DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF TECHNOLOGY
FIRST SESSIONAL
SUBJECT: (CE-316) Data Structure and Algorithms

Examination	**: B.Tech Semester III**	**Seat No.**	**: 81**
Date	**: 31/07/2023**	**Day**	**: Monday**
Time	**: 11:00 AM to 12:15 PM**	**Max. Marks**	**: 36**

INSTRUCTIONS:
1. Figures to the right indicate maximum marks for that question.
2. The symbols used carry their usual meanings.
3. Assume suitable data, if required & mention them clearly.
4. Draw neat sketches wherever necessary.

Q.1 **Do as directed.** **[12]**

CO1	R	(a)	Write INSERT function of Simple Queue.	[2]
CO1	N	(b)	Write a short note on Priority Queue.	[2]
CO3	A	(c)	Reverse the content of the simple queue using recursion. Write a suitable algorithm.	[2]
CO1	R	(d)	Compare linked list with linear array.	[2]
CO3	A	(e)	Given the head of a singly linked list, write a function in C or C++ language which detects cycle in the list and returns true, if cycle exist, false otherwise.	[2]
CO3	A	(f)	Given the head of a sorted linked list, write an algorithm to delete all duplicates such that each element appears only once. Return the linked list **sorted** as well.	[2]

Q.2 Attempt ***Any TWO*** from the following questions. **[12]**

CO1	U	(a)	Write algorithms for following operations on Doubly Linked List. 1) Insert a node at beginning. 2) Delete a first node. The algorithm must handle all possible cases.	[6]
CO1	U	(b)	Write algorithms for following operations on Circular Singly Linked List. 1) Insert a node at end. 2) Delete a last node. The algorithm must handle all possible cases.	[6]
CO3	A	(c)	Write a recursive function in C or C++ language to merge two sorted linked list. Resultant linked list must also be sorted. Note that your solution must not create any extra node.	[6]

Q.3 Attempt the following questions. **[12]**

CO1	N	(a)	Write an ALGORITHM to convert infix expression into suffix form. Consider an infix expression without parentheses.	[6]
CO3	C	(b)	Explain with given example: Stack: [34, 3, 31, 98, 92, 23] Here, '23' is the top of the stack element How to sort the elements of the Stack using a temporary Stack?	[6]

OR

CO1	N	(a)	Convert infix expression into reverse polish form: A* B+(C *D/E)* F-G.	[6]
CO3	C	(b)	Write an ALGORITHM which performs the following operation. Reverse(XY) = Reverse(Y)Reverse(X). Ex. Consider X:'ab'and Y='abb'. Reverse(XY)=Reverse(ababb). Reverse(Y).Reverse(X)= Reverse(abb)Reverse(ab)= bbaba.	[6]