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Name of Examination : **Summer 2021** - (Preview)

Course Code & Course Name : **CO353U - Design and Analysis Of Algorithms**

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Maximum Marks : **60**

Duration : **3 Hrs**

[Edit](#) [Print](#) [View Answer Key](#) [Close](#) **Answer Key Submission Type:** Marking scheme with model answers and solutions of numerical

Instructions:

1. All questions are compulsory.
2. Illustrate your answer with suitable figures/sketches wherever necessary.
3. Assume suitable additional data; if required.
4. Use of logarithmic table, drawing instruments and non programmable calculators is allowed.
5. Figures to the right indicate full marks.

- 1.) Attempt any two only -
 - A.) Why do we use asymptotic Notations in the study of Algorithms? Explain various asymptotic Notations and their significance. [6]
 - B.) What is binary search? Write and explain iterative binary search with example [6]
 - C.) Discuss the decision problems of Class P and NP. [6]
- 2.) Attempt any two only -
 - A.) Define minimum cost spanning tree. Write Prim's Algorithm to generate a minimum spanning tree for any given weighted graph with example. [6]
 - B.) Explain general procedure to solve a multistage graph problem using backtracking approach. [6]
 - C.) What is Hamiltonian cycle? Explain the Algorithm to find the Hamiltonian cycle in a given connected graph. [6]
- 3.) Attempt any two only -
 - A.) What is branch and bound technique? How it can be apply to solve the travelling salesman problem? [6]
 - B.) What is divide and conquer strategy? Write an Algorithm for merge sort and state it's time complexity. [6]
 - C.) What is dynamic programming? Explain an Algorithm for finding all pairs shortest path in a graph. [6]
- 4.) Attempt both the Questions -
 - A.) Define the optimal binary search tree problem. Explain how principle of optimality holds for this problem? Also how it is solved using dynamic programming? [6]
 - B.) What is backtracking strategy? Explain how it can be used for 8 Queen problem? Write it's state space also. [6]
- 5.) Attempt both the Questions -
 - A.) Define a binary search tree. Write an Algorithm for it and illustrate with suitable example. [6]
 - B.) List various characteristics of Greedy approach and write Algorithm for it . Which type of problems are solved using Greedy approach? [6]

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