

APPENDIX-I

MCA 503 Design & Analysis of Algorithms

UNIT-I

Introduction, Divide and Conquer , The Greedy Method - Knapsack Problem, True vertex splitting, Job sequencing, Minimum-cost spanning trees, Kruskal's algorithm, Optimal storage on tapes, Optimal merge pattern, Single source shortest paths.

UNIT-II

Dynamic Programming - General method, Multistage graph, All pairs shortest path,

Single-source shortest path, Optimal Binary search trees, String Editing, 0/1 Knapsack, Reliability design, The traveling salesman problem, Flow shop scheduling.

UNIT-III

Basic traversal & search techniques - Techniques for binary trees, techniques for graphs, connected components & spanning trees, Bi-connected components & DFS.

Back tracking - The General Method, The 8-Queens Problem, Sum of subsets, Graph coloring, Hamiltonian cycle, Knapsack problem.

UNIT-IV

Branch and Bound - The method, 0/0 Knapsack problem, Traveling salesperson, Efficiency considerations. NP hard and NP Complete Problems - Basic concepts, Cook's Theorem, NP-Hard Graph problems, NP-Hard Scheduling problem, Some simplified NP-Hard problems.

TEXT BOOKS

1. L Ellis Horwitz, Sartaj Sahni, 'Fundamentals of Computer Algorithms', Galgotia Publications, The following topics in the prescribed book Topics 1,3,4,5,6,7,8,9

REFERENCE BOOKS

1. Aho, Hopcroft & Ullman, 'The Design and Analysis of Computer Algorithms', Addison Wesley.

Thomas H.Corman et al, 'Introduction to Algorithms', PHI.

MCA/DCA 203: DATA STRUCTURES

UNIT-I

Introduction and Over View
Preliminaries

UNIT-II

String Processing
Arrays, Records and Pointers

UNIT-III

Linked Lists
Stacks, Queues, Recursions

UNIT-IV

Graphs
Trees
Sorting and Searching

Text Books:

Lipschutz S: Theory and Problems of Data Structures, Schaums Series
McGrawHill, Chapters one Through Nine

Reference Books:

Aho, Hopcroft & Ullman; Data Structures & Algorithms
Weiss M.A; Data Structures & Algorithms in C, Addison Wislay(2001)

MCA303: COMPUTER BASED OPTIMIZATION TECHNIQUES

UNIT-I

Introduction to linear Programming: The linear Programming model, Assumption of Linear Programming, Additional Examples,

Solving LPPs: The simplex method, the essentials of simplex method, Setting up the simple method, The Algebra of the simplex method, The simplex method in Tabular form. Tie Breaking in simplex method, Adopting to the other model forms.

UNIT-II

Duality theory: Primal Dual Relationships, Other Algorithm for linear programming, The dual simplex method,

The Transportation & Assignment Problems: The transportation Problems, A streamlined simplex method for the transportation problems, The Assignment Problem.

UNIT-III

Network optimization Models, The shortest path Problem, the minimum spanning tree problem, the maximum flow problem, the minimum cost flow problem,, The Project Management with PERT/CPM, Scheduling a problem with PERT/CPM, Dealing with uncertain activity durations, considering Time cost Trade-Offs, Scheduling and Controlling, Projects costs, An evaluation of PERT/CPM.

UNIT-IV

Game Theory: The formation of Two-person, Zero-sum games, Solving simple games, games with mixed strategies, Graphical solution Procedure, Solving by LP.

Inventory Theory: Components of inventory models, Deterministic continuous review models, A deterministic periodic review model, A stochastic continuous review model.

Text Book:

Hiller and Lieberman, Introduction to Operation Research (Seventh Edition) Tata McGrawHill Publishing Company Ltd(Chapter 3.3.2, 3.3.3.4, Chp 4: 4.1 to 4.6, Chp 7.7.1 to 7.4, Chp.8.8.1 to 8.3, Chp 9. 9.3 to 9.6 Chp 10: 10.3 to 10.5 10,6 &10.7, Chp 14: 14.1 to 14.5, Chp 19: 19.2 to 19.5,

Reference Books:

- 1) Ravindren Philips and Solberg, Operation Research Principles and Practice(Second Edition) John Wiley & Sons.

2) Parameswaran, Operation Research, PHI

MCA 501: DATA MINING TECHNIQUES

Unit – I

Data Warehouse-Introduction, A multi-dimensional data model, Data Warehouse Architecture, Data Warehouse implementation.

Data mining – Introduction , Data mining on what kind of data , Data mining functionalities classification of Data mining systems, Major issues in Data mining

Unit – ii

Mining Association rules in large databases - Association rule mining, Mining single-Dimensional Boolean association rules from Transactional databases, Mining multi-Dimensional Association rules from relational Databases and Data Warehouses

Unit – iii

Classification and Prediction - Introduction classification by decision tree induction, Bayesian Classification

Other classification methods, classification by back propagation, Prediction, classifier accuracy

Unit – iv

Cluster analysis – Introduction types of data in cluster analysis a categorization of major clustering methods partitioning methods, hierarchical methods, Density based methods,; DBSCAN, Grid-based method : STRING , Model based clustering method: Statistical Approach, outlier analysis

Text Books

Data mining & Techniques : Jiawei Han Micheline Kamber – Morgan Kaufmann Publishers

Reference Books :

- 1 Data warehouse Toolkit- Ralph kinball – john wiley publishers
- 2 data mining (introductory and advanced topics) –margaret H.Dunham – Pearson Education.
- 3 D.Hand , H.Mannila and P.Smyth- Principles of Data mining – Prentice Hall – 2001