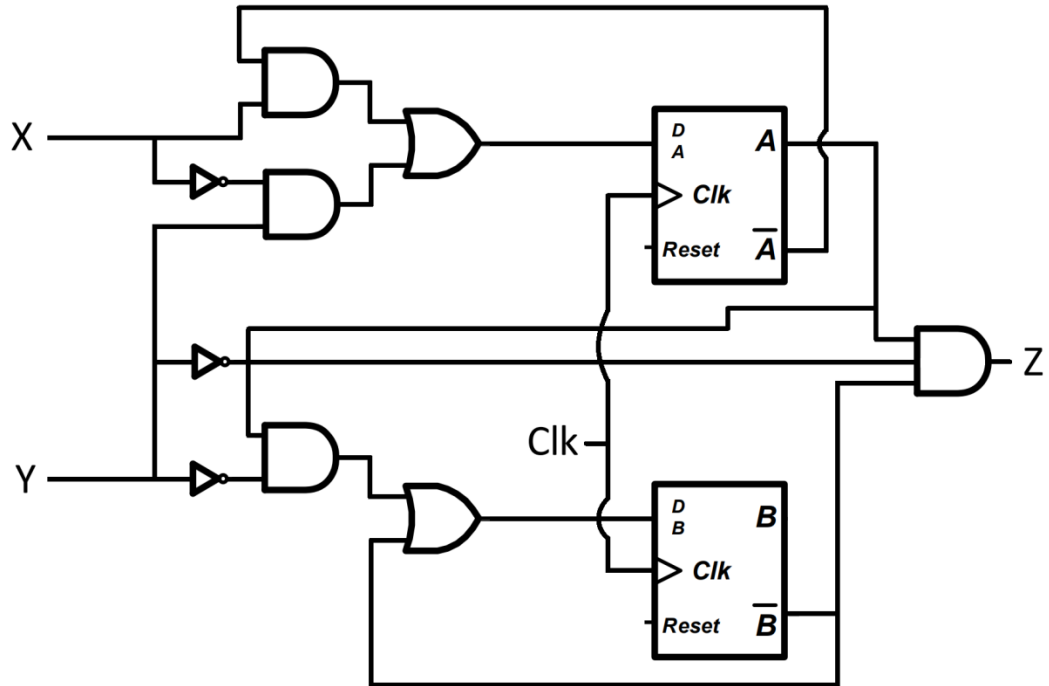


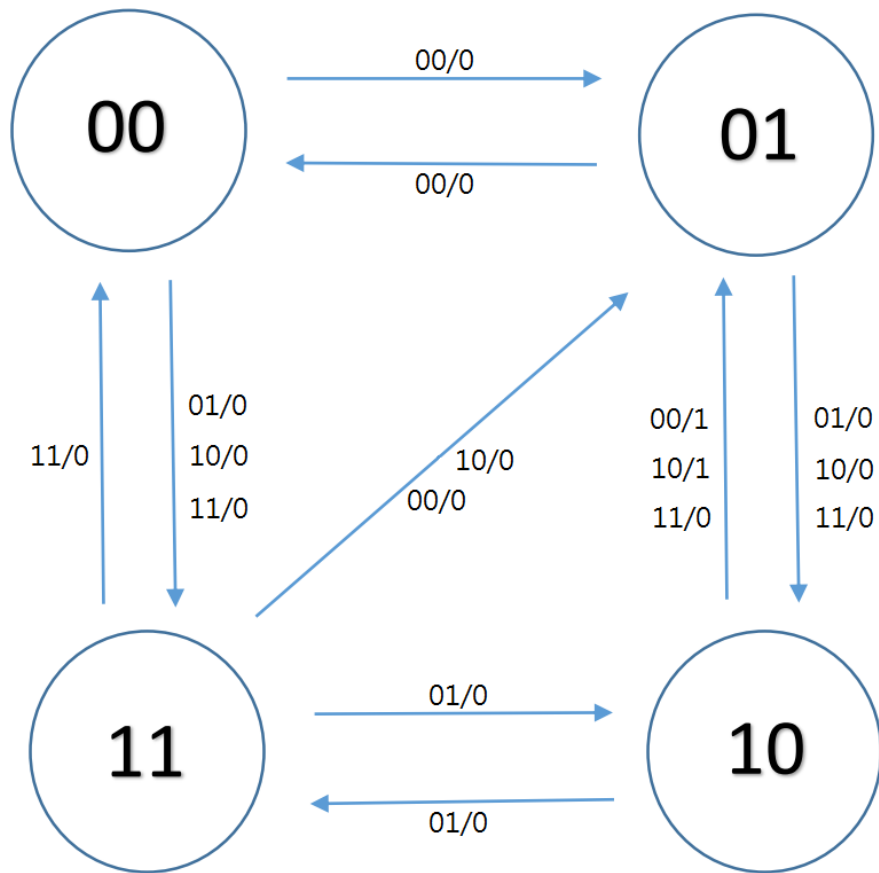
1.
(a)



