

III B.Tech I Semester Supplementary Examinations, May 2005
DESIGN & ANALYSIS OF ALGORITHMS
(Computer Science & Systems Engineering)

Time: 3 hours**Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Write a pseudo code for the implementation of UNION instruction using linked list. Explain the working of the implementation.
(b) Explain the usefulness of the following fundamental operations on sets
 - i. MIN
 - ii. DELETE
 - iii. FIND
 - iv. UNION
 - v. INSERT
2. (a) Explain control abstraction for divide-and-conquer strategy.
(b) One way to sort a file of n records is to scan the file first merging consecutive pairs of size one, then merging pairs of size two etc. Write an algorithm which carries out this process. Show how your algorithm works on data set keys (100, 300, 150, 450, 250, 350, 200, 400, 500)
3. Explain the Prim's algorithm with an example. Analyze the time complexity of the algorithm.
4. Write algorithms corresponding to ADJUST, HEAPIFY, INSERT and DELETE for the case of a min-heap represented as a complete binary tree. Explain the time complexity of HEAPIFY.
5. Discuss the dynamic programming solutions for the problems
 - (a) reliability design and
 - (b) traveling sales person.
6. (a) Write a detailed note on graph coloring. Present an algorithm which finds all m-colorings of a graph.
(b) Draw the state space tree for m-coloring graph using a suitable graph
7. Define the following terms: state space, explicit constraints, implicit constraints, problem state, solution states, answer states, live node, E-node, dead node, bounding functions.
8. What is interpolation? Explain Lagrange interpolation algorithm & Newtonian Interpolation algorithm.
