

Continuous Assessment Test (CAT) – II March 2025

Programme	:	MCA	Semester	:	Winter Sem 24-25
Course Code & Course Title	:	PMCA502L & Java Programming	Class Number	:	CH2024250501721
Faculty	:	Dr. M. Jayasudha	Slot	:	A1+TA1
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		<p>Create a Warehouse Management System where multiple Producers (supply trucks) deliver goods to the warehouse, while multiple Consumers (store employees) retrieve goods for distribution. The warehouse has a fixed storage capacity, requiring proper synchronization:</p> <ul style="list-style-type: none"> • If the warehouse is full, Producers must wait before adding more goods. • If the warehouse is empty, Consumers must wait before retrieving goods. <p>a. Develop a Warehouse class to store items with a limited capacity. (3M) b. Create a Producer thread that adds items to the warehouse. (3M) c. Create a Consumer thread that removes items from the warehouse. (3M) d. Use wait() and notify() for thread synchronization to manage warehouse operations effectively.(3M)</p>	12
2		<p>Design a JavaFX-based Online Quiz Application that utilizes event handlers (<code>setOnAction</code>), Lambda expressions, and EventFilters for user interactions. The application should include the following features:</p> <ul style="list-style-type: none"> • A Start Button that, when clicked, displays the first question. • Each Multiple Choice Question (MCQ) should have four radio button options. • Clicking on an answer choice should visually highlight the selected option. • A Submit Button that: <ul style="list-style-type: none"> ◦ Displays an alert if no answer is selected, prompting the user to choose an option. ◦ Checks the selected answer for correctness and displays a message indicating whether it is correct or incorrect. ◦ Automatically loads the next question after 2 seconds. <p>Write a Java program to implement this quiz application using JavaFX, ensuring smooth event handling and UI updates.</p>	12

		<p>As a Database Administrator, develop a Library Management System(LMS) application, where users can add, retrieve, update, and delete book records from a database using JDBC connectivity in Java. The system should efficiently manage books and their availability. The application should include the following requirements are</p> <ul style="list-style-type: none"> a. Create a table book with the following columns (id (Primary Key, Auto Increment), title(VARCHAR), author(VARCHAR), availability (BOOLEAN, indicating if the book is available)). b. Establish a JDBC connection to interact with the database. c. Implement methods to perform the following operations: <ol style="list-style-type: none"> 1. Add a new book to the database, 2. Retrieve and display all books with their availability status. 3. Update book availability (e.g., marking a book as borrowed or returned). 4. Delete a book from the database based on its ID. 	
✓ 3		<p>Design a class named ExceptionDemo with methods to demonstrate handling of each of these exceptions.</p> <ul style="list-style-type: none"> a. Implement a method parseNumber(String str) that takes a string str as input and attempts to parse it into an integer. Handle the NumberFormatException gracefully and prompt the user to enter a valid numeric string. b. Develop a method accessNullPointer(String[] arr) that tries to access an element of the array 'arr' at index 5. Handle the NullPointerException by displaying a custom error message indicating that the array is null or insufficient in size. c. Create a method readFile(String fileName) to read the content of a file specified by fileName. Handle the FileNotFoundException and notify the user appropriately if the file is not found. d. Finally, implement a method accessArrayIndex(int[] nums) that attempts to access the element at index 10 of the array nums. Catch the ArrayIndexOutOfBoundsException and notify the user about the invalid index access. <p>In the main program, instantiate an object of ExceptionDemo class and invoke each method, triggering the respective exceptions. Catch and handle each exception, providing informative error messages. Display the results to the user.</p>	12
4		<p>You are developing an online shopping website using JSP. When a user logs in, their username should be stored and maintained across multiple pages until they log out. How would you use session management in JSP to store and retrieve the logged-in user's username across different pages? Provide the JSP code snippet to set and retrieve the session attribute.</p>	10
5		<p>***** All the best *****</p>	4