PH 122: Assignment #6  Induction & Transformers

Details
This assignment will be due in class on Wednesday, March 26.

- When you answer questions, please show your reasoning.
- When you answer multiple-choice questions, please show all of your work.
- Please answer problems in three steps, “Prepare”, “Solve” and “Assess”

Problems
Chapter 25: EM Induction & EM Waves
Topic #1: Motional emf
Problems: 2, 6

Topic #2: Induction & Faraday’s Law
Questions: 7, 9, 15, 18  Problems: 22, 24, 60
Passage Problem (solve as one problem): 78-80

Chapter 26: AC Electricity
Topic #3: AC Electricity & Transformers
Questions: 3  Problems: 10
Passage Problem (solve as one problem): 66-69

Past Exam Problem
Flip Coil
In the past, a precise measurement of a magnetic field this was often accomplished with a flip coil. A coil of wire was oriented in a plane perpendicular to magnetic field; it was then quickly turned to be parallel to the field. The resulting flux change induced a current who measurement permitted a determination of the field.

An investigator measures the strength of the field in a large magnet with a flip coil of radius 12 cm and resistance 0.30 Ω. The coil is rotated as noted in a time of 0.15 s. What is the magnitude of the current in the coil during the rotation? Be sure to explain your reasoning and show all steps in your work.

Grading
We will grade 2 items.

If we grade a question, we'll give it 0, 1 or 2 points. We’ll assign points as follows:

2 = essentially all correct; 1 = partially correct; 0 = mostly incorrect.

If we grade a problem, we'll give it 0, 1 or 2 points. We'll give 1 point for “Prepare” and 1 point for “Solve”. The “Assess” step will work as a fail safe. If you didn't get the solution quite right but your “Assess” step was thoughtful and well reasoned, you can still get the full 2 points.

We'll assign 1 “Completeness Point” - with “Completeness” broadly interpreted. You need to make a serious effort on all the problems, do legible and complete work throughout, and staple your pages together.

Additional Practice
If you want additional practice, you can try the following problems:

Chapter 25:
Problems: 5, 17, 21, 61

Chapter 26:
Problems: 11, 13, 53