Date:.....

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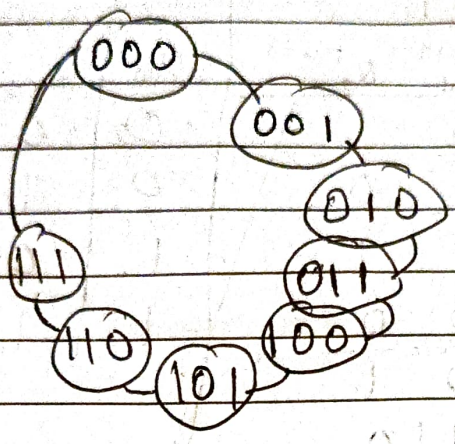
Steps to Design Counters

① State Diagram



② The state Table

current state			Next State		
Q_2	Q_1	Q_0	Q_2^+	Q_1^+	Q_0^+
0	0	0	0	0	1
0	0	1	0	1	0
0	1	0	0	1	1
0	1	1	1	0	0
1	0	0	1	0	1
1	0	1	1	1	0
1	1	0	1	1	1
1	1	1	0	0	0

③ The chosen flip flop ~~for~~ transition table (excitation table)

D flip flop :-

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

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Step 4

~~$D_0 = Q_0$~~

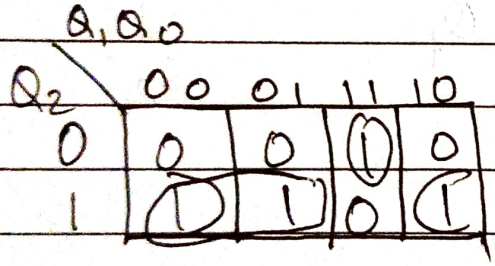
K-Map

$D_1 = \bar{Q}_1 Q_0$

~~$D_2 = Q_2$~~

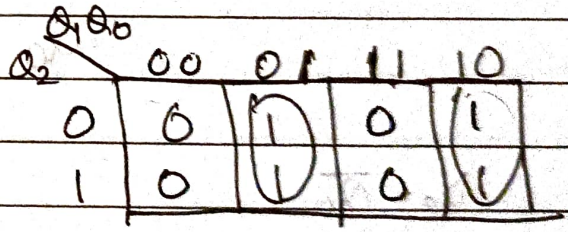
Q_2	Q_1	Q_0	Q_2^+	Q_1^+	Q_0^+	D_2	D_1	D_0
0	0	0	0	0	1	0	0	1
0	0	1	0	1	0	0	1	0
0	1	0	0	1	1	0	1	1
0	1	1	1	0	0	1	0	0
1	0	0	1	0	1	1	0	1
1	0	1	1	1	0	1	1	0
1	1	0	1	1	1	1	1	1
1	1	1	0	0	0	0	0	0

