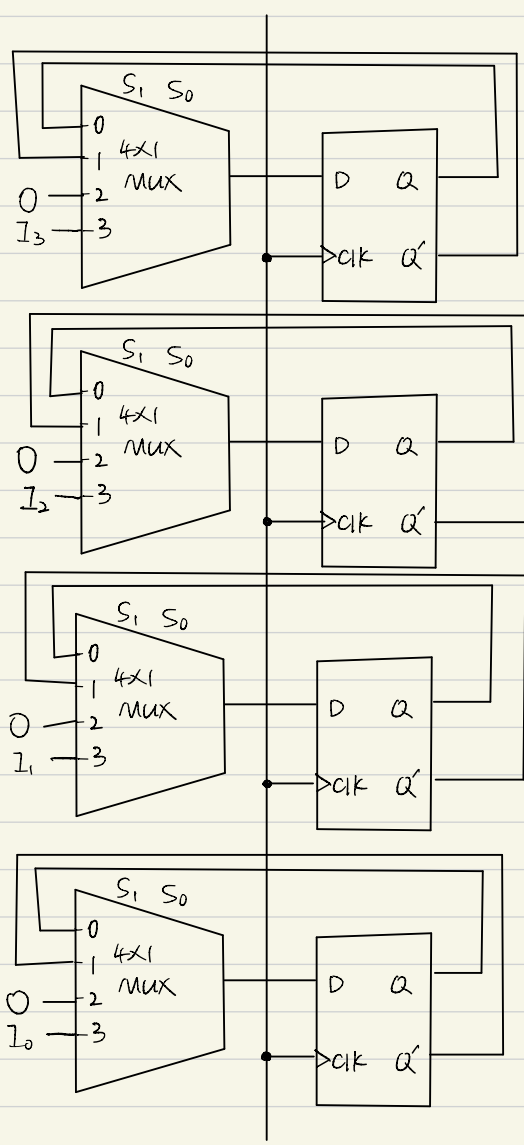


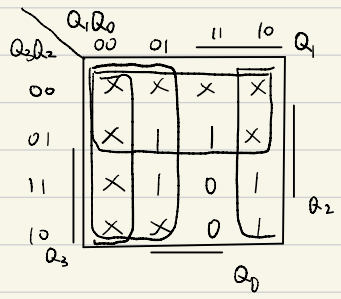
/.



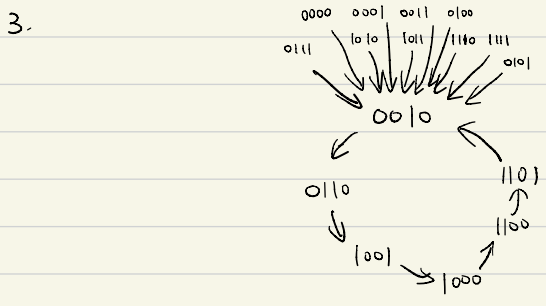
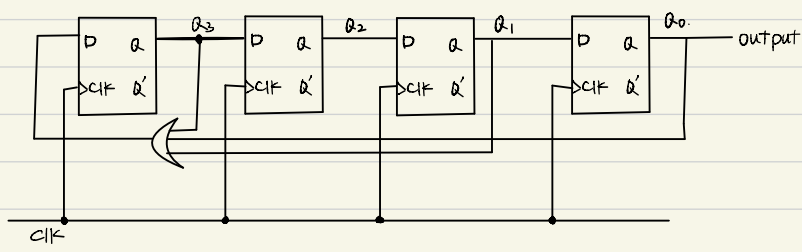
S_1	S_0	
0	0	No change
0	1	complement
1	0	clear
1	1	load parallel

2.

