Code No: RR210506 **RR**

II B.Tech I Semester(RR) Supplementary Examinations, May/June 2010
DESIGN AND ANALYSIS OF ALGORITHMS
(Common to Computer Science & Engineering, Information Technology and Computer Science & Systems Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Write an algorithm that accepts a number in decimal and produces the equivalent number in Binary. What is the time complexity of the algorithm?
   (b) Write an algorithm which performs the inverse transformation of the above problem. [8+8]
2. (a) Compute 2101 * 1130 by applying Divide and Conquer method.
   (b) Applying Divide and Conquer strategy, write a recursive algorithm for finding the maximum and the minimum element from a list. [8+8]
3. Explain the Job sequencing with dead line algorithm and also find the solution for the instance n=7, $(P_1, P_2, ..., P_7)$=(3,5,20,18,1,6,30) and $(D_1, D_2, ..., D_7)$=(1,3,4,3,2,1,2). [16]
4. Explain how the fundamental methods,
   (a) Finding an element
   (b) Inserting an element
   (c) Deleting an element
   are done on a dictionary D. [5+6+5]
5. (a) What does Dynamic programming approach have common with Divide & Conquer method?
   (b) What is the principal difference between the two techniques?
   (c) Discuss briefly the solution to the traveling salesperson problem using dynamic programming. Can it be solved by using Divide & Conquer method? [6+4+6]
6. (a) Explain the reachability problem in graphs.
   (b) Compute the time and space complexities of BFS algorithm on any graph G with n vertices and e edges, if the graph is represented by
      i. Adjacency list and
      ii. Adjacency matrix
   (c) Convert the given infix expression to postfix expression.
   (A+B+C) ↑ ((A+B) * C). [4+8+4]
7. Compare and contrast
   (a) Bruteforce approach Vs Backtracking
   (b) fixed Vs variable tuple size formulation. [8+8]
8. (a) Draw the portion of the state space tree generated by LCBB for the knapsack instance: n=5, $(p_1, p_2, ..., p_5)$=(10,15,6,8,4), $(w_1, w_2, ..., w_5)$=(4,6,3,4,2) and m=12.
   (b) What do you mean by bounding? Explain how these bounds are useful in the Branch and Bound method. [10+6]

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