Exam. Code : 206702
Subject Code : 4102

M.Sc. Computer Science 2nd Semester
DESIGN AND ANALYSIS OF ALGORITHMS
Paper—MCS-203

Time Allowed—Three Hours]　[Maximum Marks—100

Note :— There are **FOUR** Sections, each having **TWO** questions. Attempt any **FIVE** questions, selecting at least **ONE** from each section. All questions carry equal marks.

SECTION—A

1. (a) What is need of Algorithm ? What is difference between Algorithm and Pseudocode ? Write the features of algorithms.

   (b) How would you measure running time of Algorithm ? What is purpose of studying time/ space complexity ?

2. What do you mean by asymptotic notations ? Explain briefly Big O notation, Omega notation and Theta notation. Give example of each.

SECTION—B

3. What is divide and conquer strategy ? When it can be used ? Write some general characteristics of problem where this strategy does not fit ?

4. Apply merge sort algorithm on the array given below. Also find the time complexity using divide and conquer strategy. {310, 285, 179, 652, 351, 423, 861, 254, 450, 520}.

SECTION—C

5. What is Knapsack problem ? What do you mean by Greedy method ? Write an algorithm to solve Single Source Shortest Path problem using greedy method.

6. What is spanning tree ? What is Minimum cost spanning tree ? Write the differences between Prim's and Kruskul's algorithm to find minimum cost spanning tree. Explain with an example.

SECTION—D

7. Explain the advantages of using dynamic programming. Introduce travelling salesman problem. Explain the technique to solve travelling salesman problem using this technique.

8. Explain various searching techniques available for Tree and Graph data structures.