UTTARAKHAND OPEN UNIVERSITY, HALDWANI (NAINITAL)
उत्तराखंड मुक्त विश्वविद्यालय, हल्द्वानी (नैनीताल)

MCA 2ND YEAR 3RD SEMESTER ASSIGNMENT

Last Date of Submission: 15/01/2016

Course Title: Design and Analysis of Algorithm

Course Code: MCA-12

Year: 2015-16 **Maximum Marks: 40**

Section 'A' contains 08 short answer type questions of 5 marks each. Learners are required to answers 4 questions only. Answers of short answer-type questions must be restricted to 250 words approximately.

1. Explain the need of analysis of algorithm.
2. What is divide and conquer strategy? Explain with the help of an example.
3. Write a recursive function to sort elements using merge sort.
4. What is the average case complexity of linear search algorithm?
5. Define Greedy algorithm. Write any two characteristics of Greedy Algorithm.
6. Write about traveling salesperson problem. Write some applications of traveling salesperson problem.
7. What is external and internal sorting? Give examples.
8. Explain the characteristics of dynamic programming.

Section 'B' contains 04 long answer-type questions of 10 marks each. Learners are required to answers 02 questions only.

1. Write an algorithm to sort elements by bubble sort algorithm. What are the time and space complexities?
2. Discuss knapsack problem using branch and bound technique.
3. Answer the following:
   a. Write a recursive and non-recursive function for binary search algorithm.
   b. What are the difference between quick and merge sort algorithm?
4. What is 8-queen problem? How can it solved using backtracking?