

min - 28/50

REG.NO.:



VIT

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

SCHOOL OF COMPUTER SCIENCE AND ENGINEERING CONTINUOUS ASSESSMENT TEST - I WINTER SEMESTER 2024-2025

SLOT: B2+TB2

Programme Name & Branch : M.Tech Integrated & DS, CS
Course Code and Course Name : CSI2002 - Data Structures and Algorithm Analysis
Faculty Name(s) : Dr.M.P.Gopinath, Dr. Lijo V.P, Dr.N.S.Nithya
Class Number(s) : VL2024250501914, VL2024250501918, VL2024250
Date of Examination : 28.01.2025
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
CO1. Solve real life computing problems by using data structures
CO2. Select the suitable data structures for storage and management of different types data.

Q. No	Question	M	CO	BL
1.	Create a C program that demonstrates the use of a union to store different types of data and show how memory is shared among them.	10	CO1	BL3
2.	a) Engrave a program in C to compute the sum of all elements in an array using pointers. (7marks) b) Enumerate the types of data structures (3 marks)	10	CO1	BL3
3.	a) Solve the following recurrence relations using Master Theorem (6marks) i) $T(n) = 7T(n/3) + n^2 \cdot \theta(n^3)$ ii) $T(n) = 5T(n/5) + \sqrt{n} \cdot \theta(n)$ b) Calculate the time complexity for the following code snippet: (4marks) <pre>int value = 0; for(int i=0; i<n; i++) for(int j=0; j<i; j++) value += 1;</pre> $O(n^2)$	10	CO1	BL3
4.	What is the significance of using asymptotic notations in algorithm analysis? Discuss the Big O, Big Omega and Big Theta in terms of $f(n) = 2n+3$	10	CO2	BL
5.	a) Convert the following infix expression in to Postfix expression using stack. Infix Expression: $x+y*z+(p*q+r)$ $xyz*+pq*r++$ (6marks) b) Evaluate the following postfix expression using stack. (4marks) $1\ 2\ +\ 3\ * \ 6\ + \ 2\ 3\ + \ /$ $\rightarrow \frac{1}{3} / 3$	10	CO2	BL
