QUESTION BANK FOR IV SEMESTER

Algorithms Laboratory (CSL46)

I.A. Marks: 50 **Exam Hours: 03**
Credits: 0:0:1 **Exam Marks: 50**

Develop the following programs using Python Programming Language

1. Given a set of men and women design and implement Gale- Shapley algorithm to determine the stable set of marriages among them. Commenton the efficiency and the time complexity of the same. **Assumptions**: Men propose first according to their preference list. Women can choose a better partner based on the preference
2. Three users in an online music portal listen to a playlist of 8 songs that arenumbered from 1 to 8 in a random order. Each user needs to be recommended to another user playlist's order that has minimum number of inversions. Design and implement an algorithm to determine the number of inversions. State the design strategy used and time complexityof the same.
3. Design and implement recursive DFS algorithm to determine the traversalof a graph
4. Design and implement BFS algorithm to determine the traversalof a graph
5. Design and implement Mergesort Algorithm to sort a given set of numbers. Comment on its time complexity.
6. In a database of numbers there is a table of unsorted numbers. The database admin now wants to sort these numbers using an approach where in a pivot element is selected for sorting. At certain point, thefirsthalf elements are less than the pivot and right half elements are greater than the pivot. Design and implement Quicksort algorithm to solve it. State the design strategy used and time complexity of the same.
7. A car driver is given a set of locations to be covered with their distancesby a company. Now the company gives a privilege for the car driver to start at any arbitrary location. But, the condition is the route chosen by the driver should be minimum i.e. the total cost of the entire driving should be minimum. Design and implement Prim's algorithm that gives a greedy solution to the car driver and display the minimum costachieved. Find the time complexity