

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
MCA Integrated - SEMESTER-III • EXAMINATION – SUMMER • 2015

Subject Code: 4430602

Date: 05-05-2015

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) Do As Directed : 07**
1. List out applications of stack.
 2. Complexity of binary search is _____.
 3. _____ sort is the fastest sorting technique.
 4. Shortest path can be found with _____ algorithm.
 5. AVL Tree is the _____ balanced tree.
 6. Tree and Graph are _____ data structure. [Linear/Non-linear]
 7. Merge Sort follows _____ approach.
- (b) Write Algorithms : 03**
1. Push() operation in Stack 04
 2. Insert() operation in simple queue.
- Q.2 (a) Write a short note on primitive and non primitive data structure. 07**
- (b) What is stack? Compare iteration and recursion by taking the e.g. of factorial program. 07**
- OR**
- (b) Explain Tower of Hanoi problem of moving 3 discs. 07**
- Q.3 (a) Write algorithms of following operations of circular queue. 07**
1. Insert an element
 2. Delete an element
- (b) How to create node of one variable polynomial? Write an algorithm to add two polynomials. 07**
- OR**
- Q.3 (a) Explain quick sort with algorithm. 07**
- (b) What is searching? Explain linear search and binary search with suitable e.g. 07**
- Q.4 (a) Sort the following elements using heap sort (use MaxHeap) 07**
- 45, 20, 70, 99, 11, 98, 22
- (b) Find out postorder traversal from the given traversals. 07**
- Inorder : A B D F G H J K L N
Preorder: G D B A F J H L K N
- OR**
- Q.4 (a) Create AVL tree from the following elements : 07**
- 1, 2, 3, 4, 5, 6
- (b) 1. Write a short note on topological sort. 04**
- 2. Write a short note on trie structure. 03**
- Q.5 (a) What is spanning tree? Explain Prim's algorithm with suitable e.g. 07**
- (b) What is hashing? List out hashing methods. How does collision occur in hashing and how to resolve collision? 07**

OR

- Q.5** (a) Explain 2 ĩ 3 tree and weight ĩ balanced tree with e.g.
(b) Explain Dijkstraĉs algorithm with e.g.

07

07
