

Electricity Unit Question Bank

Static Electricity:

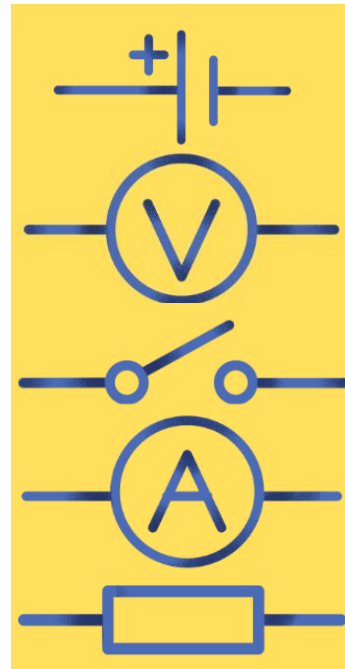
1. A charged object creating a charge in a neutral object is called what?
a) Grounding **b) Induction** c) Static Electricity d) Current
2. Excess negative charge getting absorbed by large neutral objects is called what?
a) Induction b) Conduction c) Insulation **d) Grounding**
3. The law of attraction and repulsion states that...
a) Like charges attract and unlike charges attract
b) Like charges repel and unlike charges repel
c) Like charges repel and unlike charges attract
d) Like charges attract and unlike charges repel
4. Charge flows freely through...
a) Conductors but not insulators
b) Conductors and insulators
c) Insulators but not conductors
d) Neither conductors nor insulators

Current, Voltage, & Resistance (Simple Circuits):

1. Electrons flow...
a) From the negative end of the battery
b) Opposite direction of current
c) Same direction as current
d) a & b
e) a & c

2. Match the circuit element to its picture

- Battery
- Resistor
- Switch
- Voltmeter
- Ammeter



3. On a circuit an ammeter...

- a) Reads the voltage
- b) Reads the resistance
- c) Reads the electron flow
- d) Reads the current

4. What unit is used to measure current?

- a) Amperes/Amps (A)
- b) Ohms (Ω)
- c) Volts (V)
- d) Joules (J)

