Exam Average **58.0** **Exam High Score** **65**

PH 221 **Exam # 01 (100 pts)** **Name** **Solution**

1
An amber rod and a piece of silk are originally electrically neutral (i.e. $Q_{Silk} = Q_{Amber} = 0.00$ C). The amber is rubbed with the silk for a period of time. After that we find that . $Q_{Silk} = -4.16$ nC , while the amber is $Q_{Amber} = +4.16$ nC . Which of the statements below best describes what happened?

A. $\mathbf{2.60 \times 10^{10}\ e^-}$ **moved from the amber to the silk**

B. $2.60 \times 10^{10}\ e^-$ moved from the silk to the amber

C. $3.85 \times 10^{-11}\ e^-$ moved from the amber to the silk

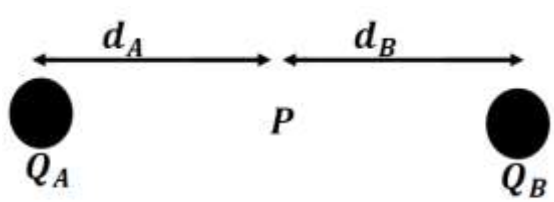
D. $3.85 \times 10^{-11}\ e^-$ moved from the silk to the amber

$$Q = Ne$$

$$N = \frac{Q}{e} = \frac{-4.16 \times 10^{-9}\ C}{-1.60 \times 10^{-19}\ C} = 2.60 \times 10^{10}\ e^-$$

So, the correct answer is A !

2



As shown on the left, Charge A ($Q_A = +56.0\ mC$) sits a distance ($d_A = 2.79 \times 10^{-4}\ m$) to the left of point P. Charge B ($Q_B = -73.4\ mC$) sits a distance ($d_B = 3.04 \times 10^{-4}\ m$) to the right of point P. What is the net electric field at point P due to these two charges?

A. $1.36 \times 10^{16}\ {}^{N}/_{C}\ \widehat{(-\imath)}$

B. $\mathbf{1.36 \times 10^{16}\ {}^{N}/_{C}\ \widehat{(+\imath)}}$

C. $6.73 \times 10^{14}\ {}^{N}/_{C}\ \widehat{(-\imath)}$

D. $6.73 \times 10^{14}\ {}^{N}/_{C}\ \widehat{(+\imath)}$

$$\overrightarrow{E_P} = \overrightarrow{E_{A\to P}} + \overrightarrow{E_{B\to P}} = \frac{Q_A}{4\pi\varepsilon_0 d_A^2}\widehat{(+\imath)} + \frac{Q_B}{4\pi\varepsilon_0 d_B^2}\widehat{(+\imath)} = \frac{1}{4\pi\varepsilon_0}\left(\frac{Q_A}{d_A^2} + \frac{Q_B}{d_B^2}\right)\widehat{(+\imath)}$$

$$\overrightarrow{E_P} = \frac{1}{4\pi\left(8.85 \times 10^{-12}\ \frac{C^2}{Nm^2}\right)}\left(\frac{56.0 \times 10^{-3}\ C}{(2.79 \times 10^{-4}\ m)^2} + \frac{73.4 \times 10^{-3}\ C}{(3.04 \times 10^{-4}\ m)^2}\right)\widehat{(+\imath)}$$

$$\overrightarrow{E_P} = \frac{1}{1.112\ x\ 10^{-10}\ \frac{C^2}{Nm^2}}\left(7.194\ x\ 10^5\ {}^{C}/_{m^2} + 7.942\ x\ 10^5\ {}^{C}/_{m^2}\right)\ \widehat{(+\imath)}$$

$$\overrightarrow{E_P} = \frac{1}{1.112\ x\ 10^{-10}\ \frac{C^2}{Nm^2}}\left(1.514\ x\ 10^6\ {}^{C}/_{m^2}\right)\ \widehat{(+\imath)} = 1.36\ x\ 10^{16}\ {}^{N}/_{C}\ \widehat{(+\imath)}$$

So, the correct answer is B !

3

An object has a mass ($m = 1.78 \text{ x } 10^{-2}$ kg) and is undergoing an acceleration $\vec{a} = 0.314\ {}^{m}/_{s^2}\ (\widehat{West})$ when it is inside an electric field $\left(\vec{E} = 906.\ {}^{N}/_{C}\ (\widehat{East})\right)$. What is the net charge on the object?

