Scientific definitions

Mechanics definitions

Physics; is the branch of science that deals with the study of matter in relation to energy.

Matter; matter is anything that occupies space and has weight

Energy; energy is the ability to do work

Fundamental quantities; fundamental quantities are quantities which can not be expressed in terms of other quantities

Derived quantities; derived quantities are quantities which can be expressed in terms of fundamental quantities.

Scalar quantities; scalar quantities are quantities that have magnitude but no direction

Vector quantities; vector quantities are quantities that have both magnitude and direction.

Length; length refers distance between two points irrespective of the path taken.

Time; time refers to the measure of duration of an event

Mass; mass is the quantity of matter an object contains

Area; area is the measure of the surface of an object

Volume; volume refers to the amount of space occupied by an object

Weight; weight is the force a body exerts on anything that freely supports it.

Density; density is the mass per unit volume of an object

Relative density; relative density refers to the ratio of density of a substance to density of water.

Relative density refers to the ratio of mass of a substance to mass of equal volume of water

Relative density refers to the ratio of weight of a substance to weight of equal volume of water.

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

A newton; a newton is a force that gives a body of mass of mass of one kilogram an acceleration of one meter per second squared.

Centripetal force; centripetal force refers to the force that keeps a body moving in a circle and is directed towards the centre of the circle.

Up thrust; up thrust is the upward force acting on a body immersed in a fluid.

Viscous drag; viscous drag is the force that opposes motion of a body immersed in a fluid.

Magnetic force; magnetic force is the pull or push exerted by a magnet.

Electrostatic force; electrostatic force is the pull or push exerted by charged bodies.

Cohesion; cohesion is the force of attraction or repulsion between molecules of the same kind.

Adhesion; adhesion refers to the force of attraction or repulsion between molecules of different kind

Gravitational force; gravitational force refers to the force that pulls bodies towards the centre of the earth

Resultant force; resultant force refers to a single force that has the same effect as two or more forces acting on a body.

Friction; friction refers to the force that opposes relative motion between surfaces in contact.

Static friction; static friction refers to the frictional force between bodies tending to slide against each other.

Dynamic friction; dynamic friction is the frictional force between bodies moving relative to each other.

Coefficient of friction; coefficient of friction refers to the ratio of limiting frictional force to the normal reaction on the body.

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

Work; work is the product of force and distance moved in the direction of force.

A joule; a joule refers to the work done when a force of one newton moves a body through a distance of one meter

Renewable sources of energy; a renewable source of energy refers to the sources of energy that can be reused to produce forms of energy.

Non-renewable sources of energy; refers to the sources of energy that cannot be reused to produce forms of energy.

Kinetic energy; is the energy possessed by the body by virtue of its motion

Potential energy; is the energy possessed by the body by virtue of its position

Mechanical energy; is the energy possessed by the body by virtue of motion and its position in the gravitation field.

Power; is the rate of doing work.

Watt; refers to the rate of working of one joule in one second.

Pressure; is the force acting normally per unit area.

Pascal; Pascal is the pressure exerted when a force of one newton is acting normally on an area of one meter squared.

Atmosphericpressure; is the force acting normally per unit area exerted against the

surface by the weight of the air above that surface.

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

Stiffness; is the ability of a material to resist change of size and shape.

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

Brittleness; is the ability of material to break just after the elastic limit is reached.

Elasticity; is the ability of a material to regain its original size or shape when the applied force is removed.

Plasticity; is the ability of a material not to regain its original size or shape when the applied force is removed.

Strong material; is amaterial that withstands any applied force without breaking

Stiff material; is a material that resists change of size or shape.

Ductile material; is a material that can be hammered,moulded, bent,stretchedannd rolled into different shapes without breaking.

Brittle material; is a material that breaks just after the elastic limit is reached.

Elastic material; is a material that regains its original size or shape when the applied force is removed.

Plastic material; is a material that cannot regain its original size or shape when the applied force is removed.

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

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

Yield point; is the point corresponding to the maximum stress for plastic deformation

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

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

Stress; is the ratio of force applied to the cross sectional area.