clk	z	Q_3	Q_2	Q_1	Q_0
↑	0	1	0	1	1
↑		1	0	1	0
↑		1	1	0	1
↑		1	1	1	0
↑		1	1	1	0
↑		0	1	1	1
↑		1	0	1	1



$$Z = Q_0' + Q_1' + Q_3'$$



Present State Next State

$Q_3 Q_2 Q_1 Q_0$

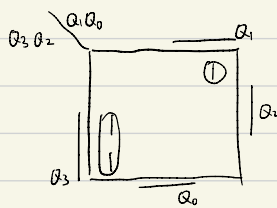
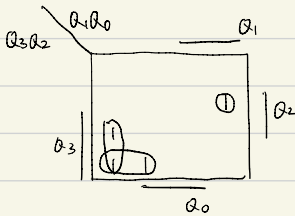
0 0 0 0
0 0 0 1
0 0 1 0
0 0 1 1
0 1 0 0
0 1 0 1
0 1 1 0
0 1 1 1
1 0 0 0
1 0 0 1
1 0 1 0
1 0 1 1
1 1 0 0
1 1 0 1
1 1 1 0
1 1 1 1

$Q_3 Q_2 Q_1 Q_0$

0 0 1 0
0 0 1 0
0 1 1 0
0 0 1 0
0 0 1 0
0 0 1 0
1 0 0 1
0 0 1 0
1 1 0 0
1 1 0 0
1 0 0 0
0 0 1 0
0 0 1 0
1 1 0 1
0 0 1 0
0 0 1 0
0 0 1 0

$$D_3 = \Sigma(6, 8, 9, 12) \quad D_2 = \Sigma(2, 8, 12)$$

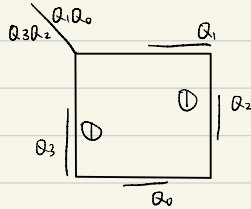
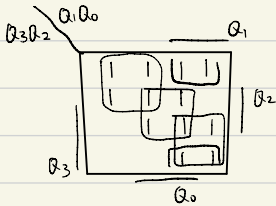
$$D_1 = \Sigma(0, 1, 2, 3, 4, 5, 7, 10, 11, 13, 14, 15) \quad D_0 = \Sigma(6, 12)$$



$$D_3 = Q_3 Q_1' Q_0' + Q_3 Q_2' Q_1' + Q_3' Q_2 Q_1 Q_0'$$

$$= Q_3 Q_1' (Q_0' + Q_2') + Q_3' Q_2 Q_1 Q_0'$$

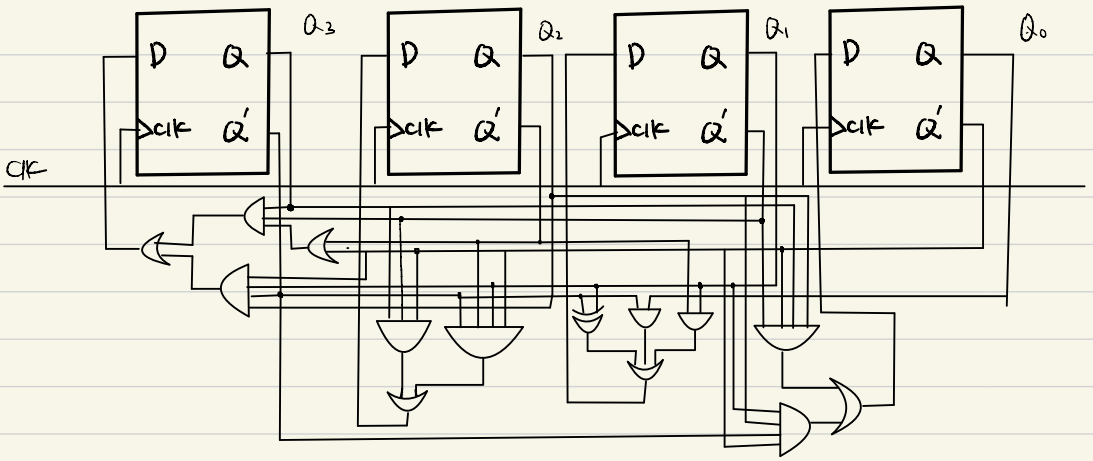
$$D_2 = Q_3 Q_1' Q_0' + Q_2' Q_2' Q_1 Q_0'$$



