

(FOR THE CANDIDATES ADMITTED

25UAI102

DURING THE ACADEMIC YEAR 2025 ONLY)

REG.NO. :

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

END-OF-SEMESTER EXAMINATIONS : NOVEMBER-2025

B.Sc. CS with AI &ML

MAXIMUM MARKS: 75

SEMESTER: I

TIME : 3 HOURS

PART - III

25UAI102 – DATA STRUCTURE AND APPLICATIONS

SECTION – A

(10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS.

(K1)

1. Elements in an array are accessed _____
a) randomly b) sequentially c) exponentially d) logarithmically
2. The time required to search an element in a linked list of length n is _____.
a) $O(\log n)$ b) $O(n)$ c) $O(1)$ d) $O(n^2)$
3. The number of edges from the root to the node is called _____ of the tree.
a) Height b) Depth c) Length d) Width
4. Which of the following is the fastest sorting algorithms?
a) Merge sort b) Shell sort c) Insertion sort d) Quick sort
5. Interpolation search is a variation of _____.
a) Exponential search b) Linear search c) Binary search d) Jump search

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES

(K2)

6. Define an Array.
7. What is the purpose of a pointer in a Linked List Node?
8. Name the two main components of a Graph.
9. What is sorting?
10. Name any two searching algorithms.

SECTION – B

(5 X 5 = 25 MARKS)

ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.(K3)

11. a) Write a short note on development of Algorithms.
(OR)
b) How will you analyze Algorithms?
12. a) Write the operations on Linked List.
(OR)
c) Write a detailed note on Dynamic Storage Management.

(CONTD 2)

13. a) Write a short note on terminologies and representation of Trees.

(OR)

- b) Discuss the applications of Trees and Graphs.

14. a) Write the concept of bubble sort

(OR)

- b) Apply Quick Sort to sort an array of strings alphabetically.

15. a) Write the algorithm and explain the working of Linear Search.

(OR)

- b) Describe how Binary Search works recursively with an example.

SECTION – C

(5 X 8 = 40 MARKS)

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

(K4 (Or) K5)

16. a) Explain the representation of Arrays with example.

(OR)

- b) Explain the operations on Queue with example.

17. a) Describe the implementation of Linked Stacks and Linked Queues with example

(OR)

- b) Write a detailed note on Garbage Collection and Compaction.

18. a) What are the three ways of traversing a Binary Tree? Describe with example.

(OR)

- b) Show the Binary Tree representation of a Tree with an example.

19. a) Explain the steps involved in Insertion Sort with example.

(OR)

- b) Write and explain the step-by-step procedure of Merge Sort on the array [38, 27, 43, 3, 9, 82, 10].

20. a) Write the steps for Fibonacci Search with example.

(OR)

- b) Explain the step by step procedure for Interpolation Search.

Ethical paper