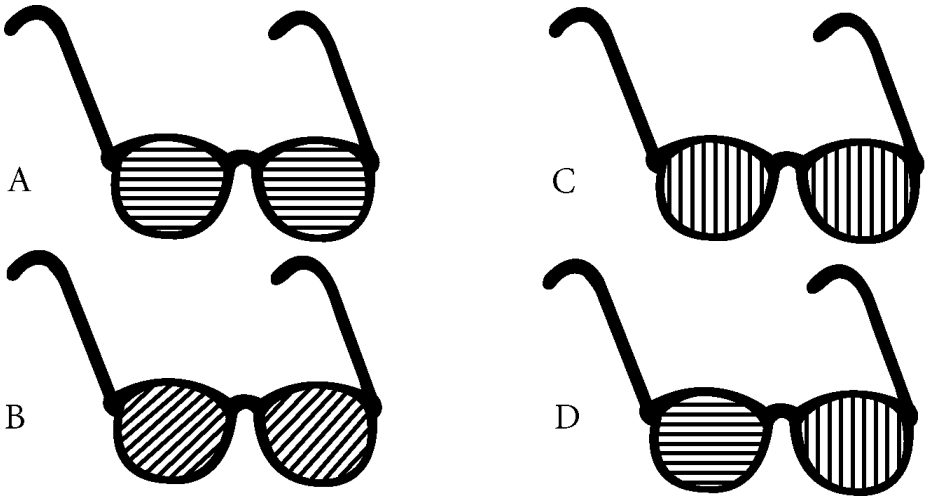
Physics12-Q3W1-Light and Reflection-H.W

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

____ 1. If a light ray strikes a flat mirror at an angle of 30° from the normal, the ray will be reflected at an angle of
a. 60° from the mirror's surface.
b. 30° from the mirror's surface.
c. 60° from the normal.
d. 90° from the normal.

____ 2. Which portion of the electromagnetic spectrum is used to identify fluorescent minerals?
a. ultraviolet light
b. X rays
c. infrared waves
d. gamma rays

____ 3. 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 less than one
b. real, inverted, and magnification less than one
c. virtual, upright, and magnification greater than one
d. real, inverted, and magnification greater than one



____ 4. 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. C
b. A
c. B
d. D

____ 5. If a light ray strikes a flat mirror at an angle of 29° from the normal, the reflected ray will be
a. 29° from the normal.
b. 27° from the normal.
c. 61° from the normal.
d. 29° from the mirror's surface.

____ 6. What is the wavelength of an infrared wave with a frequency of 4.2×10^{14} Hz?
a. 7.1×10^{-6} m
b. 1.4×10^{5} m
c. 1.4×10^{-7} m
d. 7.1×10^{6} m

____ 7. For a spherical mirror, the focal length is equal to ____ the radius of curvature of the mirror.
a. one-half
b. one-third
c. the square of
d. one-fourth

____ 8. 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. real, inverted, and magnification less than one
   b. real, inverted, and magnification greater than one
   c. virtual, upright, and magnification greater than one
   d. virtual, upright, and magnification less than one

____ 9. A parabolic mirror, instead of a spherical mirror, can be used to reduce the occurrence of which effect?
   a. mirages
   b. chromatic aberration
   c. light scattering
   d. spherical aberration

____ 10. When the reflection of an object is seen in a flat mirror, the distance from the mirror to the image depends on
   a. the distance of both the observer and the object to the mirror.
   b. the distance from the object to the mirror.
   c. the wavelength of light used for viewing.
   d. the size of the object.

____ 11. A mirror has an object located on its principal axis 40.0 cm from the mirror's surface. A virtual image is formed 15.0 cm behind the mirror. What is the mirror's focal length?
   a. -24.0 cm
   b. 2.38 cm
   c. 13 cm
   d. -10.9 cm

____ 12. If a light ray strikes a flat mirror at an angle of 27° from the normal, the reflected ray will be
   a. 90° from the mirror's surface.
   b. 63° from the normal.
   c. 27° from the mirror's surface.
   d. 27° from the normal.

____ 13. 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. 60 cm
   d. 12 cm

____ 14. What is the frequency of an electromagnetic wave with a wavelength of 1.0×10^{5} m?
   a. 3.0×10^{13} Hz
   b. 3.0×10^{-4} Hz
   c. 3.3×10^{13} Hz
   d. 1.0×10^{-4} Hz

____ 15. When red light is compared with violet light,
   a. red light travels faster than violet light.
   b. both have the same frequency.
   c. both have the same wavelength.
   d. both travel at the same speed.

____ 16. Which portion of the electromagnetic spectrum is used in a microscope?
   a. ultraviolet light
   b. gamma rays
   c. visible light
   d. infrared waves

____ 17. If a light ray strikes a flat mirror at an angle of 14° from the normal, the reflected ray will be
   a. 14° from the mirror's surface.
   b. 14° from the normal.
   c. 90° from the mirror's surface.
   d. 76° from the normal.

____ 18. As the angle between the electric-field waves and the transmission axis increases,
   a. the component of light that passes through the polarizer decreases and the brightness of the light decreases.
   b. the component of light that passes through the polarizer increases and the brightness of the light decreases.
   c. the component of light that passes through the polarizer decreases and the brightness of the light increases.
   d. the component of light that passes through the polarizer increases and the brightness of the light increases.

