Roll No. .....

Subject Code—680-X

## M.C.A. (Fourth Year) EXAMINATION

(Re-appear)

(5 Years Integrated Course)

MCA-403

ANALYSIS AND DESIGN OF COMPUTER ALGORITHMS

*Time* : 3 *Hours* *Maximum Marks* : 100

**Note** : Attempt any *Five* questions. All questions carry equal marks.

**1.** (a) What is Dynamic Programming ? Illustrate its significance through suitable examples.

(b) What is meant by graph coloring ? Discuss the significance of 4-color conjective.

2. What do you understand by Queue ? Explain its types. How the memory wastage in simple queue ?

3. What is Sorting ? Explain the process of quick-sort with the help of suitable examples. Write down the complexity of quicksort in worst case, average case and best case.

4. What is 0/1 knapsack problem ? Write down an algorithm for its solution using backtracking.

5. What is Spanning Tree ? How does Prim's algorithm result in a minimum list spanning tree ? Illustrate.

6. Explain the following :
   (a) Hashing and its applications
   (b) 8 Queen's problem and its solution.

7. What do you mean by binary search ? Determine its complexity. Write an algorithm for binary search techniques.

8. Write short notes on the following :
   (a) Divide and Conquer
   (b) Threads in binary tree.