23219



Name : .....

Reg. No. : .....

**SEVENTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2011**

CS 04 704 – DESIGN AND ANALYSIS OF ALGORITHMS

Time : 3 Hours Maximum : 100 Marks

**PART – A**

Answer all the questions

I (a) Explain the use of the asymptotic notations $o$, $\Omega$, and $\theta$ in analysis of algorithms & problems.

(b) Give an analysis of Heapsort & Explain?

(c) Explain the greedy structure algorithm. Give an example in which the greedy technique fails to deliver optional solution.

(d) State traveling sales persons problem. Comment on the nature of solution to the problem.

(e) Describe the difference between a Deterministic Finite Automata and Non-Deterministic Finite Automata? In general, which one is expected to have less number of states.

(f) Discuss about the eight queen problem.

(g) Discuss any two pseudo random number generation methods.

(h) What is directed Hamiltonian cycle?

$(8 \times 5 = 40)$

**PART – B**

II (a) Explain in detail quick sorting method. Provide a complete analysis of quicksort.

(OR)

(b) (i) Explain in general framework for analyzing the efficiency of algorithms.
(ii) Explain the various asymptotic efficiency of an algorithm?

III (a) (i) Write an algorithm to solve n queens problem using backtracking method.
(i) Write a schema for a backtracking method.

(OR)

(b) Explain string editing problem. Give the recurrence relation for the value of the optimal solution when the problem is to be solved using Dynamic programming.

For $x = (b,b,a,b,a)$ and $y = (a,b,a,a,)$. Give the matrix of the values computed in bottom up manner.

IV (a) (i) What is the basic difference between deterministic and non deterministic algorithm.
(ii) Define P and NP class of problems.
(iii) Write a non deterministic knapsack algorithm.

(OR)

(b) (i) Prove that Hamiltonian cycle is in NP.
(ii) Prove that if any NP complete problem belongs to class P, then P=NP.

V (a) Explain the Miller Robin Test and Pollard's rho heuristic.

(OR)

(b) Explain the les vegas algorithms?

$(4 \times 15 = 60)$

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