Roll No. | | | | | | | | | | | | |  Total No. of Pages : 01

Total No. of Questions : 08

M.Tech.(IT)E2(2015 & Onwards)/(CSE Engg.) (2015 to 2017) (Sem.–2)

# ADVANCED DATA STRUCTURES

Subject Code : MTCS-201

Paper ID : [72885]

Time : 3 Hrs. Max. Marks : 100

**INSTRUCTION TO CANDIDATES :**

1. **Attempt any FIVE questions out of EIGHT questions.**
2. **Each question carries TWENTY marks.**

1. a) Show how to determine in $O(n^2 \log n)$ time whether any three point in a set of n point collinear.

   b) Explain and analyze the algorithm for finding the closest pair of points.

2. Give the computational complexity of single source shortest path algorithm for the following graph representations :

   a) Adjacency matrix representation.

   b) Adjacency list representation.

3. a) What do you understand by the chromatic number of a graph? Give an example,

   b) Write an algorithm to find the kth smallest element of set S.

4. a) Explain and analyze ford-fulkerson algorithm for maximum flow .

   b) Discuss Edmond-karp algorithm for maximum flow.

5. a) Give a brief description of pattern matching problem and explain the Boyre- Moore algorithm with an example.

   b) Also five advantages and disadvantages of using AVL Trees.

6. a) Perform an analysis of closed hashing for unsuccessful search and insertion.

   b) Write about Prim's algorithm, its application and analyze both its space and time complexity.

7. Sort the following elements using Heap Sort : 17, 78, 5, 34, 28, 5, 19, 33, 27, 18, 4, 1, 11. Find the lower bound on worst case complexity.

8. How is colouring problem solved using Recursive Backtracking algorithm? Analyze the algorithm for its space as well as Time complexity.