

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.

- 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 **07**
- $x \wedge y / (5 - z) + 10 * e$
- 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**
