

(FOR THE CANDIDATES ADMITTED

25UDA205

DURING THE ACADEMIC YEAR 2025 ONLY)

REG.NO. :

N.G.M.COLLEGE (AUTONOMOUS) : POLLACHI

END-OF-SEMESTER EXAMINATIONS : MAY 2026

BSC CS WITH DA

MAXIMUM MARKS: 75

SEMESTER: II

TIME : 3 HOURS

PART - III

25UDA205 – DATA STRUCTURES

SECTION – A

(10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS.

1. Array elements are stored in memory in _____.
a) Random locations b) Linked list format
c) Contiguous memory locations d) Stack format
2. The main advantage of linked list over array is _____.
a) Faster access b) Dynamic size c) Less memory d) Easy sorting
3. A binary tree where all nodes have only one child is called _____.
a) Skewed tree b) Balanced tree c) Complete tree d) Full tree
4. Direct file organization is based on _____.
a) Sorting b) Hashing c) Chaining d) Linear search
5. In interpolation search, the position is estimated using: _____.
a) Midpoint b) Random selection
c) Linear index d) Proportional formula

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES

6. What is meant by asymptotic analysis?
7. Define node in a linked list.
8. What is tree traversal?
9. Mention the purpose of a hash function.
10. How does linear search work?

SECTION – B

(5 X 5 = 25 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.

11. a) Interpret the steps involved in analyzing an algorithm.

(OR)

- b) Describe stack overflow and stack underflow conditions.

12. a) Examine a doubly linked list with node structure.

(OR)

b) Assess the dynamic memory management in linked queues.

13. a) Describe a tree and explain its basic terminologies.

(OR)

b) Compare adjacency matrix and adjacency list representations.

14.a) Show the applications of hash tables in real-world systems.

(OR)

b) Apply direct file organization with suitable example.

15.a) Explain Fibonacci search technique with an example.

(OR)

b) Implement merge sort using divide and conquer. Provide stepwise explanation.

SECTION – C

(5 X 8 = 40 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.

16. a) Analyze the representation of one-dimensional and two-dimensional arrays in memory.

(OR)

b) Evaluate the queue implementation using array with algorithm.

17.a) Inspect multiply linked list and its applications.

(OR)

b) Discuss how linked lists are used to implement stacks and queues.

18.a) Summarize different graph representations with diagrams.

(OR)

b) Examine tree traversals (inorder, preorder, postorder) with examples.

19.a) Categorize heap, sequential, and indexed sequential file organizations.

(OR)

b) Illustrate linear open addressing and chaining methods with suitable examples.

20.a) Investigate binary search on a sorted array with a diagram.

(OR)

b) Construct radix sort with stepwise procedure and time complexity analysis.

Ethical paper