

1. T

2. F

3. F

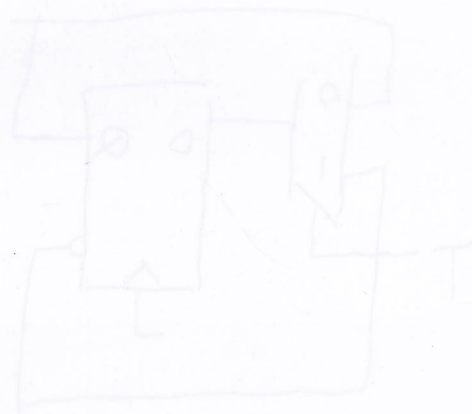
4. F

5. T

6. T

7. F

8. F



1. $P_i = A_i \oplus B_i$

$G_i = A_i \cdot B_i$

$$C_4 = G_3 + P_3 C_3 = G_3 + P_3 G_2 + P_3 P_2 G_1 + P_3 P_2 P_1 G_0 + P_3 P_2 P_1 P_0 C_0$$

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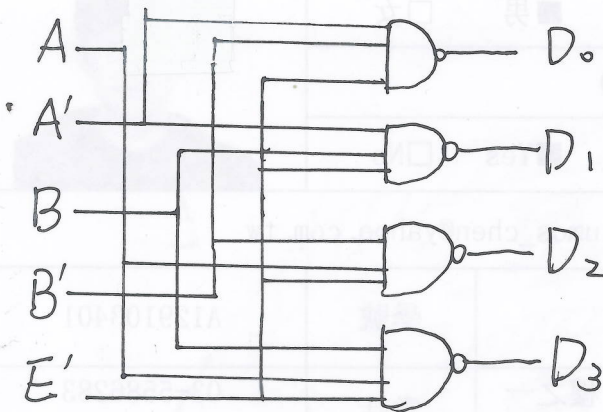
A	B	E	D ₀	D ₁	D ₂	D ₃
X	X	1	1	1	1	1
0	0	0	0	1	1	1
0	0	1	1	0	1	1
1	0	0	1	1	0	1
1	1	0	1	1	1	0

