Total No. of Questions : 8] *[Total No. of Printed Pages : 2*

Roll No .....

MCTA-102

M.E/M.Tech., I Semester

Examination, June 2016

Programming System

Time : Three Hours

Maximum Marks : 70

Note: i) Total number of questions eight. Attempt any five questions.

ii) All questions carry equal marks.

1. a) What are the different ways to represent linked list in memory? Explain by giving proper examples. Also write the advantages and disadvantages of each type. 7

   b) What are the different tree traversal techniques? Write a non-recursive algorithm for inorder tree traversal. Also give suitable examples. 7

2. a) Explain Hashing procedure. Give four advantages of a chained hash table over open addressing. 7

   b) Does every algorithm have a running-time equation? In other words, are the upper and lower bounds for the running time (on any specified class of inputs) always the same? 7

3. a) Explain the divide and conquer techniques. Write down the algorithms of finding out maximum and minimum in given array using this techniques. 7

   b) Explain the concept of Dynamic Programming and a problem based on this approach. 7

http://www.rgpvonline.com

4. a) How does strassen's matrix multiplication achieve improvement over conventional divide and conquer techniques of matrix multiplication? Determine time complexity of Strassen's matrix multiplication. 7

   b) How backward approach can be used to solve a multistage graph problem. Explain with the help of an example. 7

5. a) Solve the travelling salesman problem having following cost matrix using branch and bound technique. 7

	A	B	C	D
A	∞	20	30	10
B	15	∞	16	4
C	3	5	∞	2
D	19	6	18	∞

   b) Discuss the relationship between class P, NP, NP complete and NP hard problems with example of each class. 7

6. a) Explain deterministic and non-deterministic polynomial time algorithms. 7

   b) Write a program to implement the Merge Sort Algorithm using divide and conquer strategy. 7

7. a) What is Priority Queue? Write an algorithm to delete the first elements in a Priority Queue. 7

   b) Explain in brief heap and balanced trees. 7

8. Write short notes on the following (any four): 14
   a) NP complete problem
   b) Algorithm analysis
   c) Pre-fix and Post-fix expression
   d) Stack and Queues
   e) Set algorithms

******

http://www.rgpvonline.com

http://www.rgpvonline.com

http://www.rgpvonline.com

http://www.rgpvonline.com

http://www.rgpvonline.com