Read Chapter 21.10 – 21.13

1. What type of waves are EM waves
    a. transverse
    b. longitudinal

why?

2. What is the change in momentum of a ball (Ball A) with mass *m,* that bounces off the floor when its initial speed is v_o and its final speed is $-v_o$?
    a. mv_o
    b. $2mv_o$
    c. zero
    d. not enough information

3. What is the change in momentum of a ball (Ball B) with mass *m,* that hits the floor and sticks, if its initial speed is v_o and its final speed is 0.
    a. mv_o
    b. $2mv_o$
    c. zero
    d. not enough information

4. Which of the balls above exerts a greater impulse on the floor?
    a. Ball A
    b. Ball B
    c. They exert the same impulse

5. Light does not have mass. But it does have
    a. Energy
    b. Momentum
    c. Both a and b
    d. Neither a or be because it doesn't have mass

6. Consider the example on page 746. By what factor will the force exerted by the Sun's light be changed when the spacecraft is twice as far from the Sun?
    a. No change
    b. ½
    c. ¼
    d. 1/8

Why?

7. How are all forms of electromagnetic radiation produced?

8. Specifically how is infrared radiation produced and how does that tie to your answer in 7?

9. How are x-rays and gamma rays different and how are they the same?
    a. They are the same wavelengths of EM waves; but pose different levels of danger to humans
    b. They are the same wavelengths of EM waves; but are produced by different types of sources.
    c. They are both EM waves; but are different wavelengths, produced differently and cause different levels of damage to humans
    d. They are both EM waves; but are different wavelengths and are produced differently.

10. Consider the Doppler shift for light. What "shifts"?
    a. The color we see
    b. The brightness of the light we see
    c. The speed of light