PHYS 301 Bohr Model Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. In the line spectrum of atomic hydrogen there is also a group of lines known as the Pfund series. These lines are produced when electrons, excited to high energy levels, make transitions to the  level. Determine **(a)** the longest wavelength and **(b)** the shortest wavelength in this series. **(c)** Refer to the electromagnetic spectrum, and state where these lines are found.

2. The Bohr model can be applied to singly ionized helium . Using this model, consider the series of lines that is produced when the electron makes a transition from higher energy levels into thex  level. Some of the lines in this series lie in the visible region of the spectrum (380-750 nm). What are the values of  for the energy levels from which the electron makes the transitions corresponding to these lines?

3. The energy of the  Bohr orbit is  for an unidentified ionized atom in which only one electron moves about the nucleus. What is the radius of the  orbit for this species?

4. A certain species of ionized atoms produces an emission line spectrum according to the Bohr model, but the number of protons *Z* in the nucleus is unknown. A group of lines in the spectrum forms a series in which the shortest wavelength is 40.51 nm and the longest wavelength is 72.93 nm. Find the next-to-the-longest wavelength in the series of lines.