1. What are the two basic types of electric sources?
2. What is the effect of unlike charges on each other?
3. What is the effect of like charges on each other?
4. What is matter and what are the three states?
5. What is an element?
6. What are the three parts of an atom?
7. What value determines the atomic number of an element?
8. What type of charge do electrons have?
9. What is centripetal (centrifugal) force?
10. How many electrons can be held in the third orbit of an atom?
11. What is the maximum number of electrons that can be contained in any orbit?
12. What is the valence shell of an atom?
13. How many valence electrons do conductors typically have?
14. How many valence electrons do insulators have?
15. What statement can be made about an atom with seven or eight valence electrons?
16. How many valence electrons do semiconductors have?
17. What is the unique property of semiconductors?
18. What are the six methods for producing electricity?
19. What is the side effect of an electron entering a valence orbit?

Unit 2

1. What is a coulomb?
2. What is an ampere?
3. What is electron flow theory?
4. How long would it take for electricity to flow around the earth 10 times?
5. What is an open circuit?
6. What is a short circuit?
7. What is a grounded circuit?
8. What is the term used to describe electrical pressure?
9. What is the term used to describe the opposition to current flow?
10. What is the result of current flowing through a resistance?
11. What is impedance?
12. What is a watt?
13. What is the wattage of a toaster that uses 10 amps of current when connected to a 120 Volt outlet?
14. How many watts are in 1 HP?
15. What is ohm’s law?
16. State ohms law three different ways using E=voltage, I=current, and R=ohms.
17. How do you calculate power in watts when you know the current and resistance of a circuit?
18. What is the voltage of a device that draws 11 amps and has a resistance of 21.8 ohms?
19. What does the metric prefix mega mean?
20. What does the metric prefix milli mean?
21. What does the metric prefix micro mean?
22. What does the metric prefix kilo mean?
23. How is mass measured in the metric system?
24. What is the amperage drawn by a 3000W electric water heater connected to a 240 volt source?

25. What is the resistance of a 2000W electric heater on a 240 volt supply? (Find amperage first)

26. Fill in the missing chart values (on back of this sheet) for the ohm’s law practice problems on page 78.

Unit 3

1. What are some of the common uses of static electricity?

2. What is the most common and annoying demonstration of static electricity?

3. Under what circumstances can an electrostatic charge build up on a conductor?

4. What is the result of rubbing a glass rod with a wool cloth?

5. What is the result of rubbing a rubber rod with a wool cloth?

6. What is the average charge in a lightening bolt?

7. What type of charge does a thunder cloud have? (Positive or negative)

8. How does a lightening arrester function?

9. How are static charges eliminated on vehicles carrying hazardous materials?

10. How can static charges from touching a door knob in the home be minimized?

11. What is the unique property of selenium that makes it useful in copy machines?

Unit 9

1. What are the two general types of meters?

2. What are two features of analog meters?

3. What is the principle of operation for analog meters?

4. What change must be made in AC voltage before it can be read on a moving-coil analog voltmeter?

5. What type of analog meter is typically used to measure AC voltages?
6. How is a voltmeter connected to a circuit?

7. What property of a voltmeter allows it to be connected across the source?

8. What setting should be used on a multirange voltmeter to test a known voltage?

9. What happens to the value of resistance connected in the circuit as the voltage scale increases?

10. What factor will determine which scale is used on a multimeter?

11. How does the resistance (impedance) of an ammeter compare to the resistance of a voltmeter?

12. What is the result of connecting an ammeter across a supply voltage?

13. What is the term used to describe a low-resistance device that conducts most of the current away from a meter movement?

14. What is the resistance of an ammeter shunt designed to have a voltage drop of 50 millivolts when 25 amperes of current flow through it?

15. What is a make-before-break switch?

**16. Don’t worry about the Ayrton Shunt section!!**

17. What device is used to change scale values on most AC ammeters?

18. What is “turns ratio”?

19. What is the formula for the current and turns relationship in an AC ammeter?

20. How many turns are in the secondary winding of a current transformer if the primary has 20 turns, the primary current is 15 amps, and the secondary current is 5 amps?

21. How many turns are in the secondary winding of a current transformer if the primary has 40 turns, the primary current is 20 amps, and the secondary current is 10 amps?

22. What is the secondary current in a current transformer when there are 30 turns in the primary, 15 turns in the secondary, and the primary current is 7.5 amps?

