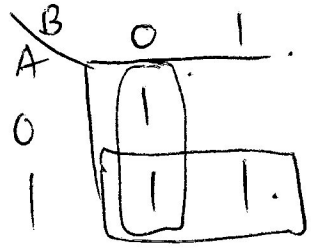
A1.1 (1)



$Y = A + \bar{B}$

(2)

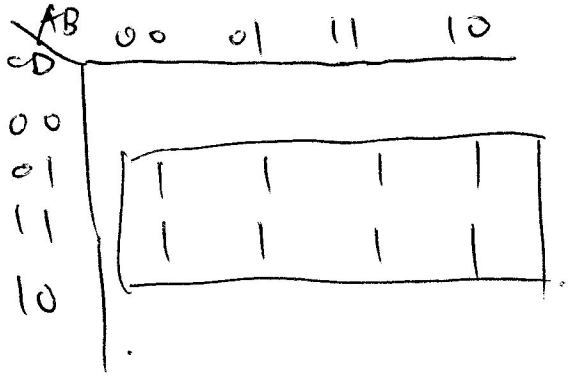
$Y = \bar{A}B + A\bar{C}$

(3)

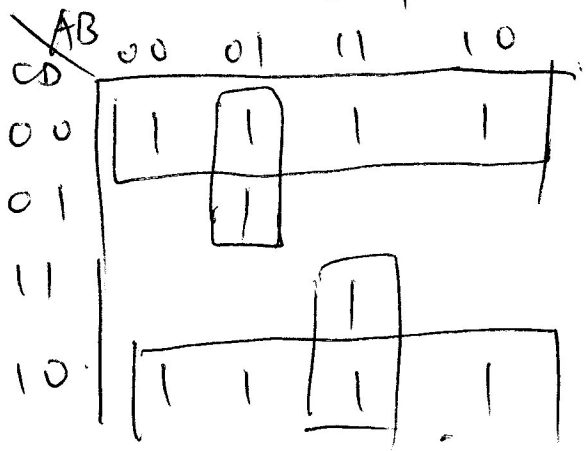
$Y = \bar{A}C\bar{D} + B\bar{C}\bar{D} + A\bar{B}\bar{D} + A\bar{B}C + \bar{A}BCD.$

(4)

$E=0$:



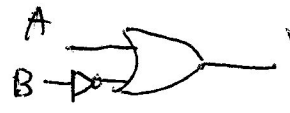
$E=1$



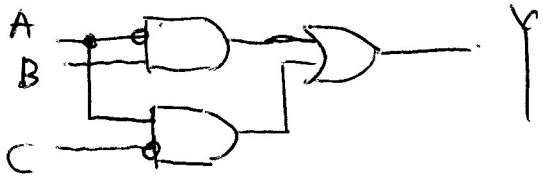
$Y = D\bar{E} + \bar{D}E + \bar{A}B\bar{C}\bar{E} + ABCE.$

A1-1 (iii).

