Enrollment No: _____   Exam Seat No:_____

C.U.SHAH UNIVERSITY
Summer Examination-2018

Subject Name: Data and File Structure

Subject Code: 4TE03DFS1   **Branch: B.Tech (CE)**

Semester: 3   **Date: 02/04/2018**   **Time: 02:30 To 05:30**   **Marks: 70**

Instructions:
  (1) Use of Programmable calculator & any other electronic instrument is prohibited.
  (2) Instructions written on main answer book are strictly to be obeyed.
  (3) Draw neat diagrams and figures (if necessary) at right places.
  (4) Assume suitable data if needed.

Q-1   **Attempt the following questions:**
  a) What is the worst case time complexity of searching an element in a list? How?   **01**
  b) Name two divide and conquer algorithms for sorting.   **01**
  c) What is the height of a complete binary with n nodes?   **01**
  d) Give two applications of graphs.   **01**
  e) List operations performed on a stack.   **01**
  f) Write two simple hash functions.   **01**
  g) Define data structure.   **01**
  h) Explain space and time complexity.   **01**
  i) What is hash collision?   **01**
  j) List the applications of Stack.   **01**
  k) Define B-Tree.   **01**
  l) Write 'C' structure of Singly linked list.   **01**
  m) What is the time complexity of Quick sort algorithm in the worst case?   **01**
  n) List the applications of Binary trees.   **01**

Attempt any four questions from Q-2 to Q-8

Q-2   **Attempt all questions**
  a) Write a program to insert and delete an element after a given node in a singly linked list.   **07**
  b) Write an algorithm for Insertion sort method. Explain each step with an example.   **07**

Q-3   **Attempt all questions**
  a) Write differences between simple queue and circular queue. Write an algorithm for insert and delete operations for circular queue.   **07**
  b) Hash function map several keys into same address called collision. How collision resolution techniques work?   **07**

Q-4   **Attempt all questions**
  a) What is Stack? List out different operation of it and write algorithm for any two operation.   **07**

b)	Explain Breadth First Search in graphs with an example? List advantages and disadvantages of Breadth First Search and Depth First Search.		**07**

Q-5 **Attempt all questions**
a)	Write an algorithm to implement insert and delete operations in a simple queue.		**07**
b)	Explain Sequential, Indexed Sequential and Random file organizations.		**07**

Q-6 **Attempt all questions**
a)	Briefly explain various linear and non-linear data structures along with their applications.		**07**
b)	Write Prim's algorithm for minimum spanning tree with an example.		**07**

Q-7 **Attempt all questions**
a)	Explain insert and delete operations in AVL trees with suitable examples.		**07**
b)	Explain the trace of bubble sort on following data. 42,23,74,11,65,58,94,36,99,87		**07**

Q-8 **Attempt all questions**
a)	Convert A+(B*C-(D/E^F)*G) infix expression into postfix format showing stack status after every step in tabular form.		**07**
b)	What is binary tree traversal? What are the various traversal methods? Explain any two with suitable example.		**07**