5. What is the variable (the letter) that represents charge?

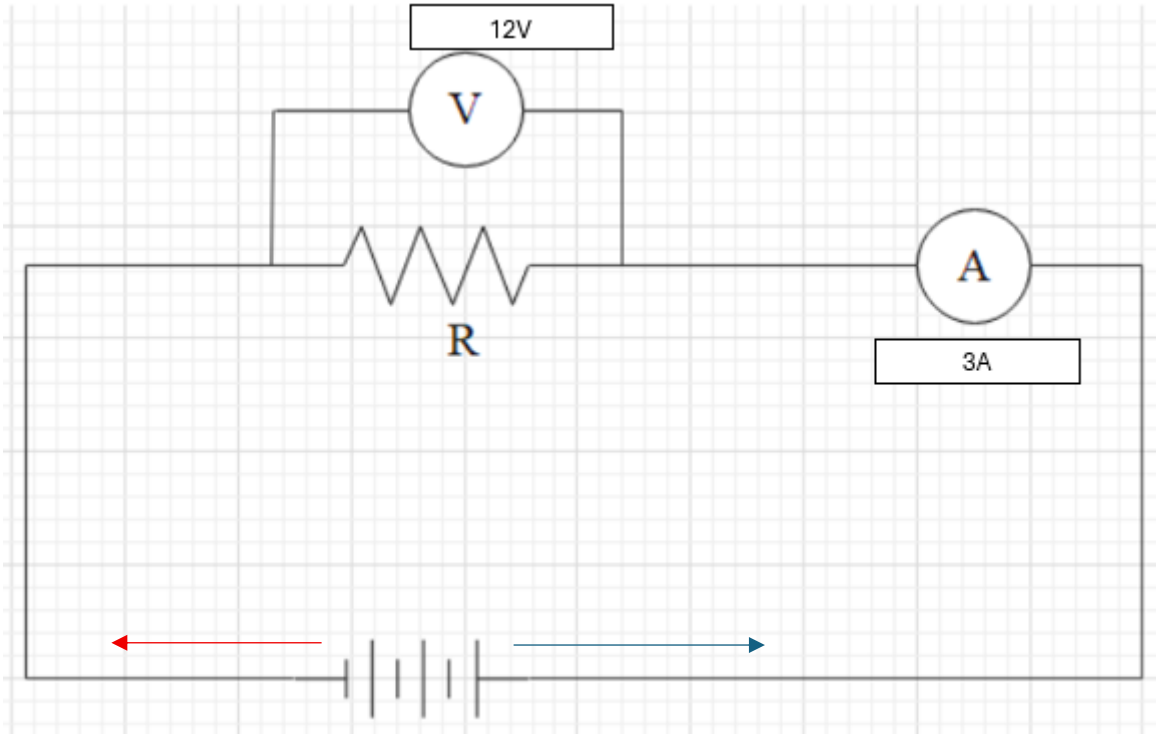
- a) I
- b) R
- c) Q
- d) E

6. What is the unit used to measure energy?

- a) Watts (W)
- b) Joules (J)
- c) Volts (V)
- d) Coulombs (C)

7. What unit used to measure time (when we do calculations)

- a) **Seconds** b) Minutes c) Hours d) Days



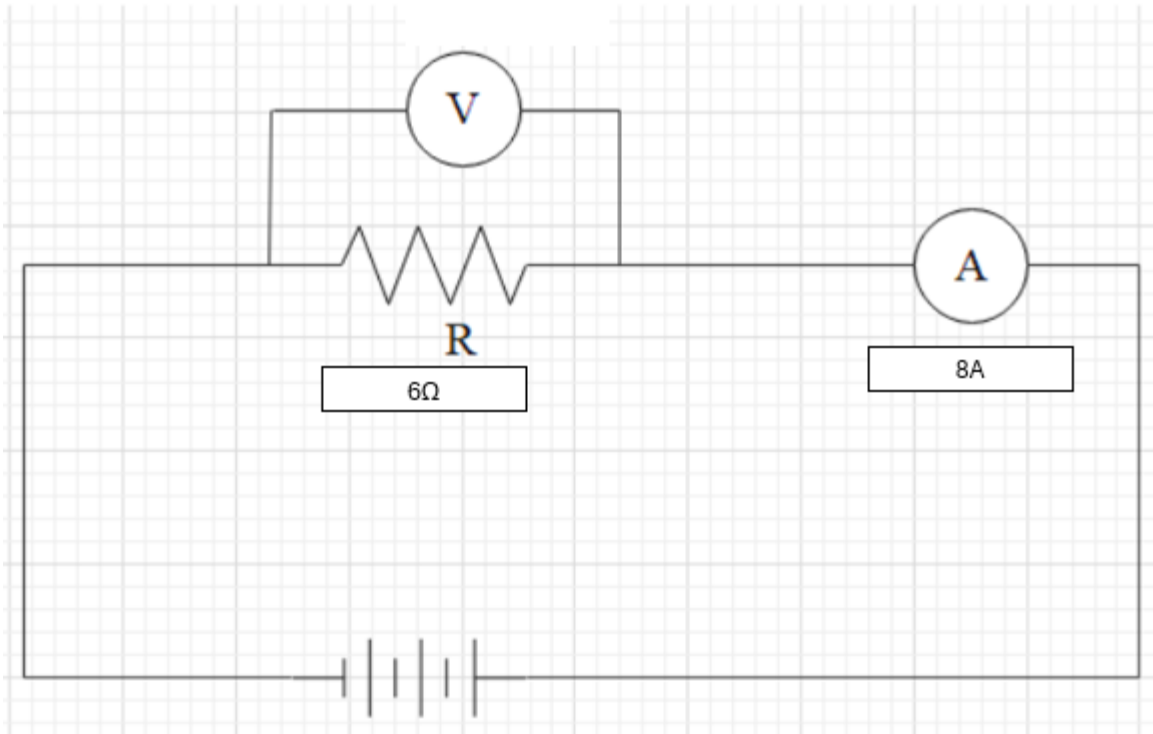
8a) Draw an arrow to indicate the direction of current. BLUE

