

USEFUL INFORMATION IN PHYSICS

❶ MECHANICS	
Mass	Mass is the quantity of matter which a body contains.
Volume	Volume is the amount of space occupied by an object
Density	Density is mass per unit volume of a substance $\text{Density} = \frac{\text{Mass}}{\text{Volume}}$
Relative density	Relative density is the ratio of the density of a substance to the density of an equal volume of water. $\text{Relative Density} = \frac{\text{Density of a substance}}{\text{Density of equal vol. water}}$ $= \frac{\text{Mass of substance}}{\text{Mass of equal Volume of water}}$ $= \frac{\text{Weight of substance}}{\text{Weight of equal Volume of water}}$
Diffusion	Is the spreading of molecules from a region of their high concentration to a region of their low concentration.
Brownian motion	Is the random movement of particles due to collision with invisible air molecules which are in a state of random motion.
FORCES	
Scalar quantity	A scalar quantity is a quantity which has magnitude only.
Vector quantity	A vector quantity is a quantity which has both magnitude and direction.
Force	Force is a physical quantity which changes a body's state of rest or of uniform motion in a straight line. $\mathbf{F} = m\mathbf{a}$
A newton	A newton is a force which gives a mass of 1kg an acceleration of 1ms^{-2} .
Acceleration due to gravity	Is the rate of change of velocity of a freely falling body.

Weight	Weight of a body is the force of gravity on it. OR: Weight is the force which a body exerts on anything which freely supports it. $\text{weight} = mg$ <u>The weight of a body varies because of;</u> - Earth is not a perfect sphere. (If a body is taken from the pole to the equator, its distance from the earth's centre increases hence reducing its weight) - The rotation of the earth. (Part of the gravitational attraction provides the necessary centripetal force) Centripetal force is the force which keeps a body moving in a circular path.
Friction	Friction is the force that opposes relative sliding motion between two surfaces in contacts.
Static friction	Static friction is the friction between two surfaces that are tending to slide over each other.
Kinetic friction	Kinetic or sliding friction is the friction between two surfaces that are moving relative to each other. It is always less than static friction.
Limiting friction	Is the maximum friction force between two surfaces which are at the verge of sliding over each other.
Coefficient of static friction	Is the ratio of limiting friction to the normal reaction.
Cohesion force	Cohesion is the force of attraction between molecules of the same substance.
Adhesion force	Adhesion is the force of attraction between molecules of different substance.
Surface tension	Surface tension is the tangential force acting normally per unit length across any line in the surface of a liquid.

	Or It is the force which causes the surface of a liquid to behave like a stretched elastic membrane.
Centripetal force	Is the force acting on a body moving in a circle and directed towards the centre of the circular path.
Up thrust	Is the upward force which acts on bodies in fluids.
Viscous drag	Is the force that opposes motion of a body through a fluid.
MOMENTS	
Moment	Moment of a force is the product of the force and the perpendicular distance of its line of action from the turning point. $\left(\begin{array}{c} \text{Moment} \\ \text{of a force} \end{array} \right) = \text{force} \times \left(\begin{array}{c} \text{perp.} \\ \text{distance} \\ \text{from} \\ \text{pivot} \end{array} \right)$ Principle Moments: When a body is in equilibrium the sum of the clockwise moment about any point equal the sum of the anti-clockwise moment. For parallel forces in equilibrium ❖ Sum of upward force = sum of downward forces ❖ Sum of anticlockwise moments = Sum of clockwise moments
Couple	A Couple: Is a pair of equal but opposite parallel forces whose lines of action do not meet. • It causes rotation of the body • It cannot be replaced by a single force. It can only be balanced by an equal but opposite couple. A torque: Is the moment of a couple.
Centre of gravity	Centre of gravity of a body is the point of application of the resultant force due to the earth's attraction on it.
Neutral Equilibrium	Is a form of equilibrium in which when a body is slightly tilted, its centre of gravity does not change position relative to the ground.
Stable Equilibrium	Is a form of equilibrium in which when a body is slightly tilted, its centre of gravity is raised and the body returns to its original position.

Unstable equilibrium	Is a form of equilibrium in which when a body is slightly tilted, its centre of gravity is lowered and the body does not return to its original position.
WORK, ENERGY AND POWER	
Work	Work is the product of force and distance moved in the direction of the force. Work = Force X Distance i.e. W = F X d A joule is the work done when a force of 1N moves through a distance of 1m. Heat is a form of energy which is transferred from one place to another due to a temperature difference between them.
Energy	Energy is the ability to do work. Kinetic energy is the energy which a body has because of its motion. $K. e = \frac{1}{2} mv^2$ Potential energy is the energy which a body has because of its position or condition. $P. e = mgh$ Principle of conservation of energy: Energy is neither created nor destroyed but changes from one form to another
Power	Power is the rate of doing work $\text{Power} = \frac{\text{work done}}{\text{Time}} = \frac{F \times d}{t}$ Power is the rate of transfer of energy $\text{Power} = \frac{\text{Energy changed}}{\text{Time taken}}$ In some cases you will find it easier to use; Power = Force X Velocity
MACHINES	
Machine	A machine is a device which enables force acting at one point to overcome force acting at some other point.
Load	Is the force that a machine overcomes
Effort	Is the force exerted to overcome the load

Pitch	Is the distance between two successive threads of a screw.
Mechanical advantage	Mechanical advantage is the ratio of the load to effort. Mechanical Advantage; $M.A = \frac{\text{Load}}{\text{Effort}}$
Velocity ratio	Velocity ratio is the ratio of distance moved by effort to distance moved by the load in the same time. Velocity Ratio (V. R) $= \frac{\text{Effort distance}}{\text{Load distance}}$ V. R of an inclined Plane $= \frac{\text{length of the plane}}{\text{height of the plane}} = \frac{l}{h}$ V. R of a screw $= \frac{\text{circumference of circle made by effort}}{\text{Pitch of the screw}}$ $= \frac{2\pi r}{p}$ V. R of a wheel and axle $= \frac{\text{circumference of wheel}}{\text{Circumference of axle}}$ $= \frac{2\pi R}{2\pi r} = \frac{R}{r}$
Efficiency	Efficiency is the ratio of useful work done by a machine to the total work put into in the machine. $\text{Efficiency} = \frac{\text{work output}}{\text{work input}} \times 100\%$ or $\text{Efficiency} = \frac{M.A}{V.R} \times 100\%$
PRESSURE	
Pressure	Pressure is the force acting normally per unit area. $\text{Pressure} = \frac{\text{Force}}{\text{Area}} \quad \text{i.e. } P = \frac{F}{A}$ Pressure in liquid $= \left(\begin{matrix} \text{height of} \\ \text{liquid} \\ \text{column} \end{matrix} \right) \times \left(\begin{matrix} \text{Density} \\ \text{of liquid} \\ \text{column} \end{matrix} \right) \times \text{Acceleration due to gravity}$ $P = h\rho g$

