O.P.Code: 24mca110	Regulation2022	H.T.No.										

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 space complexity? Evaluate space complexity for the following code
int square(int a) { return a*a; } [6M]
b) What is time complexity? Evaluate time complexity for the following code
int square(int a) { return a*a; } [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) 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]

OR

4. a) What is a Stack? What are the operations that perform on a stack? [6M]
b) What is a Queue? What are the operations that perform on a Queue? [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. Develop B – Tree with various operations. [12M]

UNIT-4

7. Differentiate various sorting techniques with time complexity. [12M]

OR

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

b) Design a program to demonstrate Linear Search. [6M]

UNIT-5

9. a) Discuss DFS Graph Traversal with an algorithm. [3M]

b) Explain DFS Graph traversal with steps for the following Graph . [9M]

OR

10. Explain in detail about various minimum cost spanning tree algorithms. [12M]