QUESTION BANK
BSc. II YEAR
DATA STRUCTURES

Short Answers Type Questions

1. Explain recursion. Write a recursive algorithm to calculate factorial of a number.
2. What is data structure? Explain various types of data structure.
3. Give the applications of stack.
4. Write an algorithm to convert Infix expression into postfix expression.
5. Describe abstract data type with example.
6. Write the applications of queue data structure.
7. Explain stack as static data structure.
8. What is link list. Explain its type with suitable diagram.
9. Write the applications of linked list.
10. Write the applications of binary tree.
11. Give algorithm to sort a list using bubble sort.
12. Differentiate between stack and queue data structures.
13. What is graph. Explain the types of graph with example.
14. Write algorithm for insertion sort. Explain with the help of example.
15. Why we need data structure?
16. Differentiate between linear and non-linear data structures.
17. Give the features of abstract data type (ADT).
18. What are the disadvantages of linked list?
19. Mention the advantages of linked list?
20. What are the advantages linked list over array?
21. Write short notes on threaded binary tree.
22. What is an algorithm? Discuss the different steps in the development of an algorithm?
23. Distinguish between primitive and non-primitive data structures.
24. Differentiate between iteration and recursion.
25. Discuss the use of stack in implementing recursive procedures?
26. Convert the following infix expression into postfix form (A+B)*(C+D)*E^F
27. Write the prefix and postfix form for: A+B*(C-D)/(E-F)
28. Write an algorithm for in-order traversal of a binary tree.
29. Explain the method of representing graphs by using matrices?

30. Explain the use of graph in data structures?

Long Answers Type Questions

1. What do you mean by Array? Describe the storage structure of array. Also explain various types of array in detail.
2. What is stack? Why it is known as LIFO? Write algorithm of PUSH and POP operation on stack.
3. What is queue? Why it is known as FIFO? Write an algorithm to insert and delete an element from a simple queue.
4. Explain circular queue? Write an algorithm to insert and delete an element from a circular queue.
5. Explain how to represent singly linked list with help of diagram and example.
6. What is minimum spanning tree. Write algorithm to find the minimum spanning tree.
7. Write and explain algorithm to insert element at the beginning of circular linked list.
8. Explain algorithm to delete element from circular linked list.
9. Write and explain algorithm to insert element at the beginning of singly linked list.
10. Explain algorithm to delete element from singly linked list.
11. Write and explain algorithm to insert element at the beginning of doubly linked list.
12. Explain algorithm to delete element from doubly linked list.
13. What is tree traversal. Explain the in-order, preorder and post-order traversal.
14. Differentiate between depth first search and breadth first search.
15. Explain how infix expressions are converted to polish notation. Illustrate your answer with suitable example?
16. Explain the implementation of circular queue using array. How an "empty queue" is distinguished from a "full queue"? Write necessary functions to perform all valid operations on circular queue.
17. Write down the steps to invert a singly-linked list to circular linked list?
18. Explain quick sort algorithm with the help of an example.
19. Explain heap sort. Construct heap sort for the initial key set 42, 23, 74,11, 65,58,94,36,99,87.
20. Discuss the advantages and disadvantages of linked list over array?

21. Write an algorithm for binary search and discuss its speed compared with linear search.
22. Discuss the improvement in performance of binary trees brought by using threads.
23. Discuss the difference between a general tree and a binary tree. What is a complete binary tree? Give an algorithm for deleting a value X from a given binary tree.
24. Write an algorithm for the depth first search of a graph? State its advantages and disadvantages?
25. Explain the Prim's algorithm to find minimal spanning tree for a graph.
26. Explain the Kruskal's algorithm to find minimal spanning tree for a graph.

References

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