UNIVERSITY OF TEHRAN
Electrical and Computer Engineering Department
ECE 367, 894- Fall 1401
Homework 1
Number Systems

Name:	**Date:**
Username:	

1. Determine the decimal values of the following unsigned numbers.
   a. $(11010101011)_2$
   b. $(10101.1001)_2$
   c. $(1010100.01)_2$
   d. $(765.04)_8$
   e. $(CDA6.6AB)_{16}$
   f. $(A658C0F)_{16}$

2. How many bits are needed to represent the decimal number 43561 as an unsigned binary number? How many bits are needed to represent the same number is BCD? Show the representation of this number in both systems.

3. Give the 16-bit sign-magnitude, 1's complement, and 2's complement representations for decimal 59135, –83656 and –3021.

4. Write 5-bit gray code bit patterns from 0 to 31.

5. All numbers below are in 8-bit Sign and Magnitude binary system. Perform the operations shown. If more bits are needed to represent the result, extend the results to 9 bits.

   a. 10110101 + 11000110
   b. 01100100 – 11101110
   c. 01001110 + 11010101
   d. 01011001 + 01101110
   e. 00101010 – 10101110

6. All numbers below are in 8-bit 2's complement. Perform operations shown. Indicate if overflow occurs, and show remedy for the overflow.

   a. 10110101 + 11000110
   b. 01100100 – 11101110
   c. 01001110 + 11010101
   d. 01011001 + 01101110
   e. 00101010 – 10101110
   f. 01101001 + 01110110