



ALIGARH COLLEGIATE

COACHING CENTRE & CAREER BUILDING INSTITUTE

JAIL ROAD CAMPUS: 11, Hyderabad Colony, Jail Road, Karachi ☎ 34120891 - 35421577

JINNAH CAMPUS: A-25, Hyderabad Colony, New M. A. Jinnah Road, Karachi ☎ 34913284

HEAT

HEAT

Something which passes from the flame onto the body and makes the body hot is called. Heat According to mechanical (molecular) theory, heat is a form of energy associated with molecular motion.

TEMPERATURE

The degree of hotness or coldness of a body. It determines the direction of flow of heat from one body to another when they are placed in contact.

Thermometer

It is a device used to detect and measure temperature. It uses that physical property of matter which changes uniformly with temperature

Internal Energy or Thermal Energy

The sum total of translational, rotational and vibrational kinetic energies of all the molecules (or atoms) of the object is called internal energy or thermal energy.

Coefficient of Linear Expansion

When thermal expansion takes place in one dimension, it is called linear expansion. The fractional increase in length per $^{\circ}\text{C}$ (K) rise in temperature is called coefficient of linear.

Coefficient of Volume (cubic) Expansion

When thermal expansion takes place in all dimensions, it is called volume or cubical expansion. The fractional increase in volume per $^{\circ}\text{C}$ (K) rise in temperature. It is expressed in $^{\circ}\text{C}^{-1}$ or K^{-1} .

Entropy

Entropy is the measure of disorder in the molecular arrangement of the system.



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ELECTROSTATICS

Coulombs is that charge which repels an equal and similar charge placed in air at a distance of one metre with a force of 9×10^9 N.

ELECTRIC FIELD

The spherical region or space around a point charge within which other charges are influenced or affected.

Electric field intensity

The Electric field intensity at a point (within the field) is the magnitude of force experienced by a unit positive charge placed at that point.

ELECTRIC FLUX

It is defined as the total number of electric lines of force passing normally through a given surface. The surface may be open or closed. For closed surface outward flux is taken positive and inward flux is taken negative.

Potential Difference

The potential difference between two points is equal in magnitude to the work done in moving a unit positive charge from one point to another against the electric intensity.

ABSOLUTE POTENTIAL

Absolute potential at a point is equal in magnitude to the work done in moving a unit positive charge from infinity to that point against the electric intensity.

CAPACITORS

A device used to store charge is called a capacitor or a condenser.



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CURRENT ELECTRICITY

ELECTRICAL CONDUCTORS

These are the substances which offer minimum opposition to the flow of the current.

ELECTRICAL INSULATORS

These are the substances which offer maximum opposition to the flow of current.

DIELECTRICS

All the electrical insulators are called dielectrics when we consider their polarizability or electric influence passing through them.

ELECTRIC CURRENT

Charge in motion constitutes electric current. It is defined as the rate of flow of charge.

ELECTROMOTIVE FORCES

Work done in carrying positive charge of one coulomb through the source of emf or one around circuit.

MAGNETISM AND ELECTROMAGNETISM

MAGNETIC INDUCTION

The magnetic force on a unit positive charge moving perpendicular to constant magnetic field with a unit velocity.

MAGNETIC FLUX AND FLUX DENSITY

The magnetic flux is the total number of lines of magnetic induction or magnetic force passing normally through a given area. The Lines of magnetic induction passing normally through a unit area or magnetic flux per unit area is called flux density.



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ELECTROMAGNETIC INDUCTION

The production of induced current and induced emf in circuit when a changing magnetic flux cuts the circuit is called electro magnetic induction.

MOTION ELECTROMOTIVE FORCE

The work done in moving a unit positive charge from one end to the other end of the conductor while the conductor is being moved across a magnetic field is the measure of motion emf.

SELF INDUCTION

If current passing through the coil is changed by varying circuit resistance with a rheostat, a changing magnetic flux cuts the coil itself and causes an induced emf in the coil. Such an emf is called self induced emf and the phenomenon is known as self induction.

DIRECT CURRENT (D.C)

Such currents which always flow in the same direction (i.e. from positive to negative terminals of the source) are called direct currents or D.C.

ALTERNATING CURRENT (A.C)

Such currents which reverse their direction several times in a second are called alternating current or A.C.

Transformer

It is device to step up or step down an A.C. voltage. A transformer which steps up the A.C. voltage is called step up transformer. A transformer which steps down the A.C. voltage is called step down transformer.

ELECTRICAL MEASURING INSTRUMENT

MOVING COIL GALVANOMETER

A device used to measure and detect small currents is called a galvanometer.

