

PHYSICS 6C PRACTICE QUIZ 9

THE FOLLOWING MULTIPLE CHOICE QUESTIONS ARE NOT TO BE TURNED IN FOR GRADING. THEY ARE INTENDED AS A SELF EVALUATION QUIZ AND PRACTICE FOR THE FINAL EXAM

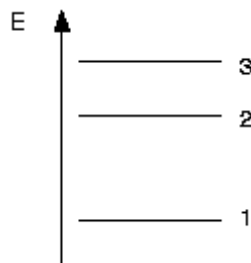
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 1) One of the emission lines described by the original version of Balmer's formula has wavelength 377 nm. What is the value of n in Balmer's formula that gives this emission line?

A) 11
B) 12
C) 13
D) 14

- 2) Part of the energy level diagram of a certain atom is shown in Figure 1. The energy spacing between levels 1 and 2 is twice that between 2 and 3. If an electron makes a transition from level 3 to level 2, the radiation of wavelength λ is emitted.

Figure 1



What possible radiation wavelengths might be produced by other transitions between the three energy levels?

- A) Only 2λ
B) Both 2λ and 3λ
C) Both $\lambda/2$ and $\lambda/3$
D) Only $\lambda/2$
- 3) The kinetic energy of an electron in a Bohr orbit of the hydrogen atom is 8.57×10^{-20} J. What is the radius of the orbit?
- A) 4.12×10^{-9} m
B) 5.29×10^{-11} m
C) 2.01×10^{-9} m
D) 1.35×10^{-9} m
E) 2.64×10^{-9} m

- 4) The energy required to remove the electron from a hydrogen atom in the $n = 11$ state is closest to:
- A) 0.11 eV
 - B) 0.094 eV
 - C) 0.080 eV
 - D) 0.14 eV
 - E) 0.17 eV
- 5) An electron has the same de Broglie wavelength as a 1.8 eV photon. The speed of the electron is closest to:
- A) 840 m/s
 - B) 1100 m/s
 - C) 980 m/s
 - D) 910 m/s
 - E) 770 m/s
- 6) The correct ground state electron configuration of boron ($Z = 5$) is:
- A) $1s^2 1p^2 2s$
 - B) $1s^2 2p^3$
 - C) $1s^2 2p^2 3s$
 - D) $1s^2 2s^2 2p^3$
 - E) $1s^2 2s^2 2p$