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

OR

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

UNIT-2

3. What is an expression? Explain various types of expressions with example. [12 Marks]

OR

4. a) Design an algorithm to insert an element at beginning of circularly linked
list.
b) Design an algorithm to delete an element at end of circular ly linked list. [6 Marks]

UNIT-3

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

OR

6. a) Analyze the steps to insert elements into Binary Search Tree.
b) Analyze the steps to search element in Binary Search Tree. [6 Marks]

UNIT-4

7. a) Discuss Space and Time Complexity for Linear and Binary Search.
b) Distinguish between Linear Search and Binary Search. [6 Marks]

OR

8. a) Explain insertion sort with an algorithm and example.

b) Design a program to demonstrate insertion sort. [5 Marks]

UNIT-5

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

OR

10. a) Define Graph. List out various graph operations?
b) What are the various applications and properties of Graphs ? [4 Marks]