# United International University

## School of Science and Engineering

Quiz#03; Year 2021; Semester: Summer

Course: PHY 105; Title: Physics

Full Marks: 20 ; Section: A; Time: 30 minutes

| Name: | ID: | Date: |
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**1.** Suppose you imagine a progressive wave. (i) What is Progressive wave? Write down the appropriate equation for it. (ii) Draw a figure showing wavelength and (iii) A standing wave has both node and antinode points. Now draw a figure for standing wave showing both node and antinode points. **1.5**

**2.** Find out the resultant amplitude, node and antinode points in terms of $\lambda$ of the following equations: $y_{1,2} = A\cos(\frac{2}{3}kx \pm \omega t)$. **2.5**

**3.** The equation of a travelling wave is $y = 10\sin 0.79\,\frac{\pi}{3}\,(36000t + 18x)$**.** Calculate (i) the amplitude of the vibrating particle, (ii) wave velocity, (ii) wave length, (iv) frequency and (v) time period. **2.5**

**4.** If R=20 Ω, L=10 mH and a capacitor are connected in series in the following figure with voltage amplitude 169.7 V, then Find out (i) the value of the capacitance that will cause the circuit to be in resonance at resonant frequency 15 kHz , (ii) $Q$ and bandwidth $\beta$ , (iii) $\omega_1$ and $\omega_2$, and (iv) amplitude of current at $\omega_0$, $\omega_1$ and $\omega_2$. **3.5**