____ 19. Which of the following best describes the image produced by a flat mirror?
a. real, upright, and magnification equal to one
b. virtual, upright, and magnification equal to one
c. virtual, inverted, and magnification greater than one
d. real, inverted, and magnification less than one

____ 20. 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. 17.0 cm
b. 12.0 cm
c. 7.14 cm
d. 1.40 cm

____ 21. If you looked at a light through the lenses from two polarizing sunglasses that were overlapped at right angles to each other,
a. little of the light would pass through.
b. none of the light would pass through.
c. most of the light would pass through.
d. all of the light would pass through.

____ 22. 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. diffuse, rough
c. regular, specular
d. diffuse, specular

____ 23. When parallel rays that are also parallel to the principal axis strike a spherical mirror, rays that strike the mirror ____ the principal axis are focused at the focal point. Those rays that strike the mirror ____ the principal axis are focused at points between the mirror and the focal point.
a. close to, far from
b. far from, close to
c. perpendicular to, far from
d. close to, perpendicular to

____ 24. A highly polished finish on a new car provides a ____ surface for ____ reflection.
a. smooth, specular
b. rough, regular
c. rough, diffused
d. specular, diffused

____ 25. When incoming rays of light strike a flat mirror at an angle close to the surface of the mirror, the reflected rays are
a. perpendicular to the mirror's surface.
b. inclined high above the mirror's surface.
c. close to the mirror's surface.
d. parallel to the mirror's surface.

____ 26. The image of an object in a flat mirror is always
a. larger than the object.
b. smaller than the object.
c. the same size as the object.
d. independent of the size of the object.

____ 27. The relationship between frequency, wavelength, and speed holds for light waves because
a. light travels slower in a vacuum than in air.
b. different forms of electromagnetic radiation travel at different speeds.
c. all forms of electromagnetic radiation travel at a single speed in a vacuum.
d. light travels in straight lines.

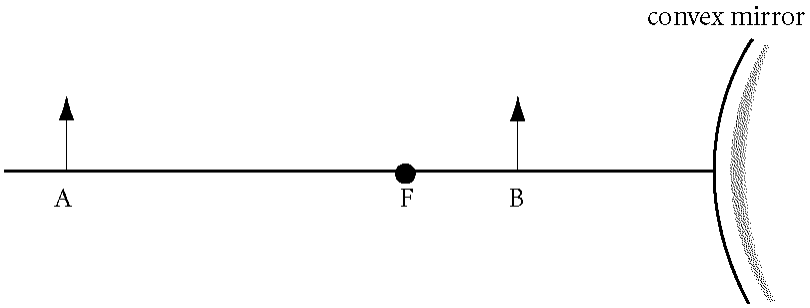
____ 28. When red light and green light shine on the same place on a piece of white paper, the spot appears to be
a. yellow.
b. white.
c. black.
d. brown.

____ 29. In a vacuum, electromagnetic radiation of short wavelengths
a. travels slower than radiation of long wavelengths.
b. travels faster than radiation of long wavelengths.
c. can travel both faster and slower than radiation of long wavelengths.
d. travels as fast as radiation of long wavelengths.

____ 30. If a virtual image is formed 10.0 cm along the principal axis from a convex mirror with a focal length of –15.0 cm, what is the object's distance from the mirror?
a. 30 cm
b. 3.0 cm
c. 6.0 cm
d. 12 cm

____ 31. Which of the following is *not* an additive primary color?
a. red
b. yellow
c. blue
d. green

____ 32. If you know the wavelength of any form of electromagnetic radiation, you can determine its frequency because
a. wavelength and frequency are equal.
b. the speed of light varies for each form.
c. all wavelengths travel at the same speed.
d. the speed of light increases as wavelength increases.



____ 33. 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.

____ 34. Which portion of the electromagnetic spectrum is used in a television?
a. gamma waves
b. infrared waves
c. radio waves
d. X rays

____ 35. 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 angle of incidence is greater than the angle of reflection.
b. the angles of incidence and reflection are equal.
c. the angle of incidence can be greater than or less than the angle of reflection.
d. the angle of incidence is less than the angle of reflection.

____ 36. 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. 3.0 m
b. 12.0 m
c. 6.0 m
d. 1.5 m

____ 37. An object is 29 cm away from a concave mirror's surface along the principal axis. If the mirror's focal length is 9.50 cm, how far away is the corresponding image?
a. 12 cm
b. 14 cm
c. 29 cm
d. 36 cm

____ 38. 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. 5.0 cm
b. 15 cm
c. 20 cm
d. 7.5 cm

____ 39. 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

____ 40. 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. enlarged, focal point
b. reduced, virtual image
c. multiple, object
d. inverted, center of curvature

____ 41. The farther light is from a source,
a. the more spread out light becomes.
b. the more light is available per unit area.
c. the more bright light becomes.
d. the more condensed light becomes.

____ 42. What type of mirror is used whenever a magnified image of an object is needed?
a. convex mirror
b. two-way mirror
c. concave mirror
d. flat mirror

____ 43. Which of the following is *not* a primary subtractive color?
a. cyan
b. magenta
c. blue
d. yellow

____ 44. 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-half as bright.
b. one-fourth as bright.
c. one-eighth as bright.
d. twice as bright.

____ 45. What is the frequency of infrared light of 1.0×10^{-4} m wavelength?
a. 3.0×10^{-13} Hz
b. 3.0×10^{4} Hz
c. 3.0×10^{12} Hz
d. 3.0×10^{2} Hz

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