Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA INTEGRATED - SEMESTER–III • EXAMINATION – SUMMER 2017

Subject Code: 4430602 **Date:08/05/2017**

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 :

1. What is the advantage of doubly linked list over singly linked list? **01**
2. What is circular queue? **01**
3. Draw node structure of 3 – variable polynomial. **01**
4. Give difference between full binary tree and complete binary tree. **02**
5. Define : best case and worst case of time complexity. **02**

(b) Do as directed :

1. Define : multiplicity and weighted graph **02**
2. Define : parallel edges and multigraph **02**
3. Define : biconnected graph and cutvertex **02**
4. If there are 20 nodes in binary tree, then it is having _____ null branches. **01**

Q.2 **(a)**

1. Draw expression tree of the following expression : **03**
   A * B + C – D + E * F / H
2. Write algorithm to insert an element in circular queue. **03**
3. If depth of the binary tree is 5, then total no. of nodes are _____ . **01**

(b) Find preorder: **07**

Inorder : 1 3 5 6 4 2 7

Postorder : 6 5 4 3 7 2 1

OR

(b) Convert following infix expression into postfix using stack table. **07**

A * B + C – D + E * F / H

Q.3 **(a)**

1. Give difference between BFS and DFS. **03**
2. Explain topological sorting in detail with e.g. **04**

(b) What is asymptotic notation? List and explain asymptotic notations in detail. **07**

OR

Q.3 **(a)** Draw AVL tree using following elements : **07**

21,22,23,24,25,26

(b)

1. Give difference between linear search and binary search. **03**
2. Explain KWIC indexing in detail with e.g. **04**

Q.4 **(a)** Write algorithm to add two 3 – variable polynomials. **07**

(b) Write algorithm of quick sort and arrange following elements in sorted order using quick sort. **07**

50,15,62,5,20,58,91,3

OR

Q.4 **(a)** Write algorithm to insert and delete node from circular singly linked list. **07**

(b) Arrange following elements in sorted order using heap sort. **07**

50,15,62,5,20,58,91,3

Q.5 **(a)** What is hashing? Explain collision resolution techniques in detail. **07**

	(b)	What is MST? Explain Kruskal's algorithm by taking e.g.	**07**
		OR	
Q.5	**(a)**	Explain Dijkstra's algorithm by taking e.g.	**07**
	(b)	1. Write a short note on trie structure.	**03**
		2. Write a short note on garbage collection.	**04**

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