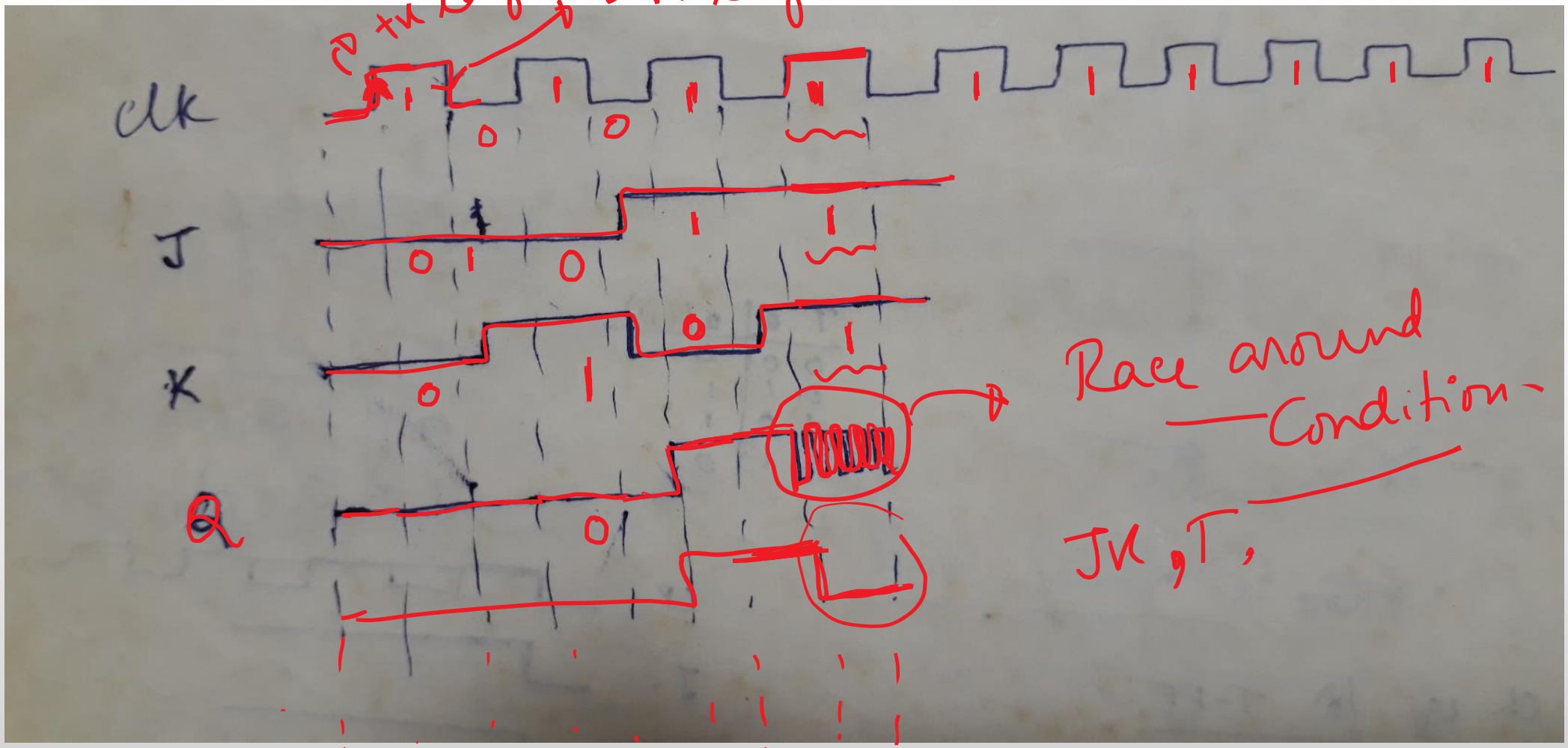
SEQUENTIAL CIRCUITS

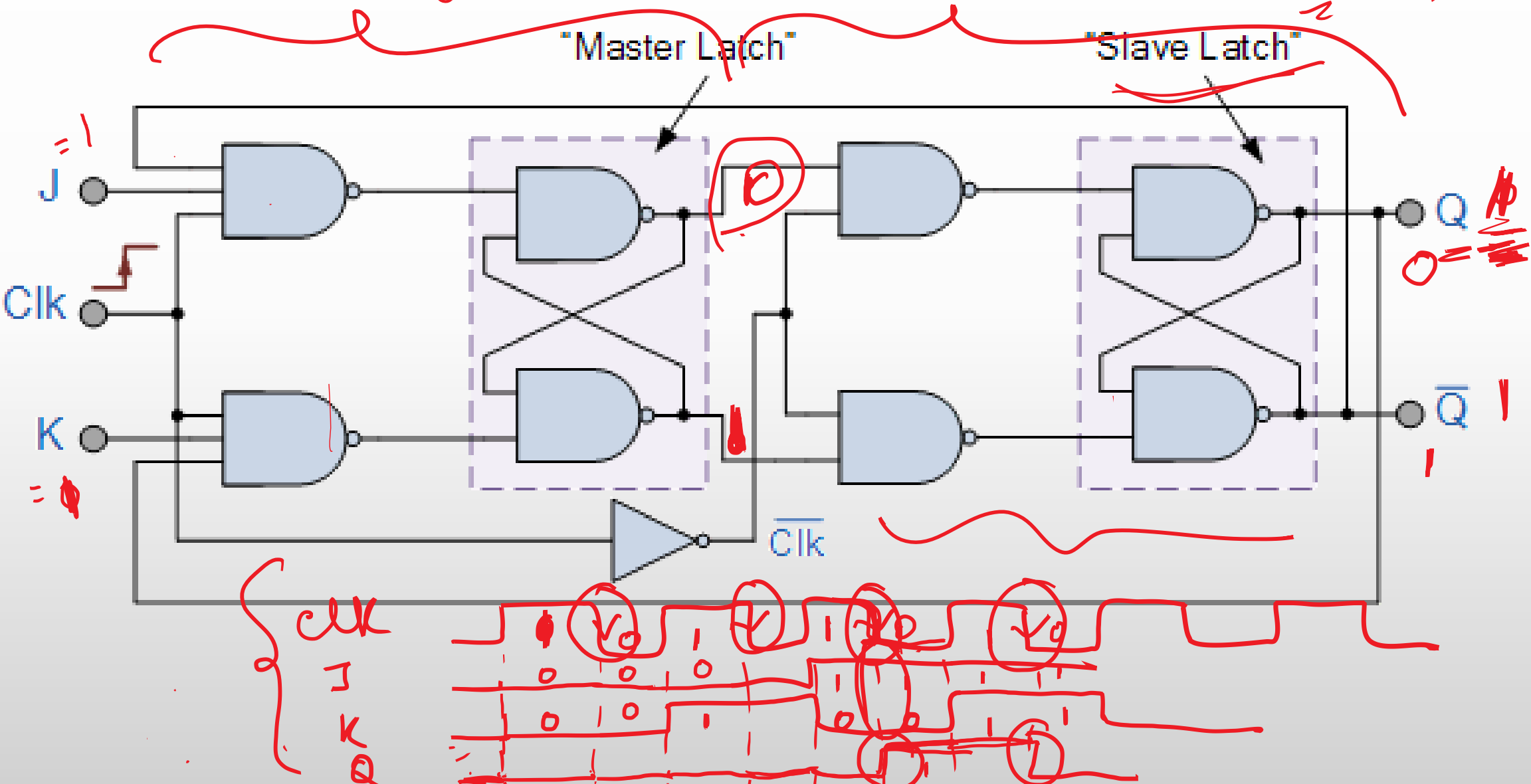
- Race around condition
- Mater slave model
- Flip flop conversion

