

CLASS 12 PHYSICS

Describe an experiment to find unknown resistance and temperature coefficient of resistance using metre bridge?

The colours of a carbon resistor is orange, orange, orange. What is the value of resistor?

Derive an expression for electric field due to an electric dipole (a) at a point on its axial line (b) at a point along the equatorial line.

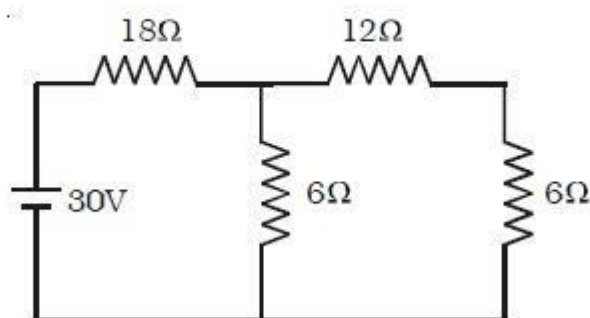
Define electric potential at a point. Is it a scalar or a vector quantity? Obtain an expression for electric potential due to a point charge.

Why is it safer to be inside a car than standing under a tree during lightning?

What is dielectric ? Explain the effect of introducing a dielectric slab between the plates of parallel plate capacitor.

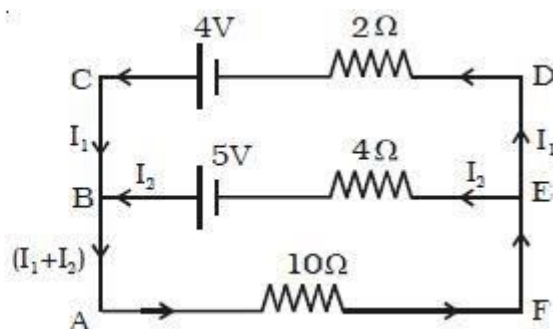
In a Wheatstone's bridge, if the galvanometer shows zero deflection, find the unknown resistance. Given $P = 1000\Omega$ $Q = 10000\Omega$ and $R = 20\Omega$

Find the voltage drop across 18Ω resistor in the given circuit



In a metre bridge, the balancing length for a 10Ω resistance in left gap is 51.8 cm . Find the unknown resistance and specific resistance of a wire of length 108 cm and radius 0.2 mm .

In the given circuit, find the current through each branch of the circuit and the potential drop across the $10\ \Omega$ resistor.



The effective resistances are $10\ \Omega$, $2.4\ \Omega$ when two resistors are connected in series and parallel. What are the resistances of individual resistors?

Two wires of same material and length have resistances $5\ \Omega$ and $10\ \Omega$ respectively. Find the ratio of radii of the two wires.

The resistance of a nichrome wire at 0°C is $10\ \Omega$. If its temperature coefficient of resistance is $0.004/^\circ\text{C}$, find its resistance at boiling point of water. Comment on the result.

A copper wire of $10^{-6}\ \text{m}^2$ area of cross section, carries a current of $2\ \text{A}$. If the number of electrons per cubic metre is 8×10^{28} , calculate the current density and average drift velocity.

A parallel plate capacitor is maintained at some potential difference. A $3\ \text{mm}$ thick slab is introduced between the plates. To maintain the plates at the same potential difference, the distance between the plates is increased by $2.4\ \text{mm}$. Find the dielectric constant of the slab.

The area of each plate of a parallel plate capacitor is $4 \times 10^{-2}\ \text{sq m}$. If the thickness of the dielectric medium between the plates is $10^{-3}\ \text{m}$ and the relative permittivity of the dielectric is 7 . Find the capacitance of the capacitor.

An electric dipole of charges $2 \times 10^{-10}\text{C}$ and $-2 \times 10^{-10}\text{C}$ separated by a distance $5\ \text{mm}$, is placed at an angle of 60° to a uniform field of 10Vm^{-1} . Find the (i) magnitude and direction of the force acting on each charge. (ii) Torque exerted by the field

A parallel plate capacitor has plates of area 200 cm^2 and separation between the plates 1 mm . Calculate (i) the potential difference between the plates if 1 nC charge is given to the capacitor (ii) with the same charge (1 nC) if the plate separation is increased to 2 mm , what is the new potential difference and (iii) electric field between the plates.

Two point charges $+9e$ and $+1e$ are kept at a distance of 16 cm from each other. At what point between these charges, should a third charge q to be placed so that it remains in equilibrium?

Two small equal and unlike charges $2 \times 10^{-8} \text{ C}$ are placed at A and B at a distance of 6 cm . Calculate the force on the charge $1 \times 10^{-8} \text{ C}$ placed at P, where P is 4 cm on the perpendicular bisector of AB.

Three small identical balls have charges $-3 \times 10^{-12} \text{ C}$, $8 \times 10^{-12} \text{ C}$ and $4 \times 10^{-12} \text{ C}$ respectively. They are brought in contact and then separated. Calculate (i) charge on each ball (ii) number of electrons in excess or deficit on each ball after contact.