

H

Roll No.

TCS-408

**B. TECH. (CSE)
(FOURTH SEMESTER)
END SEMESTER EXAMINATION,
June/July, 2022
JAVA PROGRAMMING LANGUAGE**

Time : Three Hours

Maximum Marks : 100

- Note :** (i) All questions are compulsory.
(ii) Answer any *two* sub-questions among (a), (b) and (c) in each main question.
(iii) Total marks in each main question are **twenty**.
(iv) Each sub-question carries 10 marks.
1. (a) Discuss the internal architecture of JVM with help of a diagram. (CO1)
(b) The annual examination result of 100 students are tabulated as follows :

(CO1)

P. T. O.

Roll No.	Subject1	Subject2	Subject3	Total
1				
2				
100				

Write a program to read the data and determine the following :

- (i) Total marks obtained by each student.
- (ii) The highest marks in each subject and the Roll No. of that student who secured it.
- (iii) The student who obtained the highest total marks.

- (c) Write a Java program to find the maximum occurring character in a string.

(CO1)

2. (a) What is dynamic method dispatch ? Explain it with a suitable program.

(CO1, CO2)

- (b) Explain final, finalize and finally by using suitable examples.

(CO1, CO2)

- (c) Design a class to represent a bank account that includes the following members :

(CO1, CO2)

- Name of depositor
- Account number
- Type of account
- Balance amount in the account

Methods :

- To assign initial values
- To deposit an amount
- To withdraw an amount after checking the balance.
- To display the name and balance.

Write a program to incorporate the constructor to provide initial values, use **this** keyword and also instantiate its object.

3. (a) What is exception handling in Java ? Write a program to demonstrate ArithmeticException and ArrayIndexOutOfBoundsException.

(CO2, CO3)

P. T. O.

(b) What is inter-thread communication ?

There are two threads that want to access the same account for deposit and withdrawal. But withdrawal is not possible if the account balance is not sufficient. Use inter-thread communication to maintain the integrity of the account. If the account balance is less, then the thread that is responsible for withdrawal must wait for the second thread to deposit money. Once money will be deposited then the waiting thread will resume for withdrawal. Write a Java application to implement this scenario and consider the following values in your program :

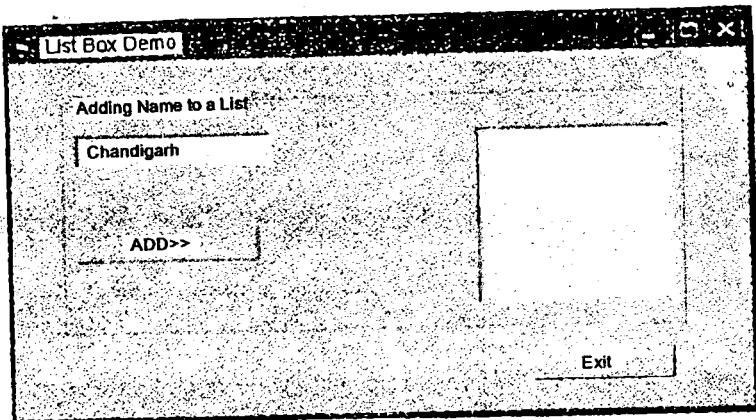
(CO2, CO3)

- accountBalance = 10,000 INR
- Withdraw 15,000 INR by one thread and deposit 10,000 INR by another thread.

(c) Create a program to count the number of characters, words and lines in a file.

(CO2, CO3)

4. (a) Write a program to create a GUI that accepts a city name from the user (through textbox) and adds it to a list box by clicking on the add button. Also write an event handler code for **add>>** and **Exit** buttons. Its screenshot is shown in Fig. below : (CO2, CO3, CO4)



- (b) Compare AWT with Swing. Also write a suitable code to create two text fields to take two integer inputs a , b and a button (submit) in a frame. When the button gets clicked the $(a^2 - b^2)$ operation will be performed and the result will be shown in a Label. (CO2, CO3, CO4)

- (c) What is Collection and Generic Framework in Java ? Write Java code to insert 10, 20 at the end and 30 at index 2 of an ArrayList<Integer> having elements 1, 2, 3, 4, 5. (CO2, CO3, CO4)
5. (a) Write a program to insert a new record and display the contents of the table. Assume the given table is stored at MySQL server : (CO3, CO5)

ID	Name	Gender	Address
1	Ram	M	Delhi
2	Shilpi	F	Noida
3	Ravi	M	Dehradun
4	Kapil	M	Delhi

- (b) Discuss JDBC drivers with suitable diagram. Also discuss their pros and cons. (CO3, CO5)
- (c) Discuss event delegation model. Also write a suitable code to handle an event by using Action Listener on two Buttons and also identify which button is pressed. (CO3, CO5)