



EAST WEST UNIVERSITY

Department of Computer Science and Engineering

B.Sc. in Computer Science and Engineering Program

Mid Term I Examination, Spring 2022 Semester

Course: CSE207-Data Structures, Section-2
Instructor: Tanni Mittra, Senior Lecturer, CSE Department
Full Marks: 30 (20 will be counted for final grading)
Time: 1 Hour and 30 Minutes

Note: There are **5 (five)** questions, answer **ALL** of them. Course Outcome (CO), Cognitive Level, and Mark of each questionnaire are mentioned at the right margin.

1. What would be the contents of queue Q1 and queue Q2 after the following code is executed and the following data are entered: 5, 7, 12, 4, 0, 4, 6 [CO1, C3, Mark: 4]
 1. Q1 = createQueue
 2. Q2 = createQueue
 3. loop (not end of file)
 - 1 read number
 - 2 enqueue (Q1, number)
 - 3 enqueue (Q2, number)
 - 4 loop (not empty Q1)
 - 1 dequeue (Q1, x)
 - 2 enqueue (Q2, x)
 - 5 end loop
 4. end loop
2. Suppose you have already developed an SLL ADT. You have to search a specific element of the linked list. If you find the element in the list then you have to swap its previous node with its next node. Otherwise, simply print the message “Data not found”. Now write a function in your SLL ADT with this functionality. [CO1, C3, Mark: 5]
3. Consider a program that will take numbers as input. Whenever zero is entered as input then the previous negative numbers(if any) will be stored separately by maintaining the arrival order of the data. For all other cases store the data in such a way that it maintains the proper order of arrival. [CO1, C3, Mark: 6]
 - a. Now choose an appropriate data structure and solve the above-mentioned problem.
 - b. Also mention the reason why you have chosen the data structure?

4. Consider the following code. [CO1, C3, Mark: 10]

```
Void exammarks()
{
    DLL *s1= new DLL();
    s1->insert(1);
    s1->insert(2);
    s1->insert(3);
    s1->insert(4); .....
```

};

Here I have created an object of doubly linked list and taken 4 inputs as student ids. In DLL each node contains two address parts, by using one address part each node of the above-mentioned DLL holds the address of the next node. With the other address part, you have to take input marks of three exams of each student using a single linked list and connect with the doubly list. Now answer the followings:

- a. For the connection do you think the Node class definition needs to be changed for DLL? If yes then mention the changes.
- b. Write the code of connecting SLL of exam marks with DLL
- c. Display the student id with their exam marks.

Example: 1→10→20→30

|
2→12→13→14
|
3→14→15→14

5. Consider a linked list is already created and the following function is added newly in SLL ADT : [CO1, C3, Mark: 5]

```
Void fun1(int data)
{
    Node* newnode, *temp= head;
    newnode = new Node(data);
    While(temp->next!= NULL && temp->next->data <newnode->data)
    {
        temp = temp->next;
    }
    newnode->next = temp->next;
    temp->next = newnode;
}
```

- a. What is the functionality of the above snippet of code? Explain with your own words.
- b. Do you think it will work for all conditions? If not then rewrite the function to meet the condition.