

AOI Logic Stick Diagrams

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

Demorgan's Law

$$\overline{A+B} = \bar{A} \cdot \bar{B}$$
$$\overline{A \cdot B} = \bar{A} + \bar{B}$$

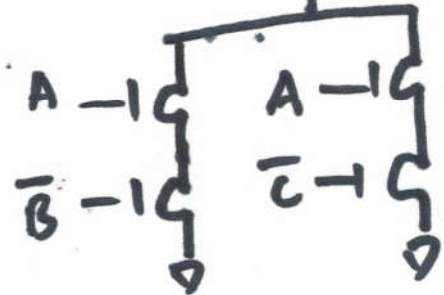
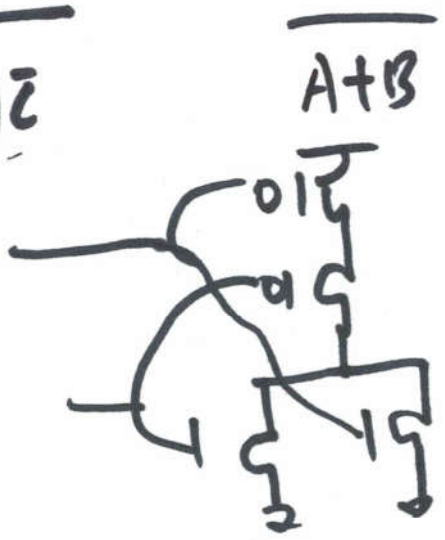
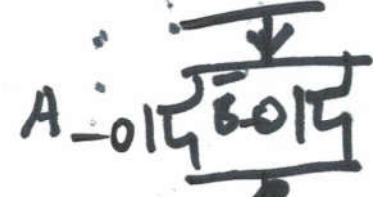
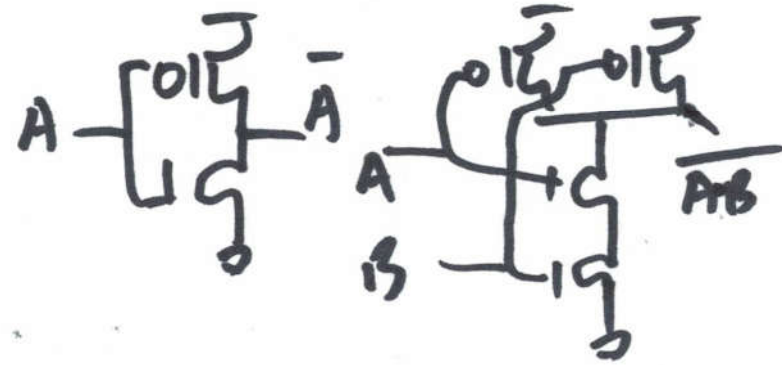
$$\overline{\overline{A\bar{B} + \bar{A}B}} = \overline{A\bar{B}} \cdot \overline{\bar{A}B} = (\bar{A} + \bar{\bar{B}}) \cdot (\bar{\bar{A}} + \bar{B})$$
$$= (\bar{A} + B)(\bar{A} + \bar{B}) = \underbrace{\bar{A}\bar{A}}_0 + \bar{A}\bar{B} + \underbrace{AB}_0 + \underbrace{B\bar{B}}_0 = \bar{A}\bar{B} + AB$$

XNOR

Method 1:

