

Satyug Darshan Institute of Technology, Faridabad		
Programme: BCA (Gen/DS)		Year/Semester: 1/2
Subject Name : Data Structures		Subject Code:BCG-104-V1
Department: Computer Science and Engineering		AY:2025-2026
Prepared By: Ms. Nikita		
Unit -1		
Short Questions		
S. No.	Questions	Bloom Taxonomy(KL)
1	Define data structure.	KL1
2	List the operations performed on data structures.	KL1
3	Define an algorithm. List the characteristics of good algorithm.	KL1
4	State two methods of analyzing an algorithm.	KL1
5	List the difference between data type and data structure	KL1
6	State the method of representing arrays into memory.	KL1
7	Define time-space complexity.	KL1
8	State the difference between linear and binary Search.	KL1
9	Mention two applications of array.	KL1
10	State the limitation of Linear array.	KL1
Long Questions		
1	Discuss Big Oh, Big Omega and Big Theta Notations with suitable examples. OR Explain asymptotic Notations with suitable examples.	KL2
2	Compare best and worst case time complexities for Linear and Binary Search.	KL4
3	Discuss about time space trade off.	KL2
5	Write an algorithm to insert and delete an element from array.	KL4
6	Discuss how arrays are represented in memory	KL2
7	Write an algorithm to sort the following array and analyse its time complexity: A = {50, 30, 20, 60, 10, 40}	KL4
8	Explain Linear and Binary Search with the help of algorithm and analyse their complexities. Discuss which algorithm will perform better if the array is sorted and why.	KL3

Unit - 2		
Short Questions		
S. No.	Questions	Bloom Taxonomy
1	Define linked list.	KL1
2	List the disadvantages of arrays.	KL1
3	State the difference between array and linked list.	KL1
4	Define singly linked list.	KL1
5	Define doubly linked list.	KL1
6	Define circular linked list.	KL1
7	What is node in linked list?	KL1
8	Define hashing.	KL1
9	What is hash function?	KL1
10	Define collision in hashing.	KL1
11	List 2 collision handling techniques.	KL1
Long Questions		
1	Explain linked list and compare it with array.	KL2
2	Describe representation of linked list with diagram.	KL2
3	Explain different types of linked lists.	KL2
4	Explain traversal operation in singly linked list with algorithm.	KL3
5	Write an algorithm for insertion in singly linked list.	KL4
6	Write an algorithm for deletion in singly linked list.	KL4
7	Explain doubly linked list with advantages and disadvantages.	KL2
8	Explain circular linked list and its applications.	KL2
9	Explain the concept of hashing with suitable example.	KL2
10	Describe different types of hash functions.	KL2
11	Explain collision in hashing and its causes.	KL2
12	Explain collision resolution techniques using open addressing.	KL2
13	Explain collision resolution using chaining method with example.	KL2
Unit - 3		
Short Questions		
S. No.	Questions	Bloom Taxonomy
1	Define stack.	KL1

2	List basic operations of stack.	KL1
3	Define overflow and underflow conditions in stack.	KL1
4	Define postfix expression.	KL1
5	Define recursion.	KL1
6	What is base condition in recursion?	KL1
7	Define queue.	KL1
8	List types of queues.	KL1
9	Define circular queue.	KL1
10	Define dequeue (double-ended queue).	KL1
Long Questions		
1	Explain stack data structure with neat diagram.	KL2
2	Describe representation of stack using array.	KL2
3	Explain representation of stack using linked list.	KL2
4	Write algorithm for push and pop operations in stack.	KL3
5	Explain applications of stack.	KL2
6	Convert the following infix expression to postfix expression using stack: $(a+b)*(c+d)$	KL3
7	Explain evaluation of postfix expression with example.	KL3
8	Explain recursion and recursive function with example.	KL2
9	Compare recursion and iteration.	KL4
10	Explain queue data structure with neat diagram.	KL2
11	Describe representation of queue using array and linked list.	KL2
12	Explain different types of queues.	KL2
13	Write algorithm for operations on circular queue.	KL3
Unit - 4		
Short Questions		
S. No.	Questions	Bloom Taxonomy
1	Describe graph and different representation of graphs.	KL2
2	Define binary search tree (BST).	KL1
3	Define AVL tree.	KL1
4	List graph traversal techniques.	KL1
5	Explain tree data structure and its applications.	KL1
Long Questions		
1	Explain graph traversal techniques.	KL2

2	Explain representation of trees.	KL2
3	Construct a Binary Search Tree (BST) using the elements: 45, 25, 65, 15, 35, 55, 75 and delete the element 25 from the tree.	KL4
4	Construct an AVL Tree by inserting the elements: 10, 20, 30, 40, 50 and balance the tree using appropriate rotation.	KL4
5	Construct a Binary Search Tree (BST) using the elements 60, 40, 80, 30, 50, 70, 90 and perform tree traversals.	KL4
6	Construct a Binary Search Tree (BST) from the elements 15, 10, 20, 8, 12, 16, 25 and convert it into a balanced AVL Tree.	KL4