VIT
Vellore Institute of Technology
CHENNAI

Reg. Number:	

Continuous Assessment Test (CAT) – II April 2024

Programme	:	MCA	Semester	:	Winter Sem 23-24
Course Code & Course Title	:	PMCA502L & Java Programming	Class Number	:	CH2023240501379
Faculty	:	Dr. K. Madheswari	Slot	:	D2+TD2
Duration	:	90 minutes	Max. Mark		50

General Instructions:

- Write only your registration number on the question paper in the box provided and do not write other information.
- Use statistical tables supplied from the exam cell as necessary
- Use graph sheets supplied from the exam cell as necessary
- Only non-programmable calculator without storage is permitted

Answer all questions

Q. No	Sub Sec.	Description	Marks
1		Design a Java program to model a simple inventory management system using interfaces. Define an interface named Storable with methods **storeItem**() and **retrieveItem**(). Create two classes: Warehouse and Store, both implementing the Storable interface. • The Warehouse class should represent a storage facility with methods to store and retrieve items. Implement the storeItem() method to add items to the warehouse inventory and the retrieveItem() method to remove items from the inventory. • The Store class should represent a retail store with similar methods for storing and retrieving items. Implement the storeItem() method to manage the store's inventory by adding items for sale, and the retrieveItem() method to handle customer purchases by removing items from the inventory. • Instantiate objects of both Warehouse and Store classes in the main program. Demonstrate the functionality of the inventory management system by performing item storage and retrieval operations for both the warehouse and the store. Display appropriate messages to indicate the success or failure of each operation. Ensure your code is well-structured and commented for clarity.	12
2		Develop a Java application to manage employees in a company. Follow the steps below to complete the task: • Create an abstract class named **Employee** with the following properties and methods: Data Members (**name, employeeID, salary**) Abstract methods (**displayInfo(), calculateSalary()**) • Consider the 3 classes: **FullTimeEmp, PartTimeEmp,** and	12

		ContractEmp, each representing a type of Employee • Each subclass should have additional properties such as **hoursWorked** for PartTimeEmp, **contractDuration** for ContractEmp. • Implement the calculateSalary method in each subclass to calculate the salary based on the specific rules for that type of employee (e.g., hourly rate (Rs 1500/-) for PartTimeEmp, fixed salary for FullTimeEmp.	
3		Discuss the fundamental principles and concepts of exception handling in Java, focusing on common exceptions such as NullPointerException, ArrayIndexOutOfBoundsException, StringIndexOutOfBoundsException, ArithmeticException, NumberFormatException FileNotFoundException and UserdefinedException . Explain how exceptions disrupt the normal flow of program execution and how Java's exception handling mechanism helps in gracefully managing such disruptions. Describe the significance of using try-catch blocks to catch and handle exceptions, highlighting the importance of providing meaningful error messages to aid in debugging. Finally, illustrate with examples how each mentioned exception can occur and how programmers can effectively handle them to enhance the robustness and reliability of their Java applications.	14
4		Write a Java program to manage a library catalog using arrays and ArrayLists. Implement a class called LibraryCatalog to represent the catalog, which contains methods for adding books, removing books, and displaying the list of books available. Additionally, create a class called Book to encapsulate information about each book, such as its title, author, and publication year. • Define the Book class with private members such as title, author, and publication year. Include appropriate constructors and getter methods to access these fields. • Define another class LibraryCatalog with private members to store an array or ArrayList of books. Provide methods to add a book to the catalog, remove a book from the catalog, and display the list of books in the catalog.	12
**** All the Best ****			