

DATA STRUCTURES AND ALGORITHMS

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Which of the following is a linear data structure? (i) Graph (ii) Tree (iii) Array (iv) Heap	K1	CO1
	2	What is the time complexity to access an element by its index in an array? (i) $O(n)$ (ii) $O(\log n)$ (iii) $O(1)$ (iv) $O(n \log n)$	K2	CO1
2	3	Find the operation is used to add a new element to the top of a stack. (i) Enqueue (ii) Push (iii) Pop (iv) Dequeue	K1	CO2
	4	Tell about a "Deque". (i) A queue with only one end (ii) A double-ended queue (iii) A priority-based stack (iv) A queue that uses a heap	K2	CO2
3	5	How many fields a node in a singly linked list must contain? (i) One (ii) Three (iii) Four (iv) Two	K1	CO3
	6	Select the following operations that is more efficient in a doubly linked list than in a singly linked list. (i) Searching for an item (ii) Deleting a node whose location is given (iii) Traversing to the end (iv) Pointing to the end	K2	CO3
4	7	Name the tree that has number of edges from the root to a specific node. (i) Height (ii) Depth (iii) Length (iv) Width	K1	CO4
	8	Label the following that is true about the in-order traversal of a Binary Search Tree (BST). (i) It traverses in a non-increasing order. (ii) It traverses in an increasing (sorted) order. (iii) It traverses in a random fashion. (iv) It performs a level-order traversal.	K2	CO4
5	9	Match the following sorting algorithms that is fastest for sorting small arrays. (i) Quick sort (ii) Shell sort (iii) Insertion sort (iv) Heap sort	K1	CO5
	10	Choose the following sorting algorithm does not use recursion. (i) Bottom up merge sort (ii) Heap sort (iii) Merge sort (iv) Quick sort	K2	CO5

Cont...

SECTION - B (35 Marks)Answer **ALL** questions**ALL** questions carry **EQUAL** Marks

(5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Apply the properties of algorithm.	K3	CO1
		(OR)		
	11.b.	Construct the Classification with an example.		
2	12.a.	Explain Circular queue.	K2	CO2
		(OR)		
	12.b.	Summarize about Linear queue.		
3	13.a.	Explain about circularly Linked Lists .	K5	CO3
		(OR)		
	13.b.	Determine use of doubly Linked Lists		
4	14.a.	Analyze the representation of Trees.	K4	CO4
		(OR)		
	14.b.	Classify the representation of Graphs.		
5	15.a.	Estimate the importance of Binary search .	K5	CO5
		(OR)		
	15.b.	Evaluate a Merge sort.		

SECTION -C (30 Marks)Answer **ANY THREE** questions**ALL** questions carry **EQUAL** Marks

(3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Explain about the development of an Algorithm.	K2	CO1
2	17	Outline on Stack and Queue operations.	K4	CO2
3	18	Assess the implementation of Linked representations.	K5	CO3
4	19	Measure the basic Terminologies of trees and Graphs.	K5	CO4
5	20	Investigate Heap sort with an example.	K4	CO5

Z-Z-Z

END