

40. (a) The wave speed is given by

$$v = \sqrt{\frac{\tau}{\mu}} = \sqrt{\frac{7.00 \text{ N}}{2.00 \times 10^{-3} \text{ kg}/1.25 \text{ m}}} = 66.1 \text{ m/s}.$$

(b) The wavelength of the wave with the lowest resonant frequency f_1 is $\lambda_1 = 2L$, where $L = 125 \text{ cm}$. Thus,

$$f_1 = \frac{v}{\lambda_1} = \frac{66.1 \text{ m/s}}{2(1.25 \text{ m})} = 26.4 \text{ Hz}.$$