

O.P.Code: 24mca110	Regulation2022	H.T.No.												
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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. Discuss about Asymptotic Notations with their types.

[12M]

(AUTONOMOUS)

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. a) Convert the expression  $(5 + 6) * (6 - 5)$  from infix to postfix

[6M]

b) Evaluate the postfix expression  $25 * 423 - * +$ .

[6M]

OR

4. What is an expression? Explain various types of expressions with example.

[12M]

#### UNIT-3

5. a) Explain BFS Tree Traversal with an example.

[6M]

b) Explain DFS Tree Traversal with an example.

[6M]

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) Explain insertion sort with an algorithm and example.

[5M]

b) Design a program to demonstrate insertion sort.

[7M]

**OR**

8. a) Prepare an algorithm for Quick sort with example.

[6M]

b) Prepare an algorithm for Merge sort with example.

[6M]

<b>UNIT-5</b>
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9. a) Discuss BFS Graph Traversal with an algorithm.

[3M]

b) Explain BFS Graph traversal with steps for the following Graph .

[9M]

**OR**

10. Explain about shortest path problem with an algorithm and example.

[12M]