

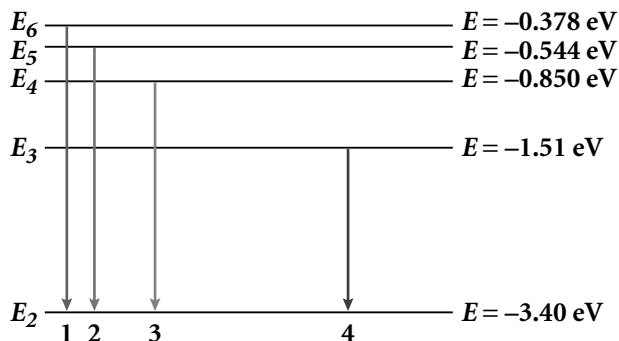


# Standardized Test Prep

## MULTIPLE CHOICE

- What is another word for “quantum of light”?
  - blackbody radiation
  - energy level
  - frequency
  - photon
- According to classical physics, when a light illuminates a photosensitive surface, what should determine how long it takes before electrons are ejected from the surface?
  - frequency
  - intensity
  - photon energy
  - wavelength
- According to Einstein’s photon theory of light, what does the intensity of light shining on a metal determine?
  - the number of photons hitting the metal in a given time interval
  - the energy of photons hitting the metal
  - whether or not photoelectrons will be emitted
  - $KE_{max}$  of emitted photoelectrons
- An X-ray photon is scattered by a stationary electron. How does the frequency of this scattered photon compare to its frequency before being scattered?
  - The new frequency is higher.
  - The new frequency is lower.
  - The frequency stays the same.
  - The scattered photon has no frequency.
- Which of the following summarizes Thomson’s model of the atom?
  - Atoms are hard, uniform, indestructible spheres.
  - Electrons are embedded in a sphere of positive charge.
  - Electrons orbit the nucleus in the same way that planets orbit the sun.
  - Electrons exist only at discrete energy levels.
- What happens when an electron moves from a higher energy level to a lower energy level in an atom?
  - Energy is absorbed from a source outside the atom.
  - The energy contained in the electromagnetic field inside the atom increases.
  - Energy is released across a continuous range of values.
  - A photon is emitted with energy equal to the difference in energy between the two levels.

The diagram below is an energy-level diagram for hydrogen. Use the diagram to answer questions 7–8.



- What is the frequency of the photon emitted when an electron jumps from  $E_5$  to  $E_2$ ?
  - 2.86 eV
  - $6.15 \times 10^{14}$  Hz
  - $6.90 \times 10^{14}$  Hz
  - $4.31 \times 10^{33}$  Hz
- What frequency of photon would be absorbed when an electron jumps from  $E_2$  to  $E_3$ ?
  - 1.89 eV
  - $4.56 \times 10^{14}$  Hz
  - $6.89 \times 10^{14}$  Hz
  - $2.85 \times 10^{33}$  Hz