St. Joseph's College of Arts and Science (Autonomous)

PG and Research Department of Computer Science

Subject Name: Fundamentals of Algorithms

Subject Code: CS306S

Unit – I

5 Mark:

1. Define Algorithm. List out its criteria in detail.
2. Write short notes on study of algorithm.
3. Explain performing analysis on complexity of an algorithm.
4. Write short notes on posterior analysis and priori analysis.
5. Explain Divide and Conquer method.
6. What is Sorting? Explain Quick Sort with example.
7. Define order of magnitude of asymptotic notation.

15 Mark:

1. Explain the Straight forward / Recursive algorithm for finding Maximum and Minimum.
2. Explain about Strassen's Matrix Multiplication with example.
3. Write an algorithm for Partition method in Quick Sort with example.
4. Write an algorithm for Merge Sort with example.
5. Explain in detail about Binary Search.

Unit – II

5 Mark:

1. What is Dynamic Programming? Explain.
2. Write short notes on Multistage Graph.
3. Write a note on Travelling Salesman Problem.
4. Difference between greedy method and dynamic method.
5. Write short note on principle of optimality.

15Mark:

1. Discuss on Multistage Graph using Backward approach.
2. Explain about Travelling Salesman Problem and discuss how to solve using Dynamic Programming.
3. Briefly explain in detail about general method of Dynamic Programming.

Unit – III

5 Mark:

1. Explain in detail about Traversal Techniques.
2. Write short notes on m-Coloring problem.
3. Write an algorithm for BFS and explain.
4. Write short note on explicit and implicit constraints.
5. Explain detail about backtracking.
6. Write an algorithm for iterative backtracking.

15 mark:

1. Explain about Graph Coloring in detail.
2. Explain detail about recursive backtracking
3. Explain in detail about Breadth First Search with example.
4. Explain in detail about Depth First Search with example.

Unit – IV

5 Mark:

1. Write short notes on Greedy method .
2. Write and explain Non-Deterministic Knapsack algorithm.
3. Explain the functions of greedy method.
4. Write short note on feasible and optimalsolution.

15 mark:

1. Explain in detail about 0/1 Knapsack problem.
2. Describe a brief note on Dijikstras Shortest path algorithm.
3. Find the solution to the 8- Queens problem using suitable algorithm.
4. Explain greedy method using single source shortest path.

Unit – V

5 Mark:

1. Write short notes on Np – Hard.
2. Write short notes on Np – Complete.
3. Explain the strategy to prove that a problem is Np-Hard.

15 Mark:

1. Explain in detail about Np – Hard and Np – Complete Problem.