

MODEL QUESTION PAPER

MFCO3

I Semester M.TECH Examination, August 2011 DESIGN & ANALYSIS OF ALGORITHM

Time: 3 Hours

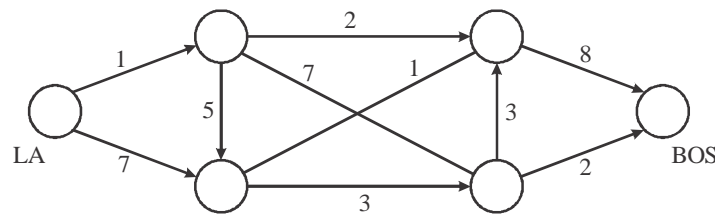
Max. Marks: 75

GROUP A : Answer any three questions.

- Q.1 Write a notes on branch and Bound.
- Q.2 What is dynamic programming algorithm? Explain Traveling sales man problem with example.
- Q.3 Explain the approach for the traveling salesman problem with example.
- Q.4 Explain backtrack programming with the help of bicycle lock prob.
- Q.5 Write a Basic steps of complete Development of an Algorithms.

GROUP B : Answer any three questions.

- Q.6 Prove that, if a node in a binary search tree has two children, then its successor has no left child and its predecessor has no right child.
- Q.7 A polynomial of degree $n > 0$ has n derivatives, each one obtained by taking the derivative of a the previous one. Devise an algorithm which produces the values of a polynomial and its n derivatives.
- Q.8 Determine which of the following sort is most efficient justify your answer.
(a) Simple insertion sort (b) String selection sort
(c) Bubble sort.
- Q.9 What is Recursion? When not to use Recursion. Write a examples of Recursive programs.
- Q.10 Find the Shortest path from the LA to all other vertices for the graph in fig.



GROUP C : All Questions are Compulsory.

Q.11 Fill in the blanks

- (i) Nodes that do not have any children are called _____.
- (ii) A _____ is a collection of distinguishable objects, called its members or elements.
- (iii) Complexity of quick sort is _____.
- (iv) The last step in the complete development of the algorithm is _____.
- (v) Kruskal algorithm is a _____.

Q.12 Multiple choice question.

- (i) The technique that can be described as organized exhaustive search which avoids searching all possibilities is _____.
 - (a) Backtrack programming
 - (b) Branch & Bound
 - (c) Heuristic technique
 - (d) None of these
- (ii) We employ dynamic programming approach when _____.
 - (a) It gives optimal solution
 - (b) The solution has optimal substructure
 - (c) It is faster than Greedy technique
 - (d) The given problem can be reduced to the 3-SAT problem.
- (iii) The Average case occur in linear search algorithm _____.
 - (a) When Item is somewhere in the middle of the array.
 - (b) When Item is not in the array at all.
 - (c) When Item is the last element in the array.
 - (d) When Item is the last element in the array or is not there at all.
- (iv) Which of the searching technique is applicable to a table organized either as an array or as linked list _____.
 - (a) Sequential searching
 - (b) Indexed sequential search
 - (c) Binary search
 - (d) Inter polation search.
- (v) Which of the following basic algorithms can be used to most efficiently determine the presence of a cycle in given graph?
 - (a) Minimum cost spanning tree algorithm
 - (b) Ford-Fulkerson's algorithm
 - (c) Breadth-first search algorithm
 - (d) Depth-first search algorithm

Q.13 True or false

- (i) The time complexity of the Heapify algorithm is $O(n)$.
- (ii) Quick sort is not called partition exchange sort.
- (iii) Undirected Graph is Essential for the Primes algorithm.
- (iv) Generally, hill climbing methods are not "greedy".
- (v) Dijkstra algorithm apply for acyclic graph.
