

ECE 130 HW#4 – Due Monday, March 22.

Do not use a calculator! Show all work!

1. Complete the following table with the indicated 4-bit signed system representations:

Decimal Value	Unsigned Binary	Sign and Magnitude	1's Complement	2's Complement
8				
7				
6				
5				
4				
3				
2				
1				
0				
-1				
-2				
-3				
-4				
-5				
-6				
-7				
-8				

2. Perform the following arithmetic problems in a 4-bit 2's complement binary system. Convert the decimal values to their 2's complement representation, calculate the result of binary addition, and then convert your answer back to decimal. Indicate when overflow/underflow has occurred.

a)  $5 - 3$

b)  $3 - 5$

c)  $7 + -7$

d)  $3 + 5$

e)  $-3 - 5$

f)  $-6 + -3$