(Please write your Exam Roll No.) Exam Roll No. .....

END TERM EXAMINATION

SIXTH SEMESTER [B.TECH/M.TECH] MAY-2010

Paper Code: IT 306 **Subject: Algorithm Analysis and Design**
Paper ID: 15306 **(Batch – 2006 Onwards)**
Time : 3 Hours **Maximum Marks : 60**

Note: Q. No. 1 is compulsory. Attempt five questions in all.

Q1. Explain in brief **(2x10=20)**

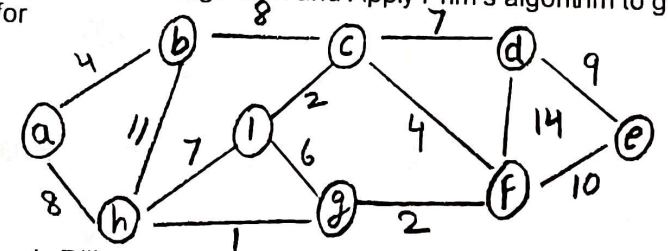
a. Show that $\sum_{K=1}^{n} 1/K^2$ is bounded above by a constant.
b. Explain Bucket sort method.
c. List the differences between Greedy approach and Dynamic programming approach,
d. What do you know about Matroids. Explain its property.
e. Define Disjoint set forest.
f. What are the differences between Depth first search and Breadth first search technique?
g. Explain sparse graph with the help of an example.
h. How can the number of strongly connected components of a graph change if a new edge is added?
i. How can the output of the Floyd- Way shall algorithm. Be used to detect the presence of a negative-weight cycle.
j. What do you understand by NP – complete problem?

Q.2 Illustrate the operation of Counting – sort on the array A = (7, 13, 12, 4, 5, 7, 2, 4, 3). **(10)**

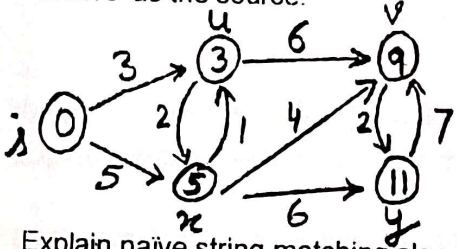
Q.3 Determine an LCS of (1,0,0,1,0,1,0,1) and (0,1,0,1,1,0,1,1,0). Write the algorithm for finding the longest common Sub sequence. **(10)**

Q.4 a. Explain the algorithm for Huffman code **(5)**
b. What is an optimal Huffman code for the following set of frequency based on the first 8 Fibonacci number 1
a:1, b:1, c:2, d:3, e:5, f:8, g:13, h:21 **(5)**

Q.5 Explain Prim's algorithm and Apply Prim's algorithm to generate minimum spanning tree for **(10)**



Q.6 Apply Dijkstra's algorithm (with explanation) to Solve the problem of shortest path with vertex's' as the source. **(10)**



Q.7 Explain naïve string-matching algorithm and show the comparison the algorithm makes for the pattern p = 0001 in the text = 000010001010001. **(10)**

Q.8 Write short note on any two. **(5x2=10)**
(a) NP – Completeness
(b) Rabin – Karp algorithm
(c) Topological Sorting
(d) Flyod Warshall algorithm

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