

AP Physics 1 – Algebra-Based: Unit 10 Mechanical Waves and Sound Waves

Question 1:



A student wants to create a longitudinal wave with a horizontal slinky. Which direction should the student move their hand?

- A. Up and Down
- B. Right and Left
- C. All directions

Question 2:

A periodic wave with wavelength $\lambda = 2\text{ m}$ has speed $v = 2\frac{\text{m}}{\text{s}}$. What is the wave's frequency? (Round answer to one significant digit.)

- A. 1 Hz
- B. 7 Hz
- C. 4 Hz
- D. 2 Hz

Question 3:

A periodic wave with frequency $f = 3\text{ Hz}$ has speed $v = 27\frac{\text{m}}{\text{s}}$. What is the wave's wavelength? (Round answer to one significant digit.)

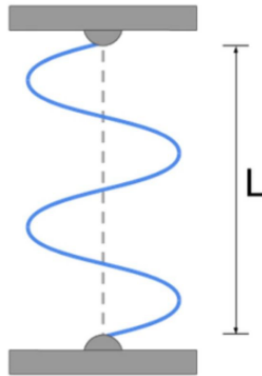
- A. 27 m
- B. 3 m
- C. 9 m
- D. 51 m

Question 4:

A periodic ocean wave with wavelength $\lambda = 8\text{ m}$ has frequency $f = 25\text{ Hz}$. What is the wave's speed? (Round answer to one significant digit.)

- A. $200 \frac{\text{m}}{\text{s}}$
- B. $300 \frac{\text{m}}{\text{s}}$
- C. $2 \frac{\text{m}}{\text{s}}$
- D. $3 \frac{\text{m}}{\text{s}}$

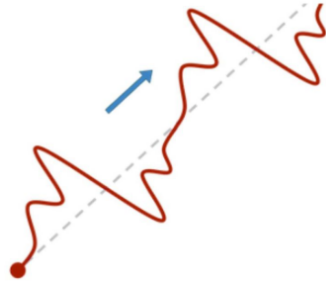
Question 5:



A string of length L vibrates to form a standing wave with four antinodes as shown above.

- A. $\frac{L}{2}$
- B. $\frac{L}{8}$
- C. L
- D. $\frac{L}{4}$

Question 6:



What type of wave does the image represent??

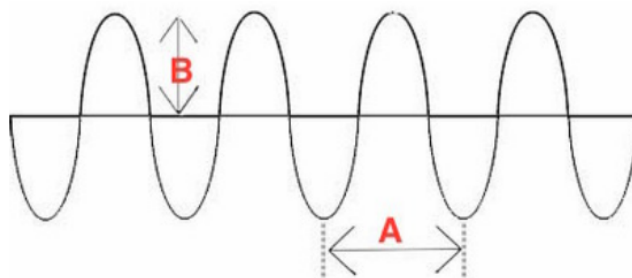
- A. Longitudinal Wave
- B. Transverse Wave
- C. None of the above

Question 7:

Waves are a transfer of...

- A. heat
- B. energy
- C. light
- D. food

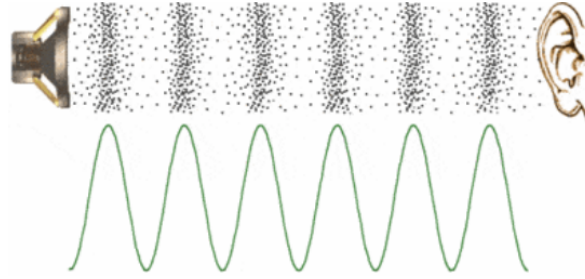
Question 8:



What property of this wave is represented by the letter "A"?

- A. amplitude
- B. trough
- C. crest
- D. wavelength

Question 9:



What is the speed of the sound wave that has a frequency of 250 hertz and a wavelength of 8 meters ?

- A. $31 \frac{m}{s}$
- B. $2,000 \frac{m}{s}$
- C. $250 \frac{m}{s}$
- D. $5,280 \frac{m}{s}$

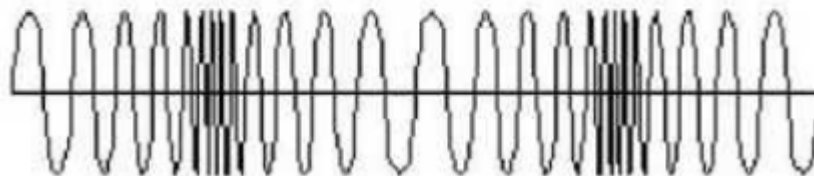
Question 10:

Which of these waves cannot travel in a vacuum?

- A. Light wave
- B. Sound wave
- C. Electromagnetic wave
- D. Microwave

Question 11:

Parts of a compression wave



Areas of increased pressure on a sound wave are known as a...

- A. refraction
- B. frequency

- C. compression
- D. amplitude

Question 12:

Which of the following would you hear as a low pitched sound?

