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| **DEPARTMENT OF COMPUTER ENGINEERING** |

Date:

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|  | **Subject : 210256- Data Structures and Algorithms Laboratory**  **List of Experiments / Assignments** | |
| **Sr. No** | **Sr. No** | **GroupA** |
| 1 | 1 | Consider telephone book database of N clients. Make use of a hash table implementation to quickly look up client‘s telephone number. Make use of two collision handling techniques and compare them using number of comparisons required to find a set of telephone numbers. |
| 2 | 4 | To create ADT that implement the "set" concept.  a. Add (new Element) -Place a value into the set , b. Remove (element) Remove the value c. Contains (element) Return true if element is in collection, d. Size () Return number of values in collection Iterator () Return an iterator used to loop over collection, e. Intersection of two sets , f. Union of two sets, g. Difference between two sets, h. Subset |
|  |  | **GroupB** |
| 3 | 5 | A book consists of chapters, chapters consist of sections and sections consist of subsections. Construct a tree and print the nodes. Find the time and space requirements of your method. |
| 4 | 6 | Beginning with an empty binary search tree, Construct binary search tree by inserting the values in the order given. After constructing a binary tree -  i. Insert new node, ii. Find 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 | 9 | Construct an expression tree from the given prefix expression eg. +--a\*bc/def and traverse it using post order traversal (non recursive) and then delete the entire tree. |
|  |  | **GroupC** |
| 6 | 13 | 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 the graph. Identify the prominent land marks as nodes and perform DFS and BFS on that. |
| 7 | 17 | There are flight paths between cities. If there is a flight between city A and city B then there is an edge between the cities. The cost of the edge can be the time that flight take to reach city B from A, or the amount of fuel used for the journey. Represent this as a graph. The node can be represented by airport name or name of the city. Use adjacency list representation of the graph or use adjacency matrix representation of the graph. Check whether the graph is connected or not. Justify the storage representation used. |
|  |  | **GroupD** |
| 8 | 18 | Given sequence k = k1 <k2 < … <kn of n sorted keys, with a search probability pi for each key ki . Build the Binary search tree that has the least search cost given the access probability for each key? |
| 9 | 19 | A Dictionary stores keywords and its meanings. Provide facility for adding new  keywords, deleting keywords, updating values of any entry. Provide facility to display whole data sorted in ascending/ Descending order. Also find how many maximum comparisons may require for finding any keyword. Use Height balance tree and find the complexity for finding a keyword |
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|  |  | **GroupE** |
| 10 | 20 | Consider a scenario for Hospital to cater services to different kinds of patients as Serious (top priority), b) non-serious (medium priority), c) General Checkup (Least priority). Implement the priority queue to cater services to the patients. |
| 11 | 22 | Department maintains a student information. The file contains roll number, name,  division and address. Allow user to add, delete information of student. Display  information of particular employee. If record of student does not exist an appropriate  message is displayed. If it is, then the system displays the student details. Use sequential file to main the data. |
|  |  | **GroupF** |
| 12 | 23 | Company maintains employee information as employee ID, name, designation and  salary. Allow user to add, delete information of employee. Display information of  particular employee. If employee does not exist an appropriate message is displayed. If it is, then the system displays the employee details. Use index sequential file to maintainthe data. |
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| 13 |  | **Mini-Projects/CaseStudy** |
| 14 |  | **Content beyond Assignment-** Dijkstra’s algorithm for shortest path using VLab |

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Subject Teacher HOD