Java Programming Basics

Part 1: Introduction to Java

1. What is Java? Explain its significance in modern software development.
2. List and explain the key features of Java.
3. What is the difference between compiled and interpreted languages? Where does Java fit in?
4. Explain the concept of platform independence in Java.
5. What are the various applications of Java in the real world?

Part 2: History of Java

1. Who developed Java and when was it introduced?
2. What was Java initially called? Why was its name changed?
3. Describe the evolution of Java versions from its inception to the present.
4. What are some of the major improvements introduced in recent Java versions?
5. How does Java compare with other programming languages like C++ and Python in terms of evolution and usability?

Part 3: Data Types in Java

1. Explain the importance of data types in Java.
2. Differentiate between primitive and non-primitive data types.
3. List and briefly describe the eight primitive data types in Java.
4. Provide examples of how to declare and initialize different data types.
5. What is type casting in Java? Explain with an example.
6. Discuss the concept of wrapper classes and their usage in Java.
7. What is the difference between static and dynamic typing? Where does Java stand?

Coding Questions on Data Types:

1. Write a Java program to declare and initialize all eight primitive data types and print their values.
2. Write a Java program that takes two integers as input and performs all arithmetic operations on them.
3. Implement a Java program to demonstrate implicit and explicit type casting.
4. Create a Java program that converts a given integer to a double and vice versa using wrapper classes.
5. Write a Java program to swap two numbers using a temporary variable and without using a temporary variable.
6. Develop a program that takes user input for a character and prints whether it is a vowel or consonant.
7. Create a Java program to check whether a given number is even or odd using command-line arguments.

Part 4: Java Development Kit (JDK)

1. What is JDK? How does it differ from JRE and JVM?
2. Explain the main components of JDK.
3. Describe the steps to install JDK and configure Java on your system.
4. Write a simple Java program to print "Hello, World!" and explain its structure.
5. What is the significance of the `PATH` and `CLASSPATH` environment variables in Java?
6. What are the differences between OpenJDK and Oracle JDK?
7. Explain how Java programs are compiled and executed.
8. What is Just-In-Time (JIT) compilation, and how does it improve Java performance?
9. Discuss the role of the Java Virtual Machine (JVM) in program execution.