ZEAL EDUCATION SOCIETY'S
ZEAL COLLEGE OF ENGINEERING AND RESEARCH

Class: SE **Semester: II**

Subject: Data Structures and Algorithms Lab

Practical Index

Group A

1. Write a C++ program to implement a hash table that handles collisions using linear probing. (Consider telephone book database of N clients.).

2. Write a C++ program to Implement all the functions of a dictionary (ADT) using hashing and handle collisions using chaining.

Group B

3. Write a C++ program to construct a tree and print the nodes. (A book consists of chapters, chapters consist of sections and sections consists of subsections). Find the time and space requirements of your method.

4. Write a c++ program to perform the following operations:
   I. Insert new node
   II. Find the number of nodes in longest path from root.
   III. Minimum data value found in the tree.
   IV. Change a tree so that the roles of the left and right pointers are swapped at every node.
   V. Search a value.

5. Write a C++ program to convert given binary tree into threaded binary tree. Analyze time and space complexity of the algorithm.

Group C

6. Write a C++ program to represent a given graph using adjacency matrix/list to perform DFS and using adjacency list to perform BFS. (Use the map of the area around the college as a graph)

7. Write a C++ program to use adjacency list representation of the graph or use adjacency matrix representation of the graph. The node can be represented by airport name or name of the city and a flight can be considered as a edge between the cities.

Group D

8. Write a C++ program to build an optimal binary search tree that has the least search cost given the access probability for each key. (Given sequence k = k1 <k2 < … <kn of n sorted keys, with a search probability pi for each key ki).

9. Write a C++ program to use a height balance tree (AVL) and provide a facility for adding new keywords and its meanings in a dictionary and displaying them in any order.

Group E

10. Write a C++ program to use a Heap data structure and read the marks obtained by students of second year in an online examination of a particular subject. Find out maximum and minimum marks obtained in that subject. Analyze the algorithm.

Group F

11. Write a C++ program for implementation of Sequential Access File to maintain the data of students and allow an user to add, search, delete and display information of the student.

12. Write a C++ program for implementation of a direct access file - Insertion and deletion of a record from a direct access file.

Mini-Projects/ Case Study

13. Design a mini project using C++ which will use the different data structure with or without C++ library and show the use of specific data structure on the efficiency (performance) of the code.

OR

Design a mini project to implement Snake and Ladders Game using Python.

OR

Design a mini project to implement a Smart text editor

OR

Design a mini project for automated Term work assessment of student based on parameters like daily attendance, Unit Test / Prelim performance, Students achievements if any.