NAME & ID

PH 102 / LeClair Summer II 2010

Quiz 6: Induction

$$\Delta V = IR \qquad \Delta V = -N\frac{\Delta\Phi_B}{\Delta t} \qquad \Phi_B = BA\cos\theta_{BA}$$

1. A technician wearing a conducting bracelet enclosing an area $0.005\,m^2$ places her hand in a solenoid whose magnetic field is $5.0\,T$ directed perpendicular to the plane of the bracelet. The resistance around the circumference of the bracelet is $0.02\,\Omega$. A power failure causes the field to drop to $1.50\,T$ in a time of $0.02\,s$. Find the current in the bracelet.

2. During an in-class demonstration, we dropped a magnet and a non-magnet of equal weight and size through a conducting aluminum tube. The non-magnet fell through the tube at the expected rate, but the magnet took many times longer to fall out, due to eddy current braking. Is it possible to have a magnet strong enough (or a tube conductive enough, etc) that it would actually stop inside the tube? Explain.