

Problem 2

3 state bits ; 3 output bits

$Q_2 \ Q_1 \ Q_0$	$Q_2^+ \ Q_1^+ \ Q_0^+$	$D_2 \ S, R, J_0, K_0$	Out
0 0 0	0 0 1	0 0 X 1 X	0 0 1
0 0 1	0 1 0	0 1 0 X 1	0 1 1
0 1 0	0 1 1	0 X 0 1 X	0 1 0
0 1 1	1 0 0	1 0 1 X 1	1 1 0
1 0 0	1 0 1	1 0 X 1 X	1 1 1
1 0 1	0 0 0	0 0 X X 1	1 0 1
1 1 0	X X X	X X X X X	X X X
1 1 1	X X X	X X X X X	X X X

$D_2: \frac{Q_2 Q_1}{Q_0} \ 0 \ 1$
0 0 0 0
0 1 0 1
1 1 X X
1 0 1 0

$\bar{Q}_0 \bar{Q}_2$

$$D_2 L = \bar{Q}_0 Q_2 + Q_0 Q_1$$

$S: \frac{Q_2 Q_1}{Q_0} \ 0 \ 1$
0 0 0
0 1 X 0
1 1 X X
1 0 0 0

$\sim \bar{Q}_2 \bar{Q}_1 Q_0$

$$S_L \leq \bar{Q}_2 \bar{Q}_1 Q_0$$

$R_1: \frac{Q_2 Q_1}{Q_0} \ 0 \ 1$
0 0 X 0
0 1 0 1
1 1 X X
1 0 X X

$$R_1 L \leq Q_1 Q_0$$

$$\begin{aligned} J_0 &\leq 1 \quad (V_{cc}) \\ K_0 &\leq 1 \quad (V_{cc}) \end{aligned}$$

$J_0: \frac{Q_2 Q_1}{Q_0} \ 0 \ 1$
0 0 1 X
0 1 1 X
1 1 X X
1 0 1 X

1

Out_2 :

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

$$Out_2 \leftarrow Q_1 Q_0 + Q_2$$

Out_1 :

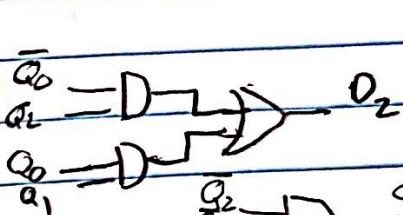
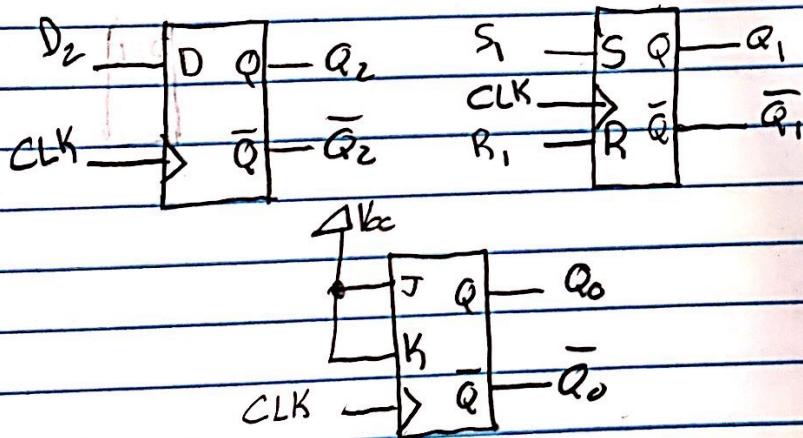
	Q_2	Q_1	Q_0
00	0	1	0
01	0	1	0
11	X	X	1
10	1	0	0

$$Out_1 \leftarrow Q_1 + (Q_2 \otimes Q_0) \bar{Q}_0$$

Out_0 :

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

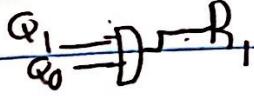
$$Out_0 \leftarrow \bar{Q}_1$$



$\bar{Q}_1 \rightarrow \text{wire} \rightarrow Out_0$



$Q_2 \rightarrow D \rightarrow Out_1$



$Q_1 \rightarrow D \rightarrow Out_2$

