

1.c.

目前狀態		input	次一狀態		output
A	B	X	A	B	Y
0	0	0	0	0	0
0	0	1	0	1	0
0	1	0	0	1	0
0	1	1	1	0	0
1	0	0	1	0	0
1	0	1	1	1	0
1	1	0	1	1	1
1	1	1	0	1	1

D.A

$$D_A = A'BX + AB' + AX'$$

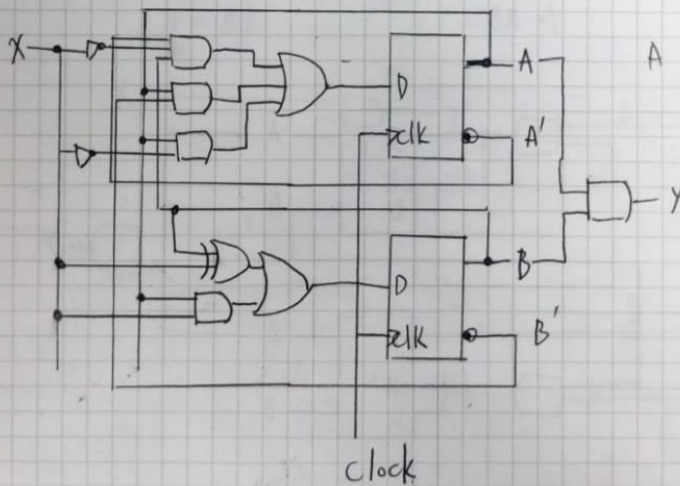
D.B

$$D_B = B'X + BX' + AX$$

$$= (B \oplus X) + AX$$

Y

$$Y = AB$$



1d.

目前狀態		input	次-狀態		output	正反器輸入			
A	B	X	A	B	Y	J _A	K _A	J _B	K _B
0	0	0	0	0	0	0	X	0	X
0	0	1	0	1	0	0	X	1	X
0	1	0	0	1	0	0	X	X	0
0	1	1	1	0	0	1	X	X	1
1	0	0	1	0	0	X	0	0	X
1	0	1	1	1	0	X	0	1	X
1	1	0	1	1	1	X	0	X	0
1	1	1	0	1	1	X	1	X	0

J_A

				1	
A	X	X	X	X	X

$J_A = BX$

K_A

					1
A				1	

$K_A = BX$

J_B

					1
A			1	X	X

$J_B = X$

K_B

					1
A	X	X			

$K_B = A'X$

Y

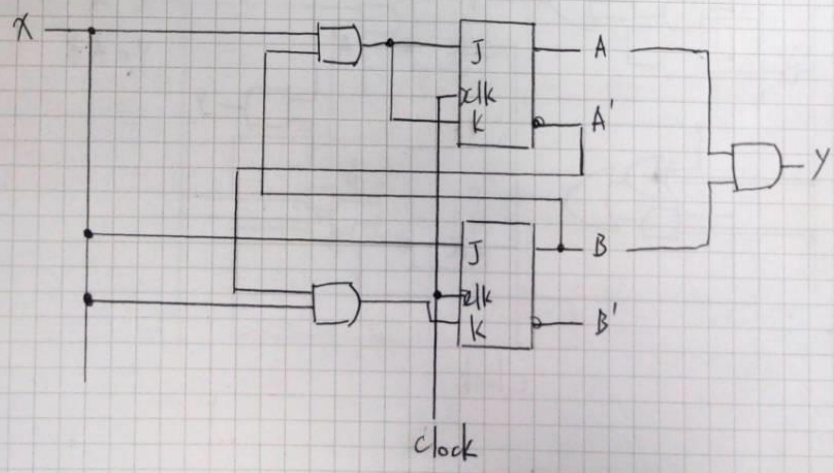
					1
A				1	1

$Y = AB$

$$A(t+1) = (BX)A' + (BX')A$$

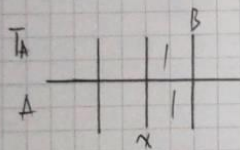
$$B(t+1) = XB' + (A'X)B$$

$$Y = A+B$$

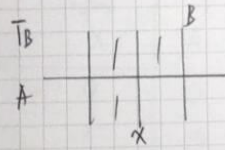


1e.

