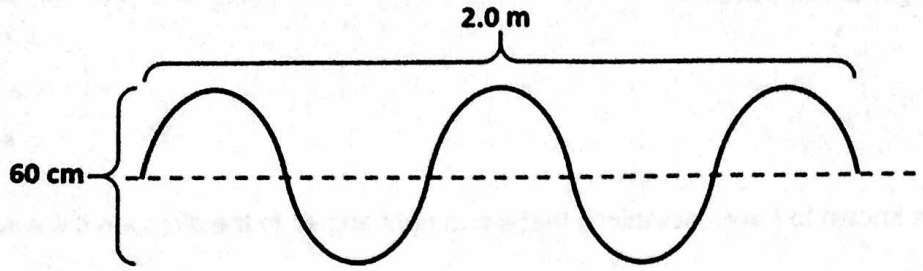

1. A wave is shown in the diagram above, moving to the right. The wave has dimensions as shown.

What is the amplitude of the wave?

a. 30 cm
b. 40 cm
c. 60 cm
d. 1 m

2. A wave is shown in the diagram above, moving to the right. The wave has dimensions as shown.

What is the wavelength of the wave?

a. 30 cm
b. 40 cm
c. 80 cm
d. 1 m

3. A certain string has two successive harmonics of 300 Hz and 400 Hz.

What is the fundamental frequency of this string?

a. 75 Hz
b. 100 Hz
c. 133 Hz
d. 700 Hz

4. A certain string is 50 cm long, and waves travel on this string at 200 m/s.

What is the fundamental frequency of this string?

a. 50 Hz
b. 100 Hz
c. 200 Hz
d. 400 Hz

5. A certain wave travels at 12 m/s, with a frequency of 3 Hz.

What is the wavelength of this wave?

a. .25 m
b. 4 m
c. 9 m
d. 36 m

6. A certain wave is known to have oscillations that are at right angles to the direction the wave itself is traveling.

According to this information, the wave must be a _____ wave

a. Transverse
b. Longitudinal
c. Mechanical
d. Non-mechanical

7. A certain wave is known to require a substance to travel through.

According to this information, the wave must be a _____ wave.

a. Transverse
b. Longitudinal
c. Mechanical
d. Non-mechanical

8. A series of wave pulses are traveling down a string.

Which of the following changes could result in a change in the speed of the pulses moving down the string?

a. Change frequency at which pulses are sent.
b. Change wavelength of pulses.
c. Change amplitude of pulses.
d. Change to a different string.

9. The third harmonic frequency of a certain string is 600 Hz.

What is the fourth harmonic frequency for this string?

a. 200 Hz
b. 450 Hz
c. 800 Hz
d. 2400 Hz

10. A certain wave travels at 8 m/s, and has a wavelength of 2m.

What is the period of this wave?

a. .25 s
b. .5 s
c. 4 s
d. 8 s

11. Which of the following statements is evidence that electromagnetic waves, such as visible light, are transverse waves.

a. EM waves do not require a medium to travel
b. EM waves can be reflected at a boundary between media
c. EM waves can be polarized using a polarizing filter
d. EM waves bend when they pass from one medium into another

12. If the amplitude of a sound wave is increased, what will be the change in the sound perceived by observers who are hearing the sound?

a. Louder sound
b. Higher pitch
c. Both A and B
d. Neither A nor B

13. If the wavelength of a sound wave is increased, what will be the change in the sound perceived by observers who are hearing the sound?

a. Louder sound
b. Higher pitch
c. Both A and B
d. Neither A nor B

14. A car sounding its horn drives past a child standing still on the sidewalk.

The Doppler effect explains what aspect of the sound that the child hears?

a. The changes in loudness observed by the child.
b. The changes in wave amplitude observed by the child
c. The shifts in pitch observed by the child
d. More than one of the above answers is correct.

15. A passenger is in a train that is moving to the east. A second train is traveling nearby, on tracks that are parallel to those of the first train. The passenger hears the second train's whistle, and the note observed has a higher frequency than the actual frequency of vibration of the whistle.
Which of the following could describe the motion of the second train?

I. Moving to the east, approaching the passenger's train from behind it.
II. Moving to the west, approaching the passenger's train from head-on.
III. Moving to the west, departing from the passenger's train after passing it.

a. I only
b. II only
c. I and II only
d. II and III only

16. A stationary observer is listening to the note produced by a departing sound source.
If the observer detects a sound of frequency 800Hz, what is the value of the frequency f being produced by the source?

a. $f < 800$ Hz
b. $f = 800$ Hz
c. $f > 800$ Hz
d. more than one of the above answers is correct

17. A certain pipe that is open at both ends is able to play a 340 Hz note as its fundamental frequency, when the air in the pipe is such that sound waves travel at 340 m/s in the air.
How long is this pipe?

a. 25 cm
b. 50 cm
c. 1 meter
d. 2 meters

18. A yodeler shouts a 1400 Hz note, which echoes off of nearby cliff wall, and the yodeler hears the note echoed back after 4 seconds.

If sound is traveling through the air at 350 m/s, how far is the yodeler from the cliff wall?

a. 4 meters
b. 175 meters
c. C. 700 meters
d. 1400 meters

19. Notes are played simultaneously by two tubas that are slightly out of tune with each other. If the frequencies played by the two instruments are 50 Hz and 55 Hz, how many beats per second are observed?

a. 1.01
b. 5
c. 105
d. No beats are observed in this situation

20. Sound waves can be categorized as both _____ and _____ types of waves.

a. Transverse, mechanical
b. Transverse, non-mechanical
c. Longitudinal, mechanical
d. Longitudinal, non-mechanical