$$D_0 = (E'A'B')'$$

$$D_1 = (E'A'B)'$$

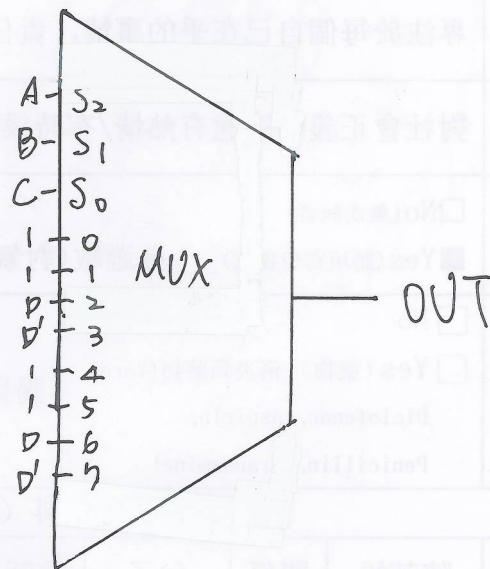
$$D_2 = (E'AB')'$$

$$D_3 = (E'AB)'$$

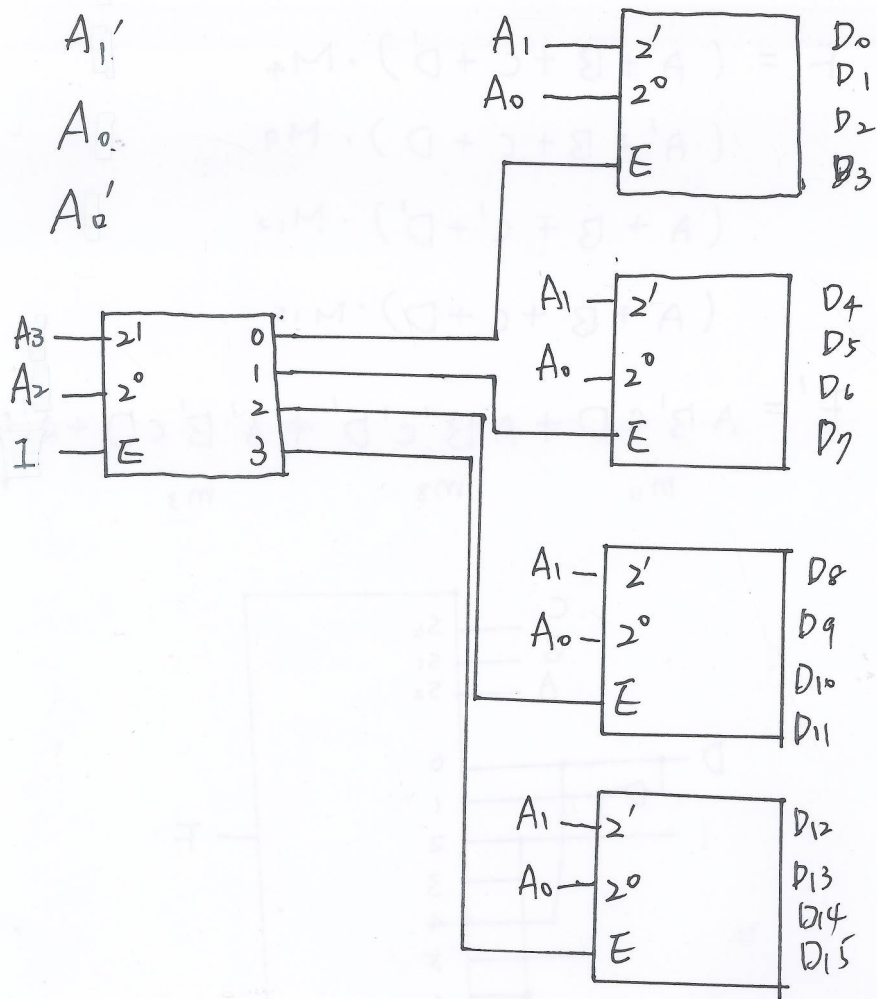


3.

A	B	C	D	OUT
0	0	0	0	1
0	0	0	1	1
0	0	1	0	1
0	0	1	1	1
0	1	0	0	0
0	1	0	1	1
0	1	1	0	1
0	1	1	1	0
1	0	0	0	1
1	0	0	1	1
1	0	1	0	1
1	0	1	1	1
1	1	0	0	0
1	1	0	1	1
1	1	1	0	1
1	1	1	1	0

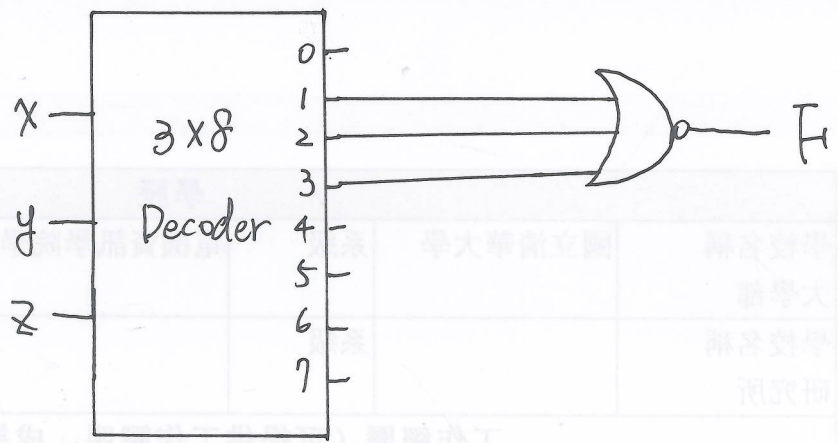


$z_1(b)$
 A_1
 A_1'
 A_0
 A_0'



