ENGR354 Homework #1

Due Friday, Sept 18
Write out the solution and submit a scan or legible photograph to D2L.

NOTE: For all these problems, do NOT use a calculator of any sort.

1) Create a column list of the powers of two from 2^0 to 2^{12} written as decimal (base 10) numbers (you can write them at the far right your homework solution page if you wish).

2) Convert the following binary numbers to hexadecimal numbers:

   a) 1 0 1 1 0 1 1 0 1 1 1 0 b) 1 0 0 1 0 1 1 0 1 c) 1 1 1 1 1 1 0 1 0 0 1 0

3) Convert the following hexadecimal numbers to decimal:

   a) D b) 2A c) 123

4) Convert the following decimal numbers to binary numbers:

   a) 202 b) 1169 c) 4096

5) Convert the following binary numbers to decimal numbers:

   a) 1 0 1 0 1 1 b) 1 0 0 0 0 0 0 1 c) 1 1 1 1 1 1

6) Assume that signed numbers are to be represented with 5 binary digits. Determine the 2's complement binary values (5 digits long) for the following decimal numbers (write the number as positive with 5 digits, complement, then add 1):

   a) 5 b) -15 c) -16

7) Determine the decimal values of the following 2's complement numbers (reverse the process of creating a signed binary number; subtract 1 and then complement):

   a) 0 1 0 0 0 1 0 0 b) 1 1 1 1 1 1 1 1 c) 1 1 1 1 0 0 1 0