Definitions and Concepts for Edexcel Physics GCSE

Topic 10: Electricity and Circuits

*Definitions in **bold** are for higher tier only*

Definitions marked by '' are for separate sciences only*

Alternating Current: Current flow consisting of charges that continually change direction. These oscillations usually occur at a set frequency.

Ammeter: A device connected in series with a component to measure the current that flows through it.

Amperes (Amps): The unit of current.

Circuit Breaker: A safety device that cuts off the power supply if a surge of current passes through it. Circuit breakers can be reset and are quicker acting than fuses.

Coulomb: The unit of charge.

Currents at a Junction: The sum of the currents entering a junction must always equal the sum of the currents leaving it. This is a consequence of the conservation of charge.

Diode: A component that only allows current to flow through in the forward direction. They have very large resistances in the reverse direction.

Direct Current: Current flow consisting of charges flowing in a single direction only. Batteries and cells provide direct current.

Earth Wire: The green and yellow striped safety wire connected to metal casings, that prevents an appliance from becoming live.

Electric Current: The rate of flow of electrical charge. Its value is the same at any position in a single closed loop. In metals, the charges that flow are electrons.

Energy Transfers in Circuits: Electrical energy is transferred to thermal energy when current does work against a resistance. In metals this is a result of collisions between electrons and ions.

Filament Lamp: A light emitting component consisting of an enclosed metal filament. Its resistance increases as the filament's temperature increases.

Fuse: A safety device consisting of a thin metal filament that melts and cuts off the power supply if there is a surge in current. Fuses are connected to the live wire.

Light Dependent Resistor (LDR): A light sensitive component whose resistance decreases as its temperature increases.

Light Emitting Diode: A device that gives out light when a current flows through it. Current can only flow through it in one direction, and a minimum voltage must be applied across it before it illuminates.

Live Wire: The brown coloured wire that carries the alternating current from the supply in a mains power supply.

Mains Electricity: An a.c supply, which in the UK has a frequency of 50Hz a value of 230V.

Neutral Wire: The blue coloured wire that completes the circuit in a mains power supply.

Ohmic Conductor: A conductor whose current flow is directly proportional to the potential difference across it, when held at a constant temperature.

Ohms: The unit of resistance.

Ohm's Law: The current flowing through an Ohmic conductor at constant temperature is directly proportional to the potential difference across it.

Parallel: Components connected in parallel have the same potential difference across each component. The total current is equal to the sum of the currents flowing through each component.

Potential Difference: The energy that is transferred per unit charge between two points in a circuit. It is often also called a voltage.

Power: The rate at which an appliance transfers energy. For a circuit component, it is equal to the product of the current passing through it and the potential difference across it.

Resistance: A measure of the opposition to current flow.

Resistors in Parallel: The total resistance is less than the lowest individual resistance.

Resistors in Series: The total resistance is equal to the sum of the resistances of the individual resistors.

Series: Components connected in series have the same current passing through each component but share the total potential difference of the power supply.

Thermistor: A temperature dependent component, whose resistance increases as its temperature decreases.

Volt: The unit of potential difference. One volt is equal to one joule per coulomb.

Voltmeter: A device that is connected in parallel with a component to measure the potential difference across it.

Watt: The unit of power.