

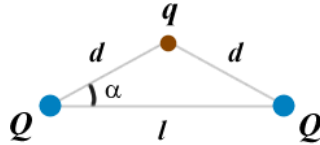
Chapter 19,21. Electric Charges, Forces, and Currents

I. Electric Charge

1. How much negative (positive) electric charge is contained in 2 molecules of water?

II. Coulomb's Law

1. Knowing that $d = 2$ m, $l = 5$ m, $Q = 2$ C, and $q = 0.5$ C, find the magnitude of the force exerted on the charge q .



III. Electric Current

1. How many charges flow through a cross section of a wire in 5 s if the current is 5 A?

IV. Resistance and Ohm's Law

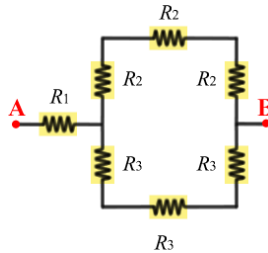
1. Find the resistivity of a wire that is 10 m long and is 3 mm in radius if under a potential difference of 15 V it conducts 5 A of current.

V. Energy and Power in Electric Circuits

1. Find the power dissipated by a 30- Ω light bulb if it operates with a current of 5 A.

VI. Resistors in Series and Parallel

1. Find the equivalent resistance between points **A** and **B** for the system of resistors shown below if $R_1 = 2 \Omega$, $R_2 = 3 \Omega$, and $R_3 = 4 \Omega$. Give the answer in *Ohms*.



VII. Kirchhoff's Rules

1. Use Kirchhoff's rules to find the magnitude of current through resistor R_1 (R_2 , R_3) if $R_3 = 12 \Omega$, $R_2 = 2 \Omega$, $R_1 = 4 \Omega$, $\epsilon_1 = 12$ V, and $\epsilon_2 = 2$ V.

