Total No. of Pages 1 IInd SEMESTER MID SEMESTER EXAMINATION

Roll No	
B.Tech.(CSE)	
(March-2025)	

Paper Code: CS-104 Time: 1:30 Hours		Title of the subject: Data Structures Max. Marks: 20	
algorithms. Assume suitable missing data, if any.			

 A singly linked list is used to store some floating point numbers in sorted order. We need to compute/return (1) sum of all numbers stored in linked list (2) average of all numbers stored in the linked list.

(a) Suggest complete structure of the linked list and associated storage/items so that we can find sum and average in O(1) time.

- (b) Write Insert() function to insert new number x into existing list.
 - (c) Write Delede() function to find and delete data x from list.

(d) Write getSum() and getAvg() functions which return sum and average respectively. (each one in O(1) time.)

[4+2+2+2=10 marks] ·

 Given array A[0:n-1] of integers, write an algorithm Rotate(A,n,k) to rotate array A right by k positions treating array A as circular array. Example A={2,3,4,5,6,7,8,9},

Rotate(A,8,3) will rotate A right by 3 positons and resultant array will be {7,8,9,2,3,4,5,6}. [Need to be done in one single loop only]. [5 marks]

3. A queue is implemented using circular array. We need to implement one special operation- secondChanceDeletion() which works as follows:

It will try to delete front element from queue but if element at front is being deleted first time, it is removed and then inserted back at rear position in same queue. This is called giving second chance to this element. But if element at front is one which earlier faced deletion but was give second chance, is now actually deleted from the queue. Define the data structure and write algorithm for secondChanceDeletion().

[5 marks]