**Seat No.: _____** **Enrolment No._____**

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER–III (OLD) - EXAMINATION – SUMMER 2018**

**Subject Code:130702** **Date: 23/05/2018**

**Subject Name: Data and File 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.**

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|---|---|---|---|
| **Q.1** | **(a)** | What is Data Structure? Explain linear and non-linear data structures with examples. | **07** |
| | **(b)** | Explain row-major representation and column-major representation of array with suitable examples. | **07** |
| **Q.2** | **(a)** | Explain the concept of static memory allocation and dynamic memory allocation with appropriate examples. Also mention the advantages and disadvantages of each. | **07** |
| | **(b)** | Write a 'C' program to implement a stack using an array. | **07** |
| | | **OR** | |
| | **(b)** | Write a 'C' program to implement a queue using linked list. | **07** |
| **Q.3** | **(a)** | State and explain the applications of stacks with examples. | **07** |
| | **(b)** | Convert the following infix expression to postfix using stack<br>^ y / (5 - z) + 10*e x | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Explain circular queue, double ended queue and priority queue with examples. | **07** |
| | **(b)** | Write an algorithm or code in 'C' to search, insert, delete and delete element from a linked list. | **07** |
| **Q.4** | **(a)** | What is a threaded binary tree? State how to create a threaded binary tree with example. | **07** |
| | **(b)** | Write an algorithm or 'C' program to create a doubly linked list and display it in reverse order. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | What is AVL tree? State the different rotations in AVL tree with examples. | **07** |
| | **(b)** | Given the following data: **57,32,48,45,68,63,75,78,60,30**. Draw a binary search tree for the given data and give inorder, preorder and postorder traversal for the same, | **07** |
| **Q.5** | **(a)** | What is a Graph? Explain the adjacency list and adjacency matrix representation of Graph with example. | **07** |
| | **(b)** | Discuss BFS and DFS in graph with example. | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | What is hashing? What is a hashing function? State and explain in brief the collision resolution techniques in hashing. | **07** |
| | **(b)** | Explain Sequential, Indexed and Relative/Random File Organization. | **07** |

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