AMMETER

It is a modified form of Weston-type moving coil galvanometer used to measure large currents.



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VOLTMETER

It is a modified form of Weston-type moving-coil galvanometer used to measure potential difference or voltage drop.

POST OFFICE BOX

It is a part of a Wheatstone bridge. It is used to determine unknown resistance accurately. Since it was originally used for measuring resistance of telegraph wires, it was called Post Office Box.

AVOMETER

It is a device designed for the measurement of current through a circuit, potential difference across a circuit and the resistance of a conductor.

ELECTRONICS

n – TYPE SEMICONDUCTOR

If pure Ge is doped with pentavalent impurity such as antimony we get excess of free electrons. A semiconductor doped in this way is called n-type material.

p – TYPE SEMICONDUCTOR

If pure Ge is doped with trivalent impurity such as indium (In) we get excess of holes. A semiconductor doped in this way is called p-type semiconductor.

RECTIFICATION

It is the process for converting A.C. wave form into D.C. waveform.

RECTIFIER

It is a device used to convert A.C. wave form into D.C. waveform [or unidirectional voltage and current]. A p-n junction or a semiconductor diode possesses this ability.

ELECTROLUMINESCENCE

A process in which electric energy is converted into light energy is called electroluminescence. It forms the basis of light emitting diodes (LED).



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TRANSISTOR

The name transistor comes from the original from the original name transfer resistor.

AMPLIFICATION

The process to convert low voltage or current signals into higher voltage or current signals is called Amplification.

MODERN PHYSICS

INERTIAL FRAME OF REFERENCE

A frame of reference which is either at rest or unaccelerated and non-rotating is called an inertial frame of reference.

NON-INERTIAL FRAME OF REFERENCE

An accelerated frame of reference is called a non-inertial frame of reference.

BLACK BODY

A body which completely absorbs all the radiation incident on it or which behaves like a perfect radiator is called a black body.

BLACK BODY RADIATION

The cavity acts as an isothermal enclosure and radiation from such a cavity radiator is called black body radiation or temperature radiation or full radiation.

PHOTO ELECTRIC EFFECT

The ejection of electrons from metal surface by light is called Photo Electric Effect.

PAIR PRODUCTION

The phenomenon in which a photon disintegrates into an electron-positron pair one striking a heavy nucleus is called pair production. The role of heavy nucleus is to conserve both energy and momentum. The process of pair production is also called materialization of energy.



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THE ATOMIC SPECTRA

EMPIRICAL OBSERVATION ON HYDROGEN SPECTRUM

When the excited hydrogen atoms return to their ground state, they emit energy in the form of spectrum called Emission spectrum.

EXCITATION AND IONISATION, POTENTIAL ENERGIES

The energy needed to move an electron from its ground state to an excited state is called excitation energy & potential at that instant is called Excitation Potential of the atom. Ionisation energy is equal to the numerical value of ground state energy of the electron to be knocked out. The corresponding value of P.D is called ionization Potential.

THE ATOMIC NUCLEUS

ISOTOPES

The nuclei of the same elements having the same number of protons but difference number of neutrons are called isotopes. The nuclei of the same elements having the same atomic number Z but different mass number A are called isotopes.

MASS DEFECT (MASS DEFICIT)

Investigation on atomic the difference in theoretical & Experimental value of mass of nuclei is called mass defect masses have shown that they are not whole number but fractional in nature.

PACKING FRACTION

The mass defect per nucleon is called packing fraction defined by:

$$\text{Packing fraction} = \frac{M - A}{A}$$

NATURAL RADIOACTIVITY

It is the self disintegration of elements having atomic number greater than 82. It is a prolonged phenomenon. The substance which possess this property and



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are found in nature are called natural radioactive substances. This activity of natural radioactive substances is called natural radioactivity.

NUCLEAR REACTIONS

The process in which nucleons are added to or removed from or rearranged within a target nucleus are called nuclear reactions.

NUCLEAR FISSION

The process in which heavy nucleus splits up into two intermediate nuclei with release of energy is called Nuclear Fission.

BREEDING AND BREEDING REACTOR

The process of producing fissionable material from some non-fissionable material is called breeding and a device which performs this function is called breeder reactor.

NUCLEAR FUSION REACTION

It is the process in which lighter nuclei combine to form a heavy nucleus with release of energy. This energy is called thermo nuclear energy.

NUCLEAR RADIATION

RADIATION DETECTORS

A radiation detector is a device used to distinguish different radiations from the intensity of ionization they produced on passing through matter.