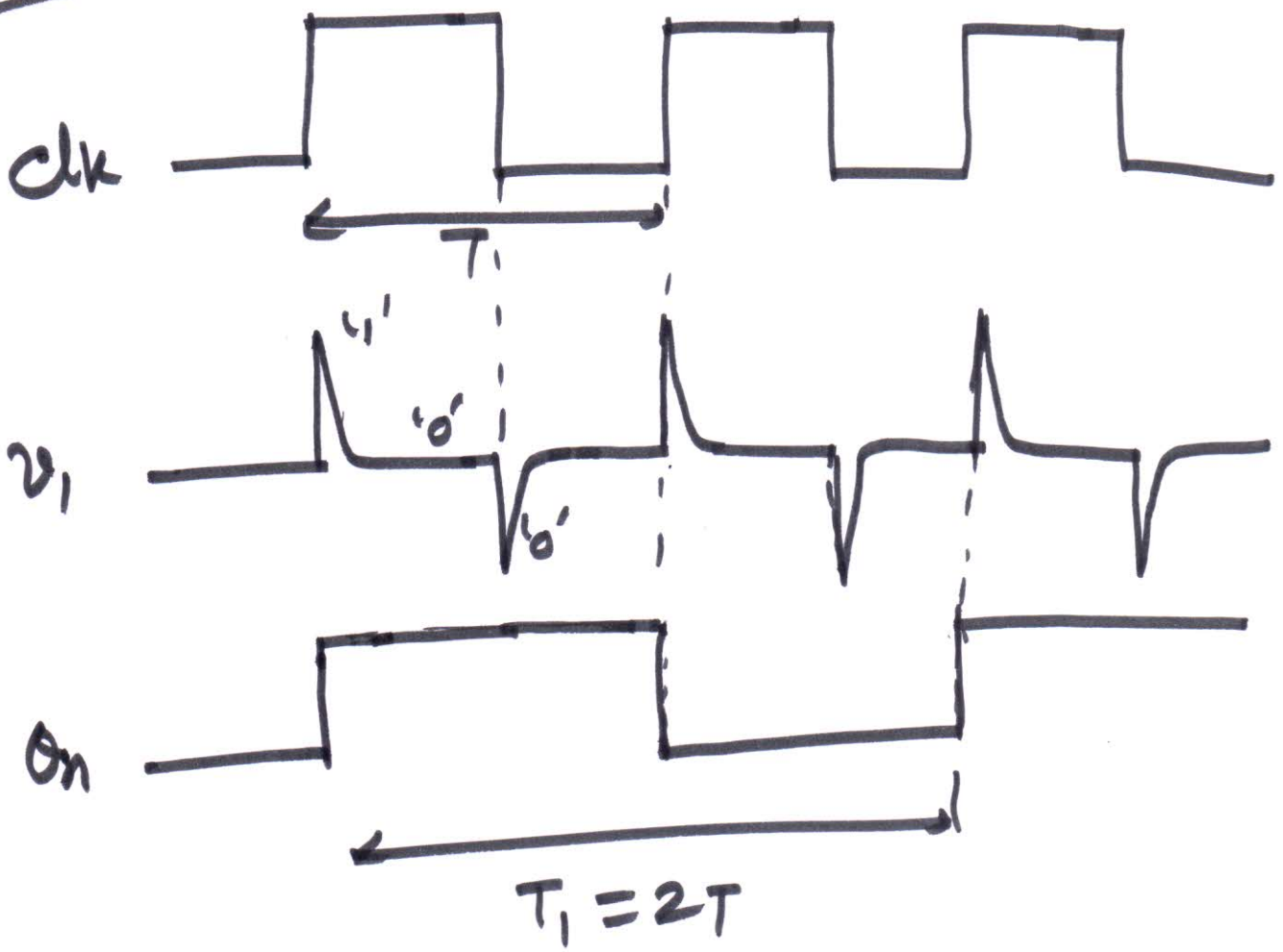


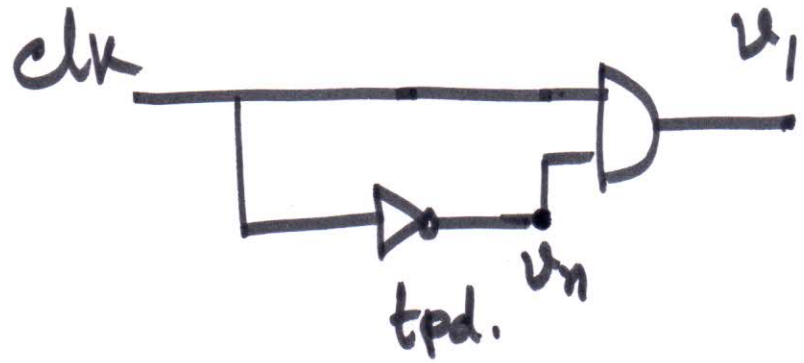
