

Physics - Blizzard Bag #3**Textbook: Chapters 16 and 17**

Directions: *Print out a paper copy of this assignment. You must show your work to receive credit for the assignment. You may use your textbook and notes as a guide for solving the problems.*

Multiple Choice

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

- The yellow color of a canary shown on a conventional computer monitor is produced by
 - refraction of white sunlight.
 - addition of red and green light.
 - absorption of blue and red light.
 - polarization of green and yellow light.
- Which of these best explains how chlorophyll causes the leaves of a tree to appear green?
 - Chlorophyll bends blue and red light without affecting green light.
 - Chlorophyll absorbs blue and red light while reflecting green light.
 - Chlorophyll destroys white and red light while storing green light to use.
 - Chlorophyll combines sunlight with blue light from the sky to form green light.
- Earth is about 150,000,000 km from the Sun. Its input of solar energy per square meter is I . Mars is about 228,000,000 km from the Sun. Which of these most likely represents the input of solar energy per square meter on Mars?
 - $0.28I$
 - $0.43I$
 - $0.65I$
 - $0.99I$
- When magenta is taken out of white light, the color that remains is
 - yellow.
 - cyan.
 - blue.
 - green.
- A driver is stopped for running a red light. Trying to avoid a ticket, the driver tells the police officer that because of the Doppler shift, the red light (650 nm) was blueshifted to a green light (470 nm). What would the driver's speed need to be for this to be true?
 - 1.1×10^8 m/s
 - 8.3×10^7 m/s
 - 1.1×10^9 m/s
 - 70 mph
- Which of these images could be inverted?
 - image of a customer in a store's convex security mirror
 - image of an object placed between the focal point and the surface of a concave mirror
 - image of a tree in the lens of a person's convex sunglasses
 - image of a strawberry in the concave bowl of a shiny spoon
- A shiny silver bowl acts as a mirrored surface with a radius of curvature of 6 cm. A strawberry is held 4 cm above the bottom of the bowl and then dropped. Which change occurs as the strawberry falls to a height of 2 cm?
 - The image goes from being smaller to being larger than the object.
 - The image goes from right side up to upside down.
 - The image goes from being larger to being smaller than the object.
 - The image goes from upside down to right side up.

8. A concave mirror has a focal length, f . A nickel placed before the mirror has a real image that is three times larger than the actual nickel. Which of these represents the object distance of the nickel?

a) $\frac{4}{3}f$

c) $\frac{3}{4}f$

b) $\frac{3}{2}f$

d) $\frac{2}{3}f$

Problem

9. Two polarizing filters are 15 cm apart. There is an angle of 20° between the polarizing axes of the filters. Light from a laser passes through filter 1 and then through filter 2. In this set up, the only change you are allowed to make is either to the distance or to the angle between the filters, in which case you may halve or double the given measurement.

a. How do you change the set up to increase the intensity of laser light passing through filter 2? Explain.

b. If the light emerging from a second polarizing filter is reduced to two-thirds its intensity coming out of a first polarizing filter. What is the angle between the polarizing axes of the two filters?

10. A concave spherical mirror forms an image of the Sun at a distance of 8.0 cm from the mirror. What is the radius of curvature of the mirror? (Use 1.50×10^{13} cm as the distance to the Sun.)