Name: _____ **Class:** _____ **Date:** _____ **ID: A**

Cp physics chapter 14 Light and Reflection

Multiple Choice

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

____ 1. What is the wavelength of microwaves of 3.0×10^{9} Hz frequency?
a. 0.050 m
b. 0.060 m
c. 0.10 m
d. 0.20 m

____ 2. What is the frequency of infrared light of 1.0×10^{-4} m wavelength?
a. 3.0×10^{-13} Hz
b. 3.0×10^{2} Hz
c. 3.0×10^{4} Hz
d. 3.0×10^{12} Hz

____ 3. What is the frequency of an electromagnetic wave with a wavelength of $1.0 \acute{} 10^{5}$ m?
a. 3.3×10^{-4} Hz
b. 3.0×10^{3} Hz
c. 1.0×10^{13} Hz
d. 3.0×10^{13} Hz

____ 4. In a vacuum, electromagnetic radiation of short wavelengths
a. travels as fast as radiation of long wavelengths.
b. travels slower than radiation of long wavelengths.
c. travels faster than radiation of long wavelengths.
d. can travel both faster and slower than radiation of long wavelengths.

____ 5. When red light is compared with violet light,
a. both have the same frequency.
b. both have the same wavelength.
c. both travel at the same speed.
d. red light travels faster than violet light.

____ 6. The farther light is from a source,
a. the more spread out light becomes.
b. the more condensed light becomes.
c. the more bright light becomes.
d. the more light is available per unit area.

____ 7. If you are reading a book and you move twice as far away from the light source, how does the brightness at the new distance compare with that at the old distance? It is
a. one-eighth as bright.
b. one-fourth as bright.
c. one-half as bright.
d. twice as bright.

____ 8. Snow reflects almost all of the light incident upon it. However, a single beam of light is not reflected in the form of parallel rays. This is an example of ____ reflection off a ____ surface.
a. regular, rough
b. regular, specular
c. diffuse, specular
d. diffuse, rough

____ 9. When a straight line is drawn perpendicular to a flat mirror at the point where an incoming ray strikes the mirror's surface, the angles of incidence and reflection are measured from the normal and
a. the angles of incidence and reflection are equal.
b. the angle of incidence is greater than the angle of reflection.
c. the angle of incidence is less than the angle of reflection.
d. the angle of incidence can be greater than or less than the angle of reflection.

____ 10. If a light ray strikes a flat mirror at an angle of 27° from the normal, the reflected ray will be
a. 27° from the mirror's surface.
b. 27° from the normal.
c. 90° from the mirror's surface.
d. 63° from the normal.

____ 11. The image of an object in a flat mirror is always
a. larger than the object.
b. smaller than the object.
c. independent of the size of the object.
d. the same size as the object.

____ 12. When two parallel mirrors are placed so that their reflective sides face each other, ____ images form. This is because the image in one mirror becomes the ____ for the other mirror.
a. multiple, object
b. reduced, virtual image
c. inverted, center of curvature
d. enlarged, focal point

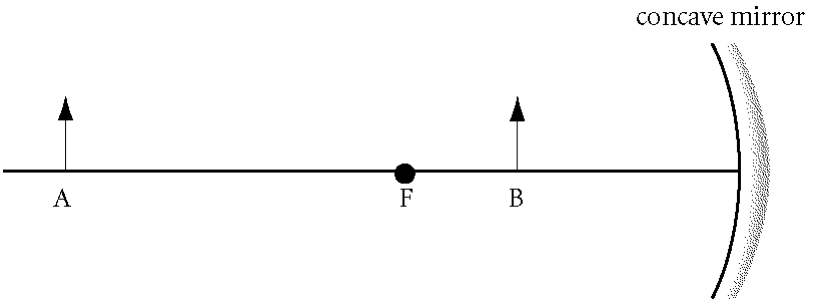
____ 13. If you stand 3.0 m in front of a flat mirror, how far away from you would your image be in the mirror?
a. 1.5 m
b. 3.0 m
c. 6.0 m
d. 12.0 m

____ 14. Which of the following best describes the image produced by a flat mirror?
a. virtual, inverted, and magnification greater than one
b. real, inverted, and magnification less than one
c. virtual, upright, and magnification equal to one
d. real, upright, and magnification equal to one

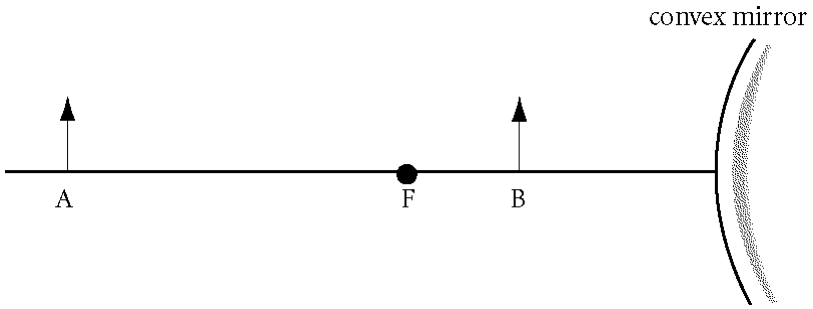
____ 15. A concave mirror with a focal length of 10.0 cm creates a real image 30.0 cm away on its principal axis. How far from the mirror is the corresponding object?
a. 20 cm
b. 15 cm
c. 7.5 cm
d. 5.0 cm

