

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. a) What is space complexity? Evaluate space complexity for the following code
int square(int a) { return a*a; }
b) What is time complexity? Evaluate time complexity for the following code
int square(int a) { return a*a; } [12 Marks]

OR

2. Analyze and write a program to store a set of values of same data type into a single variable. [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. [12 Marks]

OR

4. Explain different ways for inserting an element into a Single Linked List with example. [12 Marks]

UNIT-3

5. a) Analyze the steps to insert elements into Binary Search Tree.
b) Analyze the steps to search element in Binary Search Tree. [12 Marks]

OR

6. Develop B – Tree with various operations. [12 Marks]

UNIT-4

7. Differentiate various sorting techniques with time complexity. [12 Marks]

OR

8. a) Discuss Space and Time Complexity for Linear and Binary Search.
b) Distinguish between Linear Search and Binary Search. [12 Marks]

UNIT-5

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

OR

10. Discuss and compare various graph traversals.

Prepared by:

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Assistant Professor/ MCA [12 Marks]