
Bansilal Ramnath Agarwal Charitable Trust
Vishwakarma Institute of Technology
(An Autonomous Institute affiliated to Savitribai Phule Pune University)
Department Program In Information Technology
Java Programming Code-21435

Duration: 3 Hour

Marks: 80

Instruction

1) All Questions are Compulsory.

1. Attempt any Three

1. What is the difference between HashSet and TreeSet? Provide code examples demonstrating both. CO4 -- U
2. Explain the difference between primitive and reference data types in Java. Provide examples. CO1 -- R
3. What are the differences between ArrayList and LinkedList? CO5 -- R
4. Explain how to use a HashMap. Write a program that stores and retrieves key-value pairs. CO4 -- A

2. Attempt any Three

1. Describe the various states of a thread in Java. What methods can be used to manage thread states? CO5 -- A
2. What are the two ways to create a thread in Java? Write a simple program using both approaches. CO5 -- R
3. Explain the concept of the singleton design pattern. CO4 -- A
4. How does garbage collection work in Java? CO4 -- R

3. Attempt any Three

1. Explain the ArrayList class and its advantages. Write a program that demonstrates adding, removing, and accessing elements in an ArrayList. CO4 -- R
2. What are lambda expressions in Java? Provide an example that demonstrates the use of a lambda expression with a functional interface. CO6 -- R
3. What are static methods and variables in Java? CO3 -- U
4. Explain the concept of inheritance in Java. Write a program with a base class Animal and a derived class Dog. CO2 -- U

4. Attempt any Three

1. What is the difference between checked and unchecked exceptions? Provide examples of each. CO3 -- R
2. Explain the purpose of the Streams API. Write a program that filters a list of integers to only include numbers greater than 10. CO6 -- U

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3. Define a class Book with attributes title, author, and price. Include a constructor and a method to display book details. CO2 -- R
 4. What are Java annotations, and how are they used? CO6 -- U

5. Attempt any There

1. Explain the concept of synchronization in Java. Why is it important in multithreading? CO5 -- U
2. How do you read from a text file in Java? Write a code snippet that reads the contents of a file and prints them to the console. CO3 -- A
3. How do you declare and initialize a two-dimensional array in Java? Write a program to calculate the sum of all elements in a 2D array. CO1 -- A
4. What is polymorphism? Provide examples of method overriding and method overloading in Java. CO2 -- A

6. Attempt any There

1. Write a program that reads two integers from the user and performs division, handling any potential ArithmeticException. CO3 -- U
2. What is the volatile keyword in Java, and when would you use it? CO6 -- A
3. What is a constructor in Java? CO3 -- R
4. Write a program that uses a switch statement to determine the day of the week based on a number input (1 for Sunday, 7 for Saturday). CO1 -- U
5. What are annotations in Java? Describe the purpose of built-in annotations like @Override and @Deprecated. CO6 -- A