## Possibly Useful Information for Exam 2

Electron rest mass $= 9.1 \times 10^{-31}\ kg$
Proton rest mass $= 1.67 \times 10^{-27}\ kg$
Charge on a proton $= 1.6 \times 10^{-19}\ C$
Permeability constant $\mu_0 = 1.26 \times 10^{-6}\ T\ m/A$
Acceleration due to gravity $g = 9.8\ m/s^2$

## Possibly Useful Formulae

You should be able to interpret the meanings of various symbols below. Ask me if anything is not clear.

$$\mathbf{a} \cdot \mathbf{b} = |\ \mathbf{a}\ |\ |\ \mathbf{b}\ |\ cos\ (\theta) \tag{1}$$

$$\mathbf{a} \times \mathbf{b} = |\ \mathbf{a}\ |\ |\ \mathbf{b}\ |\ sin\ (\theta)\ \hat{\mathbf{n}} \tag{2}$$

$$V_B - V_A = -\int_A^B \mathbf{E} \cdot d\mathbf{l} \tag{3}$$

$$\mathbf{F}_m = q\ \mathbf{v} \times \mathbf{B} \tag{4}$$

$$|\mathbf{B}| = \frac{\mu_0 I}{2\pi d} \quad (long\ straight\ wire) \tag{5}$$

$$|\mathbf{F}_m|/l = B_{ext}\ I \quad (long\ straight\ wire) \tag{6}$$

$$Induced\ EMF = -\frac{d\phi_m}{dt} \tag{7}$$

$$Power = (Voltage) \cdot (Current) \tag{8}$$

Kinematic Equations

$$v_f = v_i + a\ t \tag{9}$$

$$d = v_i\ t + \frac{a\ t^2}{2} \tag{10}$$

$$v_f^2 = v_i^2 + 2\ a\ d \tag{11}$$