Name _____ Date _____

Honors Physics Modern WS #5H

Period _____ Mrs. Nadworny

A

Energy Level Diagrams

Directions: Read online textbook pages 840 – 847. Use the Energy Level Diagrams given on the Reference Tables to answer the following questions. Solve the following problems using the GUESS method and proper significant figures. Be sure to show ALL work.

1. After electrons in hydrogen atoms are excited to the n = 3 energy state, how many different frequencies of radiation can be emitted as the electrons return to the ground state?

   (A) 1 (B) 2 (C) 3 (D) 4

2. What is the minimum energy needed to ionize a hydrogen atom in the n = 2 energy state?

   (A) 1.89 eV (B) 3.40 eV (C) 10.2 eV (D) 13.6 eV

3. What is the ionization potential for an electron in a mercury atom in energy level c?

4. An electron in a mercury atom is excited to energy level g.

   a. Determine the energy (in electronvolts) of the photon released when the electron falls to energy level c.

   b. Convert the energy to joules.

   c. Calculate the frequency of the photon.

   d. Calculate the wavelength of the photon.

   e. Determine the type of electromagnetic radiation. If visible light, state the color.

Answers in size order: 4.86×10^{-19}, 4.09×10^{-7}, 3.04, 5.52, 7.33×10^{14}