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## SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

MCA I Year II Semester Regular & Supplementary Examinations June/July-2025

### DATASTRUCTURES

Time: 3 Hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

#### UNIT-1

1. a) Identify the steps to print the product of two numbers. [6M]
- b) Identify the steps to display numbers from one to given number. [6M]

OR

2. Analyze and write a program to store a set of values of same data type into a single variable. [12M]

#### UNIT-2

3. a) What is linked list? What are the different types of linked list? [6M]
- b) Explain the advantages of linked list over arrays. [6M]

OR

4. Develop Circularly Linked List with various operations. [12M]

#### UNIT-3

5. Describe different cases to delete an element in BST with an algorithm and examples. [12M]

OR

6. a) Prepare an algorithm to insert an element into B+ Tree. [6M]
- b) Prepare an algorithm to delete an element in B + Tree. [6M]

#### UNIT-4

7. a) Prepare an algorithm for Quick sort with example. [6M]
- b) Prepare an algorithm for Merge sort with example. [6M]

OR

8. a) Explain Linear Search with an algorithm and example. [6M]

b) Design a program to demonstrate Linear Search.

[6M]

<b>UNIT-5</b>
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9. Explain about shortest path problem with an algorithm and example.

[12M]

**OR**

10. a) Discuss DFS Graph Traversal with an algorithm.

[3M]

b) Explain DFS Graph traversal with steps for the following Graph .

[9M]