**1. What is the main purpose of an abstract class in Java?**

A) To create a class that cannot be instantiated  
B) To provide a template for subclasses  
C) To implement multiple inheritance  
D) To allow the use of inner classes

**Correct Answer:** A  
**Explanation:** An abstract class cannot be instantiated and is designed to be subclassed, providing a common interface or template for its subclasses.

**2. Which of the following keywords is used to define an abstract class?**

A) final  
B) abstract  
C) static  
D) virtual

**Correct Answer:** B  
**Explanation:** The abstract keyword is used to declare an abstract class in Java.

**3. In Java, which statement about inheritance is true?**

A) A class can extend multiple classes  
B) A subclass inherits methods from its superclass  
C) Inheritance can only be achieved through interfaces  
D) Constructors are inherited by subclasses

**Correct Answer:** B  
**Explanation:** A subclass inherits fields and methods from its superclass, but it cannot extend multiple classes (Java does not support multiple inheritance of classes).

**4. What is the purpose of the**super**keyword?**

A) To call the parent class constructor  
B) To reference the current class instance  
C) To define an abstract method  
D) To access private members of a superclass

**Correct Answer:** A  
**Explanation:** The super keyword is used to call the parent class constructor or to access parent class methods and fields.

**5. Which of the following is NOT a feature of an inner class?**

A) It can access members of its outer class  
B) It can have static members  
C) It can be private, public, or protected  
D) It can extend another class

**Correct Answer:** B  
**Explanation:** Inner classes cannot have static members unless they are static inner classes.

**6. What is the result of using the**equals()**method in Java?**

A) It compares object references  
B) It compares object content  
C) It must be overridden in every class  
D) It compares class types

**Correct Answer:** B  
**Explanation:** The equals() method is used to compare the contents of two objects. It should be overridden to provide a meaningful comparison.

**7. Why is it important to override the**hashCode()**method when overriding**equals()**?**

A) To ensure unique object identity  
B) To maintain the general contract for hash tables  
C) To optimize memory usage  
D) To allow method overloading

**Correct Answer:** B  
**Explanation:** When equals() is overridden, the hashCode() method should also be overridden to maintain the contract between equals and hashCode, ensuring that equal objects produce the same hash code.

**8. Which of the following is true about the Object class in Java?**

A) All classes inherit from Object  
B) Object class cannot be subclassed  
C) Object class provides no methods  
D) Object class has no constructors

**Correct Answer:** A  
**Explanation:** All classes in Java implicitly extend the Object class, which is the root of the class hierarchy.

**9. In Java, what is the visibility of a protected attribute?**

A) Accessible only within its own package  
B) Accessible only within subclasses  
C) Accessible within its own package and subclasses  
D) Accessible from anywhere

**Correct Answer:** C  
**Explanation:** A protected attribute can be accessed within its own package and by subclasses regardless of their package.

**10. What is the visibility of private attributes in Java?**

A) Accessible from anywhere  
B) Accessible only within the same class  
C) Accessible from subclasses  
D) Accessible within its own package

**Correct Answer:** B  
**Explanation:** Private attributes are accessible only within the class in which they are declared.

**11. Which of the following statements is true about multiple inheritance in Java?**

A) A class can implement multiple interfaces  
B) A class can extend multiple classes  
C) Multiple inheritance is allowed for classes and interfaces  
D) A class can inherit from multiple abstract classes

**Correct Answer:** A  
**Explanation:** Java does not allow multiple inheritance for classes (to avoid ambiguity) but allows a class to implement multiple interfaces.

**12. What is the purpose of the**instanceof**operator in Java?**

A) To check the type of an object  
B) To create an instance of a class  
C) To cast an object to a different type  
D) To compare two objects

**Correct Answer:** A  
**Explanation:** The instanceof operator is used to check whether an object is an instance of a specific class or interface.

**13. Which of the following keywords allows a class to inherit from an interface?**

A) extends  
B) implements  
C) inherits  
D) uses

**Correct Answer:** B  
**Explanation:** The implements keyword is used by a class to inherit from an interface.

**14. How can you achieve polymorphism in Java?**

A) By method overloading only  
B) By method overriding only  
C) By both method overloading and overriding  
D) By using final classes

**Correct Answer:** C  
**Explanation:** Polymorphism can be achieved through method overloading (compile-time polymorphism) and method overriding (run-time polymorphism).

