NAME & ID

PH 102 / LeClair Summer II 2012

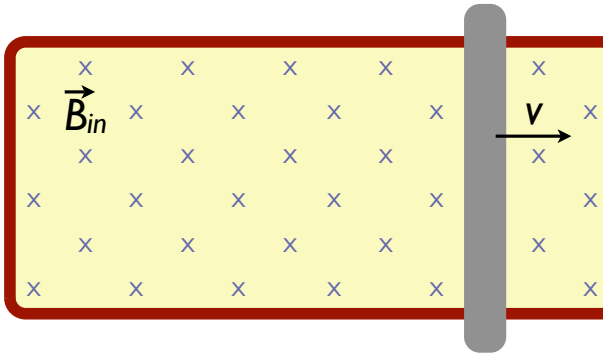
Quiz 5: Magnetism and Induction

1. Consider a solenoid that is very long compared to the radius. Of the following choices, the most effective way to increase the magnetic field in the interior of the solenoid is to

- ▫ double its length, keeping the number of turns per unit length constant
- ▫ reduce its radius by half, keeping the number of turns per unit length constant
- ▫ overwrapping the entire solenoid with an additional layer of current-carrying wire.

2. A magnet and a non-magnet of the same mass are dropped into conducting copper tubes of equal length. Which takes longer to come out?

- ▫ The magnet.
- ▫ The non-magnet.
- ▫ It takes the same amount of time.



3. A conducting bar slides on two fixed conducting rails, as shown above, with a constant magnetic field pointing into the page. What are the directions of the induced current and the force on the bar, respectively?

- ▫ Counterclockwise; to the left
- ▫ Clockwise; to the left
- ▫ Counterclockwise; to the right
- ▫ Clockwise; to the right

4. A switch controls the current in a circuit that has a large inductance. Is a spark more likely to be produced at the switch when:

- ▫ the switch is being closed
- ▫ the switch is being opened
- ▫ it doesn't matter, same probability either way