1. a) Specular reflection
   b) Diffuse reflection
   c) Specular reflection
   d) Diffuse reflection

5. \( p = q \) so 2 times as large

6. An object facing the mirror produces the image of the object. The image is virtual, located behind the mirror itself.
Section Quiz: Characteristics of Light

Write the letter of the correct answer in the space provided.

1. Which of the following is not a component of the electromagnetic spectrum?
   a. light waves
   b. radio waves
   c. microwaves
   d. sound waves

2. All of the following statements about electromagnetic waves are true except which one?
   a. Electromagnetic waves are distinguished by their different shapes.
   b. Electromagnetic waves are composed of oscillating electric and magnetic fields.
   c. Electromagnetic waves are transverse waves.
   d. Electromagnetic waves move in a direction that is perpendicular to the electric and magnetic fields.

3. Given the wave speed equation \( c = f\lambda \), what is the relationship between frequency \((f)\) and wavelength \((\lambda)\)?
   a. direct
   b. exponential
   c. inverse
   d. none of the above

4. Which variable in the wave speed equation is constant in a vacuum?
   a. \( c \)
   b. \( f \)
   c. \( \lambda \)
   d. all of the above

5. Which of the following is approximately equal to the currently accepted value for the speed of light?
   a. \( 3.00 \times 10^6 \text{ m/s} \)
   b. \( 3.00 \times 10^8 \text{ m/s} \)
   c. \( 30.0 \times 10^8 \text{ m/s} \)
   d. \( 3.00 \times 10^9 \text{ m/s} \)

6. The speed of light is incredibly fast. Physicists consider it to be
   a. finite.
   b. infinite.
   c. immeasurable.
   d. variable.
7. The intensity of light depends on the
   a. speed of the light wave and the amount of light energy emitted from
      a source.
   b. distance from the light source and the type of surface the light
      strikes.
   c. amount of light energy emitted from a source and the distance from
      the light source.
   d. size of the surface area which the light strikes and the distance
      from the light source.

8. If the distance from a light source is increased by a factor of 5, the
   illuminance
   a. also increases by a factor of 5.
   b. decreases by a factor of 25.
   c. increases by a factor of 25.
   d. decreases by a factor of 5.

9. Since each type of electromagnetic wave has its own specific range, explain
    why the electromagnetic spectrum is continuous rather than divided into
    distinct sections.

   The frequency of the electromagnetic waves continuously
   increases with increased temperature of the band.
   Represents distinguishable properties of specific ranges

10. What is the frequency of an infrared wave whose wavelength is 650 \( \mu \text{m} \)?

\[
f = \frac{v}{\lambda} = \frac{3.00 \times 10^8 \text{ m/s}}{650 \times 10^{-6} \text{ m}} = 4.61 \times 10^{11} \text{ Hz}
\]
Section Quiz: Electromagnetic Waves
Write the letter of the correct answer in the space provided.

1. Electromagnetic waves consist of ___________ electric and magnetic fields.
   a. oscillating
   b. constant
   c. parallel
   d. longitudinal

2. Which of the following statements correctly describes electromagnetic waves?
   a. The electric and magnetic fields are at right angles to each other.
   b. The electric and magnetic fields are at right angles to the direction that the wave is moving.
   c. Electromagnetic waves are transverse waves.
   d. all of the above

3. All electromagnetic waves are produced by ___________ charges.
   a. stationary
   b. accelerating
   c. neutral
   d. constant

4. Which of the following reasons best supports the conclusion that electricity and magnetism are two aspects of a single electromagnetic force?
   a. The electromagnetic force obeys the inverse-square law.
   b. Both electric and magnetic fields produce forces on charged particles.
   c. The electromagnetic force is one of the four fundamental forces in the universe.
   d. none of the above

5. Where is energy stored in electromagnetic waves?
   a. in the oscillating electric and magnetic fields
   b. in the moving charged particles
   c. in the motion of the electromagnetic waves
   d. all of the above
6. Which of the following statements about the electromagnetic force is not true?
   a. The magnitude of the electromagnetic force is proportional to the charge.
   b. The electromagnetic force is proportional to the electric field strength.
   c. The electromagnetic force is proportional to the magnetic field strength.
   d. The electromagnetic force is inversely proportional to the charge.

7. The energy transported by electromagnetic waves is called electromagnetic
   a. propagation.
   b. radiation.
   c. variation.
   d. deviation.

8. What term refers to electromagnetic waves as particles?
   a. cathodes
   b. rays
   c. photons
   d. diodes

9. What is the electromagnetic spectrum?

A graphic work to represent different types
A electromagnetic waves and illustrate the relationships these waves in
terms of wavelength, frequency and photon energy.

10. Choose one type of electromagnetic wave on the electromagnetic spectrum
    and describe its wavelength, frequency, and energy properties. Identify two
    applications of the electromagnetic wave.

   # answers well written