

Physics 112
Quiz #24
December 4, 2000

Name: _____

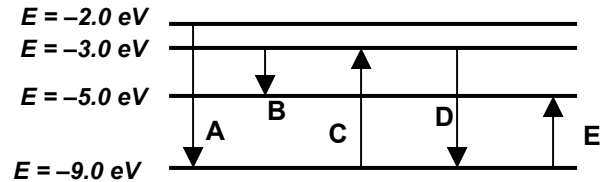
IF YOU WANT A QUESTION GRADED OUT OF THREE POINTS (-1 [MINUS ONE] FOR WRONG ANSWER!!) WRITE "3" IN SPACE PROVIDED ON EACH QUESTION.

$c = 3 \times 10^8 \text{ m/s}$

$h = 4.14 \times 10^{-15} \text{ eV}\cdot\text{s}$

1. What does arrow **C** represent?

- A. emission of a photon with frequency $7.24 \times 10^{14} \text{ Hz}$
- B. absorption of a photon with frequency $7.24 \times 10^{14} \text{ Hz}$
- C. emission of a photon with frequency $1.45 \times 10^{15} \text{ Hz}$
- D. absorption of a photon with frequency $1.45 \times 10^{15} \text{ Hz}$
- E. emission of a photon with frequency $2.17 \times 10^{15} \text{ Hz}$
- F. absorption of a photon with frequency $2.17 \times 10^{15} \text{ Hz}$



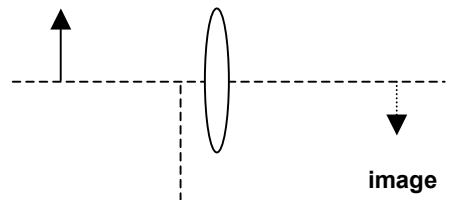
Grade out of 3? Write "3" here: _____

2. In the diagram for question #1, which letter represents the process that results in the **emission** of the **shortest wavelength** electromagnetic wave?

- A.
- B.
- C.
- D.
- E.

3. A convex lens forms an image of an illuminated arrow as shown. (Illuminated arrow is on the left.) What will happen to the image if the **bottom half** of the lens is blocked with an opaque board placed on the dashed line?

- A. The arrowhead part of the image will disappear from the image.
- B. The arrow tail part of the image will disappear from the image.
- C. The entire image will disappear.
- D. The image will get dimmer, but will undergo no other significant change.
- E. The image will be **completely** unaffected in any way.



Grade out of 3? Write "3" here: _____

4. What was the important discovery made by James Maxwell around 1860, which followed from his hypothesis that a changing electric field could produce a magnetic field?

- A. Energy of a photon has a minimum "package size," where $E = hf$.
- B. The force between two charged particles is inversely proportional to the distance between them.
- C. A changing magnetic flux can produce an electric current.
- D. A traveling wave composed of oscillating electric and magnetic fields has the same velocity as light.
- E. Atoms can emit light due to changes in energy level of the electrons.
- F. Current-carrying conductors exert attractive and repulsive forces on each other.