Strain; is the ratio of extension to original length of a material.

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

Compression forces; these are forces that bring about particles of matter to be pressed more closely

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

A structure; is a makeup which consists of materials joined together in a particular form.

A beam; is a large straight piece of material used as a support in a structure

A girder; is a piece of material that strengthens the structure

Strut; is a girder under compression

Tie; is a girder under tension

Shear force; is the force needed to fracture the material in a directionparallel to the applied force

Notch; is a cut or a weak point in a given material.

Concrete; 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; is the concrete contained with steelrods.sisalfiber,bamboo strips and wood strands.

Capillarity; is the rise or fall of a liquid in a narrow tube.

Meniscus; is a curve formed on a liquid in a capillary tube.

Surface tension; is a force acting normally per unit length on an imaginally line drawn tangentially on the surface of a liquid.

Diffusion; is the spreading of molecules from a region of higher concentration to a region of low concentration

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

Brownian motion; is the random motion of molecules

Crystal; is a solid substance with a regular form and arranged plane faces.

Crystal cleavage; is the attendance of a crystal material to split along a definite structural planes.

Distance; is the length between two points

Displacement; is the length between two points in a given direction

Speed; is the rate of change of distance moved with time

Velocity; is the rate of change of displacement moved with time

Uniform speed; is the constant rate of change of distance moved with time

Uniform velocity; is the constant rate of change of displacement moved with time

Acceleration; is the rate of change of velocity moved with time

Uniform acceleration; is the constant rate of change of velocity moved with time

Deceleration; is the rate of decease of velocity moved with time

Uniform deceleration; is the constant rate of decrease of velocity moved with time

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

Projectile; is the body moving under the influence of gravity

Trajectory; is the path followed by a projectile

Time of flight; is the time the particle spends in motion

Inertia; is the attendance of a body to remain at rest or keep moving with uniform motion

Momentum; is the product of mass and velocity

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

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

Impulse; is the productof force and time for which it acts on the body

Recoil velocity; is the velocity with which a body moves backwards when an explosion occurs

A machine; is a device that enables the force applied at one point to overcome another force placed at some other point

Load; is the force a machine must overcome

Effort; is the force applied to a machine to overcome the load

Mechanical advantage; is the ratio of load to effort

Velocity ratio; is the ratio of effort distance to load distance

Efficiency; is the ratio of useful work done by the machine to work put into the machine expressed as a machine

A lever; is a type of machine with a rigid capable of turning about a fixed point

First class levers; these are types of levers where the pivot is between the load and the effort

Second class levers; these are types of levers where the load is between the pivot and the effort

Third class levers; these are types of levers where the effort is between the pivot and the load

Pulley; is a wheel with a grooved rim

Single fixed pulley; is a simple pulley system with a rope passing around the groove of a fixed wheel

Single movable pulley; is a simple pulley system with a rope passing around the groove of movable wheel

Block and tackle; 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; is a slope that allows a load to be raised more gradually using a smaller effort.

Wheel and axle; is a machine with a common axis of rotation

Gears; is a type of machine with gears rigidly fixed to the axis and are turned with the axis

Screw; is a type of machine used for holding bodies together

Pitch; is the distance between two successive threads of the screw

Moment; is the turning effectof the force about a fixed point

Moment of a force; is the product of force and the perpendicular distance of the line of action of the force from the pivot

Couple; refers to the two equal and opposite parallel forces whose lines of action do not meet

Centre of gravity; is the point of application of the resultant force due to the earth's attraction to it

Is a point where the body's weight or mass is acting.

Equilibrium; 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; itscentre of gravitydoes not change position relative to the ground.

Stable equilibrium; this is when a body is slightly displaced its centre of gravity

Unstable 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 liquid

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 any point travel in different directions and is not parallel to one another.

