Enrollment No: _____ Exam Seat No:_____

C.U.SHAH UNIVERSITY

Winter Examination-2019

Subject Name: Data and File Structure

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

Semester : 3 Date : 22/11/2019 Time : 02:30 To 05:30 Marks : 70

Instructions:

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

Q-1 **Attempt the following questions:**

a)	What is augmented data structure?	**(01)**
b)	What is the convex hull?	**(01)**
c)	What is space complexity?	**(01)**
d)	If you are using C language to implement the heterogeneous linked list, what pointer type should be used for implementation?	**(01)**
e)	Give the difference between B tree and B+ tree.	**(01)**
f)	What is an isolated graph?	**(01)**
g)	What is the complete binary tree?	**(01)**
h)	Are linked lists considered linear or non-linear data structures? Justify your answer.	**(01)**
i)	What is the main difference between Polish Notation and Reverse Polish Notation?	**(01)**
j)	Which data structure is used in the depth-first search?	**(01)**
k)	What is the balance factor in a height-balanced tree?	**(01)**
l)	Which data structures can be used to store a graph in computer memory?	**(01)**
m)	Define the term linear data structure.	**(01)**
n)	List out applications of circular linked list.	**(01)**

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

Q-2 **Attempt all questions**

(a)	Write an algorithm to insert and delete a node from the last location in a singly linked list.	**(07)**
(b)	Implement stack with the help of a linked list.	**(07)**

Q-3 **Attempt all questions**

(a)	What is the circular queue? List down its applications. Explain the Insert and Delete algorithm of circular queue.	**(07)**
(b)	Explain Prim's algorithm with a suitable example.	**(07)**

Q-4 **Attempt all questions**

(a)	Write an algorithm for the insertion sort method. Explain it with an example.	**(07)**
(b)	Insert the following sequence of elements into a Binary Search Tree (BST), with keys: 28, 25, 18, 26, 32, 39, 45, 17, 10, 29 and later delete 39 and 28 from the BST.	**(07)**

Q-5 **Attempt all questions**

(a)	What is hashing? Write a detailed note on various collision resolution techniques that are used in hashing.	**(07)**
(b)	Create a B-tree of order 5 with keys: 15, 26, 54, 58, 44, 87, 110, 72, 126, 95, 36, 125, 145, 166 and later delete 72 and 36.	**(07)**

Q-6 **Attempt all questions**

(a)	What is the meaning of the shortest path in the graph? Discuss about shortest path-finding algorithm with an example.	**(07)**
(b)	What do you mean by tree traversal? Explain various Tree traversal method with its algorithms and example.	**(07)**

Q-7 **Attempt all questions**

Do as directed

(a)	1) Write a short note on Threaded binary tree. 2) Discuss about Random File Organization.	**(07)**
(b)	Explain Jarvis March Algorithm.	**(07)**

Q-8 **Attempt all questions**

(a)	Explain the indexed file with its structure.	**(07)**
(b)	Discuss about Binary search method with a suitable example.	**(07)**