Analysis of Algorithms Importance

Introduction:

1. What do you understand by NP complete? Explain Is subset sum problem NP complete? If so explain ?

2. What is asymptotic analysis? Define Big 0, Omega and Theta notations

3. Define master theorem. Solve the following using master method. T(n)=8T(n/2) +n2

4. Prove that Vertex Cover problem is NP Complete.

5. P, NP and NPC Classes

6. Explain Randomized algorithm with example.

7. Write a note on "Optimal Storage on Tapes".

Divide and Conquer Approach:

1. Merge sort and its complexity

2. Write an algorithm for finding minimum and maximum using 10 divide and conquer. Also derive its complexity.

3. Sort the list of the elements 10,5,7,6,1,4,8,3,2,9 using merge sort algorithm and show its computing time is O(n logn).

4. Explain the general procedure of divide and conquer method ?

5. Derive and comment on the complexity of Quick Sort algorithm ?

6. Explain binary search Tree? How to generate an optimal binary search tree.

7. Write the algorithm for finding strassen's matrix multiplication and show how the complexity is being affected ?

8. Write short note on binary search and its complexity ?

9. Explain with example how divide and conquer strategy is used in binary search?

Greedy Method Approach

1. Obtain the solution to knapsack problem by Greedy method n=7, m=15 (p1,p2.....p7) = (10,5,15,7,6,18,3), (w1,w2,.....,w7)=(2,3,5,7,1,4,1).

2. Find MST of following graph using Prims and Krusicals Algorithm

3. Write the difference between greedy method and dynamic programming

4. Job sequencing with deadlines

5. Write Kruskal's algorithm and show its working by taking suitable 10 example of graph with 5 vertices.

Dynamic Programming Approach

1. Explain in brief the concept of Multistage Graphs ?

2. All pairs shortest path algorithm ?

3. Solve the following Knapsack problem using dynamic approach N = 4 items , Capacity of knapsack M = 9 |Item i |Value vi| Weight wi| |-|-|-| |1|18|2| |2|25|4| |3|27|5| |4|10|3|

4. Solve following knapsack using dynamic approach.

5. Solve fractional knapsack problem for the following. n=6, p= (18, 5, 9, 10, 12, 7) w= (7, 2, 3, 5, 3, 2)

6. What is longest common subsequence Problem ? Find LCS for the following String x = ACBAED String y = ABCABE

7. Assembly Line Scheduling

Backtracking and Branch and bound

1. What is backtracking approach. Explain how it is used in graph coloring ?

2. 8 queens problem.

3. Explain how backtracking is used for solving n-queens problem. Show the state space tree.

4. What is sum of subset problem? Write the Algorithm and solve the following. Array A = [2,3,5,6,7,8,9] and K = 15

5. Write short note on 15 puzzle problem

String Matching Algorithms

1. What is Knuth Morris Pratt Method of Pattern Matching ? Give Examples

2. **Explain different string matching algorithms**