

PHYSICS 1020

Homework #8

(Due April 26, 2010)

1. (Giancoli 20-3) How much current is flowing in a wire 4.80 m long if the maximum force on it is 0.750 N when placed in a uniform 0.0800-T field?
2. (Giancoli 20-32) A power line carries a current of 95 A along the tops of 8.5-m-high poles. What is the magnitude of the magnetic field produced by this wire at the ground? How does this compare with the Earth's field of about $\frac{1}{2}$ gauss?
3. (Giancoli 21-1) The magnetic flux through a coil of wire containing two loops changes from -50 Wb to $+38$ Wb in 0.42 s. What is the emf induced in the coil?
4. (Giancoli 21-5) A 12.0-cm-diameter loop of wire is initially oriented perpendicular to a 1.5-T magnetic field. The loop is rotated so that its plane is parallel to the field direction in 0.20 s. What is the average induced emf in the loop?
5. (Giancoli 21-11) The magnetic field perpendicular to a circular wire loop 12.0 cm in diameter is changed from $+0.52$ T to -0.45 T in 180 ms, where $+$ means the field points away from an observer and $-$ toward the observer. (a) Calculate the induced emf. (b) In what direction does the induced current flow?