(b)

current state		input		next state		output
A	B	X	Y	A+1	B+1	Z
0	0	0	0	0	1	0
0	0	0	1	1	1	0
0	0	1	0	1	1	0
0	0	1	1	1	1	0
0	1	0	0	0	0	0
0	1	0	1	1	0	0
0	1	1	0	1	0	0
0	1	1	1	1	0	0
1	0	0	0	0	1	1
1	0	0	1	1	1	0
1	0	1	0	0	1	1
1	0	1	1	0	1	0
1	1	0	0	0	1	0
1	1	0	1	1	0	0
1	1	1	0	0	1	0
1	1	1	1	0	0	0

(c)



2.

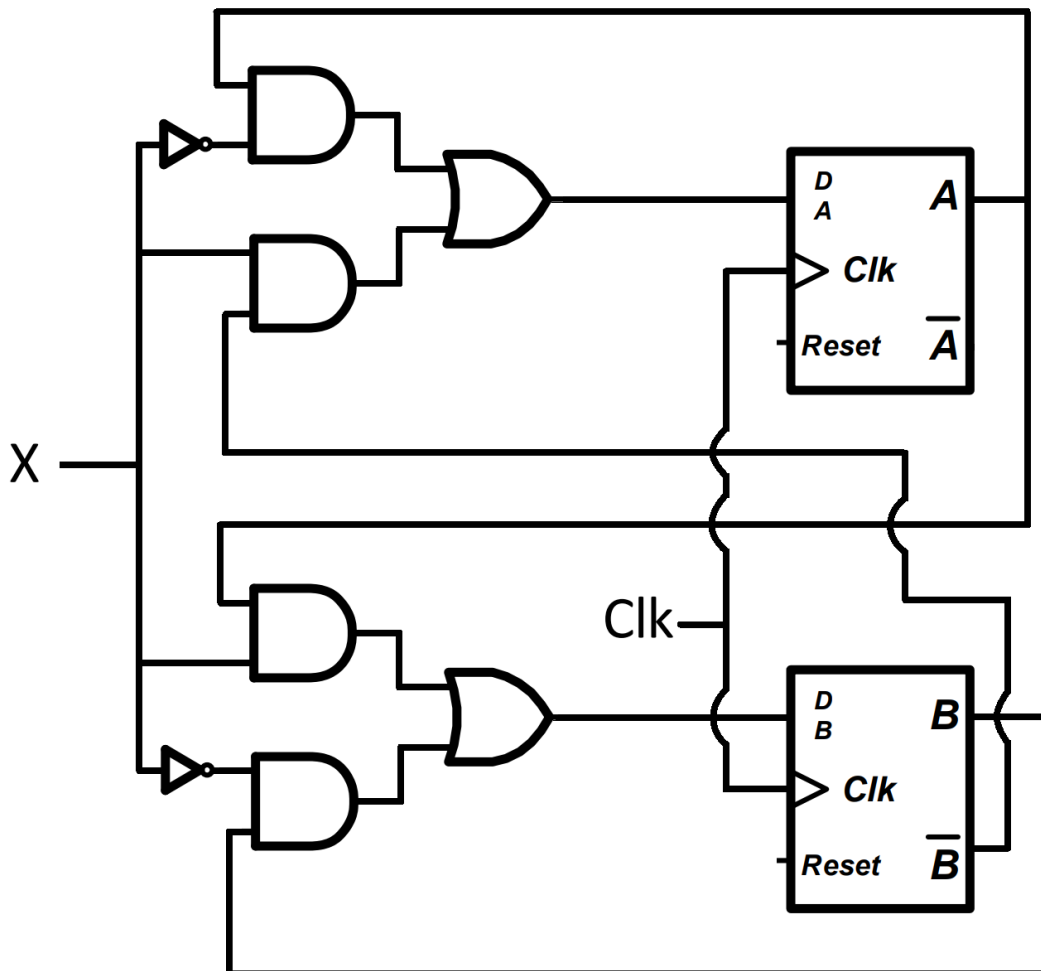
current state		input	next state	
A	B	X	A+1	B+1
0	0	0	0	0
0	0	1	1	0
0	1	0	0	1
0	1	1	0	0
1	0	0	1	0
1	0	1	1	1
1	1	0	1	1
1	1	1	0	1

