Exam.Code:459
Sub. Code: 3123

1115

M.Sc. (Information Technology)

First Semester

MS-04: Algorithm Design and Analysis (Old)

Time allowed: 3 Hours Max. Marks: 80

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

x-x-x

I. Answer the following:-

a) What is a recurrence relation?

b) Give the worst case analysis of quick sort algorithm.

c) What is the subset paradigm of greedy technique?

d) State the principle of optimality.

e) What is the total no. of nodes in the 8-queen state space tree?

f) What are the state space search methods used in branch and bound terminology?

g) What is lower bound theory?

h) State the Satisfiability problem. (8x2)

UNIT- I

II. a) Discuss the various asymptotic notations with the help of examples.

b) Discuss and analyze Strassen's matrix multiplication algorithm. (2x8)

III. a) Write and analyze the Merge sort algorithm.

b) Explain what are the best case, average case and worst case analysis with the help of examples. (2x8)

UNIT-II

IV. a) Write the Kruskal's algorithm for finding the minimum spanning tree.

b) Write and analyze the Bellman and Floyd's algorithm for finding all pair shortest path problem. (2x8)

V. a)Write an algorithm for solving the travelling salesperson problem using dynamic programming.

b) Write a greedy algorithm for any problem that fit the ordering paradigm. (2x8)

UNIT- III

VI. a) Write an iterative backtracking algorithm for solving N-queens problem.

b) Write an algorithm for finding all m-colorings of a graph. (2x8)

P.T.O.

VII. a) Explain the general recursive backtracking algorithm.

b) Discuss the FIFO Branch and bound solution of Knapsack problem. (2x8)

UNIT – IV

VIII. a) Discuss the methods for deriving lower bounds on algebraic problems.

b) What are NP-Hard problems? Give examples of any two Graph problems which are NP-Hard. (2x8)

IX. a) Discuss the use of comparison trees for determining lower bounds.

b) Define the Classes P, NP, NP-Complete and NP-Hard problems. Also, explain the relationship among them. (2x8)

x-x-x