Please read all instructions prior to beginning the exam. It is recommended that you read the entire exam prior to starting, as well.

All answers should be written directly below the questions. The space allotted should be sufficient, but if not, please clearly explain where to find the rest of the answer, and ensure that it is clearly labeled.

There are 25 questions on this exam. Any 3 may be selected for extra credit in addition to #8 and #16. Please mark them clearly. Extra credit questions are worth 3 points, while regular questions are worth 5 points each. If not enough are marked, questions beginning at 25 and working backward will be extra credit.

1. How are C++ strings converted to C style strings (null terminated character arrays)?

2. What object is used to print?

3. How is a file opened in C++?

4. Give the declaration for a vector containing 100 integers.
5. What is the difference between passing by value and passing by reference?

6. What are default parameters, and is any special consideration required when using more than one?

7. Describe the concept and purpose of a helper function.

8. What creatures “always grow louder when they’re about to feed on human flesh!”?

9. Describe 2 methods to prevent multiple inclusion of header files.
10. What is the purpose of defining a default constructor, and how is it invoked? Give examples.

11. What is the scope resolution operator?

12. Given a function `get_value()` defined on a class `object`, give the prototype for the function such that it is a `const` function.

13. What are static functions, and how are they used?

14. Describe the 2 ways in which class functions can be defined (think syntax).
15. Give the syntax for overloading the addition operator on a class called `foo`.

16. Why must stream objects be passed by reference?

17. “You keep using that word. I do not think it means what you think it means.” What is the word?

18. What is an initialization statement, and where can it be used?

19. Describe the difference between a class and an object.
20. Describe the concept of encapsulation.

21. Describe the concept of abstraction.

22. How is access control implemented in a C++ class?

23. What is the default level of access for members of a class in C++? For members of a struct?

24. What is a mutator function?

25. When accessing a vector using bracket notation what happens if \( i \) is greater than \( v.\text{size}() \)?