ECHELON INSTITUTE OF TECHNOLOGY, Faridabad

Department of Computer Applications

Assignment No– 1 : Even Semester 2023-24

Course/Branch : MCA **Semester:2**

Subject Name: ANALYSIS & DESIGN OF ALGORITHMS

Max. Marks: 20

Subject Code : MCA-20-102

NOTE: Last date of submission:29/2/2024

On completion of this course, the student will be able to

CO 1. Analyze and compare complexity for different types of algorithms for different types of problems and apply mathematical preliminaries to the analyses and design stages of different types of algorithms.
CO 2. Apply different types of data structures, analyze the best one for different types of problems and recognize the general principles and good algorithm design techniques for developing efficient computer algorithms.

I. **Descriptive questions:**

Q1. What do you understand about big-O notation? What are the other notations for analysis of algorithms? **5 marks**

Q2. Explain the difference between merge sort and quick sort? **5 marks**

Q3. Compare and differentiate- “Divide and Conquer” and “Greedy Methods” **2 marks**

II. **Solve the following:** **4 marks each**

Q3. Explain Knapsack Problem. Find the optimal solution for the following:

Sack Capacity is 15.

Objects(O)	1	2	3	4	5	6	7
Profits(P)	10	5	15	7	6	18	3
Weights(W)	2	3	5	7	1	4	1

Q4. Explain the problem of Job sequencing with deadlines. Find the greedy solution for the following:

Jobs(J)	J1	J2	J3	J4	J5	J6	J7
Profits(P)	35	30	25	20	15	12	5
Deadlines(D)	3	4	4	2	3	1	2