PHYS 202 S 2019 Study Guide For Test #3

Chapter 22: Magnetism

1. Magnets, Magnetic Field, and Earth's magnetic field.
TERMS: north pole, south pole, monopole, magnetic field lines, earth’s magnetic field, magnetic declination, and angle of dip.

2. Force on a moving electric charge in a magnetic field. 

3. Force on a moving electric charge in an electric field. 

4. Centripetal force: $F\_{c}=m\frac{v^{2}}{r}$

5. Magnetic field: Definition and units.

6. Right hand rules: Understanding and using them in problem solving.

7. Force on a current in a magnetic field. 

8. Magnetic field produced by electric current.
      

9. Velocity selector and mass spectrometer.

Chapter 23: Electromagnetic Induction

1. Magnetic flux and Faraday’s law of induction.
           

2. Lenz's law: An induced current has a direction such that the magnetic field *due to the current* opposes the change in the magnetic flux that induces the current. The induced emf has the same direction as the induced current.

3. Transformer, primary & secondary coils, step-up & step-down transformer.
 

4. Power loss in transmission lines, .

5. Applications: Ground fault interrupter, electric guitar, tape playback, moving coil microphone, electric generator, transformers, & Power Transmission

Chapter 23: Alternating Current Circuits

Capacitor, inductor, phase angle between current and voltage, resonant frequency for a series RLC circuit, and Semiconductor devices.

1. Reactance (XC) of a capacitor and Reactance (XL) of an inductor:

 

2. Impedance (Z) of a series RCL circuit:

                            

3. Resonant frequency (f0) of a series RCL circuit:

                            

Chapter 24: Historical development of the theory of electromagnetism, Electromagnetic waves, and Maxwell’s equations.

 $c=\frac{E}{B}$ $c= λf$

Electromagnetic Spectrum and the applications of electromagnetic waves.