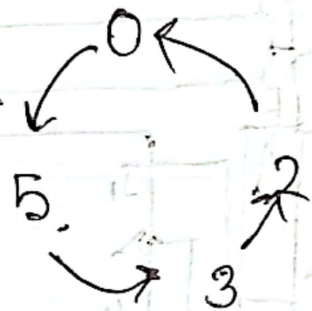


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1. $0 \rightarrow 2 \rightarrow 3 \rightarrow 5 \rightarrow 0$ (down counter)

state diagram:



Excitation table:

$Q_2 Q_1 Q_0$	Q_2^*	Q_1^*	Q_0^*	T_2	T_1	T_0
0 0 0	0	0	1	1	0	1
1 0 1	0	1	1	1	1	0
0 1 1	0	1	0	0	0	1
0 1 0	0	0	0	0	1	0

K-map:

for T_2

$Q_1 Q_0$	00	01	11	10
Q_2				
0	1	X	0	0
1	X	1	X	X

$$T_2 = \bar{Q}_1$$

for T_1

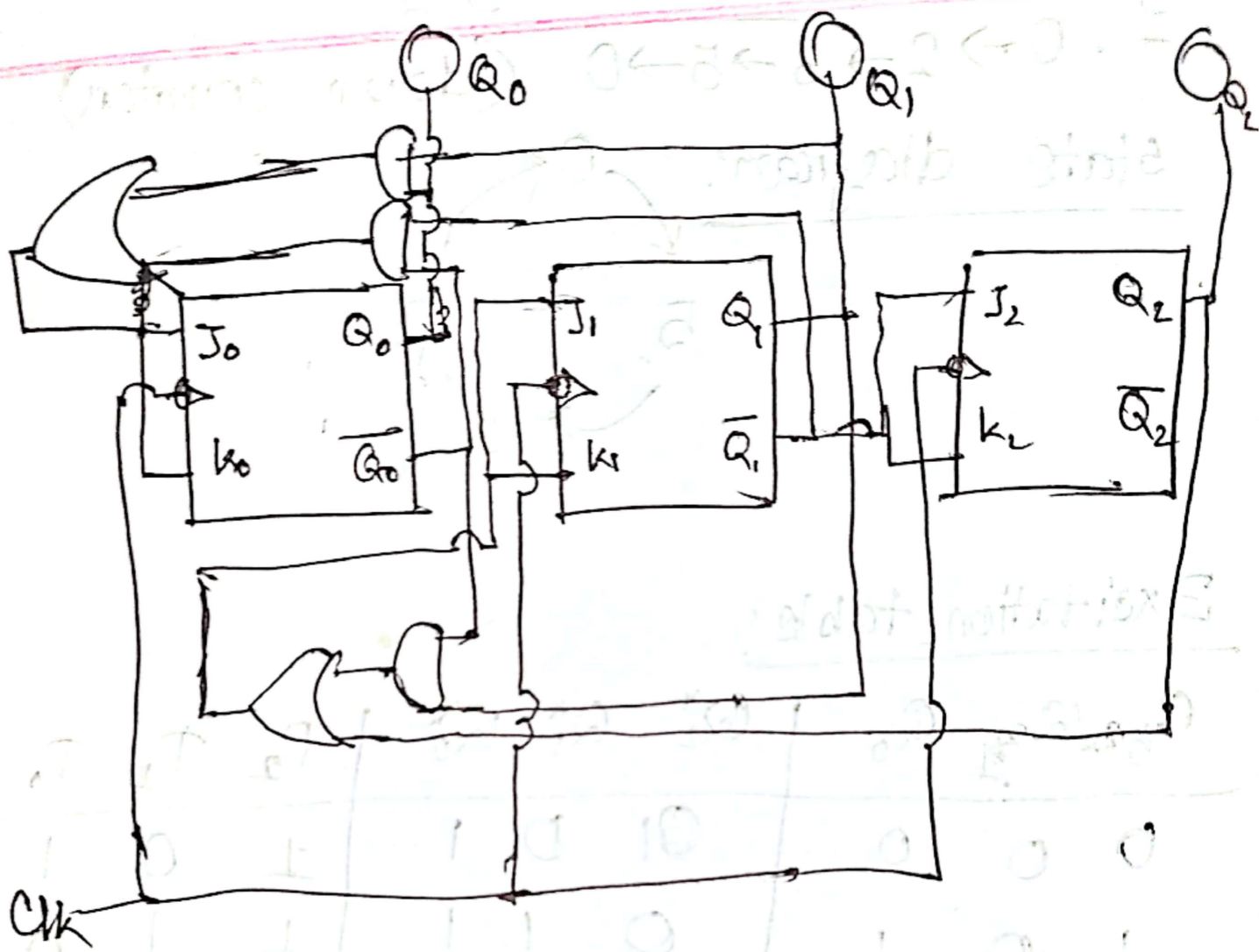
$Q_1 Q_0$	00	01	11	10
Q_2				
0	0	X	0	1
1	X	1	X	X

$$T_1 = Q_2 + Q_1 \bar{Q}_0$$

$$\begin{aligned} \text{OR } T_1 &= \bar{Q}_2 \bar{Q}_0 + Q_2 \bar{Q}_0 \\ &= Q_2 \oplus \bar{Q}_0 \end{aligned}$$

$Q_1 Q_0$	00	01	11	10
Q_2				
0	1	X	1	0
1	X	0	X	X

$$\begin{aligned} T_0 &= \bar{Q}_1 \bar{Q}_0 + Q_1 Q_0 \\ &= Q_1 \oplus Q_0 \end{aligned}$$



Truth Table for J-K Flip-Flop

J	K	Q	Q'
0	0	Q	Q'
0	1	0	1
1	0	1	0
1	1	Q'	Q

Truth Table for D Flip-Flop

D	Q	Q'
0	0	1
1	1	0

Truth Table for T Flip-Flop

T	Q	Q'
0	Q	Q'
1	Q'	Q

Equation: $Q_0 + Q_1 + Q_2 = 1$

Equation: $Q_0 = 1$