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

Group #:   U IDs:

$$x_1 \cdot 1 + x_2 \cdot 1 + x_2 \cdot x_1$$

$F = x_1 + x_2$

$$x_1 \cdot 0 + x_2 \cdot 0 + x_1 \cdot x_2$$

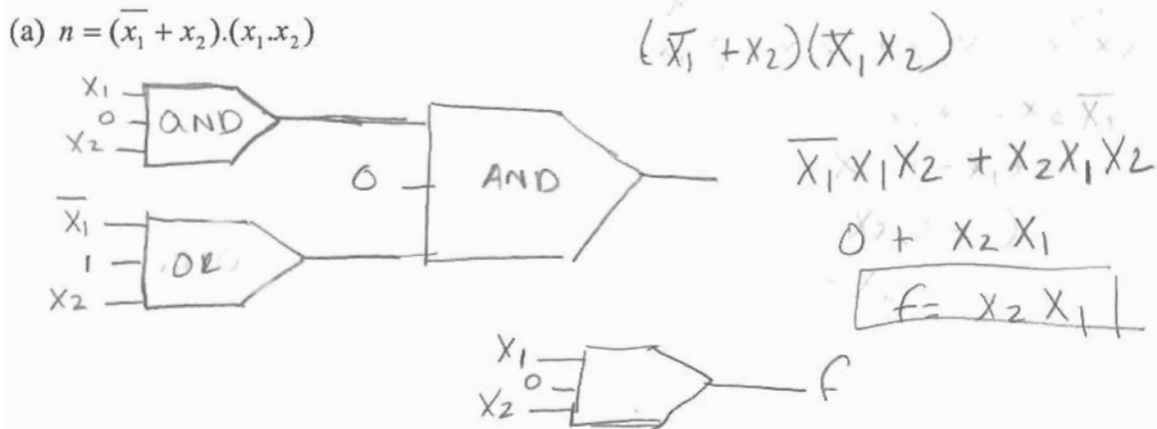$F = x_1 . x_2$

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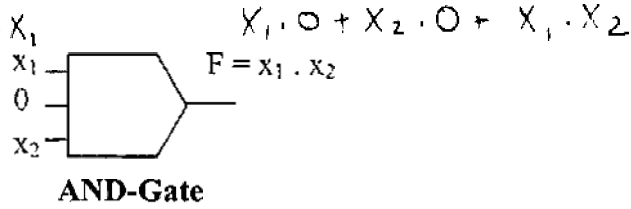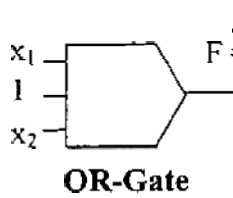
Question: Convert the following Boolean Logic expressions into equivalent Majority Gate Logic by using AND/OR mapping method demonstrated previously making use of the AND and OR forms as indicated above.

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: $n = x_1 . \overline{x_2} + \overline{x_2} . x_3$ *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) $n = (\overline{x_1} + x_2).(x_1.x_2)$

$(\overline{x_1} + x_2)(x_1 x_2)$

$\overline{x_1} x_1 x_2 + x_2 x_1 x_2$

$0 + x_2 x_1$

$\boxed{f = x_2 x_1}$

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