EAST WEST UNIVERSITY
Department of Computer Science and Engineering
B.Sc. in Computer Science and Engineering Program
Mid Term I Examination, Fall 2021 Semester

Course: **CSE207-Data Structures, Section-3**
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 **6** (**six**) questions, answer ALL of them. Course Outcome (CO), Cognitive Level and Mark of each questionare mentioned at the right margin.

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1. Consider a bank has three teller counter and each of the counter has separate line for providing services to the customer. There also exists a central line where 10 customers are waiting for taking services. Here counter1 provides services for persons of ages 18 to below 30, counter2 provides services for persons of ages 30 to below 50 and counter3 is for persons of ages more than or equal to 50. **Write** a program (only function) to divide the customers waiting in the line to different teller counter but remember you have to maintain the proper order of the customer line. Also mention which data structure you want to use to solve the problem and why? [CO1, C3, Mark: 6]

2. Do you think that reversing a circular linked list is awkward? **Write** your answer with proper justification and answer. [CO1, C2, Mark: 3]

3. Suppose you are a programmer of EWU career counselling center (CCC). Let's consider CCC gives advices to students per day. Each time a student arrives and sit on a chair. If 10 chairs are allocated then students have to wait for the next day. Remember that, the student who will sit the chair first will get service first. [CO1, C3, Mark: 5]

a. In this situation which data structure you will use and why. Give proper justification.
b. **Write** a function that will co-ordinate students for getting advice from teachers regarding their career. You can use functions of ADT of appropriate data structures that we have created in our lab class

4. Consider a program that will take both positive and negative number as input. Whenever a negative number is entered then previous 5 positive numbers will be displayed. If previous positive numbers are less than 5 then stop reading the input and display "Nothing to Display". You have to dynamically allocate memory for the numbers. [CO1, C3, Mark: 6]

5. Consider the following code. [CO1, C3, Mark: 6]

```
Void quizmarks()
{
    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 take 4 input in the data part of the node which is student id. In DLL each node contains two address part , by using one address part each node of the above mentioned DLL hold the address of next node containing student id. With the other address part you have to take input marks of three quizzes of each student using single linked list and connect with the doubly list . Now answer the followings:

a. Write the Node class for the above requirement.
b. Write the code of connecting SLL of quiz marks with DLL

Example: 1→10→20→30
|
2→12→13→14
|
3→14→15→14

6. Consider a linked list is already created and the following function is added newly in SLL ADT : [CO1, C2, Mark: 4]

```
Void newinsert(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 will be the output of following dataset using above code
   i. Already created list: 2 4
      New node: 3
   ii. Already created list: 2 3 4
      New node: 1
b. Do you think for each of the input works perfectly with the above code? If not then write necessary changes in the code.