**Electrostatics definitions**

The **potential difference** between two points in the work done in carrying unit charge from one point to the other.

**Electric field intensity** is the force per unit change.

**Conductor** Allows electricity to pass through.

**Insulator** Does not allow electricity to pass through

**Coulombs law** The force between 2 point charges is proportional to the product of the charges and inversely proportional to the square of the distance between them.

**Potential difference** between 2 points is the work done carrying unit charge from one point to the other.

**Volt** The potential difference between 2 points is 1 volt if 1 coulomb of charge gains 1 Joule of energy as it goes form one point to another.

**Capacitance** The ratio of charge to potential.

**Electricity definitions Part 1**

The **potential difference** between two points in the work done in carrying unit charge from one point to the other.

**Electrolysis** is the production of a chemical change by electricity.

**Electric field intensity** is the force per unit change.

**Conductor** Allows electricity to pass through.

**Insulator** Does not allow electricity to pass through

**Coulombs law** The force between 2 point charges is proportional to the product of the charges and inversely proportional to the square of the distance between them.

**Volt** The potential difference between 2 points is 1 volt if 1 coulomb of charge gains 1 Joule of energy as it goes form one point to another.

**Capacitance** The ratio of charge to potential.

**Electric current** The flow of charge.

**Emf** The total potential in a circuit.

**Electricity definitions Part 2**

**Ohms law** The voltage across a conductor is proportional to the current through a conductor as long as the temperature remains constant.

**Resistivity **

**Semiconductor** This material has a conductivity between that of a conductor and an insulator.

**Intrinsic conduction** Conduction in a pure semi conductor

**Extrinsic conduction** Conduction in a doped semiconductor.

**p-type semiconductor** Semiconductors where positive holes are the majority carriers

**n-type semiconductor** Semiconductors where electrons are the majority carriers

**Doping** The addition of an impurity to improve the conductivity of a semiconductor.

**Resistance** this is voltage divided by current.

**Electromagnetism**

**Magnetic flux density** This is the force per unit current per unit length on a conductor at right angles in a magnetic field.

**Ampere** One Ampere is the current in 2 straight parallel conductors one metre apart in a vacuum that causes each to exert a force of 1 x 10-7N per metre length on the other.

**Magnetic flux** 

**Faradays law** The size of an induced emf is proportional to the rate of change of magnetic flux.

**Lenz’s law** The direction of the induced emf opposes the change causing it.

**Mutual induction** A changing magnetic field in one coil induces an emf in another.

**Self induction** A changing magnetic field in one coil induces an emf in itself.

**The Electron**

**Thermionic effect** The emission of electrons from a hot metal.

**Photoelectric effect** The emission of electrons due to electromagnetic radiation of the correct frequency.

**Photon** A bundle of electromagnetic energy.

**Threshold frequency** The lowest frequency that causes photo emission.

**Einstein’s photoelectric law**

hf = Φ + mv2

**Atomic**

**Law of radioactive decay** The activity of a sample is proportional to the number of nuclei present

**Radioactivity** The spontaneous disintegration of the nucleus with the release of one of more types of radiation

**Half life** The time for the activity to reduce by half.

**Fusion** This is the joining of nuclei with the release of energy.

**Fission** This is the splitting of a nucleus with the release of energy.

**Particle physics**

**Pair production** The production of a particle and anti particle by energy.

**Pair annihilation** is the production of energy from a particle and antiparticle.

**Antimatter** Material that has the same mass as another particle but opposite charge.

**Heat Part 1**

**Temperature** is a measure of how hot or cold an object is

A **Thermometric property** is a property of a substance that changes uniformly with temperature

**Heat capacity** The heat needed to increase the temperature of a body by 10C.

The **Specific heat capacity** is the heat required to increase the temperature of a substance by 10C

**Conduction**: This is the transfer of heat through a solid, without the movement of the solid.

**Convection**: This is the transfer of heat through a liquid or a gas when molecules of the liquid or gas move and carry the heat..