A.	$-1.60 \text{ x } 10^4$ C	**C.**	$\mathbf{-6.17 \text{ x } 10^{-6}}$ **C**
B.	$+1.60 \text{ x } 10^4$ C	**D.**	$+6.17 \text{ x } 10^{-6}$ C

$$\overrightarrow{F_E} = Q\vec{E} = m\vec{a}$$

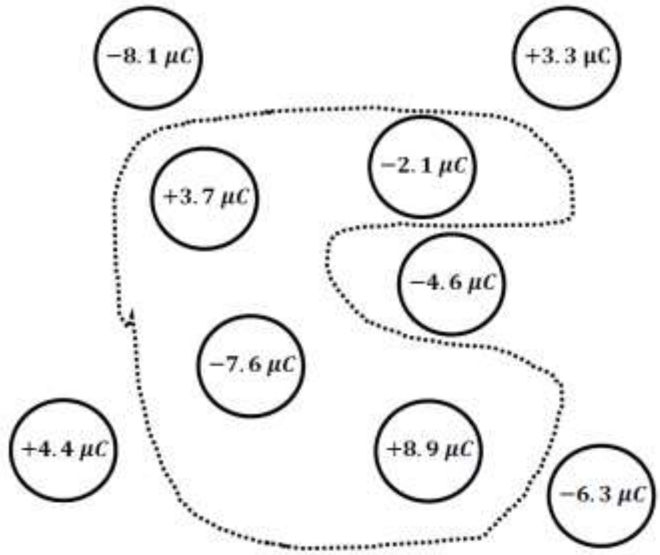
Solve for Q

$$Q = m\left(\frac{\vec{a}}{\vec{E}}\right) = (1.78\ x\ 10^{-2}\ kg)\left(\frac{0.314\ {}^{m}/_{s^2}\ (\widehat{West})}{906.\ {}^{N}/_{C}\ (\widehat{East})}\right)$$

$$Q = (1.78\ x\ 10^{-2}\ kg)\left(-3.466\ x\ 10^{-4}\ {}^{C}/_{kg}\right) = -6.17\ x\ 10^{-6}\ C$$

So, the correct answer is C !

4



What is the net electric flux passing through the surface marked by the dotted line?

A. $-1.28 \times 10^{6}\ \mathrm{Nm^2/C}$

B. $-9.27 \times 10^{5}\ \mathrm{Nm^2/C}$

C. $+1.42 \times 10^{6}\ \mathrm{Nm^2/C}$

D. $\mathbf{+3.28 \times 10^{5}\ Nm^2/C}$

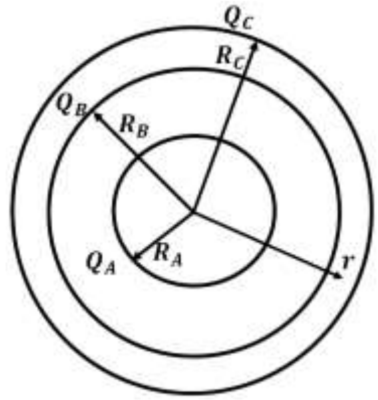
$$\Phi_E = \int \vec{E} \cdot d\vec{A} = \frac{Q_{Enclosed}}{\varepsilon_0} = \frac{-2.1\ \mu C + 3.7\ \mu C - 7.6\ \mu C + 8.9\ \mu C}{\varepsilon_0} = \frac{+2.9\ \mu C}{\varepsilon_0}$$

$$\Phi_E = \frac{+2.9 \times 10^{-6}\ C}{8.85 \times 10^{-12}\ C^2/Nm^2} = +3.28 \times 10^{5}\ Nm^2/C$$

So, the correct answer is D !

5

Three concentric spherical shells are shown in the diagram to the right. The outer one has a radius (R_C) , and a charge (Q_C) which is uniformly distributed across its surface. The middle shell similarly has a radius (R_B) , and a charge (Q_B) , while the inner shell has a radius (R_A) , and a charge (Q_A). Which of the following expressions represents the magnitude of the electric field at distance (r) , where $R_B < r < R_C$?



