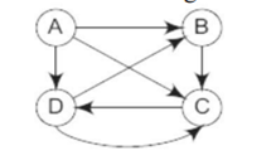
1. List some applications of queue data structure.
2. What is a pathological tree? Give example.
3. Differentiate between a singly linked list and a doubly linked list, highlighting their primary differences.
4. Define tree and its terminology with relevant example.
5. List the difference between weighted and unweighted graph.
6. Interpet the advantages of linked lists over arrays.
7. Given the prefix for an expression. Write its postfix: ++A\*BCD and +\*AB\*CD
8. Recommend the result of inserting 3,1,4,6,9,2,5,7 into an initially empty binary search tree.
9. Describe the key characteristics of a stack data structure and provide a real-world scenario where a stack is used.
10. Define indegree and out degree of a graph.
11. List out the applications of graphs.
12. Convert the infix expression (A+B)\*C/D-E into a postfix expression.
13. Define a forest by providing an example
14. Compare linear and binary search.
15. Give the purpose of Dijikstra’s algorithm.
16. Find out the in-degree and out-degree of each node in the given graph



1. What is meant by internal and external sorting? Give any two examples for each

type.

State the application of priority queue?

19. How to choose the pivot element in Quick sort?

20.State the difference between Insertion sort and Bubble sort.

21.Differentiate AVL tree and Binary search tree.

21.List the applications of Linear Probing.

22.Define Rehashing.

23.What is the Big Oh notation for the following block of code? Derive the

steps to arrive at it.

for(i=0;i&lt;n;i++)

for(j=1; j&lt;n;j\*=2)

statement block;

24. Illustrate the algorithm for the deletion of an element from an array using an

example.

25. Discuss about different types of binary tree with suitable example.

 26. Explore the steps involved in the insertion and deletion of elements in a binary search tree.

27.Traverse the following graph using Depth First Search traversal technique. Start traversing from the source vertex ‘A’

| 28.Create a binary search tree for the following numbers start from an empty binary search tree. 45,26,10,60,70,30,40 Delete keys 10,60 and 45 one after the other and show the trees at each stage |
| --- |
| Traverse the following graph using Depth First Search traversal technique. Start traversing from the source vertex ‘A’ |

29. The keys 12, 18, 13, 2, 3, 23, 5 and 15 are inserted into an initially empty hash table of length 10 using hash function h(k) = k mod 10 and linear probing. What is the resultant hash table.

30. Illustrate with example the open addressing and chaining methods of collision resolution techniques in hashing.

31. Point out the advantages of using open addressing.

32. Explain the procedure to insert an element to the queue using array implementation.

| 33.Explore the concept of graph connectivity. Explain how algorithms like BFS and DFS can be used to determine whether a graph is connected and to identify its connected components. Provide examples to illustrate these concepts. |
| --- |
| 34.What are the algorithmic steps of insertion sort method? Sort the following data elements using insertion sort method. 7, 8, 5, 2, 4, 6, 3 |
|  |
| 35.Explain the Linear Search algorithm in detail.Provide an example of a real-world scenario where linear search is applicable. |
| 36.Write short notes for the following  (i)Hash function  (ii)Quadratic Probing  (iii)Open Addressing  (iv)Rehashing  (v) Separate Chaining |

37. For the given tree find the following:

a. List the siblings for node E

b. Compute the height.

c. Mention the internal and external nodes

38. Write a program to implement the various operations of set.

39.Compare the working of the linear search and binary search technique with suitable example.

40. Explain the purpose of separate chaining used with hash table.

41. Discuss about Smart Union Algorithms

42. Design the algorithms for the following:

1. Insertion of a node in SLL

Deletion of a node in DLL

43. Evaluate the following postfix expressions by explaining each and every step:

1. 452\*+5+
2. 57+67+\*

44.Construct an AVL tree having the following elements:

H, I, J, B, A, E, C, F, D, G, K, L

45. Illustrate all the rotations of a splay tree with the help of examples.

46. Discuss the algorithm & the implementation of DFS with an example.

47. Develop an algorithm to compute the shortest path using Dijkstra’s algorithm. Validate the algorithm with suitable example

48. Implement quick sort algorithm to sort a set of ‘N’ numbers and demonstrate the sorting steps for the following set of numbers: 30, 52, 29,87,63,27,19,54.

49. Explain binary search and linear search with suitable examples.

50. Provide the algorithm for BFS and explain its working with the help of an example.

51. Describe the creation of adjacency matrix with suitable example.

52. With the help of merge sort method, sort the following elements

56,26,93,17,77,31,44,55,20.

53.Create a binary search tree for the following numbers start from an empty binary search tree. 45,26,10,60,70,30,40 Delete keys 10,60 and 45 one after the other and show the trees at each stage