**15. What does the**final**keyword signify when used with a class?**

A) The class can be subclassed  
B) The class cannot be subclassed  
C) The class can only have one constructor  
D) The class is abstract

**Correct Answer:** B  
**Explanation:** A class declared with the final keyword cannot be subclassed.

**16. Which of the following is a feature of Java’s garbage collection?**

A) Manual memory management  
B) Automatic memory management  
C) Explicit memory allocation  
D) None of the above

**Correct Answer:** B  
**Explanation:** Java has automatic garbage collection that manages memory automatically by reclaiming unused objects.

**17. In Java, what is the result of attempting to instantiate an abstract class?**

A) Compile-time error  
B) Run-time error  
C) It creates an instance of the abstract class  
D) It calls the constructor of the abstract class

**Correct Answer:** A  
**Explanation:** Instantiating an abstract class directly will result in a compile-time error.

**18. Which method can be used to create a deep copy of an object?**

A) Cloneable interface  
B) Serialization  
C) Copy constructor  
D) All of the above

**Correct Answer:** D  
**Explanation:** Deep copies can be created using the Cloneable interface, serialization, or a copy constructor.

**19. When a class inherits from an interface, which of the following must be implemented?**

A) Only abstract methods  
B) Only non-abstract methods  
C) Both abstract and non-abstract methods  
D) Only static methods

**Correct Answer:** A  
**Explanation:** A class that implements an interface must provide implementations for all abstract methods defined in the interface.

**20. What happens if a method in a subclass has the same name and parameters as a method in its superclass?**

A) The superclass method is executed  
B) The subclass method is executed  
C) A compile-time error occurs  
D) The program fails to run

**Correct Answer:** B  
**Explanation:** When a subclass method has the same name and parameters as a superclass method, it overrides the superclass method.

**21. Which of the following correctly describes a Java interface?**

A) It can have method implementations  
B) It can contain instance variables  
C) It can extend multiple classes  
D) It can only contain abstract methods

**Correct Answer:** D  
**Explanation:** An interface can only contain abstract methods (prior to Java 8) and static final variables.

**22. In Java, how can a subclass access the private members of its superclass?**

A) Directly  
B) Through public methods of the superclass  
C) By overriding the superclass method  
D) By using reflection

**Correct Answer:** B  
**Explanation:** A subclass cannot access private members directly but can access them through public or protected methods defined in the superclass.

**23. What is the purpose of the**Serializable**interface in Java?**

A) To create a deep copy of an object  
B) To allow objects to be serialized  
C) To enable thread safety  
D) To implement cloning

**Correct Answer:** B  
**Explanation:** The Serializable interface allows an object to be converted into a byte stream, enabling it to be saved to a file or sent over a network.

**24. How do you prevent a method from being overridden in a subclass?**

A) Declare it as final  
B) Declare it as private  
C) Declare it as static  
D) Declare it as abstract

**Correct Answer:** A  
**Explanation:** Declaring a method as final prevents it from being overridden in subclasses.

**25. Which of the following statements about multiple inheritance of interfaces is true?**

A) It is allowed in Java  
B) It is not allowed in Java  
C) It leads to ambiguity  
D) Only one interface can be inherited

**Correct Answer:** A  
**Explanation:** Java allows a class to implement multiple interfaces, enabling multiple inheritance of method signatures.

**26. Which of the following keywords is used to declare an inner class?**

A) inner  
B) static  
C) public  
D) class

**Correct Answer:** D  
**Explanation:** Inner classes are declared using the class keyword, just like regular classes.

**27. What is the purpose of the**clone()**method?**

A) To create a new instance of a class  
B) To create a shallow copy of an object  
C) To compare two objects  
D) To serialize an object

**Correct Answer:** B  
**Explanation:** The clone() method creates a shallow copy of the object. To create a deep copy, additional handling is required.

**28. What is the default visibility of a class member declared without any access modifier?**

A) Public  
B) Protected  
C) Private  
D) Package-private

**Correct Answer:** D  
**Explanation:** If no access modifier is specified, the member is package-private, meaning it is accessible only within its own package.

**29. Which method in Java is called when an object is deserialized?**

A) finalize()  
B) readObject()  
C) deserialize()  
D) init()

**Correct Answer:** B  
**Explanation:** The readObject() method is called during the deserialization process to restore the state of an object.

**30. What is the result of attempting to cast an object to a class that it does not inherit from?**

A) Compile-time error  
B) Run-time exception  
C) It will return null  
D) It will create a new instance

**Correct Answer:** B  
**Explanation:** A ClassCastException will be thrown at run-time if an object is cast to a class it does not inherit from.

**31. In the context of object serialization, what is a serialVersionUID?**

A) A unique identifier for each class  
B) A method used for serialization  
C) A variable that holds serialized data  
D) A marker interface

**Correct Answer:** A  
**Explanation:** The serialVersionUID is a unique identifier for each Serializable class, used to ensure that a serialized object matches the class definition during deserialization.

