ECEN 2350: Digital Logic

Assignment #1

1. [2 points.] Convert the following (decimal) numbers to binary:

   (a) 5

   (b) 37

   (c) 42

   (d) 395

2. [2 points.] Convert the following binary numbers to hexidecimal:

   (a) 1100

   (b) 01011011

   (c) 11111111

   (d) 0011110001011010

3. [5 points.] Convert the following hexidecimal numbers to binary and decimal. An example row is provided:

Hex	Binary	Decimal
0x1C	00011100	28
0x7		
0x12		
0x3F		
0xFF		
0xA6		

4. [6 points.]

   (a) How many unique 5-bit numbers are there? (e.g. 10101, 01101, etc)

(b) Complete the following table that adds three one-bit numbers (a+b+c) together, for all combinations of a, b, and c. One of the rows is shown to clarify the format:

a	b	c	$a+b+c$
1	0	0	01

(c) Looking at your table above, describe an automated way to add three 1-bit numbers together. For instance, if just one of a or b or c is a 1, what should the output be? You can use English, or code (or Verilog!) to answer.

(d) Can you come up with an equation for each of the two bits in the output ($a + b + c$) that depends on a, b, and c and doesn't use the addition operation?