

Starting Out with C++ from Control Structures to Objects, 9e (Gaddis)

Chapter 15 Inheritance, Polymorphism, and Virtual Functions

TRUE/FALSE

1. In an inheritance situation, you may not pass arguments to a base class constructor.

ANS:

2. More than one class may be derived from a base class.

ANS:

3. A derived class may become a base class if another class is derived from it.

ANS:

4. The base class access specification can be viewed as a filter that base class members must pass through when becoming inherited members of a derived class.

ANS:

5. When arguments must be passed to the base class constructor, they are passed from the derived class constructor's header line.

ANS:

6. A member function of a derived class may not have the same name as a member function of a base class.

ANS:

7. Static binding occurs when the compiler binds a function call with the function call that resides in the same class as the call itself.

ANS:

8. Pointers to a base class may be assigned the address of a derived class object.

ANS:

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

ANS:

10. In C++11, if a derived class attempts to override a **final** member function, the compiler generates an error.

ANS:

11. C++11 provides a way for a derived class to inherit some of the base class's constructors.

ANS:

12. In C++11, using constructor inheritance, it is possible for any of the base class's constructors to be inherited.

ANS:

MULTIPLE CHOICE

1. In OOP programming, _____ allows you to create new classes based on existing classes.
- polymorphism
 - inheritance
 - function overloading
 - the copy constructor
 - None of these

ANS:

2. When you derive a class from an existing class, you _____ add new data and functions.
- never
 - must
 - may
 - None of these

ANS:

3. The _____ members of a base class are never accessible to a derived class.
- private
 - public
 - protected
 - All of these
 - None of these

ANS:

4. The _____ constructor is called before the _____ constructor.
- base, derived
 - derived, base
 - public, private
 - private, public
 - None of these

ANS:

5. A _____ of a base class expects to be overridden in a derived class.
- constructor function
 - destructor function

- c. static function
- d. virtual function
- e. None of these

ANS:

6. The term _____ means the ability to take many forms.
- a. inheritance
 - b. polymorphism
 - c. member function
 - d. encapsulation
 - e. None of these

ANS:

7. When the compiler binds a member function call with the version of the function that resides in the same class as the call itself, it is considered
- a. local binding
 - b. safe binding
 - c. static binding
 - d. dynamic binding
 - e. None of these

ANS:

8. The compiler performs _____ on virtual functions.
- a. local binding
 - b. additional error checking
 - c. static binding
 - d. dynamic binding
 - e. None of these

ANS:

9. When more than one class is derived from a base class, the situation is called
- a. polymorphism
 - b. multiplicity
 - c. population
 - d. encapsulation
 - e. None of these

ANS:

10. When a derived class has two or more base classes, the situation is called
- a. multiple inheritance
 - b. multiplicity
 - c. polymorphism
 - d. encapsulation
 - e. None of these

ANS:

11. Multiple inheritance opens the opportunity for a derived class to have _____ members.

- a. dynamic
- b. private
- c. public
- d. ambiguous
- e. None of these

ANS:

12. Which is the base class in the following statement?

```
class Car : public Vehicle
```

- a. **Car**
- b. **Vehicle**
- c. **public**
- d. **class**
- e. None of these

ANS:

13. The following statement allows the _____ members of the **Car** class to access _____ members of the **Vehicle** class.

```
class Car : public Vehicle
```

- a. private, private
- b. public, private
- c. protected, private
- d. public, protected
- e. None of these

ANS:

14. Which is the derived class in the following statement?

```
class Car : protected Vehicle
```

- a. **Car**
- b. **Vehicle**
- c. **protected**
- d. There is no way to tell.
- e. None of these

ANS:

15. What is being protected in the following statement?

```
class Car : protected Vehicle
```

- a. derived class functions
- b. base class members
- c. derived class data
- d. future inherited classes
- e. None of these

ANS:

16. Arguments are passed to the base class by the _____ class _____ function.

- a. derived, constructor

- b. derived, destructor
- c. base, constructor
- d. base, destructor
- e. None of these

ANS:

17. Arguments are passed to the base class destructor by the _____ class _____ function.
- a. derived, constructor
 - b. derived, destructor
 - c. base, constructor
 - d. base, destructor
 - e. None of these

ANS:

18. Protected members of a base class are like _____, but they may be accessed by derived classes.
- a. constructor functions
 - b. static members
 - c. private members
 - d. public members
 - e. None of these

ANS:

19. The _____ destructor is called before the _____ destructor.
- a. base, derived
 - b. derived, base
 - c. public, private
 - d. private, public
 - e. None of these

ANS:

20. Which of the following is commonly used to extend a class or to give it additional capabilities?
- a. inheritance
 - b. privacy
 - c. the constructor
 - d. the destructor
 - e. None of these

ANS:

21. When member functions behave differently depending on which object performed the call, this is an example of
- a. chaos theory
 - b. virtual insubordination
 - c. polymorphism
 - d. encapsulation
 - e. None of these

ANS:

22. A virtual function is a function that expects to be _____ in a derived class.
- a. ignored
 - b. called frequently
 - c. overridden
 - d. private
 - e. None of these

ANS:

23. Multiple inheritance is when a _____ class has _____ base classes.
- a. base, no
 - b. derived, two or more
 - c. derived, no
 - d. compound, more than two
 - e. None of these

ANS:

24. A virtual function is declared by placing the _____ key word in front of the return type in the base class's function declaration.
- a. **virtual**
 - b. **private**
 - c. **public**
 - d. **protected**
 - e. None of these

ANS:

25. Polymorphism is when _____ in a class hierarchy perform differently, depending on which object performs the call.
- a. base class constructors
 - b. derived class constructors
 - c. member functions
 - d. derived class destructors
 - e. None of these

ANS:

26. Functions that are dynamically bound by the compiler are _____ functions.
- a. constructor
 - b. destructor
 - c. static
 - d. virtual
 - e. None of these

ANS:

27. C++11 introduced the _____ key word to help prevent subtle errors when overriding virtual functions.
- a. **const**
 - b. **final**
 - c. **override**
 - d. **virtual**

- e. None of these

ANS:

MULTIPLE RESPONSE

1. Select all that apply. The base class's _____ affects the way its members are inherited by the derived class.
 - a. name
 - b. return data type
 - c. access specification
 - d. construction
 - e. None of these

ANS:

2. Select all that apply. In an inheritance situation, the new class that you create from an existing class is known as the
 - a. derived class
 - b. inheritor
 - c. child class
 - d. parental class
 - e. None of these

ANS:

3. Select all that apply. Which of the following constructors cannot be inherited through constructor inheritance?
 - a. the default constructor
 - b. the virtual constructor
 - c. the move constructor
 - d. the copy constructor
 - e. the grand constructor

ANS:

4. Select all that apply. The base class access specification determines how _____ members in the base class may be accessed by derived classes.
 - a. private
 - b. public
 - c. constructed
 - d. protected
 - e. None of these

ANS: