



VIT

Vellore Institute of Technology
(Chartered to be a University under section 3 of UGC Act, 1956)

REG.NO.: 24B1T0498

SCHOOL OF COMPUTER SCIENCE ENGINEERING AND INFORMATION SYSTEMS
CONTINUOUS ASSESSMENT TEST - I
FALL SEMESTER 2025-2026

SLOT: B2+TB2

Programme Name & Branch : B.TECH IT
Course Code and Course Name : BITE201L - Data Structures and Algorithms
Faculty Name(s) : Dr. Mythili N, Dr. Nancy Victor, Dr. Tamil Priya D,
Dr. Dharmendra Singh Rajput
Class Number(s) : VL2025260103039, VL2025260103031,
VL2025260103042, VL2025260103028
Date of Examination : 18/08/2025
Exam Duration : 90 minutes
Maximum Marks: 50

General instruction(s):

- Answer All Questions
- M - Max mark; CO - Course Outcome; BL - Blooms Taxonomy Level (1 - Remember, 2 - Understand, 3 - Apply, 4 - Analyse, 5 - Evaluate, 6 - Create)
- Course Outcomes (Type the CO statements covered in this question paper. Use the CO number as per the syllabus copy)
CO 1: Identify user defined data types, linear data structures for solving real world problems.

Q. No	Question	M	CO	BL
1.	Convert the following infix expression to postfix expression. Write the procedure for conversion using stack and show every step in detail. $(A * B + (C / D)) - (E \wedge F - G) * H$	10	1	3
2.	a) How are stacks used in function calls and recursion? Give details.	3	1	3
	b) Write a recursive algorithm for Towers of Hanoi problem and trace the execution of the recursive function for n=3 where 'n' is number of disks.	7		
3.	Given a circular array-based queue Q capable of holding 7 objects. Show the final contents of the array after the following code is executed: <pre>for (int k = 1; k <= 7; k++) Q.enqueue(k); for (int k = 1; k <= 4; k++) { Q.enqueue(Q.dequeue()); Q.dequeue(); }</pre> Write the algorithms for the operations enqueue, dequeue and display.	10	1	4



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4.	Create a singly linked list to store student records. Each student record contains the roll number (integer), name (string) and marks (float). Write functions to implement the following tasks: 1. Insert a new student record (at the end). 2. Search student by Roll Number. 3. Delete student by Roll Number. 4. Display all student records. 5. Display topper (highest marks)	10	1	3
5.	You are assigned a task by a software company to develop a feature for their text-processing application that checks whether a given word or phrase is a palindrome. The constraint is that you must use a stack implemented with a singly linked list for the logic. Develop a C program to implement the same.	10	1	3