D_A		AB			
		00	01	11	10
X	0			1	1
	1	1			1

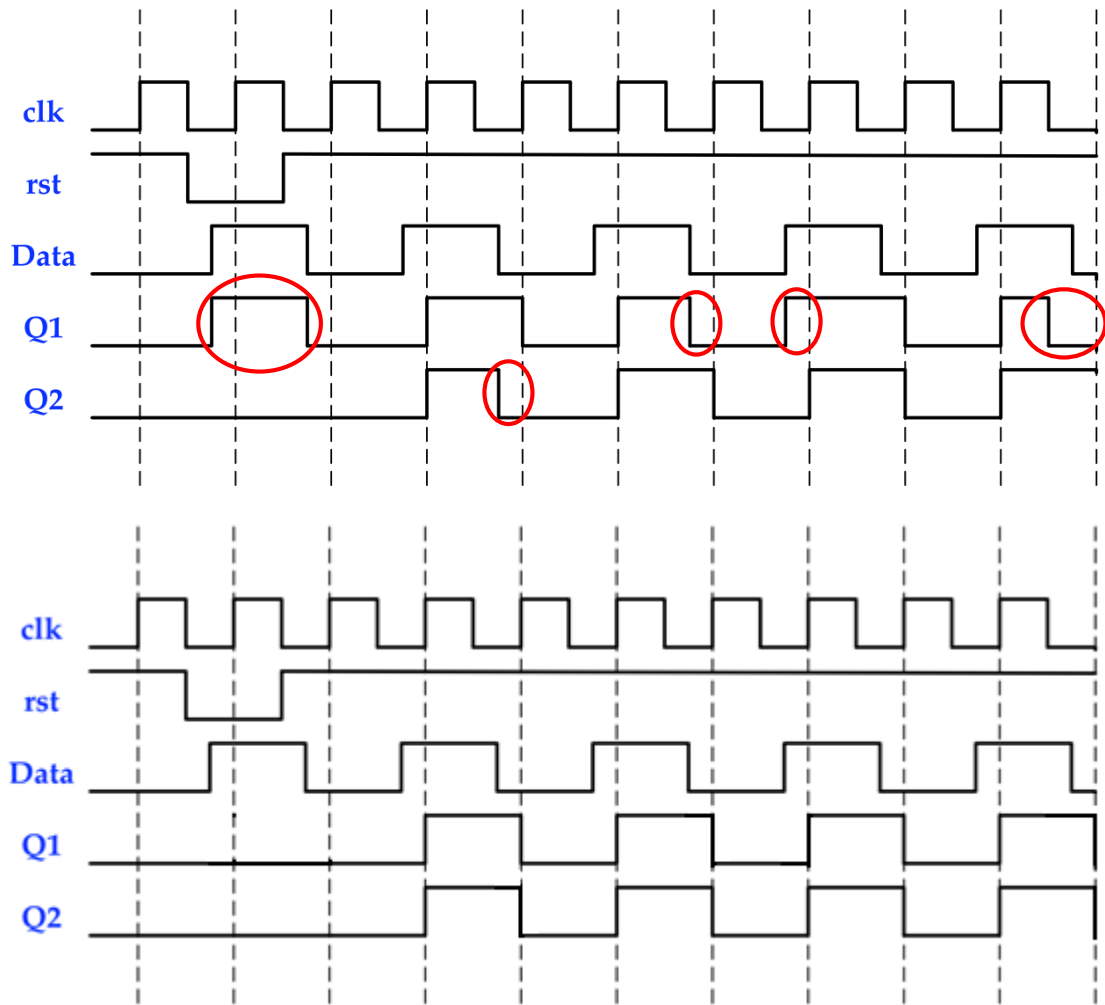
$$D_A = AX' + B'X$$

D_B		AB			
		00	01	11	10
X	0		1	1	
	1			1	1

$$D_B = AX + BX'$$



3.



4.

00 → 1000 01 → 0100 10 → 0010 11 → 0001

Present state				Input	Next state				Output
A	B	C	D	x	A+1	B+1	C+1	D+1	Y
1	0	0	0	0	0	1	0	0	1
1	0	0	0	1	1	0	0	0	1
0	1	0	0	0	0	1	0	0	0
0	1	0	0	1	0	0	1	0	0
0	0	1	0	0	0	0	0	1	0
0	0	1	0	1	0	0	1	0	0
0	0	0	1	0	0	0	0	1	0
0	0	0	1	1	1	0	0	0	0

