

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

CLASS: IMSc./BTECH
BRANCH: MATHS & COMP./CSE

SEMESTER : III/ADD
SESSION : MO/2025

SUBJECT: CS231 DATA STRUCTURES

TIME: 02 Hours

FULL MARKS: 25

INSTRUCTIONS:

1. The question paper contains 5 questions each of 5 marks and total 25 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates
-

		CO	BL
Q.1(a)	What is an abstract data type? Explain with the help of an example.	[2]	1 1
Q.1(b)	Compare and contrast between static and dynamic data structures.	[3]	1 2
Q.2(a)	Summarize the essential criteria that an algorithm must satisfy.	[2]	1 2
Q.2(b)	Compute the complexity of the given algorithm with detailed step counts: void sub (int a[n][m], int b[n][m]) { for (int i=0; i<n; i++) { for (int j=0; j<m; j++) { c[i][j] = a[i][j] - b[i][j]; } } }	[3]	1,2 4,5
Q.3(a)	Highlight a major drawback of linear queues. How can we resolve the problem?	[2]	2 2,4
Q.3(b)	Convert the following Infix Expression to the equivalent Postfix Expression: A * (B ↑ C) - D * E Note: ↑ has the highest precedence	[3]	2 3,5
Q.4(a)	Evaluate the following Postfix Expression: 2 3 * 4 * 5 - 6 + 7 - (i.e. Two Three * Four * Five - Six + Seven -)	[2]	2 3.5
Q.4(b)	Write the pseudocode to insert a given element into a queue.	[3]	2,3 3,6
Q.5(a)	Differentiate between a linked list and an array in terms of memory allocation and element access.	[2]	2 2
Q.5(b)	Consider the below given linked list: 7 → 2 → 5 → 8 → 2 → 6 → 2 → NULL Write the pseudocode to traverse the list and count how many times the number '2' appears in the given list.	[3]	2, 3 3,6

:::::18/09/2025 :::::E