Name: _____

Date:

Question:	1	2	3	4	5	Total
Points:	15	10	15	20	10	70
Score:						

Representation of numbers

- 1. Convert the following numbers to decimal representation. Show your work.
 - (a) (5 points) 11001100_2

(b) (5 points) $A11_{16}$

(c) (5 points) 411_8

- 2. (a) (5 points) Evaluate $01100001 \oplus 00111001$, where \oplus is xor operation.
 - (b) (5 points) What are the decimal, the octal, and the hexadecimal values of the result?

3. You are developing a new standard for integer arithmetic for microchips. It proposes to store a signed integer number in ten bits and use two's complement representation.

(a) (5 points) What is the smallest (negative) number in your system?

(b) (5 points) What is the largest (positive) number in your system?

- (c) (5 points) How many integer numbers are in your system?
- 4. A secret message is encrypted using Caesar cipher:

Sp S rkn kcuon zoyzvo grkd droi gkxdon, droi gyevn rkfo cksn pkcdob rybcoc.

Write a program that uses brute force to decrypt the message.

(a) (5 points) Write a function with the following declaration

void caesar (int key, char message[]);

which given a message and a key encripts the mesage using caesar cipher and prints it.

(b) (10 points) Write a program that uses your function and tries all possible values of the key to decipher the message.

Upload the standard set of files for your project to GitHub to the folder named **hw06** and provide the link to the project:

https/github.com/

- (c) (5 points) Who was the author of the message?
- 5. (10 points) Mark the statements about IEEE Standard for Floating-Point Arithmetic, IEEE 754, which are correct.
 - \Box there are at least two different floating point numbers that represent zero
 - \Box there is a floating point number that represents positive infinity
 - □ there are at least two different floating point numbers that officially are called 'Not a Number'.
 - \Box the following code fragment

1 float x = 0.3, y = 0.4, z = 0.7; 2 if (x + y == z) { 3 printf("Equal!\n"); 4 }

prints the text string Equal!.