

Total No. of Questions : 8]

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Roll No

CS-402-CBGS

B.Tech., IV Semester

Examination, June 2020

Choice Based Grading System (CBGS)

Analysis Design of Algorithms

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.

ii) All questions carries equal marks.

iii) In case of any doubt or dispute the English version question should be treated as final.

1. a) What do you mean by Asymptotic Notations? Explain different asymptotic notations used in algorithms.
- b) What is the need of obtaining the time and space complexity measures of an algorithm? Justify your answer by some example.

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PTO

[2]

2. a) Show the various steps involved in the quick sorting of (23, 67, 12, 78, 33, 28, 97, 10, 6, 87, 39)

Quick sorting

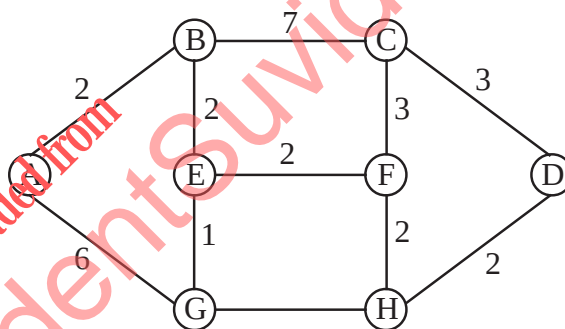
(23, 67, 12, 78, 33, 28, 97, 10, 6, 87, 39)

- b) Explain merge sort algorithm and find the complexity of the algorithm.

Merge sort

3. a) Using Dijkstra's algorithm find the shortest path from A to D for the following graph.

Dijkstra's



- b) Write a short note for the following:

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- i) Divide and Conquer technique
- ii) Greedy algorithm

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4. a) Write an algorithm to solve Knapsack problem using Greedy technique. Find the optimal solution to the Knapsack instance $n = 7, m = 15$

$(P_1, P_2, P_3 \dots P_7) = (10, 515, 7, 6, 18, 3)$

$(W_1, W_2, W_3 \dots W_7) = (2, 3, 5, 7, 1, 4, 1)$

Greedy

$(P_1, P_2, P_3 \dots P_7) = (10, 515, 7, 6, 18, 3)$

$(W_1, W_2, W_3 \dots W_7) = (2, 3, 5, 7, 1, 4, 1)$

- b) Explain Floyd-Warshall algorithm with an example of your choice.

5. a) Explain how to solve travelling salesman problem by the method of branch and bound and analyze complexity of the algorithm.

branch and bound

- b) Construct state space tree for solving four queen's problem using backtracking.

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6. a) Give a brief note on :

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i) Parallel algorithms

ii) Graph coloring

b) What is Backtracking? Discuss any one problem solved by backtracking. Also give its advantages and disadvantages.

7. a) Differentiate between DFS and BFS algorithms by an example.

b) What are B-trees? How are they created? Give its advantages.

B-trees.

8. Write short notes :

i) Binary Search Trees

ii) Tree Traversals

iii) NP-Completeness

iv) Reliability design

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