

SEVENTH SEMESTER B.TECH DEGREE EXAMINATION, OCTOBER 2012

CS / PT CS 09 702 – DESIGN AND ANALYSIS OF ALGORITHMS
(2009 Admission)

Time : Three Hours

Maximum : 70 Marks

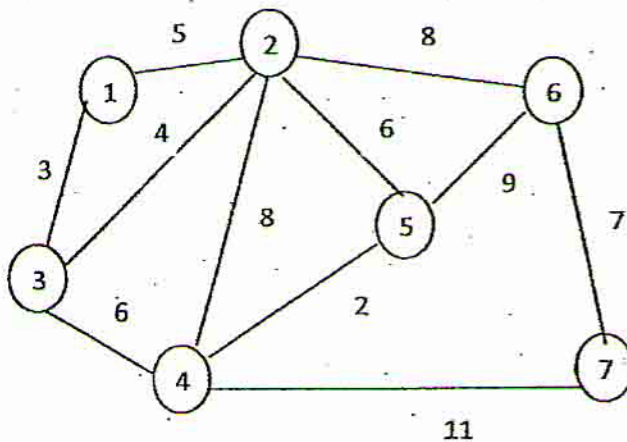
Part A

- I. (a) Define recurrence relations. Give example.
- (b) What are red black trees?
- (c) What is meant by divide and conquer method?
- (d) Define Hamiltonian cycle in a graph.
- (e) What is universal hashing?

5×2=10 Marks

Part B

- II. (a) Write the algorithm of quick sort and provide a complete analysis of it.
- (b) Explain optimal polygon triangulation.
- (c) Apply Prim's algorithm and find the minimum spanning tree for the following graph.



- (d) Prove that if $NP \neq C-NP$ then $P \neq NP$.
- (e) Show that Travelling Salesman Problem is NP-Complete.
- (f) Explain Miller-Rabin randomized primality test.

4×5=20 Marks

Part C

- III. (a) What is meant by searching? Give the algorithm for binary search and complete analysis of it with an example.

(OR)

- (b) Explain how to determine the occurrences of pattern P in the text T by examining the π function for the string PT. (the string of length $m+n$ that is the concatenation of P and T).

- IV. (a) Explain how divide and conquer is applied in Strassen's matrix multiplication algorithm.

(OR)

- (b) Define Matroid and Explain the greedy algorithm on a weighted matroid.

- V. (a) What is set covering problem? Is set-covering problem NP-hard? Explain your answer.

(OR)

- (b) Explain the clique problem and show that clique problem is NP-Complete.

- VI. (a) Define integer factorization and explain Pollard's rho heuristics to do the same.

(OR)

- (b) Explain eight queen's problem and provide randomized solution for it.

4×10=40 Marks