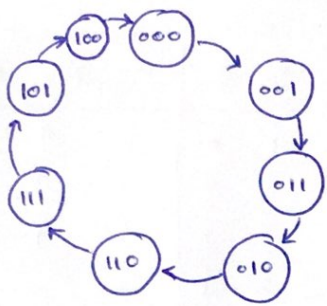


#1



Present state			Next state			FlipFlop input		
$Q_2$	$Q_1$	$Q_0$	$Q_2$	$Q_1$	$Q_0$	$D_2$	$D_1$	$D_0$
0	0	0	0	0	1			
0	0	1	0	1	1			
0	1	1	0	1	0			
0	1	0	1	1	0			
1	1	0	1	1	1			
1	1	1	1	0	1			
1	0	1	1	0	0			
1	0	0	0	0	0			

برای است با  
next state

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

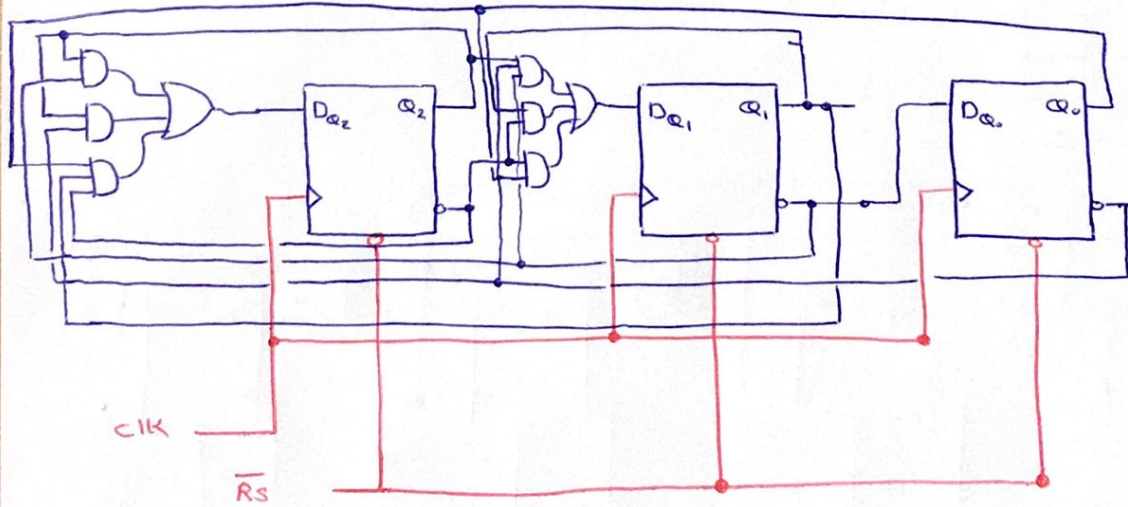
$$Q_2(t+1) = D_{Q_2} = Q_2 \bar{Q}_1 + Q_2 \bar{Q}_0 + \bar{Q}_2 Q_1 Q_0$$

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

$$Q_1(t+1) = D_{Q_1} = \bar{Q}_2 Q_0 + \bar{Q}_2 Q_1 + Q_2 \bar{Q}_1 \bar{Q}_0$$

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

$$Q_0(t+1) = D_{Q_0} = \bar{Q}_1$$



```

graph TD
    0001((0001)) --> 0010((0010))
    0010 --> 0100((0100))
    0100 --> 1000((1000))
    1000 --> 0001
  
```

Present state	Next state	FF input
$Q_3 \ Q_2 \ Q_1 \ Q_0$	$Q_3 \ Q_2 \ Q_1 \ Q_0$	$D_{a3} \ D_{a2} \ D_{a1} \ D_{a0}$
0 0 0 1	0 0 1 0	0 0 1 0
0 0 1 0	0 1 0 0	0 1 0 0
0 1 0 0	1 1 0 0	1 1 0 0
1 0 0 0	0 0 0 1	0 0 0 1

