

**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  $5 \times 12 = 60$  Marks)

**UNIT-1**

1. Discuss how you can measure Performance of an algorithm. [12 Marks]

**OR**

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

**UNIT-2**

3. Explain different ways for inserting 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. a) Prepare an algorithm to insert an element into B+ Tree.  
b) Prepare an algorithm to delete an element in B + Tree. [6 Marks]

**OR**

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

**UNIT-4**

7. a) What do you mean by searching? What are the types of searching?  
b) Differentiate various searching techniques. [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. a) Define Graph. List out various graph operations?  
b) What are the various applications and properties of Graphs ? [4 Marks]

**OR**

10. a) Discuss DFS Graph Traversal with an algorithm.  
b) Explain DFS Graph traversal with steps for the following Graph . [3 Marks]