9. (a) State & Prove Cook's theorem. 10

(b) Show that Job sequencing with deadline is NP hard problem. 10

Roll No. .....

24362

B. Tech 6th Semester (CSE) Examination – May, 2018

ANALYSIS AND DESIGN OF ALGORITHMS

Paper : CSE-306-F

Time : Three Hours] *[Maximum Marks : 100*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Question No. **1** is ***compulsory***. Attempt ***five*** questions with at least ***one*** question from each Section.

1. Write short note on the following : 4 × 5 = 20

(a) Asymptotic notation

(b) Greedy Techniques

(c) Dominance rule

(d) P & NP Class

SECTION – A

2. (a) What are sets and disjoint sets. Also write Union and find algorithm for disjoint sets. 10

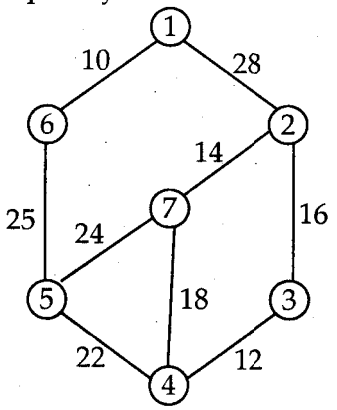
(b) Explain time & space complexity. 10

3. (a) Explain Quick sort algorithm in detail. Analyse its complexity also. 10

(b) State Strassen's matrix multiplication. How to solve this problem with Dynamic programming ? 10

SECTION – B

4. Explain the concept of minimum spanning trees. Solve the following graph using prime's algorithm. Also analyse its complexity. 20



5. Explain Optimal Binary search tree which includes following problem : $n = 4$ and (a_1, a_2, a_3, a_4) = (do, if, int, while) with profits P(1 : 4) = (3, 3, 1, 1) in case of successful search & loss q (0 : 4) = (2, 3, 1, 1, 1) in case of unsuccessfull search. Initially [W (i, i) = q (i)], c (i, i) = 0 and r (i, i) = 0 where 0 < = 2 < = 4. Also write its algorithm and analyse its complexity. 20

SECTION – C

6. Explain 8-queens method, graph coloring and Hamiltonian cycle with example. Analyse their complexity also. 20

7. Solve the following problem by using least cost Branch & Bound method :

Knapsack instance n = 4, p (1 : 4) = (10, 10, 12, 18) and weight w(1 : 4) = (2, 4, 6, 9) & max. capacity m = 15. 20

SECTION – D

8. Write short note on : 4 × 5 = 20

(a) Polynomial time & non-polynomial time algorithm

(b) Satisfiability

(c) Clique decision problem

(d) Reducibility.