



Mahila Vikas Sanstha's

INDRAPRASTHA NEW ARTS COMMERCE & SCIENCE COLLEGE,

AT POST MALWADI, DIST. WARDHA (M.S.)

Accredited 'B' by NAAC

Approved by government
of Maharashtra

Affiliated to Rashtrasant Tukadoji
Maharaj Nagpur University, Nagpur

Recognised by U.G.C New Delhi
under section 2 (f) & 12 (b) of
UGC act 1956

**Department of Computer Science
Subject : Data Structure(Paper I)
Class: Bsc III Sem
Question Bank**

Unit I

1. What is linked list ? Give array representation of linked list.
2. Write an algorithm to count the number of nodes in the single linked list.
3. Write an algorithm to insert node at the beginning of double linked list.
4. Write an algorithm to delete the last node of single linked list.
5. Define double linked list.
6. Write an algorithm to insert an element ITEM after element KEY in the double linked list.
7. Explain the representation of linked list in memory.
8. Write an algorithm to delete the front element of linked list.
9. Write an algorithm to add the two polynomials represented as a linked list.
10. Define circular linked list.
11. Write short notes on :
12. Garbage collection
13. Overflow and underflow.
14. Write an algorithm to delete the first node from a linked list.
15. What is a header list ? Explain one way and two way circular header list.
16. What is two way linked list ? Write an algorithm to insert an element at the beginning of two way linked list.
17. What are the advantages of double linked list over single linked list ?
18. What is linked list ? Explain its memory representation.
19. Write an algorithm to insert a node at the beginning of linked list.
20. What is a doubly linked list ? Write an algorithm to delete the last node from a doubly linked list.
21. Write an algorithm to delete the front node of a single linked list.
22. Differentiate between single linked list and two way linked list.



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Unit II

1. Write an algorithm for Tower of Hanoi problem.
2. What is Stack ? Explain Push Operation and Pop operation used in Stack.
3. Explain quick sort method with suitable example.
4. Convert the following expression into prefix and postfix notation :
(i) $a^x + b^y / a^x - b^y$ (ii) $ax^4 + bx^3 + cx^2 + dx + e$.
5. Solve the Tower (3, BEG, AUX, END).
6. Explain the quick sort method with suitable example.
7. What is a stack ? Explain its memory representation. Write an algorithm to insert element in stack.
8. Write an algorithm for translating the infix expression into postfix notation.
9. Explain the overflow and underflow condition in array representation of stack.
10. What is a Stack ? Explain push and pop operations on stack.
11. Write an algorithm to convert an infix expression into postfix.
12. Explain quick sort with an example.
13. Write an algorithm for evaluation of a postfix expression.
14. Convert the following infix expression into prefix :
 $A \mid (B - D) / (E - F) \wedge G$
15. Explain the stack and representation of a stack.
16. Write the algorithms for push and pop operations on stack.
17. Convert the following expression to prefix and postfix :
 $A + (B * D/E) * (F + G/H) * K. 5$
18. Write a recursive algorithm for Tower of Hanoi problem.
19. Explain recursion with an example.



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Unit III

1. Write an algorithm for Insertion sort method.
2. Define Priority Queue. Explain the array representation of priority queue in memory.
3. Explain Merge sort method with suitable example.
4. What is Queue ? Write a procedure to insert element in queue.
5. Explain memory representation of Queue.
6. Write an algorithm to delete the element from circular queue.
7. Explain insertion sort method with a suitable example.
8. Write an algorithm for selection sort method.
9. What is priority queue ? Explain the array representation of priority queue in memory.
10. Discuss the complexity of selection sort method.
11. What is a priority queue ? Give its memory representation.
12. Write an algorithm to delete an element from a linear queue.
13. Write a short note on hashing techniques.
14. Write a short note on deque.
15. Write short notes on :
 - (i) Deque
 - (ii) Priority queue.
16. Write an algorithm for inserting a node in a circular queue.
17. Explain with an example the selection sort technique.
18. What is hashing ? Explain various hashing functions.
19. Write a short note on complexity of algorithm.



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Unit IV

1. Write an algorithm for Depth-First Search (DFS) method.
2. What is tree ? Explain representation of Binary tree in memory.
3. What is graph ? Explain representation of Graph in memory.
4. Given :
Inorder : n1, n2, n3, n4, n5, n6, n7, n8, n9
Postorder : n1, n3, n5, n4, n2, n8, n7, n9, n6
5. Draw the tree.
6. Explain Binary Search tree.
7. Write an algorithm for Depth first search of graph.
8. What is graph ? Give its memory representation as an array and linked list.
9. Write an algorithm for the inorder traversal of a binary tree.
10. Explain the array representation of a graph.
11. Explain the method for breadth first search in a graph.
12. What is a heap ? How will you insert an element in a heap ?
13. Write an algorithm for pre order traversal of a binary tree.
14. Explain the linked representation of a graph.
15. Explain the steps for depth first search in a graph.
16. Explain Heap Sort method with suitable example.