Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III (New) EXAMINATION – WINTER 2018

Subject Code: 2130702 Date:28/11/2018

Subject Name: Data Structure

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.**

Q.1	**(a)**	What is Recursion? Write a pseudocode in 'C' language to find the multiplication of two natural numbers.	**03**
	(b)	Differentiate between Stack and Queue.	**04**
	(c)	Write algorithms for Push and Pop operations on a stack.	**07**
Q.2	**(a)**	Convert Infix Expression A ^ B * C - D + E / F / (G + H) into Postfix expression using stack.	**03**
	(b)	Explain average case timing analysis for Search Algorithm.	**04**
	(c)	Write an algorithms to convert Infix Expression(without parenthesis) into Postfix Expression	**07**
		OR	
	(c)	Write algorithms for Insert and Delete operation in Circular Queue.	**07**
Q.3	**(a)**	Evaluate the Postfix Expression 6 2 3 + - 3 8 2 / + * 2 $ 3 + using Stack.	**03**
	(b)	Write an algorithm for insertion of node at last position in Liner Linked List.	**04**
	(c)	Create a Binary Search Tree for the following data and do Inorder, Preorder and Postorder traversal of the tree. 45, 70,30, 60, 15,75,35,55,20,85,80	**07**
		OR	
Q.3	**(a)**	Explain Priority Queue?	**03**
	(b)	Write an algorithm for deletion of node in Liner Linked List.	**04**
	(c)	What is Binary Search Tree? Construct a binary search tree for the following elements 11,6,14,8,12,15,16,7,9,23	**07**
Q.4	**(a)**	Write an algorithm for Bubble sort.	**03**
	(b)	Write an algorithm for insertion of a node in Doubly Linked List.	**04**
	(c)	What is hashing? Explain Different Hashing techniques in brief.	**07**
		OR	
Q.4	**(a)**	Write an algorithm for Selection sort.	**03**
	(b)	Write an algorithm for deletion of a node in Doubly Linked List.	**04**
	(c)	What is hashing? Explain hash clash and its resolving techniques.	**07**
Q.5	**(a)**	Explain spanning tree with example.	**03**
	(b)	Write an algorithm for Sequential Search.	**04**
	(c)	Explain different types of File Organizations and discuss the advantages and disadvantages of each of them.	**07**
		OR	
Q.5	**(a)**	What is Topological sorting?	**03**
	(b)	Write an algorithm for Binary Search.	**04**
	(c)	Explain Sequential Files and Indexed Sequential Files Structures.	**07**

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