794 : H-m.

Con. 3546-09.

(REVISED COURSE)

VR-3783

(3 Hours)

[Total Marks : 100

N.B. (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** questions out of remaining **six** questions.
(3) **Assumptions** made should be **clearly** stated.
(4) **Figures** to the **right** indicate **full** marks.
(5) Assume **suitable** data wherever **required** but **justify** the same.

1. (a) An algorithm takes 0.5 ms for input size 100. How long it will take for input size 500 if the running time is —   **5**
      (i)   Quadratic   (ii)   NlogN.
   (b) Explain Strassen's matrix multiplication.   **5**
   (c) State advantages and disadvantages of recursion.   **5**
   (d) Prove that worst case efficiency of quick sort is $O(n^2)$.   **5**

2. (a) Explain Radix sort algorithm with example. Give its complexity.   **10**
   (b) Explain Boyer-Moore method. Give its advantages over Brute-Force method.   **10**

3. (a) Explain how branch and bound method can be applied to 15-puzzel problem using LC search. Write it's algorithm.   **10**
   (b) Explain graph coloring algorithm with backtracking.   **10**

4. (a) Explain Merge sort algorithm. Sort following numbers with Merge sort. Give output of each pass.   **10**
      84, 25, 36, 15, 48, 09, 17, 55, 92, 36
   (b) Explain 8-queen problem. Write a algorithm using backtracking to solve this problem.   **10**

5. (a) Find minimum cost spanning tree for the graph shown below using prime's algorithm.   **10**
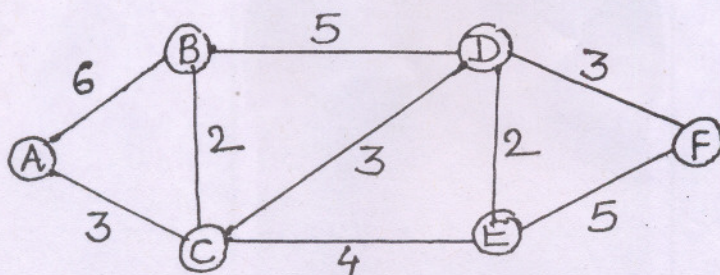
   (b) Write an algorithm for 0/1 knapsack problem using dynamic programming approach.   **10**

6. (a) What is branch and bound method ? Discuss the solution to Travelling salesman Problem using branch and bound method.   **10**
   (b) What is Multistage graph problem ? Discuss its solution based on dynamic programming approach.   **10**

7. (a) Write note on 'Tries'. **10**

    (b) (i) Compare Greedy method and Dynamic programming. **5**

       (ii) Write in brief about 'Divide and Conquer' strategy. **5**