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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.

(AUTONOMOUS) [12 Marks]

**OR**

2. Explain the following i ) Big -Oh ii) Big -Omega iii) Big -Theta [12 Marks]

**UNIT-2**

3. Explain different ways for insert ing an element into a Single Linked List with example. [12 Marks]

**OR**

4. Develop Circularly Linked List with various operations. [12 Marks]

**UNIT-3**

5. Identify the following terms from the given tree

i) Parent

ii) Child

iii) Siblings

iv) Path

v) Sub Tree [12 Marks]

**OR**

6. a) What are the different ways to define a tree?

b) Find various terminologies used in a tree. Explain any six terminologies [4 Marks]

**UNIT-4**

7. a) Explain Linear Search with an algorithm and example.

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

**OR**

8. Explain about Hashing with an example. [12 Marks]

<b>UNIT-5</b>
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9. Explain about shortest path problem with an algorithm and example. [12 Marks]

**OR**

10. a) Define Graph. List out various graph operations?

b) What are the various applications and properties of Graphs ? [4 Marks]