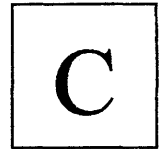


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**B.Tech. Degree V Semester Special Supplementary Examination
August 2015**

**IT 1504 DESIGN AND ANALYSIS OF ALGORITHMS
(2012 Scheme)**

Time : 3 Hours

Maximum Marks : 100

PART A
(Answer *ALL* questions)

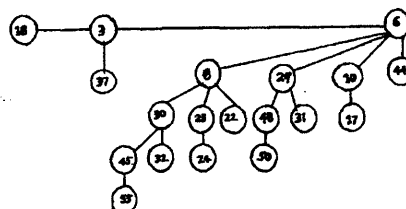
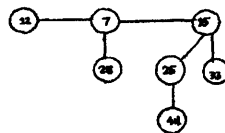
(8 × 5 = 40)

- I. (a) Define $\Theta, O, \Omega, o, \omega$ notations with examples.
- (b) State Master theorem and solve the recurrence $T(n) = 9T(n/3) + n$.
- (c) What is amotized analysis and what are the techniques used in amotized analysis?
- (d) Define a binomial heap. How will you represent a binomial heap?
- (e) Write an algorithm for finding the transitive closure of a binary relation.
- (f) What are the standard ways to represent a graph?
- (g) Explain complexity class NP.
- (h) Define NP-completeness.

PART B

(4 × 15 = 60)

- II. (a) Write an algorithm to search an element in a list using divide and conquer method and analyze it.
 - (b) Solve the recurrence $T(n) = 2T(n/2) + n \lg n$.
- OR**
- III. (a) Compare and contrast dynamic programming and greedy method using examples.
 - (b) Explain back tracking method with example.
- IV. (a) Explain heap sort and analyze it.
 - (b) Trace the heap union of binomial heaps given in the figures.



OR

(P.T.O.)

- V. Show red black tree that result success by inserting the keys 41, 38, 31, 12, 19, 8 into an initially empty red back tree and show the result from successive deletion of keys in order 8, 12, 19, 31, 38, 41.
- VI. (a) Explain all pair shortest path algorithm and analyze it.
(b) Write an algorithm to find strongly connected components in a graph.
- OR**
- VII. Explain graph traversal algorithms with example.
- VIII. Discuss TSP and show that it is NP-complete.
- OR**
- IX. Explain the performance bounds for approximate algorithm and discuss approximation algorithm for vertex cover.
