2011

M.Sc.

2nd Semester Examination

DESIGN & ANALYSIS OF ALGORITHM

PAPER—CS-203

Full Marks : 40

Time : 2 Hours

The questions are of equal value.

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Answer *Q. No. 1* and any *two* questions from the rest.

1. (a) How would you differentiate dynamic programming with greedy algorithm? 3

(b) Prove that
$2n^2 2^n + n \log n = \theta (n^2 2^n)$ 4

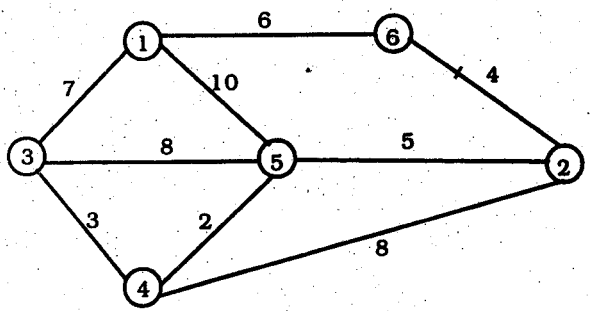
(c) How would you define UNION and FIND operation? Give example. 3

2. (a) Write a merge sort algorithm. Discuss, wherever necessary. Also, state the necessity to have the auxillary array in merge sort algorithm. 6+2

(b) How does insertion sort works? Estimate the worst case running for this algorithm. 2+5

3. (a) How does Prim's Algorithm differ with Kruskal's algorithm? 3

(b) Use Kruskal's algorithm, to find MST of the given graph G.



Also, write down the algorithm. 4+4

(c) Find the time complexity of Binary Search. 4

4. (a) Write the steps for matrix chaining multiplication problem of n matrix using Dynamic programming. 10

(b) Define N-P Hard and N-P Complete. 5

5. (a) What is Backtracking? Explain and write the algorithm to solve N–Queens problem. 2+6

(b) Formulate the solution of Matrix chain multiplication program, using dynamic programming approach. 7