United International **University**

School of Science and Engineering

Class Test I; Year 2020; Semester: Fall
Course: PHY 2105; Title: Physics
Marks: 10; Section: B; Time: 30 minutes

1. A simple pendulum is oscillating on a horizontal plane. The maximum displacement of the bob from its equilibrium is A. At what positions the maximum velocity and acceleration occur?.[2.0]

2. At $t = 0$, the displacement of the block in a spring-mass system is 15-5 is -8.50 cm. from the equilibrium position. The block's velocity then is -0.920 m/s, and its acceleration $a(0)$ is +47.0 m/s^2. (a) What is the angular frequency of this system? (b) What are the phase constant $\phi$and amplitude A? [2]

3. Suppose the block has mass $m = 2.72 \times 10^5$ kg and is designed to oscillate at frequency f=10.0 Hz and with amplitude A=20.0 cm. (a) What is the total energy E of the spring–block system? (b) What is the block's speed at the equilibrium point? [2]

4. A 0.12 kg body undergoes simple harmonic motion of amplitude 8.5 cm and period 0.20 s. (a) What is the magnitude of the maximum force acting on it? (b) If the oscillations are produced by a spring, what is the spring constant? [2]

5. What is the maximum acceleration of a platform that oscillates at amplitude 2.20 cm and frequency 6.60 Hz? [2]