**UNCC, Department of Electrical and Computer Engineering**

**ECGR 2181, Spring 2006, Homework #4, Due:  2/9/06, at the beginning of class (20 points)**

YOU MUST SHOW YOUR WORK FOR ALL PROBLEMS (therefore, don't just use a calculator.  You can use a calculator to check your work.)

1. How much time did this homework take you? (1 point)
2. Perform the following division problems in binary.  Represent the answer in binary and hexadecimal.  Each number below is a 16-bit two's complement number.  Hint:  you may need to convert a negative number to a positive number first.
   a. Binary 1101 1100 0101 1100 divided by 1111 1111 1100 1100 = ? (4 points)
3. Using the transistor notation used in the notes and the book, draw a 4-input AND gate using the appropriate p-channel and n-channel transistors (6 points)
4. Using the Boolean theorems discussed in class, reduce this equation to it's simplest form:
   F = W'X'Y'Z + W'X'YZ' + W'X'YZ + W'XYZ + WX'YZ + WXYZ
   (4 points, make sure to show each step)
5. Repeat problem 4, this time using a Karnaugh map.  Include all the correct labeling of the map.  (5 points)