



**K. K. Wagh Institute of Engineering Education & Research, Nashik**

(An Autonomous Institute From A.Y. 2022-23)

InSem Examination-IWinter 2023		
Exam Seat No.:		
Academic Year:2023-2024	Semester:III	
Name of Programme:B.Tech IT	Pattern:2022	
Name of Course:Data Structures and Algorithms IT	Course Code:INT222002	
Max. Marks:30	Duration:1	

**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 02 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**

a) What is data structure? Why do we need it? How data structures are classified? (6) CO2

**OR**

b) Explain different cases of complexity analysis of an algorithm with suitable example (6) CO2

c) Explain row and Column major representation of a matrix with example.. (5) CO2

**OR**

d) Write pseudo code to delete intermediate node from Singly linked list (5) CO2

e) Discuss advantages of Linked list over array (4) CO2

**OR**

f) What is ADT? Mention features of ADT (4) CO2

**Question No. 2 Attempt following Question**

a) Explain working of Insertion sort with suitable example (6) CO1

**OR**

b) Compare Merge sort and Bubble sort (6) CO1

c) Write pseudo code to implement Bubble sort (5) CO1

**OR**

d) Sort the following array in ascending order using Shell Sort.  
8, 3, 2, 11, 5, 14, 0, 2, 9, 4, 20 (5) CO1

e) Compare External and Internal sorting (4) CO1

**OR**

f) How binary search works? Explain with suitable example (4) CO1