A. $$E = \frac{Q_A - Q_B}{4\pi r^2 \varepsilon_0}$$

B. $$E = \frac{Q_A R_A^2 + Q_B R_B^2}{4\pi R_A R_B r^2 \varepsilon_0}$$

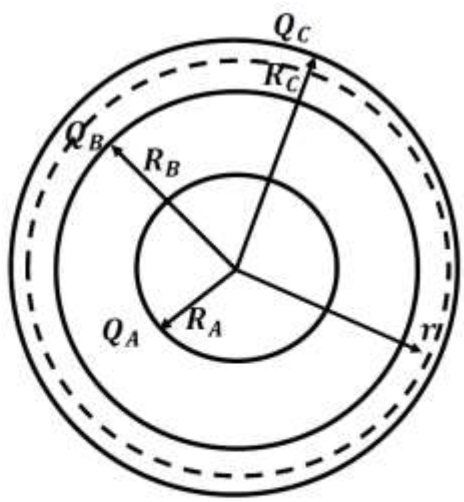
C. $$E = \frac{Q_A + Q_B + Q_C}{4\pi r^2 \varepsilon_0}$$

D. $$\mathbf{E = \frac{Q_A + Q_B}{4\pi r^2 \varepsilon_0}}$$

Gauss's Law

$$\boldsymbol{\Phi_E = \int \vec{E} \cdot d\vec{A} = \frac{Q_{Enclosed}}{\varepsilon_0}}$$

For our Gaussian surface use a sphere as shown here

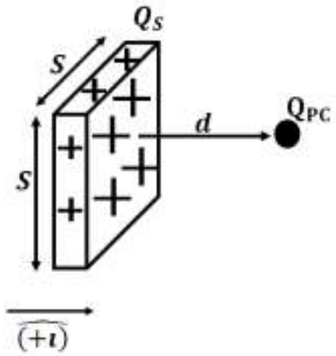


$$\boldsymbol{E4\pi r^2 = \frac{Q_{Enclosed}}{\varepsilon_0} = \frac{Q_A + Q_B}{\varepsilon_0}}$$

$$\boldsymbol{E = \frac{Q_A + Q_B}{4\pi r^2 \varepsilon_0}}$$

So, the correct answer is D !

6



A square slab of nonconducting material has charge ($Q_S = +5.60\ \mathrm{mC}$) uniformly distributed across it. The slab has side dimensions ($S = 0.240\ \mathrm{m}$) . A point charge ($Q_{PC} = -8.79\ \mathrm{mC}$) is located a distance ($d = 0.0267\ \mathrm{m}$) to the right of the square slab as shown. What is the electric force the slab exerts on the point charge?

A. $3.90 \text{ x } 10^9\ \mathrm{N}\ \widehat{(-\imath)}$

B. $3.90 \text{ x } 10^9\ \mathrm{N}\ \widehat{(+\imath)}$

C. $\mathbf{4.83 \text{ x } 10^7\ N}\ \widehat{(-\imath)}$

D. $4.83 \text{ x } 10^7\ \mathrm{N}\ \widehat{(+\imath)}$

$$\overrightarrow{F_E} = Q_{PC}\overrightarrow{E_S} = Q_{PC}\left(\frac{\sigma}{2\varepsilon_0}\right)\widehat{(+\imath)} = Q_{PC}\left(\frac{Q_S/A}{2\varepsilon_0}\right)\widehat{(+\imath)} = \frac{Q_{PC}Q_S}{2\varepsilon_0 A}\widehat{(+\imath)} = \frac{Q_{PC}Q_S}{2\varepsilon_0 S^2}\widehat{(+\imath)}$$

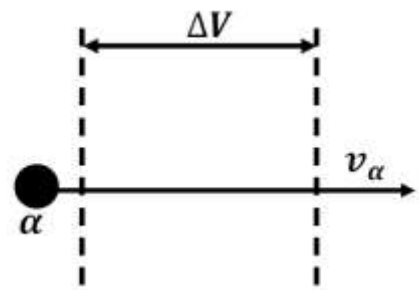
$$\overrightarrow{F_E} = \frac{(-8.79 \text{ x } 10^{-3}\ C)(5.60 \text{ x } 10^{-3}\ C)}{2\left(8.85 \text{ x } 10^{-12}\ C^2/_{Nm^2}\right)(0.240\ m)^2}\widehat{(+\imath)} = \frac{-4.922 \text{ x } 10^{-5}\ C^2}{1.0195 \text{ x } 10^{-12}\ C^2/_N}\widehat{(+\imath)}$$

$$\overrightarrow{F_E} = -3.90 \text{ x } 10^9\ N\widehat{(+\imath)} = 4.83 \text{ x } 10^7\ N\ \widehat{(-\imath)}$$

So, the correct answer is C !

