



PRESIDENCY UNIVERSITY

BENGALURU

Roll No.														
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Mid - Term Examinations - MARCH 2026

Date: 10 - 03- 2026

Time: 02:00pm - 03:30pm

School: SOCSE	Program: B.Tech	
Course Code :CSE2503	Course Name: Scalable Application Development using Java	
Semester: IV	Max Marks: 50	Weightage: 25%

CO - Levels	C01	C02	C03	C04	C05
Marks	20	18	12		

Instructions:

- (i) Read all questions carefully and answer accordingly.
- (ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks.

5Q x 2M=10M

1	State whether a Java program can execute without the main thread. List the life cycles states of a thread.	2 Marks	L1	C01
2	Define deadlock. List any two conditions for deadlock.	2 Marks	L2	C01
3	While reading a large file, the program becomes slow. Suggest a better approach using Java I/O and justify your answer.	2 Marks	L2	C02
4	Define Stream. Differentiate between Byte and Character Streams.	2 Marks	L1	C02
5	Differentiate between ArrayList and Vector.	2 Marks	L2	C03

Part B

Answer the Questions.

Total Marks 40M

6.	a.	A college has a single notice board that acts as a shared resource for the entire campus. Multiple staff members (threads) want to announce greetings to students at the same time, but simultaneous access may cause messages to overlap and create confusion. Develop a Java program using thread synchronization to ensure that only one staff member can make an announcement at a time while the remaining staff members	10 Marks	L3	C01
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		wait until the notice board becomes available.			
	b.	A university application needs to copy student records from one file to another for backup purposes. The data is stored in a file as characters. Develop a Java problem using FileReader and FileWriter to read data from the source file and write it into the destination file.	10 Marks	L3	C02
Or					
7.	a.	In a bank system, a shared bank account is accessed by two threads: Deposit Thread (Producer) : Deposits money into the account. Withdrawal Thread (Consumer) : Withdraws money from the account. The withdrawal operation should be performed only when sufficient balance is available . If the balance is insufficient, the withdrawal thread must wait until the deposit thread deposits money. Use inter-thread communication (wait() and notify()) to implement this scenario.	10 Marks	L3	C01
	b.	A college application needs to store the details of a student (student ID, name, and marks) into a file so that the data can be retrieved later. Develop a Java program to demonstrate serialization and deserialization using a Student class.	10 Marks	L3	C02

8.	a.	Create 3 threads 1 st , 2 nd and 3 rd by implementing Runnable interface to print factorial of three different numbers concurrently by extending Thread Class. <u>Requirement:</u> <ul style="list-style-type: none"> • Override run() to print factorial using for loop • Use sleep() for switching the context to other threads • Use constructor Thread() to set the name of Thread • Demonstrate join() and isAlive() method. 	10 Marks	L3	C01
	b.	A college stores the names of event participants using a LinkedList<String>. Develop a Java program to perform the following operations: <ul style="list-style-type: none"> i. add elements to the linked list ii. insert an element at a specific position iii. remove an element from the list iv. search for a given element v. display all elements using an Iterator 	10 Marks	L3	C03
Or					
9.	a.	Explain the methods of FileInputStream and FileOutputStream classes with suitable examples. Also, write a Java program to demonstrate their usage.	10 Marks	L3	C02
	b.	A data processing application receives two Integer arrays representing IDs from two different departments. Convert the arrays into Sets and perform union , intersection , and difference operations using the Set interface in Java, displaying the result of each operation using iterator.	10 Marks	L3	C03