23. What is the secondary current in a current transformer when there are 50 turns in the primary, 10 turns in the secondary, and the primary current is 2 amps?
24. What is the primary current in a current transformer when there are 120 turns in the primary, 30 turns in the secondary, and the secondary current is 4 amps?

25. What is the primary current in a current transformer when there are 90 turns in the primary, 15 turns in the secondary, and the secondary current is 6 amps?

26. How many turns are in the primary of a current transformer when there are 12 turns in the secondary, the primary current is 20 amps, and the secondary current is 5 amps?

27. How many turns are in the primary of a current transformer when there are 60 turns in the secondary, the primary current is 30 amps, and the secondary current is 10 amps?

28. What is the result of a short circuit across the terminals of a current transformer?

29. What is the standard secondary voltage of current transformers?

30. What is the result of an “open” in the secondary of a current transformer?

31. What is the result of connecting a clamp-on ammeter around two wires in a circuit?

32. What is the result of looping a wire twice through a clamp-on ammeter?

33. Will a current transformer type ammeter work with DC voltage? Why?

34. What type of DC ammeter can measure both AC and DC amps?

35. Which scale on a multimeter is not linear?

36. What are the two types of analog ohmmeters?

37. What is the first task when resistance is to be measured with an ohmmeter?

38. How accurate are digital ohmmeters?

39. What is the main precaution that must be taken when connecting an ohmmeter into a circuit?

40. Why does a multimeter have more than one (the largest) scale for each function?

41. What meter displays a two-dimensional image of voltage?

42. Which axis of an oscilloscope displays time?
43. What other feature of a waveform can be seen on an oscilloscope. (Other than voltage and time)

44. What is a chopped waveform?

45. How many terminals are on a wattmeter?

46. Skip recording meters and bridge circuits!!

Unit 12

1. What is the most common method of producing electricity?

2. What is the definition of a battery?

3. What is a voltaic cell?

4. What property determines the voltage of an individual cell?

5. What is the difference between a primary and a secondary cell?

6. What are the main parts of a carbon-zinc cell?

7. What is the main advantage of an alkaline cell compared to carbon-zinc cell?

8. What is the main disadvantage of an alkaline cell compared to a carbon-zinc cell?

9. What are the two main types of button cells?

10. Which part of a lithium cell actually contains lithium?

11. What is the shelf life of a lithium battery?

12. What is the result of using an improper charging current for a lithium battery?

13. What property of a cell determines the current available?

14. How are primary cells rated for available current?

15. What effect does aging and usage have on the electrodes and electrolyte in a cell?

16. What effect does aging and usage have on the internal resistance of a cell?

17. What is a secondary cell?

18. What is the most common secondary cell?
19. What is the term used to describe the device for measuring the specific gravity of a cell?

20. What is the indication of a lead-acid battery becoming more discharged?

21. How is a lead-acid cell charged?

22. As a secondary cell charges, what is produced at the positive and negative plates?

23. What happens in a lead-acid cell when too much charging current is used?

24. What is the most explosive element known?

25. What is the general rule for the amount of charging current for a cell?

26. What is one of the main advantages of a “gel cell”?

27. How are lead-acid cells rated?

28. What is the best test for a lead-acid cell?

29. What is the main advantage of a nickel-iron cell?

30. What are the two main disadvantages of nickel-iron cells?

31. What is the main advantage of the nicad cell?

32. What are the three disadvantages of nicad cells?

33. What are the main advantages of NiMH cells?

34. What material is used for the negative electrode in a Ni-MH cell?

35. Where are lithium-Ion cells used?

36. What are the main advantages of lithium-Ion cells?

37. What is the total voltage of 3-12 volt, 40 ampere-hour batteries connected in series?

38. What is the ampere-hours rating for 3-12 volt, 40 ampere-hour batteries connected in series?

39. What is the total voltage of 3-12 volt, 40 ampere-hour batteries connected in parallel?
40. What is the total ampere-hour rating for 3-12 volt, 40 ampere-hour batteries connected in parallel?

41. What precaution should be taken when connecting batteries in parallel?

42. What is a photon?

43. What property determines the amount of current a solar cell can deliver?

44. What is a thermocouple?

45. What two factors determine the voltage of a thermocouple?

46. What is a thermopile?

47. What is one application of a piezoelectric device?