Phys 2426 2017-10-26 Lec 16

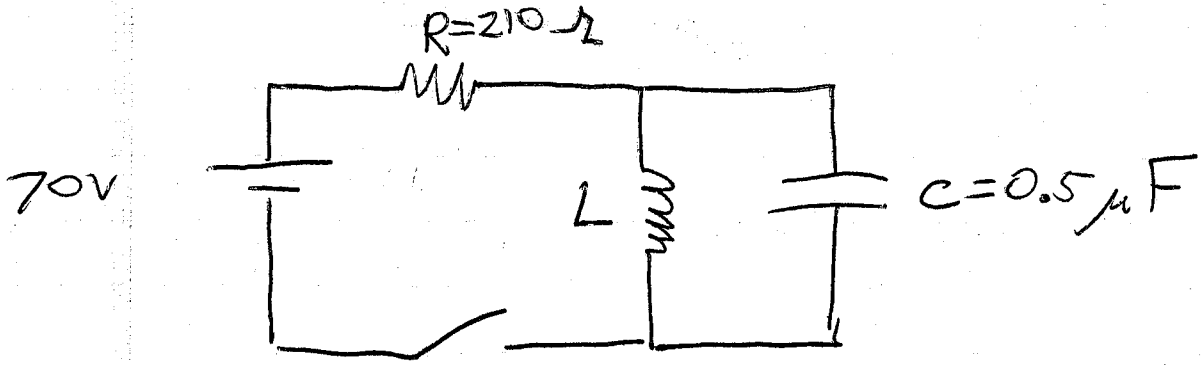
Exam 2 is Tuesday.
- Review from Fall 2016 is copied into Lecture Notes folder.

Power: DC $P = IV$

AC $P_{avg} = I_{rms} V_{rms}$ (only resistor)

↑ Not total V.

$P_{avg} = I_{rms}^2 R$




Steady State w/ Switch closed: $V = IR$

$70\,V = I\ 210\,\Omega$

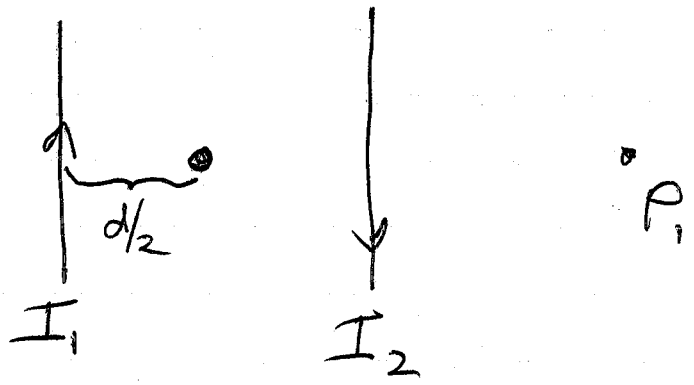
$I = 0.333\ A$

Open Switch: $Energy_L = \frac{1}{2} L I^2$

Know $V_{max} = 150\ V$ $Energy_C = \frac{1}{2} C V^2$

(2)

$B = \frac{\mu_0 I}{2\pi r}$ due to single wire




B@ midpoint: $B_1 = \frac{\mu_0 I_1}{2\pi r_1}$ (in)

$B_2 = \frac{\mu_0 I_2}{2\pi r_2}$ (in)

$B = B_1 + B_2$

B@ $P_1$ $B_1 = \frac{\mu_0 I_1}{2\pi r_1}$ (in)

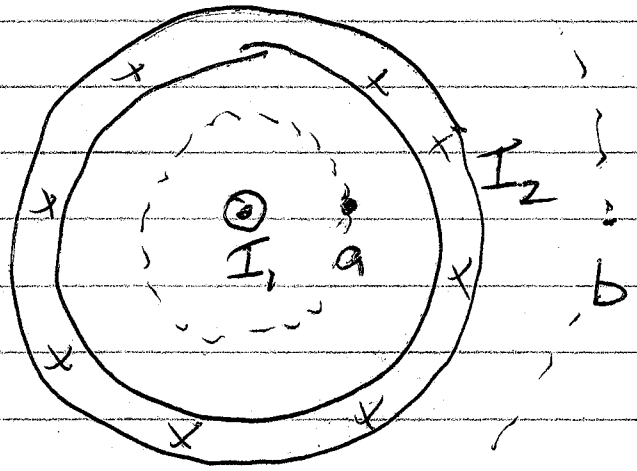
$B_2 = \frac{\mu_0 I_2}{2\pi r_2}$ (out)

$B = B_2 - B_1$ (out b/c $B_2$ stronger)

$$\int \vec{B} \cdot d\vec{l} = \mu_0 I_{enc}$$

(3)

Ampere's Law $\quad B_{avg} \cdot l = \mu_0 I_{enc}$




@ Point a: $\quad I_{enc} = +I_1$

$$B = \frac{\mu_0 I_1}{2\pi r_a}$$

@ Point b: $\quad I_{enc} = +I_1 - I_2$

$$B = \frac{\mu_0 (I_1 - I_2)}{2\pi r_b}$$

$$F_B = q\vec{v} \otimes \vec{B}$$
$$= I\vec{l} \otimes \vec{B}$$

RBA


$\vec{B}$ = (right) if $q = \oplus$

Transformer $\frac{N_S}{N_P} = \frac{V_S}{V_P}$

$V_P I_P = V_S I_S$ (100% efficient)

$(\text{Energy})_{in} \in = (\text{Energy})_{out}$

$\in$ efficiency