
Answer any Five Questions One Question for One UNIT
ALL the Question Carry Equal Marks

UNIT-I		Marks	CO	BL
1.a)	What is a data structure? Discuss various types of Complexities with suitable mathematical illustrations.	8M	CO1	2
b)	Demonstrate and explain various Nonlinear data structures.	7M	CO1	3
OR				
2.a)	With necessary demonstrations, explain the merge operation in doubly linked list.	8M	CO1	2
b)	Implement and explain the insert and delete operations in a queue using linked lists.	7M	CO1	4
UNIT-II		Marks	CO	BL
3.a)	Discuss the complexities of Linear and Binary search algorithms with an example.	8M	CO2	3
b)	Write an algorithm for merge sort. Arrange the list of numbers 31,28,17,65,35,42,86,25,45,52 into ascending order using merge sort.	7M	CO2	3
OR				
4.a)	Given In order traversal of a binary tree is D,G,B,E,A,H,F,I,C and pre order traversal is A,B,D,G,E,C,F,H,I construct binary tree.	8M	CO2	3
b)	Define Graph and explain how graphs can be represented in adjacency matrix and adjacency list.	7M	CO2	4
UNIT-III		Marks	CO	BL
5.a)	What is an abstract data type (ADT)? Implement a Stack ADT using Linked lists with an example.	8M	CO3	3
b)	Define Dictionary and Dictionary with duplicates? List the operations performed on a dictionary?	7M	CO3	4
OR				
6.a)	Explain the linear probing method in Hashing? Explain its performance analysis?	8M	CO3	3
b)	What is hashing with Chains? Explain? Compare this with Linear Probing?	7M	CO3	3
UNIT-IV		Marks	CO	BL
7.a)	Define a Priority Queue and Implement Insertion and deletion operations on a priority queue with an example.	7M	CO4	4
b)	Consider the array <i>theHeap</i> = {10, 2, 7, 6, 5, 9, 12, 35, 22, 15, 1, 3, 4}	8M	CO4	4
	(i) Heapify the tree. Show the result in both tree and array format.			
	(ii) Insert the elements 15, 20 and 45 using bubbling up process. Show the max heap following each insert.			

OR

- 8.a) Design a binary search tree by inserting the keys
4, 12, 8, 16, 6, 18, 24, 2, 14, 3.
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|---|-----|-----|---|
| (i) Draw the tree following each insert. | 15M | CO4 | 6 |
| (ii) From the tree delete keys 6, 14, 16 and 4. Draw the search tree after each deletion. | | | |

UNIT-V

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|--|--------------|-----------|-----------|
| 9.a) What is meant by height balanced tree? Write and explain the stepwise procedure to determine the height of an AVL tree with an example. | 8M | CO5 | 5 |
| b) Describe Single rotation and double rotation in deleting an element in an AVL tree. | 7M | CO5 | 3 |

OR

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|--|----|-----|---|
| 10.a) Write the advantages of splay tree in representation of dictionaries | 8M | CO5 | 4 |
| b) Define B-Tree. Generate a B-Tree of order 3 (2-3 tree) for the following key values 5,10,12,15,39,64,53 | 7M | CO5 | 6 |
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