	In a manometer: $\left(\begin{matrix} \text{Gas} \\ \text{pressure} \end{matrix} \right) = \left(\begin{matrix} \text{atmosp.} \\ \text{pressure} \end{matrix} \right) + h\rho g$ Pascal's principle It states that pressure in an enclosed fluid is equally transmitted throughout the fluid in all directions. Archimedes's principle When a body is wholly or partially immersed in a fluid it experiences an upthrust equal to the weight of the fluid displaced. Upthrust = weight of fluid displaced $U = m_f g$ $U = (\rho_f V_f)g$ Principle flotation A floating body displaces its own weight of the fluid. Upthrust = weight of the floating body $U = m_b g$ $U = (\rho_b V_b)g$
Pascal	Is the pressure exerted when a force of 1N acts on an area of 1m ² .
MOTION	
Displacement	Displacement is the distance moved in a specified direction.
Speed	Speed is the rate of change of distance moved with time. $\text{Speed} = \frac{\text{Distance}}{\text{Time}}$
Velocity	Velocity is the rate of change of displacement with time. OR: Velocity is the rate of change of distance moved with time in a specified direction.
Uniform velocity	Is the constant rate of change of displacement with time.
Acceleration	Acceleration is the rate of change of velocity with time.
Uniform acceleration	Uniform Acceleration is the constant rate of change of velocity with time.
	Equations of motion $1^{st}: v = u + at$ $2^{nd}: s = ut + \frac{1}{2}at^2$

	$3^{rd}: v^2 = u^2 + 2as$ $s = \frac{1}{2}gt^2$ (for a free fall) Newton's law of motion 1st law <i>Everybody continues in its state of rest or of uniform motion in a straight line unless an external force makes it behave differently.</i> 2nd law <i>The rate of change of momentum of a body is proportional to the applied force and takes place in the direction in which the force acts.</i> $F = ma$ 3rd law <i>To every action there is an equal and opposite reaction</i>
Momentum	Momentum of a body is the product of its mass and velocity Momentum = Mass × Velocity <u>Principle of conservation of momentum:</u> When two or more bodies act on one another, their total momentum remains constant, provided no external force acts. OR: In a system of colliding bodies, total momentum before collision is equal to total momentum after collision provided no external force acts. <u>Inelastic collisions:</u> This is where the colliding bodies stick together and move with a common velocity, V after the collision. i.e. $m_1u_1 + m_2u_2 = (m_1 + m_2)V$ <u>Elastic collisions:</u> This is where the colliding bodies separate and move with different velocities after the collision. i.e. $m_1u_1 + m_2u_2 = m_1u_1 + m_2u_2$
Impulse	Is the change in momentum. $I = \left(\begin{smallmatrix} \text{Final} \\ \text{momentum} \end{smallmatrix} \right) - \left(\begin{smallmatrix} \text{Initial} \\ \text{momentum} \end{smallmatrix} \right)$ OR; It is the product of the force and the time of action of the force. $I = F \times t$

Inertia	Inertia is the tendency of a body to remain at rest or, if moving, to continue its motion in a straight line. It is also the reluctance of a body to change its state of motion.
Terminal velocity	Is the maximum constant velocity attained by a body falling vertically through a fluid.
Stream line flow	Is the form of fluid flow in which the successive particles flowing past a section at a time are in the same direction and have the same velocity parallel to each other.
Turbulent flow	Is the form of fluid flow in which the successive particles flowing past a section at a time are in different directions and have different velocities not parallel to each other.
Elasticity	<u>Elasticity</u> is the ability of a substance to recover its original shape and size after distortion. <u>An elastic material</u> is one which recovers its original shape and size after the force deforming it has been removed. Hook's law: <i>The extension of a material is directly proportional to the applied force provided elastic limit is not exceeded.</i> Force = k(extension) $\Leftrightarrow \frac{\text{Force}}{\text{extension}} = k \Leftrightarrow \frac{F_1}{e_1} = \frac{F_2}{e_2} = k$ or $\frac{F_1}{F_2} = \frac{e_1}{e_2}$
Strength	Is the ability of a material to withstand forces which try to break it. OR Strength is the ability of a material to resist deformation.
Stiffness	Is the measure of the rigidity of a material. It is the extent to which a material resists deformation in response to an applied force.
Brittle Material	Is a material which bends very little and breaks suddenly when a tensile force acts on it.

Ductile material	Is a material which stretches first classically and then plastically before it breaks when a force acts on it.
Concrete	Is a mixture of cement, sand, gravel and water.
Stress	$\text{Stress} = \frac{\text{Force}}{\text{crosssectionalArea}} = \frac{F}{A}$
Strain	$\text{Strain} = \frac{\text{extension}}{\text{originallength}} = \frac{e}{l_0}$ $\text{Young's modulus} = \frac{\text{stress}}{\text{strain}}$
Tie	A tie is a girder which is in tension.
Strut	A strut is a girder which is in compression.
❷ <u>GEOMETRIC OPTICS:-LIGHT</u>	
REFLECTION	
(a) <u>Reflection At Plane Surfaces:</u>	
Light	Is a form of energy that stimulates the sense of vision or sight.
Luminous object	An Object that produces its own light. E.g Sun.
Non luminous object	An object that does not produce its own light but reflects light from other objects. E.g moon.
Incandescent object	An object that give off light when it is hot.
Fluorescent object	An object that gives off light without necessarily being hot.
Phosphorescent object.	An object that absorbs light falling on it and later emits it as light energy.
Transparent medium	Is a medium that allows all the light incident on it to pass through it.
Translucent medium	Is a medium that allows some of the light incident on it to pass through it.
Opaque medium	Is a medium that does not allow any of the light incident on it to pass through it.
Rectilinear propagation of light	Is a process by which light travels in a straight line.

Eclipse	Is the obstruction of light from the sun either by the moon or earth. It occurs when the sun, moon and earth are in a straight line.
Solar eclipse	Is an eclipse that occurs when the moon is between the sun and the earth, such that the moon casts its shadow onto the earth's surface. <u>Annular eclipse:</u> Is a solar eclipse that occurs when the earth is very far from the moon such that the moon's shadow does not reach the earth's surface.
Lunar eclipse	Is an eclipse that occurs when the earth is between the sun and the moon, such that the earth casts its shadow onto the moon's surface.
Reflection	Reflection is the change in the direction of a light ray or a beam of light after striking a surface.
	A ray is the direction of the path taken by light
	A beam is a stream of light energy
	Laws of reflection: 1: The incident ray, reflected ray and the normal at the point of incidence all lie in the same plane. 2: The angle of incidence is equal to the angle of reflection.
	Types of Reflection (i) Regular reflection: Is a type of reflection where an incident parallel beam is reflected as a parallel beam. It occurs on a smooth surface. (ii) Irregular (Diffuse) Reflection: Is a type of reflection where an incident parallel beam is reflected in different directions. It occurs on a rough surface.
(b) <u>Reflection At Curved Surfaces:</u>	
Focal length	Focal length is the distance between the principal focus and the pole (for a mirror) or optical centre (for a lens)

Principal focus	Is a point on the principal axis at which all rays close and parallel to the principal axis converge after reflection at the mirror or refraction at the lens.
Centre of Curvature	Is the centre of the sphere of which the mirror or lens forms part.
Radius of Curvature	Is the radius of the sphere of which the mirror or lens forms part.
Parallax	Is the apparent relative movement of two objects owing to the movement on a part of the observer.
Magnification	Is the ratio of the height of the image to the height of the object. It is also defined as the ratio of the image distance to the object distance.
Real image	Is the image formed by actual intersection of reflected rays. It's the image which can be formed on a screen.
virtual image	Is the image formed by apparent intersection of reflected rays. It's the image which cannot be formed on a screen.
REFRACTION	
Refraction	Is the change in the direction of light as it moves from one medium to another. Laws of Refraction: 1: The incident and refracted rays are on opposite sides of the normal at the point of incidence and all the three are in the same plane. 2: [Snell's law]: The ratio of the sine of the angle of incidence to the sine of the angle of refraction is a constant for a given pair of media. For all calculations, use; $n_1 \sin i = n_2 \sin r$
Refractive index	Is the ratio of the sine of the angle of incidence to the sine of the angle of refraction.
Power of a Lens	Is the reciprocal of the lens's focal length in metres. A diopter is the power of a lens of focal length 1m.

Total internal reflection	Is when light moving from a denser medium to a less dense medium is reflected when the critical angle is exceeded.
Critical angle, c	Is the angle of incidence in a denser medium when the angle of refraction in the less dense medium is 90° .
Accommodation	Is the automatic adjustment of the eye to focus far and nearby objects by changing the focal length of the eye lens.
Short sightedness (Myopia)	Is a defect of vision where a person cannot see far objects clearly but can see nearby objects clearly.
Long sightedness (Hypermetropia)	Is a defect of vision where a person cannot see nearby objects clearly but can see far objects clearly.
Astigmatism	Is a defect of vision where a person sees a distorted image. It is due to changes in the spherical curvatures of the eye lens.
Minimum deviation	Is the deviation that occurs when the angle of incidence is equal to the angle of emergence.
Dispersion	Is the separation of white light into its component colours by a glass prism.
Spectrum	Is a band of colours of white light formed on a screen when white light passes through a glass prism. A pure spectrum is a spectrum formed without overlapping of the colour bands.
Primary colours	Are colours that cannot be obtained by mixing any other colours.
Secondary colours	Are colours that can be obtained by mixing any two primary colours.
Complementary colours	Are two colours one primary and the other secondary, such that when mixed they form white light.
Colour filter	Is a transparent material that allows light of a particular wavelength (or colour) to pass through it and absorbs the rest.

THE END

SCIENTIFIC DEFINITIONS:

MECHANICS DEFINITIONS:

Physics: This is the branch of science that deals with matter in relation to energy.

Matter: This is anything that occupies space and has weight.

Energy: This is the ability to do work.

Fundamental quantities: These are quantities which cannot be expressed in terms of other quantities.

Derived quantities: These are quantities which can be expressed in terms of fundamental quantities of mass, length and time.

Scalar Quantities: These are quantities that have magnitude only but no direction.

Vector Quantities: These are quantities that have both magnitude and direction.

Length: This is the distance between two points irrespective of the path taken.

Time: This is the measure of duration of an event.

Mass: This is the quantity of matter contained in an object.

Area: This is the measure of the surface of an object.

Volume: This is the amount of space occupied by an object.

Weight: This is the force a body exerts on anything that freely supports it.

Density: This is mass per unit volume of an object.

Relative Density: This is the ratio of density of a substance to density of water.

Force: This is a push or a pull that changes a body's state of rest or uniform motion in a straight line.

A newton: This is a force that gives a body of mass one kilogram an acceleration of one metre per second squared.

Centripetal force: This is the force that keeps a body moving in a circle and is directed towards the centre of the circle.

Up-thrust: This is the upward force acting on a body immersed in a fluid.

Magnetic force: This is a push or a pull exerted by a magnet.

Cohesion: This is the force of attraction or repulsion between molecules of the same substance.

Electrostatic force: This is a push or pull exerted by charged bodies.

Adhesion: This is the force attraction or repulsion between molecules of different substances.

Viscous drag: This is the force that opposes motion of a body in a fluid.

Gravitational force: This is the force that pulls bodies towards the centre of earth.

Resultant force: This is a single force that has the same effect as two or more force acting on a body.

Friction: This is the force that opposes relative motion between two surfaces in contact.

Static friction: This is the frictional force between bodies tending to slide against one another.

Dynamic friction: This is the frictional force between two bodies moving relative to one another.

Coefficient of friction: This is the ratio of limiting frictional force to the normal reaction on the body.

Limiting friction: This is the frictional force between two bodies that are about to slide over each other.

Work: This is the product of force and distance moved in the direction of force.

A joule: This is the work done when a force of one newton moves a body through a distance of one metre in the direction of force.

Renewable sources of energy: These are sources of energy that can be re-used to produce other forms of energy.

Non-renewable sources of energy: These are sources of energy that cannot be re used to produce other forms of energy.

Kinetic energy: This is the energy possessed by a body by virtue of its motion.

Potential energy: This is the energy possessed by a body by virtue of its position in the gravitational field.

Mechanical energy: This is the energy possessed by a body by virtue of its motion and its position in the gravitational field.

Power: This is the rate of doing work.

Watt: This is the rate of working of one joule in one second.

Pressure: This is the force acting normally per unit area

Pascal: This is the pressure exerted when a force of one newton is acting normally on an area of one metre squared.

Atmospheric pressure: This is the force acting normally per unit area exerted against a surface by the weight of the air above that surface.

Strength: This is the ability of the material to withstand the applied force before breaking.

Stiffness: This is the ability of the material to resist change of size or shape.

Ductility: This is the ability of a material to be hammered, moulded, bent, stretched and rolled into different shapes without breaking.

Brittleness: This is the ability of a material to break just after elastic limit is reached.

Elasticity: This is the ability of a material to regain its original size or shape when the applied force has been removed.

Plasticity: This is the ability of the material not to regain its original size or shape when the applied force has been removed.

Strong material: This is the material that withstands any applied force without breaking.

Stiff material: This is the material that resists change of size or shape.

Ductile material: This is the material that can be hammered, moulded, bent, stretched and rolled into different shapes without breaking.

Brittle material: This is the material that breaks just after elastic limit is reached.

Elastic material: This is the material that regains its original size or shape when the applied force has been removed.

Plastic material: This is the material that cannot regain its original size or shape when the applied force has been removed.

Elastic limit: This is a point beyond which a material cannot regain its original shape or size.

Proportional limit: This is the point beyond which force applied is not directly proportional to the extension.

Yield point: This is the point corresponding to the maximum stress for plastic deformation.

Plastic deformation: This is the type of deformation in which the material cannot regain its original shape or size.

Elastic deformation: This is the type of deformation in which the material regains its original shape or size.

Stress: This is the ratio of force applied to cross sectional area of the material.

Strain: This is the ratio of extension to original length of the material.

Young's modulus: This is the ratio of tensile stress to tensile strain.

Compressional forces: These are forces that bring about particles of matter to be pressed more closely.

Tensional forces: These are forces that bring about particles of matter to be pulled further apart from one another.

A Structure: This is a makeup which consists of materials joined together in a particular form.

A Beam: This is a large straight piece of material used as a support in a structure.

A girder: This is a piece of material that strengthens a structure.

Strut: This is the girder under compression.

Tie: This is the girder under tension.

Shear force: This is the force needed to fracture the material in a direction parallel to the applied force.

Notch: This is a cut or a weak point in a given material.

Concrete: This is a stone like material which is obtained by carefully proportioned mixture of cement, sand, gravel and water and is left to harden.

Reinforced concrete: This is the concrete combined with steel rods, sisal fibre, bamboo stripes and wood strands.

Capillarity: This is the action by which the surface of a liquid where it is in contact with a solid is elevated or depressed depending on the adhesive and cohesive properties of the liquid.

Meniscus: This is curve formed on a liquid in a capillary tube.

Surface tension: This is the force acting normally per unit length on an imaginary line drawn tangentially on the surface of the liquid.

Diffusion: This is the spreading of molecules from a region of higher concentration to a region of lower concentration.

Angle of contact: This is the angle between the tangent to the surface and the solid surface measured through the liquid.

Brownian motion: This is the random motion of molecules of the fluid.

Crystal: This is a solid substance having a regular form with arranged plane faces.

Crystal Cleavage: This is the tendency of a crystal material to split along a definite structural planes.

Distance: This is the length between two points.

Displacement: This is the length between two points in a given direction.

Speed: This is the rate of change of distance moved with time.

Velocity: This is the rate of change of displacement moved with time.

Uniform speed: This is the constant rate of change of distance moved with time.

Uniform velocity: This is the constant rate of change of displacement moved with time.

Acceleration: This is the rate of change of velocity moved with time.

Uniform acceleration: This is the constant rate of change of velocity moved with time.

Deceleration: This is the rate of decrease of velocity moved with time

Uniform deceleration: This is the constant rate of decrease of velocity moved with time.

Acceleration due to gravity: This is the rate of change of velocity moved with time for a body falling freely under gravity.

Projectile: This is the body moving under the influence of gravity.

Trajectory: This is the path followed by a projectile.

Time of flight: This is the time the particle spends in motion.

Inertia: This is the tendency of a body to remain at rest or keep moving with uniform motion.

Momentum: This is the product of mass and its velocity.

Elastic collision: This is the type of collision where the colliding bodies separate after collision and both momentum and kinetic energy are conserved.

Inelastic collision: This is the type of collision where the colliding bodies stick together after collision and momentum is conserved but kinetic energy is not conserved.

Impulse: This is the product of force and the time for which it acts on the body.

Recoil velocity: This is the velocity with which a body moves backwards when an explosion occurs.

A Machine: This is a device that enables the force applied at one point to overcome another force placed at some other point.

Load: This is the force a machine must overcome.

Effort: This is the force applied to a machine to overcome the load.

Mechanical advantage: This is the ratio of load to effort.

Velocity ratio: This is the ratio of distance moved by the effort to distance moved by the load.

Efficiency: This is the ratio of useful work done by the machine to work put into a machine expressed as a percentage.

A lever: This is a type of machine with a rigid body capable of turning about a fixed point.

First class levers: These are type of levers where the pivot is between the load and the effort.

Second class levers: These are type of levers where the load is between the pivot and the effort.

Third class levers: These are type of levers where the effort is between the load and the pivot.

Pulley: This is a wheel with a grooved rim.

Single fixed pulley: This is a simple pulley system with a rope passing around the groove of a fixed wheel.

Single movable pulley: This is a simple pulley system with a rope passing around the groove of a movable wheel.

Block and tackle pulley: This is a pulley system where two or more pulleys are combined to form a machine of larger velocity ratio and higher mechanical advantage.

An inclined plane: This is a slope that allows a load to be raised more gradually using a smaller effort.

Wheel and axle: This is a machine with a common axis of rotation.

Gears: This is the type of machine with gears rigidly fixed to the axis and are turned with the axis.

Screw: This is the type of machine used for holding bodies together.

Pitch: This is the distance between two successive threads of the screw.

Moment: This is the turning effect of the force about the fixed point.

Moment of a force: This is the product of force and its perpendicular distance of the line of action of the force from the pivot.

Couple: This refers to two equal and opposite parallel forces whose lines of action do not meet.

Centre of gravity: This is the point of application of the resultant force due to the earth's attraction on it.

Equilibrium: This is when the resultant force on the body is equal to zero and the body does not move.

Neutral Equilibrium: This is when a body is slightly displaced its Centre of gravity does not change position relative to the ground.

Stable equilibrium: This is when a body is slightly displaced its Centre of gravity is raised and the body returns to its original position.

Un-Stable equilibrium: This is when a body is slightly displaced its Centre of gravity is lowered and the body does not return to its original position.

Terminal velocity: This is the constant velocity attained by a body falling vertically in a fluid.

Streamline flow: This is a flow of liquid where successive particles passing any point travel in the same direction and parallel to one another.

