

CE338 Quiz 6

1. Draw the NAND gate CMOS AOI schematic and the stick diagram (10 points)

2. Draw the CMOS AOI schematic and the stick diagram of the following logic expression. (10 points)

$$\overline{ABC + DEF}$$

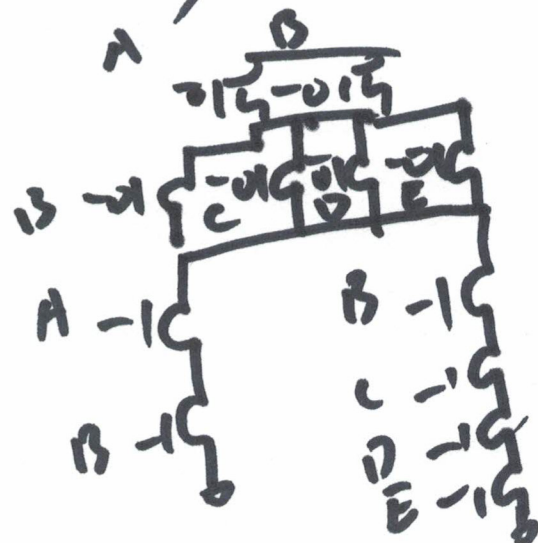
3. Simplify the logic as much as you can then draw the CMOS AOI schematic and the stick diagram. (10 points)

