

1. What are the main features of Java?

Answer: Java is a high-level, object-oriented, platform-independent language. It supports features like simplicity, robustness, security, portability, multithreading, automatic memory management (Garbage Collection), and rich API support.

2. Explain the difference between JDK, JRE, and JVM.

Answer: JVM (Java Virtual Machine) executes Java bytecode and provides a runtime environment. JRE (Java Runtime Environment) includes JVM and libraries required to run Java programs. JDK (Java Development Kit) includes JRE + development tools like compiler (javac).

3. What is inheritance? What are its types in Java?

Answer: Inheritance is the mechanism of acquiring properties and behavior from another class. Types: Single, Multilevel, Hierarchical. (Java does not support multiple inheritance using classes, but it can be achieved using interfaces).

4. What is a class and an object in Java?

Answer: A class is a blueprint or template for creating objects. An object is an instance of a class, created using the 'new' keyword.

5. What are constructors in Java? How are they different from methods?

Answer: A constructor is a special method used to initialize objects. It has the same name as the class and no return type. Unlike methods, constructors are automatically called when an object is created.

6. What is an abstract class and an interface? How are they different?

Answer: Abstract class is a class that can have abstract methods (without body) and concrete methods. Interface is a collection of abstract methods (Java 8 onwards can also have default and static methods). Difference: A class can extend only one abstract class but can implement multiple interfaces.

7. What is method overloading and method overriding?

Answer: Method overloading allows multiple methods with the same name but different parameters in the same class. Method overriding means redefining a parent class method in a child class with the same name and parameters.

8. What is the difference between static and instance variables/methods?

Answer: Static variables/methods belong to the class, shared by all objects. Instance variables/methods belong to an object, and each object has its own copy.

9. What is the purpose of the main() method in a Java program?

Answer: The main() method is the entry point of a Java program. Its signature is 'public static void main(String[] args)'. The JVM calls this method to start program execution.

10. Explain the Concept of Autoboxing and Unboxing in Java.

Answer: Autoboxing is the automatic conversion of primitive types to their wrapper classes (e.g., int to Integer). Unboxing is the reverse process (e.g., Integer to int).