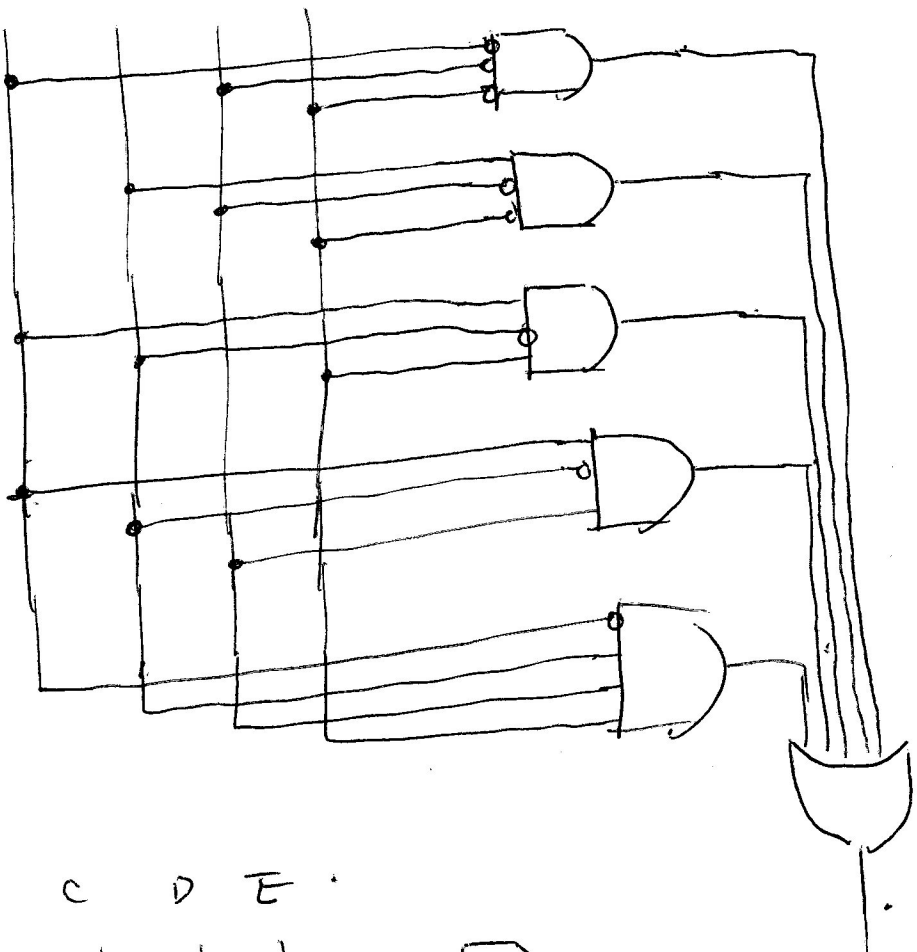
(1)



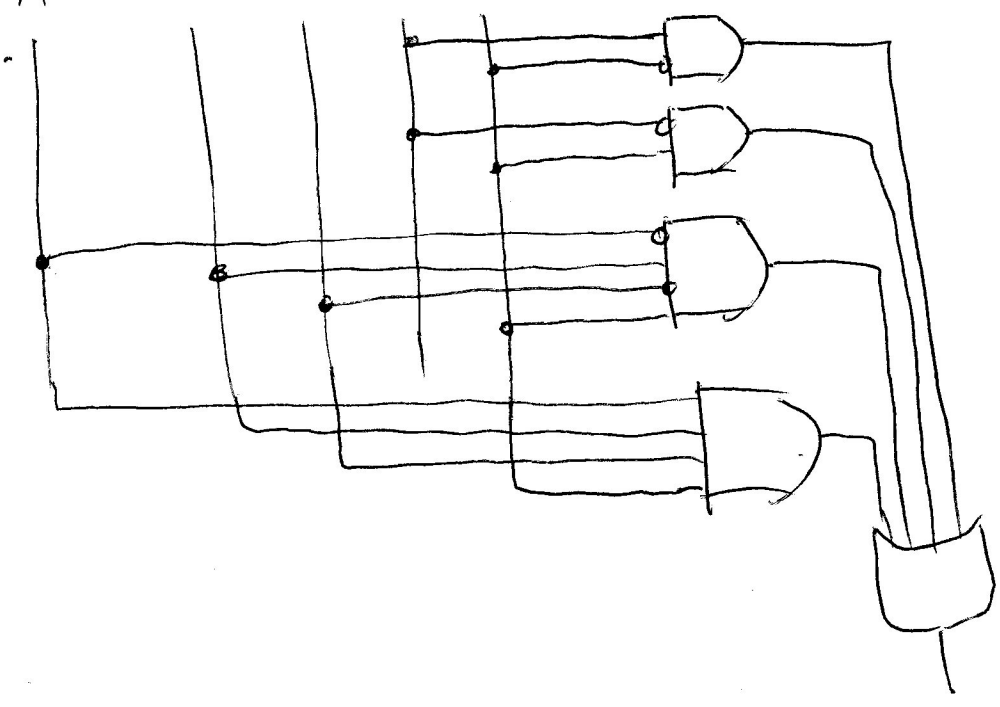
(2)



