For Batches 2015 & Onwards Academic Autonomous Institute (No. F22-1/2014 (AC)

37

BTIT-504 Design and Analysis of Algorithms

L T P 3 1 0 Internal Marks: 40 External Marks: 60 Total Marks: 100

Objectives: This subject will give an insight into the techniques used for designing the algorithms for solving any kind of problem. It also provides a way to analyze the performance of the algorithms.

1. Introduction An Overview of data Structures: Stacks, Queues, Trees and Graphs. Concept of Algorithm, Performance Analysis (Time and space complexity), Asymptotic Notations. Substitution Method, Master theorem, (4)

2. Divide and conquer approach General Method, Binary Search, Merge Sort, Quick Sort, Strassen's Matrix Multiplication. (4)

3. Greedy Method General Method, Knapsack Problem, Finding Minimum Cost Spanning Trees (Prim’s Algorithm, Kruskal’s Algorithm), Single–Source Shortest Path algorithm. ` (5)

4. Dynamic Programming General Method, Multistage Graphs, All Pairs Shortest Paths, Single Source Shortest Paths, 0/1 Knapsack and Travelling Salesman Problem. (5)

5. Backtracking approach General Method, 4–Queen’s and 8-Queen’s Problem, Graph Coloring, Hamiltonian Cycles. (5)

6. Matching Algorithms Boyer-Moore String matching algorithm, Knuth-Mooris-Pratt pattern matching algorithm (3)

7. Complexity Classes Basic Concepts, Nondeterministic Algorithms, Classes NP–Hard and NP– Complete, NP–Hard Graph Problems. (4)

8. Approximation Algorithms Introduction, Absolute Approximation (Planner Graph Coloring), İ–Approximations (Scheduling Independent Tasks and Bin Packing). (5)