

Extended Response

15.1 The Electromagnetic Spectrum 34.

A frequency of red light has a wavelength of 700 nm.

Part A—Compare the wavelength and frequency of violet light to red light.

Part B—Identify a type of radiation that has lower frequencies than red light.

Part C—Identify a type of radiation that has shorter wavelengths than violet light.

- a. A. Violet light has a lower frequency and longer wavelength than red light.
B. ultraviolet radiation
C. infrared radiation
- b. A. Violet light has a lower frequency and longer wavelength than red light.
B. infrared radiation
C. ultraviolet radiation
- c. A. Violet light has a higher frequency and shorter wavelength than red light.
B. ultraviolet radiation
C. infrared radiation
- d. A. Violet light has a higher frequency and shorter wavelength than red light.
B. infrared radiation
C. ultraviolet radiation

35.

A mixture of red and green light is shone on each of the subtractive colors.

Part A—Which of these colors of light are reflected from magenta?

Part B—Which of these colors of light are reflected from yellow?

Part C—Which these colors of light are reflected from cyan?

- a. Part A. red and green
Part B. green
Part C. red
- b. Part A. red and green
Part B. red
Part C. green
- c. Part A. green
Part B. red and green
Part C. red
- d. Part A. red
Part B. red and green
Part C. green

15.2 The Behavior of Electromagnetic Radiation 36.

Explain why we see the colorful effects of thin-film interference on the surface of soap bubbles and oil slicks, but not on the surface of a window pane or clear plastic bag.

- a. The thickness of a window pane or plastic bag is more than the wavelength of light, and interference occurs for thicknesses smaller than the wavelength of light.
- b. The thickness of a window pane or plastic bag is less than the wavelength of light, and interference occurs for thicknesses similar to the wavelength of light.
- c. The thickness of a window pane or plastic bag is more than the wavelength of light, and interference occurs for thicknesses similar to the wavelength of light.
- d. The thickness of a window pane or plastic bag is less than the wavelength of light, and interference occurs for thicknesses larger than the wavelength of light.

37.

The Occupational Safety and Health Administration (OSHA) recommends an illuminance of 500 lx for desktop lighting. An office space has lighting hung 2.50 m above desktop level that provides only 300 lx . To what height would the lighting fixtures have to be lowered to provide 500 lx on desktops?

- a. 1.22 m
- b. 1.09 m
- c. 0.96 m
- d. 1.94 m