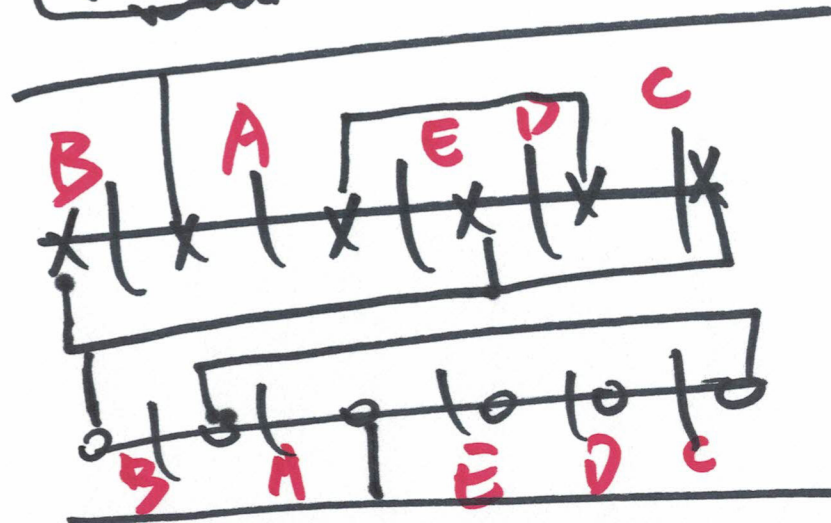
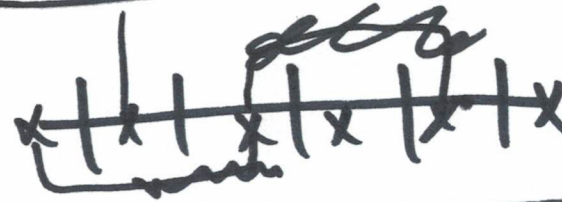
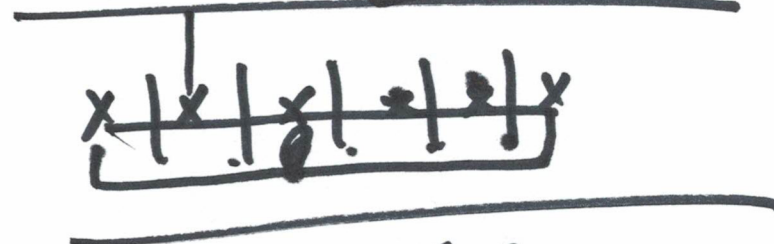
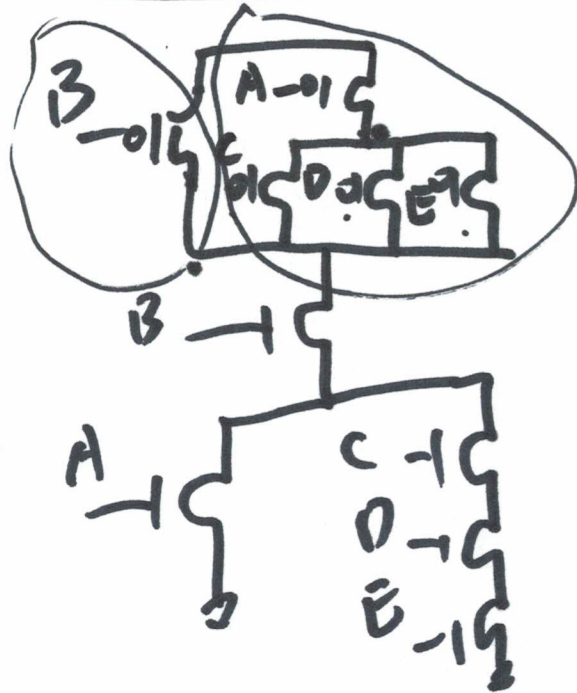
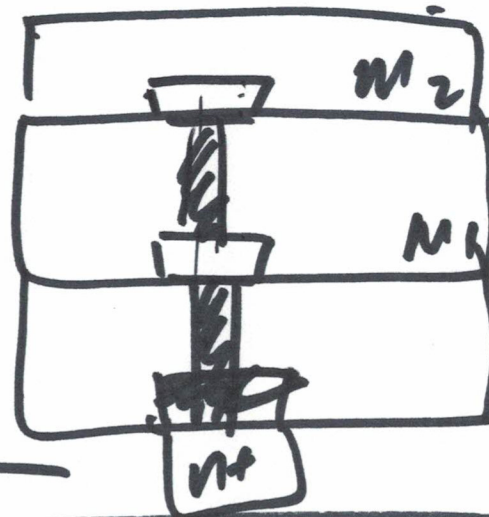
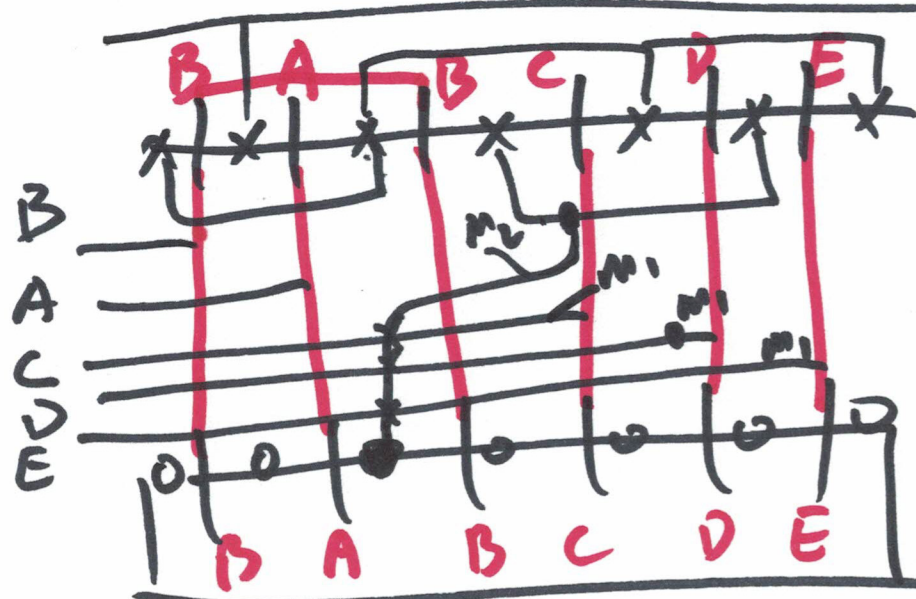
$$\overline{(AB + \underline{A} + \underline{ABD} + CDE + \underline{ABCD})B}$$

