Glossary

ammeter an instrument that measures current

analog meter a measuring instrument that gives a readout in the form of a needle movement over a marked gauge

bridge device a device that forms a bridge between two branches of a circuit; some bridge devices are used to make null measurements in circuits

capacitance the maximum amount of electric potential energy that can be stored (or separated) for a given electric potential

capacitor an electrical component used to store energy by separating electric charge on two opposing plates

conservation laws require that energy and charge be conserved in a system

current the flow of charge through an electric circuit past a given point of measurement

current sensitivity the maximum current that a galvanometer can read

digital meter a measuring instrument that gives a readout in a digital form

electromotive force (emf) the potential difference of a source of electricity when no current is flowing; measured in volts

full-scale deflection the maximum deflection of a galvanometer needle, also known as current sensitivity; a galvanometer with a full-scale deflection of 50 A has a maximum deflection of its needle when 50 A flows through it

galvanometer an analog measuring device, denoted by G, that measures current flow using a needle deflection caused by a magnetic field force acting upon a current-carrying wire

internal resistance the amount of resistance within the voltage source

Joule's law the relationship between potential electrical power, voltage, and resistance in an electrical circuit, given by: $P_e = \mathrm{IV}$

junction rule Kirchhoff's first rule, which applies the conservation of charge to a junction; current is the flow of charge; thus, whatever charge flows into the junction must flow out; the rule can be stated $I_1 = I_2 + I_3$

Kirchhoff's rules a set of two rules, based on conservation of charge and energy, governing current and changes in potential in an electric circuit

loop rule Kirchhoff's second rule, which states that in a closed loop, whatever energy is supplied by emf must be transferred into other forms by devices in the loop, since there are no other ways in which energy can be transferred into or out of the circuit. Thus, the emf equals the sum of the IR (voltage) drops in the loop and can be stated: $\mathrm{emf} = \mathrm{Ir} + \mathrm{IR}_1 + \mathrm{IR}_2$

null measurements methods of measuring current and voltage more accurately by balancing the circuit so that no current flows through the measurement device

Ohm's law the relationship between current, voltage, and resistance within an electrical circuit: $V = \mathrm{IR}$

ohmmeter an instrument that applies a voltage to a resistance, measures the current, calculates the resistance using Ohm's law, and provides a readout of this calculated resistance

parallel the wiring of resistors or other components in an electrical circuit such that each component receives an equal voltage from the power source; often pictured in a ladder-shaped diagram, with each component on a rung of the ladder

potential difference the difference in electric potential between two points in an electric circuit, measured in volts

potentiometer a null measurement device for measuring potentials (voltages)

RC circuit a circuit that contains both a resistor and a capacitor

resistance causing a loss of electrical power in a circuit

resistor a component that provides resistance to the current flowing through an electrical circuit

series a sequence of resistors or other components wired into a circuit one after the other

shunt resistance a small resistance R placed in parallel with a galvanometer G to produce an ammeter; the larger the current to be measured, the smaller R must be; most of the current flowing through the meter is shunted through R to protect the galvanometer

terminal voltage the voltage measured across the terminals of a source of potential difference

voltage the electrical potential energy per unit charge; electric pressure created by a power source, such as a battery

voltage drop the loss of electrical power as a current travels through a resistor, wire or other component

voltmeter an instrument that measures voltage

Wheatstone bridge a null measurement device for calculating resistance by balancing potential drops in a circuit