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) What is a Data Structure? Explain its advantages.   [6M]
b) Explain various types of Data Structures.   [6M]

OR

2. Discuss how you can measure Performance of an algorithm.   [12M]

UNIT-2

3. Develop various queue operations using arrays. With example   [12M]

OR

4. a) Prepare an algorithm to insert an element at the end of doubly linked list .   [6M]
b) Prepare an algorithm to delete an element at the end of doubly linked list.   [6M]

UNIT-3

5. a) Analyze the steps to insert elements into Binary Search Tree.   [6M]
b) Analyze the steps to search element in Binary Search Tree.   [6M]

OR

6. Identify the following terms from the given tree
i) Internal Nodes
ii) External Nodes
iii) Depth
iv) Height
v) Level

[12M]

UNIT-4

7. a) Explain selection sort with an algorithm and example.   [5M]
b) Design a program to demonstrate selection sort.   [7M]

OR

8. a) Explain insertion sort with an algorithm and example.   [5M]

b) Design a program to demonstrate insertion sort.   [7M]

9. a) Discuss how to represent Graph storage using Adjacency matrix.   [7M]

b) Briefly explain about Adjacency List with example.   [5M]

OR

10. a) What is minimum – cost spanning tree?   [4M]

b) Prepare an algorithm for Prim's with example.   [8M]