____ 16. A concave mirror forms a real image at 25.0 cm from the mirror surface along the principal axis. If the corresponding object is at a 10.0 cm distance, what is the mirror's focal length?
a. 1.40 cm
b. 7.14 cm
c. 12.0 cm
d. 17.0 cm

____ 17. A convex mirror with a focal length of –20.0 cm has an object 30.0 cm in front of the mirror. What is the value of q for the corresponding image?
a. −60 cm
b. −12 cm
c. 12 cm
d. 60 cm



____ 18. In the diagram shown above, the image of object *B* would be
a. virtual, enlarged, and inverted.
b. real, enlarged, and upright.
c. virtual, reduced, and upright.
d. virtual, enlarged, and upright.



____ 19. In the diagram shown above, the image of object *B* would be
a. real, reduced, and upright.
b. virtual, enlarged, and upright.
c. virtual, reduced, and inverted.
d. virtual, reduced, and upright.

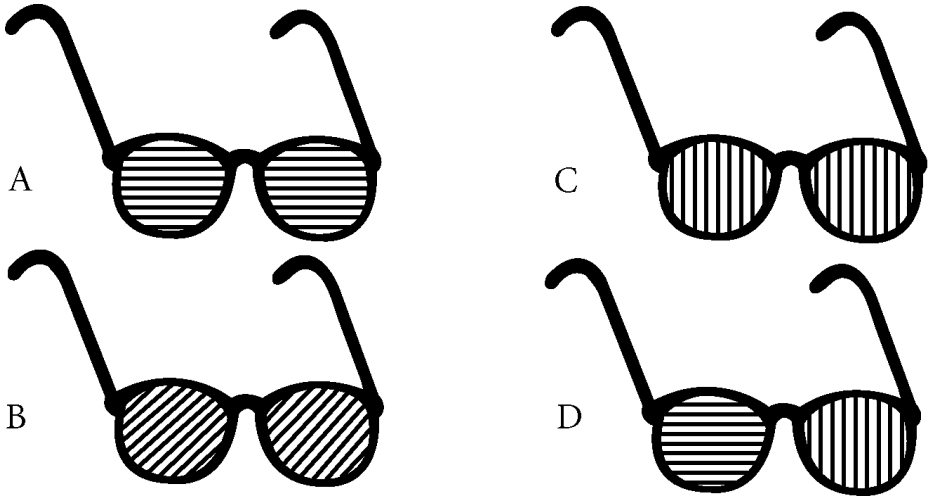
____ 20. Which best describes the image of a concave mirror when the object is located somewhere between the focal point and twice the focal-point distance from the mirror?
a. virtual, upright, and magnification greater than one
b. real, inverted, and magnification less than one
c. virtual, upright, and magnification less than one
d. real, inverted, and magnification greater than one

____ 21. Which best describes the image of a concave mirror when the object is at a distance greater than twice the focal-point distance from the mirror?
a. virtual, upright, and magnification greater than one
b. real, inverted, and magnification less than one
c. virtual, upright, and magnification less than one
d. real, inverted, and magnification greater than one

____ 22. Which best describes the image of a concave mirror when the object's distance from the mirror is less than the focal-point distance?
a. virtual, upright, and magnification greater than one
b. real, inverted, and magnification less than one
c. virtual, upright, and magnification less than one
d. real, inverted, and magnification greater than one

____ 23. Which of the following is *not* an additive primary color?
a. yellow
b. blue
c. red
d. green

____ 24. Which of the following is *not* a primary subtractive color?
a. yellow
b. cyan
c. magenta
d. blue



____ 25. Which pair of glasses shown above is best suited for automobile drivers? The transmission axes are shown by straight lines on the lenses. (Hint: The light reflects off the hood of the car.)
a. A
b. B
c. C
d. D

____ 26. If you looked at a light through the lenses from two polarizing sunglasses that were overlapped at right angles to each other,
a. all of the light would pass through.
b. most of the light would pass through.
c. little of the light would pass through.
d. none of the light would pass through.

Problem

27. A certain radio wave has a frequency of 2.0×10^6 Hz. What is its wavelength?

28. Yellow-green light has a wavelength of 560 nm. What is its frequency?

29. A concave mirror forms a real image at 17.0 cm from the mirror surface along the principal axis. If the corresponding object is at a distance of 36.0 cm, what is the mirror's focal length?

30. A concave mirror with a focal length of 18.0 cm forms a real image at 26.0 cm from the mirror's surface along the principal axis. How far is the corresponding object located from the mirror's surface?

31. A concave spherical mirror has a radius of curvature of 10.0 cm. A candle that is 5.0 cm tall is placed 15 cm in front of the mirror. Draw a ray diagram to find the image distance and height. Confirm the results of your diagram with the mirror equation and the equation for magnification.

32. A 1.5 cm high image of a candle is formed by a convex mirror whose focal length is 8.0 cm. The virtual image is 3.00 cm from the mirror's surface. The image's magnification is +0.25. Draw a ray diagram to determine the position and height of the corresponding object. Use the equation for magnification to confirm the results of your diagram.