Graphic Era
HILL UNIVERSITY

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University under section 2(f) of UGC Act, 1956

Term Evaluation (Even) Semester Examination March 2025

Roll no....................................

Name of the Course and semester: B.TECH IV
Name of the Paper: Programming in Java
Paper Code: TCS 408

Time: 1.5 hour

Maximum Marks: 50

Note:

(i) Answer all the questions by choosing any one of the sub questions
(ii) Each question carries 10 marks.
(iii) Please specify COs against each question.

Q1. (10 Marks)

a. Explain java Buzzwords with examples   CO1

OR

b. What is a final class in Java? Explain the concept of final methods and variables and discuss how they are used. Provide examples for each with the help of a java program. CO1

Q2. (10 Marks)

a. Implement a java program that performs the following tasks: CO1

- Finds the second largest and second smallest elements in the array.
- Sorts the array in descending order without using any predefined function

OR

b. Implement a Java program that accepts a string from the user, and performs the following tasks:
CO1

- Reverse the string without using any built-in reverse methods.
- Counts the frequency of each character in the string.
- Checks if the string is a valid palindrome considering both uppercase and lowercase characters.

Q3. (10 Marks)

a. Explain the difference between method overloading and method overriding in Java. Discuss the concept of compile-time and runtime polymorphism with examples.   CO1

OR

b. What is an abstract class in Java? Discuss the difference between an abstract class and an interface. Provide examples where an abstract class is preferred over an interface   CO2

Q4. (10 Marks)

a. Explain the concept of packages in Java, including built-in packages and user-defined packages. Discuss the importance of access modifiers (public, private, protected, and default) in package-based programming CO2

OR

b. Discuss the role of constructors in inheritance. How does the constructor chaining mechanism work in Java when a subclass object is created? Explain with an example. CO2

Q5. (10 Marks)

a. What are the key differences between instance methods and static methods in Java? Discuss the use of static variables and methods in a class with a java program. CO2

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OR

b. Implement a Java program that solves the following problem:

- Create a Library class with attributes name and address.
- Create a Book class with attributes title, author, isbn, and a method displayBookInfo().
- The Library class should have an array of Book objects.
- Implement methods to add books to the library, list all books in the library, and search for books by author.
- The library should use an interface LibraryOperations to declare methods addBook(), listBooks(), and searchBooks(). The Library class should implement this interface.