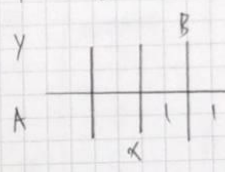
目前狀態		input	次一狀態		output	正反器輸入	
A	B	X	A	B	Y	T _A	T _B
0	0	0	0	0	0	0	0
0	0	1	0	1	0	0	1
0	1	0	0	1	0	0	0
0	1	1	1	0	0	1	1
1	0	0	1	0	0	0	0
1	0	1	1	1	0	0	1
1	1	0	1	1	1	0	0
1	1	1	0	1	1	1	0



$$T_A = BX$$



$$T_B = B'X + A'X$$

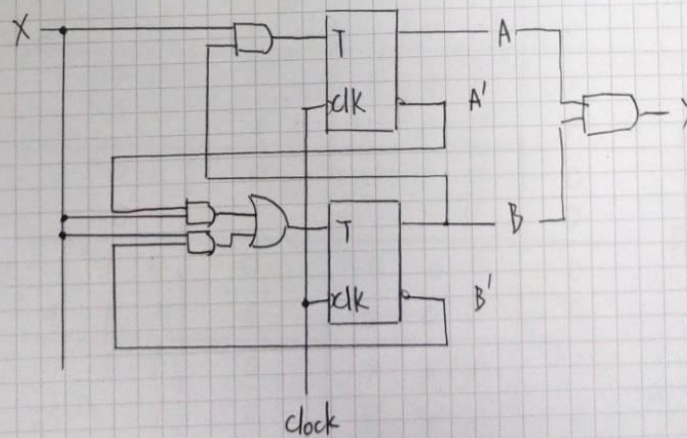


$$Y = AB$$

$$A(t+1) = (BX)A' + BX A$$

$$B(t+1) = (B'X + A'X)B + (B'X + A'X)B'$$

$$Y = AB$$



2. d.

