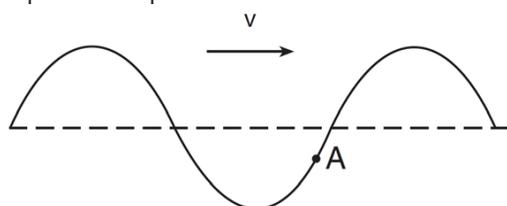


Waves-Wave Basics

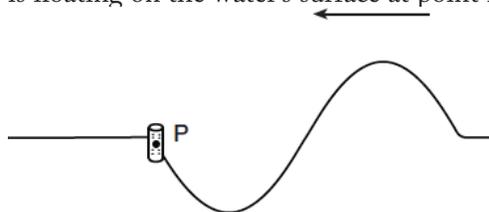
- Which type of wave requires a material medium through which to travel?
 - sound
 - television
 - radio
 - x ray
- A single vibratory disturbance moving through a medium is called
 - a node
 - an antinode
 - a standing wave
 - a pulse
- The diagram below represents a transverse wave traveling to the right through a medium. Point A represents a particle of the medium.



In which direction will particle A move in the next instant of time?

- up
 - down
 - left
 - right
- As a transverse wave travels through a medium, the individual particles of the medium move
 - perpendicular to the direction of wave travel
 - parallel to the direction of wave travel
 - in circles
 - in ellipses
 - A periodic wave transfers
 - energy, only
 - mass, only
 - both energy and mass
 - neither energy nor mass
 - Which type of wave requires a material medium through which to travel?
 - radio wave
 - microwave
 - light wave
 - mechanical wave

- A ringing bell is located in a chamber. When the air is removed from the chamber, why can the bell be seen vibrating but not be heard?
 - Light waves can travel through a vacuum, but sound waves cannot.
 - Sound waves have greater amplitude than light waves.
 - Light waves travel slower than sound waves.
 - Sound waves have higher frequencies than light waves.
- Which statement correctly describes one characteristic of a sound wave?
 - A sound wave can travel through a vacuum
 - A sound wave is a transverse wave
 - The amount of energy a sound wave transmits is directly related to the wave's amplitude.
 - The amount of energy a sound wave transmits is inversely related to the wave's frequency
- A television remote control is used to direct pulses of electromagnetic radiation to a receiver on a television. This communication from the remote control to the television illustrates that electromagnetic radiation
 - is a longitudinal wave
 - possesses energy inversely proportional to its frequency
 - diffracts and accelerates in air
 - transfers energy without transferring mass
- The diagram below represents a transverse water wave propagating toward the left. A cork is floating on the water's surface at point P.



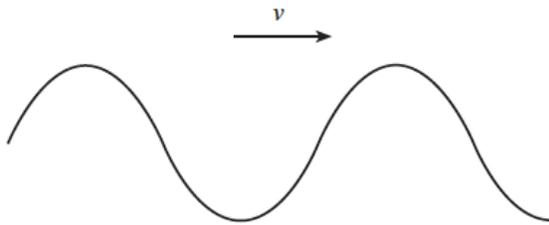
In which direction will the cork move as the wave passes point P?

- up, then down, then up
- down, then up, then down
- left, then right, then left
- right, then left, then right

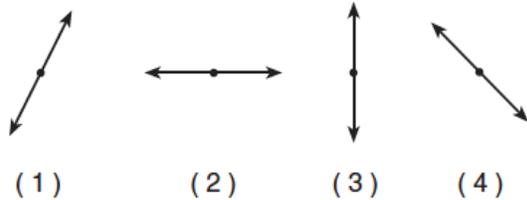
Waves-Wave Basics

11. A pulse traveled the length of a stretched spring. The pulse transferred
1. energy, only
 2. mass, only
 3. both energy and mass
 4. neither energy nor mass

12. A transverse wave passes through a uniform material medium from left to right, as shown in the diagram below.



Which diagram best represents the direction of vibration of the particles of the medium?

