

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-III (NEW) EXAMINATION – WINTER 2021****Subject Code:3134201****Date:02-03-2022****Subject Name:Data Structures and Algorithms****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.

	<b>MARKS</b>
<b>Q.1</b> (a) Explain selection sort with example.	<b>03</b>
(b) Differentiate: Linear Vs Non-linear data structure.	<b>04</b>
(c) Explain asymptotic notations in detail.	<b>07</b>
<b>Q.2</b> (a) Explain applications of stack.	<b>03</b>
(b) Explain Binary search with example.	<b>04</b>
(c) Explain types of queues in detail.	<b>07</b>
<b>OR</b>	
(c) Explain singly linked list and doubly linked list in detail.	<b>07</b>
<b>Q.3</b> (a) Explain different methods of recurrence.	<b>03</b>
(b) Explain collision resolution techniques in detail.	<b>04</b>
(c) Explain Merge sort with example.	<b>07</b>
<b>OR</b>	
<b>Q.3</b> (a) Explain activity selection problem in detail.	<b>03</b>
(b) Explain multiplication of two large integer numbers with example.	<b>04</b>
(c) Explain Quick sort with example.	<b>07</b>
<b>Q.4</b> (a) Define the following:	<b>03</b>
1. Undirected graph	
2. Directed Acyclic graph	
3. Loop	
(b) Differentiate: DFS Vs BFS.	<b>04</b>
(c) Construct the AVL tree for following sequence:	<b>07</b>
150,155,160,115,110,140,120,145,130,180	
<b>OR</b>	
<b>Q.4</b> (a) Define the following:	<b>03</b>
1. Degree of Tree	
2. Forest	
3. Complete binary tree	
(b) Construct binary search tree for following sequence and find inorder and preorder traversal for the same:	<b>04</b>
45,56,39,12,34,78,54,67,10,32,89,81	
(c) Explain kruskal's algorithm with example.	<b>07</b>
<b>Q.5</b> (a) Differentiate: Greedy Method Vs Dynamic Programming.	<b>03</b>
(b) Explain Minmax principle.	<b>04</b>
(c) Explain Matrix chain multiplication in detail.	<b>07</b>

**OR**

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|------------|----------------------------------------------------------|-----------|
| <b>Q.5</b> | (a) Explain general characteristics of greedy algorithm. | <b>03</b> |
|            | (b) Explain Making Change problem in detail.             | <b>04</b> |
|            | (c) Explain eight queen's problem in detail.             | <b>07</b> |

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