目前狀態

input

次一狀態

output

正反器輸入

A B C

X

A B C

Y

J_A K_A J_B K_B J_C K_C

0 0 0

0

0 0 1

0

0 X 0 X 1 X

0 0 0

1

0 0 0

0

0 X 0 X 0 X

0 0 1

0

0 0 1

0

0 X 0 X X 0

0 0 1

1

0 1 0

0

0 X 1 X X 1

0 1 0

0

0 1 1

1

0 X X 0 1 X

0 1 0

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0 1 1

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0 X X 0 1 X

0 1 1

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1 0 0

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1 X X 1 X 1

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X 1 X 1 0 X

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X X X

X

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X

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J_A

K_A

J_B

A

A

A

X X X X

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目前狀態

input

次一狀態

output

正反器輸入

A B C

X

A B C

Y

J_A K_A J_B K_B J_C K_C

0 0 0

0

0 0 1

0

0 X 0 X 1 X

0 0 0

1

0 0 0

0

0 X 0 X 0 X

0 0 1

0

0 0 1

0

0 X 0 X X 0

0 0 1

1

0 1 0

0

0 X 1 X X 1

0 1 0

0

0 1 1

1

0 X X 0 1 X

0 1 0

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0 1 1

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0 X X 0 1 X

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J_A

K_A

J_B

A

A

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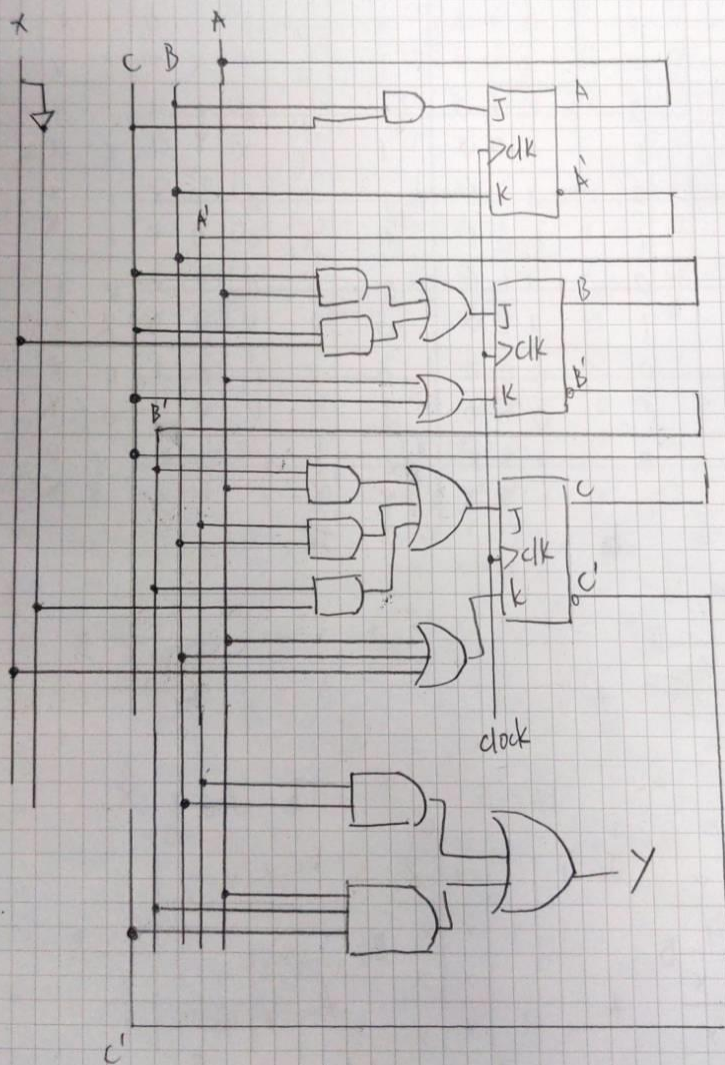
X X X X

X X X X

X X X X

X X X X

X X X X

$$y = A'B + AB'C'$$


2.e.

目前狀態			input X	次一狀態			output Y	正反器輸入		
A	B	C		A	B	C		T _A	T _B	T _C
0	0	0	0	0	0	1	0	0	0	1
0	0	0	1	0	0	0	0	0	0	0
0	0	1	0	0	0	1	0	0	0	0
0	0	1	1	0	1	0	0	0	1	1
0	1	0	0	0	1	1	1	0	0	1
0	1	0	1	0	1	1	1	0	0	1
0	1	1	0	1	0	0	1	1	1	1
0	1	1	1	1	0	0	1	1	1	1
1	0	0	0	1	0	1	1	0	0	1
1	0	0	1	1	0	1	1	0	0	1
1	0	1	0	1	1	0	0	0	1	1
1	0	1	1	1	1	0	0	0	1	1
1	1	0	0	0	0	0	0	1	1	0
1	1	0	1	0	0	0	0	1	1	0
1	1	1	0	x	x	x	x	x	x	x
1	1	1	1	x	x	x	x	x	x	x

TA

		1	1
1	1	x	x

TA = AB + BC

Y

1	1	1	1
		x	x

Y = A'B + AB'C'