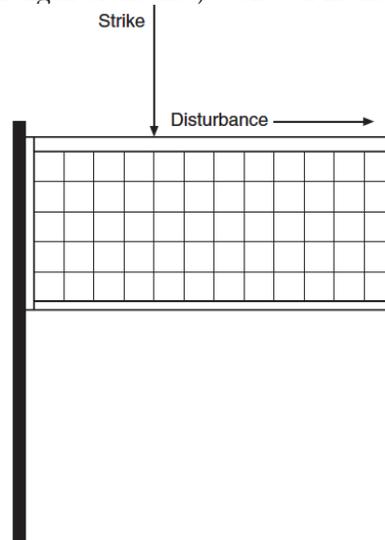


13. A tuning fork vibrating in air produces sound waves. These waves are best classified as
1. transverse, because the air molecules are vibrating parallel to the direction of wave motion
 2. transverse, because the air molecules are vibrating perpendicular to the direction of wave motion
 3. longitudinal, because the air molecules are vibrating parallel to the direction of wave motion
 4. longitudinal, because the air molecules are vibrating perpendicular to the direction of wave motion

14. Which form(s) of energy can be transmitted through a vacuum?
1. light, only
 2. sound, only
 3. both light and sound
 4. neither light nor sound

15. How are electromagnetic waves that are produced by oscillating charges and sound waves that are produced by oscillating tuning forks similar?
1. Both have the same frequency as their respective sources.
 2. Both require a matter medium for propagation.
 3. Both are longitudinal waves.
 4. Both are transverse waves.

16. A student strikes the top rope of a volleyball net, sending a single vibratory disturbance along the length of the net, as shown in the diagram below.



- This disturbance is best described as
1. a pulse
 2. a periodic wave
 3. a longitudinal wave
 4. an electromagnetic wave

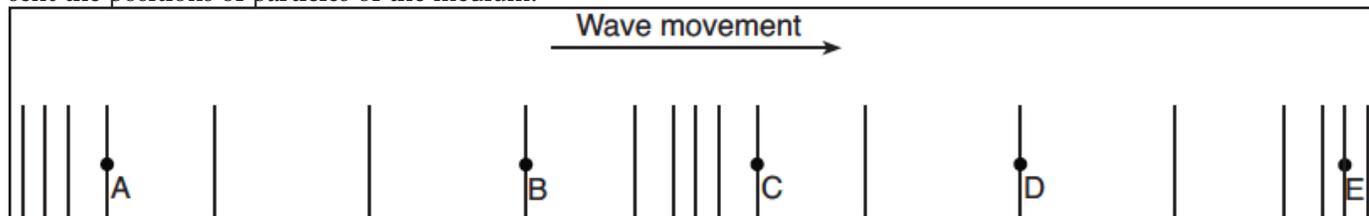
17. Which diagram below does not represent a periodic wave?



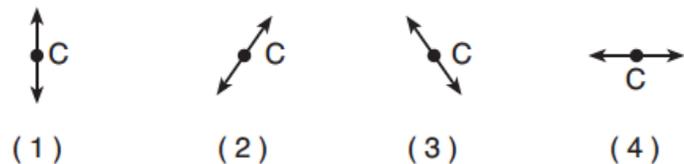
Waves-Wave Basics

18. An earthquake wave is traveling from west to east through rock. If the particles of the rock are vibrating in a north-south direction, the wave must be classified as
1. transverse
 2. longitudinal
 3. a microwave
 4. a radio wave
19. As a transverse wave travels through a medium, the individual particles of the medium move
1. perpendicular to the direction of wave travel
 2. parallel to the direction of wave travel
 3. in circles
 4. in ellipses
20. A tuning fork oscillates with a frequency of 256 hertz after being struck by a rubber hammer. Which phrase best describes the sound waves produced by this oscillating tuning fork?
1. electromagnetic waves that require no medium for transmission
 2. electromagnetic waves that require a medium for transmission
 3. mechanical waves that require no medium for transmission
 4. mechanical waves that require a medium for transmission

A longitudinal wave moves to the right through a uniform medium, as shown below. Points A, B, C, D, and E represent the positions of particles of the medium.



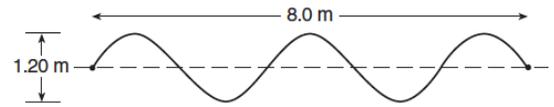
21. Which diagram best represents the motion of the particle at position C as the wave moves to the right?