Race Around Condition

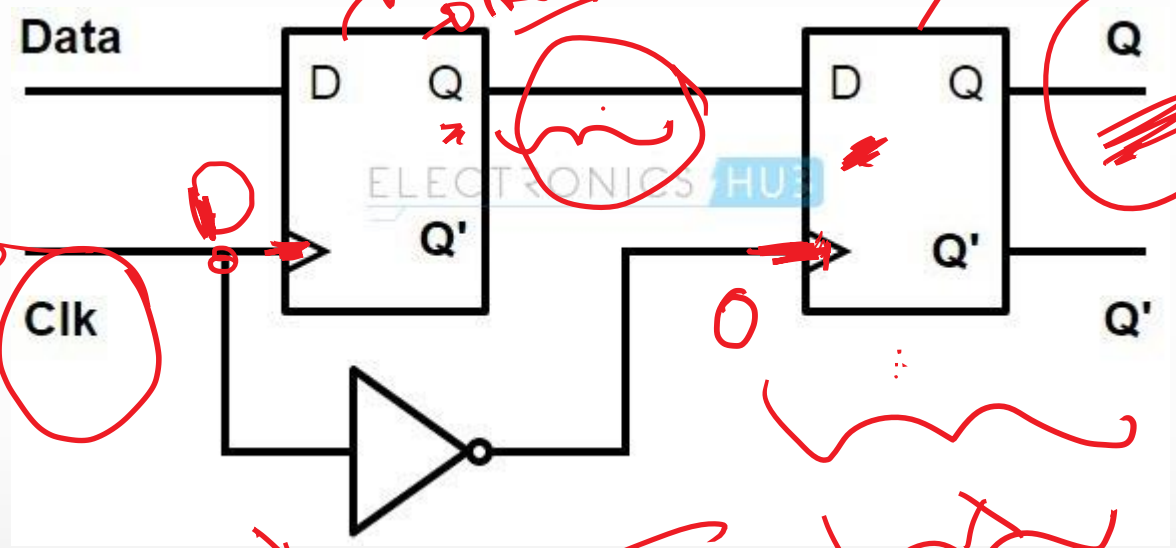
- For JK flip flop if J, K and Clock are equal to 1 the state of flip-flop keeps on toggling which leads to uncertainty in determining the output of the flip-flop. This problem is called **Race around** the **condition**.



