



COMSATS UNIVERSITY ISLAMABAD
DEPARTMENT OF COMPUTER SCIENCE
Mid Term Examination, Spring 2022

Class/Section:- BS (CS/SE/CT/AI/DS) all sections

Subject: - Data Structures and Algorithms

Instructor: - Dr. Inayat-ur-Rehman, Mr. Azfar Shakeel, Mr. Rashid Mehmood

Marks: - 25

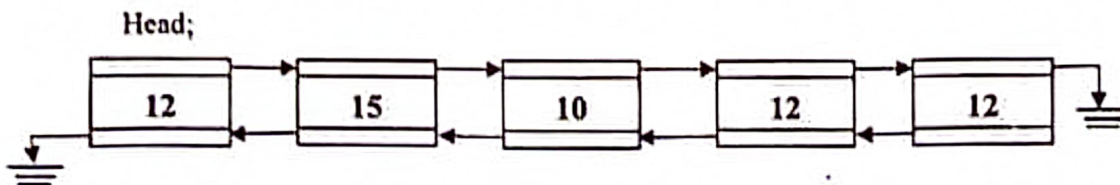
Time: - 90 minutes

Dated: - May 14th, 2022

Note: all questions carry equal marks.

-----CLO – 1-----

Q-1) Suppose we have following doubly linked list:-



Write a method which will take two arguments m & n, RemoveNth(m,n) the method should remove the m-value node from the list at its nth occurrence from end.

If called with these 12 and 2 arguments; the 2nd arrival of 12 which is fourth node should be deleted. Example call: RemoveNth (12, 2);

Q-2) Consider the following mathematical expression and convert it into postfix notation, write all the steps in a tabular form.

$$\frac{(a + b) (k - x)}{2y + d}$$

Q-3) A student class/structure is defined as following:

String RegNo,
String Name
Float GPA

Write a method to extract record of all the students having GPA greater than or equal to 3.0 from queue and store them in a stack, while the GPA less than 3.0 will remain in queue.

NOTE:

- The order of records in queue will not change, at the end the queue will have only records of students with GPA greater than 3.0 and stack will have records less than 3 GPA.
- Assume queue and stack data structures are already implemented.
- No other data structures such as array, list, LinkedList etc., can be used.

(PTO)

Q-4) Consider the following values

80, 60, 100, 110, 200, 90, 105, 50, 20, 40, 65, 75

Construct a binary search tree, then remove the node 50 and redraw the tree.

Q-5) Given a Binary Search Tree, write a method Count in BST class to count the number of leaf nodes in BST.

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