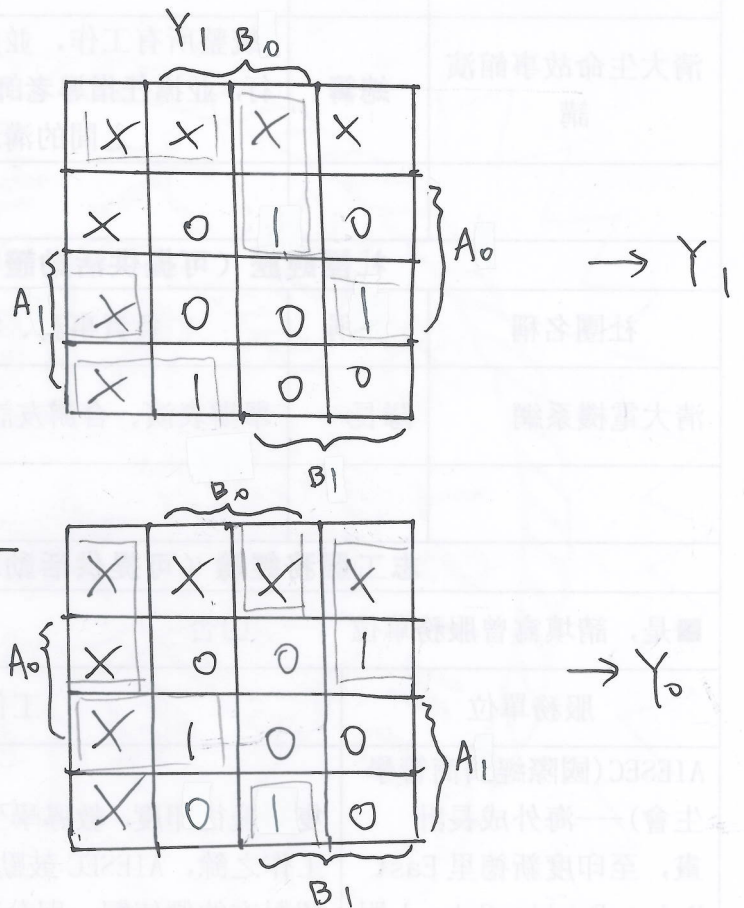
4,

x	y	z	F
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	1



5,

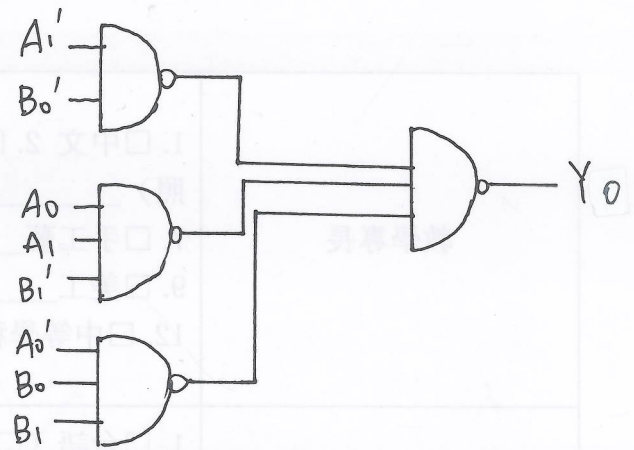
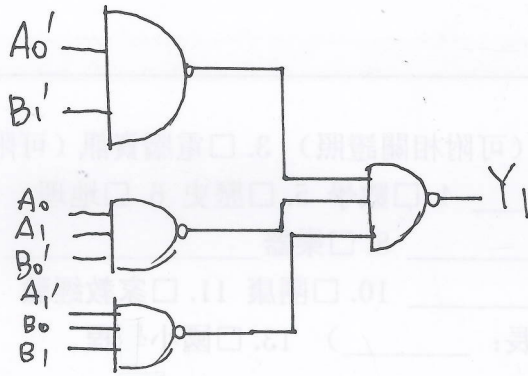
A		B		Y	
A ₁	A ₀	B ₁	B ₀	Y ₁	Y ₀
0	0	0	0	x	x
0	0	0	1	x	x
0	0	1	0	x	x
0	0	1	1	x	x
0	1	0	0	x	x
0	1	0	1	0	0
0	1	1	0	0	1
0	1	1	1	1	0
1	0	0	0	x	x
1	0	0	1	1	0
1	0	1	0	0	0
1	0	1	1	0	1
1	1	0	0	x	x
1	1	0	1	0	1
1	1	1	0	1	0
1	1	1	1	0	0