Master Slave JK Flip Flop

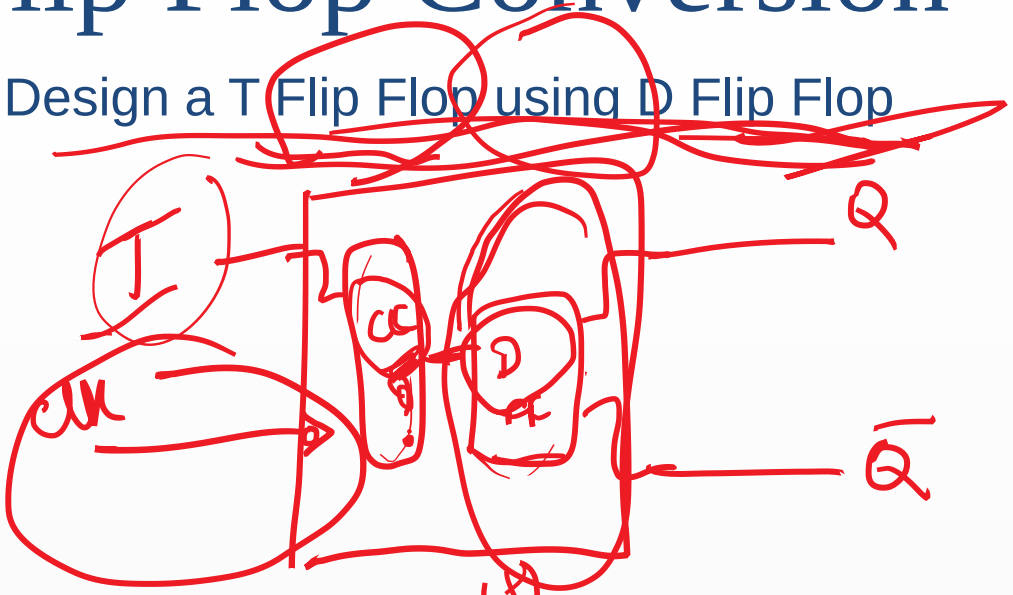


Master Slave D Flip Flop



Flip Flop Conversion

1. Design a T Flip Flop using D Flip Flop

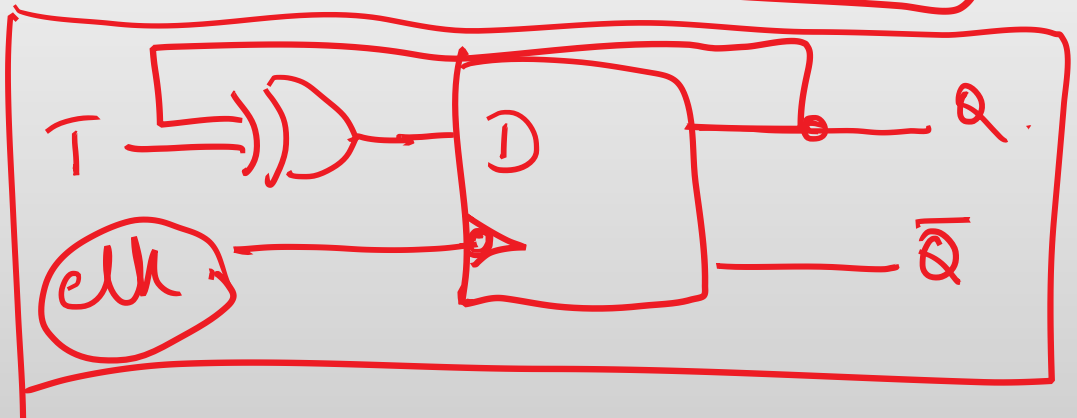


T	Q(t)	Q(t+1)	D
0	0	0	0
0	1	1	1
1	0	1	1
