

Chapter 1: Software Engineering Principles and C++ Classes

TRUE/FALSE

1. A program goes through many phases from the time it is first conceived until the time it is retired, called the life cycle of the program.

ANS: T PTS: 1 REF: 2

2. The three fundamental stages through which a program goes are implementation, use, and maintenance.

ANS: F PTS: 1 REF: 2

3. In the software maintenance process, the program is modified to fix the (identified) problems and/or to enhance it.

ANS: T PTS: 1 REF: 2

4. A program that is well developed is more expensive to maintain.

ANS: F PTS: 1 REF: 3

5. Software engineers typically break the software development process into the following four phases: analysis, design, implementation, and testing and debugging.

ANS: T PTS: 1 REF: 3

6. Dividing a problem into smaller subproblems is called structured design.

ANS: T PTS: 1 REF: 4

7. The structured design approach is also known as modular programming.

ANS: T PTS: 1 REF: 4

8. Encapsulation is the ability to handle data and operations as separate units.

ANS: F PTS: 1 REF: 4

9. In OOP, each object consists of data and operations on that data.

ANS: T PTS: 1 REF: 4

10. OOD has three basic principles: encapsulation, inheritance and polymorphism.

ANS: T PTS: 1 REF: 4

11. Encapsulation is the ability to create new data types from existing data types.

ANS: F PTS: 1 REF: 4

12. Polymorphism is the ability to use the same expression to denote different operations.
- ANS: T PTS: 1 REF: 4
13. A precondition is a statement specifying the condition(s) that must be true before the function is called.
- ANS: T PTS: 1 REF: 5
14. A postcondition is a statement specifying what is true before the function call is completed.
- ANS: F PTS: 1 REF: 6
15. In black-box testing, you do not know the internal working of the algorithm or function.
- ANS: T PTS: 1 REF: 7
16. White-box testing relies on the internal structure and implementation of a function or algorithm.
- ANS: T PTS: 1 REF: 8
17. The term asymptotic means the study of the function f as n becomes larger and larger without bound.
- ANS: T PTS: 1 REF: 14
18. The components of a class are called objects.
- ANS: F PTS: 1 REF: 17
19. If $g(n) = 1$, the growth rate is constant and does not depend on the size of the problem.
- ANS: T PTS: 1 REF: 17
20. In C++, the mechanism that allows you to combine data and the operations on that data in a single unit is called a class.
- ANS: T PTS: 1 REF: 17
21. The members of a `class` are classified into three categories: `private`, `public`, and `main`.
- ANS: F PTS: 1 REF: 18
22. `Private`, `public`, and `protected` are member access specifiers.
- ANS: T PTS: 1 REF: 18
23. A class and its members can be described graphically using a notation known as Unified Modeling Language (UML) notation.
- ANS: T PTS: 1 REF: 22
24. Class objects cannot be passed as parameters to functions or returned as function values.
- ANS: F PTS: 1 REF: 32

25. As parameters to functions, class objects can be passed only by reference.

ANS: F

PTS: 1

REF: 32

MULTIPLE CHOICE

1. The three fundamental stages a program goes through are: development, use, and ____.
- a. implementation
 - b. maintenance
 - c. analysis
 - d. requirements gathering

ANS: B

PTS: 1

REF: 2

2. When a program is considered too expensive to maintain, the developer might decide to ____ the program and no new version of the program will be released.
- a. delete
 - b. restructure
 - c. retire
 - d. release

ANS: C

PTS: 1

REF: 2

3. ____ is the first and most important step of the software development process.
- a. Analyzing the problem
 - b. Designing the software
 - c. Implementing the software
 - d. Test marketing

ANS: A

PTS: 1

REF: 3

4. A(n) ____ is a step-by-step problem-solving process in which a solution is arrived at in a finite amount of time.
- a. design plan
 - b. algorithm
 - c. process plan
 - d. structured program

ANS: B

PTS: 1

REF: 4

5. The structured design approach is also known as ____.
- a. top-down design
 - b. bottom-up design
 - c. object design
 - d. stepwise updating

