

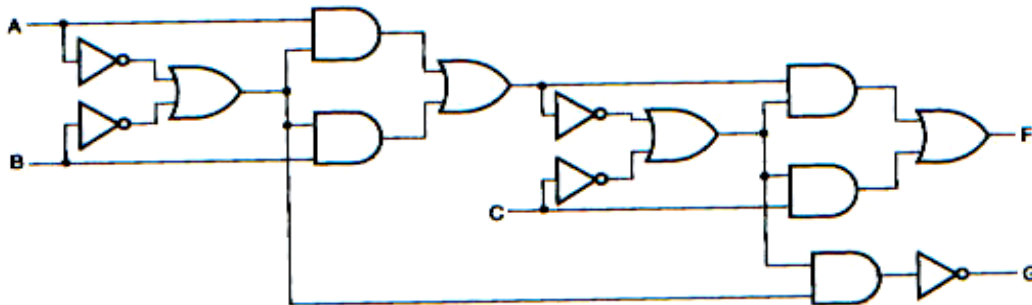
COMP 278 Homework 2

NOTE: You will not receive credit if you do not show your work.

1. Boolean algebra application

- (a) Prove $ABC + ABC' + A'B = B$
- (b) Prove $(A + B)' (A' + B') = A'B'$
- (c) Prove $A'BC + AC = C(A + B)$
- (d) Prove $(A + B' + AB')(AB + A'C + BC) = AB + A'B'C$

2. Given the following circuit



(a) Convert it to NAND gates only

Hints:

- Label each line to determine the Boolean expression for F and G
- Complement the output of each AND gate (to get a NAND) *and* the other end of the wire
- Remember an OR gate with both inputs complemented is a NAND gate
- The complement of an inverter is a wire (eliminates the inverter)

(b) Convert it to NOR gates only

3. Add the following binary integers: 101101 and 111011

4. What is 1101011010-1001010111? Both integers are in binary.