Turbulent flow: This is a flow of liquid where successive particles passing any point travel in different directions and is not parallel to one another.

LIGHT DEFINITIONS:

Light: This is a form of energy which is responsible for the sense of sight.

Luminous bodies: These are bodies which produce their own light.

Nonluminous bodies: These are bodies which don't produce their own light.

Incandescent bodies: These are bodies which give off light when hot.

Fluorescent bodies: These are bodies that produce light without being hot.

Phosphorescent bodies: These are bodies that absorb the incident energy falling on them and emit this energy in form of light.

Transparent medium: This is the type of medium which allows almost all the light to pass through it and objects are seen clearly.

Translucent medium: This is the type of medium which allows some of the light to pass through it and objects are not seen clearly.

Opaque medium: This is the type of medium which does not allow any light to pass through it and objects are not seen at all.

A ray of light: This is the direction or the path along which light travels.

A beam: This is a collection of light rays.

Parallel beam: This is the collection of light rays which do not meet or intersect.

Convergent beam: This is the collection of light rays originating from different directions but meeting at one point.

Divergent beam: This is the collection of light rays originating from one point but travel in different directions.

Rectilinear propagation of light: This is the process by which light travels in a straight line when produced from its source.

Shadow: This is an area or space where light cannot reach.

Umbra: This is the region of the shadow where no light reaches at all.

Penumbra: This is the region of the shadow where some light reaches.

Eclipse: This occurs when the sun, the moon and the earth appear in a straight line.

Solar eclipse: This occurs when the moon is between the sun and the earth.

Lunar eclipse: This occurs when the earth is between the moon and the sun.

Annular eclipse: This occurs when the sun is far away from the earth and the moon is between the sun and the earth.

Magnification: This is the ratio of size of the image to size of the object.

Reflection of light: This is the bouncing off of light from the reflecting surface.

Regular (Specular) reflection: This is the type of reflection when a parallel beam incident on a smooth surface is reflected as a parallel beam.

Irregular (Diffuse) reflection: This is the type of reflection when a parallel beam incident on a rough surface is scattered in different directions.

Incident ray: This is the ray of light from the source falling onto the reflecting or refracting surface.

Reflected ray: This is the ray of light which bounces off from the reflecting surface.

Refracted ray: This is the path along which light travels in another medium after changing direction.

The normal: This is the line perpendicular to the reflecting surface or given media.

Angle of incidence: This is the angle between the incident ray and the normal at the point of incidence.

Angle of reflection: This is the angle between the reflected ray and the normal at the point of incidence

Angle of refraction: This is the angle between the refracted ray and the normal at the point of incidence.

Glancing angle: This is the angle between the incident ray and the reflecting surface at the point of incidence.

Angle of deviation: This is the angle between the original direction of the ray and the reflected ray at the point of incidence.

Deviation: This is the change of direction of the ray on striking the reflecting or refracting surface.

Centre of curvature of the mirror: This is the center of the sphere of which the mirror forms apart.

Radius of curvature of the mirror: This is the distance between the center of curvature and the pole of the mirror.

Pole of the mirror: This is center point of the mirror.

Aperture of the mirror: This is the width of the mirror.

Principal axis of the mirror: This is the line joining the center of curvature to the pole of the mirror through its principal focus.

Principal focus of the mirror: This is the point on the principal axis to which rays parallel and close to the principal axis converge and appear to diverge after reflection from the mirror.

Principal focus of a converging mirror: This is the point on the principal axis to which rays parallel and close to the principal axis converge after reflection from the mirror.

Principal focus of a diverging mirror: This is the point on the principal axis to which rays parallel and close to the principal axis appear to diverge after reflection from the mirror.

Focal length of the mirror: This is the distance between the principal focus and the pole of the mirror.

Virtual image: This is the image formed by apparent intersection of rays.

Real image: This is the image formed by actual intersection of rays.

Refraction: This is the bending of light ray as it moves from one medium to another medium of different optical densities.

Refractive index: This is the ratio of sine of angle of incidence to sine of angle of refraction for light moving from air to any other given medium.

Total internal reflection: This is a phenomenon which occurs when light is moving from a denser medium to a dense medium and the angle of incidence is greater than the critical angle.

Critical angle: This is the angle of incidence in a denser medium for which its angle of refraction in a dense medium is ninety degrees.

Lens: This is a spherical surface of transparent material.

Principal axis of the lens: This is the line joining the principal focus to the optical center of the lens.

Optical center of the lens: This is the center point between the poles of the lens.

Poles of the lens: These are center points of the surfaces of the lens.

Principal focus of the lens: This is the point on the principal axis to which rays parallel and close to the principal axis converge and appear to diverge after refraction from the lens.

Principal focus of a converging lens: This is the point on the principal axis to which rays parallel and close to the principal axis converge after refraction from the lens.

Principal focus of a diverging lens: This is the point on the principal axis to which rays parallel and close to the principal axis appear to diverge after refraction from the lens.

Focal length of the lens: This is the distance between the principal focus and the optical center of the lens.

Power of the lens: This is the reciprocal of its focal length in meters.

Optical instruments: These are instruments that change the visual angle.

Visual angle: This is the angle subtended by an object at the eye.

Accommodation: This is changing of the focal length of the eye lens to focus the image of an object.

Short sight (Myopia): This is a defect of the eye whereby a person cannot see far objects clearly but can only see nearby objects clearly.

Long sight (Hypermetropia): This is the defect of the eye whereby a person cannot see nearby objects clearly but can see far objects clearly.

Astigmatism: This is the defect in the eye or in a lens caused by a deviation in a spherical curvature that results in distorted images as light rays are prevented from meeting a common focus.

Dispersion: This is the splitting of white light into its constituent colours by the prism.

Spectrum: This is the band of colours of white light formed on the screen after passing through the prism.

Pure spectrum: This is the spectrum formed by the prism when the colours do not overlap each other.

Rain bow: This is a phenomenon that is caused by reflection, refraction and dispersion of light in water droplets resulting in a spectrum of light appearing in the sky.

Primary colours: These are colours that cannot be obtained by mixing any other colours.

Secondary colours: These are colours that can be obtained by mixing two primary colours.

Complementary colours: These are colours when added together a white colour is produced.

Filter: This is a transparent material which absorbs other colours but allows its own colour to pass through it.

WAVES DEFINITIONS:

A wave: This is a disturbance in the medium which transfers energy from one point to another without causing any permanent displacement of medium itself.

Oscillations: This is a to and fro movement.

Frequency: This is the number of oscillations made per second.