1	1	0	0

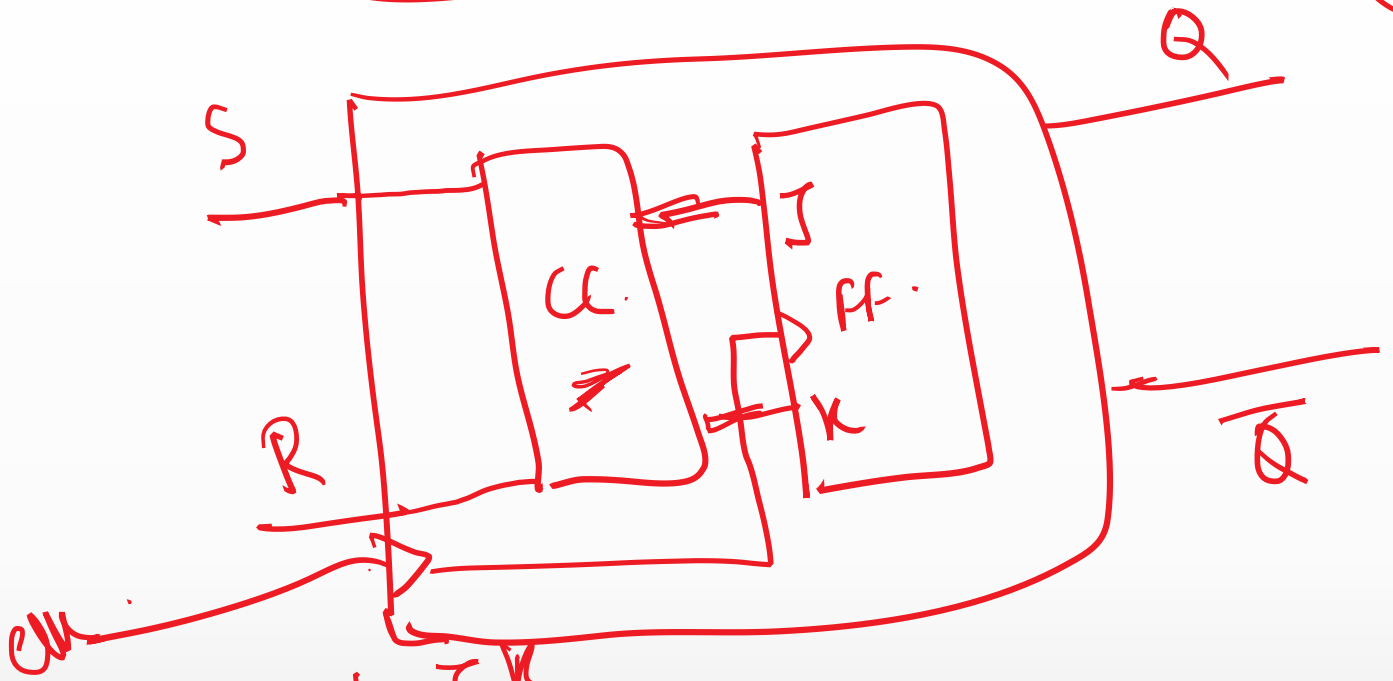
D =

T \ Q(t)	0	1
0	0	1
1	1	0

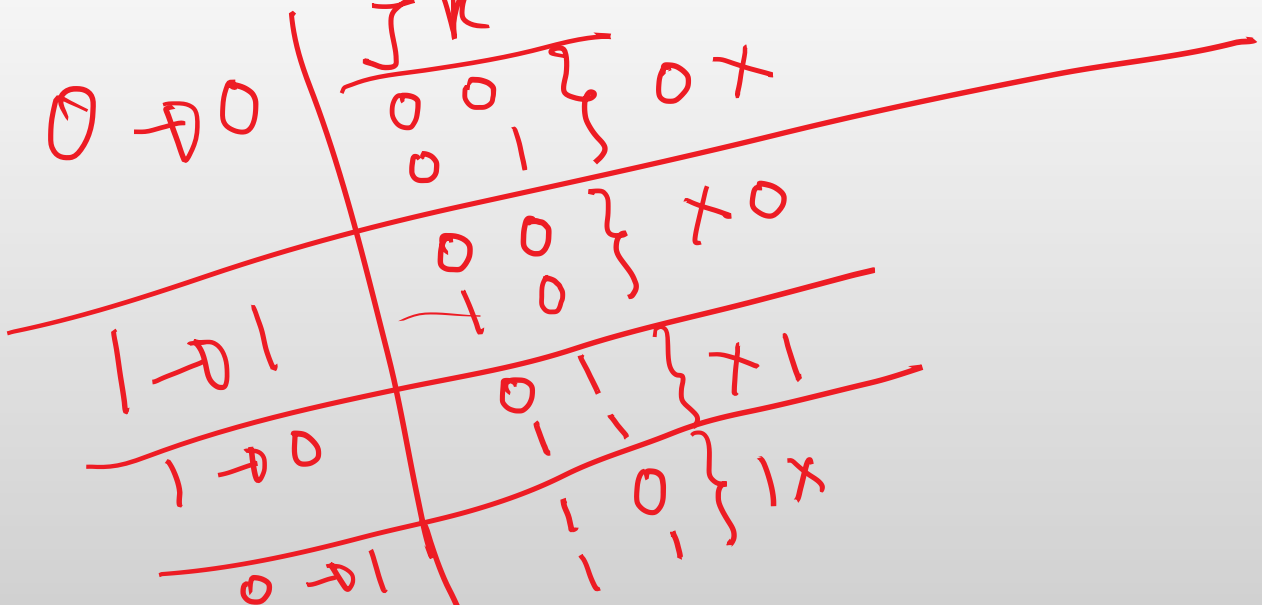
$D = T \oplus Q(t)$



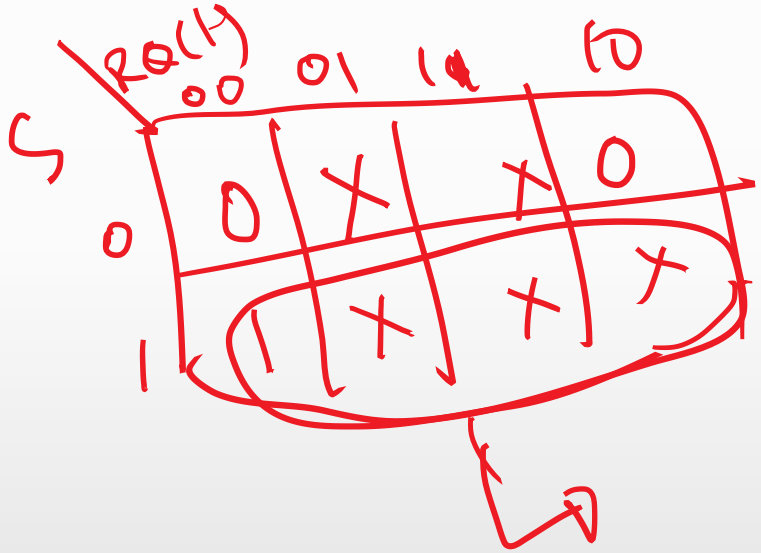
2. Convert a given JK flip flop to work as SR flip flop