$$(\overline{A(B+1+BD+BCD)} + CDE)B$$

$$(A + CDE)B$$

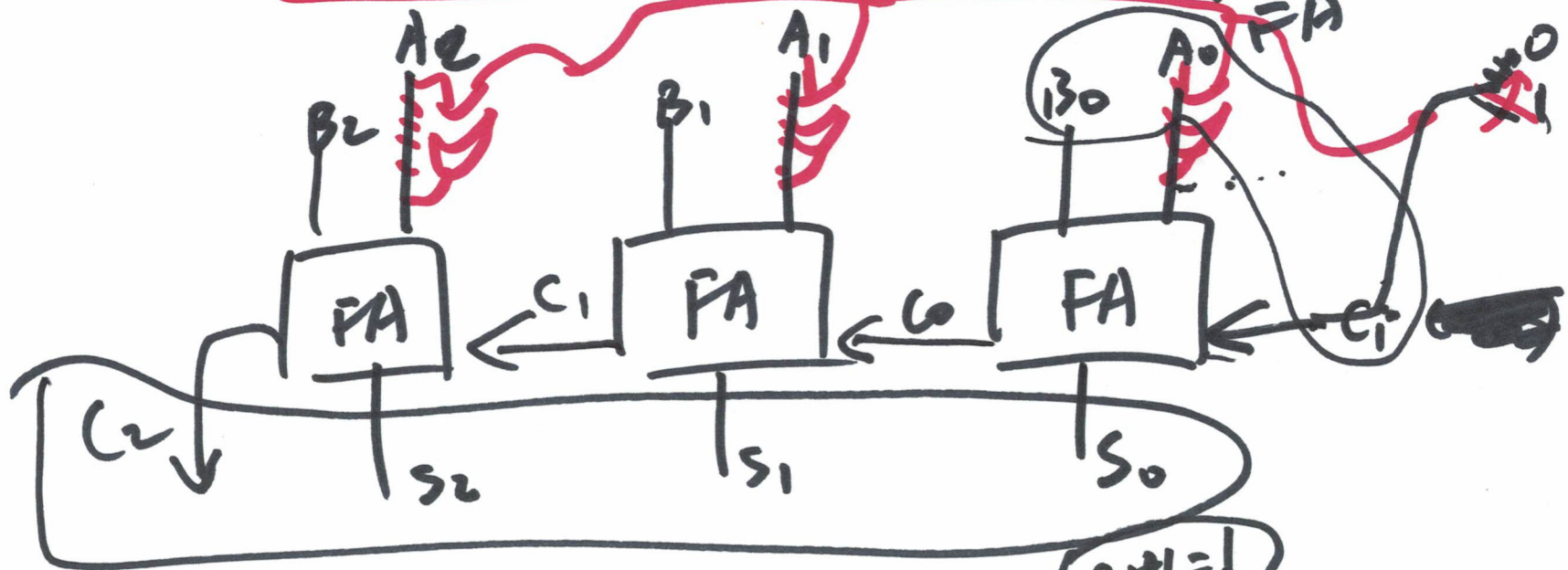
①





(2)

