

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**MCA– SEMESTER II- EXAMINATION –SUMMER-2024**

**Subject Code: 629401**

**Date: 06/06/2024**

**Subject Name: Data Structures**

**Time: 10:30 AM TO 01:00 PM**

**Total Marks: 70**

**Instructions:**

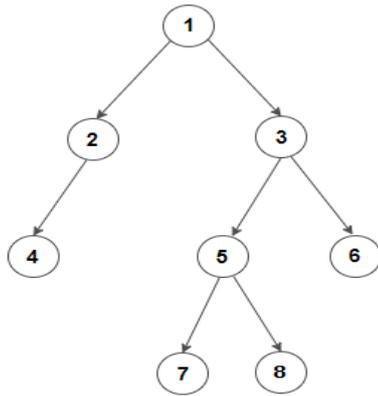
1. Attempt all questions.
2. Make Suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Use of simple calculators and non-programmable scientific calculators are permitted.

- Q.1 (a)** Answer the following questions. **07**
- a. LIFO stands for\_\_\_\_\_
  - b. Define data structure.
  - c. Write two simple hash functions.
  - d. List operations performed on a stack.
  - e. Define Mixed Graph
  - f. Write down complexity of binary search algorithm.
  - g. Define Binary tree
- (b)** Explain stack. Write an algorithm to PUSH & POP using array representation. **07**
- Q.2 (a)** Explain the data structure classification. **07**
- (b)** What is KWIC indexing? Write the algorithm to generate the KWIC index listing with example. **07**
- OR**
- (b)** Write an algorithm to perform various operations (insert, delete and display) for simple queue **07**
- Q.3 (a)** Convert following expression in infix to postfix.
- a.  $(A+B^D) / (E-F) + G$  **04**
  - b.  $(A-B) * (C/D) + E$  **03**
- (b)** What is Sparse Matrices? Explain sequential representation of Sparse Matrices with example. **07**
- OR**
- Q.3 (a)** Write an algorithm for deletion of node at the end of singly linked list. **07**
- (b)** What is spanning trees? Explain DFS and BFS spanning trees in detail. **07**
- Q.4 (a)** Discuss how following numbers are sorted using Quick Sort. **07**  
38,81,22,48,13,69,93,14,45,58,79,72
- (b)** What is doubly linked list? Write procedure to insert and delete an element from doubly linked list. **07**
- OR**
- Q.4 (a)** Describe the matrix representation of graphs in detail. **07**
- (b)** Write short note on binary search with example. **07**
- Q.5 (a)** What is hashing? Explain various techniques for collision resolution with appropriate example. **07**
- (b)** Explain Selection sort with algorithm. **07**

**OR**

**Q.5 (a)** Give the processing order of preorder, inorder and postorder of given tree.

**07**



**(b)** List out Hashing Method. Explain any two of them.

**07**

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