Name_____ Pd____

Wave Practice Test

(Show Work on all Calculations for Full Credit- even if they are multiple choice questions.)

1. A transverse wave is traveling through a medium. See diagram below. The particles of the medium are vibrating _____.

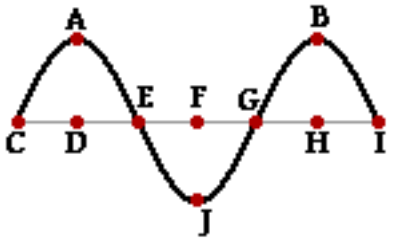
a. parallel to the line joining AD.

b. along the line joining CI.

c. perpendicular to the line joining AD.

d. at various angles to the line CI.

e. along the curve CAEJGBI.

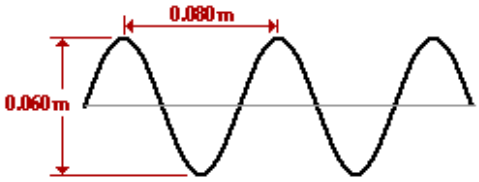


2. . When the particles of a medium are vibrating at right angles to the direction of energy transport, then the wave is a ____ wave.
a. longitudinal b. sound c. standing d. transverse

3. If the energy in a longitudinal wave travels from south to north, the particles of the medium would be vibrating _____.
a. from north to south, only b. both north and south c. from east to west, only d. both east and west

4. The main factor which effects the speed of a sound wave is the ____.
a. amplitude of the sound wave b. intensity of the sound c. loudness of the sound d. properties of the medium e. pitch of the sound

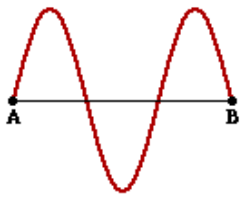
5. What is the amplitude of the wave in the diagram to the right?



a. 0.03 m. b. 0.04 m. c. 0.05 m. d. 0.06 m.

6. The wavelength of the wave in the previous question is ____ m.
a. 0.030 b. 0.040 c. 0.060 d. 0.080

Consider the following diagram for **Questions #7 & # 8**.



7. How many complete waves are shown in the diagram to the right?
a. 1 b. 2 c. 3 d. 1.5

8. If the distance from point A to point B in the diagram is 60 cm, then the wavelength is ____.
a. 20 cm. b. 40 cm. c. 60 cm. d. 90 cm.

9. A periodic and repeating disturbance in a lake creates waves which emanate outward from its source to produce circular wave patterns. If the frequency of the source is 2.00 Hz and the wave speed is 5.00m/s then the distance between adjacent wave crests is ___ meter.

a. 0.200 b. 0.400 c. 1.25 d. 2.50 e. 10.0

10. What is the frequency of a wave that has a speed of 0.4 m/s and a wavelength of 0.020 meter?

a. 10 hertz. b. 20 hertz. c. 0.008 hertz. d. 0.5 hertz.

11. A pendulum makes exactly 40 vibrations in 20.0 s. Its period is ____. (Be cautious of the units.)

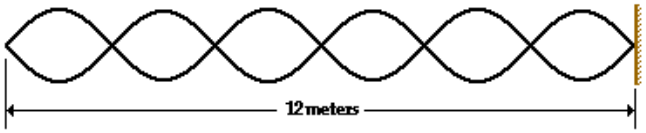
a. 0.500 Hz b. 0.500 s. c. 2.00 Hz. d. 2.00 s. e. 8.00 x 10^2 Hz.

12. A period of 0.005 seconds would be equivalent to a frequency of ____ Hz.

a. 20 b. 50 c. 200 d. 500 e. 2000

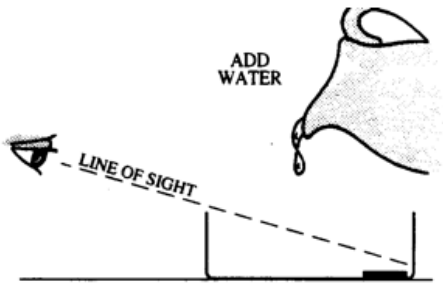
13. Consider the standing wave pattern shown below. A wave generated at the left end of the medium undergoes reflection at the fixed end on the right side of the medium. The number of antinodes in the diagram is _____.

