**CSE687 Midterm #1**

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ SUID: \_\_\_\_\_\_\_\_\_\_\_\_\_**

This is a closed book examination. Please place all your books on the floor beside you. You may keep one page of notes on your desktop in addition to this exam package. All Exams will be collected promptly at the end of the class period. Please be prepared to quickly hand in your examination at that time.

If you have any questions, please do not leave your seat. Raise your hand and I will come to your desk to discuss your question. I will answer all questions about the meaning of the wording of any question. I may choose not to answer other questions.

You will find it helpful to review all questions before beginning. All questions are given equal weight for grading, but not all questions have the same difficulty. Therefore, it is very much to your advantage to answer first those questions you believe to be the easiest.

1. State the Dependency Inversion Principle. Describe how you did, or could, use it in Project #2. Please be specific.
2. Write code for a thread that receives messages in the Core Test Harness of Project #3. Please provide all the code to dequeue messages from the Process Pool Host’s Comm instance, and deposit them in appropriate Host queues, using a lambda to define the thread’s processing. For this question, you will find a block diagram for Project #3, including the Process Pool, attached at the end of this exam packet.
3. What relationships between classes does C++ support, and how did you use them for Project #2?
4. Draw a class diagram for a design for your implementation of Project #3. Please guide your design by the Single Responsibility Principle.
5. Write all the code for a copy constructor for class D shown in the
class diagram given here. You may assume that all of the bases
and members of each class are shown in the diagram. When will
this method be called?
6. What is a virtual function pointer table? When are its contents defined and when is it used?
7. Write a class declaration for a type table that stores the name of a user-defined type and the files and namespaces where it is defined[[1]](#footnote-1). Type information will be accessed using the type name. Please also store, for each type, an instance of an unspecified type of user-defined container which may be used to save information that is application specific.
1. A classes with the same name may be defined in two or more files provided they reside in different namespaces. [↑](#footnote-ref-1)