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 :

1. Push() operation in Stack **03**
2. Insert() operation in simple queue. **04**

Q.2 **(a)** Write a short note on primitive and non ï 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 Primôs 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 ï 3 tree and weight ï balanced tree with e.g.	**07**
	(b)	Explain Dijkstraôs algorithm with e.g.	**07**

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