

UNIT WAVES, SOUND, AND LIGHT

D Unit Test C**Key Concepts**

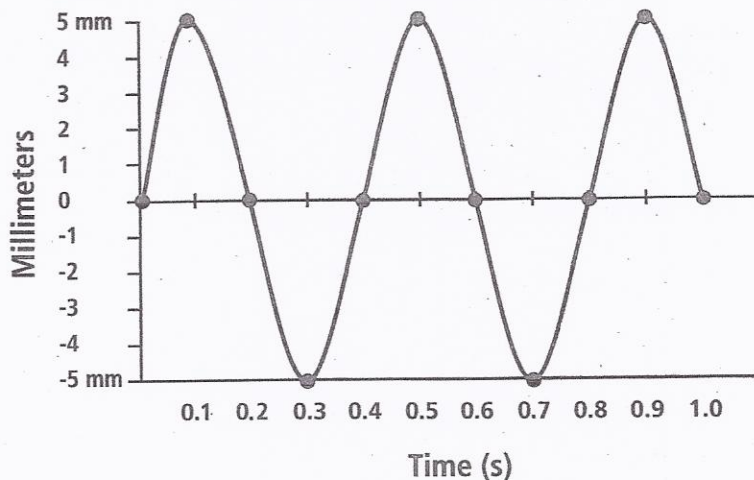
Choose the letter of the best answer. (4 points each)

- _____ 1. All waves are the result of
- the vibration of a material medium
 - a disturbance that transfers energy
 - the motion of electromagnetic fields
 - a change in the force applied to an object
- _____ 2. When a wave passes from one medium into another medium at an angle, the wave can be
- absorbed
 - diffracted
 - reflected
 - refracted
- _____ 3. When sound waves reach your ear, they
- immediately become electrical signals
 - make the eardrum and middle ear bones vibrate, transmitting sound to the cochlea
 - force air from the lungs across the vocal cords, producing sound
 - reflect off the bones of the ear
- _____ 4. To decrease the pitch of a sound, you should
- increase the amplitude of the sound wave
 - shorten the wavelength of the sound wave
 - decrease the frequency of the sound wave
 - amplify the intensity of the sound
- _____ 5. EM waves differ from mechanical waves because
- EM waves are longitudinal, and all mechanical waves are transverse
 - EM waves always have the same speed, and the speed of mechanical waves depends on the medium
 - EM waves transfer kinetic energy, and mechanical waves transfer only potential energy
 - EM waves can travel through a vacuum, and mechanical waves require a medium

- _____ 6. A firefly uses bioluminescence to shine. The light is formed by
- a. high heat
 - b. a substance that changes ultraviolet to visible light
 - c. a chemical reaction
 - d. electronic signals that use electricity
- _____ 7. Lee puts a white piece of paper under a green light. The paper appears
- a. white because it reflects all the wavelengths available
 - b. green because it reflects all the wavelengths available
 - c. black because it absorbs all the wavelengths available
 - d. green because it absorbs all the wavelengths available
- _____ 8. A convex mirror creates an image that is
- a. right-side up and enlarged
 - b. right-side up and reduced
 - c. upside down and enlarged
 - d. upside down and reduced
- _____ 9. To create a right-side-up image using a convex lens, the object must be located
- a. more than two focal lengths away from the lens
 - b. exactly two focal lengths away from the lens
 - c. between one and two focal lengths away from the lens
 - d. less than one focal length away from the lens
- _____ 10. In a microscope, the enlarged image is produced by a
- a. combination of convex lenses
 - b. convex lens and a flat mirror
 - c. convex lens and a concave lens
 - d. single concave lens

Analyzing Graphs

Using the graph, answer the following questions. (6 points each)



11. The graph shows a sound wave. What is the amplitude?

12. If the amplitude is decreased, what will happen to the sound?

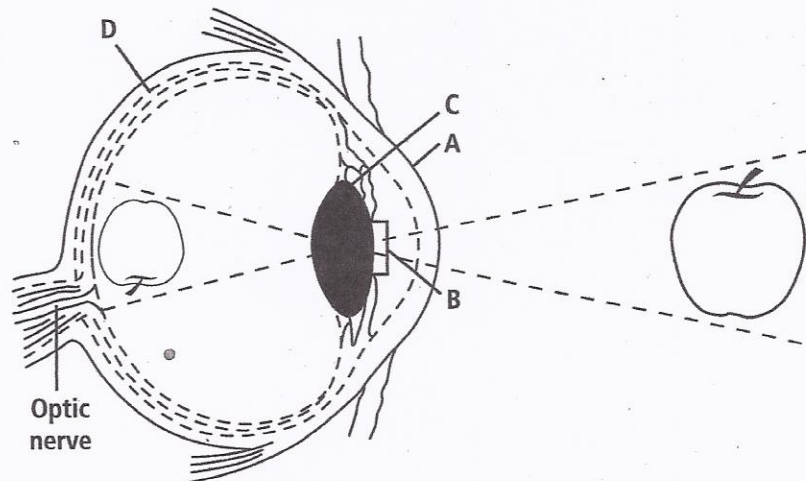
13. What is the frequency of the wave?

14. If the wave's speed is 350 m/s, what is its wavelength? The formula for the speed of a wave is $S = \lambda \cdot f$.

15. Suppose that the speed stays the same and the frequency changes to 5 Hz. What will the new wavelength be?

Interpreting Visuals

Using the picture, answer the following questions.



16. Write the name of each part of the eye shown on the diagram. (3 points each)

A _____

B _____

C _____

D _____

17. If the distance from the lens to the retina were shorter, what would happen to the person's vision? (6 points)

Extended Response

Answer the following questions on the back of this paper or on a separate sheet of paper. (6 points each)

18. **Explaining** Why is the air inside a musical instrument important? Explain how the air changes the sound produced by an instrument. You may use any instrument as an example.
19. **Evaluating** Why are x-rays and gamma rays valuable to people? Why are they also potentially dangerous? Give an example of both their uses and how they are potentially dangerous. Be sure to explain how the *frequency* and *energy* of these waves makes them both useful and potentially dangerous.