

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-III (NEW) EXAMINATION – WINTER 2021

Subject Code:2130702

Date:24-01-2022

Subject Name:Data structures

Time:10:30 AM TO 01:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) What do you mean by Data Structure? Give the difference between Primitive and Non-primitive data structures.	03
	(b) Discuss advantages and disadvantages of linked list over array.	04
	(c) Convert following infix expressions to the postfix expressions. Shows stack trace. $A/B\$C+D*E/F-G+H$ $(A+B)*D+E/(F+G*D)+C$	07
Q.2	(a) What do you mean by FIFO and LIFO?	03
	(b) What is Tower of Hanoi? Explain it with $n=3$.	04
	(c) Write an algorithm to perform insert, delete and display operations for simple queue.	07
	OR	
	(c) What is Stack? Write down algorithms for performing POP and PEEP operations on a stack.	07
Q.3	(a) Explain double ended queue.	03
	(b) Explain the concept of circular queue. Compare circular queue with simple queue.	04
	(c) Write a 'C' function to 1) deletion of a node at location 'LOC' from a singly linked list. 2) insert a node in beginning of a singly linked list.	07
	OR	
Q.3	(a) differentiate between stack & queue.	03
	(b) Explain Doubly linked list.	04
	(c) Write an algorithm to perform insert and delete operations on a circular Queue.	07
Q.4	(a) What is tree?	03
	(b) Explain representation of a binary tree using Array.	04
	(c) Define Graph. Write an algorithm to do BFS traversal of a Graph	07
	OR	
Q.4	(a) Explain Sequential search method.	03
	(b) Explain following with reference to graphs. (i)Weighted Graph (ii) Connected Graph	04
	(c) Explain binary tree traversals with proper example.	07
Q.5	(a) Briefly explain insertion sort.	03

- (b) Write a 'C' function for selection sort. **04**
- (c) Explain various Hash collision resolution techniques with example. **07**

OR

- Q.5**
- (a) Define following terms: Sequential, direct and Index sequential access of files. **03**
 - (b) Write a 'C' program for Bubble sort. **04**
 - (c) Explain Merge sort with proper example. **07**