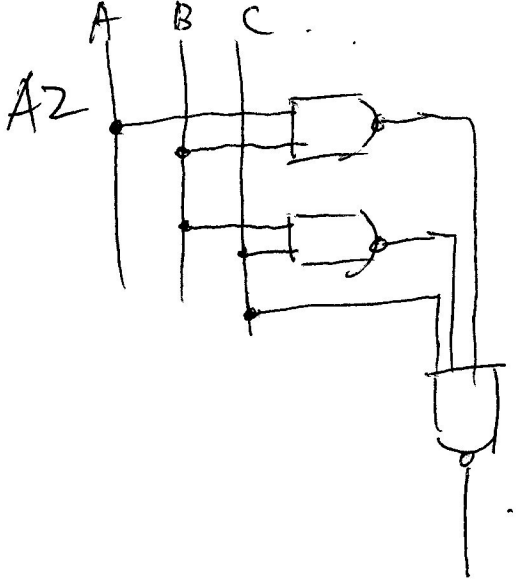
(3) A B C D.



(4) A B C D E.



A2



$$\overline{\bar{A}+\bar{B}} + BC + \bar{C}$$

$$= AB + BC + \bar{C}$$

$$= \overline{\overline{AB} \cdot \overline{BC} \cdot C}$$

A3

3.1

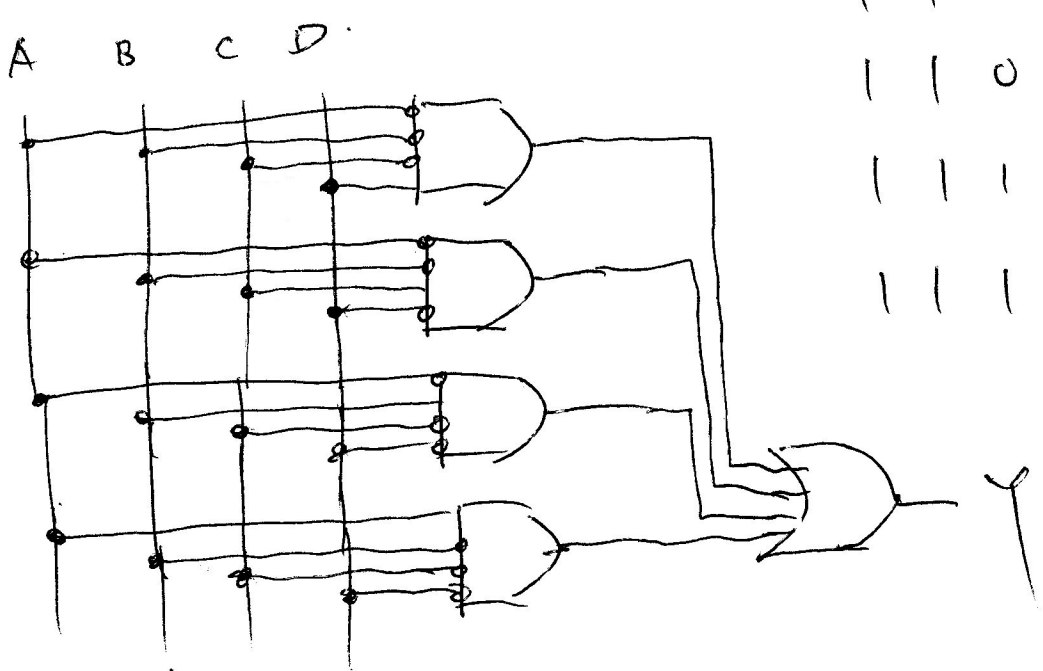
A	B	C	Y
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

3.2

A	B	C	D	Y
0	0	0	0	0
0	0	0	1	1
0	0	1	0	1
0	0	1	1	0
0	1	0	0	1
0	1	0	1	0
0	1	1	0	0
0	1	1	1	1
1	0	0	0	1
1	0	0	1	0
1	0	1	0	0
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