TB

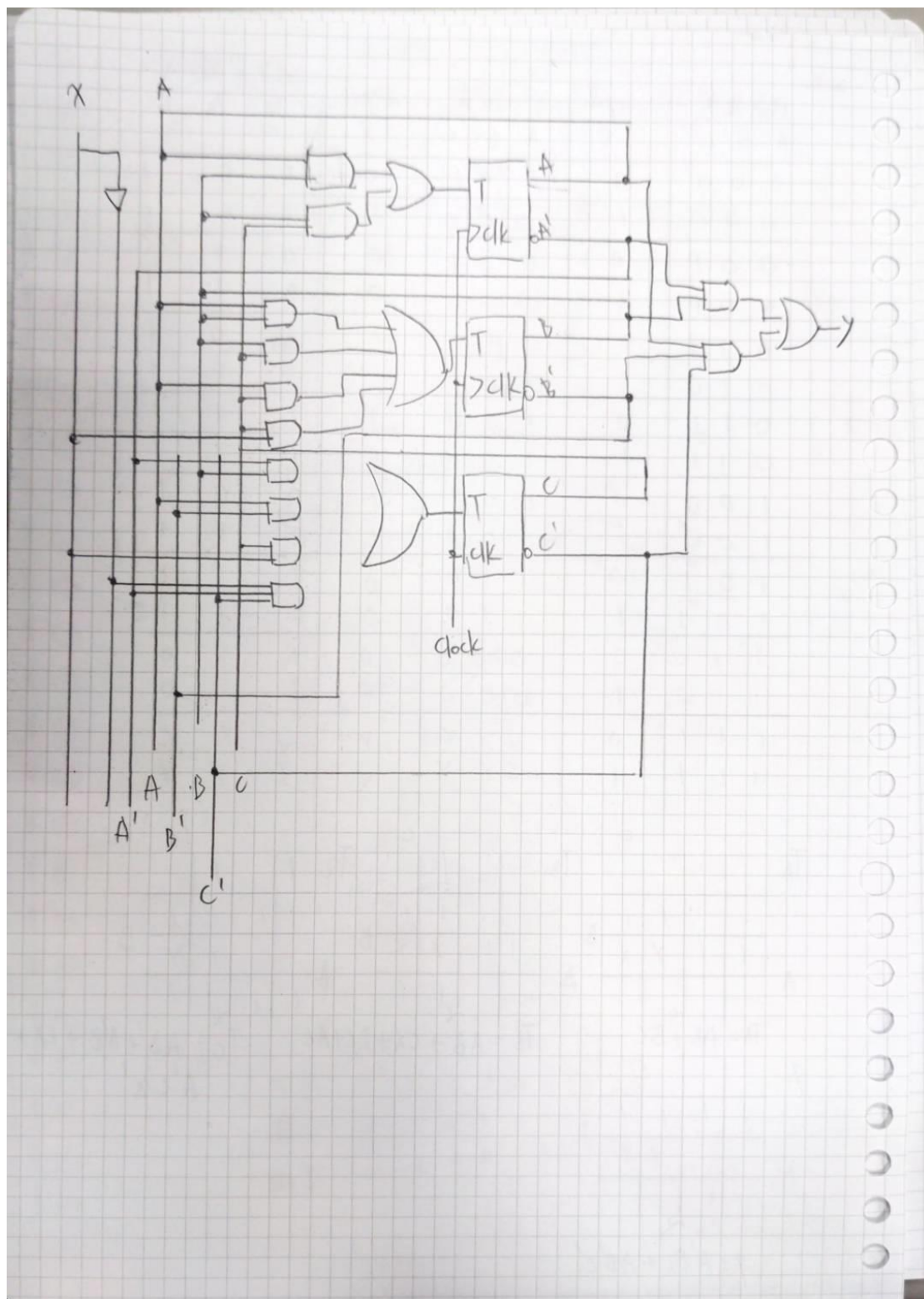
		1	1
		1	1
1	1	x	x
		1	1

TB = AB + CX + BC + AC

TC

1		1	
1	1	1	1
		x	x
1	1	1	1

TC = AB' + A'B + CX + A'C'X'

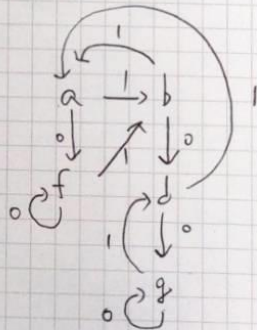


3. a

目前狀態	次-狀態		output	
	x=0	x=1	x=0	x=1
a	f	b	0	0
b	d	x a	0	0
c	f	x b	0	0
d	g	a	1	0
e	d	c	0	0
f	f	b	1	1
g	g	x d	0	1
h	g	a	1	0

目前狀態	次-狀態		output	
	x=0	x=1	x=0	x=1
a	f	b	0	0
b	d	a	0	0
d	g	a	1	0
f	f	b	1	1
g	g	d	0	1

b.



c.

