|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DIT UNIVERSITY, DEHRADUN**   |  |  | | --- | --- | | **MCA** | **: END TERM EXAMINATION, EVEN SEM 2023-24 (SEM II)** | | | | | | | | | | | | | |
| **Roll No.** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Subject Name: Advanced Java Programming** | | | | | | | | | | | | |

|  |  |
| --- | --- |
| **Time: 3 Hours** | **Total Marks: 100** |
| **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) | Write a Swing program containing three text fields. The first text field accepts the last name, and the Second text field accepts the first name. On clicking a button, the full name is displayed in the third box. | |  | (b) | Write the output with proper explanation.  public static void main( String args[] ) {  List aList = new ArrayList<String>();  for (int i = 0; i < args. length; i++ ) {  aList.add( args[ i ] );  }  Collections.sort( aList , new Comparator () );  System.out.println(aList );  }  } | |  | (c) | Write the output with proper explanation.  DataInputStream input;  try {  input = new DataInputStream(serviceSocket.getInputStream());  input.writeUTF("Hello Server");  input.flush(); //  input.close();  }  catch (IOException e) {  System.out.println(e);  } | |  | (d) | Illustrates Daemon Thread in Java? Explain its properties with the help of an example. | |  |  | **[4 x 5= 20]** | | **Q.2)** | **Attempt all Parts :** | | |  | (a) | Describe the TCP/IP client socket concept and provide Java code examples demonstrating message exchange between two programs using TCP sockets. | |  | (b) | Create a Java program that demonstrates the implementation of the Runnable interface. | |  | (c) | Describe the concept client-server system with suitable diagram. Write a Program to Send and Receive a Message using Connectionless Sockets. | |  | (d) | Write the output with proper explanation.  package com.example;  public class Main {  public static void main(String[] args) {  int array[] = {5,4,3,2,1};  for (int i=0; i<array.length; i++){  System.out.print(array[i] - (array.length - i));  }  }  } | |  |  | **[4 x 5= 20]** | | **Q.3)** | **Attempt any two parts :** | | |  | (a) | Explain the steps for accessing a database with JDBC. Write a Java program to display the employee id, age, first name and last name using JDBC connectivity. | |  | (b) | How can you create a thread pool with a fixed size of three threads? Describe the process of submitting a task to this thread pool. How would you determine when all tasks have been completed? | |  | (c) | Explain life cycle of a Servlet. Write a simple program to demonstrate the life cycle of a Servlet. | |  |  | **[2 x 10= 20]** | |  | | | | **Q.4)** | **Attempt any two parts :** | | |  | (a) | Write a Java program to simulate a bank account system using multithreading. Implement a BankAccount class with deposit and withdrawal methods. Create multiple Client threads to perform random deposit and withdrawal operations concurrently. Use synchronization mechanisms to ensure thread safety. Monitor the account balance and print status updates. | |  | (b) | Create a Java program for a server that communicates with a client. The client will transmit loan details, including the (annual interest rate, loan duration in years, and loan amount) to the server. Subsequently, the server will calculate the monthly and total payments for the loan and return these values to the client. | |  | (c) | Develop a Java Swing application to create a registration form, employing various layout managers such as Border and Card Layouts to organize the form components. Evaluate and compare the visual presentation and functionality of layout managers. | |  |  | **[2 x 10= 20]** | |  | | | | **Q.5)** | **Attempt any two parts:** | | |  | (a) | What do you understand by java thread synchronization problem? Explain with suitable example. Write a java program to book the tickets for a cricket match, when multiple persons trying to book tickets on a same time.(Using synchronized block method) | |  | (b) | Write a Java program that correctly implements the  procedure-consumer problem using the concept of inter  thread communication  Write a Java program that correctly implements the  procedure-consumer problem using the concept of inter  thread communication  Develop a Java program that employs the binary search algorithm to efficiently locate an element within a sorted array. | |  | (c) | Write a program that will create two threads names one and two from the main thread. Each of the thread will display the message ”Thread name Starting”, where name is the name of the thread. Each thread will then print a message “Hello from thread name” 3 times on the screen. Here, name is the child thread. After each write on the screen it will sleep for 500 milliseconds. Main thread should wait for the termination of the child thread. | |  |  | **[2 x 10= 20]** | | -----END OF PAPER ---- | | | | |