AB \ CD	00	01	11	10
00	x	0	x	0
01	0	x	x	x
11	x	x	x	x
10	0	x	x	x

$X=0$

AB \ CD	00	01	11	10
00	x	0	x	1
01	1	x	x	x
11	x	x	x	x
10	0	x	x	x

$X=1$

$$D_A = B'C'X$$

AB \ CD	00	01	11	10
00	x	1	x	1
01	0	x	x	x
11	x	x	x	x
10	0	x	x	x

$X=0$

AB \ CD	00	01	11	10
00	x	0	x	0
01	0	x	x	x
11	x	x	x	x
10	0	x	x	x

$X=1$

$$D_B = C'D'X'$$

AB \ CD	00	01	11	10
00	x	0	x	0
01	0	x	x	x
11	x	x	x	x
10	0	x	x	x

$X=0$

AB \ CD	00	01	11	10
00	x	1	x	0
01	0	x	x	x
11	x	x	x	x
10	1	x	x	x

$X=1$

$$D_C = A'D'X'$$

	AB	00	01	11	10
CD	00	x	0	x	0
	01	1	x	x	x
	11	x	x	x	x
	10	1	x	x	x

$X=0$

	AB	00	01	11	10
CD	00	x	0	x	0
	01	0	x	x	x
	11	x	x	x	x
	10	0	x	x	x

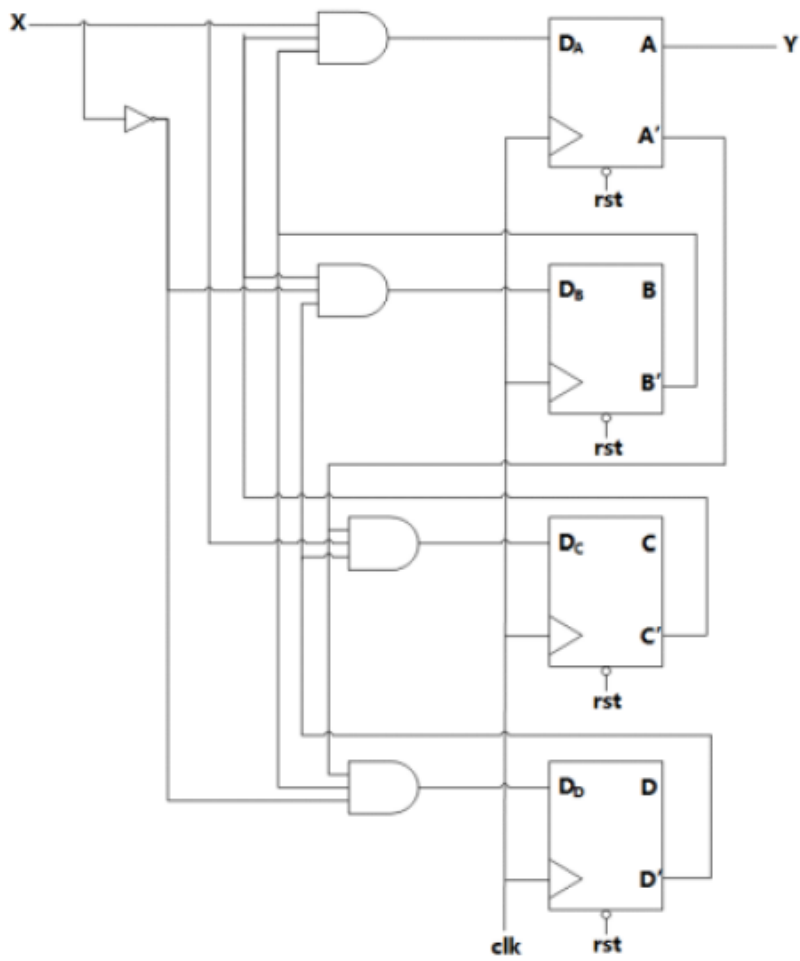
$X=1$

$$D_D = A'B'X'$$

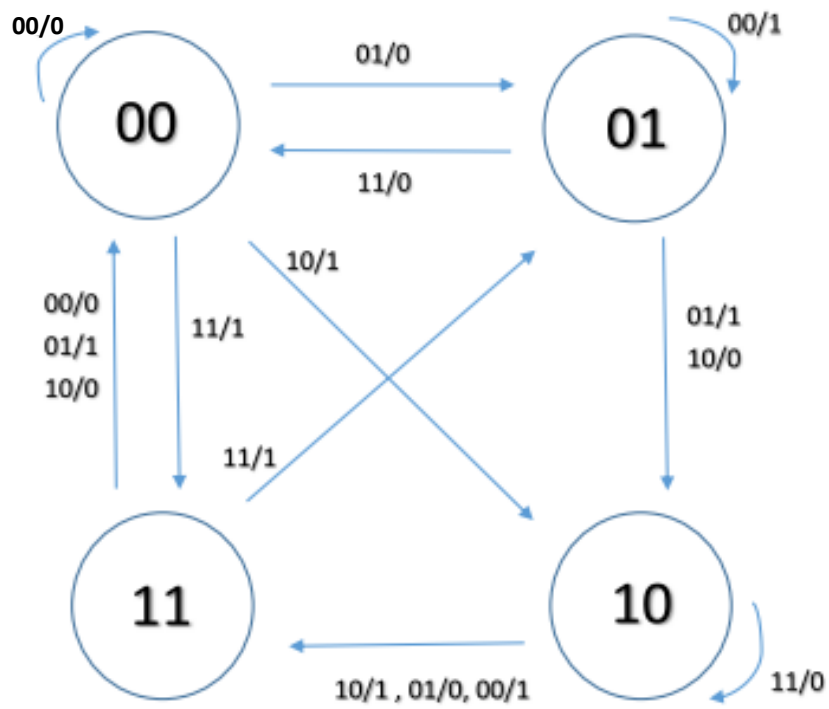
	AB	00	01	11	10
CD	00	x	0	x	1
	01	0	x	x	x
	11	x	x	x	x
	10	0	x	x	x

	AB	00	01	11	10
CD	00	x	0	x	1
	01	0	x	x	x
	11	x	x	x	x
	10	0	x	x	x

$$Y = A$$

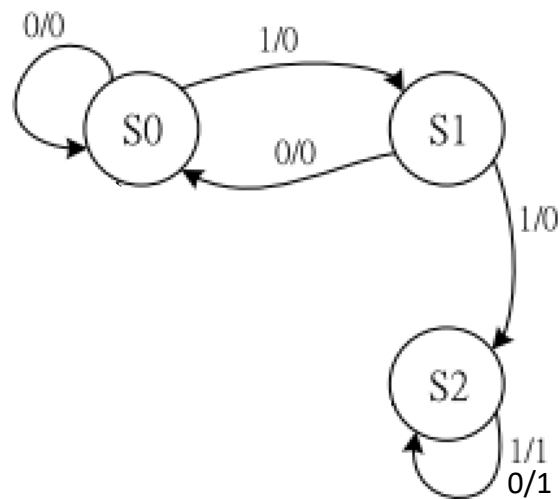


5.



