Name _____ CM _____ Due date: **Monday, Sept. 15**

ECE130 Homework #3 (binary numbers) Fall 2003

1 (Part of Problem 3 on page 19 of Dr. Eccles' book). Convert each of the following unsigned binary numbers to their decimal equivalent.

Unsigned Binary	Decimal
0011010	
100101	

2 (Part of Problem 5 on page 19 of Dr. Eccles' book). Convert each of the following decimal numbers to their binary equivalent.

Decimal	2's complement Binary
23	
61	
-49	

3 (Part of Problem 8 on page 19 of Dr. Eccles' book). Convert each of the following unsigned binary numbers to their decimal equivalent.

Unsigned Binary	Decimal
01100.011	
1011.1101	

4 (Part of Problem 22 on page 20 of Dr. Eccles' book). Perform the following unsigned arithmetic in binary.

Operation	Result
101001+111101	
10101*101	

5 Convert the following 2's complement numbers to their counterparts.

11011010	
00110100	

6 Carry out the following additions and indicate if there is overflow for unsigned or 2's complement representations.

			Decimal sum w/ sign		Overflow (Yes/No)	
Addend	Augment	Binary sum w/ carry	Unsigned	signed	Unsigned	2's compl
0110	1101					
1001	1101					
1100	1110					

7 Use the simple rule to know if any one of the following operations causes overflow.

	101010101
+	011011110

	101110101
+	110101011

8 Carry out the following 4-bit subtraction and indicate if there is overflow for unsigned or 2's complement representations.

		Difference /carry	Decimal subtraction with sign		Overflow (Yes/No)	
Minuend	Subtrahend	Binary result	Unsigned	signed	Unsigned	2's compl
1001	1011					
0110	1110					
1011	0111					