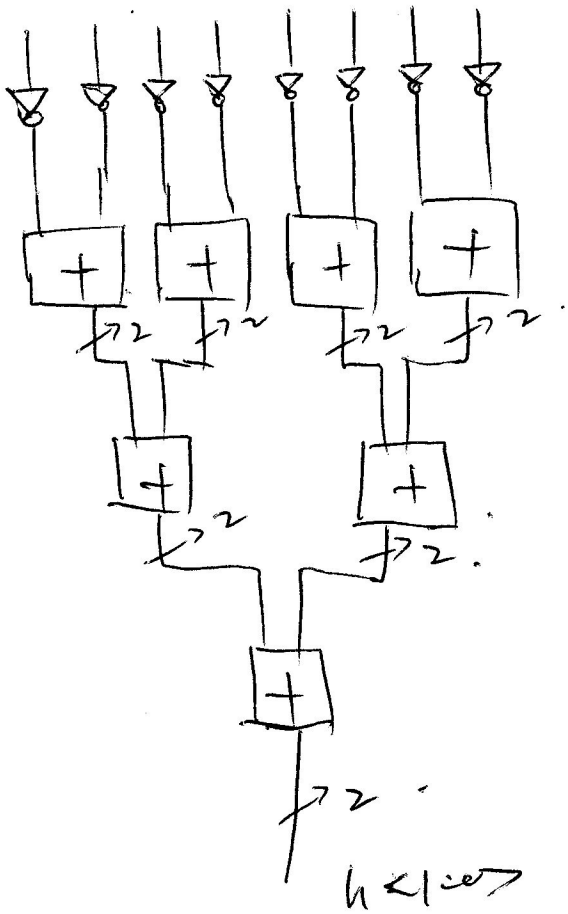
3.3

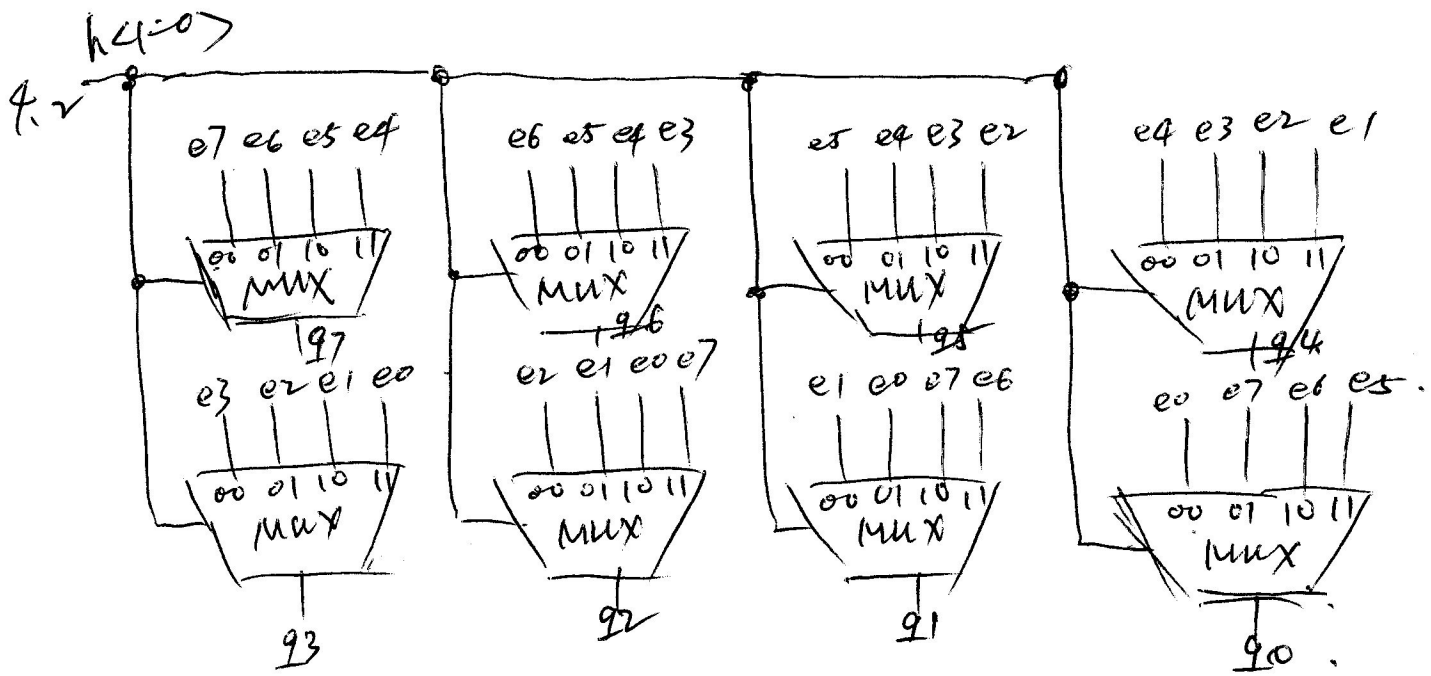
$$Y = \bar{A}\bar{B}\bar{C}D + \bar{A}\bar{B}C\bar{D} + \bar{A}B\bar{C}\bar{D} + A\bar{B}\bar{C}\bar{D}$$



