Review for Midterm II **Due: 3/28/2008 before the test** **CMSC 121 Marmorstein**

1. (4 pts) Find the excess-127 version of each of the following numbers:

a) 3

b) -2

2. (10 pts) Convert each of these IEEE floating point numbers to decimal:

a) 01000001110000000000000000000000

b) 10111111101000000000000000000000

3. (10 pts) Find the IEEE binary floating point form of each of the following decimal numbers:

a) $1.27 * 10^2$

b) $1.6 * 10^1$

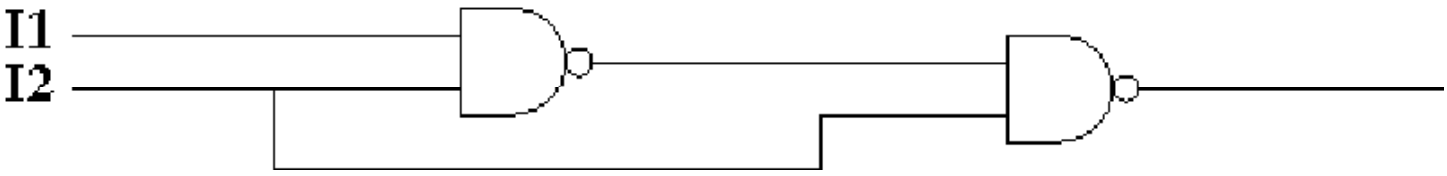
4. (8 pts) Draw a truth table for the expression (p^q) + (~p^q).

5. (16 pts) Using the laws of logic, simplify the expression p + (~p^~q) + (q^false). Show each step and tell which law you used.

6. (12 pts) Using the laws of logic, simplify the expression (p+q) ^ (p +~q). Show each step and tell which law you used.

7. (10 pts) Draw a circuit for the expression: $(I_1 \wedge I_2) + \sim I_3$

8. (30 pts) Here is a digital circuit that uses NAND gates:



a) Draw the truth table for the circuit.

b) Draw an equivalent circuit that uses only NOR gates.

c) Use the "sum of products" rule to find a boolean expression for this circuit.

d) Using the truth table from step (a) and Karnaugh maps, simplify the boolean expression.