LIGHT DEFINITIONS

Light; is a form of energy which is responsible for the sense of sight

Luminous bodies; these are bodies which produce their own light

Nonluminous; these are bodies which don't produce their own light

Incandescentbodies; these are bodies that give off light when hot

Fluorescentbodies; these are bodies that produce light without being hot

Phosphorescentbodies; these are bodies that absorb the incident energy falling on them and emit this energy inform of light

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

Translucent medium; this is the type of medium which allows part 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 path taken by light

A beam; this is the collection of light rays

Parallel beam; this is the collection of light rays which don not meet

Convergent beam; this is the collection of light rays originating from different directions and meet at one point

Divergent beam; this is the collection of light rays originating from one point but travel to different directions.

Rectilinear propagationof light; this is the process by which light travels in a straight line when produced from its source

Shadow; this is an area where light cannot reach

Umbra; is the region of the shadow where no light reaches at all

Penumbra; is the region of the shadow where some light reaches

Eclipse; this occurs when the sun, moon, and the earth are 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 sun and the moon

Annular eclipse; this occurs when the sun is far away from the earth and the moon and the moon is between the sun and the earth

Magnification; is the ratio of size of the image to size of the object

Is the ratio of distance of the image to distance of the image

Reflection of light; is the bouncing off of light from the reflecting surface

Regular/specular reflection; is the type of reflection when a parallel beam of light incident on a smooth surface and is reflected as a parallel beam

Irregular/diffuse reflection; is the type of reflection when a parallel beam of light is incident on a rough surface is scattered in different directions

Incident ray; is the ray of light from the source falling onto the reflecting surface

Reflected ray; is the ray of light which bounces off from the reflecting surface

Refracted ray; is the path along which light travels in another medium after changing direction

The normal; is the line perpendicular to the reflecting surface

Angle of incidence; is the angle between the incident ray and the normal at the point of incidence

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

Angle of refraction; is the angle between the refracted ray and the normal at the point of incidence

Glancing angle; is the angle between the incident ray and the reflecting surface at the point of incidence

Angle of deviation; is the angle between the original direction of the ray and the reflected ray at the point of incidence

Deviation; is the change of direction of the ray on striking the reflecting or refracting surface

Centre of curvature; is the centre of the sphere of which the mirror forms a part

Radius of curvature; is the distance between the centre of curvature and the pole of the mirror

Pole of the mirror; is the centre point of the mirror

Aperture of the mirror; is the width of the mirror

Principal axis of the mirror; is the line joining the centre of curvature to the pole of the mirror through its principal focus

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

Focal length of the mirror; is the distance between the principal focus and the pole of the mirror

Virtual image; is the image formed by apparent intersection of rays

Real image; is the image formed by actual intersection of rays

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

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

Total internal reflection; is a phenomenon which occurs when light is travelling from a denser medium to a dense medium and the angle of incidence is greater than the critical angle

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

Lens; is a spherical surface of transparent material

Principal axis of the lens; is the line joining the principal focus to the optical centre of the lens

Optical centre of the lens; is the centre point between the poles of the lens

Poles of the lens; these are centre points of the surfaces of the lens

Principal focus of the lens; 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; 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; 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; is the distance between the principal focus and the optical centre of the lens

Power of the lens; is the reciprocal of the focal length of the lens in metres

Optical instruments; these are instruments that change the visual angle

Visual angle; is the angle subtended by an object

Accommodation; this is changing of the focal length of the eye to focus the imageof an object

Short sightedness/myopia; is a defect of the eye whereby a person cannot see far objects clearly but can see nearby objects clearly

Long sightedness/hypermetropia; is the defect of the eye where a person cannot see nearby objects clearly but can see far objects clearly.