**Radiation** This is the transfer of heat by electromagnetic radiation.

**Heat Part 2**

**Latent heat** is the heat needed to change the state of an object.

The **Specific Latent heat** is the heat required to change the state of 1Kg of a substance.

The **Specific Latent heat of vaporization** is the heat required to change the state of 1Kg from liquid to gas.

The **Specific Latent heat of fusion** is the heat required to change the state of 1Kg form solid to liquid.

**Solar constant** The rate at which solar energy falls perpendicularly on unit area when the earth is at its mean distance from the sum.

**U value** The rate at which heat energy is transferred through 1m2 area for a 10C temperature difference.

**Joules Law** The rate that heat is produced in a resistor is proportional to the square of the current flowing through the resistor.

**Light**

**Laws of reflection**

The incident, the reflected and the normal ray lie on the same plane.

The angle of incidence equals the angle of reflection.

**Laws of refraction**

The incident, the refracted and the normal ray lie on the same plane.

The sine of the angle of incidence is proportional to the sine of the angle of refraction.

**Refractive index**

n = 

**Critical angle** This is the angle of incidence in the denser medium that produces an angle of refraction in the less dense material of 90o.

**Total internal reflection** This occurs when the angle of incidence in the denser medium exceeds the critical angle.

**Dispersion** This is the splitting of light into its component colours.

**Primary colour**s These 3 colours combine to form white light.

**Secondary colours** This is a colour that combine with a primary colour to give white light.

**Complimentary colours** These are 2 colours that combine to give white light.

A **real image** is formed by the actual intersection of light rays.

An **imaginary image** is formed form the apparent intersection of light rays.

The **electromagnetic spectrum** is an arrangement of electromagnetic waves in order of increasing frequency.

**Mechanics Part 1**

**Displacement** Distance in a given direction.

**Velocity** The rate of change of displacement.

**Acceleration** Rate of change of velocity.

**Newton’s 3 laws of motion**

A body’s velocity does not change unless a force acts on it.

The rate of change of a body’s momentum is proportional to the force acting on it and takes place in the direction of the force.

Every action ha an equal and opposite reaction.

**Force** A force is anything that changes an objects velocity.

**Momentum** mass x velocity

**Couple** Two forces that have a turning effect only.

**Conservation of momentum** In an interaction in a closed system, the total momentum is constant.

**Conditions for equilibrium**

The algebraic sum of the forces is zero.

The algebraic sum of the moments is zero.

**Energy** The ability to do work.

**Principle of conservation of energy** energy cannot be created or destroyed but is changed from one form to another.

**Mechanics Part 2**

**Centripetal force** the force towards the centre on an object in a circular path.

**Angular velocity** The rate of change of angular displacement.

**Newton’s law of gravitation**

The force between 2 point masses is proportional to the product of the masses and inversely proportional to the square of the distance between them.

**Weight** The pull of gravity.

**Density** The mass of unit volume.

**Pressure** The force per unit area.

**Moments** The turning effect of a force.

**Work** This is done when a force moves an object.

**Mass** The amount of matter in an object.

**Power** The rate at which work is done.

**Waves**

**Frequency** The number of waves that pass a point per second.

**Amplitude** The height of a wave.

**Wavelength** The distance between two crests

**Reflection** The bouncing of a wave off an object.

**Refraction** The change in direction as a wave passes from one medium to another.

**Polarisation** a polarised wave vibrates in one plain only.

**Stationary wave** is produced waves of the same frequency travelling in opposite directions meet.

**Sound intensity** This is the rate at which sound energy passes through unit area perpendicular to the direction that the sound is travelling.

A **Longitudinal wave** is a wave that vibrates parallel to the direction in which the energy is travelling.

A **Transverse wave** vibrates perpendicular to the direction in which the energy is travelling

**Interference** is the change in amplitude that occurs when waves meet

**Diffraction** is the spreading of wave round an obstacle or gap in its path

**Resonance** is the transfer of energy between bodies with same natural frequency

**Fundamental frequency** is the lowest resonant frequency of a vibrating object

The **Doppler Effect** is the apparent change in the frequency of a wave due to the motion of the source of the wave.