Show your work.   Homework # 2   NO CALCULATORS

1.   How many unique symbols would be required to represent digits in a base 32 number system?

2.   Express in decimal the largest number that can be represented by a 15 bit unsigned binary number (i.e. all 15 bits are significant bits, there is no sign bit).

3.   a) Consider the unsigned three digit decimal number 999. What is the minimum number of bits that are required to write this number in binary?

     b) If the number in part (a) were signed, how many bits would be required?

4.   Add the following pairs of binary numbers (show all carries):

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

5.   Perform the following conversions between number bases:

        a)   0 1 0 1 1 0 1 1   binary   => _____ dec

        b)   2 1 3   decimal   => _____ bin

        c)   1 0 0 1 1 1 1 0 0 1 0 1 1 0 1 0 bin   => _____ hex

        d)   F 1 6 B   hex   => _____ bin

6.   How many bits are there in a byte?   _____

7.   How many bits are in a word?   _____

8.   Find 8-bit 2's complement representations for the following signed numbers (given in decimal): (note: the sign bit is one of the 8 bits)

        a) +12   b) -5   c) - 123