**Basic Electricity and Electronics**

**Module One – Quiz Key**

1. Which device opposes current?
   1. **Resistor**
   2. Capacitor
   3. Inductor
   4. Coil
2. Which of the following is a control device?
   1. Resistor
   2. **Switch**
   3. Fuse
   4. Ground
3. What is the most common material a resistor is made from?
   1. Silicon
   2. Metal film
   3. **Carbon**
   4. Ceramics
4. Which of the following is the symbol for current?
   1. A
   2. V
   3. Ω
   4. **I**
5. How much resistance does an insulator have?
   1. Zero
   2. Some
   3. A lot
   4. **Infinite**
6. Different elements always have different numbers of \_\_\_\_\_\_\_\_\_\_\_?
   1. **Protons**
   2. Neutrons
   3. Atoms
   4. Atomic shells

1. A volt is a/an:
   1. **Potential difference between two points**
   2. Unit of charge on an electron
   3. Rate of flow of charge
   4. Opposition to current flow
2. How many forms of Ohm’s Law are there?
   1. One
   2. Two
   3. **Three**
   4. Four
3. Energy is:
   1. **The fundamental ability to do work**
   2. The rate at which energy is used
   3. The amount when one joule is used in one second
   4. The maximum amount of power dissipated without damage
4. A KW-Hr is a unit of:
   1. **Energy**
   2. Power
   3. Heat
   4. Voltage times current
5. An electrical load is:
   1. Any weight being carried
   2. The amount of horsepower in a circuit
   3. **Any resistive element connected to a power supply**
   4. Taking more than four classes a semester
6. Which of the following is a unit of power?
   1. Joule
   2. **Joule per second**
   3. Joule-second
   4. Volt-ohm
7. When the voltage across a resister is doubled, the current will:
   1. Triple
   2. Halve
   3. **Double**
   4. Not change
8. When the resistance in a circuit is doubled, the current will:
   1. Triple
   2. **Halve**
   3. Double
   4. Not change
9. Sound is the movement of:
   1. **Air molecules**
   2. Electrons
   3. Protons
   4. Electricity
10. A speaker acts similar to a:
    1. Generator
    2. **Motor**
    3. Transistor
    4. Battery
11. What performs the work in an electric circuit?
    1. Heat
    2. Voltage
    3. A resistor
    4. **Current**
12. What is the definition of current?
    1. **The movement of electrons**
    2. Force created by the buildup of charge
    3. Force times distance
    4. A twisting or rotary force
13. What is the definition of voltage?
    1. The movement of electrons
    2. **Force created by the buildup of charge**
    3. Force times distance
    4. A twisting or rotary force

1. What is resistance?
   1. The interaction of two magnetic fields
   2. Conversion of mechanical energy into electrical energy
   3. An imbalance between electrons and protons
   4. **The opposition to current flow**
2. What is the formula for Ohm’s Law?
   1. P = V I
   2. **I = V / R**
   3. F = M A
   4. I = V2 R
3. CD data represents:
   1. Signal frequency as a binary code
   2. **Signal amplitude as a binary code**
   3. Cosine transform coefficients
   4. Data reduction through elimination of masked signals
4. What is the sample rate of CD audio?
   1. 20,000 samples/second
   2. 128 Kbytes per second
   3. **44,100 samples per second**
   4. 32 bits per second
5. The unit of resistance is the:
   1. Coulomb
   2. Joule
   3. Ampere
   4. **Ohm**
6. The unit of electrical charge is the:
   1. **Coulomb**
   2. Joule
   3. Ampere
   4. Ohm

26. A circuit has a 12 V power supply and a 1 kΩ resistor. What is the current?

**I = V/R = 12V divided by 1000Ω= .012 A or 12 mA**

27. A circuit has a 42 kΩ resistor and 8 mA of current. What is the voltage?

**V = I X R = .008 A X 42,000Ω = 336 V**

1. A circuit has 520 milli amps of current and 240 volts. What is the resistance?

**R = V/I = 240V divided by .52A = 461.5Ω**

1. List some of the reasons electricity is so useful.
   * **A good power source**
   * **Easy to create**
   * **Easy to control**
   * **Efficient to transmit**
   * **Easy to measure**
   * **Makes everything work – our way of life depends on it**

30. A circuit has 470 kΩ and 16 V. What is the current?

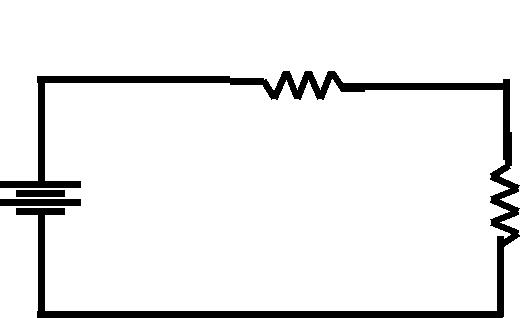
**I = V/R= 16V divided by 470,000Ω = 0.000034 A = 34 μA**

31. I = 145 mA, R = 10 MΩ. V = ?

**V = I x R = .145 A X 10,000,000Ω = 1.45 MV**

32. In the following circuit calculate current and voltage drops.

R1 = 2 KΩ



**IT = 2 mA**

**V1 = 4V**

**V2 = 8V**

R2 = 4 KΩ

VS =

12V

VS = 18V

VS = 12V

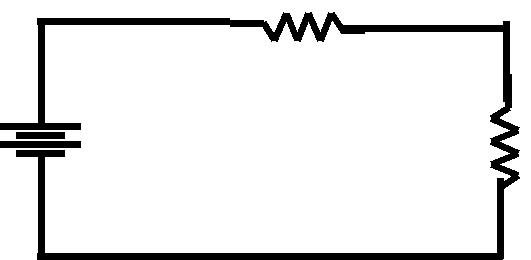
VS = 18V

33. In the following circuit, calculate total current and total resistance.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | R1 = |  | R2 = | **IT = 13.5 mA** |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  | **RT = 1333Ω** |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  | 2kΩ |  | 4kΩ |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |



1. In the following circuit, what is R1? R1



**R1 = 8 kΩ**

R2 = 4 KΩ

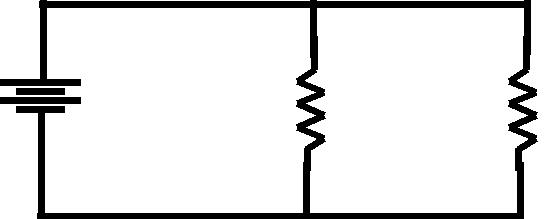
I = 1 mA

1. A power supply consumes 320 mW in order to supply 288 mW to the load. What is the efficiency?

**Eff = power out divided by power in = 288/320 = .9 = 90%**

36. What is R2 in the following circuit?

IT = 12 mA



|  |  |  |
| --- | --- | --- |
| R1 = | **R2 = 6 kΩ** |  |
| R2 = ? |  |
| 2kΩ |  |
|  |  |