Code No : **19CST301/19ITT301**

R19

II B. Tech I Semester Regular Examinations, March - 2021

DATA STRUCTURES

(Common CSE and IT)

Time : 3 Hours **Max. Marks : 60**

Note : Answer **ONE** question from each unit **(5 × 12 = 60 Marks)**

~~~~~~

UNIT-I

1. a) Write an algorithm to implement Quick sort. [6M]

   b) Derive the best case, worst case time complexities of the same. [6M]

(OR)

2. a) Sort the array 28, 98,3, 67,87,65 using Insertion Sort, and find the element with key 87 using binary search. [8M]

   b) Write pseudo code for merge sort algorithm. [4M]

UNIT-II

3. a) Explain the applications of Stacks. [6M]

   b) Read a list of integers (say A= {1,3,5,7,9,2,4,6,8}) and print them in reverse order using a stack. [6M]

(OR)

4. a) Explain the implementation of queue operations using Stack. [6M]

   b) Discuss the implementation of Round robin algorithm using a Queue. [6M]

UNIT-III

5. a) Write short note on sparse matrix manipulation using linked list. [6M]

   b) What are the various operations performed on a single linked list? Describe them using suitable diagrams. [6M]

(OR)

6. a) What is a Circular linked list? Mention few advantages and disadvantages of a Circular linked list. [6M]

   b) Why Double linked list is called a two-way list. Explain with a diagram. [6M]

UNIT-IV

7. a) Represent a binary tree using arrays and suggest appropriate formulae to store siblings in a binary tree. [6M]

   b) Write an algorithm to perform insertion operation in a binary tree. [6M]
~~~~~~

(OR)

8. a) Define binary search tree ? Create the binary search tree with the following elements 12, 19, 46, 37, 88, 96, 20 and then delete 46 and 12. [6M]

   b) Explain tree traversing techniques. [6M]

UNIT-V

9. a) Discuss the properties of a tree and a graph in detail. [6M]

   b) Explain how graphs can be represented with examples. [6M]

(OR)

10. a) Explain Prim's algorithm with example. [6M]

    b) Explain how BFS traversing algorithm can be used to check a given graph is connected or not. [6M]

*** * * * ***