

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III (OLD) - EXAMINATION – SUMMER 2017****Subject Code: 130702****Date: 02/06/2017****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 does abstract data type means? Briefly explain linear and non linear data structures. **07**
- (b) Explain PUSH and POP operation of the stack with algorithm. **07**
- Q.2** (a) Convert following infix expressions to the postfix expressions. Shows stack trace. **07**
- $$A/B\$C+D*E/F-G+H$$
- $$(A+B)*D+E/(F+G*D)+C$$
- (b) Write an algorithm to convert infix to postfix expression and explain it with example. **07**
- OR**
- (b) Write a Program to perform insert and delete operations on a circular Queue. **07**
- Q.3** (a) Define recursion. What care should be taken in writing recursive function? Give a recursive solution for the problem of “Towers of Hanoi”. **07**
- (b) Write an algorithm to insert and delete a node in Doubly Linked List. **07**
- OR**
- Q.3** (a) Differentiate between stack & queue. Also explain priority queue with example. **07**
- (b) Write a program to search an element in a linked list. **07**
- Q.4** (a) Create a Binary Search Tree for the following data and do in-order, Preorder and Post-order traversal of the tree. **07**
- 40, 60, 15, 4, 30, 70, 65, 10, 95, 25, 34
- (b) Define the following with example : **07**
- Strictly binary tree
 - Complete binary tree
- OR**
- Q.4** (a) How graph can be represented? Write an algorithm for Breadth First Search Traversal of a Graph. **07**
- (b) What is an AVL tree? Explain the different types of rotations used to create an AVL tree with suitable examples. **07**
- Q.5** (a) What is hashing? Explain hashing functions. **07**
- (b) Write a short note on inverted key file organization **07**
- OR**
- Q.5** (a) Define Hash Clash. Explain Primary Clustering, secondary clustering, rehashing and double hashing. **07**
- (b) Write a short note on indexed file organization. **07**
