

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

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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**

$R = V/I = 9/3 = 3$ Ω .

9. **48 W**

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

10. **2 Ω**

$1/R = 1/4 + 1/4 = 1/2$, so $R = 2$ Ω .