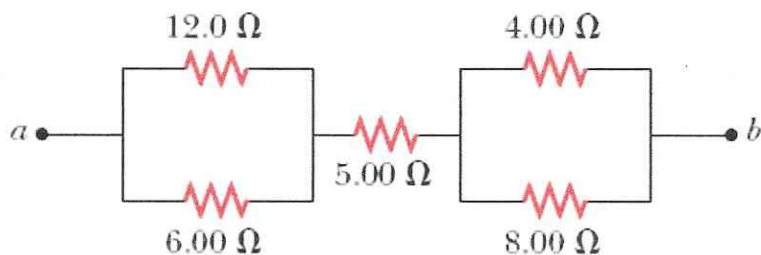


Consider the combination of resistors shown in the figure below.



(a) Find the equivalent resistance between point a and b .

Ω

(b) If a voltage of 42.1 V is applied between points a and b , find the current in each resistor.

$12\ \Omega$ A

$6\ \Omega$ A

$5\ \Omega$ A

$4\ \Omega$ A

$8\ \Omega$ A

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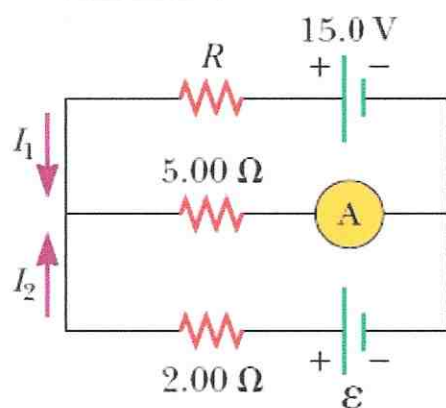
2. -/2 points SerCP10 18.P.017.

The ammeter shown in the figure below reads **2.28 A**. Find I_1 , I_2 , and $\mathcal{E}$. (Assume $R = 6.75 \Omega$.)

$I_1 =$ A

$I_2 =$ A

$\mathcal{E} =$ V

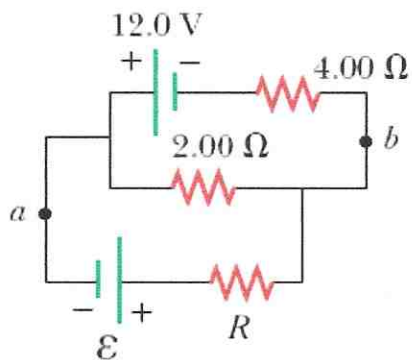


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3. -/2 points SerCP10 18.P.018.WI.

For the circuit shown in the figure, calculate the following. (Assume $\mathcal{E} = 8.34$ V and $R = 5.88$ Ω .)



(a) the current in the 2.00- Ω resistor

A

(b) the potential difference between points a and b , $\Delta V = V_b - V_a$

V

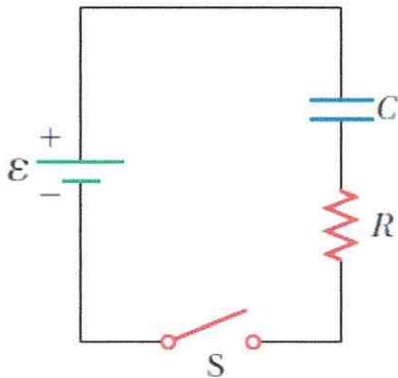
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4. -/2 pointsSerCP10 18.P.031.

Consider the series RC-circuit shown below for which $R = 73.5 \text{ k}\Omega$, $C = 47.5 \text{ }\mu\text{F}$, and $\mathcal{E} = 11.5 \text{ V}$. Find the following.



