

Study guidelines for exam #3

Content

Exam 3 is on current and resistance, DC circuits, magnetic field and forces, electric field 9, 10, 11, 12 and 13 (written and mastering physics) are pertinent to this exam, and quizzes 8, 9, 10, and 11. Here is an outline of concepts and topics you should *understand and practice*:

- Current and resistance (Ohm's Law, current density, resistivity, conductivity, emf, ...).
- DC circuits
 - Equivalent capacitance.
 - Equivalent resistance.
 - Time constant.
 - RC circuits
 - Kirchhoff's loop law.
 - Kirchhoff's junction law.
 - Power
- Magnetic field and forces.
 - B-field of a moving charge, straight wire, current loop, solenoid, toroid, ...
 - Right hand rules.
- Magnetic field lines.
- Permanent magnets.
- Current wires.
- Motion of charges in \vec{E} and \vec{B} .
- Lorentz equation.
- Cyclotron motion.
- Hall effect.
- Ampere's Law.
- Bio-Savart Law.
- Electromagnetic induction
 - Magnetic flux
 - Lenz's Law
 - Faraday's Law
 - Eddy currents
 - Motional EMF
 - Transformers.

We have covered almost all the content from the chapters. For exam #3 you may skip *ONLY* the following sections:

- Chapter 25, section 10.
- Chapter 27, section 7.
- Chapter 28, sections 9 and 10.
- Chapter 29, sections 7 and 8.

How to study?

- Go over all the homework problems (written and MP), the recitation problems, and the examples from the text. Going over the problems mean you need to **grab a pencil and paper and re-work the problems with only a cheat sheet and a calculator available to you**. You need to know how to solve the problems, and do not need to (shouldn't) memorize them. Memorizing the problems won't help, you need to understand the concepts.
- Very important: go over quizzes and MP homework. Do you understand the answers to all the questions now? If the answer is NO, you are not ready for the exam. Take action!
- Start studying at least 10 days in advance.
- If you come across a concept you don't understand, come see me, or ask the TA, or go to any of the help sessions.
My office hours are posted on my website, or you can schedule an appointment by email.

No cheat-sheet

I will provide a formula sheet with the exam. There will be only formulas and if you have studied enough you will recognize them (I will keep same notation as the text book).