Homework2

Louis Deslauriers
Started: September 22, 2009 1:04 PM
Questions: 16

Finish Save All Help

1. Question1 (Points: 0)

Each week you should review both your answers and the answer key for the previous week's homework to make sure that you understand all the questions and how to answer them correctly. Starting this week, your first homework question will be to submit one homework correction. Select one problem for which you had the wrong answer. In the text box below,
i) identify the question number you are correcting
ii) state (copy) your original wrong answer,
iii) explain where your original reasoning was incorrect, the correct reasoning for the problem, and how it leads to the right answer.
If you got all the answers correct!!! Great ... then state which was your favorite /most useful homework problem and why.

New Insert equation

Save Answer

2. Question2 (Points: 1)

Explain why accelerating charges generate light but charges that are stationary or moving at a constant velocity do not.

New Insert equation

Save Answer

3. Question3 (Points: 1)

It is the thermal motion of charged particles at the sun's surface that produces the electromagnetic radiation emitted by the sun.
To generate a blue light at 400nm, at what frequency would a charged particle have to be vibrating back and forth? (your answer should have the following format: 1.0 E10 Hz -- to two significant figures)
1.

Save Answer

4. Question 4 (Points: 1)

Even in the most advanced circuits, we cannot oscillate electrons back and forth at that rate through wires. But we can oscillate charges back and forth quickly enough to broadcast TV using radiowave signals. At what frequency does that electronics at the TV station need to have the charges oscillate back and forth on a TV broadcast antenna to transmit a typical TV signal (say a radiowave transmission signal with a wavelength of 3 meter)?

1. 100 kHz (or 1E5 Hz)
2. 1 MHz (or 1E6 Hz)
3. 10 MHz (or 1E7 Hz)
4. 100 MHz (or 1E8 Hz)
5. 1 GHz (or 1E9 Hz)

Save Answer

5. Question5 (Points: 1)

When we were discussing the classical wave-view of electromagnetic light, we considered the following scenario where 3 different beams of laser light (single-frequency light) were hitting 3 barrels filled with water. The drawing showed the frequency and amplitude of the electromagnetic wave in each case (the amplitude for #1 and #2 are the same).
The clicker question compared how fast the barrels will heat.
The total amount of power hitting barrel #1 is less than the total amount hitting barrel #2.

a. True
b. False

Save Answer

6. Questions6 (Points: 1)

The amount of energy in each photon hitting barrel #1 is the same as the amount in each photon hitting barrel #3.
(Since we haven't yet covered the "photon" concept in class, but you seem to all know about it anyway, attempt to answer this question -- it will be graded for participation)

a. True
b. False

Save Answer

7. HW2 (question7) (Points: 1)

The number of photons hitting barrel #1 per second is the same as the number of photons hitting barrel #2 per second. (Again, since we haven't yet covered the "photon" concept in class, but you seem to all know about it anyway, attempt to answer this question -- it will be graded for participation)

a. True
b. False

Save Answer

8. HW2 (question8) (Points: 1)

Barrel #1 and #2 heat up at the same rate.

a. True
b. False

Save Answer

9. HW#2 (question9) (Points: 1)

From the picture you can see that, (wavelength of #2) = 3/5 (wavelength of #1). If there are 2,500,000 photons per second hitting barrel #2, how many photons are hitting barrel #1 per second? (3 Significant dig)
(Again, since we haven't yet covered the "photon" concept in class, but you seem to all know about it anyway, attempt to answer this question -- it will be graded for participation)

1.

Save Answer

10. HW2 (question 10) (Points: 1)

A photoelectric-effect experiment finds a stopping potential of 1.93 V when light of 200 nm is used to illuminate the cathode. From what metal is the cathode made? (hint, use table 39.1 in Knight Volume 5)

1. Potassium
2. Sodium
3. Aluminum
4. Tungsten
5. Copper
6. Iron
7. Gold

Save Answer

11. HW2 (question 11) (Points: 1)

In the same photoelectric-effect experiment (original stopping potential: 1.93V, wavelength 200nm) the intensity of the light is doubled. What is the stopping potential now?

