

Course Name : PG Diploma in Advanced Computing

Batch : August 2019

Module Name : Algorithm And Data Structures

Date : _____

Student Name : _____

Max Marks : 40 Marks

PRN No : _____

Duration : 2 Hours

1. Write a program to implement a circular doubly linked list. Also implement an iterator for the class. The class should provide member functions to

- Add a element **[20 Marks]**
 - at the beginning
 - at the end
 - after the position specified by an iterator object
- Delete
 - the first occurrence of a specific element
 - the element pointed by the iterator object

2. Write a program to implement the selection sorting with examples. **[10 Marks]**

Evaluation of Lab Exam should be based on the following criteria:

Criteria	Details	Max Marks	Marks Obtain
Efficiency	Documentation of Algorithm and Flowchart		
	Program adheres to the algorithm and flowchart		
	Program is using only the required number of variables /conditions/loops/pointers etc and is optimal		
	The program produces desired output for a given input		
	The program handles all valid and Invalid inputs		
	The program has meaning variable/function names		
	The program is commented properly (At least 20% of the code should be commented)		
Viva		10	
	Total Marks	40	

Signature of Student

Signature of Evaluator

Signature of Coordinator

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-
1. Implement the following class for Stack using Linked List

[20 Marks]

```
class Stack
{
    Public:
        //Constructor
        Stack(int);
        //Destructor
        ~Stack();
        //Copy constructor
        Stack(const Stack&);
        //Overloaded assignment operator. Implement deep copy
        Stack & operator = (const Stack &);
        void Push(int StackNo, char);
        char Pop(int StackNo);
        bool IsEmpty(int StackNo);
        bool IsFull(int StackNo);
        void Init(int StackNo);
}
```

2. WAP to sort the elements of an arrays using Insertion Sorting Mechanism.

[10 Marks]

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1. Implement the following class for Queue using Linked List [20 Marks]

```
class Queue
{
    public:
        //Constructor
        Queue(int);
        //Destructor
        ~Queue();
        //Copy constructor
        Queue(const Queue&);
        //Overloaded assignment operator. Implement deep copy
        Queue & operator = (const Queue &);
        void QInsert(int QueueNo, char);
        char Qdelete(int QueueNo);
        bool IsEmpty(int QueueNo);
        bool IsFull(int QueueNo);
        void Init(int QueueNo);
}
```

2. WAP to implement the bubble sorting logic in an array of the elements. [10 Marks]

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	Program is using only the required number of variables /conditions/loops/pointers etc and is optimal		
	The program produces desired output for a given input		
	The program handles all valid and Invalid inputs		
	The program has meaning variable/function names		
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Write a program to maintain a singly linked list having the following functions:

- Creation of the list **[10 Marks]**
- Displaying the list. **[10 Marks]**
- Traverse through the linked list and subtract two consecutive nodes. The result should be inserted just before the nodes subtracted.
E.g.: 5 15 8 9 2 6
Output: -10 5 15 -1 8 9 -4 2 6 **[10 Marks]**

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	The program handles all valid and Invalid inputs		
	The program has meaning variable/function names		
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Total Marks		40	

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