A4

4.1





4.3:

0: 00110000 (10) 6: 00110110 (00)

1: 00110001 (01) 7: 00110111 (11)

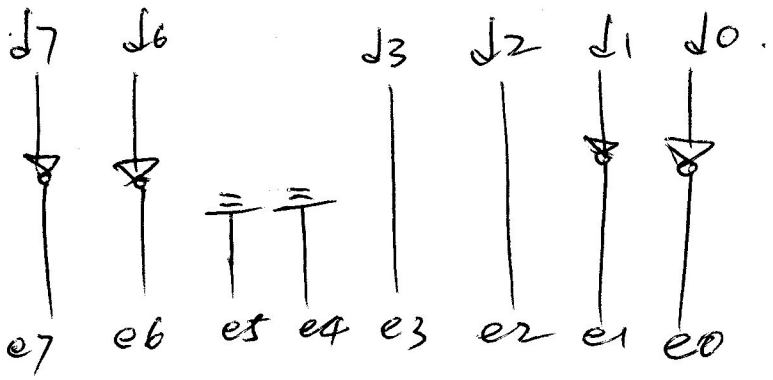
2: 00110010 (01) 8: 00111000 (01)

3: 00110011 (00)

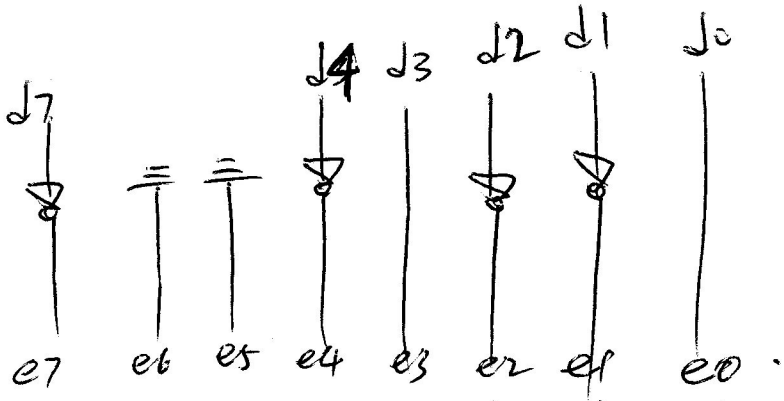
4: 00110100 (01) 9: 00111001 (00).