at $t = 0$ $\quad v_c(0) + v_o(0) = 0$

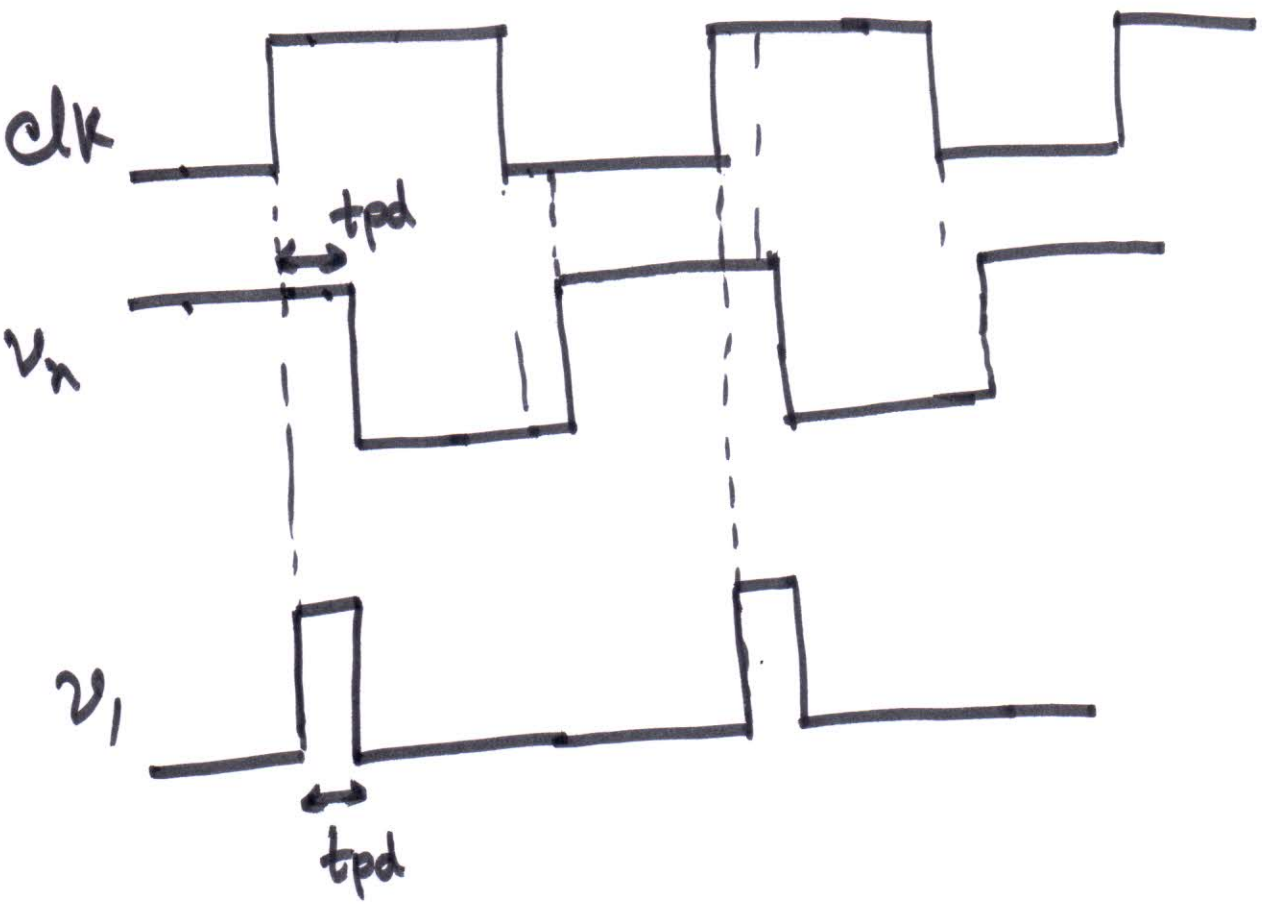
$$\Rightarrow \quad