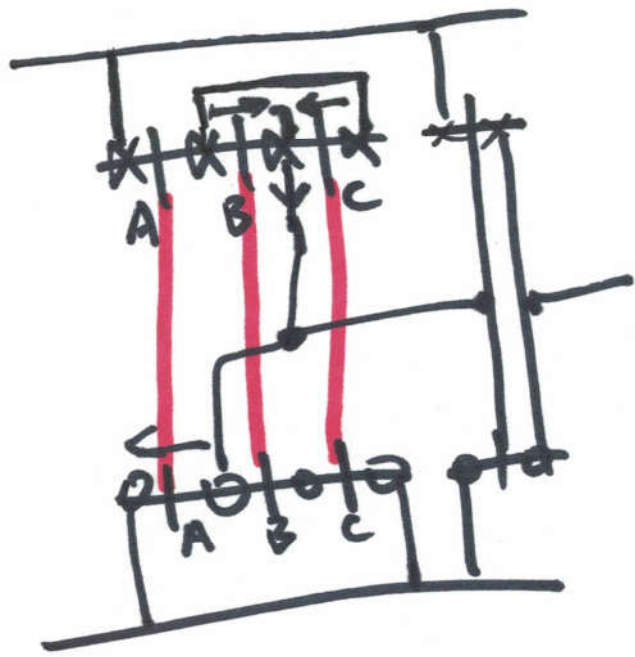
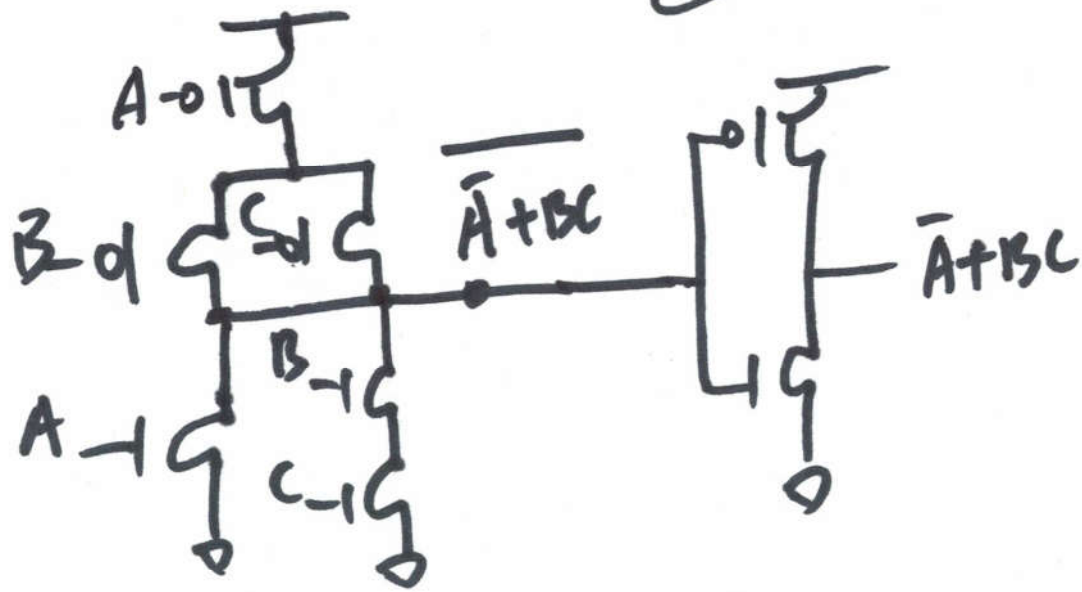
$$\begin{aligned}
 Y &= \overline{\overline{A + BC}} \\
 &= \overline{\overline{A} + (BC)} \\
 &= \overline{\overline{A} + BC} \\
 &= \overline{\overline{A}} \cdot \overline{BC}
 \end{aligned}$$

$$= \overline{\overline{A} \cdot \overline{BC}} = \overline{\overline{A} \cdot (\overline{B} + \overline{C})} = \overline{\overline{A} \cdot \overline{B} + \overline{A} \cdot \overline{C}}$$

