Design & Analysis of Algorithms

UNIT-I

Part – A (Short Answer Questions)

S.No.	Questions	BT	CO	PO
1	Define the term algorithm and state the criteria of an algorithm.	L1	CO1	PO1
2	Define order of an algorithm and the need to analyze the algorithm.	L4	CO1	PO2
3	Define asymptotic notations: Big-Oh, Omega and Theta.	L3	CO1	PO1
4	Distinguish between Algorithm and Pseudocode.	L2	CO2	PO2
5	State the best-case and worst-case analysis for Binary Search.	L1	CO1	PO1
6	State the best-case analysis of Quick Sort.	L4	CO2	PO2
7	Give the recurrence equation for the worst-case behavior of Merge Sort.	L1	CO3	PO3
8	Compute the average-case time complexity of Quick Sort.	L1	CO2	PO2
9	How can performance be analyzed? Explain with an example.	L1	CO1	PO2
10	Describe best-case, average-case, and worst-case efficiency of an algorithm.	L2	CO2	PO2

Part – B (Long Answer Questions)

Q.No.	Question	BT	CO	PO
11(a)	Discuss various asymptotic notations used for best-case, average-case, and worst-case analysis of algorithms.	L4	CO2	PO2
11(b)	Define: (i) Time Complexity (ii) Space Complexity.	L5	CO2	PO1
12(a)	Discuss Binary Search algorithm and analyze its time complexity.	L6	CO1	PO2
12(b)	Explain the Quick Sort algorithm with an example and find the time complexity.	L3	CO2	PO3
13(a)	Explain Binary Search algorithm.	L1	CO3	PO1
13(b)	Explain the Merge Sort algorithm with an example and find the time complexity.	L2	CO2	PO3
14(a)	Give the algorithm for Strassen's Matrix Multiplication and find the time complexity.	L3	CO3	PO3
14(b)	Explain the properties/characteristics of an algorithm with an example.	L2	CO1	PO1
15(a)	Write a Java program to implement Quick Sort algorithm for sorting a list of integers in ascending order.	L3	CO2	PO3
15(b)	Sort the list of numbers using Merge Sort: 78, 32, 42, 62, 98, 12, 34, 83, 10.	L4	CO1	PO3

16(a)	Discuss Binary Search algorithm and analyze its time complexity.	L1	CO3	PO2
16(b)	Discuss various asymptotic notations used for best-case, average-case, and worst-case analysis of algorithms.	L2	CO4	PO2