

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
MCA - SEMESTER- II EXAMINATION – SUMMER 2017

Subject Code: 2620001

Date: 31-05-2017

Subject Name: Data Structures

Time: 10:30 am - 01:00 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 the following terms **07**
1. Primitive data structure
 2. m-ary Trees
 3. Forest
 4. Spanning tree
 5. Sparse matrix
 6. Null graph
 7. Avl tree
- (b)** What is string? Explain any four the string handling functions. Write the applications of string **07**
- Q.2 (a)** What is stack? Write the algorithm for pop. Explain the applications of stack **07**
- (b)** Write the algorithm to convert infix to postfix and convert the following expression into postfix. **07**
- $A + B * C / D - E + F * G$
- OR**
- (b)** Explain the storage structure of a two dimensional array **07**
- Q.3 (a)** What is a priority queue? Write the algorithm to insert and delete element from a priority queue. **07**
- (b)** What is a binary tree? How it is stored in memory? Explain the traversal technique in a binary tree. **07**
- OR**
- Q.3 (a)** What is a linked list? Write the algorithm to insert an element in a doubly linked list. **07**
- (b)** Differentiate BFS and DFS. Explain how it works with a suitable example **07**
- Q.4 (a)** Write the algorithm for quick sort and sort the following numbers according to it. **07**
- 25, 85, 60, 10, 58, 47, 35, 16, 72, 50
- (b)** What is heap? Demonstrate heap sort with a suitable example. **07**
- OR**
- Q.4 (a)** What is graph? Explain all the representation of graphs with suitable example. **07**

- (b) Explain all the deletion processes in a binary tree with example. **07**
- Q.5** (a) What is hashing? Explain the hashing functions with example. **07**
- (b) What is a binary search tree? Create binary search tree for the following data. **07**
Write all the traversal order for the created tree
32, 75, 48, 82, 68, 99, 87, 15
- OR**
- Q.5** (a) Write and explain Dijkstra's algorithm for shortest path **07**
- (b) What is complexity of an algorithm? Compare the algorithms of selection and merge sort using algorithm analysis technique. **07**
