1. What is the default value of a reference?
   - A) 0
   - B) ""
   - C) null
   - D) default
2. A default constructor has how many parameters?
   - A) 0
   - B) 1
   - C) 2
   - D) a variable number
3. Which statement prints the floating-point value 123.456 right justified with a field width of 10?
   - A) System.out.printf(“%d10.3”, 123.456);
   - B) System.out.printf(“%10.3d”, 123.456);
   - C) System.out.printf(“%f10.3”, 123.456);
   - D) System.out.printf(“%10.3f”, 123.456);
4. Suppose variable gender is MALE and age equals 60, how is the expression (gender == FEMALE) && (age >= 65) evaluated?
   - A) The condition (gender == FEMALE) is evaluated first and the evaluation stops immediately.
   - B) The condition (age >= 65) is evaluated first and the evaluation stops immediately.
   - C) Both conditions are evaluated, from left to right.
   - D) Both conditions are evaluated, from right to left.
5. To declare a method as static, place the keyword static before _____ in the method’s declaration.
   - A) the method modifier
   - B) the return type
   - C) the method name
   - D) the argument list
6. Any field declared with keyword _____ is constant.
   - A) static
   - B) const
   - C) constant
   - D) final
7. Declaring main as _____ allows the JVM to invoke main without creating an instance of the class.
   - A) public
   - B) void
   - C) static
   - D) final
8. When an object is concatenated with a String:
   - A) a compilation error occurs.
   - B) a runtime error occurs.
   - C) the object’s toString method is implicitly called to obtain the String representation of the object.
   - D) the object’s class name is used.
9. A static method can _____.
   - A) call only other static methods of the same class directly.
   - B) manipulate only static fields in the same class directly.
   - C) be called using the class name and a dot (.).
   - D) All of the above.
10. Overloaded methods always have the same _____.
    - A) method name
    - B) return type
    - C) number of parameters
    - D) order of parameters
11. Which of the following methods are overloaded with respect to one another?

A) public int max (int a, int b) { … }

B) public double max (double a, double b) { … }

C) public int max (int a, int b, int c) { … }

D) public double max (double a, double b, double c) { …}

- A) A and B are overloaded; C and D are overloaded.
- B) A and C are overloaded; B and D are overloaded.
- C) A, B and C are overloaded.
- (•) D) All these four methods are overloaded.

12. In a class containing methods with the same name, the methods are distinguished by:

- A) Number of arguments
- B) Types of arguments
- C) Return type
- (•) D) (a) and (b)
- E) (b) and (c)

13. Which of the following statements about creating arrays and initializing their elements is false?

- A) The new keyword should be used to create an array.
- B) When an array is created, the number of elements must be placed in square brackets following the type of element being stored.
- (•) C) The elements of an array of integers have a value of null before they are initialized.
- D) A for loop is commonly used to set the values of the elements of an array.

14. Which of the following tasks cannot be performed using an enhanced **for** loop?

- A) Calculating the product of all the values in an array.
- B) Displaying all even element values in an array.
- C) Comparing the elements in an array to a specific value.
- (•) D) Incrementing the value stored in each element of the array.

15. Which statement correctly passes the array items to method takeArray? Array items contains 10 elements.

- A) takeArray(items[])
- (•) B) takeArray(items)
- C) takeArray(items[9])
- D) Arrays cannot be passed to methods—each item must be sent to the method separately

16. Consider array items, which contains the values 0, 2, 4, 6 and 8. If method changeArray is called with the method call changeArray(items, items[2]), what values are stored in items after the method has finished executing?public static void changeArray(int[] passedArray, int value){ passedArray[value] = 12; value = 5;} // end method changeArray

- A) 0, 2, 5, 6, 12.
- B) 0, 2, 12, 6, 8.
- C) 0, 2, 4, 6, 5.
- (•) D) 0, 2, 4, 6, 12.

17. In Java, multidimensional arrays:

- A) are not directly supported.
- B) are implemented as arrays of arrays.
- C) are often used to represent tables of values.
- (•) D) All of the above.

18. Which of the following sets of statements creates a multidimensional array with 3 rows, where the first row contains 1 value, the second row contains 4 items and the final row contains 2 items?

