Faculty of Engineering, University of Jaffna

Department of Computer Engineering

EC4070: Data Structures and Algorithms

Lab – 06

Tree

Date: 18th December 2020 **Duration: 3 hour**

1. **City Database** **[100 Marks]**

   Implement a city database using a Binary Search Tree (BST) to store the database records. Each database record contains the name of the city (a string of arbitrary length) and the coordinates of the city expressed as double values of latitude and longitude coordinates in **Decimal Degrees** type.

   The BST should be organized by city name. Your database should allow records to be

   - Inserted (25 marks)
   - Deleted by name (25 marks)
   - Searched by name (15 marks)
   - Print city records in descending order by their city name (15 marks)
   - Print all cities within a given distance of a specified point (20 marks)

   Example of city records:

   - Colombo, 6.927079, 79.861244
   - Chicago, 41.881832, -87.623177
   - Sydney, -33.865143, 151.209900

Instructions:

- Implement Java program for given question using best coding practices. You should name your classes using appropriate names.
- Create a zip file named 201x_E_xxx_L6 which contains all the Java programs and upload the zip file before given deadline via team.
- Any plagiarized work will get 0 marks.