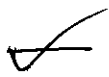


B.Tech Degree VIII Semester Examination May 2003



CS/IT 805(C) ALGORITHM & COMPLEXITY (1999 Admissions)

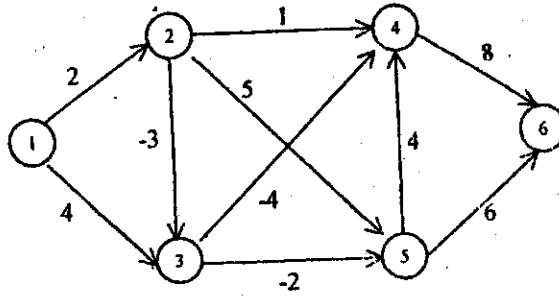
Time: 3 Hours

Maximum Marks: 100

- I. (a) Explain any one model of Computation ? (10)
 (b) Write a quick sort algorithm and analyse it to find out its best, worst and average time complexity. (10)

OR

- II. (a) State NP complete problem. Explain a nondeterministic algorithm of complexity $O(n)$ to determine whether there is a subset of n numbers $a_i, 1 \leq i \leq n$ that sums to m . (10)
 (b) Explain DFS and BFS on directed graphs. (10)
- III. (a) Define the principle of optimality. Find the shortest paths from node 1 to every other node in the following graph. (10)



- (b) Describe an algorithm for finding out an optimal binary search tree. (10)
- OR
- IV. (a) Explain the term Catalan numbers. What is its significance in chained matrix multiplication. Demonstrate this with an example. (10)
 (b) Write notes on appropriate string matching. (10)
- V. (a) Describe a recursive algorithm for fast fourier transform. (10)
 (b) Write and explain matrix inversion algorithm. (10)
- OR
- VI. (a) Explain Strassen matrix multiplication technique. Determine when Strassen's method outperforms the classical matrix multiplication. (10)
 (b) Explain Boolean matrix multiplication technique. (10)
- VII. (a) What is modular arithmetic ? Describe Euclid's Algorithm. (10)
 (b) What is a sparse polynomial. Design an algorithm for sparse polynomial evaluation. (10)
- OR
- VIII. (a) State and prove Chinese remainder theorem. Trace it with an example. (10)
 (b) Explain polynomial multiplication algorithm. (10)
- IX. (a) Explain PRAM model of computation. (10)
 (b) Explain how write conflicts are handled in various PRAM models. (10)
- OR
- X. (a) Explain parallel odd-even merge algorithm with an example. (10)
 (b) Prove that the maximum of n keys can be found in $O(\log \log(n))$ time using n common concurrent read concurrent write PRAM processors. (10)

