PVP 12

Code: CS6T5

III B.Tech - II Semester – Regular Examinations – April 2016

DESIGN & ANALYSIS OF ALGORITHMS

(COMPUTER SCIENCE & ENGINEERING)

Duration: 3 hours Max. Marks: 70

Answer any FIVE questions. All questions carry equal marks

1.

a) List and Explain different algorithm design techniques? 7 M

b) For computing the sum of n numbers algorithm, Euclid's algorithm indicate 7 M

i) a natural size metric for its inputs

ii) its basic operation and

iii) whether the basic operation count can be different for inputs of the same size.

2.

a) Write an algorithm for selection sort? Explain with an example. 8 M

b) Find the time complexity for sequential search. 6 M

3.

a) Explain about Strassen's matrix multiplication with an example. 6 M

b) Write a divide and conquer algorithm for binary search and find the best case time complexity. 8 M

4.

a) What is horner's rule? Why do we use it? 6 M

b) Write an algorithm for topological sort. 8 M

5.

a) Explain how one can generate a Huffman code without an explicit generation of a Huffman coding tree. 6 M

b) Write prim's algorithm for finding minimal spanning tree. 8 M

6. Use function OBST to compute w(i, j), r(i, j) and c(i, j), 0<=i<j<=4, for the identifier set (a1, a2, a3, a4) = (count, float, if, while) with (p1, p2, p3, p4) = (1/20, 1/5, 1/10, 1/20) and (q0, q1, q2, q3, q4) = (1/5, 1/10, 1/5, 1/20, 1/20). use r(i, j) to construct OBST. 14 M

7.

a) Explain about decision trees for searching sorted array? 7 M

b) Show that the partition problem is polynomially reducible to the decision version of the knapsack problem. 7 M

8.

a) Find all feasible solutions for the knapsack instance N=5, M=15
(p1, p2, p3, p4, p5) = (10, 5, 15, 7, 6) and
(w1, w2, w3, w4, w5) = (2, 3, 5, 7, 1) using branch and bound. 8 M

b) How does back tracking work on 4 queen problem? 6 M