LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – **COMPUTER SCIENCE**

SECOND SEMESTER – **APRIL 2022**

PCS 2501 – DESIGN AND ANALYSIS OF ALGORITHMS

Date: 15-06-2022 Dept. No. Max. : 100 Marks

Time: 09:00 AM - 12:00 NOON

Part – A (10 x 2 = 20 marks)

Answer all the questions

1. Differentiate time and Space efficiency.
2. List the factors which affects the running time of the algorithm.
3. What is the basic principle of Greedy method?
4. What is called Minimal Spanning Tree?
5. Differentiate Depth-First Search and Breadth-First search.
6. Define the term : Dynamic Programming
7. What is the Hamiltonian cycle?
8. What is Subset Sum Problem?
9. Define the term : NP Class
10. What is NP Complete Problem?

Part – B (5x 8 = 40 marks)

Answer all the questions

11. Discuss in detail about fundamentals of algorithmic problem solving.

(or)

Explain any two important problem types in detail.

12. Describe Strassen's matrix multiplication in detail? And provide the complete analysis with example.

(or)

Explain Dijkstra's algorithm using divide and conquer method with an example.

13. Explain the procedure involved in Selection sort algorithm with an example.

(or)

Explain Breadth-First Search algorithm with suitable example.

14. Explain the Backtracking technique with suitable Example.

(or)

Write short notes on Space state tree with suitable example.

15. Write short notes on Approximation algorithms for NP-hard problems.

(or)

Describe in detail about complexity Classes in the field of theoretical computer science.

Part – C (2x 20 = 40 marks)

Answer any two questions

16. a) Illustrate mathematical analysis (Time Efficiency) of Non-recursive Algorithms.

    b) Explain how greedy technique is utilized in Kruskal's algorithm with suitable example.

17. a) Enlighten the Floyd Warshall's algorithm with Example.

    b) Explain the procedure involved in Traveling salesman problem using Branch and bound technique with an example.

18. a) Explain approximation algorithm for the Traveling salesman problem with example.

    b) Describe Quick sort algorithm using divide and conquer method with an example.

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