**32. What is the purpose of a marker interface in Java?**

A) To provide methods for implementation  
B) To mark a class for specific behavior  
C) To prevent multiple inheritance  
D) To enforce type safety

**Correct Answer:** B  
**Explanation:** A marker interface does not contain any methods; instead, it is used to indicate that a class should be treated in a certain way by the Java runtime.

**33. Which of the following statements about static members is true?**

A) Static members are associated with the instance of a class  
B) Static members can be accessed without creating an instance of a class  
C) Static members cannot be inherited  
D) Static members can only be private

**Correct Answer:** B  
**Explanation:** Static members belong to the class itself and can be accessed without creating an instance of the class.

**34. What happens if you do not override the**toString()**method in a class?**

A) The program will not compile  
B) The default implementation from Object class will be used  
C) It will throw a run-time exception  
D) It will return null

**Correct Answer:** B  
**Explanation:** If toString() is not overridden, the default implementation from the Object class will be used, which typically returns the class name followed by the object's hash code.

**35. What is an anonymous inner class in Java?**

A) A class defined without a name  
B) A class that does not inherit from any superclass  
C) A class that cannot access outer class members  
D) A class with multiple constructors

**Correct Answer:** A  
**Explanation:** An anonymous inner class is defined without a name and is instantiated in place.

**36. Which of the following methods should be overridden for correct serialization of an object?**

A) finalize()  
B) readObject() and writeObject()  
C) clone()  
D) toString()

**Correct Answer:** B  
**Explanation:** To customize serialization, the readObject() and writeObject() methods should be overridden.

**37. When using**super()**in a constructor, what must be true?**

A) It must be the first statement in the constructor  
B) It must be called after any initialization  
C) It can only be called in the constructor of a subclass  
D) It cannot be used in abstract classes

**Correct Answer:** A  
**Explanation:** The super() call must be the first statement in the constructor to ensure the superclass is initialized before the subclass.

**38. What is true about the visibility of an inner class?**

A) It can be private, protected, or public  
B) It cannot have private members  
C) It can only be public  
D) It cannot be a static class

**Correct Answer:** A  
**Explanation:** An inner class can have any visibility modifier, including private, protected, or public.

**39. Which of the following is a correct way to declare a static inner class?**

A) public class Outer { static class Inner {} }  
B) public class Outer { Inner static {} }  
C) static class Outer { class Inner {} }  
D) class Outer { static class Inner {} }

**Correct Answer:** A  
**Explanation:** A static inner class is declared using the static keyword within the outer class.

**40. Which of the following keywords can be used to prevent method overriding?**

A) final  
B) static  
C) abstract  
D) virtual

**Correct Answer:** A  
**Explanation:** The final keyword is used to prevent method overriding in subclasses.

**41. Which of the following statements about the**hashCode()**method is true?**

A) It can return negative values  
B) It is mandatory to override hashCode() when equals() is overridden  
C) It is called automatically during object comparison  
D) It returns the memory address of the object

**Correct Answer:** B  
**Explanation:** It is crucial to override hashCode() whenever equals() is overridden to maintain the contract between the two methods.

**42. How can you invoke a method of a superclass from a subclass?**

A) Using the base keyword  
B) Using the super keyword  
C) Directly, by method name  
D) Using the parent keyword

**Correct Answer:** B  
**Explanation:** The super keyword is used to invoke methods of a superclass from a subclass.

**43. In the context of OOP, what is encapsulation?**

A) Inheriting methods from a superclass  
B) Hiding the internal state and requiring all interaction to be performed through an object’s methods  
C) Using multiple classes to implement a single function  
D) Overriding methods in subclasses

**Correct Answer:** B  
**Explanation:** Encapsulation involves bundling the data (attributes) and the methods (functions) that operate on the data into a single unit (class) and restricting access to some of the object’s components.

**44. What does the**final**keyword signify when used with a variable?**

A) The variable can be changed  
B) The variable can only be initialized once  
C) The variable can be accessed from anywhere  
D) The variable is a class constant

**Correct Answer:** B  
**Explanation:** A final variable can only be initialized once, and its value cannot be changed thereafter.

**45. Which of the following is a valid way to implement an interface?**

A) class MyClass implements MyInterface {}  
B) class MyClass inherits MyInterface {}  
C) class MyClass extends MyInterface {}  
D) MyClass : MyInterface {}

**Correct Answer:** A  
**Explanation:** The correct syntax for implementing an interface is to use the implements keyword.

