

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**
 $A * B + C - D / E * F \wedge G$
- (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 : $A * B + C - D / E * F \wedge G$ **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. **07**
60, 20, 40, 10 , 80, 70, 30, 50

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**