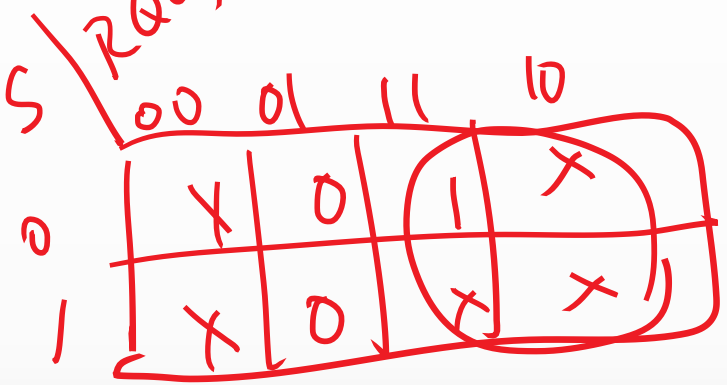
S	R	Q(t)	Q(t+1)	J	K
0	0	0	0	0	X
0	0	1	1	X	0
0	1	0	0	0	X
0	1	1	0	X	1
1	0	0	1	1	X
1	0	1	1	X	0
1	1	0	X	X	X
1	1	1	X	X	X



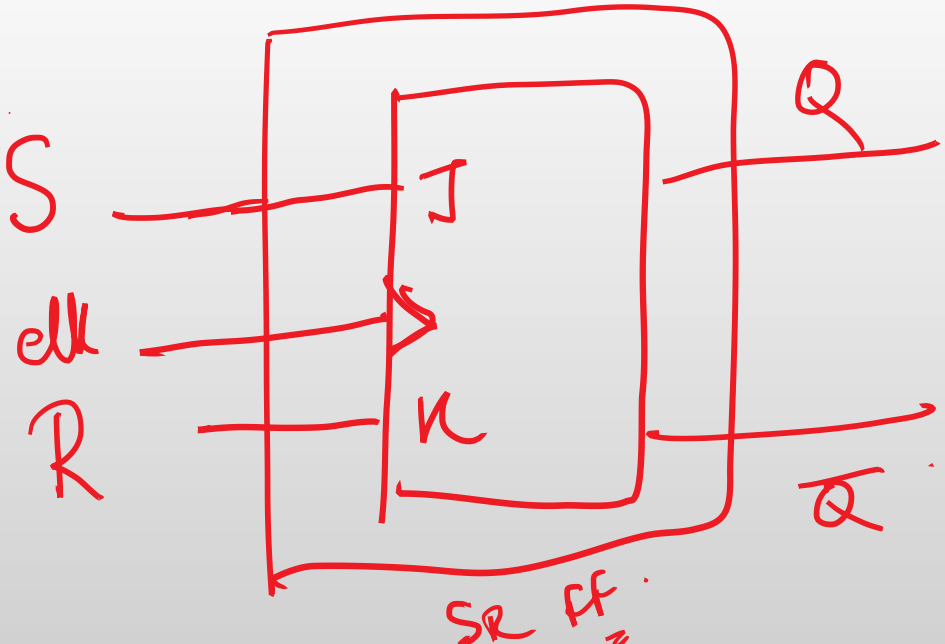
$S = R = 1 \Rightarrow$ doesn't occur.



$J = S$.

