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 an Algorithm? Explain its specifications. [6M]
b) What are the steps required to find sum of two numbers. [6M]

OR

2. a) What is an Array? Explain the representation of an array. [6M]
b) Apply various operations that can perform on array. [6M]

UNIT-2

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

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) What are the different ways to define a tree? [4M]
b) Find various terminologies used in a tree. Explain any six terminologies [8M]

OR

6. Identify the following terms from the given tree
i) Parent
ii) Child
iii) Siblings
iv) Path
v) Sub Tree

[12M]

UNIT-4

7. a) Discuss Space and Time Complexity for Linear and Binary Search. [6M]

b) Distinguish between Linear Search and Binary Search. [6M]

OR

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

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

UNIT-5

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

OR

10. a) Define Graph. List out various graph operations? [4M]

b) What are the various applications and properties of Graphs ? [8M]