

Chapter 14 Properties of Light

14.1 Questions About Reflection

1) Light is emitted when

- A) electron clouds of atoms are forced into oscillation.
- B) atomic nuclei are made to vibrate.
- C) electromagnetic waves emanate from matter.
- D) high-frequency sound waves strike matter.

Answer: A

Diff: 1

Topic: Reflection

2) Light will almost always travel from one place to another along a path of least

- A) distance.
- B) time.
- C) effort.
- D) expense.
- E) complication.

Answer: B

Diff: 1

Topic: Reflection

3) The incident light ray, the reflected light ray, and the normal between them

- A) lie in the same plane.
- B) may or may not lie in the same plane.
- C) lie in planes that are perpendicular to one another.

Answer: A

Diff: 1

Topic: Reflection

4) Object and image for a plane mirror lie

- A) along the same plane.
- B) equal distances from the mirror.
- C) at right angles to each other.
- D) all of these
- E) none of these

Answer: B

Diff: 1

Topic: Reflection

- 10) If you walk towards a mirror at a certain speed, the relative speed between you and your image is
- A) half your speed.
 - B) your speed.
 - C) twice your speed.
 - D) none of these

Answer: C

Diff: 2

Topic: Reflection

- 11) The shortest plane mirror in which you can see your entire image is
- A) half your height.
 - B) about $\frac{3}{4}$ your height.
 - C) about $\frac{1}{3}$ your height.
 - D) equal to your height.
 - E) dependent on your distance from the mirror.

Answer: A

Diff: 2

Topic: Reflection

- 12) To see his full height, a boy that is 1 meter tall needs a mirror that is at least
- A) 0.33 m tall.
 - B) 0.50 m tall.
 - C) 0.75 m tall.
 - D) 1 m tall.
 - E) depends on how far the mirror is from the boy

Answer: B

Diff: 2

Topic: Reflection

- 13) As you face a plane mirror on the east wall of your room, you raise your north hand. Your image raises
- A) its left hand.
 - B) its north hand.
 - C) its south hand.
 - D) neither hand.
 - E) both hands.

Answer: B

Diff: 2

Topic: Reflection

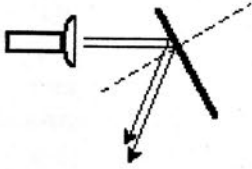
- 14) You wish to photograph the image of your little sister, who is standing 2 meters from a plane mirror. Holding the camera beside her head, you should set the distance for
- A) 1 meter.
 - B) 2 meters.
 - C) 3 meters.
 - D) 4 meters.
 - E) none of these

Answer: D

Diff: 2

Topic: Reflection

Figure 14-A



- 20) When a mirror with a fixed beam on it is rotated through a certain angle, the reflected beam is rotated through an angle that is
- equal to the angle of rotation.
 - twice as large.
 - four times as large.
 - none of these

Answer: B

Diff: 3

Topic: Reflection

- 21) The inversion of your image in a plane mirror is actually an inversion of
- left - right.
 - up - down.
 - front - back.
 - all of these

Answer: C

Diff: 3

Topic: Reflection

Figure 14-B



- 22) Reflected light from the moon in a lake often appears as a vertical column when the water is
- perfectly still.
 - slightly rough.
 - very rough - churning with waves.

Answer: B

Diff: 3

Topic: Reflection

- 2) When light passes through an ordinary window pane, its angle of emergence is
- A) usually less than its angle of incidence.
 - B) always less than its angle of incidence.
 - C) the same as its angle of incidence.
 - D) usually more than its angle of incidence.
 - E) always more than its angle of incidence.

Answer: C

Diff: 1

Topic: Refraction

- 3) Light travels fastest in

- A) warm air.
- B) cool air.
- C) a vacuum.

Answer: C

Diff: 1

Topic: Refraction

- 4) Atmospheric refraction makes the daylight hours a bit

- A) longer.
- B) shorter.
- C) longer in summer but shorter in winter.

Answer: A

Diff: 1

Topic: Refraction

- 5) A mirage is a result of atmospheric

- A) reflection.
- B) refraction.
- C) scattering.
- D) dispersion.
- E) aberrations.

Answer: B

Diff: 1

Topic: Refraction

- 6) The twinkling of the stars is a result of atmospheric

- A) reflection.
- B) refraction.
- C) scattering.
- D) dispersion.
- E) aberrations.

Answer: B

Diff: 1

Topic: Refraction

22) Optical fibers are now used by

- A) surgeons.
- B) mechanics.
- C) engineers.
- D) polar bears.
- E) all of these

Answer: E

Diff: 1

Topic: Refraction

23) Your image in a plane mirror is

- A) virtual.
- B) real.
- C) both of these
- D) neither of these

Answer: A

Diff: 1

Topic: Refraction

24) The type of lens that spreads parallel light is a

- A) converging lens.
- B) diverging lens.
- C) combination converging-diverging lens.

Answer: B

Diff: 1

Topic: Refraction

25) Which of the following can be projected onto a viewing screen?

- A) a real image
- B) a virtual image
- C) both
- D) neither

Answer: A

Diff: 1

Topic: Refraction

26) A "burning glass" used to concentrate sunlight in a tiny spot is a

- A) converging lens.
- B) diverging lens.
- C) either
- D) neither

Answer: A

Diff: 1

Topic: Refraction

- 47) A primary rainbow is brighter than a secondary rainbow because
- A) sunlight reaching it is more intense.
 - B) there is one less reflection inside the water drops.
 - C) larger drops produce primary rainbows.
 - D) the secondary bow is a dim reflection of the primary rainbow.
 - E) none of these

Answer: B

Diff: 2

Topic: Refraction

Figure 14-E



- 48) The sun's elliptical shape at sunset can be adequately explained by
- A) Fermat's principle.
 - B) the law of refraction.
 - C) both of these
 - D) none of these

Answer: C

Diff: 2

Topic: Refraction

- 49) Objects infinitely far away are focused by a converging lens
- A) in front of the focal point.
 - B) at the focal point.
 - C) beyond the focal point.

Answer: B

Diff: 2

Topic: Refraction

- 50) If you wish to spear a fish with a regular spear, you should compensate for refraction between the air and water and throw your spear
- A) directly at the sighted fish.
 - B) above the sighted fish.
 - C) below the sighted fish.

Answer: C

Diff: 2

Topic: Refraction

- 55) A person who sees more clearly under water without eyeglasses or a face mask is
- A) nearsighted.
 - B) farsighted.
 - C) neither

Answer: A

Diff: 3

Topic: Refraction



- 56) A mirage occurs for surfaces that are
- A) horizontal.
 - B) vertical.
 - C) both of these

Answer: C

Diff: 3

Topic: Refraction

- 57) A mirage occurs for road surfaces that are
- A) warm.
 - B) cold.
 - C) wet.
 - D) hard.
 - E) snowy.

Answer: A

Diff: 3

Topic: Refraction

- 58) When light is refracted, there is a change in its
- A) frequency.
 - B) wavelength.
 - C) both of these
 - D) neither of these

Answer: B

Diff: 3

Topic: Refraction

- 59) The moon's redness during a lunar eclipse results from
- A) only lower frequencies being reflected from the moon.
 - B) infrared radiation that is normally blocked.
 - C) an optical illusion.
 - D) refraction by the Earth's atmosphere of Earth's sunrises and sunsets.
 - E) none of these

Answer: D

Diff: 3

Topic: Refraction