Lab 6 - Vertical Circular Motion

purpose – to predict the string tension in a pendulum Setup:

force

sensor

photogate

Method: When released from a higher point the object will swing along a path

that is an arc of a circle. The photogate will measure the speed of the object

at its lowest point of the swing. From this speed, the mass of the object,

and the length of the string, the tension of the string at this lowest

point can be calculated. The predicted tension from the calculations

can then be compared with the tension measured by the force sensor.

Data: length of string = \_\_\_\_\_\_ cm 🡪 \_\_\_\_\_\_ m

 mass of object = \_\_\_\_\_\_ g 🡪 \_\_\_\_\_\_ kg

FBD for object at lowest point

 speed of object = \_\_\_\_\_\_ m/s

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 measured string tension = \_\_\_\_\_\_ N

Calculations:

Calculate the force of gravity on the object at the lowest point.

Calculate the centripetal force on the object at the lowest point.

Calculate the NET force on the object at the lowest point.

Calculate the tension in the string at the lowest point.