Roll No. .....

3rd Semester, Examination–2014

MCA-11 / MSc (IT) 12

(Master of Computer Applications/ Master of Science in Information Technology)

MCA-12 / MSc. IT-12

Design and Analysis of Algorithm

Time : 3 Hours **Maximum Marks :** 60

Note : The question paper is divided into three sections A, B and C. Give the answer according to the directions given in each section.

Section-A

(Long Answer Type Questions)

Note : Answer any two questions. Each question carries 15 Marks.

(2×15=30)

1. What do you mean by dynamic programming? What is the difference between dynamic programming and greedy method?

2. Write the algorithm of Heap sort and find the running time of this algorithm.

3. What is an algorithm? Discuss in detail about its properties.

4. How does the binary search algorithm follow the divide and conquer method? Explain with an example.

Section-B

(Short Answer Type Questions)

Note : Answer any four questions. Each question carries 5 Marks.

$(4 \times 5 = 20)$

1. Explain graph coloring problem.

2. Explain travelling salesman problem.

3. Explain Dynamic programming.

4. Explain the basic conecpt of a divide-and-conquer algorithm.

5. Write an algorithm for eight qeens problem.

6. What are the characteristics of dynamic programming ?

7. What is 0/1 knapsack problem? Explain it with an example.

8. Explain the need of Analysis of Algorithm.

Section-C

Objective Type Questions (Compulsory)

Note : Answer all questions. Each question carries 1 Mark.

$(10 \times 1 = 10)$

1. Two main measures for the efficiency of an algorithm are :

   A. Processor and memory

   B. Complexity and capacity

   C. Time and space

   D. Data and space

2. The time factor when determining the efficiency of algorithm is measured by :

   A. Conting microscconds

   B. Conunting the number of key operatins

   C. Counting the number of statements

   D. Counting the kilobytes of algorithm

3. Which of the following case does not exist in complexity theory:

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   A. Best case

   B. Worst case

   C. Avcragc casc

   D. Null case

4. Linked lists are best suited :

   A. For relatively permanent collection of data

   B. For the size of the structure and the data in the structure are constantly changing

   C. For both of above situation

   D. For none of above situation

5. A step by step procedure used to solve a problem is called :

   A. Operating system

   B. Algorithm

   C. Application Program

   D. None of the above

6. The complexity of merge sort algorithm is :

   A. O(n) B. O (log n)

   C. O(n2) D. O(n log n)

7. The complexity of Binary search algorighm is :

   A. O (n) B. O (log)

   C. O (n2) D. O (n log n)

8. Merge sort uses :

   A. Divide and conquer strategy

   B. Greedy

   C. Array

   D. Link List

9. The copmplexity of linear search algorithm is :

   A. O(n) B. O(log n)

   C. O(n2) D. O(n log n)

10. The Knapsack problem belongs to the domain of ..... problems.

   A. Optimization B. NP Complete

   C. Linear Solution D. Sorting