LAB 0-A

NUMBERING SYSTEMS

OBJECTIVE:

- To practice converting data from decimal to binary and hexadecimal systems.

REFERENCE:

- Mazidi and Naimi "The AVR Microcontroller and Embedded Systems," Chapter 0.

MATERIAL:

- Microsoft Windows Calculator

ACTIVITY 1

Perform the following conversions and verify your results using Windows Calculator. The calculator is in the Accessories folder of Windows. Select the *Programmer* calculator.

a)

Base-10	Base-2	Base-16
63	**111111**	**3F**
256	**100000000**	**100**
10	**1010**	**A**
512	**1000000000**	**200**
255	**11111111**	**FF**

b)

Base-2	Base-16	Base-10
11010	**1A**	**26**
10000	**10**	**16**
11110	**1E**	**30**
101010	**2A**	**42**
1111	**F**	**15**

c)

Base-16	Base-2	Base-10
3BC	**1111001112**	**956**
10A	**1000010102**	**266**
20	**1000002**	**32**
FFF	**111111111112**	**4095**
FA	**111111111112**	**250**
BAD	**101110101101**	**2989**

WORKSHEET

Name: *Class:*
Last Name: *Lab#:*

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1) Give the highest single digit for each of the number systems: decimal, binary, and hex.

1. **Decimal:** 9
2. **Binary:** 1
3. **Hex:** f

2) Which of the following cannot be a number in base-2? Give the reason.

(a) 11001 **(b) 113** (c) 10001

Por que tiene el numero 3, y para tener ese numero tendriamos que usar como minimo base 4.

3) What is the highest 8-bit number?

(a) In binary: **255 (11111111)**

(b) In hex: **4294967295 (FFFFFFFF)**

4) What is the highest 16-bit number?

(a) In binary: **65535 (1111111111111111)**

(b) In hex: **18446744073709552000 (FFFFFFFFFFFFFFFF)**

5) Convert binary 100000 to decimal and hex.

(a) Decimal: **32**

(b) Hex: **20**

6) Convert hex number BAAD to binary and decimal.

(a) Binary: **1011101010101101**

(b) Decimal: **47789**