ANS: A

PTS: 1

REF: 4

6. ____ is the ability to create new data types from existing data types.
- a. Encapsulation
 - b. Information hiding
 - c. Inheritance
 - d. Polymorphism

ANS: C

PTS: 1

REF: 4

7. ____ is the ability to use the same expression to denote different operations.
- a. Overloading operators
 - b. Polymorphism
 - c. Inheritance
 - d. Encapsulation

ANS: B

PTS: 1

REF: 4

8. The output of ____ is immediately sent to the standard error stream, which is usually the screen.
- a. cerr
 - b. cout
 - c. cerror
 - d. cerrout

ANS: A

PTS: 1

REF: 5

9. The main types of testing are ____ testing.

- a. white-box and blue-box
- b. black-box and blue-box
- c. white-box and green-box
- d. white-box and black-box

ANS: D PTS: 1 REF: 7

10. In the function ____, the growth rate is a function of the base 2 logarithm of n .

- a. $g(n)=1$
- b. $g(n)=\log_2 n$
- c. $g(n)=n\log_2 n$
- d. $g(n)=2^n$

ANS: B PTS: 1 REF: 17

11. In the function ____, the growth rate is quadrupled when the problem size is doubled.

- a. $g(n)=1$
- b. $g(n)=n\log_2 n$
- c. $g(n)=n^2$
- d. $g(n)=2^n$

ANS: C PTS: 1 REF: 17

12. In the function ____, the growth rate is exponential.

- a. $g(n)=1$
- b. $g(n)=n^2$
- c. $g(n)=n\log_2 n$
- d. $g(n)=2^n$

ANS: D PTS: 1 REF: 17

13. A(n) ____ is a collection of a fixed number of components.

- a. object
- b. member
- c. class
- d. friend

ANS: C PTS: 1 REF: 17

14. The components of a class are called the ____ of the class.

- a. operators
- b. friends
- c. objects
- d. members

ANS: D PTS: 1 REF: 17

15. The members of a class are classified into three categories called ____ access specifiers.

- a. member
- b. object
- c. function
- d. object

ANS: A PTS: 1 REF: 18

16. Deciding which member to make `private` and which to make `public` depends on the ____ of the member.

- a. nature
- b. size
- c. function
- d. identity

ANS: A PTS: 1 REF: 19

17. By default, all members of a class are ____.

- a. `public`
- b. `protected`
- c. `private`
- d. `open`

ANS: C PTS: 1 REF: 20

18. To guarantee that the instance variables of a class are initialized, you use ____.

- a. friend functions
- b. constructors
- c. void functions
- d. destructors

ANS: B PTS: 1 REF: 21

19. The constructor without parameters is called the ____.
- a. helper function
 - b. default constructor
 - c. destructor
 - d. default destructor

ANS: B PTS: 1 REF: 21

20. The name of a constructor is the same as the name of the ____.
- a. class
 - b. main function
 - c. helper function
 - d. friend function

ANS: A PTS: 1 REF: 21

21. In C++ terminology, a class variable is called a ____.
- a. class object
 - b. class placeholder
 - c. class member
 - d. class template

ANS: A PTS: 1 REF: 23

22. The general syntax for declaring a class object that invokes the default constructor is ____.
- a. `className classObject.new;`
 - b. `className ObjectName;`
 - c. `className classObjectName;`
 - d. `classObjectName className;`

ANS: C PTS: 1 REF: 23

23. ____ serves to hide the details of the operations on the data.
- a. Inheritance
 - b. Information hiding
 - c. A destructor
 - d. A constructor

ANS: B PTS: 1 REF: 25

24. The destructor automatically executes when the class object goes out of ____.
- a. scope
 - b. use
 - c. bounds
 - d. phase

ANS: A PTS: 1 REF: 33

25. A(n) ____ is a data type that separates the logical properties from the implementation details.
- a. public
 - b. protected
 - c. private
 - d. abstract data type

ANS: D PTS: 1 REF: 34