v_o(0) = -v_c(0)$$



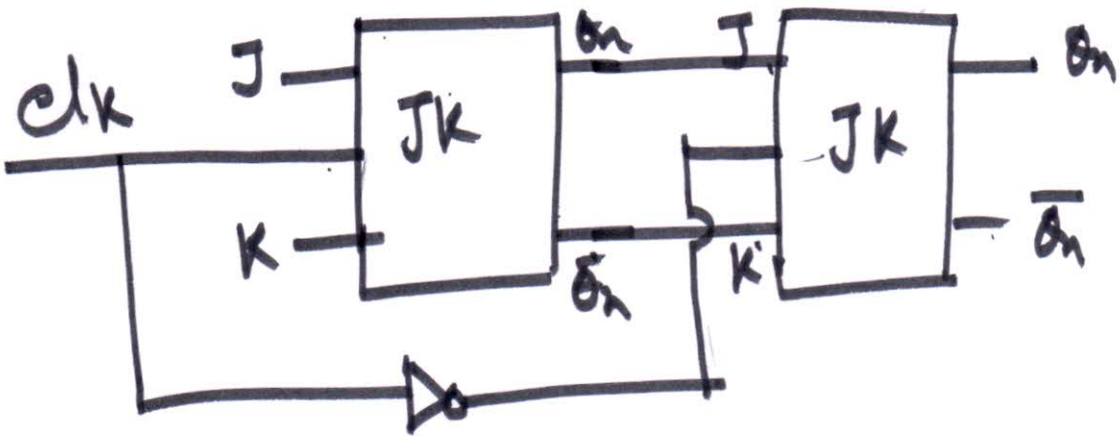
J=1 & K=1 , $Q_n = 0$ (initially)