- A) int[][] items;
items = new int[3][?];
items[0] = new int[1];
items[1] = new int[4];
items[2] = new int[2];
- (•) B) int[][] items;
items = new int[3][ ];
items[0] = new int[1];
items[1] = new int[4];
items[2] = new int[2];
- C) int[][] items;
items = new int[?][?];
items[0] = new int[1];
items[1] = new int[4];

items[2] = new int[2];
D) int[][] items;
items[0] = new int[1];
items[1] = new int[4];
items[2] = new int[2];

19. An argument type followed by a(n) _____ in a method's parameter list indicates that the method receives a variable number of arguments of that particular type.
- A) square brackets ([]).
- B) ellipsis (…).
- C) varargs keyword.
- D) All of the above are acceptable to indicate a variable number of arguments.

20. Class _____ represents a dynamically resizable array-like data structure.
- A) Array
- B) ArrayList
- C) Arrays
- D) none of the above

21. Which statement is false?
- A) The actual data representation used within the class is of no concern to the class's clients.
- B) Clients generally care about what the class does but not how the class does it.
- C) Clients are usually involved in a class's implementation.
- D) Hiding the implementation reduces the possibility that clients will become dependent on class-implementation details.

22. Which of the following should usually be private?
- A) Methods.
- B) Constructors.
- C) Variables (or fields).
- D) All of the above.

23. When should a program explicitly use the this reference?
- A) Accessing a private variable.
- B) Accessing a public variable.
- C) Accessing a local variable.
- D) Accessing a field that is shadowed by a local variable.

24. Constructors:
- A) Initialize instance variables.
- B) When overloaded, can have identical argument lists.
- C) When overloaded, are selected by number, types and order of types of parameters.
- D) a and c.

25.
Set methods are also commonly called _____ methods and ***get*** methods are also commonly called _____ methods.

- A) query, mutator.
- B) accessor, mutator.
- C) mutator, accessor.
- D) query, accessor.

26.
Using **public** *set* methods provides data integrity if:

- A) The instance variables are **public**.
- B) The instance variables are **private**.
- C) The methods perform validity checking.
- D) Both b and c.

27. Static class variables:
- A) are **final**.
- B) are **Public**.
- C) are **Private**.
- D) are shared by all objects of a class.

28. Which of the following is false?
- A) A **static** method must be used to access **private static** instance variables.
- B) A **static** method has no **this** reference.

C) A **static** method can be accessed even when no objects of its class have been instantiated.
D) A **static** method can call instance methods directly.

29. Which syntax imports all static members of class Math?
A) **static import java.lang.Math.***
B) **import static java.lang.Math.***
C) **static import java.lang.Math**
D) **import static java.lang.Math**

30. Instance variables declared final do not or cannot:
A) Cause syntax errors if used as a left-hand value.
B) Be initialized.
C) Be modified.
D) None of the above.

31. A final field should also be declared _____ if it is initialized in its declaration.
A) private
B) protected
C) public
D) static

32. Which of the following statements is *false*?
A) A subclass is often smaller than its superclass.
B) A superclass object is a subclass object.
C) The class following the **extends** keyword in a class declaration is the direct superclass of the class being declared.
D) Java uses interfaces to provide the benefits of multiple inheritance.

33. Which of the following keywords allows a subclass to access a superclass method even when the subclass has overridden the superclass method?
A) base
B) this
C) public
D) super

34. Superclass methods with this level of access cannot be called from subclasses.
A) private
B) protected
C) public
D) package

35. Every class in Java, except _____, extends an existing class.
A) Integer
B) Object
C) String
D) Class

36. To avoid duplicating code, use _____, rather than _____.
A) inheritance, the “copy-and-past” approach.
B) the “copy-and-past” approach, inheritance.
C) a class that explicitly extends Object, a class that does not extend Object.
D) a class that does not extend Object, a class that explicitly extends Object.

37. Consider the classes below, declared in the same file:

```
class A
{
   int a;
   public A()
   {
      a = 7;
   }
}

class B extends A
{
   int b;
   public B()
   {
        b = 8;
   }
}
```

Which of the statements below is *false*?

- (●) A) Both variables a and b are instance variables.
- ( ) B) After the constructor for class B executes, the variable a will have the value 7.
- ( ) C) After the constructor for class B executes, the variable b will have the value 8.
- ( ) D) A reference of type A can be treated as a reference of type B.