7

An alpha particle is two protons bonded with two neutrons. It has a mass $(m_\alpha = 6.64 \text{ x } 10^{-27} \text{ kg})$, and a charge of $(Q_\alpha = +3.20 \text{ x } 10^{-19} \text{ C})$. Alpha particles are often scattered off of other atoms or materials. To accelerate the alpha particles potential differences are used. As shown on the right, we have an alpha particle being accelerated to a velocity $(v_\alpha = 7.43 \text{ x } 10^5 \text{ m/s})$. What is the magnitude of the potential difference (ΔV) needed? Which side of the potential difference is the positive side Right or Left?



A. $5.73 \text{ x } 10^3 \text{ V}$ Right Side Positive!

B. **$5.73 \text{ x } 10^3 \text{ V}$ Left Side Positive!**

C. $7.71 \text{ x } 10^{-3} \text{ V}$ Right Side Positive!

D. $7.71 \text{ x } 10^{-3} \text{ V}$ Left Side Positive!

Since the alpha particle is positively charged, to accelerate it to the right, the positive side of the potential difference must be on the left.

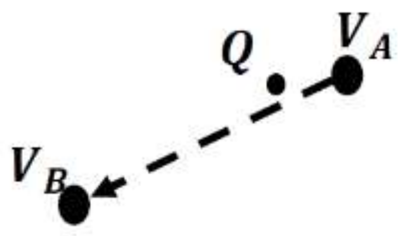
$$\Delta E = \Delta U + \Delta K = 0 = -Q_\alpha \Delta V + \frac{1}{2} m_\alpha (v_\alpha^2 - 0)$$

Solve for ΔV

$$\Delta V = \frac{m_\alpha v_\alpha^2}{2Q_\alpha} = \frac{(6.64 \text{ x } 10^{-27} \text{ kg})(7.43 \text{ x } 10^5 \text{ m/s})^2}{2(3.20 \text{ x } 10^{-19} \text{ C})} = \frac{3.666 \text{ x } 10^{-15} \text{ J}}{6.40 \text{ x } 10^{-19} \text{ C}} = 5.73 \text{ x } 10^3 \text{ V}$$

So, the correct answer is B !

8



As we can see on the left, a charge $(Q = -12.4\ mC)$ is moved from a region of electric potential $(V_A = -35.0\ V)$ to a region of electric potential $(V_B = -2.78\ V)$. What is the change in the charge's electrical potential energy?

A. $\mathbf{-4.00\ x\ 10^{-1}\ J}$

B. $+4.00\ x\ 10^{-1}\ J$

C. $-4.68\ x\ 10^{-1}\ J$

D. $+4.68\ x\ 10^{-1}\ J$

$$\Delta U = Q\Delta V = Q(V_B - V_A) = (-12.4\ x\ 10^{-3}\ C)\big(-2.78\ V - (-35.0\ V)\big)$$

$$\Delta U = (-12.4\ x\ 10^{-3}\ C)(+32.22\ V) = -4.00\ x\ 10^{-1}\ J$$

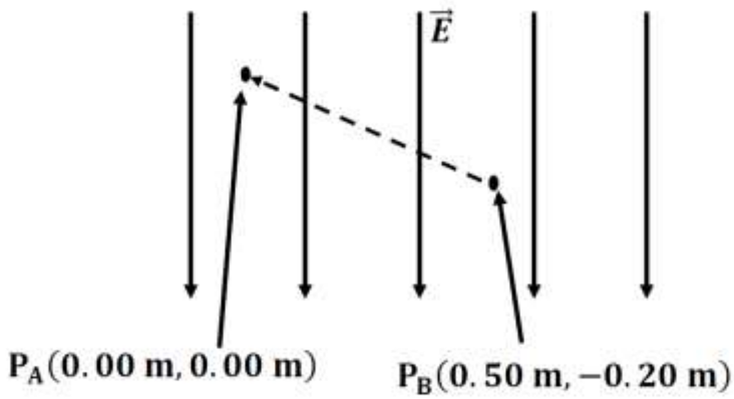
So, the correct answer is A !

9

An electric field has a uniform constant value given by the expression:

$$\vec{E} = 9.13 \text{ x } 10^{6} \, {}^{N}/_{C} \; \widehat{(-j)}$$

What is the change in electric potential going from point P_B to point P_A ?



