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Question Paper Code: 41023

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2015.

Fourth Semester

Computer Science and Engineering

01UCS404 - DESIGN AND ANALYSIS OF ALGORITHMS

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. What is an algorithm?
2. Differentiate time complexity from space complexity.
3. How divide and conquer technique can be applied to binary trees?
4. What is knapsack problem?
5. Define dynamic programming.
6. State the all-pair shortest-paths problem.
7. Define feasible solution. Give an example.
8. List the steps for simplex methods.
9. Define tractable and intractable problems.
10. When a node in a state space tree is said to be promising?

PART - B (5 x 16 = 80 Marks)

11. (a) Briefly discuss the steps in designing and analyzing an algorithm. (16)

Or

(b) Elaborate on Asymptotic Notations and its basic efficiency classes with examples.

(16)

12. (a) (i) Write down the algorithm for quick sort.

(8)

(ii) Explain how the following elements get sorted using quick sort.

5, 3, 1, 9, 8, 2, 4, 7.

(8)

Or

(b) (i) What are the steps required to solve the travelling sales man problem.

(6)

(ii) Write the algorithm for Iterative binary search.

(10)

13. (a) What is optimal binary search tree? Write the algorithm to find the optimal binary search tree by dynamic programming.

(16)

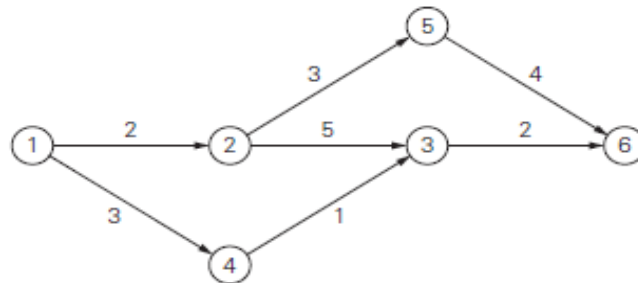
Or

(b) Define Minimum Spanning Tree. Explain Prim's Algorithm with an example.

(16)

14. (a) Apply the shortest-augmenting path algorithm to find a maximum flow and a minimum cut in the following network graph.

(16)



Or

(b) What is maximum matching? Illustrate the steps involved in finding the maximum matching in Bipartite Graphs.

(16)

15. (a) (i) State the n-queens problem. How will you solve the four queens problem by using backtracking?

(8)

(ii) Draw the State-space tree of solving the four queens problem by backtracking.

(8)

Or

(b) Explain NP hard and NP complete problems with example.

(16)