

Satyug Darshan Institute of Technology, Faridabad

Programme: B.Tech (CSE)	Year:/Semester: 2nd /3rd
Subject Name : Data Structure and Algorithm	Subject Code:CEU-201-V
Department: DCSE	AY:2025-2026

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Unit -1

Short Questions

S. No.	Questions	Bloom Taxonomy(KL)
1	Recall the meaning of an algorithm and enumerate its characteristics.	KL1
2	State the meaning of complexity. Define time complexity and space complexity.	KL1
3	Define ADT.	KL1
4	Define analysis of an algorithm.	KL1
5	Differentiate between Linear search and Binary search.	KL1
6	Define Time-space trade off in detail.	KL1
7	Describe algorithm analysis and its types.	KL2
8	Differentiate between data structure & data Type.	KL3
9	Explain data structure classifications with diagram.	KL2
10	Differentiate between primitive & non-primitive data types.	KL2

Long Questions

1	Explain Asymptotic Notation in detail	KL2
2	Discuss data structures and illustrate the operations that can be applied to them.	KL2
3	Explain Binary Search algorithm and its techniques with example.	KL2
4	Write algorithm for array traversal, insertion & deletion.	KL3

5	What is searching? Explain binary search algorithm with example and also find its time complexity.	KL2
6	What is searching? Explain linear search algorithm with example and also find its time complexity.	KL2
7	Explain sparse matrices, & write program for the same.	KL3

Unit -2

Short Questions

S. No.	Questions	Bloom Taxonomy
1	List different operation performs on queue.	KL1
2	State applications of stack.	KL1
3	Describe the concept of polish notation in stack.	KL2
4	Classify stack and queue.	KL2
5	Discuss about Circular queue.	KL2
6	List some applications of stack and queue.	KL1
7	Describe enqueue operation algorithm for queue.	KL2
8	State advantages of circular queue over normal Queues	KL1
9	Describe dequeue operation algorithm for queue.	KL3
10	List types of doubly ended queues & also give their two applications	KL1
11	Difference between stack and queue.	KL2

Long Questions

1	Explain Push,pop peek & display operation in stack with algorithm.	KL2
2	Explain Dequeue & Enqueue operation in queue with algorithm.	KL2
3	Evaluate the following Postfix Expression: 15 7 11 + - / 3 * 2 11 + + -	KL3
4	convert infix to postfix- $X+Y*Z^P-(X/Y+Z)$	KL3
5	Write an algorithm to convert infix to postfix form for the expression. $(a + b) * (C^d - e)^{(f+g*h)-i}$	KL2
6	Write an algorithm to evaluate postfix expression	KL3
7	Describe circular queue Write are its applications. Explain the underflow and overflow conditions in circular	KL2
8	$K+L-M*N+(O^P)*W/U/V*T+Q$ Infix to postfix conversion.	KL3
9	Differentiate between between circular queue & normal queue	KL3
10	Explain recursion with suitable examples & write a recursive algorithm for factorial calculation	KL2
11	Explain priority queue in in brief.	KL2

	Unit -3	
	Short Questions	
1	Explain the various drawbacks of array.	KL2
2	Explain the various operations of link list.	KL2
3	Write the algorithm of traversing a linked list.	KL2
4	Describe the concept of Free Storage list.	KL2
5	List various application of tree data structure.	KL1
6	Discuss how to store stack using linked list.	KL2
7	Describe rotation and its types in AVL tree.	KL2
8	Define tree and write the properties of a tree.	KL1
9	Describe Binary Search tree and its applications.	KL2
10	Define binary tree, full binary tree, and strict binary tree. Write the properties of binary tree also.	KL1
11	Describe the concept of multiway tree.	KL2
12	Write insertion, deletion and searching operations on AVL trees.	KL2
	Long Questions	
1	What is linked list? Write and explain the algorithm for create and traverse operations in single linked list with	KL2
2	What are the drawbacks of single linked list? Write and explain the algorithm for search and modify operations	KL2
3	Explain the advantages of linked list over arrays.	KL2
4	Write algorithm for insert and delete a node from doubly linked list.	KL2
5	Write the algorithm of traversing a linked list.	KL2
6	What are the drawbacks of single linked list? Explain how to implement insert and traverse operations in	KL2
7	What is linked list? Write and explain the algorithm for create, insertion and traverse operations in doubly	KL2
8	Explain the circular linked list in detail.	KL2
9	Discuss about Heaps and Heaps as Priority Queues.	KL2
10	Write the algorithm of pre order, in order, post order traversal.	KL2
11	Build a B Tree of order 3 using key values: 2,7,6,5,8,14,12,18,22,7,9.	KL3
12	Construct AVL tree for the following data: 21, 26, 30, 9, 4, 14, 28, 18, 15, 10, 23, 7.	KL3
13	What is a Binary Search Tree? How do you insert an element into a Binary Search Tree?	KL2
14	What is traversing? Write recursive procedure for inorder traversal in a binary tree.	KL2
15	Explain how to delete an element from the Binary Search Tree.	KL2

16	Write recursive algorithm for preorder traversal.	KL2
17	Discuss threaded binary trees.	KL2
18	Explain height balanced tree.	KL2
Unit -4		
Short Questions		
1	Define sorting. List the different types of sorting techniques.	KL1
2	Define heap sort.	KL1
3	Write the time complexity of merge sort in best, average and worst case.	KL1
4	Define heap and its types.	KL1
5	Discuss about insertion sort.	KL2
6	Discuss various graph representation methods in brief.	KL2
7	List different types of graphs.	KL1
8	Discuss various graph representation methods in brief.	KL2
9	Discuss about collision and hashing with example.	KL2
10	Give adjacency list and adjacency matrix representations of a graph.	KL1
11	Define complete graph and strongly connected graph.	KL1
12	Define Chaining with example.	KL1
13	Discuss about CRT and its types.	KL2
14	Define hash table	KL1
15	Define probing.	KL1
Long Questions		
1	Sort the following list in ascending order using insertion sort. 25,15,30,9,99,20,26	KL3
2	Construct max heap for the following list of elements: 7,3,9,5,1,13,11,15	KL4
3	Explain how to sort the elements using insertion sort and derive time complexity for the same.	KL2
4	Write a routine for sorting elements using quick sort method. Explain the working of the routine with an	KL3
5	Explain how to sort the elements using selection sort and derive the time complexity for the same.	KL2
6	Discuss the algorithm of merge sort with an example. Derive its time complexity.	KL2
7	Write and explain bubble sorting algorithm and also find its time complexity.	KL3
8	Apply the Quick Sort algorithm to sort the following elements: 45, 23, 89, 12, 78, 34, 67	KL3
9	Insert the keys 19, 27, 36, 10, 64 into a hash table of size 9 using quadratic probing. Hash function: $h(k) = k$	KL3

10	Insert the keys 18, 41, 22, 44, 59, 32, 31, 73 into a hash table of size 10 using open addressing with linear probing. Use the hash function $h(k) = k \bmod 10$.	KL3
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