Period: This is the time taken to complete one oscillation.

Hertz: This is the frequency of one oscillation made in one second.

Amplitude: This is the maximum displacement from undisturbed position of the wave.

Crest: This is the point of maximum displacement from undisturbed position of the wave.

Trough: This is the point of minimum displacement from undisturbed position of the wave.

Wave length: This is the distance between two successive crests or troughs.

Wave form: This is the shape of the wave.

Phase: This is the time of the wave in comparison with another wave.

Mechanical wave motion: This is a mechanism by which energy is transferred from one point to another through a material medium.

Electromagnetic waves: These are waves made up of electric and magnetic vibrations of high frequency.

Radio waves: These are waves produced when electrons are accelerated in an aerial.

Infrared radiations: These are radiations that cause the body temperature to rise due to heat energy.

Ultraviolet light: This is a radiation which causes certain metal surfaces to emit electrons and photosynthesis in green plants.

Progressive waves: These are waves which carry energy away from the source of the wave.

Transverse wave: This is a wave where the direction of travel of the particles is perpendicular to the direction of travel of the wave.

Longitudinal wave: This is a wave in which the direction of travel of the particles is the same as the direction of travel of the wave.

Compression: These are regions in which the oscillating particles are close together.

Rarefaction: These are regions in which the oscillating particles are far apart.

Stationary wave: This is the wave formed when two progressive waves of the same speed, frequency and wavelength moving in opposite direction meet.

Antinodes: These are points on a stationary wave which are vibrating with maximum displacement.

Nodes: These are points on a stationary wave which are permanently at rest.

Wave front: This is the surface of the wave form on which every particle transmitting the wave is at the same distance from the source of the wave and in the same state of disturbance.

Reflection of the waves: This is the bouncing off of the waves when they meet a barrier.

Refraction of waves: This is the change of direction or speed of the waves when they move from one medium to another of different optical densities.

Diffraction of waves: This is the spreading of the waves of the same speed, frequency and wavelength around a corner or barrier.

Interference: This is the effect which occurs when two waves of the same speed, frequency and wavelength moving in the same direction meet.

Constructive interference: This is the type of interference which occurs when a crest of one wave meets a crest of another wave.

Destructive interference: This is the type of interference which occurs when a crest of one wave meets a trough of another wave.

Sound: This is a form of energy produced when particles of the medium are set into vibrations.

Echo: This is the reflected sound.

Reverberation: This is the prolonged sound.

Ultrasonic sound: This is the sound of very high frequency which cannot be detected by the human ear.

Musical sounds: These are sounds with uniform and regular vibrations.

Music: This is the sound with uniform and regular frequency.

Noise: This is the sounds produced by sources vibrating at irregular frequency.

Pitch of sound: This is the sharpness or mildness of the musical note.

Loudness of sound: This is the sensation of the musical note in the mind of an individual.

Quality of sound: This is the property that distinguishes a musical from another of the same pitch and loudness.

Intensity: This is the rate of flow of energy per unit area perpendicular to the direction of sound.

Fundamental note: This is the lowest musical note produced by any musical instrument.

Fundamental frequency: This is the lowest predominant frequency note produced by any musical instrument on which other notes are derived from.

Harmonics: These are integral multiples of the fundamental frequency.

Overtone: These are higher frequency musical notes produced that are integral multiples of the fundamental frequency.

Resonance: This occurs when a body is set into vibrations with its own natural frequency as a result of vibrations received from another body vibrating with the same frequency.

HEAT DEFINITIONS:

Heat: This is the form of energy which flows from one point to another due to temperature difference.

Temperature: This is the average kinetic energy of the molecules in the body.

Thermometric property: This is a physical property which changes continuously and linearly with change in temperature.

Fixed point: This is temperature at which a physical change is expected to occur.

Lower fixed point: This is the temperature of ice-water mixture.

Upper fixed point: This is the temperature at which steam and water exist in equilibrium.

Scale of temperature: This is the scale used to measure the degree of hotness or coldness.

Heat transfer: This is the transition of heat from a hot region to a cold region.

Conduction: This is the transfer of heat through matter from a region of high temperature to a region of low temperature without the movement of matter as a whole.

Convection: This is the transfer of heat through fluids from a region of high temperature to a region of low temperature with the movement of the fluid as a whole.

Radiation: This is the transfer of heat from one place at high temperature to another of low temperature by means electromagnetic waves.

Greenhouse effect: This is used in providing appropriate conditions for plants in cold regions.

Sea breeze: This is cool air which blows from the sea to inland during day time.

Land breeze: This is warm air which blows from inland to the sea at night.

Thermal expansion: This is the increase in size of matter in all directions when matter is heated.

Anomalous expansion of water: This is an abnormal property of water where by water expands instead of contracting when the temperature rises from 0°C to 4°C and becomes less dense.

Bimetallic strip: This is formed when two metals of different expansivity are riveted together.

Heat capacity: This is the heat required to raise the temperature of a body by one kelvin.

Specific heat capacity: This is the heat required to raise the temperature of one kilogram mass of a body by one kelvin.

Calorimetry: This is the method used in measurement of heat flow.

Latent heat: This is the heat required to change the state of a substance without change in temperature.

Latent heat of fusion: This is the heat required to change the state of a substance from solid to liquid without change in temperature.

Latent heat of vaporization: This is the heat required to change the state of a substance from liquid to vapour without change in temperature.

Specific latent heat: This is the heat required to change the state of one kilogram mass of substance without change in temperature.

Specific latent heat of fusion: This is the heat required to change the state of one kilogram mass substance from solid to liquid at constant temperature.

Specific latent heat of vaporization: This is the heat required to change the state of one kilogram mass substance from liquid to vapour without change in temperature.

Gas: This is the state of a substance above its critical temperature.

Ideal gas: This is a gas whose intermolecular forces of attraction or repulsion are negligible.

Real gas: This is a gas whose intermolecular forces attraction or repulsion are not negligible.

Absolute zero temperature: This is the temperature at which the molecules of the gas have minimum kinetic energy.

Triple point of water: This is the temperature at which pure water, pure melting ice and saturated vapour exist in equilibrium.

Vapour: This is the mass of liquid drops in air.

Saturated vapour: This is the vapour which is in dynamic equilibrium with its own liquid.

Unsaturated vapour: This is the vapour which is not in dynamic equilibrium with its own liquid.

Saturated vapour pressure: This is the pressure exerted by the vapour which is in dynamic equilibrium with its own liquid.

Unsaturated vapour pressure: This is the pressure exerted by the vapour which is not in dynamic equilibrium with its own liquid.

