JAVA Practice Questions

Object-Oriented Programming Concepts

1. Class and Object:

   - Define a class `Rectangle` with attributes length and breadth. Include methods to calculate the area and perimeter of the rectangle. Create objects of the class and display the results.

2. Constructor:

   - Create a class `Student` with attributes name and roll number. Implement a constructor to initialize these attributes and a method to display the student's details.

Basic Java Programming

3. Data Types and Variables:

   - Write a Java program to demonstrate the use of different data types. Declare variables of all primitive data types, assign values to them, and print their values.

4. Operators:

   - Write a program to perform the following operations: addition, subtraction, multiplication, division, and modulus. Accept two numbers from the user as input and display the results.

Control Structures

5. If-Else:

   - Write a program to check if a given number is even or odd.

6. Switch-Case:

   - Write a program that takes a day number (1 for Monday, 2 for Tuesday, etc.) as input and prints the corresponding day of the week using a switch-case statement.

Loops

7. For Loop:

   - Write a program to print the first 10 natural numbers using a for loop.

8. While Loop:

   - Write a program to calculate the sum of digits of a given number using a while loop.

9. Do-While Loop:

- Write a program to reverse a given number using a do-while loop.

Arrays

10. Single Dimensional Array:

- Write a program to find the maximum and minimum elements in an array of integers.

11. Two Dimensional Array:

- Write a program to perform matrix addition. Accept two 3x3 matrices as input and display the resultant matrix after addition.

String Handling

12. String Methods:

- Write a program to count the number of vowels in a given string.

13. String Comparison:

- Write a program to compare two strings and check if they are anagrams.

Input/Output

14. Scanner Class:

- Write a program to accept a list of integers from the user and find their average using the `Scanner` class.

Mathematical Library Methods

15. Math Class:

- Write a program to calculate the area of a circle given its radius. Use the `Math.PI` constant and `Math.pow` method for calculations.

Methods and Functions

16. Method Overloading:

- Write a program with overloaded methods to calculate the area of a rectangle, a square, and a circle.

17. Returning Values:

- Write a method to calculate the factorial of a number and return the result. Use this method in the main program.

Object-Oriented Programming

18. Encapsulation:

- Create a class `BankAccount` with private attributes account number, account holder name, and balance. Provide public methods to deposit money, withdraw money, and check the balance.

19. Inheritance:

- Create a class `Person` with attributes name and age. Inherit this class to create a class `Employee` with additional attributes employee ID and department. Implement methods to display the details of both the person and the employee.

20. Polymorphism:

- Create a superclass `Shape` with a method `draw()`. Implement subclasses `Circle`, `Rectangle`, and `Triangle`, each with their own implementation of the `draw()` method.

Practice Questions for Loops and Arrays

21. Nested Loops:

- Write a program to print the multiplication table of a given number up to 10 using nested loops.

22. Array Sorting:

- Write a program to sort an array of integers in ascending order using the bubble sort algorithm.

Additional Practice Questions

23. Pattern Printing:

- Write a program to print a right-angled triangle pattern using asterisks (`*`).

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24. Palindrome Check:

- Write a program to check if a given string is a palindrome.

25. Sum of Array Elements:

- Write a program to calculate the sum of all elements in an array.

26. Linear Search:

- Write a program to search for an element in an array using the linear search algorithm.

27. Binary Search:

- Write a program to search for an element in a sorted array using the binary search algorithm.

28. Fibonacci Series:

- Write a program to print the Fibonacci series up to a given number of terms.

29. Prime Number Check:

- Write a program to check if a given number is a prime number.

30. GCD and LCM:

- Write a program to calculate the Greatest Common Divisor (GCD) and Least Common Multiple (LCM) of two numbers.