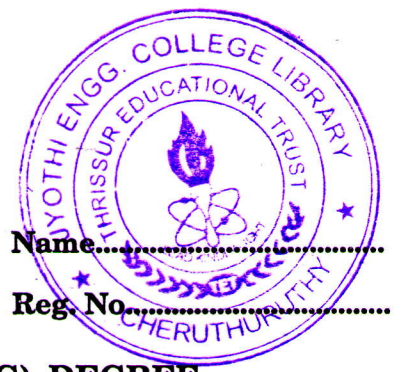


C 6251

(Pages : 2)

Name

Reg. No.



**SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE
EXAMINATION, JUNE 2005**

CS. 2K. 601—DESIGN AND ANALYSIS OF ALGORITHMS

(New Scheme)

Time : Three Hours

Maximum : 100 Marks

Part A

- I. (a) Prove that for any two functions $f(n)$ and $g(n)$, $f(n) = \theta(g(n))$ if and only if $f(n) = \theta(g(n))$ and $f(n) = \Omega(g(n))$.
- (b) Write a procedure to insert a node with value "key" into a heap A. Assume appropriate data structure for the heap A.
- (c) Write short notes on optimal polygon triangulation problem.
- (d) Explain Kniskals algorithm which is based directly on the generic minimum-spanning tree algorithm.
- (e) Write short notes on Vetex-cover problem.
- (f) Show that the travelling-salesman problem is NP-complete.
- (g) Write Pollard rho factoring algorithm to find the factor of n .
- (h) What is meant by universal hashing? How this approach is able to yield good performance?

(8 × 5 = 40 marks)

Part B

- II. (a) Discuss in detail about the *three* different methods available for solving recurrences.
- Or
- (b) Analyse the behaviour of Quick sort algorithm for Worst cases and Average cases.
- III. (a) Describe in detail about Flayol-Warshll algorithm that is used to solve all pair shortest path problem on a directed graph $G = (V, E)$.
- Or
- (b) Develop an algorithm to solve Matrix-chain multiplication problem using dynamic programming approach.
- IV. (a) State Hamiltonian cycle problem and explain how this problem belongs to NP-complete class.
- Or
- (b) State subset sum problem and derive a fully polynomial-time approximation scheme by trimming each list L_i after its creation.

Turn over

- V. (a) (i) Write an algorithm to perform probabilistic primality test on the given integer n suggested by Miller-Rabin also called as strong Pseudoprime test. (10 marks)
- (ii) State and explain Monte Carlo algorithm. (5 marks)

Or

- (b) (i) Discuss in detail about the randomized solution available for eight-queen problem. (10 marks)
- (ii) Elaborate on the different pseudo random number generation methods. (5 marks)
- [4 × 15 = 60 marks]