$$B_2 B_1 B_0 + \bar{A}_2 A_1 A_0 =$$



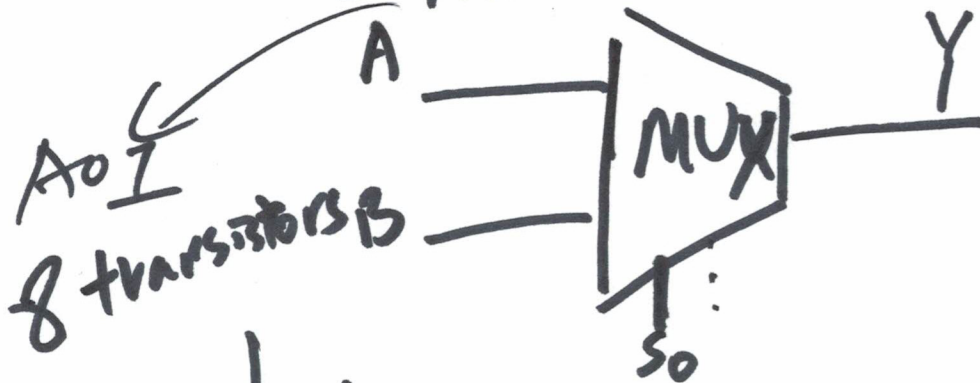
$$\begin{aligned} 0 \oplus 1 &= 1 \\ 1 \oplus 1 &= 0 \\ A \oplus 1 &= \bar{A} \\ A \oplus 0 &= A \\ 0 \odot 0 &= 0 \\ 1 \odot 0 &= 1 \end{aligned}$$

$$\begin{aligned} &A_2 A_1 A_0 \\ &\uparrow \uparrow \uparrow \\ &\sim +1 \end{aligned}$$

(3)

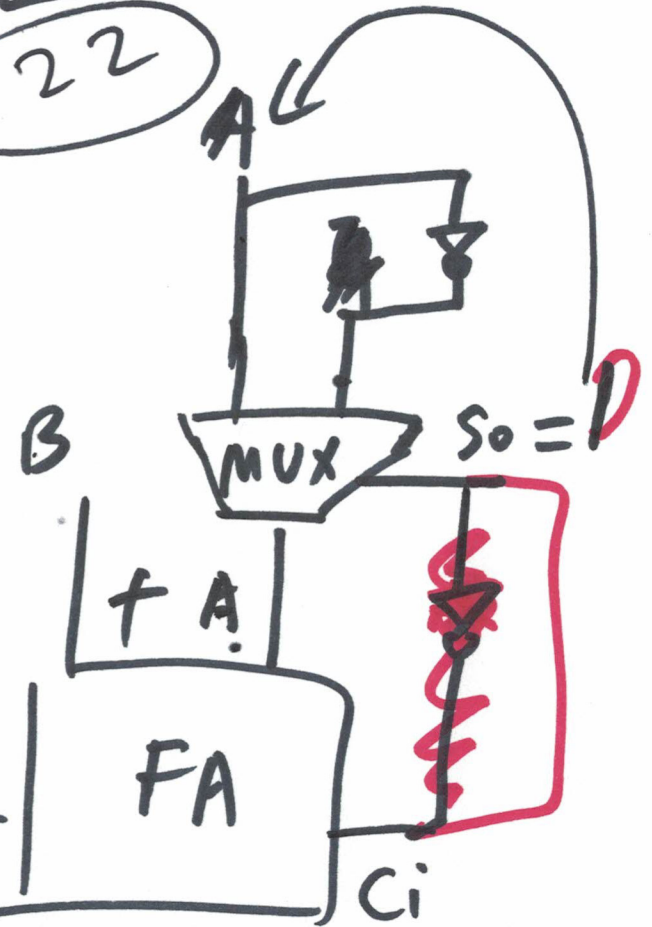
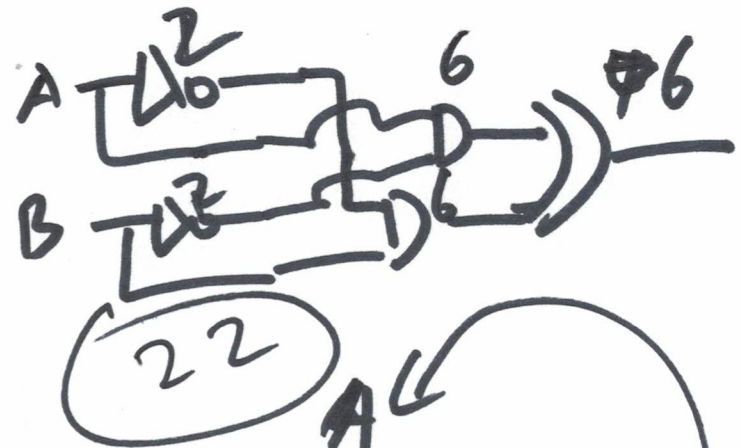
$$A \oplus B = \overline{A}B + A\overline{B}$$

