ALGORITHMS Ph.D. GENERAL EXAM

(Aug 20, 2008)

Format: 4 groups (A-D) each having 2 questions. Students must answer 5 questions, choosing atleast 1 from each group. Passing grade would be 75/100.

Co-ordinator: Dr. Iyengar

Committee Members: Dr. Kundu, Dr. Karki, Dr. Rahul Shah and Dr. Zhang.

(Broad) Topics:

1. Mathematical Foundations: Recurrence and Complexity Analysis

2. Sorting and Searching, Median, Order Statistics

3. Divide and Conquer

4. Data Structures : Binary Search trees (red-black tree, AVL tree, 2-3 Trees, B-Trees), Heaps (binomial heap, Fibonacci heap), Amortized Analysis

5. Greedy Algorithms and Dynamic Programming (Offline Paging, Minimum Spanning Tree, Least Common Subsequence, Tree Problems, Local register allocation etc)

6. Graph Algorithms (DFS, BFS, Bi-connected components, Shortest Paths, Longest Paths), Max-flow and Combinatorial Optimization problems.

Textbook:

Introduction to Algorithms by Cormen, Leiserson, Rivest and Stein, 2nd Edition

Other reference books:

Anany Levitin, Introduction to The Design & Analysis of Algorithms.
Data Structures : Mark Allen Weiss

Reference Websites:

http://csc.lsu.edu/~karki/, http://csc.lsu.edu/~kundu/, http://csc.lsu.edu/~rahul/