

AP Physics C: Electricity and Magnetism

Name: _____ Score: _____

1. Electric current is:

- ☐ force per charge
- ☐ energy per charge
- ☐ the rate of charge flow, dQ/dt
- ☐ charge times time

2. The EMF of a battery is:

- ☐ the energy given to each coulomb (volts)
- ☐ its internal charge
- ☐ the current it carries
- ☐ a force in newtons

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

- ☐ $V = R/I$
- ☐ $V = I/R$
- ☐ $V = IR$
- ☐ $V = I + R$

4. Electric power delivered to a component is:

- ☐ $P = V/I$
- ☐ $P = I/V$
- ☐ $P = IV$
- ☐ $P = I + V$

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

- ☐ $R_1 + R_2$
- ☐ $R_1 R_2$
- ☐ less than either one
- ☐ zero

6. A 12 V battery drives current through a $2\ \Omega$ and a $2\ \Omega$ resistor in series. Find I (in A).

_____ A

7. 7 A enters a junction and one branch carries 4 A. Find the other branch current (in A).

_____ A

8. A $5\ \Omega$ resistor charges a 4 F capacitor. Find τ (in s).

_____ s

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

_____ A

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

☐ True ☐ False

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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. **3 A**

$12 - I(2) - I(2) = 0 \Rightarrow 12 = 4I \Rightarrow I = 3 \text{ A}$.

7. **3 A**

$7 = 4 + I_2 \Rightarrow I_2 = 3 \text{ A}$.

8. **20 s**

$\tau = RC = 5 \times 4 = 20 \text{ s}$.

9. **2 A**

$I = Q/t = 10/5 = 2 \text{ A}$.

10. **True**

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