

Tutorial 1- Number Systems

ECSE104L

1. Convert following into 2's and 1's complement.

- a. +25
- b. -25
- c. -13
- d. +13

2. Perform the following conversion

- a. $(10101.1100)_2 = (?)_4$
- b. $(101011.10)_2 = (?)_{16}$
- c. $(AABC.A9)_{16} = (?)_8$
- d. $(765.12)_8 = (?)_{16}$
- e. $(3673)_8 = (?)_4$
- f. $(123.56)_{10} = (?)_5$
- g. $(190.25)_{16} = (?)_{10}$

3. Perform following arithmetic operation:

- a. $(123)_4 + (321)_4 = (?)_4$
- b. $(267)_8 + (31)_8 = (?)_8$
- c. $(123)_4 + (321)_8 = (?)_8$

4. Fill the table

Bit Pattern	Signed Magnitude	1's Complement	2' Complement
11011			
0101			
11111 11			
1111			

Take Home exercises

- 5. Write a short note on why Binary, Octal, and Hexadecimal was needed while Decimal was available.
- 6. Write a short note on what is the significance of 1's complement and 2's complement? What are advantages and disadvantages of 2's complement over 1's complement and signed binary numbers?