b) Draw another arrow to indicate the direction of electron flow. RED

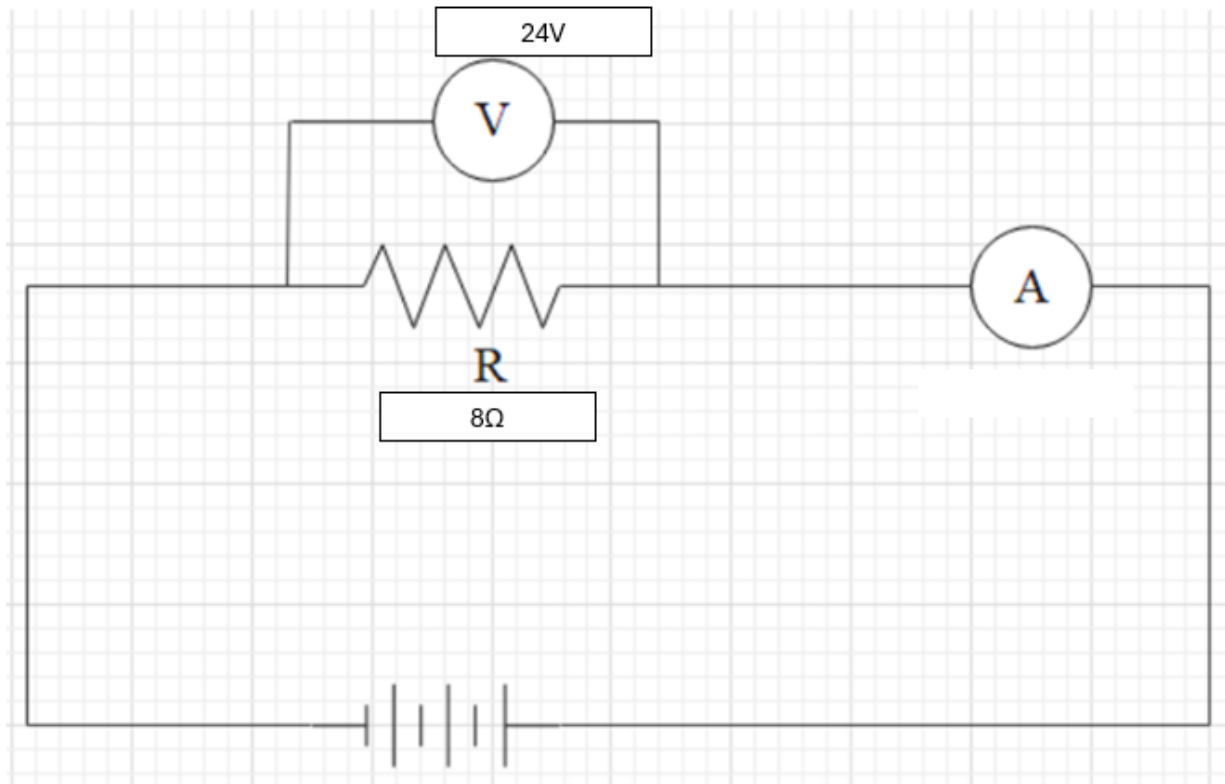
c) What is the resistance of the resistor? **4Ω**

e) If the resistor uses 3.6 kJ of energy, how much charge moves across the resistor? **300C**

f) How long does it take for this much charge be moved? **100 seconds**



- 9a) How much charge is moved at a point in 3 minutes? **1440C**
- b) How much potential energy does the resistor use to move this much charge? **69,120J**
- c) What is the potential difference across the resistor? **48V**



