

END TERM EXAMINATION**SIXTH SEMESTER [B.TECH/M.TECH] MAY-JUNE 2014****Paper Code: IT-306****Subject: Algorithm Analysis and Design****Time: 3 Hours****Maximum Marks: 60****Note: Attempt all questions. Internal choices are indicated.**

Write short note on the following:-

(2x10=20)

- Q1
- BFS
 - DFS
 - Bellman Ford Algorithm
 - Activity Selection Problem
 - Optimal Binary Search Tree
 - Complexity of Radix Sort
 - Optimal Substructure of 0/1
 - Recurrence relation of Strassen's matrix multiplication method
 - Complexity of Kruskal's algorithm
 - String matching with Finite Automata.

Unit-I

- Q2 Explain Different asymptotic notations, used to analyse algorithm efficiency prove that θ is an equivalence relation. **(10)**

ORAnalyse the complexity of an algorithm to find i^{th} element from a list of n elements. **(10)****Unit-II**

- Q3 (a) Explain LCS algorithm and find LCS of the following two sequences:- **(5)**

X = A, B, C, D, A, B
Y = B, D, C, A, B, A

- (b) Find the optimal parathesization of the matrix chain whose dimensions are as follows:-

$A_1[10 \times 2]$ $A_2[2 \times 3]$ $A_3[3 \times 5]$ $A_4[5 \times 1]$ **(5)**

ORFind Huffman code for each character having following frequencies:- **(10)**

A = 0.30
B = 0.20
C = 0.16
D = 0.12
E = 0.05
F = 0.05
G = 0.10
H = 0.02

Unit-III

- Q4 With the help of disjoint-set operations, find the connect components of a graph. Find its complexity. **(10)**

OR

- (a) Explain Floyd-Warshall algorithm and its functioning using an example. Can we find negative weight cycle using this algorithm? How? **(5)**
 (b) Find the minimum spanning tree of the following graph. Use any algorithm of your choice and explain the method. **(5)**

Unit-IV

- Q5 Explain Rabin-Karp algorithm and its functioning using an example. **(10)**

OR

Give definition of NP, NP-hard and NP-complete problems and explain the word "polynomial time reducibility." **(10)**

P

M-T-19-11/9/12