

## Atomic Spectra Practice

Name: \_\_\_\_\_ Date: \_\_\_\_\_

For each of the following problems, write a formula, substitute numbers appropriately, and include proper units. (*Use proper significant figures in final answer*)

1) Excited sodium atoms may emit radiation having a wavelength of  $5.89 \times 10^{-7}$  meters.

a) What is the **frequency** of this photon (light)?

b) What **region** of the electromagnetic spectrum is this photon contained in?

2) A radio station has a frequency of 96.5 MHz. Find the **wavelength**. *Hint: Convert MHz to Hz ( $s^{-1}$ ) first. ( $1 \text{ MHz} = 1.0 \times 10^6 \text{ Hz}$ )*

3) A photon of light has an energy value of  $2.93 \times 10^{-25}$  Joules (J). What is its **frequency**?

a. What **region** of electromagnetic radiation does the photon correspond to on the electromagnetic spectrum?

4) A CD player uses light photons of frequency  $3.85 \times 10^{14}$  Hz to read the information on the disc.

a. What is the **wavelength** of the photon (light)?

b. What **region** of the electromagnetic spectrum does this wavelength correspond to?

c. What is the **energy** of one photon of this light?

5) After absorbing x-rays of wavelength 53.7 nm, helium atoms emit light at wavelength 501.6 nm.

a. What is the **frequency** of the x-ray radiation?

b. What is the **energy** of one photon of the x-ray radiation?

c. What is the **frequency** of the light emitted from the helium atom?

d. What is the **energy** of one photon of this light emitted from the helium atom?

e. What **region** of the electromagnetic spectrum does the light emitted from the helium atom correspond to?