CS 149 **Final Exam** Name _____
Dr. Overstreet May 4, 2004 8:30 a.m. Education 226

This exam is open book, open notes. Wherever possible, show work. Good luck!!

1. (6 pts) Convert each of the following numbers from hexidecimal to binary notation.

   a) 418 _____

   b) B1 _____

   c) 62 _____

2. (3 pts) What is the value of the binary number 1101.011? Show work.

3. (4 pts) What is the value of 10111 if it represents an integer in:

   a) sign-magnitude notation?

   b) binary notation?

4. (10 pts) Translate each of the following statements into the machine language of the text.

Opcode	Meaning of Instruction
00000	Stop execution
00001	Load operand into a register (either A of X)
00010	Store the contents of register (either A or X) into operand
00011	Add the operand to register (either A or X)
00100	Subtract the operand from register (either A or X)
11011	Character input to operand
11100	Character output from operand

   a. LOAD register A with the hexadecimal number 3A. _____

   b. LOAD register A with the contents of memory location 4. _____

   c. Add the hexadecimal number 44 to the contents of register X _____

   d. Stop execution _____

5. (5 pts) Compute following sums. Assume all numbers are hexadecimal. Leave the sum in hexadecimal.

a) 287 + C8

b) 221 + F2

6. (6 pts) Convert each of the following octal numbers to their binary equivalent.

a) 6_8

b) 711_8

7. (6 pts) Convert each of the following octal number to their base 10 equivalent.

a) 6_8

b) 711_8

8. (5 pts) CD surfaces reflect light, disk drive surfaces hold magnetic charges, switches can be on or off. Why are these characteristics useful in computing?

9. (18 pts) For each of the following, indicate whether the statement is true or false.

____ a) Admiral Grace Hopper first used the word “bug” to describe a computer error.
____ b) If C++, some numbers are too large to be stored as "`double`".
____ c) If C++, some numbers are too large to be stored as "`int`".
____ d) If a C++ program includes a “`cout`“ or a “`cin`“ statement, it should include a "`#include <iostream>`".
____ e) A `while`-loop is appropriate when the number of loop iterations is not known when the loop starts.
____ f) In C++, “=” is used to assign a new value to a variable.
____ g) In C++, “==” must be used to compare the values of two numbers.
____ h) In C++, if a program includes both SUM1 and Sum1 as variables, they indicate different memory locations.
____ i) Downloading music files from the Internet is always legal.

10. (10 pts) What will be printed on the computer screen by the following C++ program?

```
// Program prints nursery rhyme.  uses strings.  v. 040504

#include <iostream>
#include <string>

using namespace std;

void main()
{
  const char SEMICOLON = ';';
  const char COMMA = ',';
  const string ADJECTIVE1 = "Little "
  const string ADJECTIVE2 = "a ";
  const string ADJECTIVE3 = "her ";
  const string VERB1 = "sat on  ";
  const string VERB2 = "eating ";
  const string VERB3 = "along came ";
  const string NOUN1 = "Miss Muffet ";
  const string NOUN2 = "There ";
  const string OBJECT1 = "tuffet";
  const string OBJECT2 = "curds and whey";
  const string OBJECT3 = "a spider"

  string firstLine;
  string secondLine;
  string thirdLine;
  string fourthLine:

  firstLine = ADJECTIVE1 + NOUN1;
  secondLine = VERB1 + ADJECTIVE2 + OBJECT1 + COMMA;
  thirdLine = VERB2 + ADJECTIVE3 + OBJECT2 + SEMICOLON;
  fourthLine = VERB3 + ADJECTIVE2 + OBJECT3;

  for ( int i=0; i<2; i++ )
  {
    cout << firstLine << endl;
    cout << secondLine << endl;
    cout << thirdLine << endl;
    cout << fourthLine << endl;
    cout << endl;
  }

  cout << endl << "Thanks.  Hope you enjoyed the rhyme." << endl;

}
```

11. (10 pts) What is produced by the following C++ code fragment?

```
Value = -2;
if ( Value <= 0 )
   Value = 2;
for( i=0; i<=5; i++ )
{
   Value = Value + 2;
}
cout << Value << endl;
```

12. (10 pt bonus) Write a C++ program fragment that uses a "for-loop" to display the integers from 1 to 20.

Pledged: I have neither given nor received help on this exam.

Signature:_____