ABES Engineering College, Ghaziabad

Department of Computer Science and Engineering-Data Science

Session: 2023-2024 **Semester: Vth** **All Sections**

Subject Code: KCS 503 **Subject Name: Design and Analysis of Algorithms**

Date of Assignment: 11/10/23 **Date of submission: 20/10/23**

Unit 1 Assignment 1

S.no	Questions	CO/ Bloom's
1	What is an algorithm? Define types of algorithm. Explain notations for algorithm. What is complexity? Define types of complexity?	CO1, K1 , K2
2	Explain growth of functions. Mention all the asymptotic notations. How running time and complexity of an algorithm are related to each other. Elucidate with the help of asymptotic notations.	CO1. K1 , K2
3	Solve the following recurrences. T (n) = 3T (n/4) + n log n. ii. T (n) = T (√n) + 1. iii. T (n) = 2T (n/4) + √n. iv. T (n) = T (n-1) + n	CO1, K3
4	Explain & write merge sort with all required and related Procedure. Write complexity & draw step by step execution with appropriate data structure to Illustrate MERGESORT on A = {8, 31, 32, 6, 38, 57, 9, 49, 11, 5, 84}.	CO1, CO 2, K 3
5	Explain and write heap sort with all required and related Procedure. Write complexity and draw step by step execution with appropriate data structure to Illustrate HEAPSORT on the array A = {25, 3, 22, 15, 72, 17, 30, 18, 4}.	CO1, K3
6	Explain and write quick sort with all required and related Procedure. Write complexity and draw step by step execution with appropriate data structure to Illustrate PARTITION on A = {3, 19, 91, 5, 22, 8, 7, 41, 11, 12, 6, 21, 44}.	CO1, K 2. K3
7	Explain and write counting sort. Write complexity and draw step by step execution with appropriate data structure to illustrate the operation of COUTINGSORT on A = {6, 0, 2, 0, 1, 3, 4, 6, 1, 3, 2};	CO 1, K2, K3
8	Discuss the best case, Worst case Complexity of Insertion Sort and Quick Sort	CO 1, K2,K3