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

END SEM EXAMINATION
WINTER 2023

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. 1 OR Q.2** 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	Differentiate between linear and non-linear data structure.	05	02	CO1
	b	Describe an algorithm to implement selection sort with suitable example.	05	02	CO1
		OR			
2	a	Explain the significance of asymptotic notations and describe the types of Asymptotic notations.	05	02	CO1
	b	Differentiate between Searching and Sorting.	05	02	CO1

END SEM EXAMINATION

Q.	S.Q.	Question	Marks	BT Level	CO
3	a	Differentiate between Linear Search and Binary Search.	05	02	CO2
	b	Write a program to find transpose of a matrix.	05	02	CO2
4	a	Describe queue full and queue empty operation conditions on linear queue with suitable example.	06	01	CO3
	b	Evaluate infix expression into prefix expression: (A+B)*(C/G)+F	04	05	CO3
5	a	Create a Binary Tree from the given expression $((u+v)-(w*x))\ \%\ ((y\ \hat{}\ z)/(a-b))$	04	06	CO4
	b	Develop a C Program to implement Pre-Order, In-Order and Post-Order traversals in a binary tree.	06	06	CO4
6	a	Explain Graph Traversal Technique along with example	05	02	CO5
	b	Define with proper diagram. 1.Connected Path 2. Cycle 3. Complete Graph 4. Adjacent Nodes 5.Weighted Graph	05	02	CO5