$$= \overline{A}\overline{B} + AB$$



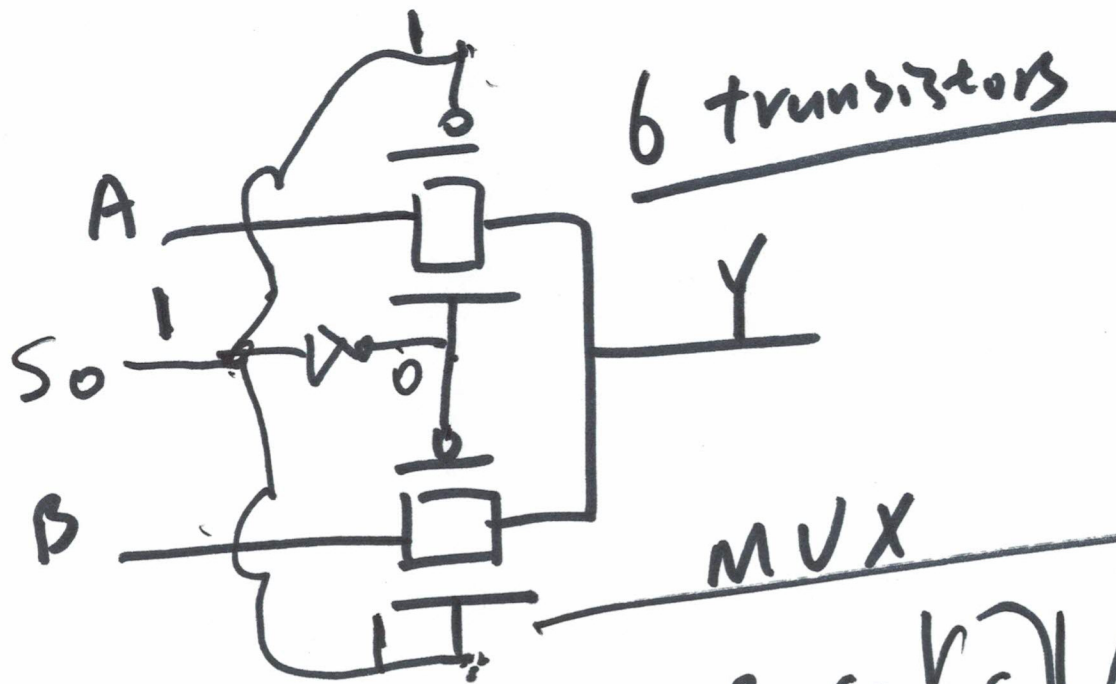
A	B	S ₀	Y
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	1

AB \ S ₀	0	1
00	0	0
01	0	1
10	1	0
11	1	1



$$\overline{A}S_0 + BS_0 = Y$$

(4)



$S_0 = 0, A = Y$

MUX

A	B	C_i	S	C_o
0	0	0	0	0
0	0	1	1	0
0	1	0	1	0
0	1	1	0	1
1	0	0	1	0
1	0	1	0	1
1	1	0	0	1
1	1	1	1	1

(5)

$$S = A \oplus B \oplus C_i$$

$$C_o = (A+B)C_i + AB$$

$$S = (A+B+C_i) \cdot \overline{C_o} + ABC_i$$

$$C_o = (A+B)C_i + AB$$

