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IIIRD SEMESTER

B.Tech.(Computer Engg.)

MID SEMESTER EXAMINATION (Sept. – 2022)

Course Code: COE-201 Course title: Data Structures

Time: 1:30 Hours Max. Marks: 20

Note:	Answer all questions. Use C codes /pseudo codes for you answers. Assume suitable missing data, if any.

1. A set is stored as an unordered linked list. Write a method to compute union of two sets s1, and s2 represented as linked lists. Your method should not destroy linked lists s1 and s2. Also compute time complexity of you algorithm.

[4+1][CO2)

2. Write an algorithm for returning value stored in k^{th} node (from end) of the singly linked list. (return first node value if linked list length is less than k and -1 if linked list is empty).

[4][CO2]

3. Consider strings constructed using only the following characters '(', ')', '[', and ']'. Character '(' matches with only ')' and '[' matches with only ']'. A string comprising of these characters is complete if every character is followed by its matching character or a substring that is complete followed by its matching character. For example "()", "[]", "([])", "[]([]())" are all examples of complete strings, while "([)]" and "[][(])" are examples of incomplete strings.
Write algorithm/code using character stack which accepts such strings as input and prints "Complete" or "Incomplete".

[4][CO1]

4. A queue is implemented using array. We need to modify behavior of queue. When a request to delete the front element X is called and X is being deleted first time, then element X is given a second chance. Here, X is removed from front side and inserted at rear side. But when X is the front element and a delete request comes, and it is second time a delete request comes and X is at front, it is removed from queue. Define modified queue data structure and write codes/pseudo codes for InsertQ() and DeleteQ() methods.

[4][CO1]

5. Consider a 3-dimensional array A[12][5][10] and base address of array is 20000. If this array is stored in row-major form, calculate the address of array element A[6][3][5]. Remember, array index starts from 0.

[3][CO1]