**Astronomy Assessment and TPS Questions:**

**Electromagnetic Spectrum of Light**

1. Which of the following moves the slowest?
   1. radio waves
   2. visible light
   3. x-rays
   4. infrared light
   5. They all move at the same speed.
2. Which of the following has the least energy?
   1. radio waves
   2. visible light
   3. x-rays
   4. infrared light
   5. They all have the same energy.
3. Which of the following has the most energy?
   1. radio waves
   2. visible light
   3. x-rays
   4. infrared light
   5. They all have the same energy.
4. Light can be thought of as being composed of tiny packets of energy, or particles called
   1. protons.
   2. electrons.
   3. photons.
   4. neutrons.
5. Which of the following is not a form of light?

a. radio waves

b. microwaves

c. x-rays

d. All of the above are a form of light.

e. None of the above is a form of light

1. Which of the following has the shortest wavelength?
2. A photon of ultraviolet light.
3. Blue electromagnetic radiation.
4. An X-ray.
5. A radio wave.
6. Infrared radiation.
7. Which of the following has the longest wavelength?
8. A photon of ultraviolet light.
9. Blue electromagnetic radiation.
10. An X-ray.
11. A radio wave.
12. Infrared radiation.
13. Which of the following would be true about comparing visible light and radio waves?
    1. The radio waves would have a lower energy and would travel slower than visible light.
    2. The visible light would have a shorter wavelength and a lower energy than radio waves.
    3. The radio waves would have a longer wavelength and travel the same speed as visible light.
    4. The visible light would have a higher energy and would travel faster than radio waves.
    5. The radio waves would have a shorter wavelength and higher energy than visible light.
14. Which of the following would be true about comparing gamma rays and radio waves?
15. The radio waves would have a lower energy and would travel slower than gamma rays.
16. The gamma rays would have a shorter wavelength and a lower energy than radio waves.
17. The radio waves would have a longer wavelength and travel the same speed as gamma rays.
18. The gamma rays would have a lower frequency and travel the same speed as gamma rays.
19. The radio waves would have a shorter wavelength and higher energy than gamma rays.
20. The diagram at right represents three different waves of light emitted at the same time by the Sun. Which wave will arrive first at a satellite orbiting just above Earth’s atmosphere?
    1. Wave 1
    2. Wave 2
    3. Wave 3
    4. All three waves arrive at the same time.
21. Which of the following has the highest speed?
    1. x-rays
    2. ultraviolet light
    3. gamma rays
    4. They all have the same speed.
22. Which of the following has the most energy?
    1. Red light
    2. Blue light
    3. Yellow light
    4. All of the above have the same energy because they are all visible light
23. What form of light has a slightly shorter wavelength than Indigo?
    1. Blue light
    2. UV
    3. Infrared
    4. Gamma
24. The wavelength of photon A is shorter than the wavelength of photon B. Which photon (A or B) has a higher frequency?
    1. A
    2. B
    3. They have the same frequency
    4. Cannot tell from information given
25. Which of the following types of electromagnetic radiation is not visible to the human eye?
    1. Red
    2. Ultraviolet
    3. Blue
    4. White
    5. They are all visible to the human eye
26. When compared to infrared light, X-ray light has a \_\_\_\_\_\_\_ wavelength and a \_\_\_\_\_\_\_ frequency:
    1. shorter, lower
    2. shorter, higher
    3. longer, lower
    4. longer, higher
27. You are making a hot pocket in your microwave and you see that the inside of the appliance is illuminated. What type of radiation are you observing with your eyes?
    1. Radio
    2. Visible
    3. Microwave
    4. X-ray
28. Which of the following is always true about Electromagnetic Radiation?
    1. It cannot easily pass through Earth’s atmosphere
    2. It is not visible to the human eye
    3. It travels at the speed of light
    4. More than one answer above is correct
    5. None of the answers above are correct
29. Light with a very short wavelength has a \_\_\_\_\_ frequency and \_\_\_\_\_ energy.
    1. high; low
    2. low; high
    3. low; low
    4. high; high
30. Light with a high energy has a \_\_\_\_\_ frequency and a \_\_\_\_\_ wavelength
    1. high; short
    2. high; long
    3. low; short
    4. low; long
31. Rank the speed, from fastest to slowest, of the following light forms: Gamma rays, UV, Radio, X-rays, and Infrared:
    1. Gamma rays, X rays, UV, Infrared, Radio
    2. Radio, Infrared, UV, X-rays, Gamma Rays
    3. Gamma rays, UV, Infrared, Radio, X-rays
    4. None of the above
32. If you can see light coming from a bulb, and it has a long wavelength, then the light must be \_\_\_\_\_\_\_
    1. red.
    2. violet.
    3. yellow.
    4. microwaves.
    5. gamma rays.
33. Which of the following is true when comparing Infrared light and Radio waves?
    1. Infrared light has a shorter wavelength and travels slower than Radio waves
    2. Infrared light has a higher frequency and travels faster than Radio waves
    3. Radio waves have a lower frequency and travel the same speed as Infrared light
    4. Infrared light has a longer wavelength and less energy than Radio waves
    5. Radio waves have a higher frequency and travel the same speed as Infrared