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

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

InSem Examination-I Winter2025	
Exam Seat No.:	
Academic Year:2025-2026	Semester:I
Class:PG-I	Program:MCA
Branch Code:M.C.A.	Pattern:2024
Name of Course:Data Structures and Algorithms	Course Code:2409502
Max. Marks:30	Duration:1.15 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 __1__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)	Explain the different types of asymptotic notations used to describe algorithm efficiency. Discuss how Big-O, Theta, and Omega notations are used to compare the performance of algorithms.	(7)	CO5
Question No. 2			
2 a)	Compare the row-major and column-major order in memory representation of two-dimensional arrays. Describe how these methods affect memory access.	(8)	CO5
	OR		
2 b)	Describe how a sparse matrix can be represented using arrays. Explain the steps for performing addition and transpose operations on sparse matrices.	(8)	CO5
Question No. 3			
3 a)	Explain how insertion and deletion operations are carried out in a singly linked list. Give a simple example to illustrate these operations.	(7)	CO1
Question No. 4			
4 a)	Demonstrate how insertion and deletion operations are performed in a circular linked list with an example. Write the corresponding algorithms.	(8)	CO1
	OR		
4 b)	Apply the concept of doubly linked list to store and reverse a sequence of integers. Write an algorithm and explain each step with a suitable example.	(8)	CO1

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