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

Dispersion; is the splitting of white light into its constituent colours by the prism

Spectrum; is the band of colours of white light formed on the screen after passing through the prism

Pure spectrum; is the spectrum formed by the prism when colours don not overlap each other

Rain bow; 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; is a transparent material which absorbs other colours but allows its own colour to pass through it

WAVE DEFINITIONS

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

Oscillation; is a to and fro movement

Frequency; is the number of complete cycles made in one second

Period; is the time taken to complete one oscillation

Hertz; is the frequency of one oscillation made in one second

Amplitude; is the maximum displacement of a particle from the rest position

Crest; is the upward displacement of a particle from the rest position

Trough; is the downward displacement of a particle from the rest position

Wave length; is the distance between two successive crests or troughs

Wave form; is the shape of a wave

Phase; is the time of the wave in comparison with another wave

Wave front; is the line/ section taken through an advancing wave in which all particles are in phase

Mechanical wave motion; 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 risedue to heat energy

Ultraviolet light; these are radiations that cause certain metal surfaces to emit electrons and photosynthesis in green plants

Progressive waves; these are waves which carry energy away from the source

Transverse waves; is a wave where the direction of travel of the particles is perpendicular to the direction of travel of the wave

Longitudinal wave; is a Wave in which the direction of travel of the particles is parallel to 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; is the wave formed when two progressive wave 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

Reflection of waves; is the bouncing off of waves when they meet the barrier

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

Diffraction of waves; is the spreading of waves of the same speed, frequency and wavelength around a barrier

Interference; is the effect which occurs when two waves of the same speed, frequency and wave length moving in the same direction meet

Constructive interference; is a type of interference which occurs when a crest of one wave meets a crest of another wave

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

Sound; is a form of energy produced when particles of the medium are set into vibrations

Echo; is the reflected sound

Reverberation; is the prolonged sound

Ultrasonic sound; 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; sound with regular and uniform frequency

Noise; is sound produced bysources of vibrating at irregular frequencies

Pitch of sound; is the sharpness or mildness of the musical note

Loudness of sound; is the sensation of the musical note in the mind of an individual

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

Intensity; is the rate of flow of energy per unit area perpendicular to the direction of sound

Fundamental note; is the lowest musical note produced by any musical instrument

Fundamental frequency; 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

Overtones; 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; is the form of energy which flows from one point to another due to temperature difference

Temperature; is the average kinetic energy of the molecules in the body

Thermometric property; is a physical property which changes continuously and linearly with change in temperature

Fixed point; is the temperature at which a physical change is expected to occur

Lower fixed point; is the temperature of ice- water mixture

Upper fixed point; is the temperature at which steam and water exist in equilibrium

Scale of temperature; is the scale used to measure the degree of hotness or coldness

Heat transfer; is the transition of heat from a hot region to a cold region

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

Convection; 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; is the transfer of heat from one place at a high temperature to another of low temperature by means of electromagnetic waves

Green house effect; 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 daytime

Land breeze; this is warm air which blows from inland

Thermal expansion; is the increase in size of matter in all directions when matter is heated

Biometric strip; this is formed when two metals of different expansivity are riveted together

Heat capacity; is the heat required to raise the temperature of a body by one Kelvin

Specific heat capacity; is the heat required to raise the temperature of one kilogram mass of a body by one Kelvin

Calorimetry; is the method used in measurement of heat flow

Latent heat; is the heat required to change the heat of a substance without change in temperature

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

Latent heat of vaporization; heat required to change the state of a substance from liquid to vapor without change in temperature

Specific latent heat; is the heat required to change the state of one kilogram mass of a substance without change in temperature

Specific latent heat of fusion; is the heat required to change the state of one kilogram mass of a substance from solid to liquid without change in temperature

Specific latent heat of vaporization; is the heat required to change the state of one kilogram mass substance from liquid to vapor

Gas; is the state of a substance above its critical temperature

Ideal gas; is a gas whose intermolecular forces of attraction or repulsion are negligible

Real gas; is a gas whose intermolecular forces of attraction or repulsion are not negligible

Absolute zero temperature; is the temperature at which the molecules of the gas have minimum kinetic energy

Triple point of water; is the temperature at which pure water,pure melting ice and saturated vapor exist at equilibrium

Vapour; is the mass of liquid drops in air

Saturated vapour; is the vapor which is in dynamic equilibrium with its own liquid

Unsaturated vapour; is the vapor which is not in dynamic equilibrium with its own liquid

Saturated vapour pressure; is the pressure exerted by the vapour which is in dynamic equilibrium with its own liquid