(a) the time constant of the circuit

s

(b) the charge on the capacitor one time constant after the switch is closed

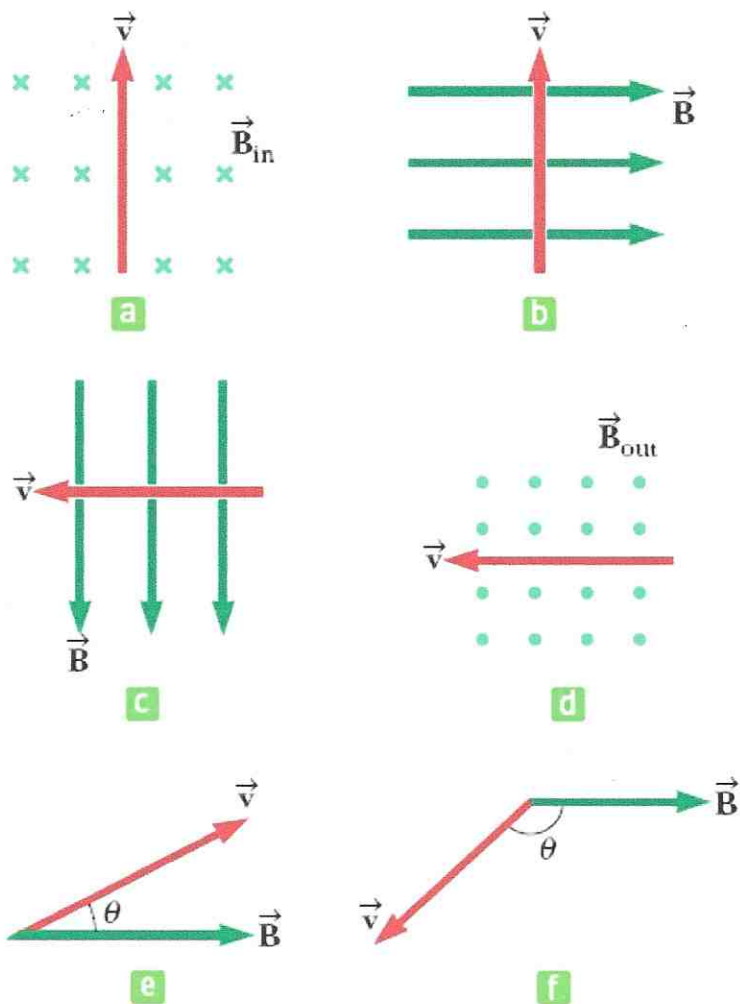
C

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5. -/2 pointsSerCP9 19.P.002.

Consider the following figure.



(a) Find the direction of the force on a proton (a positively charged particle) moving through the magnetic fields in the figure, as shown.

Field	Force Direction
(a)	---Select---
(b)	---Select---
(c)	---Select---
(d)	---Select---
(e)	---Select---
(f)	---Select---

(b) Repeat part (a), assuming the moving particle is an electron.

Field	Force Direction
(a)	---Select---

(b)

(c)

(d)

(e)

(f)

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6. -/2 pointsSerCP9 19.P.013.WI.

A current $I = 13$ A is directed along the positive x -axis and perpendicular to a magnetic field. A magnetic force per unit length of 0.14 N/m acts on the conductor in the negative y -direction. Calculate the magnitude and direction of the magnetic field in the region through which the current passes.

T

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7. -/2 pointsSerCP9 19.P.025.

A wire is formed into a circle having a diameter of 10.4 cm and is placed in a uniform magnetic field of 3.08 mT. The wire carries a current of 5.00 A. Find the maximum torque on the wire.

$\mu\text{N} \cdot \text{m}$

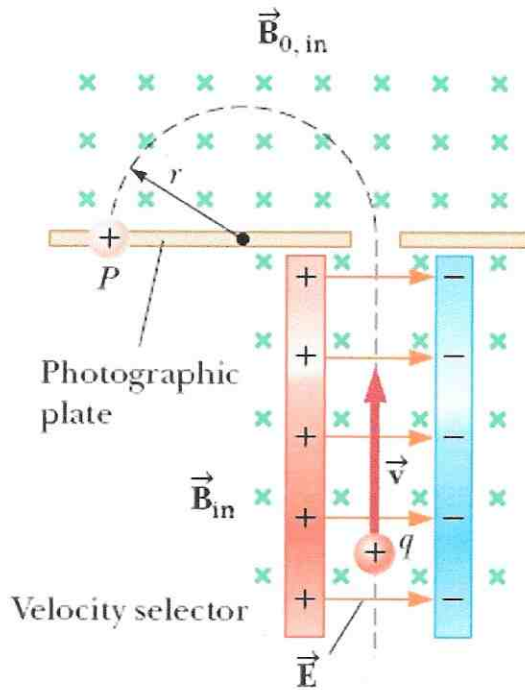
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8. -/2 pointsSerCP9 19.P.036.WI.

Consider the mass spectrometer shown schematically in the figure below. The electric field between the plates of the velocity selector is 6100 V/m , and the magnetic fields in both the velocity selector and the deflection chamber have magnitudes of 0.0670 T . Calculate the radius r of the path for a singly charged ion with mass $m = 3.63 \times 10^{-26} \text{ kg}$.

$r =$ m



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9. -/2 pointsSerCP9 19.P.045.

Neurons in our bodies carry weak currents that produce detectable magnetic fields. A technique called *magnetoencephalography*, or MEG, is used to study electrical activity in the brain using this concept. This technique is capable of detecting magnetic fields as weak as $1.0 \times 10^{-15} \text{ T}$. Model the neuron as a long wire carrying a current and find the current it must carry to produce a field of this magnitude at a distance of 2.5 cm from the neuron.

A

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10. -/2 points SerCP9 19.P.055.

Two long, parallel wires separated by 3.50 cm carry currents in opposite directions. The current in one wire is 1.75 A, and the current in the other is 3.20 A.

(a) Find the magnitude of the force per unit length that one wire exerts on the other.

N/m

(b) Is the force attractive or repulsive?

☐ attractive

☐ repulsive

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