22. The wavelength of this wave is equal to the distance between points
1. A and B
 2. A and C
 3. B and C
 4. B and E
23. The energy of this wave is related to its
1. amplitude
 2. period
 3. speed
 4. wavelength

Waves-Wave Basics

Base your answers to questions 24 and 25 on the diagram at right, which shows a wave in a rope.



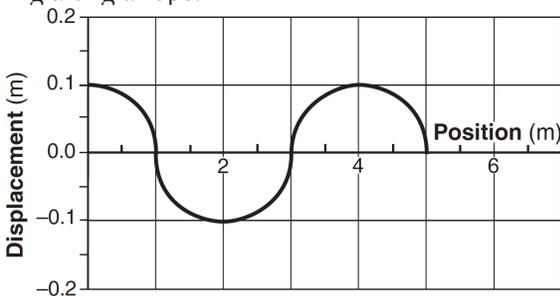
24. Determine the wavelength of the wave.

25. Determine the amplitude of the wave.

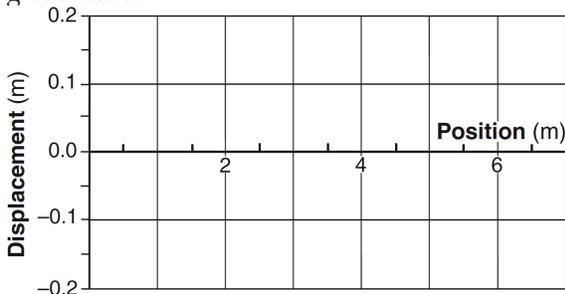
26. The energy of a sound wave is most closely related to the wave's
1. frequency
 2. amplitude
 3. wavelength
 4. speed

27. Which statement describes a characteristic common to all electromagnetic waves and mechanical waves?
1. Both types of waves travel at the same speed.
 2. Both types of waves require a material medium for propagation.
 3. Both types of waves propagate in a vacuum.
 4. Both types of waves transfer energy.

28. The diagram below represents a periodic wave moving along a rope.

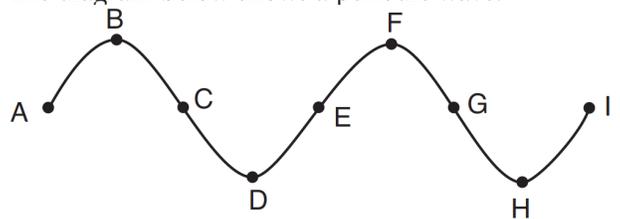


On the grid below, draw at least one full wave with the same amplitude and half the wavelength of the given wave.



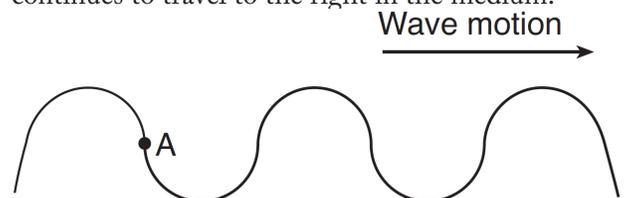
29. Transverse waves are to radio waves as longitudinal waves are to
1. light waves
 2. microwaves
 3. ultraviolet waves
 4. sound waves

30. The diagram below shows a periodic wave.



Which two points on the wave are 180° out of phase?

1. A and C
 2. B and E
 3. F and G
 4. D and H
31. The diagram below shows a mechanical transverse wave traveling to the right in a medium. Point A represents a particle in the medium. Draw an arrow originating at point A to indicate the initial direction that the particle will move as the wave continues to travel to the right in the medium.



Waves-Wave Basics

32. The amplitude of a sound wave is most closely related to the sound's
1. speed
 2. wavelength
 3. loudness
 4. pitch
33. As a longitudinal wave moves through a medium, the particles of the medium
1. vibrate parallel to the direction of the wave's propagation
 2. vibrate perpendicular to the direction of the wave's propagation
 3. are transferred in the direction of the wave's motion, only
 4. are stationary