

QP CODE

H1033

Enrollment Number:

Name:

B.SC DEGREE EXAMINATIONS, FEBRUARY 2026

Third Semester

B.Sc. Data Science

B24DS05DC – Data Structures

(2024 July Admissions)

Time: 3 Hours

Max Marks: 70

Section A

Answer any ten of the following questions in a word or sentence each. Each question carries 1 mark.

1. Define Data Structure.
2. Give the function of Stack.
3. State the concept of binary tree.
4. Give a clear definition of graph.
5. Describe the purpose of hashing.
6. Give one solution to collision.
7. List the main property of AVL tree.
8. Define node in linked list.
9. Mention the concept of queue.
10. List any two examples for linear data structure.
11. Name the type of queue that allows insertion and deletion from both ends.
12. List one disadvantage of doubly linked list.
13. State the concept of ADT.
14. Define recursion.
15. Mention the concept of full binary tree.

(1X10=10)

Section B

Answer any five of the following questions in two or three sentences each. Each question carries 2 marks.

16. Illustrate one-dimensional array.
17. Explain priority queue.
18. Discuss the concept of dynamic memory allocation.
19. Give a brief description about BFS traversal.

20. Describe the degree of vertex in a graph.
21. What is polish notation? Give an example.
22. Compare BFS and DFS.
23. Clarify Self Referential Structure.
24. Differentiate between single and doubly linked list.
25. Explain collision in hashing.

(2X5=10)

Section C

Answer any five of the following questions in a paragraph each. Each question carries 4 marks.

26. Explain the operations on singly linked list.
27. Describe the traversal techniques in binary trees.
28. Discuss the array representation of stacks and queues.
29. Explain the Adjacency Matrix and Adjacency list of graphs.
30. Write the algorithm for binary search with example.
31. Briefly explain the concepts of rotation in AVL trees.
32. Discuss various representations of heap.
33. Briefly explain about overlapping subproblems.
34. State the Principle of Optimality.
35. Explain spanning trees and minimum spanning trees with example.

(4X5=20)

Section D

Answer any two of the following questions in three pages each. Each question carries 15 marks.

36. What is dynamic programming? Briefly explain dynamic programming with any one example.
37. Explain in detail the concept of Heap, characteristics, properties and operations on heap.
38. Compare and contrast Prim's and Kruskal's Algorithms with example in detail.
39. Explain stack and queue ADT. Describe their implementations using arrays and linked lists.

(15X2=30)