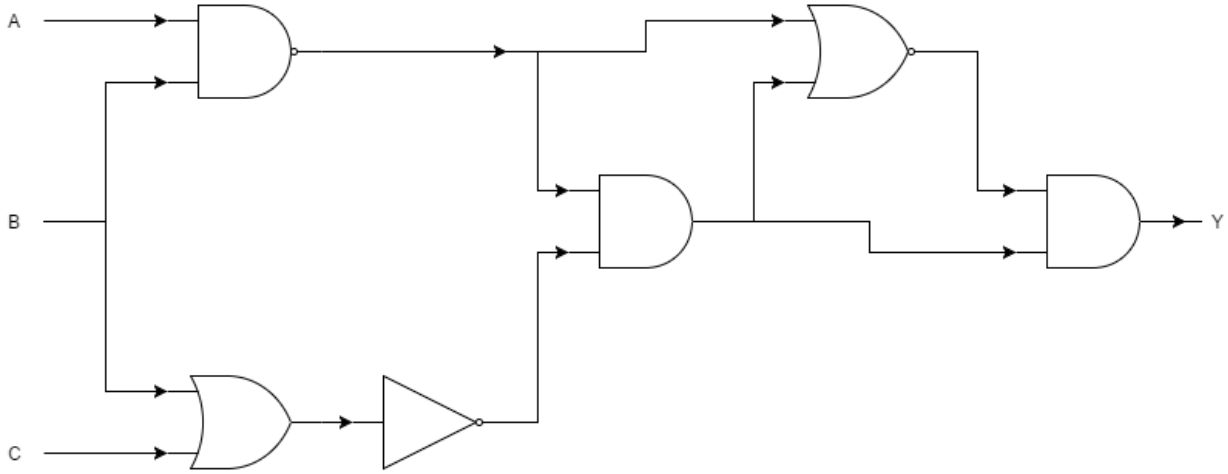
UNIVERSITY OF CALIFORNIA, SANTA CRUZ
BOARD OF STUDIES IN COMPUTER ENGINEERING

CMPE12/L: COMPUTER SYSTEMS AND ASSEMBLY LANGUAGE

Homework #1
Worth 100 points
Covers most of Chapter 3 and parts of Chapter 2

1. (5 pts) Build a 5-input and gate out of 2-input and gates.
2. (5 pts) How many output lines will a five-input decoder have?
3. (5 pts) How many output lines will a 16-input multiplexer have? How many select lines will this multiplexer have?
4. (5 pts) You know a byte is 8 bits. We call a 4-bit quantity a nibble. if a byte-addressable memory has a 14-bit address, how many nibbles of storage are in this memory?
5. (15 pts) All Logic circuits can be created by NAND gates. Prove this by building logic circuits for NOT, OR and AND using only NAND gates.
6. (10 pts) Distinguish between a memory address and the memory's addressability.
7. (15 pts) Give the logic circuit below, fill in the truth table for the output value Y.



8. (15 pts) Create the Logic gates for the truth Table below.

A	B	C	Y
0	0	0	1
0	0	1	1
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	1

9. (25 pts) Convert the following numbers to binary and perform binary subtraction on them. Do not use additive inverse.
    a. 39 - 22
    b. 25 - 14
    c. 39 - 12
    d. 18 - 11
    e. 30 - 26