1) **Textbook Problems**

Do problems 1.87, 2.1(c), 2.2(c), 2.8(a,b), (first minimize the equations using Boolean Algebra), 2.23.

2) **Boolean Algebra**

Minimize your equations from problems 2.1(c) and 2.2(c) using Boolean algebra.

3) **Overflow**

Design a circuit that detects if the addition of two 4-bit two’s complement numbers results in overflow. The inputs to the adder are the two 4-bit numbers A[3:0] and B[3:0]. The outputs to the circuit are the 4-bit sum, Sum[3:0], and the carry out, Cout. You can use any of these signals to create the Overflow output, but your circuit should be as simple as possible. **Hint:** before doing anything, think about how you would detect it by looking at the numbers.

Write the function of your circuit as a Boolean equation (Overflow = ….) and sketch your overflow circuit.

4) **Transistors**

Design an AOI (and-or-invert) gate. Its function is: \( Y = \text{NOT}(AB + C) \). Use no more transistors than necessary.

5) **Time**

Please indicate how many hours you spent on this problem set. This will not affect your grade, but will be helpful for calibrating the workload for next semester’s class.