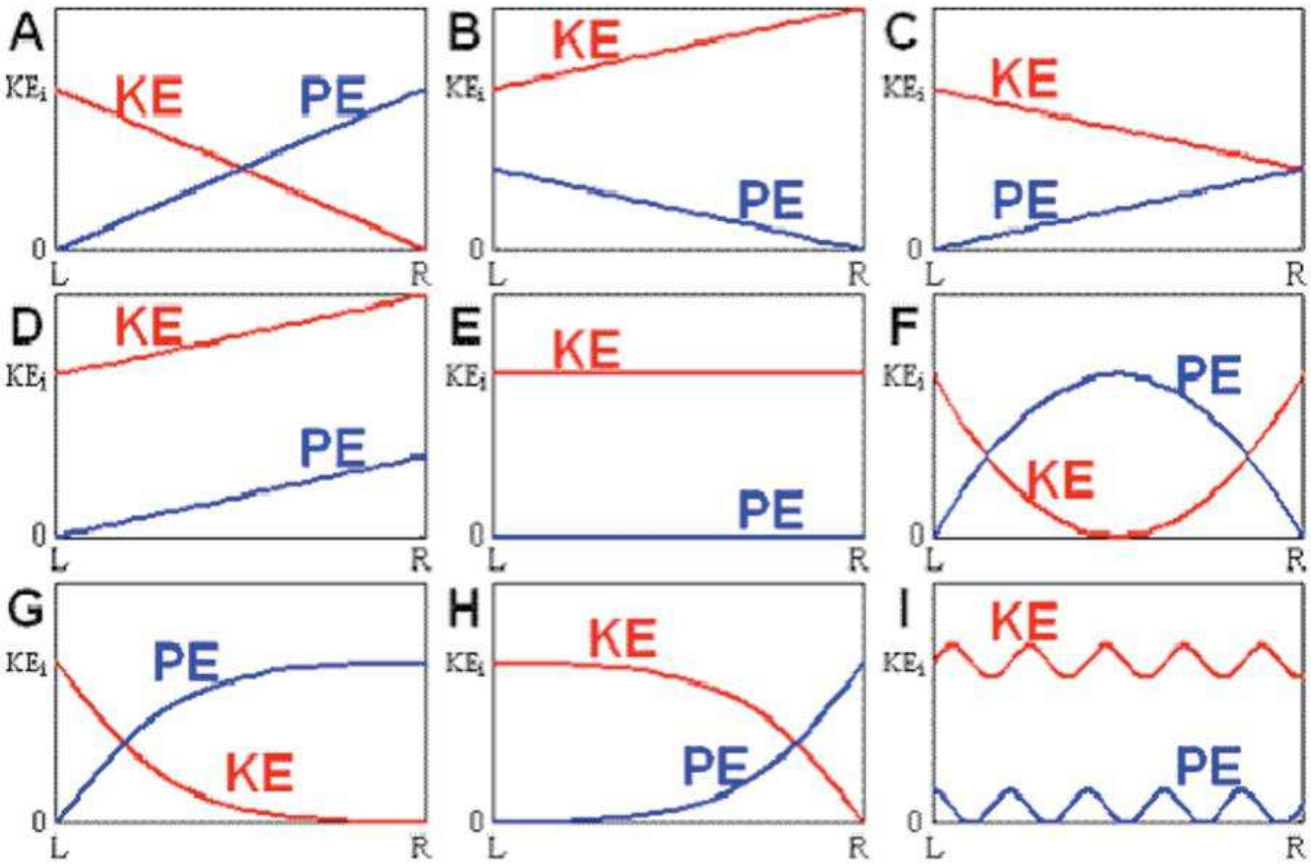
1.

Save Answer

12. HW2 (question12) (Points: 1)

Below are possible plots of kinetic energy (KE) and potential energy (PE) as a function of position for an electron as it travels from the left plate (L) to the right plate (R). KEi is the initial kinetic energy of the electron.

Which of the above plots describe the kinetic and potential energy of the electron as a function of position in the case where...V >0



1. A
2. B
3. C
4. D
5. E
6. F
7. G
8. H
9. I

Save Answer

13. HW2 (question 13) (Points: 1)

If V=0 (using the same picture in question 12)

1. A
2. B
3. C
4. D
5. E
6. F
7. G
8. H
9. I

Save Answer

14. HW2 (question 14) (Points: 1)

In the case where V < 0 and the electron almost reaches the right plate and then turns around. (again, using the same K.E. and P.E. graphs in Q12)

- 1. A
- 2. B
- 3. C
- 4. D
- 5. E
- 6. F
- 7. G
- 8. H
- 9. I

Save Answer

15. HW2 (question 15) (Points: 1)

In the case where V < 0 but the electron has plenty of energy to get to the right plate.

- 1. A
- 2. B
- 3. C
- 4. D
- 5. E
- 6. F
- 7. G
- 8. H
- 9. I

Save Answer

16. HW2 (question 16) (Points: 2)

We would like to know what you expect your grade to be in this course (in percent). In a few sentences, please explain why.
This will be graded on your participation.

New Insert equation

Save Answer

Finish **Save All** **Help**