5: 00110101 (00)

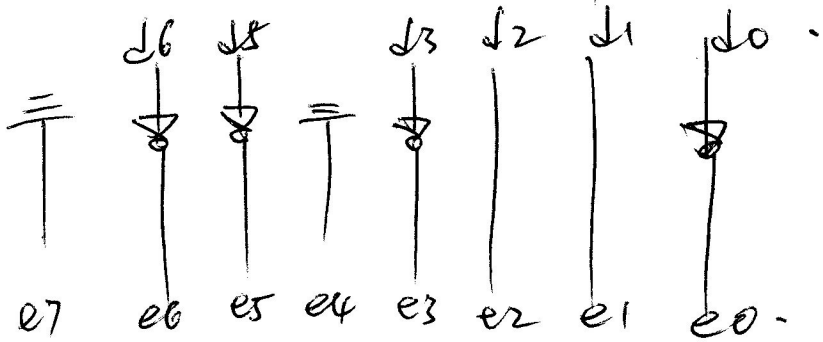
4.4 00:


d7 d6 d3 d2 d1 d0.
e7 e6 e5 e4 e3 e2 e1 e0

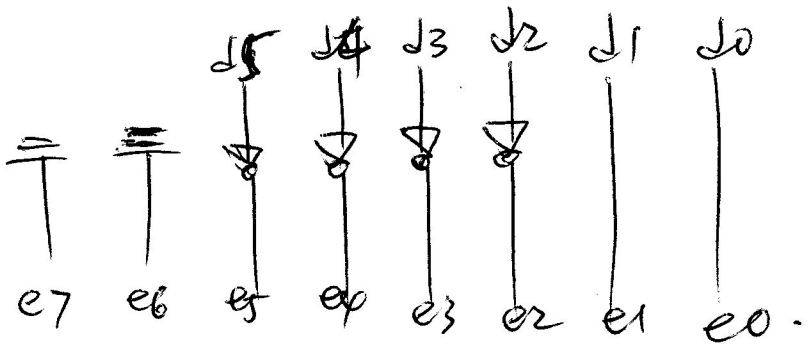
01:

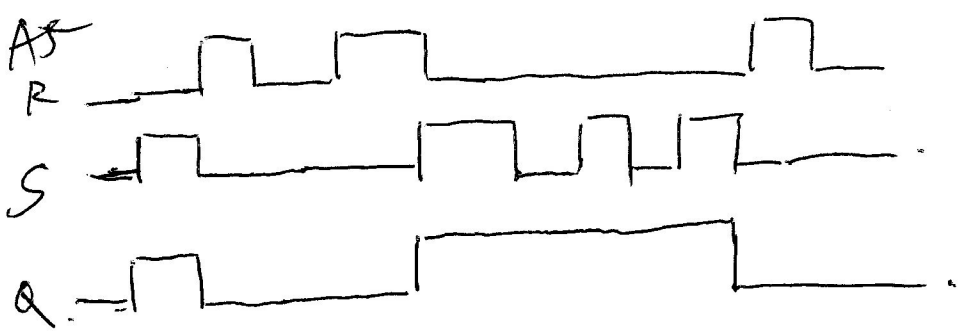

d4 d3 d2 d1 d0
d7
e7 e6 e5 e4 e3 e2 e1 e0.

10:

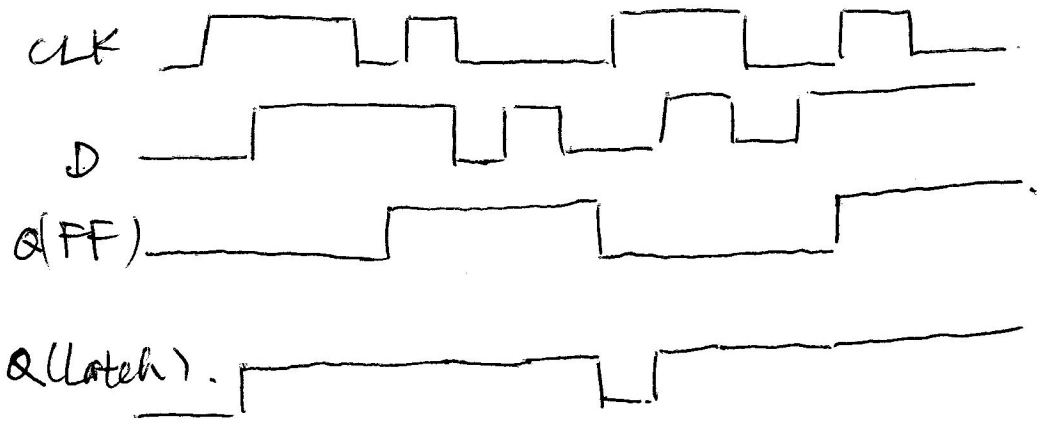

d6 d5 d3 d2 d1 d0.
e7 e6 e5 e4 e3 e2 e1 e0.

