Answer on Question #41997, Physics, Other

Students are observing a wave generator in a ripple tank that is producing circular patterns at a frequency of 5.0Hz. A student measures the distance on the floor between the crests of the 2nd and 5th waves to be 5.25cm. What is the speed of the wave in meters per second?

Solution

The distance between the crest of one wave and the crest of the next wave is wavelength λ, thus the distance between the crests of the 2nd and 5th waves is $3\lambda = 5.25\text{cm}$.

The speed of the wave is

$$v = f\lambda = 5.0\text{Hz} \cdot \frac{5.25 \cdot 10^{-2} m}{3} = 8.75 \cdot 10^{-2} \frac{m}{s} = 0.0875 \frac{m}{s}.$$

Answer: $\mathbf{0.0875} \frac{\boldsymbol{m}}{\boldsymbol{s}}$.