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

Evaporation; is the escape of molecules of the liquid from its surface

Boiling; is the process which occurs when the saturated vapour pressure is equal to external pressure

Boiling point; is the temperature at which the saturated vapour pressure is equal to external pressure

Freezing; is the process that occurs when a substance changes from liquid to solid state at constant temperature

Freezing point; is the temperature at which a substance changes from liquid state to solid state

Melting; is the process which occurs when a substance changes from solid to liquid state at constant temperature

Melting point; is the temperature at which a substance changes from solid state to liquid state

Dew point; is the temperature at which air is saturated with water vapour

ELECTRICITY DEFINITIONS

Electrostatic electricity; is the study of electric charges at rest

Current electricity; is the study of electric charges in motion

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

An insulator; is a substance in which electrons are not free to move and do not conduct electricity easily

Electrostatic induction; 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; is an area around a charge where an electric force is experienced

Electric flux; is the number of electric field lines

Electric field line; is the line drawn such that its direction at any point is the direction of electric field line at that point

Neutral point; is an area with no electric field lines

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

An electrolyte; is a substance when in solution or molten form conducts electricity

Primary cell; is a cell which cannot be renewed when exhausted

Secondary cell; is a cell which can be renewed when exhausted

Polarization; 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

Charge; is the quantity of electricity that passes any section of aconductor

Charge density; is charge per unit density

A coulomb; 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; is the electrical discharge brought about by ionization of air surrounding a charged conductor

Current; is the rate of flow of charge

Ampere; is the current which when flowing in two long straight parallel conductors

placed one metre apart produces a force between them

Resistance; is the opposition to the flow of current within a conductor

An ohm; 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; is the work done to move one coulomb of charge from one end to another

A volt; 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); is the work doneto move one coulomb of charge from one point to another in a circuit in which a cell is connected

Internal resistance of a cell; is the opposition to the flow of current in a cell

Electrical energy; is the work done on an electrically charged particle by an electric field

Electrical power; is the rate of charge of electrical energy

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

Switch; is a device used for connecting and disconnecting the current

Fuse; is a device which cuts off current if too much flows

Short circuit; this occurs when the positive terminal is connected to the negative terminal

MODERN PHYSICS

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

Atomic number; is the total number of protons in the nucleus of an atom

Atomic mass/mass number; is the total 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 number

Isotopy; is the existence of an element in more than one form

Radioactivity; is the spontaneous disintegration of unstable nucleus to form a stable nucleus with emission of radiations

Alpha particle; is a high speed helium nucleus

Beta particle; is a high speed electron emitted from the nucleus of radioactive atom

Gamma ray; is a high electromagnetic radiation of very short wavelength emitted from the nucleus of a radioactive atom

Radioactive decay; is a spontaneous breakdown of radioactive nuclide with emission of radiations

Transmutation; is the change of an element into another element

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

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

Activity; is the number of disintegrations per second

Half-life; is the time taken by a radioactive material to decay to half its original mass

Thermionic emission; is the process by which electrons are emitted from a metal surface with application of heat energy

Photoelectric emission; is the process by which electrons are emitted from the metal surface when exposed to radiations

Diode; is an electrical device that conducts electricity in only one direction

Rectifier; is an electrical device that converts alternating current to direct current

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

Full wave rectifier; is an electronic circuit in which both half cycle of incoming alternating current changes to direct current output

Rectification; is the process of changing alternating current to direct current by use of a diode

Half wave rectification; is he process by whichone half cycle of incoming alternating current is converted to direct current output

Full wave rectification; is the process by which both half cycles of incoming alternating current are converted to direct current output

Cathode rays; these are fast moving electrons

Cathode ray oscilloscope; is a device used to study current and voltage wave forms

Time base; 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 wave length 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 applied

MAGNETIC DEFINTIONS

A magnet; is a piece of metal that attracts other metals

Ferro magnetic substance; these are substances which are strongly attracted by a magnet

Diamagnetic materials; these are magnetic material that are slightly repelled by a magnetic field