$$Y_1 = A_0' B_1' + A_0 A_1 B_0' + A_1' B_0 B_1$$

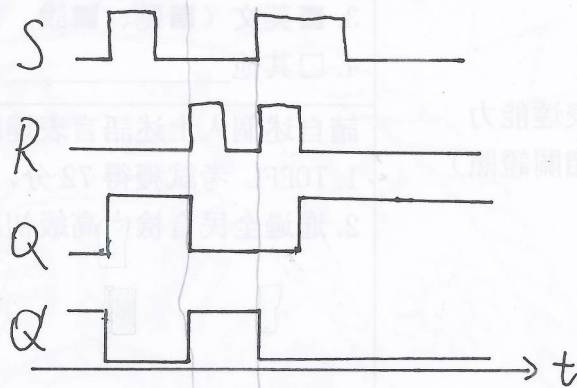
$$Y_0 = A_1' B_0' + A_0 A_1 B_1' + A_0' B_0 B_1$$

5.(C)



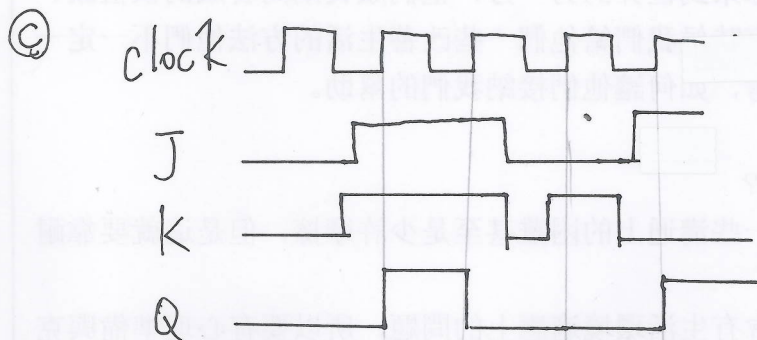
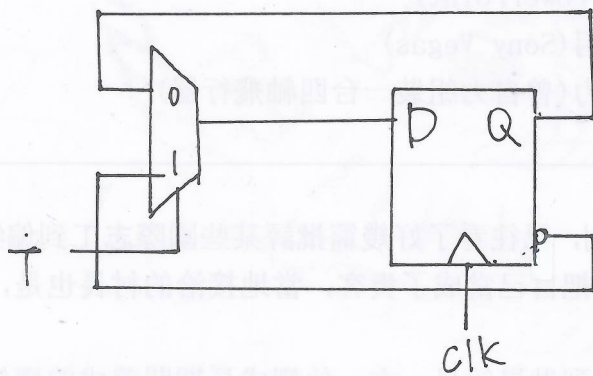
6. (a)

S	R	Q	Q(t+1)	Q'(t+1)
0	0	0	0	1
0	0	1	1	0
0	1	0	0	1
0	1	1	0	1
1	0	0	1	0
1	0	1	1	0
1	1	0	0	0
1	1	1	0	0



(b)

$$Q(t+1) = TQ' + T'Q$$



JK	Q(t+1)
00	Q(t)
01	0
10	1
11	Q'(t)

