# C. U. SHAH UNIVERSITY
## Winter Examination-2022

**Subject Name : Data and File Structure**

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

**Semester : 3**         **Date : 13/01/2023**         **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:**         **(14)**

|    |    |    |
|----|----|----|
| **a)** | Define Data Structure | 1 |
| **b)** | What is time complexity? | 1 |
| **c)** | Draw a complete binary tree. | 1 |
| **d)** | Write applications of stack. | 1 |
| **e)** | Define B tree. | 1 |
| **f)** | Define node. | 1 |
| **g)** | Define height of tree. | 1 |
| **h)** | Define graph. | 1 |
| **i)** | Define stack. | 1 |
| **j)** | What is linked list? | 1 |
| **k)** | Write applications of queue. | 1 |
| **l)** | Define best case. | 1 |
| **m)** | Write the applications of linked list. | 1 |
| **n)** | Define primitive data structure. | 1 |

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

| **Q-2** | | **Attempt all questions** | **(14)** |
|----|----|----|----|
| | **A** | Explain array with its type, applications and examples. | **07** |
| | **B** | Explain bubble sort with the help of example. | **07** |

| **Q-3** | | **Attempt all questions** | **(14)** |
|----|----|----|----|
| | **A** | Write a note on Binary search. | **07** |
| | **B** | What is hashing? Explain in detail. | **07** |

| **Q-4** | | **Attempt all questions** | **(14)** |
|----|----|----|----|
| | **A** | List the types of operations on a file and explain them briefly. | **07** |
| | **B** | Explain the methods of Binary Search Tree with example. | **07** |

| Q-5 | | **Attempt all questions** | **(14)** |
|-----|---|---|---|
| | **A** | Write an algorithm to insert and delete a node from the last location in a singly linked list. | **07** |
| | **B** | What is the circular queue? Explain insertion algorithm of circular queue. | **07** |

| Q-6 | | **Attempt all questions** | **(14)** |
|-----|---|---|---|
| | **A** | What do you mean by tree traversal? Explain various tree traversal methods with examples. | **07** |
| | **B** | Write an algorithm to insert and delete an element from stack. | **07** |

| Q-7 | | **Attempt all questions** | **(14)** |
|-----|---|---|---|
| | **A** | Write a note on doubly linked list. | **07** |
| | **B** | Convert A + (B*C-(D/E^F)*G) infix expression into postfix form. | **07** |

| Q-8 | | **Attempt all questions** | **(14)** |
|-----|---|---|---|
| | **A** | Explain insertion sort with example. | **07** |
| | **B** | Define an AVL tree. Obtain an AVL tree by inserting one integer at a time In the following sequence. 150,155,160,115,110,140,120,145,130,147,170,180. Show all the steps. | **07** |