



K. K. Wagh Institute of Engineering Education & Research, Nashik
(An Autonomous Institute From A.Y. 2022-23)

SUMMER-2024	
Exam Seat No.:	
Academic Year:2023-2024	Semester:III
Class:SY	Program:B.Tech
Branch Code:INT	Pattern:2022
Name of Course:Data Structures and Algorithms	Course Code:INT222002
Max. Marks:60	Duration:2.30 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains 2 page(s).
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.

Question No. 1 Attempt following Question

- 1a) Explain Doubly Linked List in detail (6) CO2

Question No. 2 Attempt following Question

- 2a) Explain working of quick sort considering at least 10 elements (6) CO1

Question No. 3 Attempt following Question

- 3a) Explain any 4 applications of Queue (5) CO2

OR

- 3b) Compare Stack and Queue with minimum 5 points (5) CO2

- 3c) Convert infix string $((a/(b-c+d))*(e-a)*c)$ into postfix using stack. Show the content of stack in each step (5) CO2

OR

- 3d) Write an algorithm to convert infix to postfix expression (5) CO2

- 3e) Write pseudo code for implementing Stack using sequential organization (6) CO5

OR

- 3f) Write pseudo code for implementing Circular Queue using sequential organization (6) CO5

Question No. 4 Attempt following Question

- 4a) Explain use of stack for any one type of tree traversal with suitable example (5) CO3

OR

4b) Explain the different cases to delete an element from binary search tree (5) CO3

4c) Construct binary search tree from following elements: (5) CO3

15, 19, 23, 12, 8, 14, 23, 33, 31

Show each step of insertion. Perform in-order, pre-order and post-order traversal of the tree.

OR

4d) For the binary tree representation as an array, perform in-order threading for the tree (5) CO3

A B C D E G H _ _ F _ _ _ J K _ _ _ _ _ _ _ _ _ L _ _

4e) Write pseudo code for non recursive pre-order traversal of binary tree (6) CO3

OR

4f) Write pseudo code to delete an element from binary search tree (6) CO3

Question No. 5 Attempt following Question

5a) Explain methods of Graph representation with suitable example (5) CO4

OR

5b) Explain concept of linear probing in hashing with example (5) CO4

5c) Write algorithm for DFS traversal of graph (5) CO4

OR

5d) Write Dijkstra's Algorithm to find shortest path (5) CO4

5e) Sort the following numbers using heap sort (6) CO4

24, 4, 75, 2, 60, 10, 80

OR

5f) Explain each type of rotation with suitable example in AVL tree (6) CO4

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