Evaporation: This is the escape of molecules of the liquid from its surface.

Boiling: This is the process which occurs when the saturated vapour pressure is equal to external pressure.

Boiling point: This the temperature at which the saturated vapour pressure is equal to external pressure.

Freezing: This is the process that occurs when a substance changes from liquid state to liquid state at constant temperature.

Freezing point: This is the temperature at which a substance changes from liquid state to solid state.

Melting: This is a process which occurs when a substance changes from solid state to liquid state at constant temperature.

Melting point: This is the temperature at which a substance changes from solid state to liquid state.

Dew point: This is the temperature at which air is saturated with water vapour.

ELECTRICITY DEFINITIONS:

Electrostatic electricity: This is the study of electric charges at rest.

Current electricity: This is the study of electric charges in motion.

A conductor: This is a substance in which electrons are free to move and conducts heat and electricity easily.

An insulator: This is a substance in which electrons are not free to move and does not conduct heat and electricity easily.

Electrostatic induction: This is the method of charging a conductor using the charged body without touching it.

Lightening: This occurs when two oppositely charged clouds meet.

Electric field: This is an area around a charge where an electric force can be experienced.

Electric flux: This is the number of electric field lines.

Electric field line: This is the line drawn such that its direction at any point is the direction of electric field line at that point.

Neutral point: This is an area with no electric field lines.

Electric cell: This is a device which is capable of driving an electric charge around the circuit in form of current.

An electrolyte: This is a substance when in solution or molten form conducts electricity.

Primary cells: These are cells which cannot be renewed when exhausted.

Secondary cells: These are cells which can be renewed when exhausted.

Polarization: This is the accumulation of hydrogen bubbles around the copper plate.

Local action: This is when the zinc plate is eaten away due to impurities.

Amalgamation: This is coating zinc with mercury.

Zinc amalgam: This is zinc coated with mercury.

Charge: This is the quantity of electricity that passes any section of a conductor.

Charge density: This is the charge per unit area.

A coulomb: This is the quantity of electricity that passes any section of a conductor in one second when a current of one ampere is flowing through the conductor.

Corona discharge (Charge leakage): This is the electrical discharge brought about by ionization of air surrounding a charged conductor.

Current: This is the rate of flow of charge.

Ampere: This is a constant current which when flowing in two long straight parallel conductors placed one metre apart in a vacuum produces a force of $2 \times 10^{-7} \text{N}$ per metre length between them.

Resistance: This is the opposition to the flow of current with in a conductor.

An ohm: This is the resistance of a conductor in which a current of one ampere flows when a potential difference of one volt is applied across its ends.

Potential difference (p.d): this is the work done to move one coulomb of charge from one to another.

A volt: This is the potential difference between two points when one joule of work is done to move one coulomb of charge from one point to another.

Electromotive force (emf): This is the work done to move one coulomb of charge from one point to another in a circuit in which a cell is connected.

Internal resistance of a cell: This is the opposition to the flow of current with in the cell.

Electrical energy: This is the work done on an electrically charged particle by an electric field.

Electrical power: This is the rate of change of electrical energy.

Kilowatt hour: This is the rate of working of one thousand watts for one hour.

Filament: This is a small coil tungsten wire which becomes white hot when current flows through it.

Fluorescent tube: This is a gas discharge lamp that uses electricity to excite mercury vapour.

Switch: This is a device used for connecting and disconnecting the current.

Fuse: This is a device which cuts off current if too much of it flows.

Short circuit: This occurs when the positive terminal is connected to the negative terminal.

MODERN DEFINITIONS:

An atom: This is the smallest particle of an element that can take part in a chemical reaction.

Atomic number: This is the number of protons in the nucleus of an atom.

Atomic mass: This is the number of protons and neutrons in the nucleus of an atom.

Isotopes: These are atoms of the same element with the same atomic number but different mass numbers and number of neutrons.

Isotopy: This is the existence of an element in more than one form.

Radioactivity: This is the spontaneous disintegration of unstable nucleus to form a stable nucleus with emission of radiations.

Alpha particle: This is a high speed helium nucleus.

Beta particle: This is a high speed electron emitted from the nucleus of radioactive atom.

Gamma ray: This is a high energy electromagnetic radiation of very short wavelength emitted from the nucleus of radioactive atom.

Radioactive decay: This is a spontaneous break down of radioactive nuclide with emission of radiations.

Transmutation: This is the change of an element into another element.

Background radiations: These are ionizing radiations from a variety of natural sources, artificial sources and are always present in the environment.

Nuclear fusion: This is the process by which two light nuclei combine to form a heavy nucleus with a release of energy.

Nuclear fission: This is the process by which a heavy nucleus splits into two light nuclei with release of energy.

Activity: This is the number disintegrations per second.

Half-life: This is the time taken by a radioactive substance to decay to a half its original value.

Thermionic Emission: This is a process by which electrons are emitted from the metal surface by application of heat energy.

Photoelectric Emission: This is a process by which electrons are emitted from the metal surface when exposed to radiation of given frequency.

Diode: This is an electrical device that conducts electricity in only one direction.

Rectifier: This is an electrical device that converts alternating current to direct current.

Half wave rectifier: This is an electronic circuit in which one half-cycle of incoming alternating current changes to direct current output.

Full wave rectifier: This is an electronic circuit in which both half-cycles of incoming alternating current change to direct current output.

Rectification: This is a process of changing alternating current to direct current by use of a diode.

Half wave rectification: This is a process by which one half-cycle of incoming alternating current is converted to direct current output.

Full wave rectification: This is a process by which both half-cycles of incoming alternating current are converted to direct current output.

Cathode rays: These are streams of electrons moving at a very high speed.

Cathode ray oscilloscope: This is a device used to study current and voltage wave forms.

Time base: This is a special circuit that generates potential difference which rises steadily to a maximum value and falls rapidly to zero.

X-Rays: These are short wavelength electromagnetic waves produced when cathode rays are stopped by a heavy metal.

Soft X-Rays: These are x-rays produced when a low potential difference is used.

Hard X-Rays: These are x-rays produced when a high potential difference is used.

MAGNETISM DEFINITIONS:

A magnet: This is a piece of metal that attracts other metals.

Ferro magnetic substances: These are substances which are strongly attracted by a magnet.

Diamagnetic materials: These are magnetic materials that are slightly repelled by a magnetic field.

Paramagnetic materials: These are materials that are slightly attracted by a magnetic field and the material does not retain the magnetic properties when the external field is removed.

Non-Ferro magnetic substances: These are substances which are not attracted by a magnet at all.

