Name _____

Section _____

CS2303   C08
Systems Programming Concepts
Final Exam
February 29, 2008

Question	Points	Score
0	1	
1	8	
2	7	
3	6	
4	4	
5	5	
6	6	
7	4	
8	10	
9	8	
10	16	
11	7	
12	7	
13	6	
14	6	
Total	100	

Trivia Question (1 extra credit point)

0. (a) What is the capital of Liechtenstein?

-OR-

   (b) What movie won the Best Picture Award at 2008 Oscars?

(4 pts) 1a. Starting from the following input: **16, 7, 9, 25, 18, 10, 5**, use the **insertion algorithm** for a **binary tree** to build the binary tree that keeps the elements of the tree in numerical order. Draw the final tree.

(4 pts) 1b. What is the output of a **postorder traversal** of this tree that prints when it visits a node?

(3 pts) 2a. Present an example of one application where **hashing** is useful.

(4 pts) 2b. What are the properties of a good **hash function**?

(6 pts) 3. When, why and how are **default arguments** specified?

(4 pts) 4. How are **overloaded functions** distinguished by the compiler?

(5 pts) 5. What does a **function template** provide for the C++ programmer?

(6 pts) 6. What is the difference between a **local variable** and a **data member** in a C++ class?

(4 pts) 7. List two limitations on **constructor** functions.

(6pts) 8a. List three operators that must be **overloaded** as **class member functions**.

(4pts) 8b. List two operators that must be **overloaded** as **global functions**.

(8 pts) 9. Explain why and how the **this** pointer needs to be used when overloading the **assignment operator**.

(16 pts) 10. Name four things **NOT** inherited by **derived classes**?

(5 pts) 11a. What happens when the **delete** operation executes?

(2 pts) 11b. What is the impact on a C++ program of forgetting to include the **[ ]** in the statement below?

      delete [ ] gradesArray;

(5 pts) 12a. Explain and give an example of the use of a **static data member** for a class.

(2 pts) 12b. How is the declaration of a **static member function** different in the **header** file and in the **.cpp** file?

(6 pts) 13. Discuss two disadvantage of using **protected** data members in a **base class** to allow **derived classes** to access them.

(6 pts) 14. What is the difference between accessing a **virtual function** with a **dot member operator** and a **pointer**?