Short Answer

15.1 The Electromagnetic Spectrum 26.

Describe one way in which heat waves—infrared radiation—are different from sound waves.

a. Sound waves are transverse waves, whereas heat waves—infrared radiation—are longitudinal waves.
b. Sound waves have shorter wavelengths than heat waves.
c. Sound waves require a medium, whereas heat waves—infrared radiation—do not.
d. Sound waves have higher frequencies than heat waves.

27.

Describe the electric and magnetic fields that make up an electromagnetic wave in terms of their orientation relative to each other and their phases.

a. They are perpendicular to and out of phase with each other.
b. They are perpendicular to and in phase with each other.
c. They are parallel to and out of phase with each other.
d. They are parallel to and in phase with each other.

28.

Explain how X-radiation can be harmful and how it can be a useful diagnostic tool.

a. Overexposure to X-rays can cause HIV, though normal levels of X-rays can be used for sterilizing needles.
b. Overexposure to X-rays can cause cancer, though in limited doses X-rays can be used for imaging internal body parts.
c. Overexposure to X-rays causes diabetes, though normal levels of X-rays can be used for imaging internal body parts.
d. Overexposure to X-rays causes cancer, though normal levels of X-rays can be used for reducing cholesterol in the blood.

29.

Explain how sunlight is the original source of the energy in the food we eat.

a. Sunlight is converted into chemical energy by plants; this energy is released when we digest food.
b. Sunlight is converted into chemical energy by animals; this energy is released when we digest food.
c. Sunlight is converted into chemical energy by fish; this energy is released when we digest food.
d. Sunlight is converted into chemical energy by humans; this energy is released when we digest food.

15.2 The Behavior of Electromagnetic Radiation 30.

Describe what happens to the path of light when the light slows down as it passes from one medium to another?

a. The path of the light remains the same.
b. The path of the light becomes circular.
c. The path of the light becomes curved.
d. The path of the light changes.

31.

What is it about the nature of light reflected from snow that causes skiers to wear polarized sunglasses?

a. The reflected light is polarized in the vertical direction.
b. The reflected light is polarized in the horizontal direction.
c. The reflected light has less intensity than the incident light.
d. The reflected light has triple the intensity of the incident light.

32.

How many lumens are radiated from a candle which has an illuminance of 3.98 lx at a distance of 2.00 m?

a. 400 lm
b. 100 lm
c. 50 lm
d. 200 lm

33.

Saturn is 1.43×1012 m from the Sun. How many minutes does it take the Sun's light to reach Saturn?

a. 7.94×10^{9} minutes
b. 3.4×10^{4} minutes
c. 3.4×10^{-6} minutes
d. 79.4 minutes