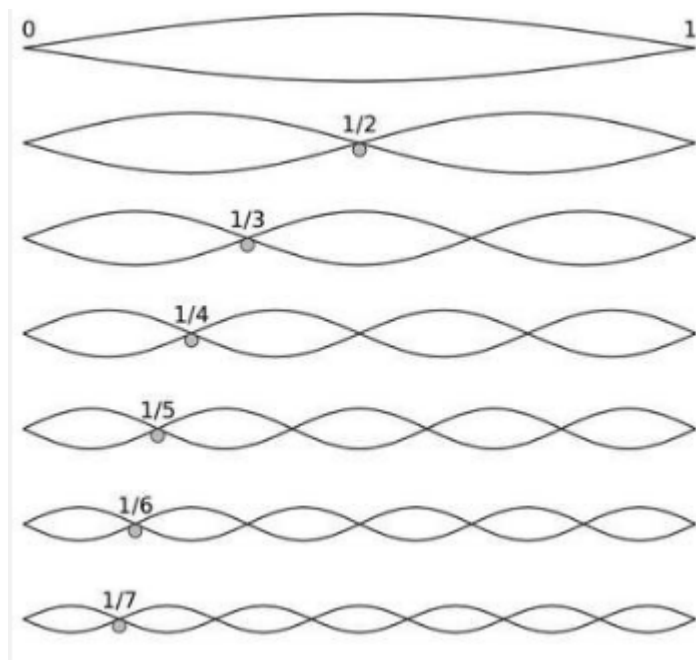
- A. Sound wave with a frequency of 50 Hz
- B. Sound wave with an intensity of 10 dB
- C. Sound wave with frequency of 10,000 Hz
- D. Sound wave with an intensity of 100 dB

Question 13:

Sound travels fastest through which of the following materials?

- A. A type of gas, like helium
- B. A metal such as iron
- C. Empty space
- D. Water

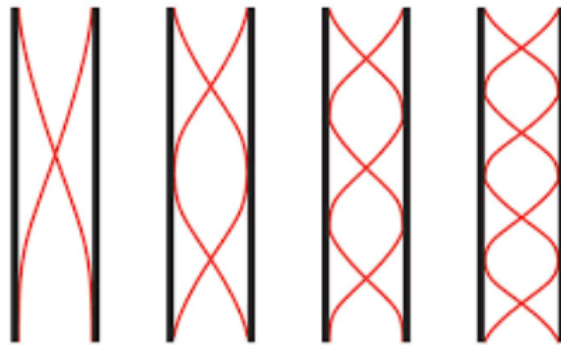
Question 14:



For the wave that is labeled “ $\frac{1}{2}$ ”, which equation would you use to find the frequency?

- A. $f = \frac{v}{2L}$
- B. $f = \frac{3v}{2L}$
- C. $f = \frac{4v}{2L}$
- D. $f = \frac{2v}{2L}$

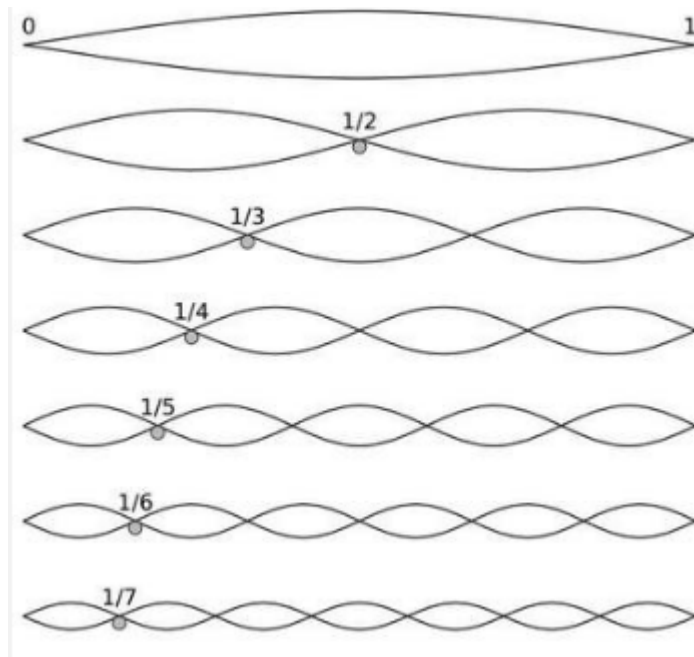
Question 15:



For the tube on the far right, how many nodes does it have?

- A. 3
- B. 5
- C. 4
- D. 6

Question 16:



For the string labeled $\frac{1}{4}$, what is the harmonic number?

- A. first harmonic
- B. second harmonic
- C. third harmonic
- D. fourth harmonic

Question 17:

When the frequency of a wave increases, what happens to the wavelength?

- A. The wavelength is not directly affected by the frequency of a wave.
- B. The wavelength increases.
- C. The wavelength decreases.
- D. More specific information is needed to form a conclusion about the wavelength.

Question 18:

It is the bending of waves around an object (such as through a doorway).

- A. diffract
- B. sound
- C. pitch
- D. volume

Question 19:

It is a disturbance that transfers energy from one place to another without transferring energy.

- A.** wave
- B.** pitch
- C.** trough
- D.** sound

Answer Key:

- 1. B
- 2. D
- 3. C
- 4. A
- 5. A
- 6. B
- 7. B
- 8. D
- 9. B
- 10. B
- 11. C
- 12. A
- 13. B
- 14. D
- 15. C
- 16. D
- 17. C
- 18. A
- 19. A

