

Chapter 29

Multiple Choice

Identify the letter of the choice that best completes the statement or answers the question.

- _____ 1. The law of reflection says that
 - a. the angle of reflection from a mirror equals the angle of incidence.
 - b. waves incident on a mirror are partially reflected.
 - c. all waves incident on a mirror are reflected.
 - d. the angle a ray is reflected from a mirror is random.
- _____ 2. When a virtual image is created in a plane mirror
 - a. the image is upright.
 - b. the image is located behind the mirror.
 - c. reflected rays diverge.
 - d. all of the above
 - e. none of the above
- _____ 3. An echo occurs when sound
 - a. is transmitted through a surface.
 - b. is reflected from a distant surface.
 - c. changes speed when it strikes a distant surface.
 - d. all of the above
 - e. none of the above
- _____ 4. It is difficult to see the roadway from a car on a rainy night because the road surface
 - a. is obscured by the rain itself.
 - b. that is normally a diffuse reflector when dry becomes a mirror surface when wet.
 - c. absorbs the light more when wet.
 - d. scatters light in all directions.
- _____ 5. Refraction is caused by
 - a. different wave speeds.
 - b. more than one reflection.
 - c. displaced images.
 - d. bending.
- _____ 6. Refraction occurs
 - a. when a wave changes speed.
 - b. only at a wave front.
 - c. at any unpredictable time.
 - d. only with light waves.
 - e. all of the above
- _____ 7. A penny lies in the bottom of a tea cup filled with water. As you look down on the penny, compared to its actual depth, it looks
 - a. closer.
 - b. farther away.
 - c. at the same depth.

- _____ 8. When you see a "wet spot" mirage on the road in front of you, you are most likely seeing
- water.
 - hot air.
 - a figment of your imagination.
 - sky.
 - none of the above
- _____ 9. A beam of light emerges from water into air at an angle. The beam is bent
- away from the normal.
 - not at all.
 - 48 degrees upward.
 - 96 degrees upward.
 - towards the normal.
- _____ 10. When a light beam emerges from water into air, the average light speed
- remains the same.
 - decreases.
 - increases.
- _____ 11. The effect that we call a mirage has most to do with
- reflection.
 - refraction.
 - diffraction.
 - interference.
 - scattering.
- _____ 12. A person standing waist-deep in a swimming pool appears to have short legs because of light
- refraction.
 - interference.
 - diffraction.
 - reflection.
 - absorption.
- _____ 13. Different colors of light travel at different speeds in a transparent medium. In a vacuum, different colors of light travel at
- the same speed.
 - different speeds.
- _____ 14. The spectrum produced by a prism or a raindrop is evidence that the average speed of light in the material depends on the light's
- transmission qualities.
 - color.
 - wave nature.
 - particle nature.
- _____ 15. If you walk towards a mirror at a certain speed, your relative speed with respect to your image is
- the same as your actual speed.
 - half your actual speed.
 - twice your actual speed.
 - none of the above
- _____ 16. When you look at yourself in a pocket mirror and then hold the mirror farther away, you see
- less of yourself.
 - more of yourself.
 - the same amount of yourself.

- _____ 17. A beam of light travels fastest in
- a. air.
 - b. water.
 - c. plastic.
 - d. glass.
 - e. Its average speed is the same in each of the above.
- _____ 18. Which of the following is a consequence of the refraction of light?
- a. rainbows
 - b. mirages
 - c. internal reflection
 - d. all of the above
 - e. none of the above
- _____ 19. In a curved optical fiber, light
- a. gains energy in each internal reflection.
 - b. internally reflects in a succession of straight-line paths.
 - c. bends and follows the curve of the fiber.
 - d. scatters in random directions from the fiber's inner surface.
- _____ 20. A rainbow nicely illustrates an example of light
- a. internal reflection.
 - b. refraction.
 - c. both A and B
 - d. neither A nor B