A pole of magnet: This is an area on a magnet where the magnetic force is strongest.

Magnetic field: This is the area around a magnet where the magnetic force is experienced.

Magnetic field line: This is the path a magnetic pole follows if it is placed in a magnetic field.

Magnetic flux: This is the number of magnetic field lines.

Magnetism: This is the force exerted by the magnetic field.

Magnetic shielding (screening): This is protecting a delicate instrument from the magnetic fields using a soft iron ring.

Magnetic saturation: This is the point where a magnetic substance cannot be magnetized any more.

Neutral point: This is an area where the resultant magnetic force is zero.

Geographic meridian: This is the vertical plane which passes through the earth's geographic poles.

Magnetic meridian: This is the vertical plane in which a freely suspended magnetic needle sets itself.

Angle of declination: This is the angle between the geographic meridian and the magnetic meridian.

Angle of dip: This is the angle between the horizontal and the magnetic axis of a freely suspended magnet in the magnetic meridian.

Soft magnetic materials: These are magnetic materials which are easily magnetized but do not retain their magnetism.

Hard magnetic materials: These are magnetic materials which are difficult to magnetize and retain their magnetism for a long time.

Magnetization: This is a process by which randomly arranged molecular magnets of a ferromagnetic substance are made to point in one direction.

Induced magnetism: This is the process of magnetizing a magnetic material temporarily by induction.

Demagnetization: This is a process by which randomly arranged molecular magnets of a magnet are made to point in different directions.

Electro magnet: This is the magnet produced when an electric current flows in a solenoid with soft iron core.

Eddy currents: These are currents induced when the magnetic flux linking the coil changes.

Current sensitivity: This is the deflection per unit current.

Voltage sensitivity: This is the deflection per unit voltage.

Electromagnetic induction: This is the process by which an electric current is induced in coil due to the change in magnetic flux linking the coil.

Moving coil galvanometer: This is a device used to detect small currents and potential differences.

Self-induction: This is a process by which an emf is induced due the change of current in the coil itself.

Mutual induction: This is the process by which emf is induced in coil due to change of current in the nearby coil.

A generator: This is a device that converts mechanical energy into electrical energy.

An electric motor: This is a device that converts electrical energy into mechanical energy.

Ac transformer: This is a device used to increase or decrease an alternating voltage.

Step up transformer: This is the type of transformer in which the number of turns in the secondary coil is greater than the number of turns in the primary coil.

Step down transformer: This is the type of transformer in which the number of turns in the secondary coil is less than the number of turns in the primary coil.

A multiplier: This is a resistor of very high resistance.

A shunt: This is a resistor of very low resistance.

SCIENTIFIC LAWS & PRINCIPLES:

Laws of friction:

Frictional force is independent of the area of contact but depends on the nature of the surface.

Frictional force always opposes relative motion.

Frictional force is independent of the relative velocity of the two surfaces in motion.

Frictional force is directly proportional to the normal reaction.

The principle of conservation of energy: It states that energy is neither created nor destroyed but changes from one form to another.

The principle of transmission of pressure in fluids (Pascal's principle): It states that pressure applied at any point of an enclosed fluid is transmitted equally throughout the whole fluid.

Hooke's law: It states that the force applied to elastic material is directly proportional to the extension provided elastic limit is not exceeded.

Kinetic theory of matter: It states that matter is made up of tiny particles which are in constant random motion and possess energy.

Newton's laws of motion:

Everybody continues in its state of rest or uniform motion in a straight line unless acted upon by external force.

The rate of change of momentum is directly proportional to the force applied and takes place in the direction of force.

For every action there is always an equal but opposite reaction.

The principle of conservation of linear momentum: It states when two or more bodies collide, their total linear momentum remains constant provided no external force is acting.

The principle of moments: It states that when body is in equilibrium the sum of clockwise moments is equal to the sum of anticlockwise moments about the same point.

Archimedes' principle: It states that when a body is wholly or partially immersed in a fluid it experiences an up-thrust equal to the weight of the fluid displaced.

The law of floatation: It states that a floating body displaces its own weight of the fluid on which it floats.

Laws of reflection of light:

Angle of incidence is always equal to angle of reflection.

The incident ray, reflected ray and the normal at point of incidence all lie in the same plane.

Laws of refraction of light:

The incident ray, refracted ray and the normal at point of incidence all lie in the same plane.

The ratio of sine of angle of incidence to sine of angle of refraction is a constant for a ray of light moving from air to any other medium of different optical density.

Snell's law: It states that the ratio of sine of angle of incidence to sine of angle of refraction is a constant for a ray of light moving from air to any other medium of different optical density.

The law of reversibility of light: It states that light will follow exactly the same path if its direction of travel is reversed.

Laws of reflection of wave:

Angle of incidence of the wave is always equal to angle of reflection of the wave.

The incident wave, reflected wave and the normal at point of incidence all lie in the same plane.

Boyle's law: It states that the volume of the fixed mass of a gas is inversely proportional to its pressure provided temperature is kept constant.

Charles' law: It states that the volume of a fixed mass of gas is directly proportional to its absolute temperature provided pressure is kept constant.

Pressure law: It states that pressure of a fixed mass of a gas at constant volume is directly proportional to its absolute temperature.

The law of charges: It states that like charges repel and unlike charges attract each other.

The law of conservation of charge: It states that charge can neither be created nor destroyed but it is transferred from one body to another.

Ohm's law: It states that current flowing through a conductor is directly proportional to the potential difference across its ends provided temperature and other physical factors are kept constant.

The law of magnetism: It states that like poles repel and unlike poles attract each other

Domain theory of magnetism: It states that all magnetic materials are composed of dipoles which are divided into regions and point in different directions.

Right hand grip rule: It states that if the wire carrying current is grasped in the right hand with the thumb pointing in the direction of current then the other fingers will point in the direction of field.

Maxwell's cork screw rule: It states that if the right hand is used to screw a cork screw along the wire carrying current and in the direction of current then the direction of rotation of the screw gives the direction of the field.

Fleming's left hand rule: It states that if the left hand is held with the thumb and the first two fingers mutually at right angles with the first finger pointing in the direction of the field, the second finger in the direction of current then the thumb will point in the direction force

Fleming's right hand rule: It states that if the right hand is held with the thumb and the first two fingers mutually at right angles with the thumb pointing in the direction motion, the first finger in the direction of field then the second finger will point in the direction current.

Faraday's law: It states that the induced emf in coil is directly proportional to the rate of change of the magnetic flux linked with the coil.

Lenz's law: It states that the induced emf flows in a direction so as to oppose the effect causing it

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