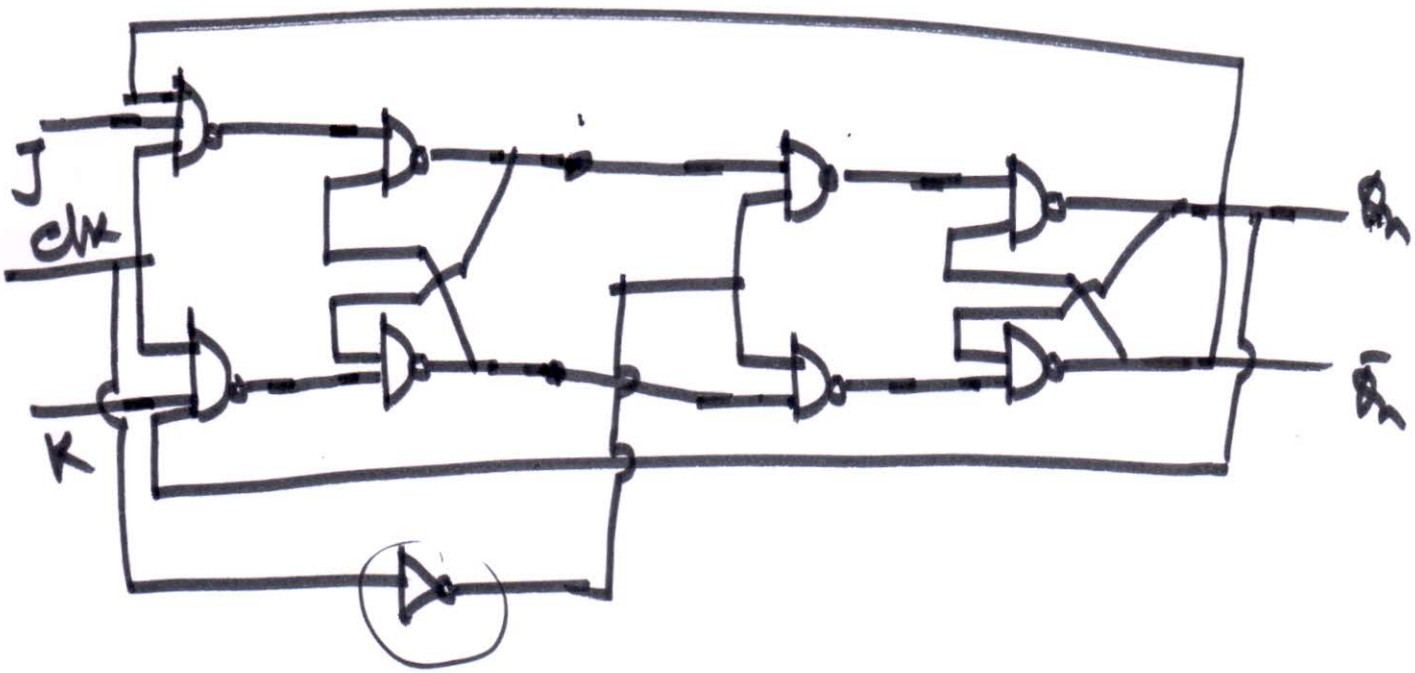



clk
v_1
v_n
tpd.

