G.H RAISONI INSTITUTE OF ENGINEERING & TECHNOLOGY, NAGPUR

(Approved by AICTE, New Delhi and Recognized by DTE, Maharashtra)
An Autonomous Institute Affiliated to Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur
Accredited by NAAC with A+ Grade

RAISONI GROUP

END SEM EXAMINATION

WINTER VACATION

Name of Program:	**Bachelor of Technology (BTECH) in COMPUTER SCIENCE AND ENGINEERING /ARTIFICIAL INTELLIGENCE /DATA SCIENCE/ COMPUTER SCIENCE ENGINEERING (CYBER SECURITY)/INFORMATION TECHNOLOGY**	**Sem:**	**3rd**
Name of Course :	**DATA STRUCTURES & ALGORITHMS**	**Course Code**	**UCSL201**
Max Marks:	**50 Marks**	**Duration:**	**Mins.150**

INSTRUCTION TO THE STUDENTS

1. *Read the question paper carefully (Branch, Semester, Scheme) before attempting the questions.*
2. *Solve **Q. 4 OR Q. 5** remaining questions are mandatory*
3. *Every question has equal weightage.*
4. *Use of programmable calculator is prohibited.*
5. *Assume suitable data wherever necessary.*
6. *Draw neat and proper diagram/sketches.*
7. *Don't use red pen for writing the answers.*
8. *Don't write any other comments except answers of questions.*

ABBREVIATIONS

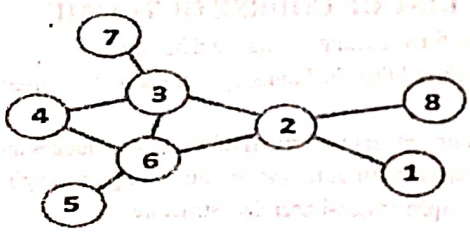
Q.: Question Number S.Q.: Sub Question Number BT: Blooms taxonomy Level CO: Course Outcome

LIST OF COURSE OUTCOME

CO1: Analyze various techniques for searching, Sorting and hashing.
CO2: Illustrate linear arrays and linked lists, including operations such as insertion, deletion, traversal, sorting and searching.
CO3: Demonstrate the array and linked representations of stacks and queues and their applications.
CO4: Apply trees as non-linear data structures to find solutions for given engineering applications.
CO5: Understand the basics of Graphs as non-linear data structures.

Q.	S.Q.	Question	Marks	BT Level	CO
1	a	Outline the sorting of given list of elements using Radix Sort. **73, 802 , 17, 100 , 160 , 88 , 44 , 25**	05	04	CO1
	b	Describe the Insertion sort algorithm with the help of an example.	05	02	CO1
2	a	Illustrate the Circular Linked List in details.	03	03	CO2
	b	Demonstrate an algorithm to perform the following operations: 1. Insert a node at any position in Singly Linked List. 2. Delete the last node from Doubly Linked List.	07	02	CO2

Q.	S.Q.	Question	Marks	BT Level	CO
3	a	Convert the given expression into postfix form using stacks. Show stepwise procedure. A+B^C*(D/E)-F/G	05	03	CO3
	b	Discuss the concept of circular Queue along with its insertion of a new element operation.	05	02	CO3
4	a	Describe Threaded Binary Trees with the help of an example.	05	02	CO4
	b	Create an AVL tree by inserting the following elements in the given order. 55, 7, 15, 25, 18, 103, 96, 83	05	06	CO4
		OR			
5	a	Define an AVL Tree. Explain with suitable example how nodes are deleted from an AVL Tree.	06	02	CO4
	b	Compare B-Trees and B+ Trees.	04	05	CO4
6	a	Solve following Undirected graph to find : 1. Adjacency List 2.Adjacency Matrix 3.Indegree and Outdegree of each vertex.	06	03	CO5



	b	Outline Spanning trees with example and its application.	04	4	CO5