a. 3 b. 5 c. 6 d. 7 e. 12

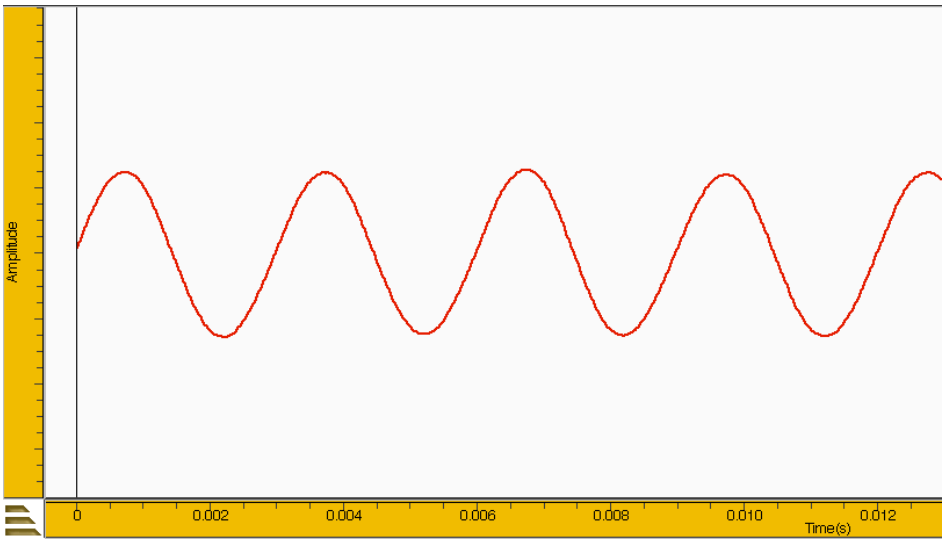


14. Sunscreens that are described as "broad spectrum" block UVA and UVB rays from the sun. The shorter wavelength UVB rays don't penetrate deeply into skin; they cause significant damage to DNA and are the primary cause of sunburn and skin cancer. Knowing that ALL electromagnetic radiation travels at 3.0 X10^8 m/s, what is the wavelength (in nanometers) of a UVB ray with a frequency of 9.84 X10^{14} Hz?

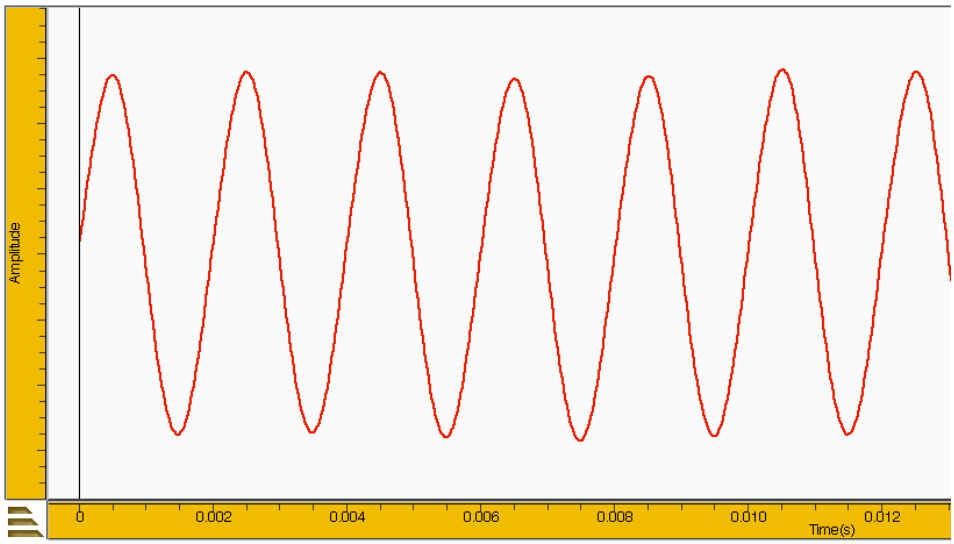
15. Explain why you would see the penny when the cup is filled with water but not when it is empty.



