**Vishwakarma Government Engineering College, Chandkheda**

**Information Technology Department**

**B.E. Semester 5, Academic Year: 2021-22 (Odd Term)**

**3150703:**  **Analysis and Design of Algorithms**

**Practical List**

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| **No.** | **Aim of Practical** | **CO** |
| **1** | Implement a function for each of following problems and count the number of steps executed/Time taken by each function on various inputs and write complexity of each function. Also draw a comparative chart. In each of the following function N will be passed by user.  1. To calculate sum of 1 to N numbers using loop.  2. To calculate sum of 1 to N numbers using equation.  3. To calculate sum of 1 to N numbers using recursion. | 1 |
| **2** | Write user defined functions for the following sorting methods and compare their performance by time measurement with random data and sorted data.  1.      Selection Sort  2.      Bubble Sort  3.      Insertion Sort  4.      Merge Sort  5.      Quick Sort | 1,2 |
| **3** | Implement a function of sequential search and count the steps executed by function on various inputs for best case and worst case. Also write complexity in each case and draw a comparative chart. | 1 |
| **4** | Compare the performance of linear search and binary search on various inputs. | 1,2 |
| **5** | Implement functions to find factorial of any number using iteration and recursive method. Compare the performance of two methods by counting number of steps executed/ Time taken by each function on various inputs. Also draw a comparative chart. | 1,2 |
| **6** | Implement Program for fractional/binary Knapsack using greedy design technique. | 3 |
| **7** | Implement program for Making Change using greedy design technique. | 3 |
| **8** | Implement program for Graph searching techniques (DFS and BFS). | 6 |
| **9** | Implement program for prim’s algorithm | 3,6 |
| **10** | Implement program for Kruskal's algorithm. | 3,6 |
| **11** | Implement program to solve problem of making a change using dynamic programming. | 3 |
| **12** | Implement program of chain matrix multiplication using dynamic programming. | 3 |
| **13** | Implement program to solve LCS problem using dynamic programing. | 3,4 |
| **14** | Implement program to solve Knapsack problem using dynamic programming. | 3 |
| **15** | Implement Rabin-Karp string matching algorithm. | 4 |