

# AMCS-13 SYSTEM ANALYSIS AND DESIGN

## UNIT-1 INTRODUCTION

- 1.1 Algorithm analysis, Time complexity and space complexity,
- 1.2 O notation Omega notation and Theta notation.
- 1.3 DIVIDE AND CONQUER: General Method, merge sort, quick sort, strassen's matrix multiplication.
- 1.4 GREEDY METHOD: General method, optimal storage on tapes, knapsack problem, minimum spanning tree.

## UNIT-2 SET MANIPULATION ALGORITHMS

- 2.1 Fundamental operation of sets,
- 2.2 Algorithm for UNION and FIND,
- 2.3 Introduction to optimal binary search tree,
- 2.4 Balanced tree schemes, 2-3 tree, AVL tree,
- 2.5 Dictionary, priority queue, merge able heap,
- 2.6 Heap for priority queue.

## UNIT-3 DYNAMIC PROGRAMMING

- 3.1 Multistage graphs, optimal binary search trees,
- 3.2 0/1 knapsack problem,
- 3.3 Reliability design problem,
- 3.4 Travelling sales person problem.

## UNIT-4 SEARCH AND TRAVERSAL TECHNIQUES

- 4.1 Efficient non-recursive binary tree traversal algorithms,
- 4.2 Tree traversal,
- 4.3 Breadth first search and traversal,
- 4.4 Depth first search and traversal,
- 4.5 AND/OR graphs, game tree.
- 4.6 BACK TRACKING: General method,
- 4.7 8\_queen problem, graph coloring problem.

## UNIT-5 BRANCH AND BOUND

- 5.1 LC search, bounding,
- 5.2 LC branch and bound, FIFO branch and bound.
- 5.3 ALGEBRAIC SIMPLIFICATION AND TRANSFORMATIONS: General Method, Evaluation and interpolation, modular arithmetic.

### Reference Books:

1. E. HOROWITZ and S. SAHNI: "Fundamentals of Algorithms", GALGPTIA.
2. AHO, HOPCRAFT AND ULLMAN: "Design and Analysis of Algorithms" Edition 1984.