狀態	a	f	b	d	a	f	f	b	d	a	b
輸入	0	1	0	1	0	0	1	0	1	1	1
輸出	0	1	0	0	0	1	1	0	0	0	0

4. a.

目前狀態		input	次一狀態		output
A	B	X	A	B	Y
0	0	0	1	0	1
0	0	1	0	1	1
0	1	0	0	1	0
0	1	1	0	1	1
1	0	0	1	1	1
1	0	1	0	1	1
1	1	0	1	0	0
1	1	1	0	1	0

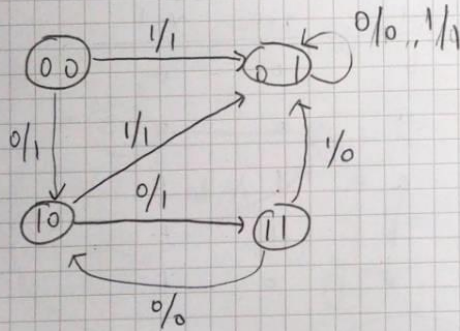
狀態方程式

$$A(t+1) = X'(A+B')$$

$$B(t+1) = (A \oplus B) + X$$

$$Y = (X'A') + B'$$

b.



5. a.

目前狀態		input X	次一狀態		output Y	正反器輸入			
A	B		A	B		J _A	K _A	J _B	K _B
0	0	0	1	0	1	1	1	0	0
0	0	1	0	1	1	0	1	1	1
0	1	0	0	1	1	0	0	1	0
0	1	1	0	0	1	0	0	1	1
1	0	0	0	1	1	1	1	1	0
1	0	1	0	1	1	0	1	1	1
1	1	0	0	1	0	1	1	0	0
1	1	1	0	0	0	0	1	1	1

$$J_A A' + K_A A$$

$$J_A = X'(A+B')$$

$$K_A = A+B'$$

$$J_B = X + (A \oplus B)$$

$$K_B = X$$

$$A(t+1) = X'(A+B')A' + (A+B')A$$

$$= (AX' + B'X')A' + A'BA$$

$$= A'B'X'$$

$$B(t+1)$$

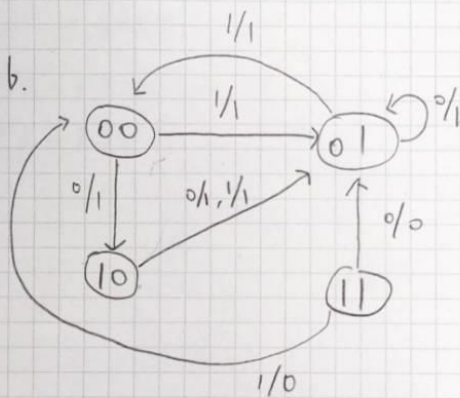
$$[(A \oplus B) + X]B' + X'B$$

$$= (AB' + A'B)B' + B'X + BX'$$

$$= AB' + B'X + BX'$$

$$Y = A' + B'$$

b.



6.a.

目前狀態		input X	次一狀態		output Y
A	B		A	B	
0	0	0	0	0	0
0	0	1	0	1	0
0	1	0	0	1	1
0	1	1	1	0	1
1	0	0	1	1	1
1	0	1	0	1	1
1	1	0	1	0	1
1	1	1	0	0	1

$$T_A = X(A+B)$$

$$T_B = A+X$$

$$Y = A+B$$

$$A(t+1) = (A+B)XA' +$$

$$[(A+B)X']'A$$

$$= (AX+BX)A' + (A'B'+X')A$$

$$= A'BX + AX'$$

$$B(t+1)$$

$$= (A+X)B' + (A+X)'B$$

$$= AB' + B'X + A'X'B$$

$$= AB' + B'X + A'BX'$$

