EAST WEST UNIVERSITY
Department of Computer Science and Engineering
B.Sc. in Computer Science and Engineering Program
Mid Term I Examination, Summer 2022 Semester

Course: **CSE 207- Data Structures, Section-1**
Instructor: **Dr. Maheen Islam, Associate Professor, CSE Department**
Full Marks: **40 (20 will be counted for final grading)**
Time: **1 Hour and 20 Minutes**

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

1.	Given a singly linked list, **write** a function *middleList*() that will find middle of the linked list. For example, if given linked list is 1->2->3->4->5 then output should be 3. If there are even nodes, then there would be two middle nodes, you need to print second middle element. For example, if given linked list is 1->2->3->4->5->6 then output should be 4.	[CO1,C3, Mark: 6]

2	Given a doubly linked list and a key **x**, **write** a function to delete all occurrences of the given key **x** from the doubly linked list.
	Examples:
	`Input : DLL: 2 <-> 2 <-> 10 <-> 8 <-> 4 <-> 2 <-> 5 <-> 2`
	`x = 2`
	`Output : 10 <-> 8 <-> 4 <-> 5`
		[CO1,C3, Mark: 6]

3.	Given a string str, **write** a program to print reverse of individual words using stack. **Examples:** Input : Hello World Output : olleH dlroW	[CO1,C3, Mark: 7]
4.	Given an integer k and a queue of integers, **write** a program to remove the first k elements of the queue, reverse their order and append them at the end of the queue, leaving the other elements in the same relative order. Only a stack can be used as an auxiliary space and the following standard operations are allowed on queue. • enqueue(x) : Add an item x to rear of queue • dequeue() : Remove an item from front of queue **Examples:** **Input:** Q = 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, k =5 **Output:** Q = 60, 70, 80, 90, 100, 50, 40, 30, 20, 10 **Input:** Q = 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, k =2 **Output:** Q = 30, 40, 50, 60, 70, 80, 90, 100, 20, 10	[CO1,C3, Mark: 7]
5.	**Apply** the algorithmic method to change the (A-B) * (C / (D+E) + F) expression in postfix expression using stack. Show each step of the conversion including stack contents and postfix expression.	[CO1,C3, Mark: 7]

6.	What would be the contents of queue Q after the following code is executed and the following data are entered? The data are: 5, 7, -12, 4, 0, 4, 6, -8, 67, 34, -23, -5, 0, 44, 33, 22, 6, 0. Show step by step output of the following code fragment.
	
	Q = createQueue
	loop (not end of file)
	read number
	if (number > 0)
	enqueue (Q, number)
	else
	x = dequeue (Q)
	enqueue (Q, x)
	end if
	end loop
		[CO1,C3, Mark: 7]