Seat No.: _____   Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
MCA – SEMESTER – II - EXAMINATION – SUMMER 2022

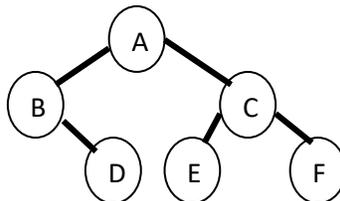**Subject Code: 629401**   **Date: 28/07/2022**
Subject Name: Data Structures

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)** Define the following terms.   **07**
        1. Priority Queues
        2. Mixed Graph
        3. Binary tree
        4. Height of tree
        5. Adjacent Node
        6. Loop in Graph
        7. Null Graph

    (b) What is KWIC indexing? Write the algorithm to generate the KWIC index   **07**
        listing with example.

Q.2 **(a)** Explain the storage structure for arrays in detail.   **07**
    (b) Write an insertion and deletion algorithms for Circular Queue.   **07**
                                  OR
    (b) What is recursion? Explain how stack is used in recursion.   **07**

Q.3 **(a)** Give the processing order of preorder, inorder and postorder of given tree. **07**
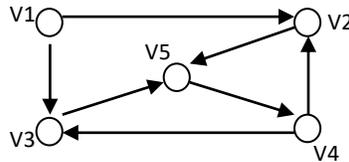

    Also write the algorithm for preorder traversal.

(b) What is Sparse Matrices? Explain sequential representation of Sparse Matrices with example.   **07**

<div align="center">**OR**</div>

Q.3 **(a)** Discuss the Matrix representation of Graphs? Also give the adjacency matrix for given graph.   **07**

(b) Explain BFS and DFS in detail. Also give the difference between BFS and DFS.   **07**

Q.4 **(a)** Write an algorithm for insertion of node at the end of linked list.   **07**

(b) Explain the application of trees in expression evaluation in details.   **07**

<div align="center">**OR**</div>

Q.4 **(a)** Explain the algorithm for deleting the node from binary search tree using example.   **07**

(b) Explain the selection sort process on following data.   **07**
<div align="center">44,22,75,10,65,56,92,36,98,85</div>

Q.5 **(a)** Discuss the Quick Sort algorithm with example.   **07**

(b) What is Hash-Table Methods? Discuss the Division Method in detail.   **07**

<div align="center">**OR**</div>

Q.5 **(a)** Explain Weight-Balanced Trees in detail.   **07**

(b) Write algorithms for insertion and deletion of node in doubly linked list.   **07**

<div align="center">*************</div>