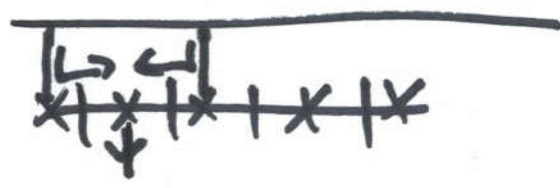
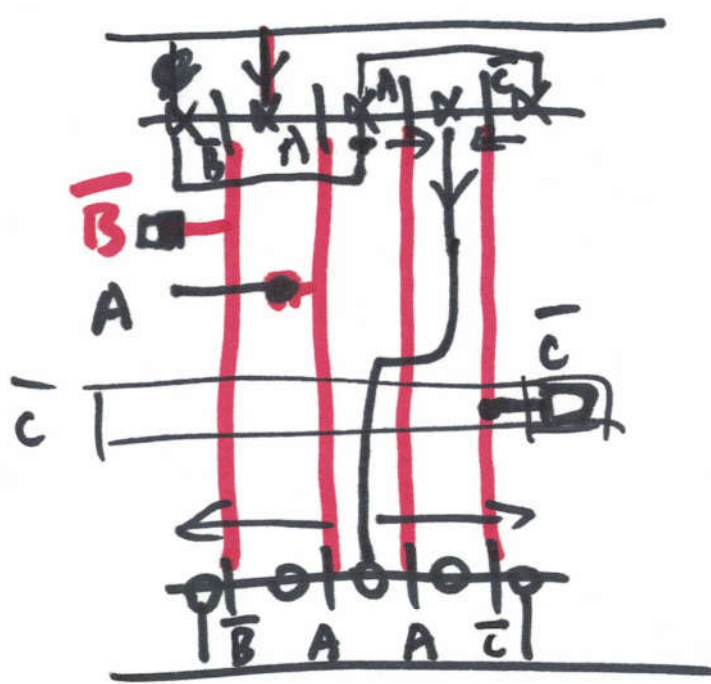


(2)

