L. D. College Of Engineering
Practical List
1ST SEM ME -CE

M. E. SEMESTER: **I**   **Computer Engineering**

Subject Name: **COMPUTER ALGORITHMS**

Subject Code: **2710201**

No.	Aim of the Practical	Hrs
01	Implementation and Time analysis of sorting algorithms. : Bubble sort, Selection sort, Insertion sort, Merge sort and Quicksort	02
02	Implementation and Time analysis of linear and binary search algorithm.	02
03	Implementation of max-heap sort algorithm	04
04	Implementation and Time analysis of factorial program using iterative and recursive method	02
05	Implementation of a knapsack problem using dynamic programming.	02
06	Implementation of chain matrix multiplication using dynamic programming.	02
07	Implementation of making a change problem using dynamic programming	02
08	Implementation of a knapsack problem using greedy algorithm	02
09	Implementation of Graph and Searching (DFS and BFS).	04
10	Implement prim's algorithm	04
11	Implement kruskal's algorithm.	02
12	Implement LCS problem.	02

Semi Projects

1. List the factors that may influence the space complexity of a program. Write a recursive and nonrecursive function to compute n! Compare the space requirements of nonrecursive function with those of recursive version.

2. The array a[0:9]=[4,2,6,7,1,0,9.8.5.3] is to be sorted using insertion sort. Show the best case, average case and worst case analysis.

3. Write a program to determine whether or not a character string has an unmatched parenthesis. Use a stack. What is the time complexity of your program? Can we replace the stack with a queue?

4. Write a program that implements change making solution. Assume that the cashier has currency notes in the denominations Rs. 100, Rs. 50, Rs. 20, Rs. 10, Rs. 5 and Rs. 1 in addition to coins .Program should include a method to input the purchase amount and the amount given by the customer as well as method to output the amount of change and a breakdown by denomination.Apply greedy algorithm at the cahier side that is give less number of coins if sufficient currency of that denomination available.

5. Write a program for 0/1 knapsack problem using this heuristic : Pack the knapsack in nonincreasing order of profit density.

6. Write a program that implement divide and conquer method to find the maximum and minimum of n elements. Use recursion to implement the divide and conquer scheme.

7. Implement the Rabin – Karp matcher and Boyer Moore string matching algorithm. Give analysis For pattern matching in FIREWALL which algorithm is best suited?

8. Implement Bellman ford algorithm. Find an application that can best be solved by Bellman Ford algorithm.

9. Implement Dijkstra's algorithm. Find an application that can best be solved by Dijkstra's algorithm.

10. Consider the subnetting in router. How a source node must be sending a packet to destination node.Does it use greedy,divide and conquer or dynamic programming? Perform analysis.

11. Consider your E-mail account. What data structure can be used to make the search faster if we want subject wise or sender wise search.