PVP 14

Code: CS4T2

II B.Tech - II Semester–Regular/Supplementary Examinations–April 2018

DESIGN AND ANALYSIS OF ALGORITHMS
(COMPUTER SCIENCE & ENGINEERING)

Duration: 3 hours Max. Marks: 70

PART – A

Answer ***all*** the questions. All questions carry equal marks

11 x 2 = 22 M

1. a) Discuss the various rules to manipulate Big-Oh expressions.
   b) Distinguish between Algorithm and Pseudocode.
   c) Describe the Algorithm Analysis of Quick Sort.
   d) In how many passes does the Merge sort technique sorts the following sequence 3, 27,4,11,45,39,2,16,56?
   e) Write Technique of Greedy method.
   f) Define minimum cost spanning tree.
   g) State all-pair shortest path problem.
   h) Define Bounding function? Give the statement of traveling sales person problem.
   i) Find an optimal solution to the knapsack instance n=4 objects and the capacity of knapsack m=15, profits(10,5,7,11) and weight are (3,4,3,5). Distinguish between Dynamic Programming and Greedy method.
   j) Distinguish between fixed tuple sized and variable tuple sized state space tree organization.
   k) Define NP-complete problem.

PART – B

Answer any ***THREE*** questions. All questions carry equal marks. 3 x 16 = 48 M

2. a) Define time and space complexity. Describe different notations used to represent these complexities. 6 M

   b) Show that f1(n)+f2(n) = O(max(g1(n), g2(n))) where f1(n) = O(g1(n)) and f2(n) =O(g2(n)) 6 M

   c) Explain the Omega and Theta notations. 4 M

3. a) Explain General Method of Divide-and-Conquer. 4 M

   b) Sort the following using Quick sort and write its pseudo code. 50, 15, 25, 49, 5, 10, 16 12 M

4. a) Explain the procedure to formulate General greedy Procedure? 8 M

   b) What is the difference between Greedy & Dynamic Programming? 8 M

5. Solve the all-pair shortest path problem for given adjacency matrix graph using Floyd's algorithm. 16 M

$$D_0 = \begin{array}{c} \\ 1 \\ 2 \\ 3 \\ 4 \\ 5 \end{array} \begin{array}{c} \begin{array}{ccccc} 1 & 2 & 3 & 4 & 5 \end{array} \\ \begin{bmatrix} 0 & 8 & 3 & 5 & \infty \\ 8 & 0 & 2 & \infty & 5 \\ \infty & 1 & 0 & 3 & 4 \\ 6 & \infty & \infty & 0 & 7 \\ \infty & 5 & \infty & \infty & 0 \end{bmatrix} \end{array}$$

6. What is travelling salesman problem? Solve the following salesman problem instance using Branch and Bound. 16 M

$$\begin{bmatrix} 0 & 10 & 15 & 20 \\ 5 & 0 & 9 & 10 \\ 6 & 13 & 0 & 12 \\ 8 & 8 & 0 & 0 \end{bmatrix}$$