



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

InSem Examination-I Winter2024	
Exam Seat No.:	
Academic Year:2024-2025	Semester:III
Class:SY	Program:B.Tech
Branch Code:INT	Pattern:20
Name of Course:Data Structures & Algorithm	Course Code:2308202
Max. Marks:30	Duration:1.30 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 \_\_\_\_\_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.

**Marks CO**

**Question No. 1**

- 1 a) What is Data Structures? and what are different types of data structures? (4) CO2
- 1 b) What is Analysis of Algorithm? Explain various types of Analysis of Algorithm. (3) CO2

**Question No. 2**

- 2 a) Write pseudo code to insert intermediate and Last node separately from Singly linked list. Draw a diagram to illustrate the process. (8) CO2

**OR**

- 2 b) Write pseudo code to insert intermediate and front node separately from doubly linked list. Draw a diagram to illustrate the process. (8) CO2

**Question No. 3**

- 3 a) What is a Binary search algorithm? Explain its operation and provide an example of how it is implemented on a sorted array. (4) CO1
- 3 b) Define and explain the difference between linear and non-linear data structures. Provide examples of each. (3) CO1

**Question No. 4**

- 4 a) What is a Quick sort algorithm? Solve given unsorted array using quick Sort (35,50,15,25,80,20,90,45).And discuss its time complexity (8) CO1

**OR**

- 4 b) What is a Merge sort algorithm? Solve given unsorted array using merge sort (35,50,15,25,80,20,90,45).And discuss its time complexity (8) CO1

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