A. $\mathbf{+1.83 \text{ x } 10^{6} V}$ **B.** $-1.83 \text{ x } 10^{6}\text{V}$ **C.** $-4.92 \text{ x } 10^{6}\text{V}$ **D.** $+4.92 \text{ x } 10^{6}\text{V}$

Consider going from Point P_B to Point P_A can be done in two steps, $\boldsymbol{P_B(0.50\,m, -0.20\,m)}$ first to $\mathbf{P_C(0.50\,m, 0.00\,m)}$ and then to $\boldsymbol{P_A(0.00\,m, 0.00\,m)}$. For step one we have

$$\boldsymbol{V_C - V_B = -\int \vec{E} \cdot d\vec{y} = -\int -Edy = E\Delta y = \left(9.13 \text{ x } 10^{6} \, {}^{N}/_{C}\right)\left(0.00\,m - (-0.20\,m)\right)}$$

$$\boldsymbol{V_C - V_B = +1.83\ x\ 10^{6} V}$$

For Step two

$$\boldsymbol{V_A - V_C = -\int \vec{E} \cdot d\vec{x} = 0}$$

$$\boldsymbol{V_A - V_B = (V_A - V_C) + (V_C - V_B) = 0 + (+1.83\ x\ 10^{6} V) = +1.83\ x\ 10^{6} V}$$

So, the correct answer is A !

10

In the Rutherford experiment of 1912, alpha particles ($Q_\alpha = +3.20 \text{ x } 10^{-19}$ C, $m_\alpha = 6.64 \text{ x } 10^{-27}$ kg) are provided with a speed ($v_{\alpha 0} = 4.68 \text{ x } 10^4$ m/s) and they are aimed at gold nuclei ($Q_{Au} = +1.26 \text{ x } 10^{-17}$ C, $m_{Au} = 3.27 \text{ x } 10^{-25}$ kg) , which can be considered at rest. Because both charges are positive the repulsive force slows down the alpha particle as it approaches the gold nuclei. How close can the alpha particle get to the gold nuclei before it is momentarily stopped before it begins to move away?

A. $2.33 \text{ x } 10^{-4}$ m

B. $\mathbf{4.99 \text{ x } 10^{-9}}$ **m**

C. $1.01 \text{ x } 10^{-10}$ m

D. $4.74 \text{ x } 10^{-6}$ m

$$\Delta E = 0 = \Delta U + \Delta K = \frac{Q_\alpha Q_{Au}}{4\pi\varepsilon_0 d} + \frac{1}{2}m_\alpha\left(v_{\alpha f}^2 - v_{\alpha 0}^2\right) = \frac{Q_\alpha Q_{Au}}{4\pi\varepsilon_0 d} + \frac{1}{2}m_\alpha\left(0 - v_{\alpha 0}^2\right) = 0$$

$$\frac{Q_\alpha Q_{Au}}{4\pi\varepsilon_0 d} = \frac{1}{2}m_\alpha v_{\alpha 0}^2$$

Solve for d

$$d = \frac{Q_\alpha Q_{Au}}{4\pi\varepsilon_0 \frac{1}{2}m_\alpha v_{\alpha 0}^2} = \frac{Q_\alpha Q_{Au}}{2\pi\varepsilon_0 m_\alpha v_{\alpha 0}^2}$$

$$d = \frac{(3.20\ x\ 10^{-19}\ C)(1.26\ x\ 10^{-17}\ C)}{2\pi\left(8.85\ x\ 10^{-12}\ C^2/Nm^2\right)(6.64\ x\ 10^{-27}\ kg)(4.68\ x\ 10^4\ m/s)^2}$$

$$d = \frac{4.032\ x\ 10^{-36}\ C^2}{8.087\ x\ 10^{-28}\ C^2/m} = 4.99\ x\ 10^{-9}\ m$$

So, the correct answer is B !

11

A parallel plate capacitor has a capacitance $(16.0\ \mathrm{mF})$ and it is connected to a voltage source $(\mathrm{V_S} = 15.0\ \mathrm{V})$ and the capacitor is allowed to come to fully charged. After the capacitor is allowed to be fully charged, the capacitor is disconnected from the voltage source. Then a dielectric slab $(\kappa = 4.78)$ is inserted between the plates of the capacitor. What is the final voltage across the plates of the capacitor?

