Wave Calculations

Multiple Choice

Identify the choice that best completes the statement or answers the question.

Speed of a wave = wavelength x frequency

$$v = \lambda f$$

v = velocity (speed), measured in meters/second (m/s)
λ = wavelength, measured in meters (m)
f = frequency, measured in Hertz (Hz = 1/s)

____ 1. A sound wave has a frequency of 2700 Hz and a wavelength of .20 m. What is its speed?

a. 13,500 m/s
b. 0.00007 m/s
c. 540 m/s

____ 2. The speed of sound in air is about 340 m/s. What is the wavelength of sound waves produced by a guitar string vibrating at 490 Hz?

a. 1.4 m
b. 0.7 m
c. 166,600 m

____ 3. A sound wave has a frequency of 3250 Hz and a wavelength of 0.1 m. What is its speed?

a. 325 m/s
b. 32,500 m/s
c. 0.00003 m/s

____ 4. A wave along a guitar string has a frequency of 540 Hz and a wavelength of 2.5 meters. Calculate the speed of the wave:

a. 216 m/s
b. 1350 m/s
c. 0.0046 m/s

____ 5. The string on a piano that produces an A sharp vibrates with a frequency of 235 Hz. If the sound waves produced by this string have a wavelength (in air) of 1.49 meters, what is the speed of sound in air?

a. 158 m/s
b. 350 m/s
c. 0.006 m/s

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