11:


d5 d4 d3 d2 d1 d0
e7 e6 e5 e4 e3 e2 e1 e0.


AS
R
S
Q

A6.



A7. Mealy machine.

$S_1 S_0$

S_0: 00

S_1: 01

S_2: 10

S_1	S_0	A	B	S_1'	S_0'
0	0	0	0	0	0
0	0	0	1	0	0
0	0	1	0	0	1
0	0	1	1	0	0
0	1	0	0	1	0
0	1	0	1	0	0
0	1	1	0	0	1
0	1	1	1	0	0
1	0	0	0	1	0
1	0	0	1	0	0
1	0	1	0	0	1
1	0	1	1	0	0

$$S_1' = \bar{S}_1 S_0 \bar{A}\bar{B} + S_1 \bar{S}_0 \bar{A}\bar{B}$$

$$= \bar{A}\bar{B}(\bar{S}_1 S_0 + S_1 \bar{S}_0)$$

$$= \bar{A}\bar{B}(\bar{S}_1 S_0 + S_1 \bar{S}_0 + S_1 S_0) = \bar{A}\bar{B}(\bar{S}_1 S_0 + S_1)$$

$$= \bar{A}\bar{B}(S_0 + S_1)$$

$$S_0' = \bar{S}_1 \bar{S}_0 A\bar{B} + \bar{S}_1 S_0 \bar{A}\bar{B} + S_1 \bar{S}_0 A\bar{B}$$

$$= A\bar{B}(\bar{S}_1\bar{S}_0 + \bar{S}_1 S_0 + S_1\bar{S}_0) = A\bar{B}(\bar{S}_1 + S_1\bar{S}_0) = A\bar{B}(\bar{S}_1 + \bar{S}_0) = A\bar{B}(\bar{S}_1\bar{S}_0 + \bar{S}_1 S_0 + S_1\bar{S}_0 + S_1 S_0) = A\bar{B}$$

S_1	S_0	A	B	Y
0	0	0	0	0
0	0	0	1	0
0	0	1	0	1
0	0	1	1	0
0	1	0	0	1
0	1	0	1	0
0	1	1	0	1
0	1	1	1	0
1	0	0	0	1
1	0	0	1	0
1	0	1	0	1
1	0	1	1	0

$$Y = \bar{S_1}\bar{S_0}A\bar{B} + \bar{S_1}S_0\bar{A}\bar{B} + S_1\bar{S_0}\bar{A}\bar{B} + S_1S_0A\bar{B} + S_1\bar{S_0}\bar{A}B + S_1S_0A\bar{B}$$

$$= A\bar{B}(\bar{S_1}\bar{S_0} + \bar{S_1}S_0 + S_1\bar{S_0}) + \bar{A}\bar{B}(\bar{S_1}S_0 + S_1\bar{S_0})$$

$$= A\bar{B}(\bar{S_1}\bar{S_0} + \bar{S_1}S_0 + S_1\bar{S_0} + S_1S_0) + \bar{A}\bar{B}(\bar{S_1}S_0 + S_1\bar{S_0} + S_1S_0)$$

$$= A\bar{B} + \bar{A}\bar{B}(S_0 + S_1\bar{S_0})$$

$$= A\bar{B} + \bar{A}\bar{B}(S_0 + S_1).$$

$$= \bar{B}[A + \bar{A}(S_0 + S_1)]$$

$$= \bar{B}[A + S_0 + S_1].$$