A. $0.319\ \mathrm{V}$ **B.** $1.07\ \mathrm{V}$ **C.** $\mathbf{3.14\ V}$ **D.** $71.7\ \mathrm{V}$

Initially charging the capacitor the voltage will be the power source, so $V_{C0} = 15.0\ V$

The charge on the capacitor is $Q_0 = C_0 V_S = (16.0\ mF)(15.0\ V) = 240\ mC$

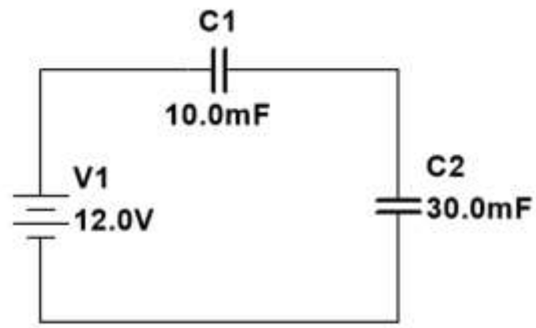
Isolated from the battery, the charge cannot change, but the capacitance does change $C_\kappa = \kappa C_0$ now we can find the new voltage across the plates can be found from

$$V_\kappa = \frac{Q_\kappa}{C_\kappa} = \frac{Q_0}{\kappa C_0} = \frac{V_S}{\kappa} = \frac{15.0\ V}{4.78} = 3.14\ V$$

So, the correct answer is C !

12

In the circuit shown on the right, how much energy is stored in capacitor C_2 ?



A. 405.0 mJ **B.** 2160. mJ **C.** 540.0 mJ **D.** **135.0 mJ**

$$U_{Stored} = \frac{1}{2}CV^2 = \frac{1}{2}QV = \frac{1}{2}\frac{Q^2}{C}$$

To find the Charge first find total capacitance. Then we know the charge of the total is the charge on each capacitor.

$$\frac{1}{C_{Total-Series}} = \frac{1}{C_1} + \frac{1}{C_2} = \frac{1}{10.0\ mF} + \frac{1}{30.0\ mF} = \frac{3+1}{30.0\ mF} = \frac{4}{30.0\ mF} = \frac{1}{7.50\ mF}$$

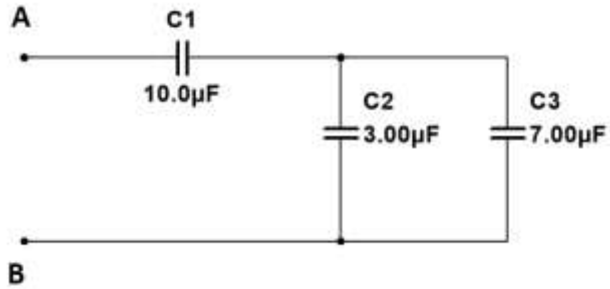
$$C_{Total-Series} = 7.50\ mF$$

$$Q_{C_2} = C_{Total}V = (7.50\ mF)(12.0\ V) = 90.0\ mC$$

$$U_{Stored} = \frac{1}{2}\frac{Q^2}{C} = \frac{1}{2}\frac{(90.0\ mC)^2}{30.0\ mF} = 135.\ mJ$$

So, the correct answer is D !

13



What is the total capacitance between points A and B in the circuit to the left?

A. 1.74 μF **B.** 12.1 μF **C.** 20.0 μF **D.** **5.00 μF**

Capacitors C_2 and C_3 are in parallel. Add them then the combination is in series with C_1

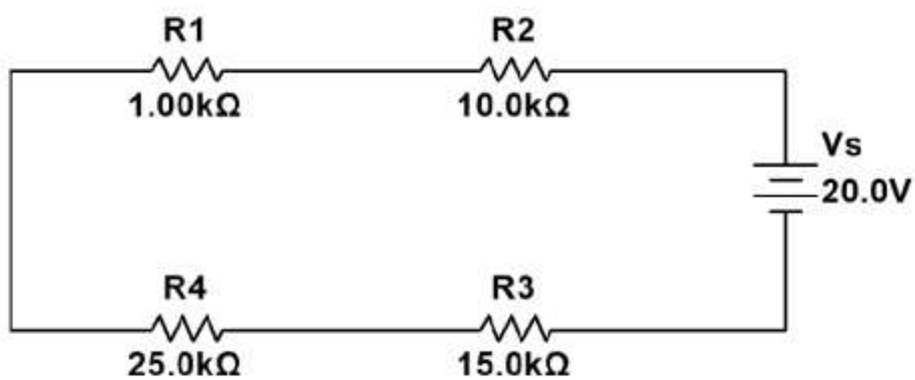
$$C_{2,3} = C_2 + C_3 = 3.00\ \mu F + 7.00\ \mu F = 10.0\ \mu F$$

$$\frac{1}{C_{AB}} = \frac{1}{C_1} + \frac{1}{C_{23}} = \frac{1}{10.0\ \mu F} + \frac{1}{10.0\ \mu F} = \frac{2}{10.0\ \mu F} = \frac{1}{5.00\ \mu F}$$

$$C_{AB} = 5.00\ \mu F$$

So, the correct answer is D !

