Worksheet 8  
EEL 4705  
Emerging Logic Devices – AND/OR Mapping  

Group #: 1  
U IDs:

**Question:** Convert the following Boolean Logic expressions into equivalent Majority Gate Logic by using AND/OR mapping method demonstrated previously making use of the AND and OR forms as indicated above.

Use the method to first perform a direct AND/OR mapping of the expression. Then see if the expression can be further reduced to a simpler logic form and perform an AND OR mapping of the reduced expression.

*Example:* \( n = x_1 \overline{x_2} + x_2 \overline{x_3} \) can be further reduced to \( n = (x_1 + x_3) \overline{x_2} \). Similarly, for all the equations below perform the AND/OR mapping for the original expression and the reduced form of the expression.

(a) \( n = \overline{(x_1 + x_2)}(x_1, x_2) = \overline{x_1 x_2} + x_2 \overline{x_1} x_2 = 0 + x_2 \overline{x_1} = x_2 \overline{x_1} \)

(b) \( n = \overline{x_1 x_3} + x_2 \overline{x_3} = \overline{(x_1 + x_2)} \overline{x_3} \)

(reduced)