Quizzes (Fall 2024)

PHYS 205B-001: UNIVERSITY PHYSICS

School of Physics and Applied Physics, Southern Illinois University–Carbondale

Due date: At 9:30 AM before each class, on D2L

Instructions

- This document collects the quizzes for the complete semester. One question below is due on each day of lecture.
- Assessment of quizzes does not look for correctness. Instead, it expects you to be critical and creative.
- The questions are conceptual. They might be open ended, thus, it is not recommended to spend more than ten minutes on a question. You are encouraged to ponder about it though.
- Additional questions, with hyperlinks to exams, are available in Lecture Notes.
- After completion, scan the pages as a single PDF file, and submit the file on D2L (under Assessments → Assignments). The question number syntax Q-MMDD is derived from date.

Questions

Electric charge and electric forces

(**Q-0820:**) Watch the following YouTube video by Bruce Yeany

https://youtu.be/jcoTqhXehDQ
https://youtu.be/U6bKDaZiy_k

to gain insight on how we can manipulate the electric charges in materials. Explain the demonstration using the idea of transfer of charges.

(**Q-0822:**) A charged conducting sphere is brought close to another neutral conducting sphere. (The spheres are not allowed to touch.) Is the electric force between the spheres zero? If not, is the force attractive or repulsive?

Check out the following presentation at Jefferson Lab,

https://youtube.com/embed/n3tauzN6-Uk?start=150&end=332,

that demonstrates this efect between timestamps 2:30 to 5:32 minutes.

Electric field

(**Q-0827:**) The following is a video illustrating the idea of Faraday cage in the SPARK Museum of Electrical Invention in Bellingham, Washington,

https://youtu.be/uAJfw3tALbI.

A perfect Faraday cage shields one from electric force. Imagine ways to shield from gravitational force.

(**Q-0829:**) The following is a short 3D animation from the Physics and Astronomy Animation Project at Penn State Schuylkill,

https://youtu.be/LB8Rhcb4eQM

Sketch the electric field lines of three identical positive charges at the corners of an equilateral triangle. Repeat the exercise after you replace one of the positive charge with a negative charge.