38. Which of the following is the superclass constructor call syntax?

- ( ) A) keyword **super**, followed by a dot (.)
- (●) B) keyword **super**, followed by a set of parentheses containing the superclass constructor arguments.
- ( ) C) keyword **super**, followed by a dot and the superclass constructor name.
- ( ) D) None of the above.

39. Which statement is *true* when a superclass has **protected** instance variables?

- ( ) A) A subclass object can assign an invalid value to the superclass's instance variables, thus leaving an object in an inconsistent state.
- ( ) B) Subclass methods are more likely to be written so that they depend on the superclass's data implementation.
- ( ) C) We may need to modify all the subclasses of the superclass if the superclass implementation changes.
- (●) D) All of the above.

40. Failure to prefix the superclass method name with the keyword **super** and a dot (.) separator when referencing the superclass's method causes _____.

- ( ) A) a compile-time error.
- ( ) B) a syntax error.
- (●) C) infinite recursion.
- ( ) D) a runtime error.

41. When a subclass constructor calls its superclass constructor, what happens if the superclass's constructor does not assign a value to an instance variable?

- ( ) A) A syntax error occurs.
- ( ) B) A compile-time error occurs.
- ( ) C) A run-time error occurs.
- (●) D) The program compiles and runs because the instance variables are initialized to their default values.

42. Which of the following statements is (are) *true*?

A. We can use inheritance to customize existing software.

B. A superclass specifies commonality.

C. A superclass can be modified without modifying subclasses

D. A subclass can be modified without modifying its superclass.

- (●) A) All of the above.
- ( ) B) None of the above.

C) A, B and C.
D) A, B and D.

43. Which of the following is an example of a functionality that should *not* be "factored out" to a superclass?

A) Both ducks and geese are birds that know how to start flying from the water.
B) All vehicles know how to start and stop.
C) All animals lay eggs, except for mammals.
D) All paints have a color.

44. The default implementation of method **clone** of **Object** performs a _____.

A) empty copy
B) deep copy
C) full copy
D) shallow copy

45. The default **equals** implementation of class **Object** determines:

A) whether two references refer to the same object in memory.
B) whether two references have the same type.
C) whether two objects have the same instance variables.
D) whether two objects have the same instance variable values.

46. Polymorphism enables you to:
A) program in the general.
B) program in the specific.
C) absorb attributes and behavior from previous classes.
D) hide information from the user.

47. Which of the following statements about interfaces is *false*?

A) An interface describes a set of methods that can be called on an object, providing a default implementation for the methods.
B) An interface describes a set of methods that can be called on an object, not providing concrete implementation for the methods.
C) Interfaces are useful when attempting to assign common functionality to possibly unrelated classes.
D) Once a class implements an interface, all objects of that class have an is-a relationship with the interface type.

48. For which of the following would polymorphism not provide a clean solution?
A) A billing program where there is a variety of client types that are billed with different fee structures.
B) A maintenance log program where data for a variety of types of machines is collected and maintenance schedules are produced for each machine based on the data collected.
C) A program to compute a 5% savings account interest for a variety of clients.
D) An IRS program that maintains information on a variety of taxpayers and determines who to audit based on criteria for classes of taxpayers.

49. Polymorphism allows for specifics to be dealt with during:
A) execution
B) compilation
C) programming
D) debugging

50. Which statement *best*

describes the relationship between superclass and subclass types?

A) A subclass reference *cannot* be assigned to a superclass variable and a superclass reference *cannot* be assigned to a subclass variable.
B) A subclass reference *can* be assigned to a superclass variable and a superclass reference *can* be assigned to a subclass variable.
C) A superclass reference *can* be assigned to a subclass variable, but a subclass reference *cannot* be assigned to a superclass variable.
D) A subclass reference *can* be assigned to a superclass variable, but a superclass reference *cannot* be assigned to a subclass variable.

51. A(n)_____ class cannot be instantiated.

- A) final
- B) concrete
- C) abstract
- D) polymorphic

52. Which of the following could be used to declare **abstract** method **method1** in **abstract class Class1** (**method1** returns an **int** and takes no arguments)?

