☐ PHYS1050 / ☐ PHYS1250
Ref. (Staff Use)_____

Pre-Laboratory Worksheet
Experiment NE01-Centripetal Force
Department of Physics
The University of Hong Kong

Name**:** _____ Student ID**:** _____ Date: _____

Remark: Please submit Pre-Laboratory Worksheet to laboratory technician when you arrive the laboratory

1. An approximation is used to derive $\left|\Delta\vec{r}\right| \approx \left|\vec{r}\right|\Delta\theta$. From the Taylor series expansion of sine function about 0, show that the approximation holds for small angle $\Delta\theta$. Taylor series could be referred in appendix of the lab manual.

2. Using similar approach in Derivation part of the manual, derive $\left|\vec{a}\right| = R\left|\omega\right|^2 = \frac{\left|\vec{v}\right|^2}{R}$

3. In Setup Procedure (8), why do we need to keep the connecting cable vertical? (Hint: What thing is necessary for performing a circular motion?)

4. In experimental procedure (2) of Experiment 1, why do we need to add equal amount of mass to the free mass holder and fixed mass holder?

5. In experimental procedure (3) of Experiment 1 and Figure I.2, there is a formula for velocity. State what apparatus is used for measurement for velocity and describe how to express the information of velocity.

6. In experimental procedure (9) of Experiment 1, we need to set zero the force scale when there is no force. In principle, there is another step to complete the calibration of economy force sensor. (We do not need to do it because the economy force sensor has been pre-calibrated.) Briefly describe the missing step.

7. The ‘Tare’ button on the economy force sensor is to set the force to be zero. How to verify the result?

8. Which fitting functions should be used in Experiments 1, 2, and 3 respectively? Why?

9. State one safety precaution to prevent accidental injury for the experiment.

References:

PASCO scientific. (n.d.). 012-08478B Centripetal Force Manual. Roseville, CA, USA: PASCO scienfitic.