Q.10

Isos

	00	01	11	10
00	0	0	0	1
01	X	X	X	X
11	X	X	X	X
10	X	X	X	X

$$Q_3(t+1) = 1)Q_3 + Q_1 \bar{Q}_0$$

$Q_1 Q_2$   
 $Q_3 Q_2$

	00	01	11	10
00	0	1	0	1
01	X	X	X	X
11	X	X	X	X
10	X	X	X	X

$$Q_2(t+1) = \eta Q_2 = \bar{Q}_1 Q_0 + Q_1 Q_0$$

$Q_3 Q_2$  \  $Q_1 Q_0$   
 $Q_3 Q_2$    00   01   11   10  
 00   1   0   0   0  
 01   X         
 11   X         
 10   X      

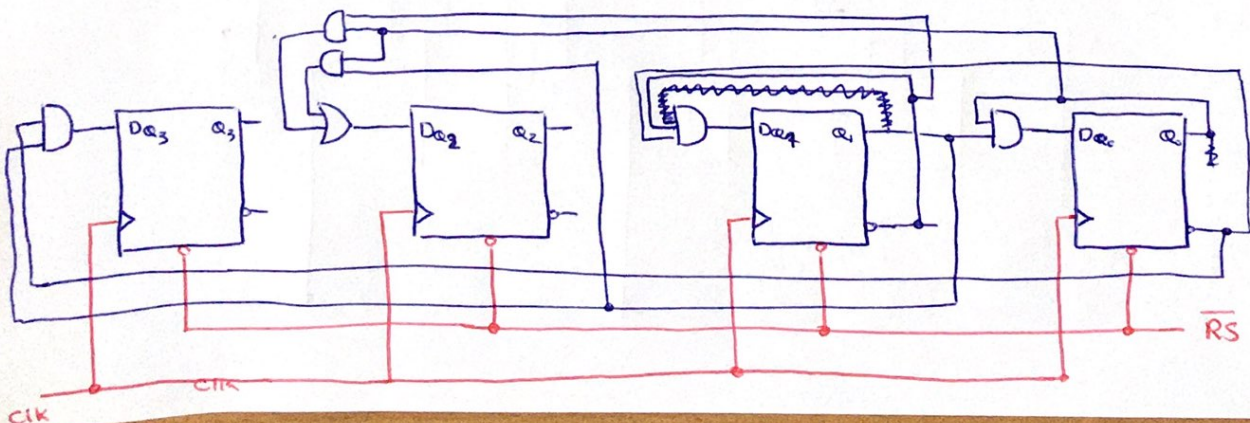
$$\mathcal{Q}_1(t+1) = \cap \mathcal{Q}_1$$

$$= \overline{\mathcal{Q}_0} \overline{\mathcal{Q}_1}$$

$Q_1 Q_0$   
 $Q_3 Q_2$

	00	01	11	10
00	0	0	1	0
01			X	
11			X	
10			X	

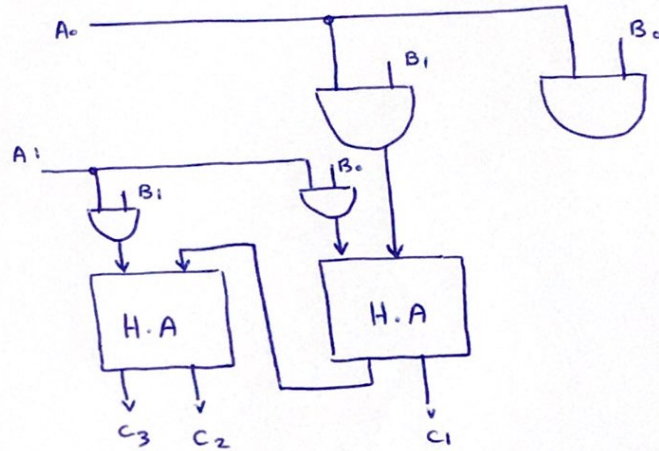
$$Q_0(t+1) = BQ_0 = Q_0Q_1$$





#3

		$B_1$	$B_0$	
		$A_1$	$A_0$	$\times$
		<hr/>		
		$A_0 B_1$	$A_0 B_0$	
		<hr/>		$+$
		$A_1 B_1$	$A_1 B_0$	
		<hr/>		
$C_3$	$C_2$	$C_1$	$C_0$	



gate level:

$$\begin{cases} A = A_1 A_0 \\ B = B_1 B_0 \\ y = C_3 C_2 C_1 C_0 \end{cases}$$

