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| SURESH<br>GYAN VIHAR<br>UNIVERSITY<br>Accredited by NAAC with 'A' Grade | | **INTERNAL ASSIGNMENT - 1** |
| **Course** | **MCA** | **Design & Analysis Of Algorithm** |
| **Semester** | **4** | |
| **Total Marks:** | **15** | |

**Q.1.** **Write answers for any two questions from below. (5 marks each – Word limit – 500)**

**A.** What are the different mathematical notations used for algorithm analysis?

**B.** Relate Hamiltonian cycle with travelling sales person problem and also give the backtracking solution vector that finds all Hamiltonian cycles for any directed or undirected graph.

**C.** What is a Minimum Cost Spanning tree? Explain Kruskal's Minimum cost spanning tree algorithm with suitable example.

**Q.2.** **Write short notes on all of the following topics (1 mark each - Word limit - 100)**

**A.** 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).

**B.** The basic principle of Divide and Conquer method.

**C.** Define Minimum Cost Spanning tree and list its applications.

**D.** Write Control Abstraction of Divide-and-Conquer.

**E.** Draw all possible binary search trees for the identifier set (do, if, stop).

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| SURESH<br>GYAN VIHAR<br>UNIVERSITY<br>Accredited by NAAC with 'A' Grade | | INTERNAL ASSIGNMENT - 2 |
| Course | MCA | Design & Analysis Of Algorithm |
| Semester | 4 | |
| Total Marks: | 15 | |

**Q.1. Write answers for any two questions from below. (5 marks each – Word limit – 500)**

**A.** Show that the travelling salesman problem is NP-Complete.

**B.** What is a Spanning tree? Explain Prim's Minimum cost spanning tree algorithm with suitable example.

**C.** Explain the basic methodology of divide and conquer algorithm. List the advantages of divide and conquer algorithm.

**Q.2. Write short notes on all of the following topics (1 mark each - Word limit - 100)**

**A.** What is meant by Divide-and-Conquer approach?

**B.** Give the problem formulation of Knapsack problem using greedy method.

**C.** Time Complexity

**D.** Using step count find the time complexity of sum of 'n' natural numbers.

**E.** Write the Control Abstraction of iterative Backtracking method.