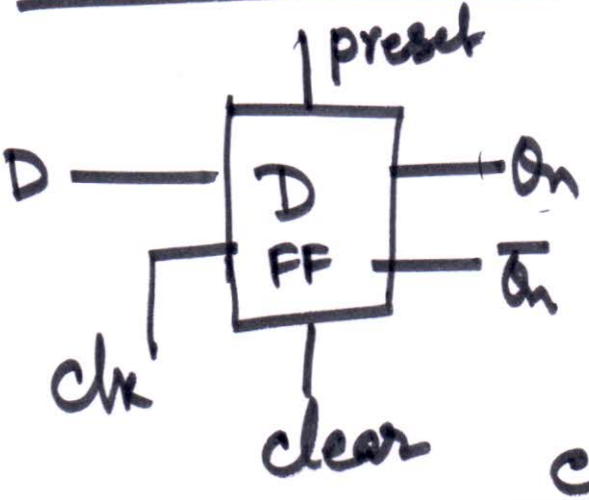

clk
tpd
v_n
v_1
tpd

Master - Slave F/F



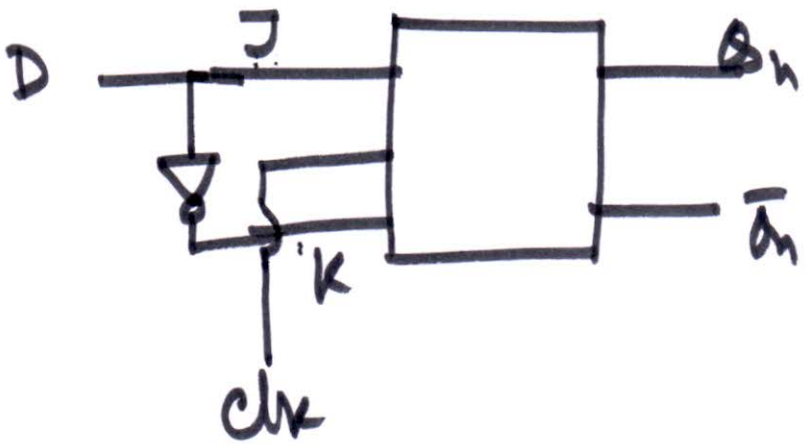


D- Flip Flop

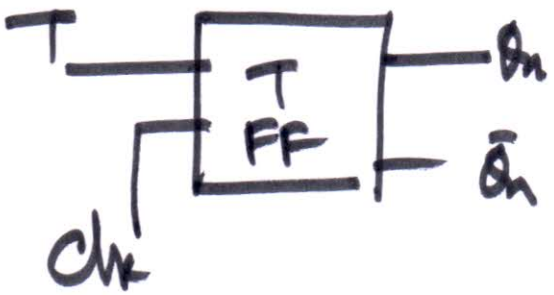


clk	D	Q_{n+1}
0	X	Q_n
1	0	0
1	1	1

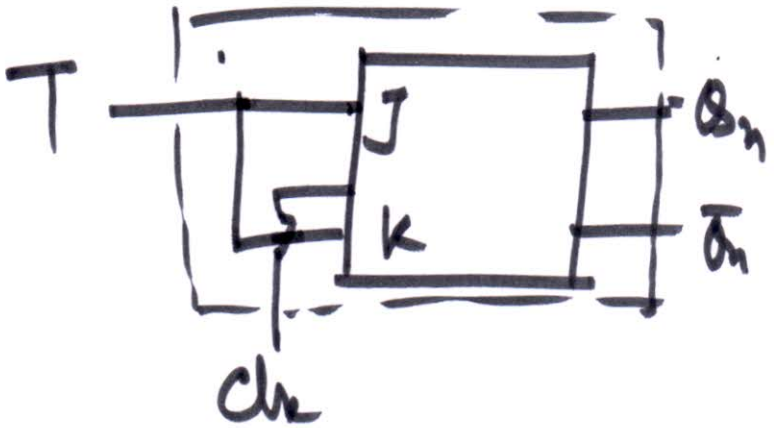
D Flip Flop using JK Flip-Flop



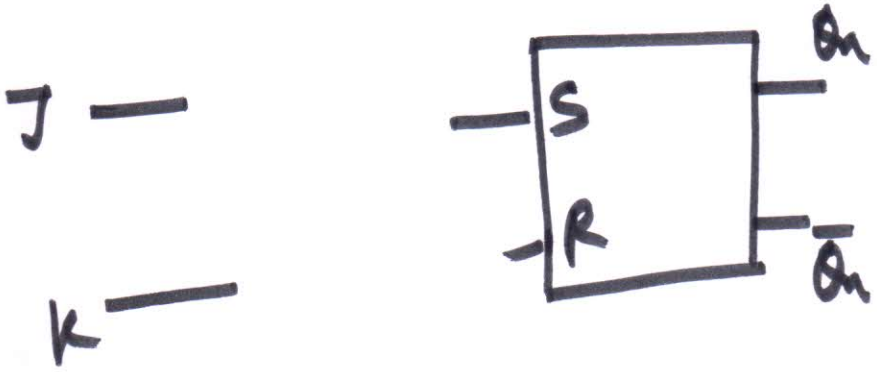
T- Flip-flop



Clk	T	Q_{n+1}
0	x	Q_n
1	0	Q_n
1	1	$\overline{Q_n}$



Design J K FF from RS FF



S	R	Q_n	Q_{n+1}
