**Python Programming Lab Activities (7th Semester)**

**Instructions:**

* All the activities will be completed by students and teachers in the computer lab.
* All students must submit the following practical activities before the end of the semester for evaluation purposes.

**Lab 1: Python Programming Fundamentals**

1.1 Installing Python and setting up the development environment (e.g., Anaconda, Jupyter Notebook). 1.2 Running a simple program using the command line or Jupyter Notebook.

1.3 Write programs to illustrate variables, constants, data types, and type conversion.

1.4 Write a program to demonstrate:

a. if

b. else if

c. match

d. for

e. while

f. do while (using while loop as Python does not have a do-while loop)

**Lab 2: Control Statements in Python**

2.1 Write programs to apply if, match, break, and continue statements for decision making.

2.2 Write programs to utilize different loop statements (while, for) to solve meaningful problems.

2.3 Write programs to demonstrate input validation using loops.

2.4 Write programs to create different patterns using nested loops.

2.5 Write programs to make use of infinite loops (with a proper exit condition).

**Lab 3: Lists, Tuples, Dictionaries, Sets, and Strings**

3.1 Write programs to create lists, add elements, remove elements, and display list items.

3.2 Write programs to make use of list slicing to display elements.

3.3 Write programs to elaborate different list methods (append, index, insert, sort, remove, reverse, min, max).

3.4 Write programs to apply list comprehension.

3.5 Write programs to illustrate two-dimensional lists.

3.6 Write programs to create tuples, add elements, remove elements, and display tuple items.

3.7 Write programs to create dictionaries, add elements, remove elements, and display dictionary items. 3.8 Write programs to create sets, add elements, remove elements, and display set items.

3.9 Write programs to perform set operations (union, intersection, difference).

3.10 Write programs to make use of string manipulation methods and perform different string operations.

**Lab 4: Object-Oriented Programming with Python**

4.1 Write programs to illustrate the object-oriented concept with simple examples.

4.2 Write programs to make use of the \_\_init\_\_ method to initialize objects.

4.3 Write programs to apply different types of inheritance (single, multiple, hierarchical, multilevel).

4.4 Write programs to implement method overloading and overriding.

4.5 Write programs to elaborate polymorphism and data hiding concepts.

**Lab 5: Function, Exception, and File Handling**

5.1 Write programs to divide work into functions.

5.2 Write different varieties of functions: functions with arguments, value-returning functions, functions without arguments.

5.3 Write programs to store output in files.

5.4 Write programs to read input from files.

5.5 Write programs to handle different types of exceptions using try, except, finally blocks.

**Lab 6: Database and GUI Programming**

6.1 Write programs to establish a connection with a database (SQLite) and create or delete databases and tables.

6.2 Write programs to store data in a database and manipulate the data.

6.3 Write programs to perform CRUD operations in the database.

6.4 Write programs to create simple GUIs with widgets: label, text entry, radio buttons, check buttons using the tkinter module.

6.5 Write programs to organize different widgets with frames to create attractive designs.

6.6 Write programs to draw different geometrical shapes using the canvas widget.