Name Date

PH 102 Quiz 8: Probably you won't drop this one.

20Apr07 LeClai

$$\begin{aligned} E &= hf = \frac{hc}{\lambda} \\ e\Delta V &= KE_{\max} = hf - \phi \\ E_n &= -13.6\,\text{eV}/n^2 \\ h &= \lambda|\vec{\mathbf{p}}| \end{aligned}$$

$$\begin{aligned} \Delta E \Delta t &\geq \frac{h}{4\pi} \\ h &= 6.624 \times 10^{-34}\,\text{J}\cdot\text{s} \\ e &= 1.602 \times 10^{-19}\,\text{C} \\ c &= 3.00 \times 10^{8}\,\text{m/s} \\ m_e &= 9.11 \times 10^{-31}\,\text{kg} \end{aligned}$$

1. What is the energy of a photon that, when absorbed, could cause an electronic transition from the $n=3$ to the $n=6$ state in a Hydrogen atom?

- ◯ 1.13 eV
- ◯ 1.85 eV
- ◯ 2.24 eV
- ◯ 0.85 eV

2. What is the energy of a photon that, when absorbed, could cause an electronic transition from the $n=2$ to the $n=3$ state in a Hydrogen atom?

- ◯ 1.13 eV
- ◯ 1.89 eV
- ◯ 2.24 eV
- ◯ 0.85 eV

3. A pulsed ruby laser emits light at 694.3 nm. For a 13.6 ps pulse containing 3.40 J of energy, how many photons are in the pulse? 1 ps is 10^{-12}s.

- ◯ 2×10^{20}
- ◯ 1×10^{19}
- ◯ 3×10^{21}
- ◯ 5×10^{17}

4. What is the orbital speed of a Hydrogen atom in the $n=1$ state according to the Bohr model?

- ◯ 2×10^{4} m/s
- ◯ 1×10^{7} m/s
- ◯ 3×10^{8} m/s
- ◯ 2×10^{6} m/s

5. Which color was not one of the Hydrogen lines you saw yesterday?

- ◯ blue
- ◯ violet
- ◯ red
- ◯ yellow