

Exam.Code:0924
Sub. Code: 6854

1058

B.E. (Information Technology)

Sixth Semester

ITE-656: Design and Analysis of Algorithms

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

- I. Attempt the following:-
- When do you say a function $f(n)$ is asymptotic to $g(n)$? What is its significance?
 - Solve the 4-queens problem using backtracking.
 - What is the greedy approach to knapsack problem?
 - State the principle of optimality in dynamic programming.
 - When do we say a problem A is reducible to problem B? (5x2)

UNIT - I

- II. a) Demonstrate the divide and conquer strategy for matrix multiplication using 3×3 matrices.
- b) Write an algorithm to compute the largest number in an array of N numbers and analyze the best, average and worst case performance. (5,5)
- III. a) Explain the Greedy method to solve Single source shortest path problem.
- b) Analyse the merge sort algorithm for worst case performance. (5,5)
- IV. Write and explain the algorithm for quick sort using divide and conquer strategy. Mention the complexity. (10)

UNIT - II

- V. What is the general method for dynamic programming? How it is applied to solve 0/1 knapsack Problem? (10)
- VI. a) Write and explain the algorithm for solving n -queens problem using backtracking.
- b) State (i) Multi stage graph problem and (ii) sum of subsets problem (5,5)
- VII. a) Define and provide an example of non deterministic algorithm.
- b) Define and provide an example of NP complete problem. (5,5)

x-x-x