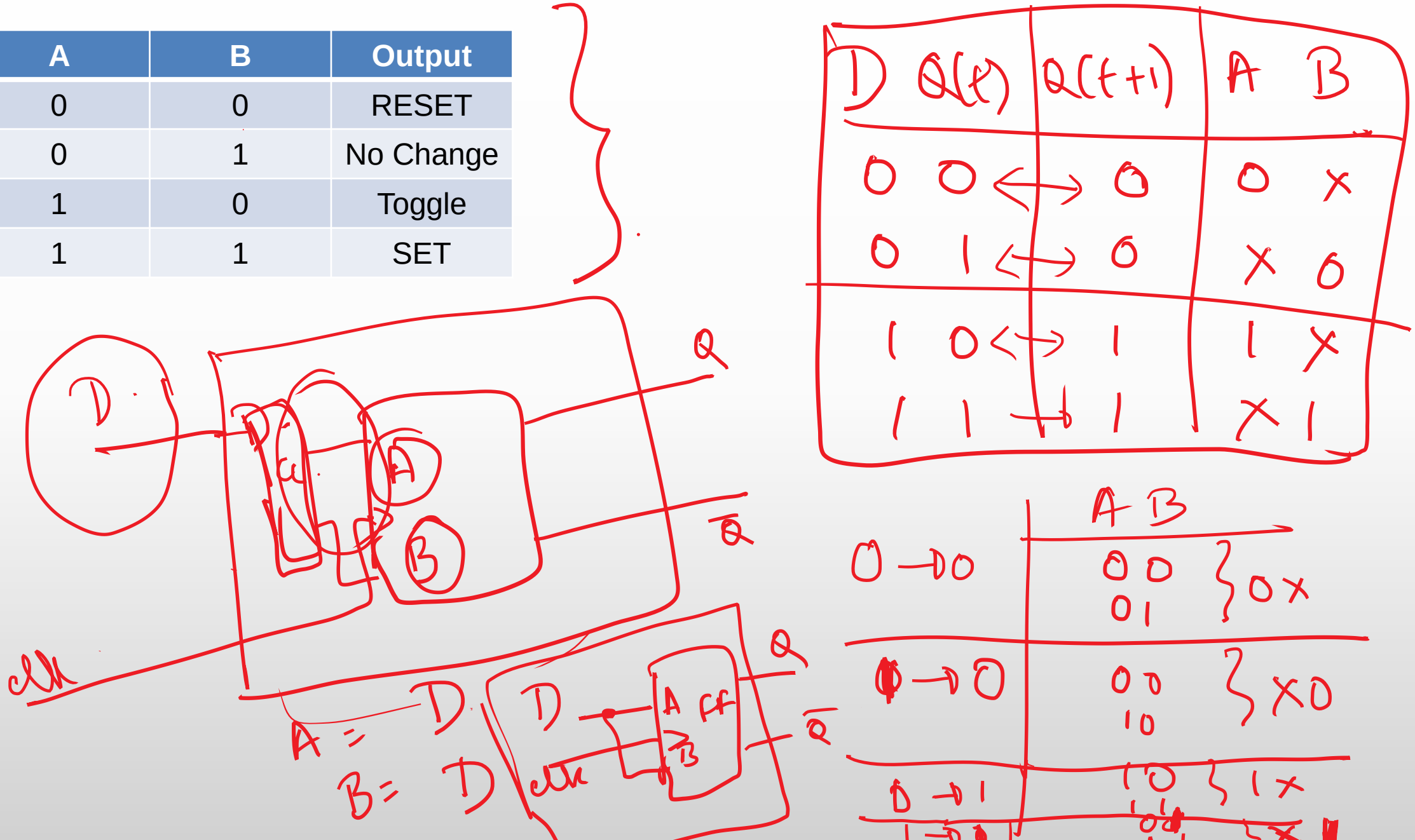


$K = R$.

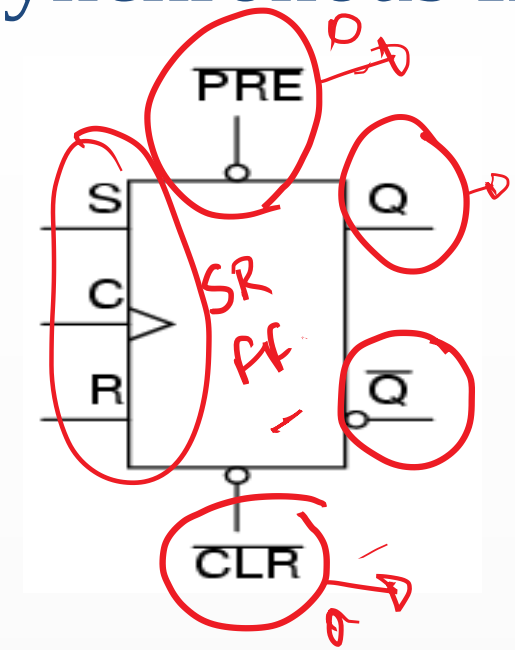


3. Design a D flip flop using an AB flip flop whose function table is given below.

A	B	Output
0	0	RESET
0	1	No Change
1	0	Toggle
1	1	SET



Asynchronous Inputs:



PRESET	CLEAR	FF Response
0	0	Indeterminate
0	1	SET
1	0	CLEAR
1	1	Clocked operation