Graph A



Graph B



16. Use the graphs above to answer the following questions.

Compare the following properties of the two waves shown above using A>B, A<B, or A=B.

a. _____ compare their frequencies.

b. _____ compare their amplitudes

c. _____ compare their periods

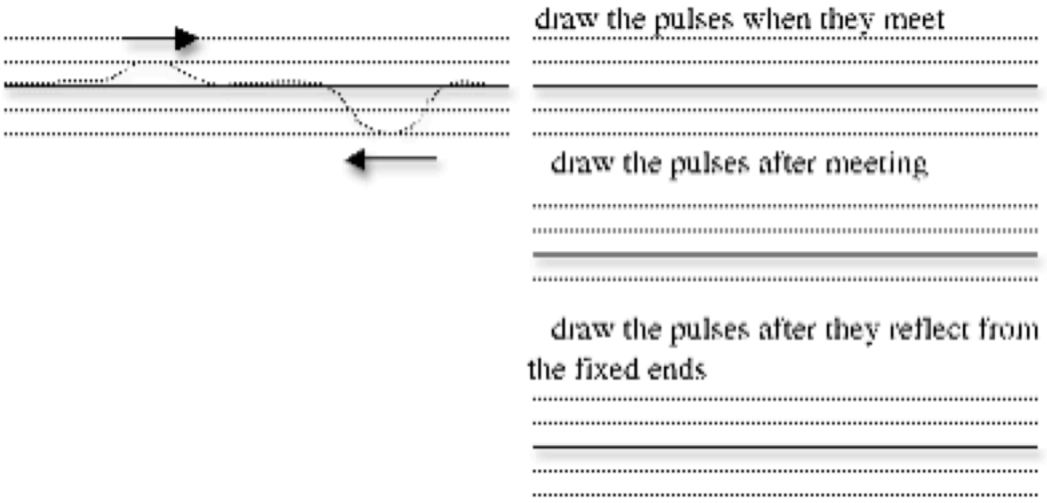
d. _____ compare their wavelengths, assuming the waves are travelling in the same medium

e. _____ compare their wave speeds, assuming the waves are travelling in the same medium

f. Calculate the frequency of the waves in graph A.

g. Calculate the wavelength of the waves in graph B, assuming the wave velocity is 25 cm/s.

17. Consider the pulses approaching each other in the diagram below.
At the right of the diagram, sketch how the waveform would appear when the two waves meet, and then make a sketch of the pulses once they have separated.



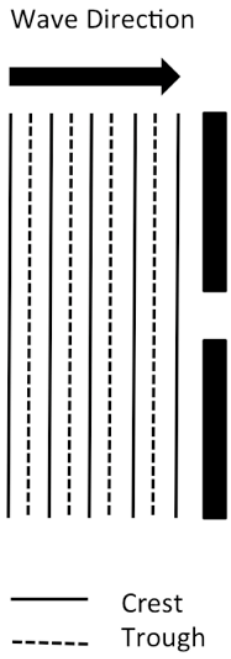
18. A guitar string has a fundamental frequency of 256 Hz.

A. Draw a picture of the standing wave created when a guitar string is plucked.

B. What are the next three frequencies that would produce standing waves on this string? What would the string look like?

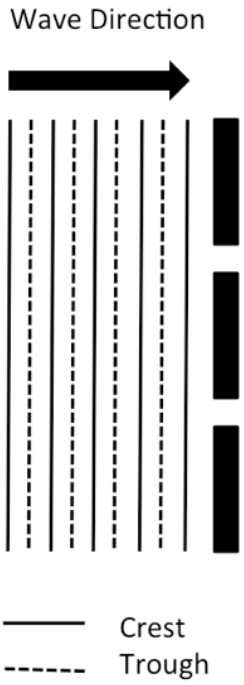
C. If you place a tuning fork with the same frequency near this string while you were playing it what would happen? Why?

19. A series of water waves travel through a harbor until they hit a breakwater as shown below.
a. Draw the waves an overhead observer would see once they pass through the opening.



b. Explain why this happens.

c. In a different part of the harbor, the waves hit a breakwater as shown to the right. Explain what happens when the waves pass through the openings. Label locations of constructive and destructive interference.
(Hint: See sections 31.3 and 31.4 in your book).



20. Explain what a beat is and how musicians use it to tune their instruments.

21. Define resonance and give an example of how it works in real life.