

(FOR THE CANDIDATES ADMITTED

24UCS307

DURING THE ACADEMIC YEAR 2024

ONLY)

REG.NO. :

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

END-OF-SEMESTER EXAMINATIONS : NOVMEBER-2025

BSC (COMPUTER SCIENCE) AIDED & SF

MAXIMUM MARKS: 75

SEMESTER : III

TIME : 3 HOURS

PART - III

24UCS307 – DATA STRUCTURES

SECTION – A

(10 X 1 = 10 MARKS)

ANSWER THE FOLLOWING QUESTIONS.

(K1)

1. Which of the following data structure uses LIFO principle?
(a) Stack (b) Queue (c) Array (d) Linked List
2. In doubly linked list, each node contains_____
(a) data and one pointer (b) data and two pointers (c) only data and links (d) three pointers
3. In binary tree, the number of subtrees of a node is called its _____.
(a) Degree (b) Level (c) Siblings (d) Ancestors
4. Which of the following sorting algorithms has the best average case time complexity?
(a) Quick Sort (b) Bubble Sort (c) Insertion Sort (d) Selection Sort
5. In which of the following file organization records are stored sequentially and allows indexed access?
(a) Random organization (b) Linked organization
(c) Sequential organization (d) Indexed Sequential Access Method

ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES

(K2)

6. Define array.
7. List the advantages of Linked List.
8. Define Binary tree.
9. Define Sorting.
10. List the advantages of cylinder surface indexing.

SECTION – B

(5 X 5 = 25 MARKS)

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

11. a) Explain the representation of Arrays in memory.

(OR)

- b) Write and explain an algorithm to convert an infix to postfix expression with example.

(CONTD 2)

12. a) Define Sparse Matrices. Explain how it is efficiently represented using Linked List.
(OR)
b) Describe the Garbage Collection and Compaction in dynamic memory management.
13. a) Illustrate the representation of Binary Trees with example.
(OR)
b) Define Graph. Illustrate the different types of graphs used in data structure with example.
14. a) Write an algorithm for Binary search and explain with an example.
(OR)
b) Compare Quick sort and Merge sort in terms of time and space complexity.
15. a) Discuss the Query types in Storage device types with an example.
(OR)
b) Differentiate random and sequential file organizations.

SECTION – C**(5 X 8 = 40 MARKS)****ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.(K4 (Or) K5)**

16. a) Analyze the step by step push and pop operation in a stack with an example.
(OR)
b) Distinguish between enqueue and dequeue operations a queue. with an example.
17. a) Write a function to add two Polynomials with example.
(OR)
b) Illustrate the insertion and deletion operations in a Singly Linked list with suitable example.
18. a) Write an algorithm and discuss inorder, preorder and postorder traversal of a binary tree.
(OR)
b) Evaluate the adjacency list and adjacency matrix representations of graphs with appropriate examples.
19. a) Apply Fibonacci Search on the sorted list: [2, 5, 7, 9, 13, 21, 28] to find the key = 13.
(OR)
b) Compare Quick sort and Heap sort algorithms in terms of time complexity and recursion
20. a) Discuss the concept of Hashed indexes and their advantages in file systems.
(OR)
b) Analyze the structure and access mechanism of Inverted files and Cellular Partitions in file systems.
