

LNCT UNIVERSITY, BHOPAL

Enrolment No. LNCT21096

CS / AL-402 /CS /AL/CD-401 B.TECH (CS / AIML/DS) IV SEMESTER EXAMINATION [JUNE-2025] ANALYSIS & DESIGN OF ALGORITHM

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. Explain Quick Sort.
- ii. Explain Huffman Coding.
- iii. Describe Minimum Spanning Trees.
- iv. Write short note on Multistage Graph.
- v. Define 8 Queen's Problem.
- vi. Describe Travelling Salesman Problem.
- vii. Explain Tree Traversal Algorithms.

(SECTION-B)

2. Long answer type questions (Attempt any Four)

(4x10=40)

- i. Explain the various definitions of algorithms and the importance of analyzing their time and space complexity in computer science.
- ii. Discuss various code tuning techniques such as loop optimization, data transfer optimization, and logic optimization. How do these techniques improve the overall performance of an algorithm?
- iii. Define the Greedy strategy. What are the essential components for a problem to be solved using a Greedy method?
- iv. Describe the Floyd-Warshall algorithm. How does it differ from Dijkstra's algorithm in terms of functionality and implementation?
- v. Explain the concept of Backtracking. How is it different from brute-force search?
- vi. Define NP-Hard and NP-Complete problems. How do you prove that a given problem is NP-Complete?