Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA - SEMESTER– II• EXAMINATION – WINTER 2016

Subject Code: 2620001 **Date:31/12/ 2016**

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)** Define following terms : **07**

1. Multiplicity
2. Cutvertex
3. Spanning tree
4. Ancestor
5. Sling
6. Stack
7. Full binary tree

(b) Do as directed : **07**

1. What is variable – length record?
2. Which algorithms are used to find minimal cost spanning tree?
3. Define: best case and worst case.
4. Give difference between stack and queue.
5. What is simulation?
6. What is the advantage of B – tree?
7. List out applications of stack.

Q.2 **(a)** Convert following infix expression into postfix by using stack table. **07**

A * B + C – D / E * F ^ G

(b) What is asymptotic notation? List and explain asymptotic notations with proper e.g. **07**

OR

(b)

1. Write a short note on KWIC indexing. **04**
2. Explain primitive and non – primitive data structures. **03**

Q.3 **(a)**

1. Write an algorithm to insert an element in circular queue. **03**
2. Write an algorithm to delete specific element from circular singly linked list. **04**

(b) Draw binary search tree from the given elements and traverse the tree in preorder, postorder and inorder. **07**

20, 10, 5, 7, 50,45,75, 65, 80, 3, 1

OR

Q.3 **(a)** Write an algorithm to add two 3 – variable polynomials using singly linked list. **07**

(b)

1. Draw expression tree of given expression : A * B + C – D / E * F ^ G **03**
2. Give difference between linear search and binary search. **04**

Q.4 **(a)**

1. What is the advantage of AVL tree over BST. **03**
2. Explain 2 – 3 tree in detail. **04**

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

60, 20, 40, 10 , 80, 70, 30, 50

OR

Q.4	**(a)**	Explain threaded binary tree in detail with e.g.	**07**
	(b)	1. Write a short note on garbage collection.	**04**
		2. Explain trie structure with e.g.	**03**
Q.5	**(a)**	1. Give difference between BFS and DFS.	**04**
		2. Explain topological sorting in detail with e.g.	**03**
	(b)	Arrange following elements in sorted order using heap sort. 60, 20, 40, 10 , 80, 70, 30, 50	**07**

OR

Q.5	**(a)**	1. Explain sparse matrix with multi – linked structure in detail with e.g.	**04**
		2. Explain Dijkstra's algorithm in detail.	**03**
	(b)	What is collision? List and explain collision – resolution techniques with proper e.g.	**07**

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