**46. In Java, what is method overloading?**

A) Having the same method name with different parameters in the same class  
B) Having the same method name with the same parameters in different classes  
C) Changing the method implementation in subclasses  
D) Using the same method name across different packages

**Correct Answer:** A  
**Explanation:** Method overloading occurs when two or more methods in the same class have the same name but different parameter lists.

**47. What happens if you attempt to serialize an object without implementing**Serializable**?**

A) The object will be serialized anyway  
B) A NotSerializableException is thrown  
C) The object will be partially serialized  
D) The object will lose all its data

**Correct Answer:** B  
**Explanation:** If a class does not implement the Serializable interface, attempting to serialize an instance will throw a NotSerializableException.

**48. What is the primary reason for using interfaces in Java?**

A) To implement multiple inheritance  
B) To provide a way to define abstract methods  
C) To allow different classes to communicate with each other  
D) To achieve abstraction and polymorphism

**Correct Answer:** D  
**Explanation:** Interfaces are used to achieve abstraction and polymorphism, allowing different classes to implement the same methods defined in the interface.

**49. Which of the following is NOT a feature of a constructor in Java?**

A) It must have the same name as the class  
B) It can be overloaded  
C) It has a return type  
D) It is called when an object is created

**Correct Answer:** C  
**Explanation:** Constructors do not have a return type, not even void.

**50. Which keyword is used to access members of the superclass in Java?**

A) this  
B) base  
C) super  
D) parent

**Correct Answer:** C  
**Explanation:** The super keyword is used to access members of the superclass.

**51. What is the purpose of the**instanceof**operator?**

A) To check if an object is an instance of a specific class or subclass  
B) To cast an object to a specified class  
C) To compare two objects  
D) To clone an object

**Correct Answer:** A  
**Explanation:** The instanceof operator checks whether an object is an instance of a specific class or subclass.

**52. What does it mean when a class is declared as**abstract**?**

A) The class cannot have constructors  
B) The class cannot be instantiated  
C) The class cannot have fields  
D) The class cannot implement interfaces

**Correct Answer:** B  
**Explanation:** An abstract class cannot be instantiated directly. It can only be subclassed.

**53. Which of the following statements about final classes is true?**

A) They can be subclassed  
B) They can have constructors  
C) They cannot have any methods  
D) They cannot have any attributes

**Correct Answer:** B  
**Explanation:** A final class can have constructors, fields, and methods, but it cannot be subclassed.

**54. In Java, what is the visibility of a member marked as**protected**?**

A) Accessible only within its own package  
B) Accessible only within its own class  
C) Accessible by subclasses and classes in the same package  
D) Accessible by any class

**Correct Answer:** C  
**Explanation:** A protected member is accessible within its own package and by subclasses.

**55. Which of the following is true regarding the**equals()**method?**

A) It must be overridden if the == operator is used  
B) It checks for reference equality by default  
C) It can return null  
D) It must return a boolean value

**Correct Answer:** B  
**Explanation:** By default, equals() checks for reference equality unless it is overridden to provide custom equality logic.

**56. What is an interface?**

A) A class that cannot be instantiated  
B) A contract that classes can implement  
C) A special type of class with abstract methods  
D) A way to define constants

**Correct Answer:** B  
**Explanation:** An interface defines a contract that implementing classes must fulfill, specifying method signatures without providing implementations.

**57. What is the significance of overriding the**hashCode()**method?**

A) To change the default hashing behavior  
B) To ensure consistent behavior with equals()  
C) To improve performance  
D) To enable object cloning

**Correct Answer:** B  
**Explanation:** It is essential to override hashCode() when overriding equals() to maintain the general contract for hash codes.

**58. Which of the following statements about inner classes is true?**

A) An inner class cannot access the outer class’s private members  
B) An inner class can be static  
C) An inner class can only be public  
D) An inner class can be instantiated without an outer class instance

**Correct Answer:** B  
**Explanation:** An inner class can be declared as static, which allows it to be instantiated without an instance of the outer class.

**59. What happens when you call the**finalize()**method on an object?**

A) The object is destroyed  
B) The object is marked for garbage collection  
C) The object’s resources are released  
D) The object’s state is saved

**Correct Answer:** C  
**Explanation:** The finalize() method is called before an object is garbage collected, allowing the object to release its resources.

**60. What is the difference between**==**and**equals()**in Java?**

A) == compares references, while equals() compares values  
B) == compares values, while equals() compares references  
C) They are interchangeable  
D) == is used for primitives, while equals() is used for objects

**Correct Answer:** A  
**Explanation:** The == operator compares object references, while equals() is used to compare the actual content of objects.

