

Multiple Choice Questions

- Light of which of the following colors has the greatest photon energy?
(d) Violet
- The Bohr theory was developed to explain which of these phenomena?
(b) The photoelectric effect
- In which of the following states does a hydrogen electron have the greatest energy?
(c) $n=5$

Fill In The Blank Questions

- In the equation $E=hf$, the h is called Planck's constant.
- A quantum of electromagnetic radiation is commonly called a(n) photon.
- In the Bohr model, as n , increases, the distance of the electron from the nucleus increases.
- A photon is absorbed when an electron makes a transition from one energy level to a higher one.
- The X in X-ray stands for unknown.

Short Answer Questions

- What do we mean when we say that something is *quantized*?
We mean that it has specific levels. For example stairs, you cannot exist on a 1.5 stair, only on the first or second stair.
- Distinguish between a proton and a photon. Proton – Has mass and a charge. Photon – Is Energy, no mass and no charge.
- Explain the difference between a photon of red light and one of violet light in terms of energy, frequency and wavelength.

	Energy	Frequency	Wavelength
Red Light	Lesser Energy	Lower Frequency	Longer Wavelength
Violet Light	Greater Energy	Higher Frequency	Shorter Wavelength

Exercises

2. Light having a frequency of about 5.00×10^{14} Hz (a wavelength of about 600 nm) appears orange to our eyes. What is the energy in joules of the photons associated with this light?

$$E = hf$$

$$E = (6.63 \times 10^{-34} \text{ J} \cdot \text{s})(5.00 \times 10^{14} \text{ Hz})$$

$$E = 3.32 \times 10^{-19} \text{ J}$$

FOR CHECKING YOUR WORK ONLY