**BCE102L - STRUCTURED AND OBJECT ORIENTED PROGRAMMING**

**LAB Exercises**

1. Design a hierarchy of classes for geometrical shapes Circle, Ellipse, Rectangle, Triangle and Square. They have a function to calculate area (Circle: πr2 , Ellipse Circle: πab, Rectangle: lb, Triangle: 1/2bh, Square: a2 ). Demonstrate the usage of virtual functions.

2. Create an abstract class Shape with two double members dim1 and dim2 to represent the dimensions of two dimensional figure. Declare two pure virtual functions getdata() and display area() in class shape. Derive two specific classes called Triangle and Rectangle from the base class and provide definitions for the member functions getdata () to read input for base class data members and display area() to compute and display the area of the figure in the derived classes. Get the details of the shape (Triangle or Rectangle) from the user and compute its area using the classes designed.

3. Create a class person with data members name, age, gender and member function getdata() to get the details of a person and printdata() to print the details of a person.
   Create another class student by deriving (public) the class person; provide additional data members for holding five subject marks and total mark.
   Create another class teacher by deriving (public) the class person, providing additional members for subjects taught.
   Create another class TeachingAssistant by deriving from student and teacher, providing additional members for labs_handled.
   Create two students, two teachers and 1 teaching assistant. Output the total marks, subjects taught and labs handled for the teaching assistant.

Define the necessary constructors and member functions. Override appropriately the member functions in the base class and avoid the multipath problem.