

QUESTION BANK
DATA STRUCTURE (USING C/C++)
PAPERCODE 301

1. What is an algorithm?
2. Explain algorithm properties.
3. Explain the characteristics of an algorithm.
4. What is an algorithm design technique?
5. What do you understand by Efficiency of Algorithms?
6. What do you understand by complexity of Algorithms?
 - What is time complexity of an algorithm? Explain with the help of example.
 - What is space complexity of an algorithm? Explain with the help of example.
7. What is Asymptotic Notation in algorithm?
8. Explain Big-Oh (O) notation.
9. Explain Big - Omega (Ω) notation.
10. Explain Big-Theta (Θ) notation.
11. Compare Big-Oh (O), Big-Omega (Ω) and Big-Theta (Θ) notation.
12. What do you understand by Best, Worst, and Average Case of an algorithm? Explain with the help of example.
13. Explain applications of Best, Worst, and Average Case Analysis of an algorithm.
14. What is Data Structure?
15. Explain classification of Data Structure.
16. What is an Array?
17. Explain different types of Array.
18. What is LIFO?
19. What is FIFO?

20. What do you mean by Stack?
21. What is the role of PUSH operation in Stack?
22. What is the role of POP operation in Stack?
23. Differentiate between PUSH and POP operation of Stack.
24. Write an algorithm in C to perform PUSH and POP operation in Stack.
25. What is Queue?
26. Explain different types of Queue.
27. What is Peek operation in Queue?
28. Explain circular Queue and its operations. 16. What is
29. Double Ended Queue explain with example. 17. What is the importance circular queue over simple linear Queue? 18. How
30. Priority Queue is different from Simple Queue? 19. Write an algorithm in C to perform insertion and deletion an element in Circular
31. Write an algorithm in C to perform insertion and deletion an element Queue. in Double Ended Queue.
32. What is Linked List?
33. What is Head in Linked List?
34. Explain advantage of Linked List.
35. Explain drawback of Linked List.
36. How represent Linked List?
37. What is the meaning get node and free node in Linked List?
38. Explain different types of operations related to Linked List.
39. Write algorithm for inserting node into an ordered single Linked List at beginning
40. Write algorithm for inserting node into an ordered single Linked List at end.
41. Write algorithm for inserting node into an ordered single Linked List at after specified node.

42. Write an algorithm for deleting a node from an ordered single Linked List at beginning.
43. Write an algorithm for deleting a node from an ordered single Linked List at end.
44. Write an algorithm for deleting a node from an ordered single Linked List at after specified node.
45. How represent single linked list as a circular linked list?
46. How represent doubly linked list as a circular linked list?.
47. What is need of Doubly Linked List?
48. Write an algorithm for traversal in a Linked List.
49. Write an algorithm for searching a node's value in a Linked List.
50. Explain the procedures for inserting and deleting nodes from a single linked list.
51. Explain the procedures for inserting and deleting nodes from a doubly linked list.
52. Write difference between circular linked list and doubly linked list.
53. Write advantage of doubly linked list over single linked list.
54. What is Sibling?
55. What is root node in a Tree?
56. What do you mean by Non-linear Data Structure?
57. What is Binary Tree?
58. What is Binary Search Tree?
59. What is extended Binary Tree?
60. What do you mean by Traversal
61. State the list of operation which can be performed on Binary Search Tree?
62. What do you understand by BST? Construct a BST where input list is:

15. 16, 5, 10, 8, 19, 6, 17.

63.Explain the array representation of a tree.

64.What is a Tree? Explain any four types of trees with the help of suitable example.

65.What is binary tree? How are it implemented in memory

66.Construct a Binary Search tree where input list is: 15, 17, 6, 11, 8, 20, 5, 18, 6

67.What are general trees? How are it implemented in memory.

68.Write down the recursive function for following to traverse a Binary Search Tree:

(a) In-Order

(b) Pre-Order

(c) Post Order

69.Construct the Binary Tree:Given the following traversal result:

In-order: G, C, B, D, A, F, E

Post-order: G, C, D, B, F, E, A

70.Explain Huffman's Algorithm with example in details.

71.Write short notes on:

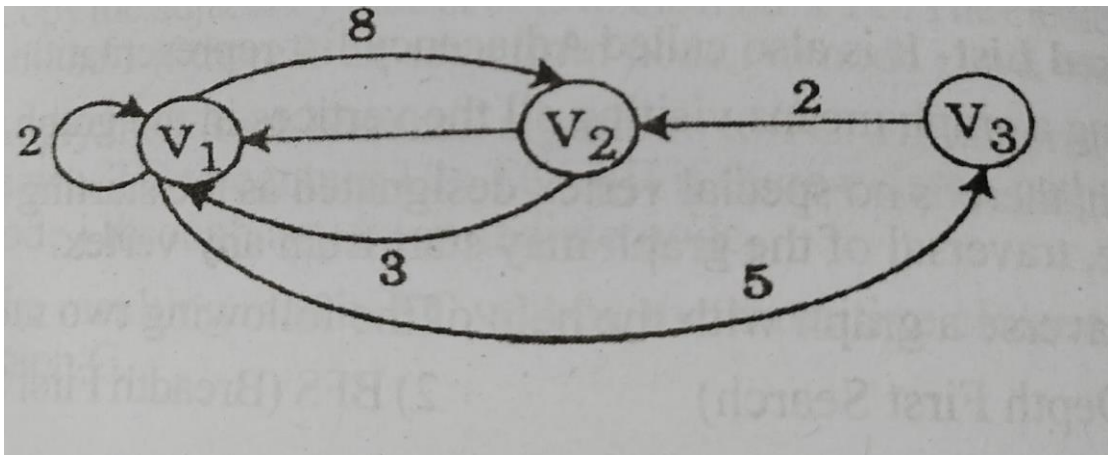
(a) Expression tree

(b) General tree

(c) Binary tree

72. What is Binary Search Tree? Mention its properties. Also write an algorithm for deleting a node from a binary search tree.
73. What is binary tree? How it is different from binary search tree. Also write different operation possible on binary tree.
74. Write an algorithm for deleting a node from a binary search tree. Take all possible cases.
75. What is Adjacency Matrix?
76. Define Graph?
77. Why graph data structure is used?
78. What is a loop in graph?
79. What is Adjacency Matrix?
80. What is Directed Graph?
81. What do you know by Successor and Predecessor node in directed graph
82. Define the term Degree and Cycle applicable to a graph.
83. What do you mean by vertices of a Graph?
84. How to differ Graph from Tree?
85. What is BFS (Breadth First Search)?
86. Define Directed Graph.
87. What do you know by Weighted Graph? Explain.
88. Distinguish between Tree and Graph.
89. How Depth First Search (DFS) Traversal works?
90. Explain Orthogonal Representation of Graph?
91. Explain BFS and DFS algorithm for graph traversal with example.

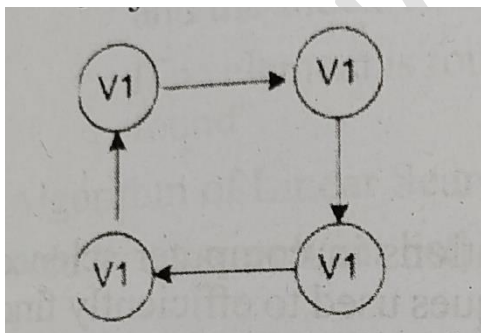
92. Write an WARSHALL algorithm. Consider the following diagram



93. Distinguish between the BFS and DFS traversal in a Graph.

94. List and explain the various terminologies used in Graph. Write an algorithm for DFS and BFS in graph application.

95. Consider the following graph, prepare an Adjacency Matrix and Adjacency List.



96. Explain the Directed graph, Complete graph and Connected graph with suitable example.

97. Write short notes on the following:

- a. Shortest path
- b. Graph traversal DFS algorithm.

98. What do you mean by Adjacency Matrix? Explain the Adjacency Matrix representation using a suitable example.

99. What is a Graph? Explain the uses of Graph Data Structure.

100. What is Adjacency Matrix? How is it made? Explain with the help of proper example.

101. Write short note on:

- (a) DFS traversing of a Graph
- (b) Warshall's Algorithm for Graph

102. Explain the various representation of graph with examples in details?

103. Explain Breadth First Search algorithm with example?

104. Explain Depth First and Breadth First Search traversal?

105. Write a program to perform the DFS and BFS traversal of a graph.

106. What is Merge Sort?

107. What is Hashing?

108. What is the Time Complexity of Quick Sort?

109. Explain the Time Complexity of Insertion Sort?

110. What is Sequential Search?

111. What do you mean by Sorting?

112. What is Complexity of Quick Sort?

113. What is Hash Function?

114. What is Searching?
115. How insertion sort and selection sort are different?
116. What is the difference between an internal sorting and external sorting?
- 117.** Write short note on Hash Searching
118. What is Selection Sort? Write an algorithm for selection sort considering below elements: 77, 33, 44, 11, 88, 22, 66, 55
119. Write an algorithm for Bubble Sort and Quick Sort.
120. What do you mean by Searching? Write an algorithm to implement Binary Search Technique.
121. What are the complexities of Binary Search?
122. What is Insertion Sort? How to work Insertion Sort explain with example? Write Insertion Sort algorithm.
123. What is Bubble Sort? Give step-by-step representation of Bubble Sort for the followings: 11, 12, 15, 9, 20, 28, 27, 17.
124. Describe the Binary Search Algorithm with the help of proper example
7. Explain the Selection Sort algorithm with the help of suitable example.