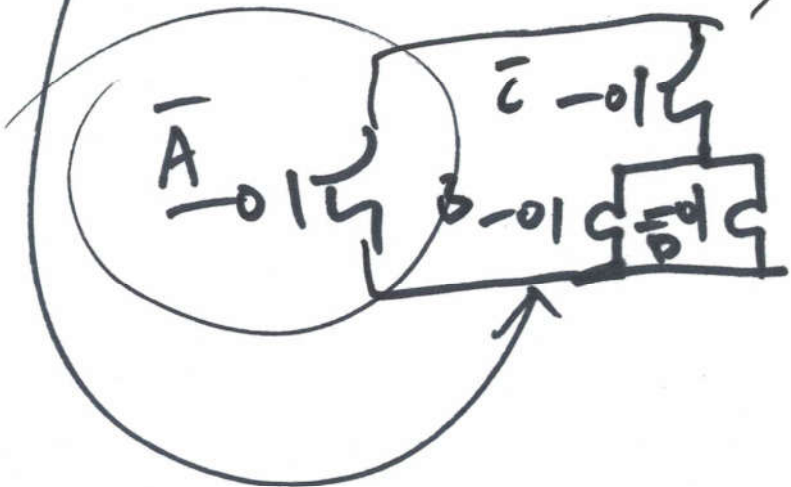
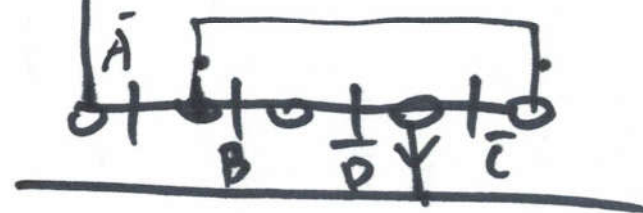
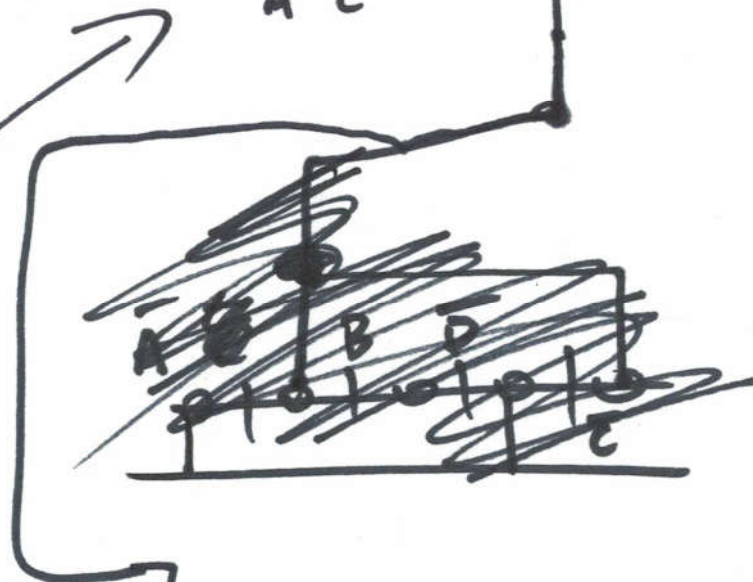
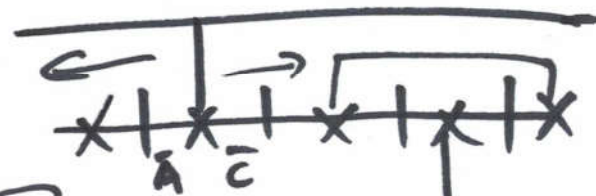
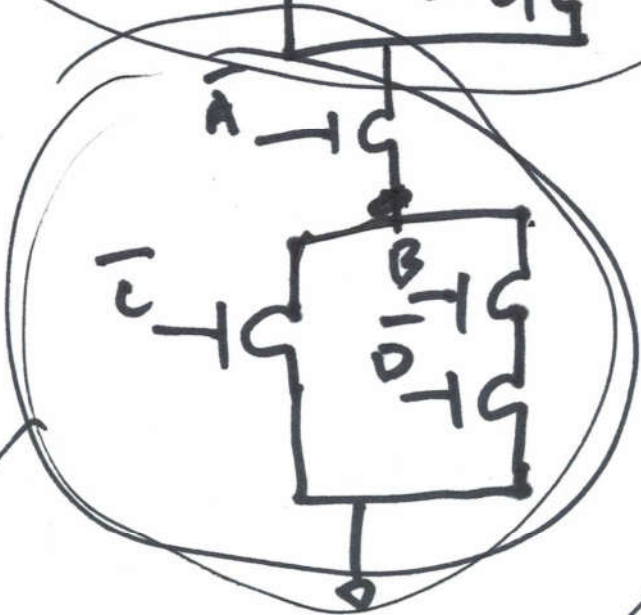
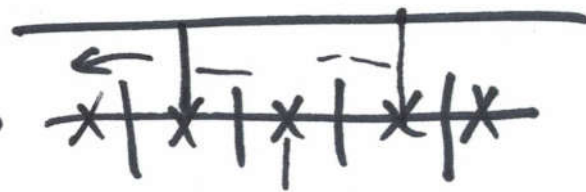
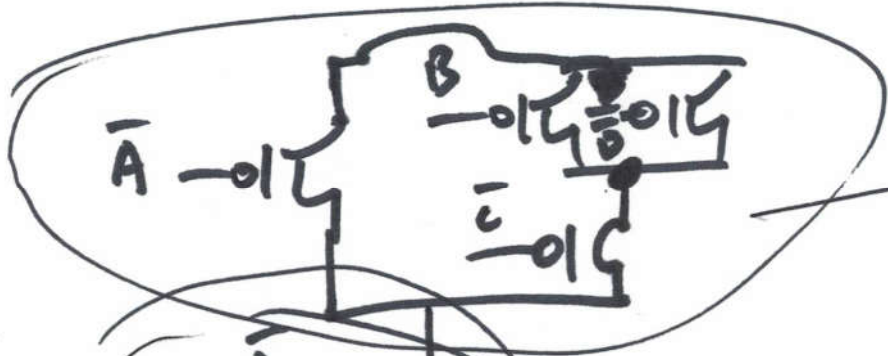
Method II: $Y = \bar{A} + BC = \bar{A} + BC$



(3)



$$\begin{aligned}
 \Delta Y &= A + \bar{B}C + CD = \overline{\overline{A + (\bar{B} + D)C}} = \bar{A} \cdot \overline{(\bar{B} + D)C} \\
 &= \bar{A} \cdot \overline{(\bar{B} + D + \bar{C})} = \bar{A} \cdot (\bar{\bar{B}} \cdot \bar{D} + \bar{C}) = \bar{A} \cdot (B \cdot \bar{D} + \bar{C})
 \end{aligned}$$



(5)