

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

OR

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

UNIT-2

3. 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 circularly linked list. [6 Marks]

OR

4. a) What is linked list? What are the different types of linked list?
b) Explain the advantages of linked list over arrays. [6 Marks]

UNIT-3

5. a) What is the various representation of a binary tree?
b) List out and explain various binary tree traversals. [6 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 bubble sort with an algorithm and example.
b) Design a program to demonstrate bubble sort. [5 Marks]

OR

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

UNIT-5

9. Discuss and compare various graph traversals.

Prepared by:

Assistant Professor/ MCA [12 Marks]

OR

10. Explain about shortest path problem with an algorithm and example. [12 Marks]