Instructor:
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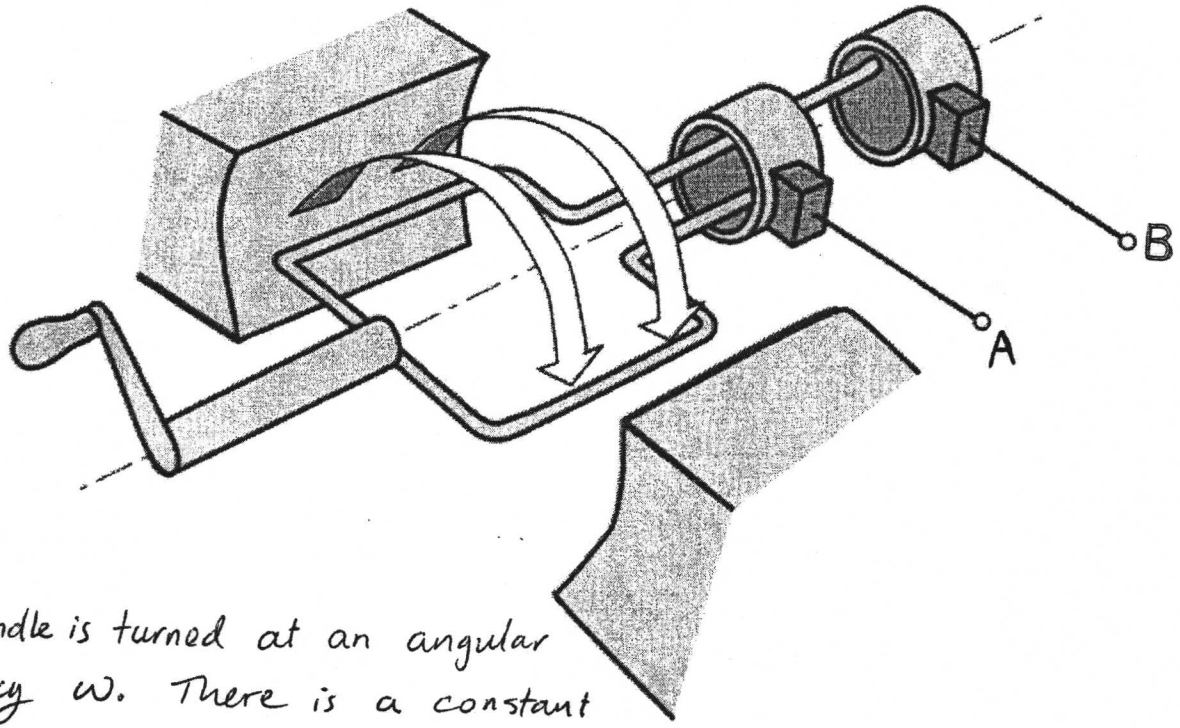
PH 632

Winter 2016

Pop Quiz Questions: Day 11-23

~~Midterm Questions~~

DAY 11 Pop Quiz (7)

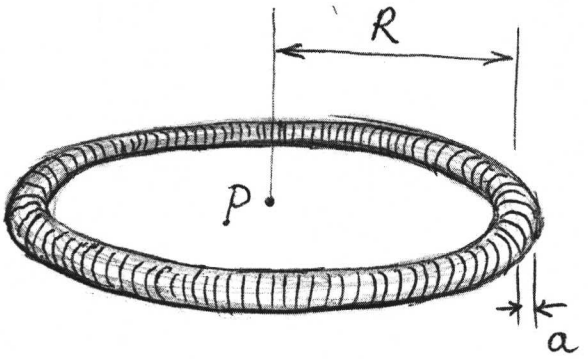


The handle is turned at an angular frequency ω. There is a constant B-field, B_0, between the poles of the magnet. The square shaped wire loop has area a^2.

a) A voltmeter measures across the terminals A & B. Find $V(t)$.

b) What is the peak voltage when $a = 0.1\,m$
$B_0 = 0.1\,T$
$\omega = 400\,s^{-1}$

POP QUIZ DAY 12



A toroidal solenoid with n turns per unit length has a small radius a and a large radius $R \gg a$.

The current in the solenoid varies with time, $I = I_0 e^{-\alpha t}$.

Find $\vec{E}(t)$ in the center of the solenoid.

POP QUIZ

DAY 13

In class we showed that $W = \frac{1}{2} L I^2$ for a loop of inductance L.

If the loop was a very long solenoid, show that

$$\frac{1}{2} L I^2 \approx \frac{1}{2\mu_0} \int_{\substack{\text{volume} \\ \text{inside} \\ \text{solenoid}}} |\vec{B}|^2 \, d^3\vec{r}$$