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

OR

2. Discuss about Asymptotic Notations with their types.
(AUTONOMOUS) [12 Marks]

UNIT-2

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

OR

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

UNIT-3

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

OR

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

UNIT-4

7. a) Discuss Space and Time Complexity for Linear and Binary Search.
b) Distinguish between Linear Search and Binary Search. [6 Marks]

OR

8. a) Explain Binary Search with an algorithm and example.
b) Develop a program to demonstrate Binary Search. [6 Marks]

UNIT-5

9. Discuss and compare various graph traversals.
Prepared by:
Assistant Professor/ MCA [12 Marks]

OR

10. a) Define Graph. List out various graph operations?
b) What are the various applications and properties of Graphs ? [4 Marks]