D_2



$D_2 = Q_2\bar{Q}_1 + Q_2\bar{Q}_0 + \bar{Q}_2 Q_1 Q_0$

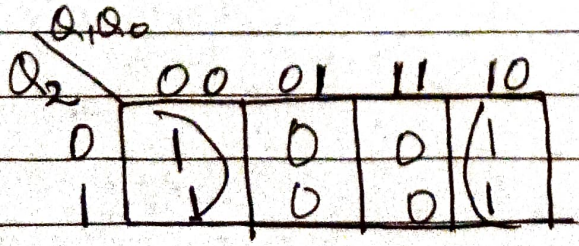
D_1



$D_1 = \bar{Q}_1 Q_0 + Q_1 \bar{Q}_0$

$= Q_1 \oplus Q_0$

D_0



$D_0 = \overline{Q_0}$

Step 5 Draw circuit

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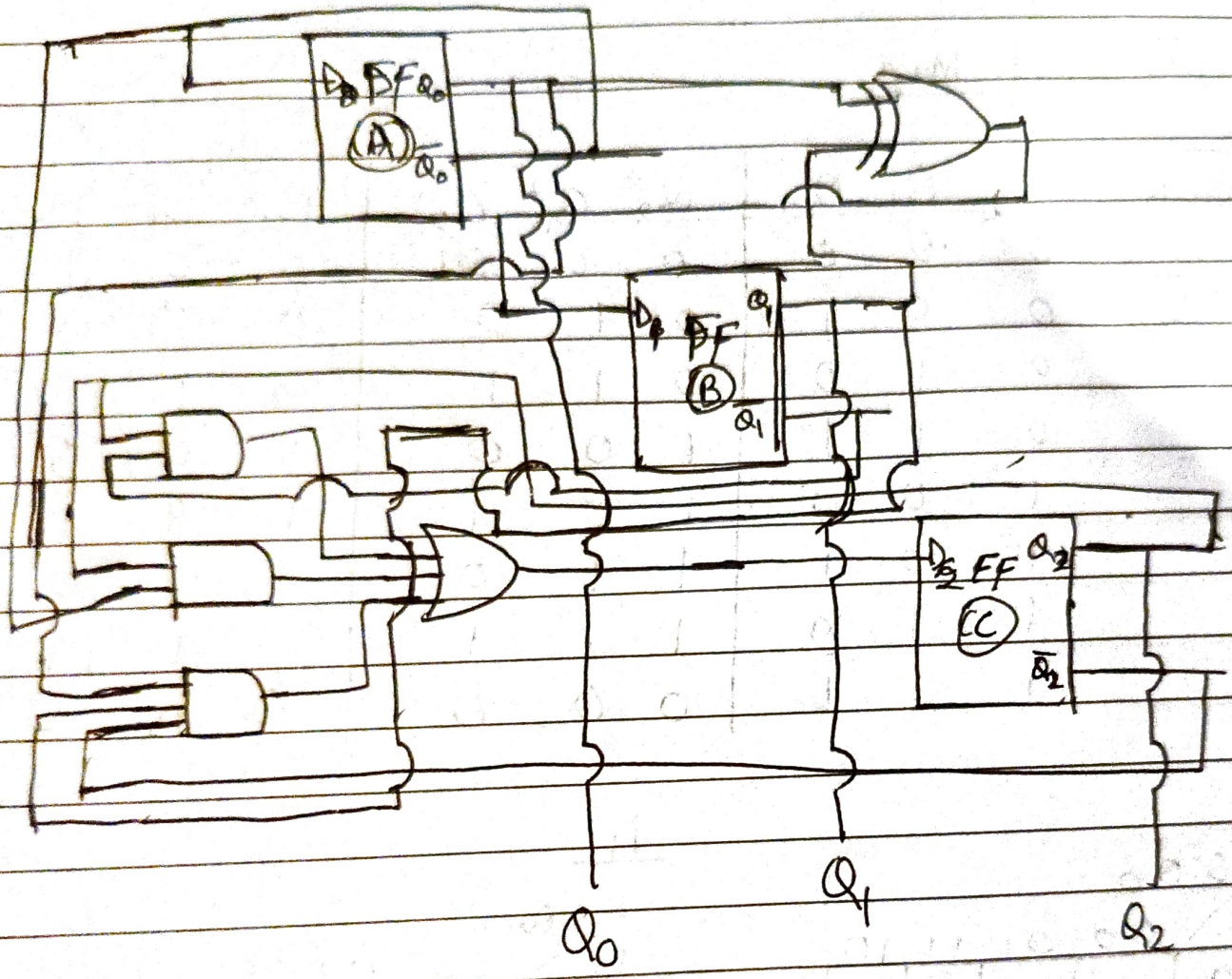

$D_0 = \bar{Q}_0$

$D_1 = Q_1 \oplus Q_0$

$D_2 = Q_2 \bar{Q}_1 + Q_2 \bar{Q}_0 + \bar{Q}_2 Q_1 Q_0$