14



In the circuit shown above, which resistor dissipates the most power?

A. 1.00 Ω **B.** 15.0 Ω **C.** **25.0 Ω** **D.** 10.0 Ω

Since it is a series circuit all the components have the same current in them. Since power dissipated is given by:

$$P_{Dis} = i^2 R$$

The largest resistor dissipates the most Power! So, the 25.0 Ω resistor!

So, the correct answer is C !

15

A precision resistor is machined from aluminum ($\rho_{Al} = 2.82 \text{ x } 10^{-8}\ \Omega\ \text{m}$). The bar has length ($\text{L} = 1.75\ \text{m}$) . What is the needed cross-sectional area if the resistor is to have the value $7.90\ \Omega$?

A. $1.27 \text{ x } 10^{-7}\ \text{m}^2$

B. $\mathbf{6.25 \text{ x } 10^{-9}\ m^2}$

C. $7.91 \text{ x } 10^{-5}\ \text{m}^2$

D. $1.09 \text{ x } 10^{-8}\ \text{m}^2$

$$R = \frac{\rho L}{A}$$

Solve for area

$$A = \frac{\rho_{Al} L_{Al}}{R_{Al}} = \frac{(2.82\ x\ 10^{-8}\ \Omega\ m)(1.75\ m)}{7.90\ \Omega} = \frac{4.935\ x\ 10^{-8}\ \Omega m^2}{7.90\ \Omega} = 6.25\ x\ 10^{-9}\ m^2$$

So, the correct answer is B !

16

You have a $^1/_8$ Watt $7.50\ \Omega$ resistor, what is the maximum voltage you can put across this resistor before it overheats and catches fire?

A. $\mathbf{0.968\ V}$ **B.** $0.938\ \text{V}$ **C.** $7.75\ \text{V}$ **D.** $60.0\ \text{V}$

$$P = iV = \frac{V^2}{R}$$

Solve for voltage

$$V^2 = RP$$

$$V = \sqrt{RP} = \sqrt{(7.50\ \Omega)(^1/_8\ W)} = \sqrt{0.9375\ V^2} = 0.968\ V$$

So, the correct answer is A !

17

A battery has an emf ($\varepsilon = 13.7\ \mathrm{V}$) and has developed an internal resistance ($r_{int} = 1.63\ \Omega$). What would a voltmeter read as the voltage across its terminals if it is driving a current through a load with an effective resistance ($R_{Load} = 47.6\ \Omega$) ?

A. $\mathbf{13.2\ V}$ **B.** $13.7\ \mathrm{V}$ **C.** $14.2\ \mathrm{V}$ **D.** $0.454\ \mathrm{V}$

$$V_{Terminal} = \varepsilon - i r_{int}$$

We find current from

$$i = \frac{V_{Total}}{R_{Total}} = \frac{\varepsilon}{r_{int} + R_{Load}}$$

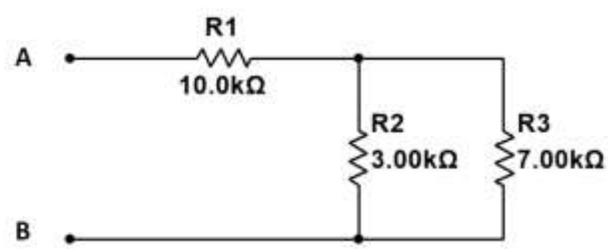
$$V_{Terminal} = \varepsilon - i r_{int} = \varepsilon - \left(\frac{\varepsilon}{r_{int} + R_{Load}}\right) r_{int} = \varepsilon\left(1 - \frac{r_{int}}{r_{int} + R_{Load}}\right) = \varepsilon\left(\frac{r_{int} + R_{Load} - r_{int}}{r_{int} + R_{Load}}\right)$$

$$V_{Terminal} = \varepsilon\left(\frac{R_{Load}}{r_{int} + R_{Load}}\right) = (13.7\ V)\left(\frac{47.6\ \Omega}{1.63\ \Omega + 47.6\ \Omega}\right) = (13.7\ V)(0.9669) = 13.2\ V$$

So, the correct answer is A !

18

What is the total resistance between points A and B?



