FORM 2 (put name, form, and section number on test!!!)

CS 162 Exam I

True (A) / False (B) (2 pts)

1. A structure has member variables, like an object, but they are usually all public and accessed directly with the dot operator, instead of by calling member functions.

2. The `this` pointer is a special built-in pointer that is automatically passed as a hidden argument to all instance member functions.

3. When you overload an operator, you cannot change the number of operands taken by the operator.

4. The default copy constructor and default operator = provide deep copy.

5. Only one file stream object can be declared per C++ program.

6. By default, when an object is assigned to another, each member of one object is copied to its counterpart in the other object.

7. In an inheritance situation, you can't pass arguments to a base class constructor.

8. File output may be formatted the same way as screen output.

9. A constructor is a public class function that gets called whenever you want to re-initialize an object's member data.

10. If employee is an instance of a class with 3 member variables (name, salary, and department), the values of all three members will be output by the statement

```
cout << employee;
```

11. A class can only have one constructor.

12. Any use of the keyword `const` is a promise to the compiler, and a request to the compiler to enforce the promise.

13. A derived class may not have any classes derived from it.

14. The include statement, `#include "file.h"`, looks first in the system defined directory for file.h and then, if the file is not found, it looks in the user's current directory.

Multiple Choice (3 pts):

15. To dereference an object pointer and access one of the object's members, use the
    A) & operator.
    B) -> operator.
    C) <> operator.
    D) dot operator.
    E) None of the above

16. When a class contains a pointer to dynamically allocated memory, it is a good idea to have
    A) a dynamically allocated constructor.
    B) an inline constructor.
    C) a static constructor and an overloaded comparison operator.
    D) a copy constructor.
    E) None of the above

17. In the statement `class Car:public Vehicle`, which is the base class?
    A) public
    B) class
    C) Car
    D) Vehicle
    E) None of the above

18. The process of having a class contain an instance of another class is known as
    A) operator overloading.
    B) object overloading.
    C) a "is a" relationship.
    D) a "has a" relationship.
    E) None of the above

19. The _____ data type can be used to create files and write information to them.
    A) ostream
    B) ofstream
    C) istream
    D) ifstream
    E) None of the above

20. A(n) _____ member variable may be accessed before any objects of the class have been declared.
    A) static
    B) private
    C) inline
    D) public
    E) None of the above

21. The member function, _____, reads a single character from a file.
    A) get
    B) read
    C) input
    D) put
    E) None of the above

22. A class may have _____ default constructor(s) and _____ destructor(s).
    A) only one, only one
    B) more than one, more than one
    C) only one, more than one
    D) no, only one
    E) more than one, only one

23. The _____ member function reports when the end of a file has been found.
    A) eof()
    B) stop()
    C) end()
    D) done()
    E) None of the above

24. A(n) _____ is a special function that is called whenever a new object is created and initialized with data from another object of the same class.
    A) copy constructor
    B) destructor
    C) assignment function
    D) static function
    E) None of the above

25. Which of the following is the correct set of preprocessor commands necessary to prevent multiple inclusions of header files?
    A) `#include "header.h"`
    B)
    ```
    #define HEADER_H
    #ifndef  HEADER_H
    //declarations for header.h go here
    #endif
    ```
    C)
    ```
    #ifndef  HEADER_H
    #define HEADER_H
    // declarations for header.h go here
    #endif
    ```
    D)
    ```
    #ifndef  HEADER_H
    //declarations for header.h go here
    #endif
    ```

26. The name of a destructor must begin with
    A) a capital letter.
    B) an underscore.
    C) the name of the class.
    D) a tilde (~).
    E) none of the above.

27. Suppose class D is derived from class B, and class B has a public member function whose declaration is virtual void f();. Suppose class D has its version of the function, void f(). Here is a pointer definition and an access to a member function..
    ```
    B* bPtr = new D;
    bPtr->f();
    ```
    Suppose this is embedded in an otherwise correct and complete program. Which version of f() will be called?
    A) D::f()
    B) B::f()
    C) This is illegal. You can't assign a D object to a variable of type pointer to B.

28. Consider the class inheritance.

```
class B
{
public:
  B();
  B(int nn);
  void f();
  void g();
private:
  int n;
};
class D: public B
{
public:
  D(int nn, double dd);
  void h();
private:
  double d;
};
```

How many public members does an object of class D have?

A) 0
B) 1
C) 2
D) 3
E) 4

29. If Square is the name of a class, which of the following statements would create a Square object named box?

A) box Square;
B) Square box;
C) box Square();
D) Square box();
E) None of the above

box = Square( )

30. _____ members of a base class are never accessible to a derived class.

A) Protected
B) Public
C) Private
D) A, B, and C
E) None of the above

31. The _____ class constructor is called before the _____ class constructor.

A) derived, base
B) base, derived
C) private, public
D) public, private
E) None of the above

32. _____ allows us to create new classes based on existing classes.
    A) Function overloading
    B) Polymorphism
    C) Inheritance
    D) The copy constructor
    E) None of the above

33. A destructor is a member function that
    A) causes the program to end.
    B) is used to remove old unneeded objects.
    C) can only be called by the main function of a program.
    D) is automatically called when an object is destroyed.
    E) None of the above.

34. A(n) _____ member function may only be called from a function that is a member of the same class.
    A) private
    B) constructor
    C) public
    D) local
    E) overloaded

35. Given the class definition, which is not legal?

```
class A
{
public:
  A(){}
  A(int x, char y):xx(x), yy(y) {}
// other members
private:
  int xx;
  char yy;
};
```

A) A x(2, 'A');
B) A x;
C) A x = A(2, 'A');
D) A x(1);

36. When a member function is defined outside of the class declaration, the function name must be qualified with the class name, followed by
    A) the private access specifier.
    B) the scope resolution operator (::).
    C) the public access specifier.
    D) a semicolon(;).
    E) a tilde (~).

37. When an object or structure variable is passed to a function as a constant reference
    A) the function accesses the original object, rather than a copy of it.
    B) the function cannot make any changes to the member variables.
    C) it is more efficient than passing it by value.
    D) all of the above are true.
    E) A and B are true, but not C.

38. The _____ operator may be used to assign one object to another.
    A) &
    B) =
    C) ==
    D) <>
    E) None of the above

Extra Credit (2 pts):

39. Which of the following can be `virtual`?
    A) Constructors
    B) Destructors
    C) Ordinary functions
    D) Friend functions
    E) Static functions

40. If I need to build an object for return from a function, I can construct that object directly in the return statement.

41. It is OK to assign an object of base type to an object of a derived type.

42. I want to have a nonmember function to have access to the private members of a class. The class must declare that function a
    A) friend
    B) inline
    C) static
    D) None of the above nonmember functions can have the access described here.

43. Which of the following is not correct, regarding presence and behavior of constructors? Assume that the class name is `C`.
    A) To invoke the default constructor, the syntax must be `C x();`
    B) A constructor is called automatically when you declare an object of class type, but any constructor can be called after declaration to set all the member variables to a known state.
    C) An explicit call to a constructor creates an anonymous object, which can be assigned.
    D) In spite of the fact that a constructor appears to be a member function, a constructor may not be called as if it were a member function
    E) None of the above