

EE 2310 Homework #1 – Binary Numbers and Numeric Conversions

Name _____

1. Convert the following positive decimal numbers to binary (take the binary point of non-exact fractions to at least 2x the decimal number of places):

126 0.125 23.57

57 0.875 11.0625

0.0625 77.7 32.96875

2. Convert the following positive binary numbers to decimal:

11 1011 1010.01 111.111

111 0011 0.0011 1111.011

3. Convert the following binary numbers to hexadecimal (prefix the hexadecimal number with “0x,” which means “hexadecimal number”).

11010111111100100111010.1111 10001.11

1110.01111001111010111111 1111010.001

1010010111111011.111101 101101.00011

4. Convert the following hexadecimal numbers to binary (byte form):

0x d6.e8 0x 2eb5.cc4

0x 548cf.b3 0x f8.d8

5. Convert the following two's complement binary numbers to decimal.
(Remember to show all 8 bits in 2's complement, which includes the sign bit).

1001 1111

1010 1111

0110 1000

1111 1100

0111 0111

1100 0001

0010 0110

1111 0001

1000 0010

6. Convert the following decimal numbers to signed binary numbers, using the 2's complement sign convention:

-2

-101

-96

-54

75

121

-110

99

-23

7. Perform the indicated math operation (numbers are two's complement binary).
Write the decimal value of the answer below the binary answer.

$$\begin{array}{r} 1110\ 0111 \\ +0111\ 1100 \\ \hline 0110\ 0011 \end{array}$$

$$\begin{array}{r} 0011\ 1000 \\ -1011\ 1010 \\ \hline 0111\ 1110 \end{array}$$

8. Perform the indicated math operation (numbers are two's complement binary).
Write the decimal value of the answer below the binary answer.

$$\begin{array}{r} 0000\ 0111 \\ -0111\ 0000 \\ \hline \end{array}$$

$$\begin{array}{r} 1111\ 1000 \\ -1100\ 0001 \\ \hline \end{array}$$