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**Course Code: MCA-201**

**Course Name: Design and Analysis of Algorithms**

**Assignment 1**  
**(Based on Unit-I & II)**

No.	Question	CO	BTL
Q 1.	Solve the recurrence $T(n) = 4T(n/2) + n^3$	CO1	BTL 1
Q 2.	“Sorting of list” is mandatory before “merging of list” in merge sort. Justify. Can we merge unsorted lists to get sorted list?	CO3	BTL 3
Q 3.	Differentiate between big oh (O) and little oh (o) asymptotic functions..	CO2	BTL 2
Q4.	Illustrate time complexity of merge sort as $O(n \log n)$ .	CO1	BTL 1
Q5.	Apply bucket sort on the input array [0.78, 0.17, 0.39, 0.26, 0.72, 0.94, 0.21, 0.12, 0.23, 0.68]	CO1	BTL 1
Q6.	Define the terms best case, worst case, and average case time complexity.	CO1	BTL 1
Q7.	Solve using Master’s Theorem: 1. $T(n) = 2T(n/4)+1$ 2. $T(n) = 2T(n/4) + \text{sqrt}(n)$	CO3	BTL 3
Q8.	Show that the solution of $T(n) = T(n-1) + n$ is $O(n^3)$ .	CO2	BTL 2
Q9.	Explain string matching with finite automata algorithm.	CO1	BTL 1