DESIGN AND ANALYSIS OF ALGORITHMS

IMPORTANT QUESTIONS

<u>UNIT-1</u>

- 1. What is an algorithm?Explain about the criteria's for an algorithm.
- 2. Calculate the space and time complexity for matrix multiplication algorithm.
- 3. What are the characteristics of an algorithm ?Explain.
- 4. Explain about asymptotic notations with 3 examples for each.
- 5. Explain the procedure for calculating time and space complexity.
- 6. Explain pseudo code conventions for writing an algorithm.
- 7. How to validate and testing of an algorithm.
- 8. What is time complexity? Explain with an example.
- 9. What is space complexity? Explain with an example.
- 10. Explain probabilistic and amortized analysis?

<u>UNIT-2</u>

- 1. Write an algorithm for quick sort? Find the best, average and worst case complexity for quick sort.
- 2. Explain the algorithm for merge sort ?Find the best ,average and worst case complexity for merge sort.
- 3. Write control abstraction for divide and conquer method.
- 4. Write the iterative algorithm for searching an element by using binary search.

- 5. Explain the method for searching an element 94 from the set of elements using binary
 - $search.\{10, 12, 14, 16, 18, 20, 25, 30, 35, 38, 40, 45, 50, 55, 60, 70, 80, 90\}$
- 6. Draw the binary decision tree and search for an element -2 using binary search {-15,-6,0,7,9,23,54,82,101,112}.
- 7. Find the time complexities for merge sort?
- 8. Find the time complexities for quick sort?
- 9. Write and explain recursive binary search algorithm with example.
- 10. Compare merge sort and quick sort with examples.

UNIT-3

- 1. Write Prim's algorithm for minimum spanning tree?
- 2. Write an algorithm for knapsack problem?
- Find an optimal solution to the knapsack instance n=7,M=15,(p1,p2,p3,p4,p5,p6,p7)=(10,5,15,7,6,18,3) and (w1,w2,w3,w4,w5,w6,w7)=(2,3,5,7,1,4,1).
- 4. Write Kruskal 's algorithm for minimum spanning tree?
- 5. Find the time complexity for Kruskal's algorithm?
- Write control abstraction for greedy method ? Find the optimal solution for the following knapsack problem :n=3,m=20,(p1,p2,p3)=(25,24,15) and (w1,w2,w3)=(18,15,10)
- 7. Discuss in detail about single source shortest path problem.
- 8. Explain job sequencing with deadlines in detail.
- 9. What is greedy method ?Write the algorithm for it.
- 10. Compare Prim's and Kruskal's algorithms.