ICS Assignment 2

Name: _____ ID: _____

1. ( )When we want to store music in a computer, the audio signal must be _____.

   (A) sampled only
   (B) coded only
   (C) sampled, quantized, and the coded
   (D) quantized only

2. ( )When a fractional part is normalized, the computer stores the _____.

   (A) the sign, exponent, and mantissa
   (B) only the exponent
   (C) only the mantissa
   (D) only the sign

3. ( )An image can be represented in a computer using the _____ method.

   (A) vector graphic only
   (B) bitmap graphic only
   (C) Excess system only
   (D) either bitmap or vector graphic

4. ( )A floating-point value after normalization is $(1.0101) \times 2^{-4}$. What is the value of the exponent section in the Excess-127 representation?

   (A) 127 (B) 123 (C) 4 (D) -4

5. ( )How many symbols can be represented by a bit pattern with ten bits?

   (A) 1024 (B) 128 (C) 512 (D) 256

6. A student's grade in a course can be A, B, C, D, F, W(withdraw), or I(incomplete). How many bits are needed to represent the grade?

7. What steps are needed to convert audio data to a bit pattern?

8. Change the following decimal numbers to 16−bit unsigned integers.

   (a) 342

   (b) 41

9. The following are two's complement binary numbers. Show how to change the sign of the number.
   (a) 11111100
   (b) 01110111

10. Convert the following numbers in 32−bit IEEE format.
   (a) $-2^0 \times 1.10001$
   (b) $+2^3 \times 1.111111$

11. Answer the following questions about floating-point representations of real numbers:
   (a) What is normalization necessary?
   (b) After a number is normalized, what kind of information does a computer store in memory?

12. If we use a 4−bit pattern to represent the digit 0 to 9, how many bit patterns are wasted?

13. Here is a message in ASCII. What does it say?

01000011	01101111	01101101	01110000
01110101	01110100	01100101	01110010
00100000	01010011	01100011	01101001
01100101	01101110	01100011	01100101
00100001			