

Roll No.

Total No. of Pages : 02

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B.Tech. (Electronics and Communication Engg.) (Sem.-4)

**DATA STRUCTURES AND ALGORITHMS**

Subject Code : BTCS-301-18

M.Code : 77567

Date of Examination : 07-07-22

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A**

**1. Write briefly :**

- a. What is a Queue? Write applications of queue.
- b. Define link list. How it is represented in memory?
- c. What is a data structure? Give example.
- d. Compare single and doubly linked list.
- e. What do you mean by algorithmic complexity?
- f. Discuss the sequential representation of a tree.
- g. How you can delete a node from an existing binary tree.
- h. Distinguish between linear and binary search techniques.
- i. Compare array and linked list data structures.
- j. What is a priority queue? How it is created?

## SECTION- B

2. What do you mean by stack? Explain the various operations of stack.
3. Write an algorithm for linear search and discuss with suitable example.
4. Write an algorithm for Selection sort and discuss the same with the help of an example.
5. What is a binary tree? Explain binary tree traversals with the help of an example.
6. Define Graph. Explain BFS and DFS graph traversals with examples.

## SECTION-C

7.
  - a) Compare sequential and linked memory representation of binary tree.
  - b) What is the concept of Hashing? Explain the various techniques used for hashing. How collisions are handled while addressing?
8. Write an algorithm to insert a new node in a sorted one-way link list and illustrate with the help of an example.
9. What is a circular queue? Write algorithm how you can insert and delete an element from circular queue. Write its applications also.

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**