

2005 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

III B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS
DESIGN AND ANALYSIS OF ALGORITHMS
 (COMMON TO COMPUTER SCIENCE & ENGINEERING AND INFORMATION
 TECHNOLOGY)

/APRIL/MAY 2005

TIME: 3 HOURS
 MAX MARKS: 70

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. Explain the strassen's matrix multiplication concept with an example.
3. (a) Write Prim's algorithm under the assumption that the graphs are represented by adjacency lists.
 (b) Analyze precisely the computing time and space requirements of your new version of Prim's algorithm using adjacency lists.
4. Use an AVL tree as the basis of an algorithm to execute MIN, UNION, and DELETE on sets consisting of integers 1 through n, using $O(\log n)$ steps per operation.
5. (a) Show that the computing time of algorithm OBST is $O(n^2)$.
 (b) Write an algorithm to construct the optimal binary search tree T given the roots $R(i, j)$, $0 \leq i \leq j \leq n$. Show that this can be done in time $O(n)$.
6. Write and explain an algorithm to determine whether the two binary trees T and U are equivalent. Two binary trees are equivalent if they are structurally equivalent and data in corresponding nodes of T and U are same.
7. (a) Define the term branch and bound technique Explain it with an Example.
 (b) Explain Properties of LC - Search.
8. What is interpolation? Explain Lagrange interpolation algorithm & Newtonian Interpolation algorithm.