Paramagnetic materials; these are materials that are slightly attracted by the magnetic field and the material and the material does not retain the magnetic properties when the external field is removed

Non-Ferro magnetic materials; these are substances which are not attracted by a magnet at all

A pole of a magnet; is an area on a magnet where the magnetic force is strongest

Magnetic field; is the area around a magnet where the magnetic force is experienced

Magnetic field line; is the path a magnetic pole follows if it is placed in a magnetic field

Magnetic flux; is the number of magnetic field lines

Magnetism; 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; is the point where a magnetic substance cannot be magnetized

Neutral point; is an area where the resultant magnetic force is zero

Geographical meridian; is the vertical plane which passes which passes through the earth's geographical pole

Magnetic meridian; is the vertical plane in which a freely suspended magnetic needle sets itself

Angle of declination; is the angle between the geographical meridian and the magnetic meridian

Angle of dip; 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 don not retain their magnetism

Hard magnetic materials; these are materials which are difficult to magnetize and retain their magnetism for a long time

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

Induced magnetism; is the process of magnetizing a magnetic material temporally by induction

Demagnetization; is the process by which randomly arranged molecular magnets of a magnet are made to point in different directions

Electro magnet; 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; is the deflection per unit current

Voltage sensitivity; is the deflection per unit voltage

Electromagnetic induction; is the process by which an electric current is induced in a coil due to change in magnetic flux linking the coil

Moving coil galvanometer; is a device used to detect small currents and potential differences

Self- induction; is the process by which an emf is induced due the change of current in the coil itself

Mutual induction; is the process by which an emf is induced in the coil due to change of current in the nearby coil

A generator; is a device that converts mechanical energy into electrical energy

An electronic motor; is a device that converts electrical energy into mechanical energy

Ac transformer; is a device used to increase or decrease an alternating voltage

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

Step down transformer; 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; is a resistor of very high resistance

A shunt; 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 is independent of the relative velocity of the two surfaces in motion
- ✔ Frictional force always opposes relative motion
- ✔ Frictional force is directly proportional to the normal reaction

The principle of conservation of energy 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) states that pressure applied at any point of an enclosed fluid is transmitted equally throughout the whole fluid

Hooke's law; states that the force applied to an elastic material is directly proportional to

the extension produced provided the elastic limit is not exceeded

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

Newton's laws of motionstates that;

- ✔ Everybody continues in its state of rest or uniform motion in a straight line unless acted upon by an 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; states that when two or more bodies collide, their total linear momentum remains constant provided no external force is acting

The principle of moments; states that when a body is in equilibrium the sum of clockwise moments about any point is equal to the sum of anticlockwise moments about the same point

Archimedes principle; 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 laws of floatation; states that a floating body displaces its own weight of the fluid on which it floats

Laws of reflection of light; states that;

- ✔ The incident ray, normal and the reflected ray at the point of incidence all lie in the same plane
- ✔ The angle of incidence is always equal to the angle of reflection

Laws of refraction; states that;

- ✔ The incident ray, the normal and the refracted ray at the point of incidence all lie in the same plane
- ✔ The ratio of the sine of the angle of incidence to the sine of the angle of refraction is a constant for light moving from one medium to another of different optical densities (snell's law)

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

Laws of reflection of wave; states that;

- ✔ The angle of incidence of the wave is always equal to the angle of reflection of the wave
- ✔ The incident wave, the normal and the reflected wave at the point of incidence all lie in the same plane

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

Charles's law; states that volume of a fixed mass of a gas is directly proportional to the

absolute temperature provided pressure is kept constant

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

The law of charges; states that like charges repel while unlike charges attract

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

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

The law of magnetism; states that like poles repel while unlike poles attract

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

Right hand grip rule; 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 the field

Fleming's left hand rule; states that if the left hand is held with a 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 of force

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

Faraday's law; states that the induced electromotive force in the coil is directly proportional to the rate of change of the magnetic flux linked with the coil.

Lenz's law; states that the induced electromotive force flows in a direction so as to oppose the effect causing it