C 27587

(2 pages)

Name.....

Reg. No.....

SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, JUNE 2003

CS. 2K. 601. DESIGN AND ANALYSIS OF ALGORITHM

Time : Three Hours

Maximum : 100 Marks

Answer **all** *questions.*

Part A

1. (a) Why people prefer to use Binary search ?

   (b) Why is it necessary to have the auxiliary array in merge sort ?

   (c) What is optimal polygon triangulation ?

   (d) Explain CYK algorithm.

   (e) What is the problem of obtaining a maximum Clique of an undirected graph ?

   (f) State and explain vertex cover problem.

   (g) What is the success rate in Monte-Carlo experimentation ?

   (h) What is 8-Queen's problem ?

(8 × 5 = 40 marks)

Part B

2. (A) Design and test an algorithm which determines how long it takes your computer to execute 2^n.

Or

(B) Give an algorithm and calculate upper and lower bound in heap sort. Give examples and justify.

3. (A) Consider the following instance knapsack problem. $n = 3$, $m = 20$, $(P_1, P_2, P_3) = (25, 24, 15)$ and $(W_1, W_2, W_3) = (18, 15, 10)$. Suggest feasible solutions.

Or

(B) We wish to find a shortest path from vertex i to vertex j. State and explain various algorithms to do this.

4. (A) (i) What is satisfiability ? (5 marks)

   (ii) Prove that satisfiability is in P if and only if P = NP. (10 marks)

Or

(B) Show that clique decision problem reduces do node cover decision problem.

Turn over

(A) (i) State the complexity of integer factorization. (7 marks)

(ii) Describe how Branch and Bound technique can be applied to 8-quuns problem. (8 marks)

Or

(B) (i) Explain Primality testing. (7 marks)

(ii) What is Les Vegas algorithm ? (8 marks)

[4 × 15 = 60 marks]