11. Electric Circuits

Starter Quiz · 课前小测

AP Physics C: Electricity and Magnetism Name: _____ Score: _____

1. Electric current is:

   ☐ charge times time

   ☐ the rate of charge flow, dQ/dt

   ☐ energy per charge

   ☐ force per charge

2. The EMF of a battery is:

   ☐ a force in newtons

   ☐ the energy given to each coulomb (volts)

   ☐ the current it carries

   ☐ its internal charge

3. Ohm's law relates voltage, current and resistance as:

   ☐ $V = I/R$

   ☐ $V = IR$

   ☐ $V = R/I$

   ☐ $V = I + R$

4. Electric power delivered to a component is:

   ☐ $P = IV$

   ☐ $P = I/V$

   ☐ $P = V/I$

   ☐ $P = I + V$

5. Two resistors in series have a total resistance of:

   ☐ $R_1 + R_2$

   ☐ less than either one

   ☐ $R_1 R_2$

   ☐ zero

6. If 10 C passes a point in 5 s, find the current (in A).

   _____ A

7. Opening a switch anywhere in a simple loop stops the current everywhere.

   ☐ True ☐ False

8. A 9 V supply drives 3 A through a resistor. Find R (in Ω).

   _____ Ω

9. A device draws 4 A at 12 V. Find its power (in W).

   _____ W

10. Two 4 Ω resistors in parallel give what total resistance (in Ω)?

    _____ Ω

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Answers · 答案

AP Physics C: Electricity and Magnetism

1. **the rate of charge flow, dQ/dt**

   $I = dQ/dt$ — charge passing a point per second.

2. **the energy given to each coulomb (volts)**

   EMF is energy per charge, in volts — not really a force.

3. $V = IR$

   $V = IR$ for an ohmic device.

4. $P = IV$

   $P = IV$ — current times voltage, in watts.

5. $R_1 + R_2$

   Series resistances add: $R = R_1 + R_2$.

6. **2 A**

   $I = Q/t = 10/5 = 2$ A.

7. **True**

   A break anywhere opens the loop, so no current flows at all.

8. **3 Ω**

   $R = V/I = 9/3 = 3\ \Omega$.

9. **48 W**

   $P = IV = 4 \times 12 = 48$ W.

10. **2 Ω**

    $1/R = 1/4 + 1/4 = 1/2$, so $R = 2\ \Omega$.