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BPHY DA1(b)

Q2 $y = 0.002 \sin(300t - 15x)$, $\mu = 0.1\ kg/m$

$$T = \mu V^2$$

$$V = \frac{\omega}{k} \quad ; \quad \omega = 300,\ k = 15$$

$$\Rightarrow V = \frac{300}{15} \Rightarrow \boxed{V = 20\ m/s}$$

$$\Rightarrow T = 0.1 \times (20)^2 = 40N$$

$$\Rightarrow \boxed{T = 40N}$$

Q3 $y = 0.02 \sin\left[2\pi\left(\frac{t}{0.04} - \frac{x}{0.40}\right)\right]$, $\mu = 0.04\ kgm^{-1}$

$$V = \frac{\omega}{k} \quad ; \quad \omega = \frac{2\pi}{0.04},\ k = \frac{2\pi}{0.40}$$

$$\Rightarrow V = \frac{2\pi}{0.04} \times \frac{0.40}{2\pi} \Rightarrow \boxed{V = 10\ m/s}$$

$$T = \mu V^2$$

$$\Rightarrow T = 0.04 \times (10)^2 = 4N$$

$$\therefore \boxed{T = 4N}$$