CSCI 255 – Intro to Embedded Systems
Homework #2
Fall 2013

Due: **9/9/2013** at the beginning of lab

SHOW YOUR WORK

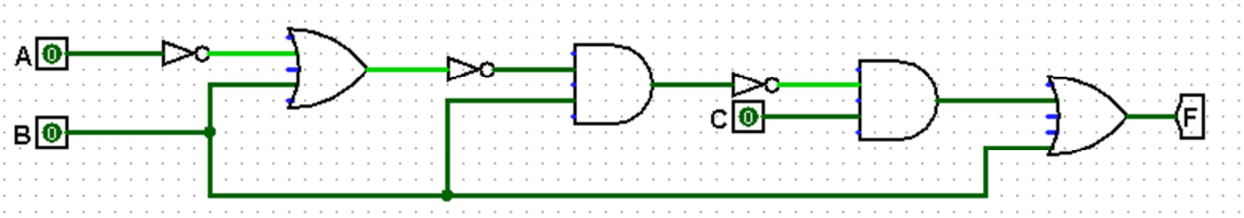
1 Prove the following logical theorems using Boolean algebra:

a) X (X' + Y) = XY
b) X + XY = X
c) XY + XY' = X
d) (A+B)(A+B') = A

2 Simplify the following expressions to a minimum expression

a) [(AB)' + C'D]'
b) [A + B(C' + D)]'
c) [(A + B') C]' (A + B)(C + A)'

3 Find **F** and simplify:



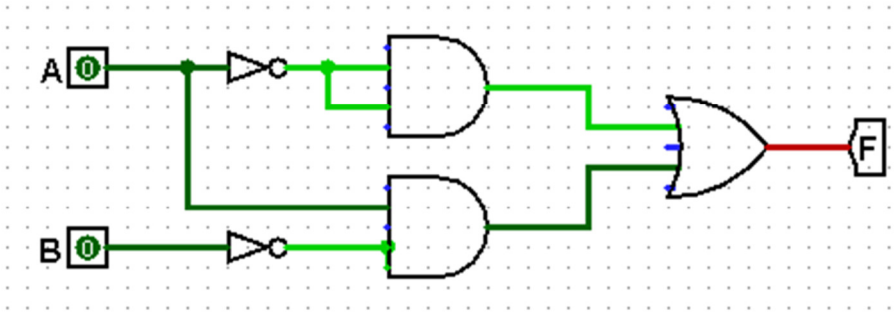
4 Draw a circuit that uses two OR-gates and two AND-gates to realize the following function:

$$F = (V + W + X)(V + X + Y)(V + Z)$$

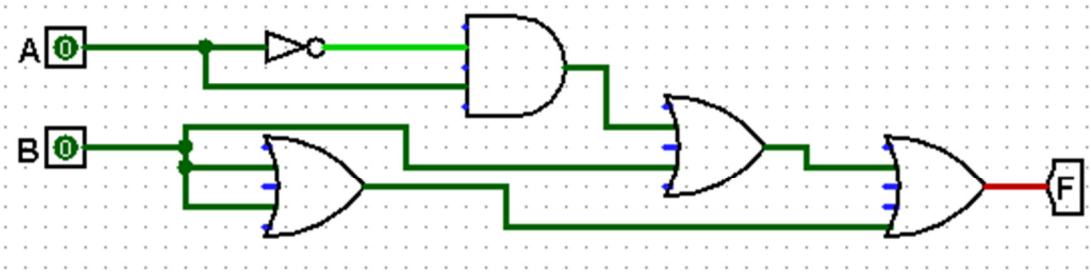
Hint: when using the theorems wisely, it can be solved in 2 steps

5 For each of the following circuits, find the output and design a simpler circuit that has the same output:

a)



b)



6 Prove the following equations using truth tables:

a) W'XY + WZ = (W' + Z)(W + XY)
b) (A + C)(AB + C') = AB + AC'

7 Perform the following logical expressions:

1 0 1 0 1 1 1 1 1 1 1 0 1 1 1 1 (AND) ----------	1 0 1 0 1 1 1 1 1 1 1 0 1 1 1 1 (OR) ----------
1 0 1 0 1 1 1 1 1 0 1 0 0 1 1 1 (OR) ----------	0 0 1 1 1 1 0 1 1 1 1 0 1 0 1 1 (AND) ----------