**Data Structure Assignment**

**Last date for submitting the assignment is 16th April 2012.**

**Assignment submitted after the last date will not be credited**

**Arrays**

1. Write an algorithm to extract unique elements from a sorted array list.

2. Write an algorithm to merge two unsorted arrays to generate a sorted array.

3. Write an algorithm insert an element at a desired location of an array.

4. Write an algorithm to delete an element from an array.

5. Write an algorithm to find the duplicates in two unsorted arrays

6. Write an algorithm to circular left–shift and circular right–shift the elements of an

array by N places.

7. Write an algorithm to find the median and mode of two sorted arrays.

8. Write an algorithm to find two elements in an array whose sum is closest to zero.

**Linked List**

1. Write an algorithm to create a single linked list.

2. Write an algorithm to perform the following operations on the single linked list:

(a) Insertion at the beginning

(b) Insertion at the end

(c) Insertion at a specific position

(d) Insertion after a specific position

(e) Reversing the linked list

3. Write an algorithm to perform the following operations on the circular linked list:

(a) Insertion at the beginning

(b) Insertion at the end

(c) Insertion at a specific position

(d) Insertion after a specific position

(e) Reversing the linked list

4. Write an algorithm to perform the following operations on the grounded header

linked list:

(a) Insertion at the beginning

(b) Insertion at the end

(c) Insertion at a specific position

(d) Insertion after a specific position

(e) Reversing the linked list

5. Write an algorithm to perform the following operations on the circular header linked

list:

(a) Insertion at the beginning

(b) Insertion at the end

(c) Insertion at a specific position

(d) Insertion after a specific position

(e) Reversing the linked list

6. Write an algorithm to perform the following operations on the two–way circular

linked list:

(a) Insertion at the beginning

(b) Insertion at the end

(c) Insertion at a specific position

(d) Insertion after a specific position

(e) Reversing the linked list

7. Write an algorithm to perform the following operations on the single linked list:

(a) Deletion from the beginning

(b) Deletion from the end

(c) Deletion from a specific position

(d) Deletion after a specific position

(e) Deletion before a specific position

8. Write an algorithm to perform the following operations on the circular linked list:

(a) Deletion from the beginning

(b) Deletion from the end

(c) Deletion from a specific position

(d) Deletion after a specific position

(e) Deletion before a specific position

9. Write an algorithm to perform the following operations on the grounded linked list:

(a) Deletion from the beginning

(b) Deletion from the end

(c) Deletion from a specific position

(d) Deletion after a specific position

(e) Deletion before a specific position

10. Write an algorithm to perform the following operations on the circular header linked

list:

(a) Deletion from the beginning

(b) Deletion from the end

(c) Deletion from a specific position

(d) Deletion after a specific position

(e) Deletion before a specific position

11. Write an algorithm to perform the following operations on the two–way circular

linked list:

(a) Deletion from the beginning

(b) Deletion from the end

(c) Deletion from a specific position

(d) Deletion after a specific position

(e) Deletion before a specific position

12. Given a singly linked list, determine whether it contains a loop or not without using

temporary space.

13. Given a singly linked list , find the middle of the list in single traversal without

using temporary memory.

14. Write an algorithm to find (*n − k*)*th* node,where (*k < n*), in a single traversal.

15. Write an algorithm to reverse a singly linked list using recursion.