

Time: 3 Hours

Subject: Design Analysis and Algorithms

Max. Marks: 70

Note: (i) First question is compulsory and answer any four questions from the remaining six questions. Each questions carries 14 Marks.
(ii) Answer to each question must be written at one place only and in the same order as they occur in the question paper.
(iii) Missing data, if any, may be suitably assumed.

1. a) Why an Algorithm analysis is required?
b) Write the properties of Big oh notation.
c) Define feasibility solution w.r.t greedy knapsack problem.
d) Compare quick sort vs Merge Sort.
e) Define the term Branch and Bound.
f) Define chromatic number.
g) Discuss Clique Decision problem.
2. a) Write the non recursive algorithm for finding the Fibonacci sequence and derive.
b) Write a short note on UNION and FIND operations in set theory.
3. a) Derive the time complexity for quicksort Algorithm.
b) Explain the knapsack problem using greedy method.
4. a) Explain about All pairs Shortest path with an example using Dynamic Programming.
b) Write a complete LC-branch and bound algorithm for knapsack problem.
5. a) Explain about B in detail.
b) Describe Search engine indexing and external Searching.
6. a) Explain Non deterministic Algorithms in detail.
b) Explain the satisfiability problem and write the algorithm for the same.
7. a) What are best case, average case, and worst-case performance? Explain.
b) Write the non recursive algorithm for finding the Fibonacci sequence and derive its time complexity.