10a) What is the current of the circuit? **3A**

b) How much energy does the resistor use to move $30C$ of charge? **720J**

c) After 2 minutes, how much charge passes through the circuit? **360C**

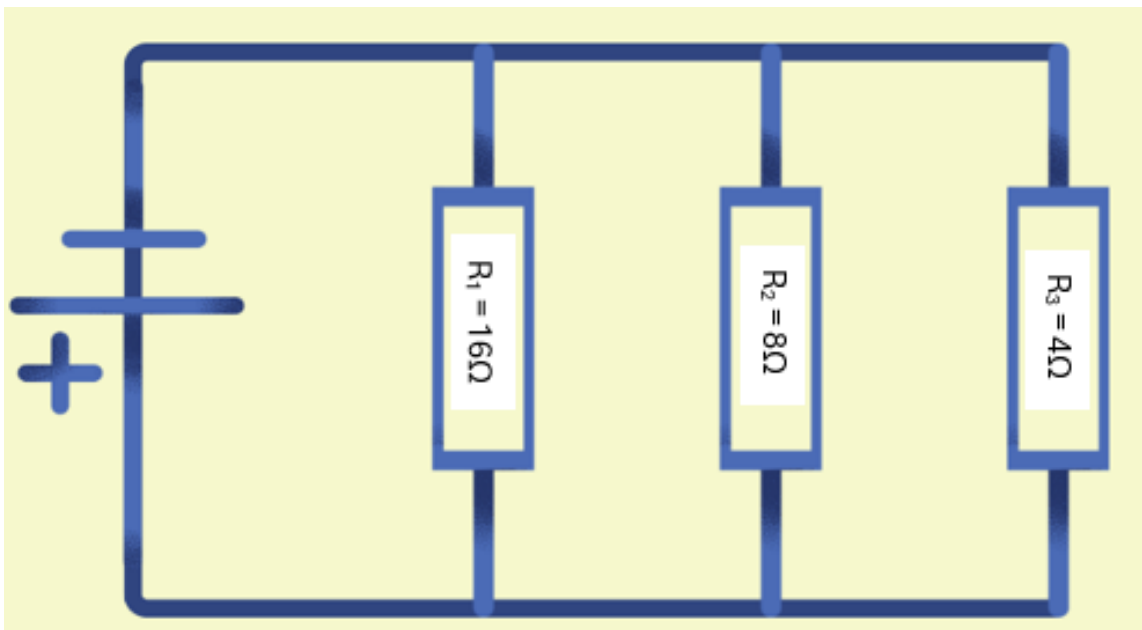
Series & Parallel Circuits:

1. Which of the following statements is false for series circuits?

- a) Current is constant throughout the entire circuit
- b) Equivalent resistance is calculated by adding up the individual resistances
- c) Total voltage is split amongst the resistors
- d) Voltage is constant over the entire circuit

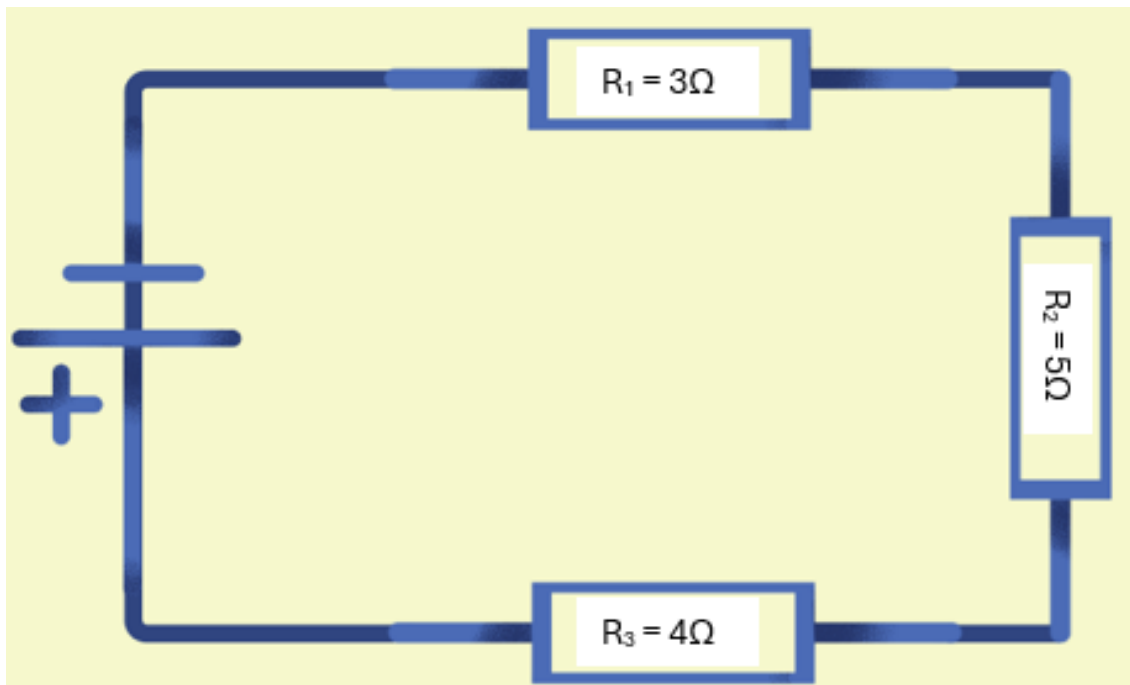
2. Which of the following statements is true for parallel circuits?

