

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY**

**MCA- II<sup>nd</sup> SEMESTER-EXAMINATION -JUNE - 2012**

**Subject code: 620001**

**Date: 08/06/2012**

**Subject Name: Data Structures (DS)**

**Time: 10:30 am – 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 Attempt following. 14
- a) Explain best case, average case and worst case in analysis of algorithm.
  - b) List out the common operations performed on all Data Structure.
  - c) Give definition with example
    - a. Vertices
    - b. Null graph
  - d) List out the areas where Data Structure is used extensively.
  - e) What is the role of HEAD node in doubly linked list?
  - f) What is storage structure and file structure?
  - g) Which kind of recursion Factorial function belongs to?
- Q.2 a) What is stack and write an algorithm for PEEP and CHANGE operations. 07
- b) Write an algorithm for inserting new node in singly linked list 07
- OR
- b) Write an algorithm for queue insert and delete with an example which shows the tracing of each operation on simple queue. 07
- Q.3 a) Write a brief note on application of Linked Linear Lists. 07
- b) Write an algorithm for deleting an element from input - restricted queue. 07
- OR
- Q.3 a) Write an algorithm for Circular Queue operations. 07
- b) Write an algorithm which perform operations to insert a new node at the end of the doubly linked list. 07
- Q.4 a) Write an algorithm for Linear Search. 07
- b) Explain binary tree and complete binary tree with suitable example. 07
- OR
- Q.4 a) List out the Applications of Tree. 03
- b) Give the difference between DFS and BFS. 04
- c) Write an algorithm for Binary Search. 07
- Q.5 a) What is sorting? Explain Bubble sort algorithm and trace it with sample data. 07
- b) What are the various techniques for collision-resolution? Explain in detail 07
- OR
- Q.5 a) Write an algorithm for Selection sort. 07
- b) What is hashing function? Explain the following hashing methods 07
- a. The Folding Method
  - b. The Division Method
  - c. The Midsquare Method

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