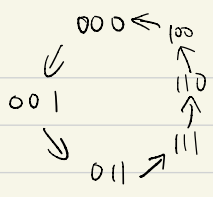
$$D_1 = Q_3' Q_1' + Q_3' Q_0 + Q_3 Q_1 + Q_2' Q_1$$

$$= (Q_1 \oplus Q_3)' + Q_3' Q_0 + Q_2' Q_1$$

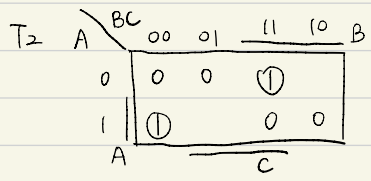
$$D_0 = Q_3 Q_2 Q_1' Q_0' + Q_3' Q_2 Q_1 Q_0'$$



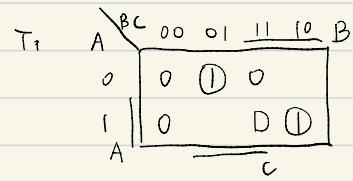
4



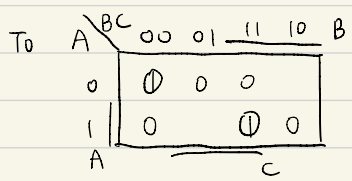
present state A B C	next state A B C	TFF		
		T ₂	T ₁	T ₀
0 0 0	0 0 1	0	0	1
0 0 1	0 1 1	0	1	0
0 1 1	1 1 1	1	0	0
1 1 1	1 1 0	0	0	1
1 1 0	1 0 0	0	1	0
1 0 0	0 0 0	1	0	0



$$T_2 = AB'C' + A'BC$$

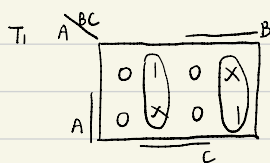
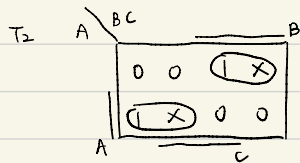


$$T_1 = A'B'C + ABC'$$



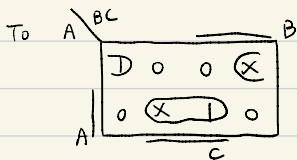
$$T_0 = ABC + A'B'C'$$

010 101 are don't care condition.



$$T_2 = AB' + A'B = A \oplus B$$

$$T_1 = BC' + B'C = B \oplus C$$

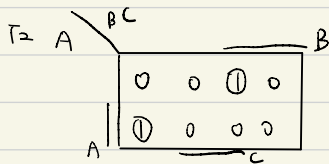


$$T_0 = AC + A'C' = (A \oplus C)'$$

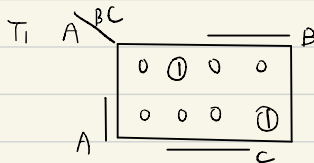
Present state			Next State			TFF		
A	B	C	A	B	C	T_2	T_1	T_0
0	1	0	1	0	1	1	1	1
1	0	1	0	1	0	1	1	1

Solution.

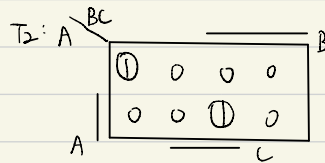
present state			Next State			TFF		
A	B	C	A	B	C	T_2	T_1	T_0
0	1	0	0	0	0	1	1	1
1	0	1	0	0	0	1	1	1



$$T_2 = AB'C' + A'BC$$



$$T_1 = A'B'C + ABC'$$



$$T_0 = ABC + A'BC'$$