

CHAPTER 15 REVIEW

Understanding Concepts

- Who first discovered the magnetic induction of an electric current?
 - Ampère
 - Faraday
 - Henry
 - Lenz
 - Oersted
- Which of the diagrams in Figure 15.50 represents a correct relation between the directions of the current, the external magnetic field, and the force on the conductor?
 - I and II only
 - I and III only
 - II and III only
 - I, II, and III
 - none of the diagrams

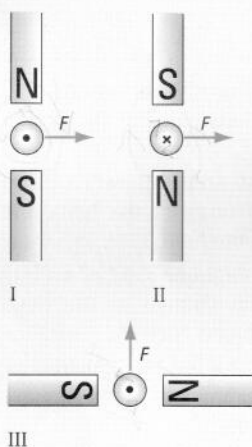


FIGURE 15.50

- Which of the following affects the magnitude of an induced potential difference in a solenoid (helix)?
 - number of turns in the solenoid
 - rate of change of the magnetic field
 - strength of the magnetic field
 - resistance of the wire used in the solenoid

Choose your answer from the following:

 - I and II only
 - I and III only
 - I and IV only
 - II and III only
 - II and IV only
- Generating plants use step-up transformers before the electrical energy is transmitted across the country in order to:
 - reduce the resistance
 - increase the current in the lines
 - reduce the potential difference in the lines
 - reduce the power loss in the lines
 - keep birds from perching on the lines

- What are the essential parts of a galvanometer?
 - What is the function of each part?
- In a direct current motor, what is the function of
 - the field windings?
 - the rotor?
 - the split-ring commutator?
- Why are the brushes in a DC motor usually spring loaded (attached to compressed springs)?
- In a television set, what is the function of
 - the electron gun?
 - the deflection coils?
- What is the function of the cone in a speaker?
- Why is a helix attached to the cone of a speaker?
- List three important parts of the AC generator and state their functions.
- Compare the transformations of energy in the electric motor and the generator.
- What is the frequency of alternating current in North America?
- What is the relationship between the turns on the primary and secondary coils for
 - a step-down transformer?
 - a step-up transformer?
- What is the relationship between the potential differences and current in the primary and secondary coils of
 - a step-down transformer?
 - a step-up transformer?
- Which type of transformer is used for
 - a television picture tube?
 - a doorbell?
- What potential difference is provided to homes in Canada?

Applying Inquiry/Communication Skills

- Design a device that would use the motor principle to compare magnetic field strengths.
- Sketch a graph of current against time for segment AB of the DC motor shown in Figure 507 (page 554). Assume the rotation rate is 100 rev/s. Show at least five complete revolutions of the loop, beginning with it oriented as shown in Figure 15.17a).
- Explain how deflection coils control the vertical motion of the electron beam in a television set.
 - How would the operation of the coils be different if the gun fired protons instead of electrons? Assume that the protons travel at the same speed as did the electrons. (Protons have a positive charge and nearly 2000 times the mass of electrons.)