

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**

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|------------|------------|---|-----------|
| | (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 |
