



United International University

School of Science and Engineering

Quiz#02; Year 2020; Semester: Fall

Course: PHY 105; Title: Physics

Full Marks: 20; Section: A; Time: 20 minutes

Name:	ID:	Date:
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1. Suppose $x = A\omega\cos(-\omega t - \delta)$. Calculate velocity and acceleration. Draw acceleration graph with naming axis label. **2**
2. What is leading of a wave? Draw (i) the phase difference of two waves for $\delta = 180^\circ$ and (ii) the leading and lagging nature of two waves when $\delta = 45^\circ$. **2**
3. A body of mass 250 gm is attached with a spring of spring constant 400 dynes/cm. The body is displaced by 100cm from its equilibrium position and released. Then the body executes simple harmonic motion. Calculate (i) the time period, (ii) frequency, (iii) angular frequency, (iv) maximum velocity, and (v) maximum acceleration. **2**
4. A particle executes simple harmonic motion given by the equation $y = 12\sin(\frac{3\pi t}{10} + \frac{\pi}{4})$. Calculate (i) amplitude, (ii) frequency, (iii) displacement at $t = 1.25s$, (iv) velocity at $t = 2.5s$, and (v) acceleration at $t = 5s$. **2.5**
5. A hydrogen atom has a mass of $1.68 \times 10^{-27}kg$, when it attach to a certain massive molecule, it oscillate as classical oscillator with frequency of 10^4 Hz and with amplitude of $10^{-10}m$. Calculate force acting on the hydrogen atom. **1.5**