

<b>O.P.Code:</b> 24mca110	<b>Regulation2022</b>	<b>H.T.No.</b>												
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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) What is an Array? Explain the representation of an array. [6M]
- b) Apply various operations that can perform on array. [6M]

**OR**

2. a) Explain Linear and Non Linear Data structure with examples [6M]
- b) Differentiate linear and non -linear data structure . [6M]

#### UNIT-2

3. Develop various queue operations using arrays. With example [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) Explain BFS Tree Traversal with an example. [6M]
- b) Explain DFS Tree Traversal with an example. [6M]

**OR**

6. a) Define binary tree and give the binary tree node structure. [6M]
- b) What are the various types of a binary tree? [6M]

#### 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 Binary Search with an algorithm and example. [6M]

b) Develop a program to demonstrate Binary Search.

[6M]

<b>UNIT-5</b>
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9. a) Define Graph. List out various graph operations?

[4M]

b) What are the various applications and properties of Graphs ?

[8M]

**OR**

10. a) What is minimum – cost spanning tree?

[4M]

b) Prepare an algorithm for Prim's with example.

[8M]