Name: _____

Student ID number: _____

CS 14 – Basic Proficiency Exam

20 points possible

1. a) (2.25 pts) In c++ classes, what are the three levels of protection provided for member variables and member functions?

b) (2.25 pts) Briefly describe each level of protection.

2. (3.5 pts) Define pass-by-value and pass-by-reference.

3. (3 pts) Given a word stored in an array of characters, write a recursive function to print out the characters in ***reverse*** order. You may assume that the word is null terminated or you may assume that the character array has MAX_CHARS in it. Be sure to use good programming style and yes, syntax will be graded.

4. (4 pts) Given the following snippet of code:

```
int x = 1;
int* ptr1 = NULL;
int* ptr2 = 0;
int* ptr3 = &x;
int*ptr4 = x;
*ptr3 = 2;
```

Describe what the following statements will produce (either what will be printed or what will happen).

a) cout << ptr1 << endl;

b) cout << ptr2 << endl;

c) cout << ptr3 << endl;

d) cout << ptr4 << endl;

e) cout << &x << endl;

f) cout << *ptr1 << endl;

g) cout << *ptr2 << endl;

h) cout << *ptr3 << endl;

i) cout << *ptr4 << endl;

j) cout << x << endl;

5. (5 pts) Create a class called **IntegerSet**. **IntegerSet** will have two member variables. One data member variable, **set**, will be a pointer to a dynamically created integer array. The second data member variable, **size**, will hold the size of the **set** array. Create a constructor that takes as a parameter the size of the **set** array and the array is dynamically allocated in the constructor and all array locations are initialized to 0. Write one member function, **setArrayLocation** that takes two parameters: the first parameter indicates the array location to set and the second parameter indicates the integer value to set that array location to. Write a destructor to delete all allocated memory. You must write the code for the class and the code for the constructor, destructor, and member function described above. Remember to provide error checking and use good programming constructs throughout. Syntax will be graded.