- a) Current is constant throughout the entire circuit
- b) Total current is equal to the current of each branch added together
- c) Total voltage is split between each branch
- d) Equivalent resistance is calculated by adding up the resistance of each branch



3a) What is the equivalent resistance? 2.29Ω

b) If the battery is 12V, what is the voltage across R_1 ? 12V



4a) What is the equivalent resistance? 12Ω

b) If R_3 receives a potential difference of 3V, what is the current of the whole circuit? $0.75A$

Resistors:

1. If the length of a resistor is doubled, then its resistance is...
 - a) Halved
 - b) Doubled**
 - c) Quartered
 - d) Quadrupled

2. If the length of a resistor is cut to one third the length, then the resistance is...
 - a) Multiplied by 3
 - b) Divided by 9
 - c) Multiplied by 9
 - d) Divided by 3**

3. If the diameter of a resistor is tripled, then the resistance is...
 - a) Tripled
 - b) Divided by 3
 - c) Divided by 9
 - d) Multiplied by 9

4. If the diameter of a resistor is shaved down to half its original size, then the resistance is...
 - a) Quadrupled
 - b) Quartered
 - c) Doubled
 - d) Halved

Power & % Efficiency:

1. At the winter semi-formal dance, the Mr. K requested the song “Watch me Whip”. The song is roughly 3 minutes, and the DJ’s speakers have a power rating of 22W. How much energy is needed to play the song?
3960J

2. Also at the winter semi-formal dance, Christian & Heba noticed the party lights were on for the whole 2 hours. 93,600J (93.6kJ) of energy are needed for them to stay on this long. What is the power rating of the party lights?
13W

3. Jody and Dylan decide to play a game on their chromebooks against Keith and Harley. If Jody’s chromebook uses 300,000J (300kJ), but it needs 720,000J (720kJ) to work, what is the percent efficiency of the chromebook?
41.67%

4. Noah and Luke decide to make a smoothie for Mr. K because they love his science class so much. The blender they use has a percent efficiency of 50% and needs 420,000J (420kJ) to work. How much energy is used to make the smoothie?

210,000J

5. Gabby and Felicja start a YouTube Chanel about the science of electricity because they missed Mr. K so much after he had to leave. For one episode they invite Alexis as a special guest. The ring light they use for the video has a power rating of 10W. The video takes 45 minutes to record, and the light uses 18,000J (18kJ) to make light. What is the percent efficiency of the ring light?

67%

6. Ali is upset that Clea and Mae didn't invite her to battle rap with them in the talent show, so Ali writes and records a diss track. Ali's diss track is 12 minutes long (she had a lot to say). The mic she uses to record has a power rating of 14W. The mic uses 7560J of energy to record the track. What is the percent efficiency of Ali's mic?

75%