

30 pts

Name: _____

Class Day / Time: _____

Due Date: _____

Lab #1 – Data Representation

Convert the following numbers in the radix (base) given to their equivalent value in the radix requested. Do not show leading and trailing zeros. Show all work.

1. 110101.110010111 radix 2 = _____ radix 16.

2. ABC.123 radix 16 = _____ radix 10.

Show the fractional part of the number in X/Y format.

Show conversion of ABC to base 10:

Show conversion of .123 to base 10:

3. $486.75_{\text{radix } 10} = \underline{\hspace{2cm}}$ radix 16.

Show conversion of 486 to base 16:

Show conversion of .75 to radix 16:

4. Perform the following arithmetic operations in binary (base 2). Show all work including carries and borrows.

$$\begin{array}{r} \text{a)} \quad 1111011 \\ + 11001 \\ \hline \end{array}$$

$$\begin{array}{r} \text{b)} \quad 11011011110 \\ - 111101011 \\ \hline \end{array}$$

$$\begin{array}{r} \text{c)} \quad 11011 \\ \times 1011 \\ \hline \end{array}$$

$$\begin{array}{r} \text{d)} \quad 101 \overline{)111110} \end{array}$$

5. Perform the following arithmetic operations in hexadecimal (base 16).

$$\begin{array}{r} \text{a)} \quad 3A37B \\ + 579A \\ \hline \end{array}$$

$$\begin{array}{r} \text{b)} \quad 35724 \\ - A97C \\ \hline \end{array}$$

6. Perform the following operations in base 2 and base 16.

$$\begin{array}{r} \text{Base 2:} \\ \text{a)} \quad 10111 \\ + 11111 \\ \hline \end{array}$$

$$\begin{array}{r} \text{Base 16:} \\ \text{b)} \quad 10111 \\ + 11111 \\ \hline \end{array}$$

7. Find the two's complement of the following binary numbers with an object size of **8 bits** (i.e. 8 binary digits).

(a) 10011 = _____ (b) 1100 = _____

(c) 10000000 = _____ (d) 11110001 = _____

Show calculations:

8. Show the correspondent ASCII code for the following character sequences (in hexadecimal representation).

(a) CS3B = _____

(b) Assembly = _____

(c) Don't miss classes = _____

(d) Spring Semester = _____