United International University

School of Science and Engineering

Quiz#02; Year 2020; Semester: Fall
Course: PHY 105; Title: Physics
Full Marks: 20; Section: E; Time: 20 minutes

Name:	**ID:**	**Date:**

1. Suppose $x = -A\omega^2 cos(-\omega^2 t - \delta)$. Calculate velocity and acceleration. Draw acceleration graph with naming axis label. **1.5**

2. What is phase difference? Draw the phase difference of two waves for (i) 45^o and (ii) 0^o. **1**

3. For the simple harmonic oscillation where k = 19.6 N/m, A = 0.5 m, x = -0.5 m sin 0.08t, determine (a) the total energy, (b) the kinetic and potential energies as a function of time, (c) the velocity when the particle mass is 0.03 m from equilibrium position, (d) maximum velocity, and (e) maximum acceleration. **2.5**

4. A 460 gm body undergoes simple harmonic motion of amplitude 18.5cm and period 0.20s. (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**

5. In an electric shaver, the blade moves back and forth over a distance of 4cm in simple harmonic motion, with a frequency 12nHz. Find (a) the amplitude, (b) the maximum blade speed and (c) the magnitude of the maximum acceleration of blade. **2.5**