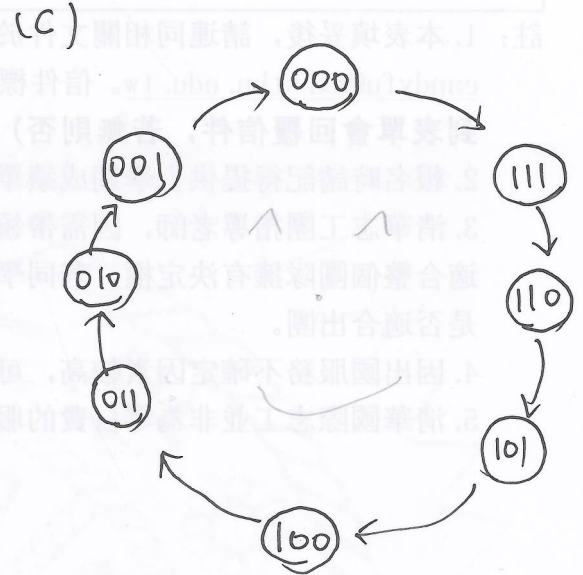
7, (a) $A_2(t+1) = A_2(t) \cdot A_0(t) + A_2(t) \cdot A_1(t) + A_0'(t) \cdot A_1'(t) \cdot A_2'(t)$

$A_1(t+1) = A_1(t) \cdot A_0(t) + A_1'(t) \cdot A_0'(t)$

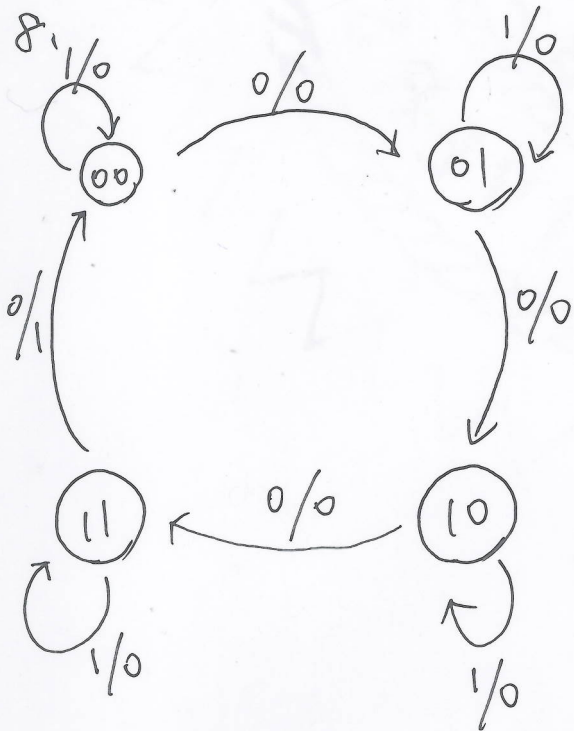
$A_0(t+1) = A_0'(t)$

(b)

PS			NS		
A_2	A_1	A_0	A_2	A_1	A_0
0	0	0	1	1	1
0	0	1	0	0	0
0	1	0	0	0	1
0	1	1	0	1	0
1	0	0	0	1	1
1	0	1	1	0	0
1	1	0	1	0	1
1	1	1	1	1	0



(d) Moore Machine.



A	B	Hold	A	B	Carry-out
0	0	0	0	1	0
0	0	1	0	0	0
0	1	0	1	0	0
0	1	1	0	1	0
1	0	0	1	1	0
1	0	1	1	0	0
1	1	0	0	0	1
1	1	1	1	1	0

(b) It's mealy machine

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$A(t+1)$

Hold.

	Hold.		
	0	0	0
	0	0	1
A	1	1	1
			0
	B		

$B(t+1)$

Hold

	Hold		
	1	0	1
	1	0	0
A	1	0	1
			0
	B		

$$\text{Carry out} = AB\text{Hold}'$$

$$A = AH + AB' + A'BH'$$

$$B = B'H' + BH$$

