BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: BTECH/IMSC. **SEMESTER : III/ADD**
BRANCH: CSE/AIML/MATHS & COMP. **SESSION : MO/2024**

SUBJECT: CS231 DATA STRUCTURES

TIME: 3 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

			CO	BL
Q.1(a)	Write the pseudo code for sorting an integer array using Selection Sort and find its time complexity using step count.	[5]	1	3
Q.1(b)	Define the following asymptotic notations in terms of their mathematical definitions and show their meaning while analyzing the complexity taking suitable example algorithms: i) θ ii) Ω	[5]	1	3
Q.2(a)	Write an algorithm to convert an Infix expression to corresponding Postfix expression. Also explain the steps using suitable example expression.	[5]	2	4
Q.2(b)	Write a pseudo code to convert a decimal number to binary number using stack data structure.	[5]	2	3
Q.3(a)	Write an algorithm to perform the subtraction of two polynomials using liked list.	[5]	3	3
Q.3(b)	Write a pseudo code to insert a new node before the last node of a doubly linked list.	[5]	3	3
Q.4(a)	Write pseudo code to find the sum of K smallest elements in Binary Search Tree (BST)using linked list(K > 0 & K< number of nodes in a given BST).	[5]	4	4
Q.4(b)	Write an algorithm for Breadth First traversal. Also illustrate the traversal using suitable graph.	[5]	4	3
Q.5(a)	Write an algorithm for Insertion Sort and explain it using suitable example integer list.	[5]	5	4
Q.5(b)	Write the steps for K-way merging. Explain the process of sorting a dataset of size larger than the available RAM using K-Way merging.	[5]	5	4

::::::23/11/2024::::::E