Definitions and Concepts for OCR (A) Physics GCSE

Topic 4: Magnetism and Magnetic Fields

*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.

***Alternator:** **A device that makes use of the generator effect to generate alternating current.**

Current-Carrying Wires: When current flows through a wire, a magnetic field is generated around it. The strength of the field depends on the magnitude of the current and the distance from the wire.

***Dynamo:** **A device that makes use of the generator effect to generate direct current.**

Electric Motor: **A current-carrying coil of wire in a magnetic field. The two sides of the coil that are perpendicular to the magnetic field experience forces in opposite directions, causing rotation.**

Electromagnet: A solenoid with an iron core.

Fleming's Left-Hand Rule: **A rule used to determine the orientation of the force (thumb), current (second finger) and magnetic field (first finger) when a current-carrying wire is placed in a magnetic field (motor effect).**

Force on a Wire: **When a current-carrying wire is placed perpendicular to a magnetic field, a force is exerted on it. The force is proportional to the magnetic flux density of the field and proportional to the current and length of the wire.**

Generator Effect: **When there is relative motion between an electrical conductor and a magnetic field, a potential difference will be induced across the ends of the conductor. A current will flow if this conductor is part of a complete circuit.**

Induced Magnet: A material that becomes a magnet when it is placed in an existing magnetic field, but loses its magnetism quickly once it is removed. Induced magnetism always produces attractive forces.

Like Magnetic Poles: When matching poles of a magnet are brought near each other they repel each other.

***Loudspeaker:** **A device that converts variations in current into vibrations of a diaphragm to produce corresponding sound waves.**

Magnetic Field Lines: Lines that show the strength and direction of a magnetic field. The lines point from North to South and their concentration represents the magnitude of the field.

Magnetic Field: The region around a magnet in which another magnet or magnetic material will experience a non-contact force.

Magnetic Materials: Iron, steel, cobalt and nickel.

Magnetic Poles: The regions of a magnet where the magnetic forces are at their strongest.

***Microphone:** **A device that converts the pressure variations in sound into corresponding current variations.**

Permanent Magnet: A magnet that produces its own magnetic field.

Power Cables: Metal wires that are part of the National Grid. Electricity is transported along them at very high voltages to reduce the energy loss and make the transportation more efficient.

Right-Hand Rule: **A method for determining the direction of the magnetic field produced around a current-carrying wire. Point your thumb in the direction of the conventional current flow and the direction that your fingers wrap around the wire determines the direction of the field lines.**

Solenoid: A wire wrapped into the shape of a coil, that has a strong and uniform magnetic field inside of it. The solenoid's magnetic field strength can be increased by adding an iron core.

***Step-Down Transformer:** **A transformer that has a smaller potential difference in the secondary coil than in the primary coil. This is a result of the secondary coil having fewer turns.**

***Step-Up Transformer: A transformer that has a larger potential difference in the secondary coil than in the primary coil. This is a result of the secondary coil having more turns.**

Tesla: The unit of magnetic flux density.

***Transformer: An iron core with a primary and secondary coil of wire wound around opposite ends. Transformers can change the magnitude of an alternating voltage.**

***Turns Ratio: The number of turns in the primary coil of a transformer over the number of turns in the secondary coil. This is equal to the voltage ratio for a 100% efficient transformer.**

Unlike Magnetic Poles: When opposite poles of a magnet are brought near each other they attract each other.

***Voltage Ratio: The potential difference across the primary coil of a transformer over the potential difference across the secondary coil.**