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	
1	1	1	

J	K	Q_n	Q_{n+1}	S	R
0	0	0	0	0	X
0	0	1	1	X	0
0	1	0	0	0	X
0	1	1	0	0	1
1	0	0	1	1	0
1	0	1	1	X	0
1	1	0	1	1	0
1	1	1	0	0	1

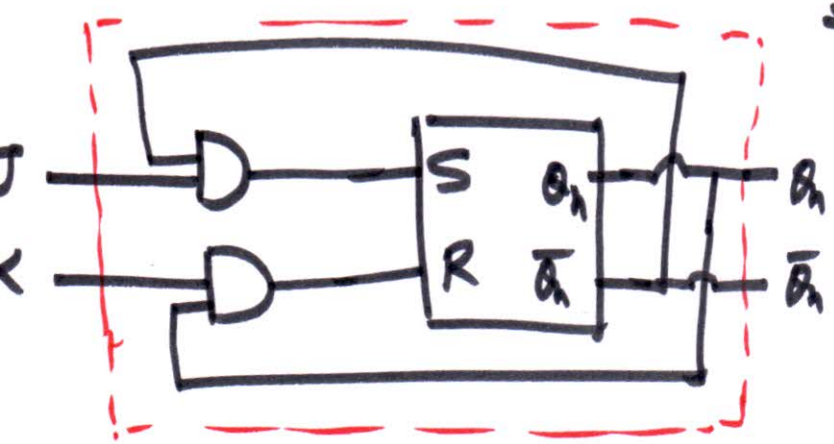
0 0
1 0

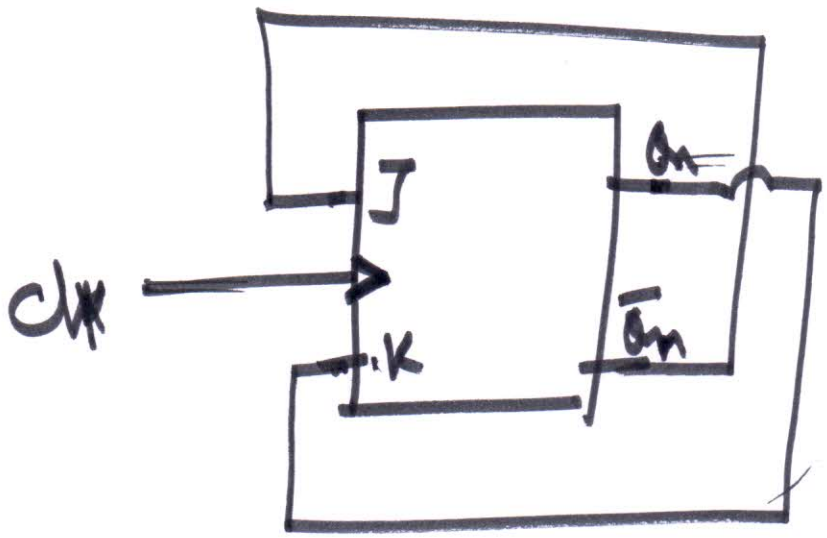
S $S = J\overline{Q_n}$

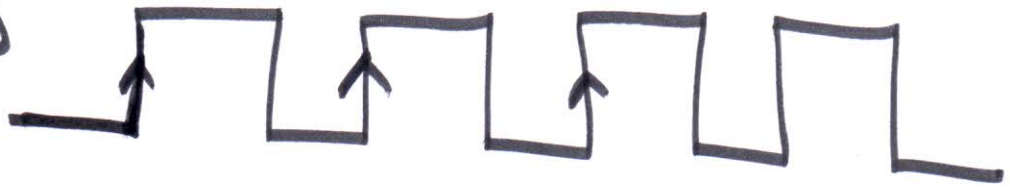
J \ KQ_n	00	01	11	10
0		X		
1	1	X		1

R $R = KQ_n$

J \ KQ_n	00	01	11	10
0	X		1	X
1			1	





$Q_n = 0$

$J = \bar{Q}_n$
$K = Q_n$