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Question Paper Code: U9C04

B.E./B.Tech. DEGREE EXAMINATION, APRIL / MAY 2025

Professional Elective

21CBV704-PROGRAMMING IN JAVA

(Regulations 2021)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Explain the primary function of the Java Virtual Machine (JVM). CO1- U
2. Develop a program to read three numbers, find greatest, and display the result. CO2-App
3. Develop the Java Program to Add Two numbers using Constructor. CO2-App
4. Compare constructors and other methods. CO1- U
5. Explain an abstract class in Java, and why is it used. CO1- U
6. Compare method overloading and method overriding. CO1- U
7. Implement a program fragment to use the import keyword to access a class from a built-in package like java.util. CO2-App
8. Explain the need for an interface. CO1- U
9. Explain the difference between FileReader and FileWriter in Java. CO1- U
10. Explain the difference between InputStream and OutputStream in Java. CO1- U

PART – B (5 x 16= 80 Marks)

11. (a) (i) A programmer developing a number analysis tool for a math tutoring app. As part of the functionality, the app should generate and display all prime numbers between 1 and 100. Additionally, it should calculate the sum of all these prime numbers to display a quick statistic for users. Generates and prints 1 to 100 prime numbers and calculates the sum of all prime numbers between the ranges. CO2- App (8)
- (ii) A mathematical research team is studying numbers with a unique property where the sum of the digits raised to the power of the number of digits is equal to the number itself. These numbers are called Armstrong numbers. The team wants a program to check if a given number is an Armstrong number. CO2- App (8)

Or

- (b) (i) A developer is working on a number puzzle game where players need to identify numbers that have a special property. The game identifies Strong numbers, where the sum of the factorial of each digit is equal to the number itself. CO2- App (8)
- (ii) Develop a Java program to print the following output for the given input. CO2- App (8)

Input:5
Output:1 2 3 4 5
2 3 4 5 1
3 4 5 1 2
4 5 1 2 3
5 1 2 3 4

Input:3
Output: 1 2 3
2 3 1
3 1 2

12. (a) A Programmer gave a task with building a utility for string manipulation as part of a text-processing application. The application must provide essential functionalities such as determining the length of a string, reversing it, and checking whether it is a palindrome. These operations will help users analyze and manipulate text more effectively. CO2- App (16)
- (i) Calculate and display the length of the string without using a built-in method like length ().
- (ii) Reverse the string and display the result.
- (iii) Check if a string is a palindrome.

Or

- (b) (i) Develop a Java program to calculate the factorial of a number using a method. CO2- App (8)
- (ii) Develop a Java program to find the sum of all elements in an array using a method. CO2- App (8)

13. (a) Explain super and final keyword with all its usages. Support explanation with a program. CO1- U (16)

Or

- (b) Explain the usage and significance of the this keyword in Java Single inheritance with detailed examples. CO1- U (16)

14. (a) Develop a Java program to manage student records using packages. Create separate packages for storing student details, calculating grades, and displaying results, and integrate them into a single application. CO2- App (16)
- Or
- (b) Develop a Java program that performs basic arithmetic operations using interfaces and packages. Define an interface Arithmetic Operations in one package, implement addition, subtraction, multiplication in separate packages, and use them in the main program. CO2- App (16)
15. (a) Explain is an exception? How are exceptions handled in Java? Explain the exception handling mechanism with suitable examples. CO1- U (16)
- Or
- (b) Explain the different types of I/O streams in Java with examples. Discuss the differences between byte streams and character streams, and illustrate their usage with suitable programs. CO1- U (16)

