United International University

School of Science and Engineering

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

Name:	ID:	Date:

1. Suppose $x = A\omega sin(-\omega^3 t - \delta)$. Calculate velocity and acceleration. Draw velocity graph with naming axis label. **1.5**

2. What is phase difference? Draw the phase difference of two waves for (i) 90^o and (ii) 135^o. **1**

3. A 0.7 kg block on a spring is pulled a maximum distance of 30 cm from its equilibrium position. The subsequent oscillations are measured to have a period of 0.80 s. At what position (or positions) is the speed of the block 150 cm/s? **2.5**

4. A particle executes simple harmonic motion given by the equation $y = 10\sin(10t - \frac{\pi}{6})$. Calculate the (i) frequency, (ii) time period, (iii) the maximum displacement, (iv) the maximum velocity, (v) the maximum acceleration, (vi) displacement at t= 1.5s, and (vii) velocity at t= 3s. **2.5**

5. A particle executes SHM of amplitude 5m when the particle is 3m from its mean position, its acceleration is found to be $38 m/s^2$. Find (i) velocity (ii) time period (iii) maximum velocity and (iv) maximum acceleration. **2.5**