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| **DIT UNIVERSITY DEHRADUN**   |  |  | | --- | --- | | **B.TECH (CSE)** | **MID TERM EXAMINATION, EVEN SEM 2023-24 (SEM IV)** | | | | | | | | | | | | | |
| **Roll No.** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Subject Name: Advanced Java Programming** | | | | | | | | | | | | |

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| **Time: 2 Hours** | **Total Marks: 50** |
| **Note: All questions are compulsory. No student is allowed to leave the examination hall before the completion of the exam.**  **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**   |  |  |  | | --- | --- | --- | | **Q.1)** | **Attempt all Parts :** | | |  | (a) | Define polymorphism. Explain the two types of polymorphism in Java with examples. | |  | (b) | Write a code in java to display a simple Hello message in Applet. | |  | (c) | Describe the lifecycle of a thread in Java, including all possible states. | |  | (d) | Explain how the Java Collections Framework supports generics and how it contributes to type safety in collections? | |  |  | **[4 x 2.5= 10]** | |  | | | | **Q.2)** | **Attempt all Parts :** | | |  | (a) | Explain with justification, what is the output of the following program?  import java.util.\*;  public class Treeset {  public static void main(String[] args)  {  TreeSet<String> treeSet = new TreeSet<>();  treeSet.add("DIT ");  treeSet.add("SOC");  treeSet.add("CSE");  treeSet.add("IT");  for (String temp : treeSet)  System.out.printf(temp + " ");  System.out.println("\n");  }  } | |  | (b) | What is an applet in Java and how is it typically used in web development? | |  | (c) | What are the basic interfaces of Java Collections Framework? | |  | (d) | Explain with justification, what is the output of the following program?  Import java.util.\*;  public class hashSet {  public static void main(String[] args)  {  HashSet<String> hashSet = new HashSet<>();  hashSet.add("SOC");  hashSet.add("CSE");  hashSet.add("CSE");  hashSet.add("SOC");  System.out.println(hashSet);  }  } | |  |  | **[4 x 2.5= 10]** | |  | | | | **Q.3)** | **Attempt any Two Parts :** | | |  | (a) | Explain the difference between AWT and Swing in Java. | |  | (b) | Design a Java Swing application that uses a BorderLayout. Place a JButton in the SOUTH region, a JTextField in the NORTH, and a JTextArea in the CENTER. When the button is pressed, append the text from the JTextField into the JTextArea. | |  | (c) | Write a Java program to create an ArrayList of integers. Add five integers to it and then perform the following operations:  a. Iterate over the list and print each element.  b. Sort the list in descending order | |  |  | **[2 x 5= 10]** | |  | | | | **Q.4)** | **Attempt any Two Parts :** | | |  | (a) | Develop a Swing application using JFrame that contains a JLabel centered in the window. The JLabel should display the text "Hello, Swing!" Ensure the application exits properly when the window is closed. | |  | (b) | Implement a Stack using LinkedList in Java, including methods for push, pop, and peek operations. | |  | (c) | Write a simple java program that demonstrates the creation of a thread in Java using both the Thread class and the Runnable interface. | |  |  | **[2 x 5= 10]** | |  | | | | **Q.5)** | **Attempt any Two Parts :** | | |  | (a) | Write a Swing application called SwingAdder as shown. The "ADD" button adds the two integers and display the result. The "CLEAR" button shall clear all the text fields.  images/ExerciseGUI_SwingAdder.png | |  | (b) | What are adapter classes in Java? Write the importance of these classes for developers when working with event-driven interfaces. Provide details on five adapter classes offered by Java, along with the corresponding interfaces. | |  | (c) | Provide a basic example of a Java applet and explain how its life cycle methods are implemented in the code? | |  |  | **[2 x 5= 10]** | | **-----END OF PAPER ----** | | | | |