Java Semester Examination Questions

Unit I: Introduction to OOP and Basic Java Concepts

1. Explain the four principles of Object-Oriented Programming with suitable examples.

2. Write a Java program to display "Hello World". Explain the steps for writing, compiling, and running a Java program.

3. Differentiate between JDK, JRE, and JVM with the help of a diagram.

4. What is a class and an object in Java? Write a Java program to demonstrate the creation of a class with a constructor and methods.

5. Explain method overloading in Java with an example. How is it different from method overriding?

6. Discuss the different data types available in Java. Provide examples of each.

7. Write a Java program to check whether a number is prime or not using control statements.

8. Write a Java program to reverse a string using the String class methods.

9. Explain single-dimensional and multi-dimensional arrays in Java with examples. Write a program to add two 3×3 matrices.

10. Describe the basic input and output in Java using Scanner and System.out. Give an example program.

11. What are operators in Java? Explain different types of operators with examples.

12. Explain the difference between while and do-while loops with examples.

13. Write a Java program to generate the Fibonacci series using a for loop.

14. Discuss the difference between primitive and reference data types in Java.

15. Explain the difference between == operator and .equals() method in Java.

16. Write a Java program to demonstrate the use of the switch statement for a simple calculator.

17. What are wrapper classes in Java? Explain with an example.

18. Write a Java program to find the largest element in an array.

19. Explain how Java achieves platform independence.

20. Describe memory management in Java with the help of garbage collection.

Unit II: Inheritance, Interface, and Packages

1. Explain different types of inheritance in Java. Which types are not supported directly, and why?

2. Write a Java program to demonstrate single inheritance using the super keyword.

3. What is method overriding? Write a program to illustrate method overriding and use of the final keyword.

4. Explain abstract classes and methods in Java. Write an example program.

5. What is an interface in Java? How is it different from an abstract class? Give an example.

6. Write a Java program to demonstrate multiple inheritance through interfaces.

7. What are packages in Java? Explain the steps to create and use a user-defined package.

8. Write a Java program to import the java.util package and use the ArrayList class.

9. Explain the access modifiers in Java with respect to packages. Provide examples.

10. What are functional interfaces and default methods in Java interfaces? Give a suitable example.

11. Write a Java program to show hierarchical inheritance with at least three classes.

12. Explain the role of the super() constructor in inheritance. Provide an example.

13. Differentiate between static import and normal import in Java with examples.

14. Write a Java program to demonstrate interface extension (an interface extending another interface).

15. What is the significance of java.lang and java.util packages? Explain with examples.

16. Write a Java program to demonstrate the use of the final class.

17. Explain the concept of multiple inheritance issues in Java and how interfaces solve them.

18. Write a Java program to implement a functional interface using a lambda expression.

19. Discuss package naming conventions and their importance.

20. Compare and contrast abstract classes, interfaces, and concrete classes in Java.

Previous Paper Questions (Mid Semester Test - I, Oct 2024)

PPQ1. Illustrate the steps to compile and run a Java program that prints 'Hello, World' from the command line.

PPQ2. Explain the concept of the String Pool in Java. What happens when you create strings using double quotes ("String") versus using the new String() constructor? Provide an example to illustrate the concept.

PPQ3. OR Illustrate the immutability of Strings in Java with memory diagrams.

PPQ4. Distinguish Abstract class and Interface with the help of example programs of Employee class and Employee interface.

PPQ5. Show how a subclass constructor can initialize parent class constructor by creating a class grandparent with attribute Home, Parent with attribute Car, Child with attribute Bike.

PPQ6. OR Represent Hierarchical Inheritance with an abstract class Shape and abstract method calculatePerimeter(). Then, create two classes Triangle and Square that extend Shape and provide implementations for the method.

PPQ7. Differentiate method overloading and method overriding with example method area.

PPQ8. OR Explain Constructor Overloading by creating a class Employee with attributes name, id, and salary. Next, modify the class to include both a default constructor and a parameterized constructor.