QUIZ-2

Time: 40 minutes

Total Points: 25

This is a closed book examination. Any kind of notes, books, electronic devices, etc., are not allowed.

In all questions, whenever applicable, you can assume that the head of the linked list is already given that you can directly use in your algorithm. You can write your algorithm in pseudocode or C. Other formats are not allowed.

1. Write an algorithm to find a node that contains the minimum value in a singly linked list of integers. You can assume that the list is not empty. [5]

2. Write an algorithm to delete all nodes that contains an even number in a singly linked list of integers. You can assume that the list is not empty and the first node contains an odd number. The time complexity of your algorithm should not be more than O(n). The extra space taken by your algorithm should not depend on the number of elements in the list. [7]

3. Write an algorithm to insert a new node at position 1000 in a doubly linked list of integers. You can assume that the list is not empty and a pointer to the new node is already given to you. The position of the first node in the linked list is zero, the second node is one, and so on. Your algorithm should print an error if the number of nodes in the linked list is less than 1000. What is the time complexity of your algorithm? The extra space taken by your algorithm should not depend on the number of elements in the list. [8]

4. Suppose array A is an array of integers sorted in descending order. Our goal is to sort array A in ascending order. We have two choices to sort array A in ascending order. The first choice is `Quicksort`, and the second choice is `Mergesort`. Which of the two sorting algorithms is better for this job? Justify your answer. [5]