Roll Number: _____

MID SEMESTER EXAMINATION (EVEN SEM 24)

Date: 7th March, 2025
Time: 2 hrs, M. Marks: 25

Course Code: TC2409
Course Name: Design and Analysis of Algorithms
Name of Instructor: Dr. Anupam Garg

Note: All questions are compulsory. Attempt the subparts of the question at one place.

			CO	BL
1.	What is the use of asymptotic notations? Explain its different types in detail.	5	CO1	L1
2.	For $T(n)=7T(n/2)+18n^2$ Solve the recurrence relation and find the time complexity.	5	CO3	L3
3.	Illustrate Merge sort algorithm with its algorithm and discuss its time complexity.	5	CO2, CO3	L3
4(a).	Explain the general procedure divide and conquer approach in detail.	2	CO1	L1
4(b).	Write the algorithm of binary search and discuss its time complexity.	3	CO3	L2
5.	Consider the following code: **template<class T>** **void rank (T a[ ], int n, int r[ ])** **{** **//Rank the n elements a[n]** **//element ranks returned in r[n]** **for (int i=0; i<n; i++)** ** r[i] =0;** **for (int i=1; i<n; i++)** ** for (int j=0; j<i; j++)** ** if(a[j]<=a[i]) r[i]++;** ** else r[j]++;** **}** Describe the time complexity of each step and overall code. Also describe the space complexity of the code.	5	CO3	L3