**61. Which of the following can an abstract class do?**

A) Provide implementations for some methods  
B) Only have abstract methods  
C) Be instantiated directly  
D) Inherit from a concrete class

**Correct Answer:** A  
**Explanation:** An abstract class can provide implementations for some methods while still declaring others as abstract.

**62. Which of the following statements is true about interfaces in Java?**

A) An interface can extend multiple classes  
B) An interface can have method implementations  
C) An interface can contain fields  
D) An interface can extend multiple interfaces

**Correct Answer:** D  
**Explanation:** An interface can extend multiple other interfaces, allowing it to inherit method signatures from multiple sources.

**63. In the context of inheritance, what does the term “subclass” refer to?**

A) A class that inherits from another class  
B) A class that cannot be instantiated  
C) A class that contains inner classes  
D) A class that implements interfaces

**Correct Answer:** A  
**Explanation:** A subclass is a class that inherits from another class (the superclass) and can extend or modify its behavior.

**64. What does polymorphism allow in Java?**

A) Multiple classes to be instantiated from a single class  
B) Objects to be treated as instances of their parent class  
C) Methods to be defined only in abstract classes  
D) Variables to change type at runtime

**Correct Answer:** B  
**Explanation:** Polymorphism allows objects to be treated as instances of their parent class, enabling method overriding and dynamic method resolution.

**65. Which of the following is NOT a type of inner class?**

A) Member inner class  
B) Local inner class  
C) Anonymous inner class  
D) External inner class

**Correct Answer:** D  
**Explanation:** There is no such thing as an “external inner class”; inner classes can be member inner classes, local inner classes, or anonymous inner classes.

**66. What keyword is used to define an interface in Java?**

A) interface  
B) abstract  
C) class  
D) implements

**Correct Answer:** A  
**Explanation:** The interface keyword is used to declare an interface in Java.

**67. Which of the following statements about method overriding is true?**

A) The overriding method must have the same name and parameters as the method in the superclass  
B) The overriding method can have a different return type  
C) The overriding method can be more restrictive in terms of access  
D) All of the above

**Correct Answer:** A  
**Explanation:** The overriding method must have the same name and parameters as the method in the superclass, while the return type can be the same or a subtype.

**68. Which of the following is true about the**Object**class in Java?**

A) It is the superclass of all classes  
B) It cannot be extended  
C) It contains only abstract methods  
D) It is not part of the Java API

**Correct Answer:** A  
**Explanation:** The Object class is the root class in Java, and every class is a descendant of Object.

**69. What is the purpose of the**Serializable**interface?**

A) To mark a class for serialization  
B) To prevent class modification  
C) To create constant values  
D) To implement security features

**Correct Answer:** A  
**Explanation:** The Serializable interface marks a class as capable of being serialized, allowing its objects to be converted into a byte stream.

**70. What does the**protected**access modifier allow?**

A) Access only within the same package  
B) Access only within subclasses  
C) Access within the same package and subclasses  
D) Access from any class

**Correct Answer:** C  
**Explanation:** The protected access modifier allows access within the same package and by subclasses, even if they are in different packages.

**71. In Java, what will happen if you attempt to access a private member from outside its class?**

A) It will compile successfully  
B) It will result in a run-time error  
C) It will lead to a compile-time error  
D) It will print null

**Correct Answer:** C  
**Explanation:** Accessing a private member from outside its class will lead to a compile-time error as private members are not visible outside their defining class.

**72. Which of the following is true about the**final**keyword?**

A) It can be applied to classes, methods, and variables  
B) It cannot be used with methods  
C) It restricts the use of static members  
D) It can be applied only to variables

**Correct Answer:** A  
**Explanation:** The final keyword can be applied to classes (to prevent inheritance), methods (to prevent overriding), and variables (to make them constant).

**73. How do you declare a variable of an interface type in Java?**

A) Interface varName;  
B) varName: Interface;  
C) Interface varName();  
D) Interface varName = new Interface();

**Correct Answer:** A  
**Explanation:** You can declare a variable of an interface type using Interface varName;, but you cannot instantiate an interface directly.

**74. What does the**throws**keyword indicate in a method declaration?**

A) The method is guaranteed to throw an exception  
B) The method may throw exceptions of specified types  
C) The method handles exceptions internally  
D) The method will not throw any exceptions

**Correct Answer:** B  
**Explanation:** The throws keyword indicates that the method may throw exceptions of the specified types, which must be handled by the calling code.

**75. What is the default access level of class members in Java?**

A) public  
B) private  
C) protected  
D) package-private

**Correct Answer:** D  
**Explanation:** If no access modifier is specified, class members have package-private access, meaning they are accessible only within the same package.