6.

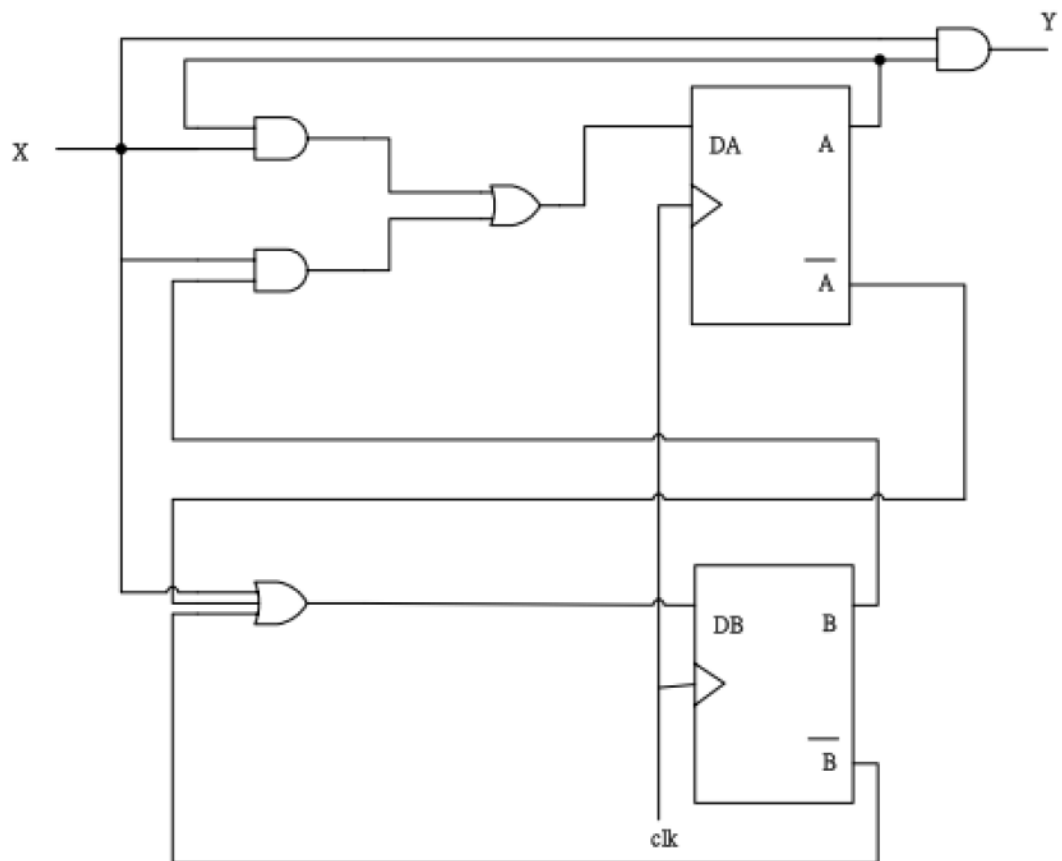
(a)



(b)

Present state		Input	Next state		output
A	B	x	A+1	B+1	Y
0	0	0	0	0	0
0	0	1	0	1	0
0	1	0	0	0	0
0	1	1	1	0	0
1	0	0	0	0	0
1	0	1	x	x	1

(c)



8.

Reduced state table

Present state	Next state		Output	
	X=0	X=1	X=0	X=1
a	f	b	0	0
b	d	b	1	0
d	d	a	1	0
f	f	b	1	1
h	d	a	0	0

Original table

state	a	b	d	a	b	d	a	f	b	d	g
Input	1	0	1	1	0	1	0	1	0	0	1
Output	0	1	0	0	1	0	0	1	1	1	0

Reduced table

state	a	b	d	a	b	d	a	f	b	d	d
Input	1	0	1	1	0	1	0	1	0	0	1
Output	0	1	0	0	1	0	0	1	1	1	0