Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA INTEGRATED– SEMESTER III- EXAMINATION –SUMMER-2022

Subject Code: 4430602 **Date: 13/06/2022**

Subject Name: Data Structure

Time: 02:30 PM to 05:00 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) Answer the Following. **07**

1. Define : Data Structures
2. Define :Primitive data structure
3. Give two example of Stack application.
4. Define graph.
5. What is dequeue?
6. Write application of tree.
7. Trie structure.

(b) Answer the Following. **07**

1. Define Minimum spanning tree.
2. Full form of KWIC.
3. Write application of queue.
4. Define Acyclic Graph.
5. Draw the node structure to represent polynomial having two variables.
6. Define Directed Graph.
7. Differentiate complete binary tree and full binary tree.

Q.2(a) Explain Tower of Hanoi problem of moving 3 discs. **07**

(b) Write an algorithm to add two one variable polynomials. **07**

OR

(b) Write the algorithm to convert infix to postfix and convert the following expression into postfix. **07**

A + B * C / D – E + F * G

Q.3(a) What are the operations performed on stack? Write algorithm to insert, update and delete element from stack. **07**

(b) Define Queue and Circular Queue. Also Explain How Circular Queue differs from Queue? Write an algorithm for insert of new element into Circular Queue. **07**

OR

(a) (1) Explain KWIC Indexing. **02**

(2) Explain Weight Balanced Tree. **02**

(3) Write the similarity & difference between tree and graph. Write the names of traversing methods of graph. **03**

(b) Explain pre-order, post-order and in-order traversal in binary tree. **07**

Q.4(a)	Explain and show Quick Sort on the following set of Numbers. 70 36 44 12 89 20 58 64 76 52	**07**
(b)	Define Sparce Matrix. Explain the Representation of Sparce Matrix with example.	**07**
	OR	
(a)	Define Searching. Write an algorithm for Binary Search.	**07**
(b)	Sort Following data using Heap Sort 18, 25,38,12,8,22,48,39,72,36	**07**
Q.5(a)	Explain Dijkstra's algorithm with example.	**07**
(b)	1. Give difference Between BFS and DFS.	**04**
	2. What is hashing? Write any one Collision Resolution Technique.	**03**
	OR	
(a)	Explain Kruskal's Algorithm with example.	**07**
(b)	Explain AVL tree with suitable example.	**07**

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