

GUJARAT TECHNOLOGICAL UNIVERSITY**MCA – SEMESTER – II • EXAMINATION – SUMMER 2018****Subject Code: 3620002****Date: 21-May-2018****Subject Name: Data Structures****Time: 10.30 am to 1.00 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 **07**
1. Define the following terms.
Binary tree, Height of the tree
 2. What is a dequeue?
 3. Write application of priority queue.
 4. Write at least three operations normally performed on Tree.
 5. Which traversal of Binary search tree gives the data elements in ascending order?
 6. List any four application of data structure in computer science.
 7. What is KWIC indexing?
- (b)** Write down various primitive and non primitive data structure in detail. **07**
- Q.2 (a)** What is stack and write an algorithm for PEEP and CHANGE operations. **07**
- (b)** Convert a given INFIX expression to POSTFIX expression **07**
(A + B) * (C * (D + E) + F)
- OR**
- (b)** Compare simple queue and circular queue and write an algorithm to insert element in circular queue. **07**
- Q.3 (a)** What is doubly linked list? Write procedure to insert and delete an element from doubly linked list. **07**
- (b)** Write short note on threaded storage representation of binary tree with example. **07**
- OR**
- Q.3 (a)** Define singly linked list. Write an algorithm to implement following operation in singly linked list. **07**
1. Insert the node at the beginning of linked list.
 2. Insert the node at the end of linked list
- (b)** What is graph? Explain all the representation of graphs with suitable example. **07**
- Q.4 (a)** What is a binary search tree? Create binary search tree for the following data. **07**
Write all the traversal order for the created tree.
11, 8, 2, 20, 17, 14, 26, 22, 25
- (b)** Compare BFS and DFS. Explain how it works with an example. **07**
- OR**
- Q.4 (a)** Explain the delete operation to delete an element from a binary tree by giving suitable example with following cases. **07**
- (1) Delete a leaf node
 - (2) Delete a node having single child node (left or right)
 - (3) Delete a node having two child nodes
- (b)** Explain binary search technique with suitable example. **07**
- Q.5 (a)** Write short notes on (i) AVL tree (ii) 2-3 tree. **07**

- (b) Arrange following elements in sorted order using heap sort. **07**
25 37 52 38 12 86 92 35

OR

- Q.5** (a) Write the algorithm for quick sort and sort the following numbers using quick sort. **07**
25,17,57,90,13
- (b) What is hashing? Write down any four collision resolution techniques. **07**

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