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LNCT UNIVERSITY, BHOPAL

Enrollment No. ..

CS-205
B.TECH II SEMESTER
EXAMINATION [JUNE-2025]
DATA STRUCTURES

Maximum Marks: 70 **Time Allowed: 3Hours**

Note:- Attempt all questions Internal choices are given.

(SECTION –A)

1. Short Answer Type Questions (Attempt Any Five) **[5x6=30]**

i. What is the difference between linear search and binary search?
ii. List advantages of using a circular linked list over a singly linked list?
iii. What is Polish notation and how is it used in stack applications?
iv. Briefly explain how recursion can be implemented using a stack
v. What is the key difference between a circular queue and a priority queue?
vi. Write Dijkstra's algorithm to finding the shortest path in a graph?
vii. Define an AVL tree and explain one of its key properties?

(SECTION –B)

2. Long Answer Type Questions (Attempt Any Four) ***[4x10=40]***

i. Explain different sorting techniques Compare their time complexities and mention the situations in which each is preferred?
a). Bubble Sort b) Insertion Sort c) Selection Sort.

ii. Describe the applications of stack in detail. Explain how stack is used in the evaluation of postfix expressions with an example?

iii. Explain different types of queues with diagrams. How does a priority queue differ from a circular queue in terms of structure and usage?

iv. Define Binary Search Tree (BST). Write the algorithm for inserting an element in a BST and explain with an example. Also, describe how to perform in-order traversal?

v. Explain AVL trees with suitable diagrams. What rotations are required to balance the tree and how do they work?

vi. Problem: Given the following binary tree, perform Preorder, Inorder, and Postorder traversals.