A. $20.0\ \mathrm{k\Omega}$ **B.** $\mathbf{12.1\ k\Omega}$ **C.** $5.00\ \mathrm{k\Omega}$ **D.** $1.74\ \mathrm{k\Omega}$

Resistors R_2 and R_3 are in parallel. Their combination is in series with R_1 .

$$\frac{1}{R_{23}} = \frac{1}{R_2} + \frac{1}{R_3} = \frac{1}{3.00\ k\Omega} + \frac{1}{7.00\ k\Omega} = \frac{7+3}{21.0\ k\Omega} = \frac{10}{21.0\ k\Omega} = \frac{1}{2.10\ k\Omega}$$

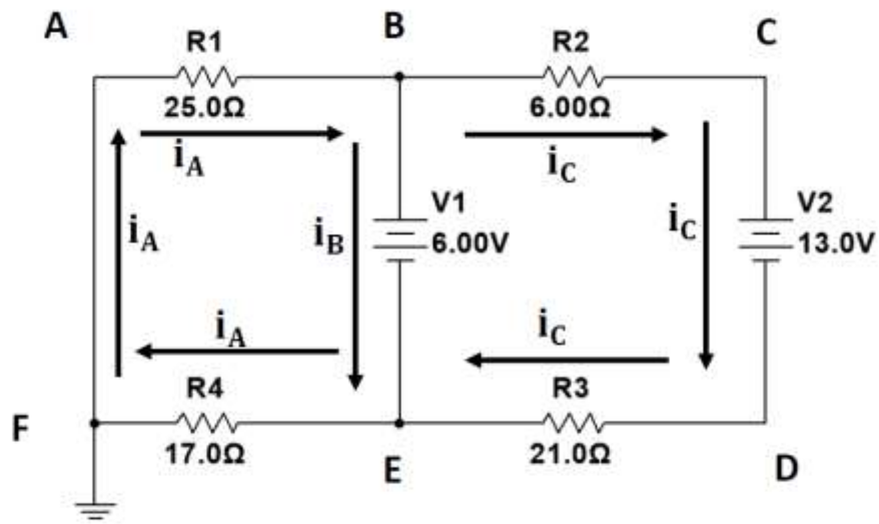
$$R_{23} = 2.10\ \mathrm{k\Omega}$$

$$R_{AB} = R_1 + R_{23} = 10.0\ k\Omega + 2.10\ k\Omega = 12.1\ k\Omega$$

So, the correct answer is B !

19

A circuit is shown below with currents already determined:



With the current directions as defined by the arrows shown above, the values for the currents are found to be:

$$i_A = -0.143\ A$$

$$i_B = +0.116\ A$$

$$i_C = -0.259\ A$$

What is the change in voltage if you moved from Point A to Point D?

A. +7.87 V **B.** +18.1 V **C.** **−7.87 V** **D.** −18.1 V

Multiple paths to go from A to D.

Path 1

$$\Delta V_{A\to D} = -i_A(25.0\ \Omega) - i_C(6.00\ \Omega) - 13.0\ V$$

$$\Delta V_{A\to D} = -(-0.143\ A)(25.0\ \Omega) - (-0.259\ A)(6.00\ \Omega) - 13.0\ V$$

$$\Delta V_{A\to D} = +3.575\ V + 1.554\ V - 13.0 = -7.87\ V$$

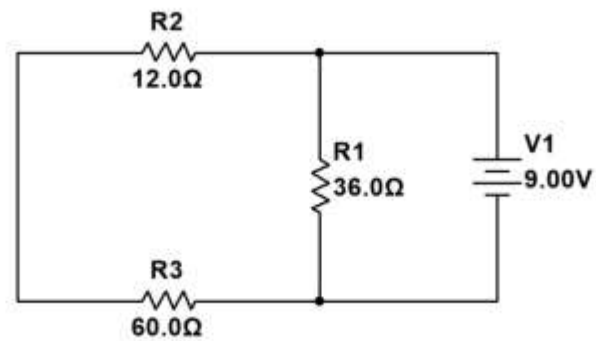
Path 2

$$\Delta V_{A\to D} = +i_A(17.0\ \Omega) + i_C(21.0\ \Omega) = +(-0.143\ A)(17.0\ \Omega) + (-0.259\ A)(21.00\ \Omega)$$

$$\Delta V_{A\to D} = -2.431\ V - 5.439\ V = -7.87\ V$$

So, the correct answer is C !

20



How much current flows through resistor R_1 in the circuit shown on the left?

A. 2.67 A **B.** 0.375 A **C.** 4.00 A **D.** **0.250 A**

$$i_1 = \frac{V_1}{R_1} = \frac{9.00\ V}{36.0\ \Omega} = 0.250\ A$$

So, the correct answer is D !