- A) public int method1();
- B) public int abstract method1();
- C) public abstract int method1();
- D) public int nonfinal method1();

53. Which of the following statements about abstract superclasses is *true*?

- A) abstract superclasses may contain data.
- B) abstract superclasses may not contain implementations of methods.
- C) abstract superclasses must declare all methods as abstract.
- D) abstract superclasses must declare all data members not given values as abstract.

54. Consider the `abstract` superclass below:

```
public abstract class Foo
 {
    private int a;
    public int b;

    public Foo( int aVal, int bVal )
    {
       a = aVal;
       b = bVal;
    } // end Foo constructor

    public abstract int calculate();
 } // end class Foo
```

Any *concrete* subclass that *extends* class `Foo`:

- A) Must implement a method called **calculate**.
- B) Will *not* be able to access the instance variable **a**.
- C) Neither (a) nor (b).
- D) Both (a) and (b).

55. Consider classes **A**, **B** and **C**, where **A** is an abstract superclass, **B** is a concrete class that inherits from **A** and **C** is a concrete class that inherits from **B**. Class **A** declares abstract method **originalMethod**, implemented in class **B**. Which of the following statements is *true* of class **C**?

- A) Method **originalMethod** *cannot* be overridden in class **C**—once it has been implemented in concrete class **B**, it is implicitly **final**.
- B) Method **originalMethod** *must be* overridden in class **C**, or a syntax error will occur.
- C) If method **originalMethod** is not overridden in class **C** but is called by an object of class **C**, an error occurs.
- D) None of the above.

56. When a superclass variable refers to a subclass object and a method is called on that object, the proper implementation is determined at execution time. What is the process of determining the correct method to call?

- A) early-binding.
- B) non-binding.
- C) on-time binding.
- D) late(dynamic) binding.

57. Every object in Java knows its own class and can access this information through method _____.

- A) getClass
- B) getInformation
- C) objectClass
- D) objectInformation

58. Assigning a subclass reference to a superclass variable is safe:

- A) because the subclass object *has an* object of its superclass.
- B) because the subclass object *is an* object of its superclass.

C) only when the superclass is **abstract**.
D) only when the superclass is concrete.

59. All of the following methods are implicitly final except:
A) a method in an **abstract** class.
B) a **private** method.
C) a method declared in a **final** class.
D) **static** method.

60. Declaring a method **final** means:

A) it will prepare the object for garbage collection.
B) it cannot be accessed from outside its class.
C) it cannot be overloaded.
D) it cannot be overridden.

61. Which keyword is used to specify that a class will define the methods of an interface?
A) uses
B) implements
C) defines
D) extends

62. Which of the following is *not* possible?

A) A class that implements two interfaces.
B) A class that inherits from two classes.
C) A class that inherits from one class, and implements an interface.
D) All of the above are possible.

63. A class that implements an interface but does not declare all of the interface's methods must be declared:
A) public
B) abstract
C) interface
D) final

64. Which of the following statements regarding the throw point of an exception is *false*?

A) It specifies the point at which the exception must be handled.
B) It is the initial point at which the exception occurs.
C) It is specified as the top row of the method-call stack at the time the exception occurred.
D) All of the above statements except one are true.

65. To catch an exception, the code that might throw the exception must be enclosed in a
A) throws block.
B) catch block.
C) try block.
D) finally block.

66. In Java, after an exception is handled, control resumes _____. This is known as the _____ model of exception handling.
A) after the last catch block (or the finally block, if there is one), termination
B) after the last catch block (or the finally block, if there is one), resumption
C) just after the throw point, termination
D) just after the throw point, resumption

67. The **throws** clause of a method:

A) specifies the exceptions a method catches.
B) specifies the exceptions thrown by the calling method.
C) specifies the exceptions a method throws.
D) specifies the exceptions a method throws and catches.

68. Which of the following exceptions is a checked exception?
A) ArithmeticException.
B) IOException.

C) RuntimeException.
D) InputMismatchException.

69. Which of the following statements is true?
A) The code in a finally block is executed only if an exception occurs.
B) The code in a finally block is executed only if an exception does not occur.
C) The code in a finally block is executed only if there are no catch blocks.
D) None of the above are true.

70. After a finally block has finished executing (and there are no exceptions to be handled):
A) control proceeds to the first statement after the finally block.
B) control returns to the throw point.
C) the application exits.
D) control proceeds to the first statement after the last catch block.

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