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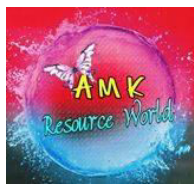
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Science Bit Bank

MAGNETISM AND ELECTRICITY

- The natural ore of magnet is Magnetite
- The first person to make scientific study of magnets is William Gilbert
- The freely suspended magnet comes to rest in North and South direction
- The free ends of a magnet where attraction is maximum are called Poles of the magnet
- Like poles of the magnet Repel each other
- Unlike poles of the magnet attract each other
- The area in which magnetic force is present and magnetic effect is felt is Magnetic field
- The lines used to represent magnetic field are called Magnetic lines of Force
- The magnetic field strength decreases as substance moves away from the source
- The substances that are attracted by a magnet are called Magnetic substances
- The substances that are not attracted by magnet are called Non Magnetic substances
- An example for Diamagnetic element is Bismuth
- An example for Diamagnetic compound is Benzene
- An example for Paramagnetic non metal is Oxygen
- An example for Paramagnetic metals is Magnesium
- An example for Ferromagnetic substance is Iron
- The first theory that made a attempt to explain the phenomenon of Magnetism is Molecular theory
- The kinetic energy of the molecular magnet increases as when heated
- The ability of paramagnetic substances increases magnetism as we cool it
- An one of the method of making artificial magnets is Mechanical Magnet
- The temporary magnets are called as electromagnets

- Magnetic resonance imagery technique uses the principle of Magnetism
- The average speed of Magnetic levitation trains is 500km/h
- The best form of the energy is electrical energy
- The unit of measurement of electricity in the SI system is Joule
- The SI unit of Electric Power is Watt
- If p is power, E is energy and t is time is expressed by the formula $P = E/t$
- The unit used to measure electricity used for commercial purpose is Kilowatt hour(KWh)
- The presence of magnetic field around the current carrying conductor was discovered by Henry Christian Oersted
- The alloys of Fuse wire are Lead and Tin
- The protective device that is based on the heating effect of electric current is Fuse
- The substances which does not allow the current to flow through them are Insulators
- The substances that allow the current to flow through them in liquid form are electrolytes
- The substances that does not allow the current to flow through them even in aqueous solution is called Non electrolytes
- 1 Kilowatt hour is equal to 3600000 joules
- The device that converts chemical energy into electrical energy is called Electric Cell
- CFT stands for Compact Fluorescent Tube
- An example for Dry cells is Nickel Cadmium cells
- The magnets that are prepared in the laboratory are called Artificial Magnets
- The iron fillings on the magnet cling more at the Poles of Magnet
- The strength of the magnet decrease when it is heated strongly
- An example for a magnetic substance is Iron
- An example for a non magnetic substance is Paper
- The weakest of all types of Magnetism is Diamagnetism
- The substance that get weakly magnetized when placed in a magnetic field, in a direction opposite to the direction of the magnetic field are called Diamagnetic substances
- The substances that exhibit weak magnetism due to an external magnetic field in the direction of the magnetic field itself are called Paramagnetic substance

- The substances which are easily magnetized by external magnetic fields are called Ferromagnetic substances
- A device that converts electrical energy into heat energy is Electric iron
- A device that converts electrical energy into light energy is Flourescent Lamp
- A device that converts electrical energy into sound energy is Loud speaker
- The energy can neither be created nor destroyed but can be converted from one form to another is called Conservation of Energy
- In how much time does an electric fan of 60W, use 3000J of energy is 50s
- The energy used in 1min by a device that is rated 40W is 2400J
- A bulb consumes 1500J of electrical energy in 25s, the power is 60W
- A 40 bulb is used daily for 5 hours, the electricity used in one month is 6kwh
- The phenomenon in which a substance undergoes a chemical change due to the flow of electricity through it is called Chemical effect of Electric current
- An example for electrolytic substance is Sodium Chloride
- An example for non electrolytic substance is Kerosene
- A safety device used in electric circuit in order to prevent damage to the circuit and appliances is Electric Fuse
- A electric field works on the principle of heating effect of electric current
- An electric bulb works on the principle of heating effect of electric current
- An electric lamp of 25 W uses 25 joules of energy in one second
- The type of magnet is used in an electric bell is Electromagnet
- The pole of the magnet that shows northern direction is North pole
- The pole of the magnet that shows southern direction is South pole
- An electrolyte used in a dry cell is Ammonium Chloride
- The soft iron pieces used to preserve magnets called Keepers
- The two metals that are Paramagnetic magnet are Magnesium and Platinum
- The substance that is filed in the bulb to give it long life is Nitrogen
- The space between the layer and walls of zinc can is filled with paste of Ammonium Chloride in Dry Cell
- The two methods of preparing artificial magnets are Mechanical and Electrical method
- The substance that is used to temporarily magnetize by electrical method is Steel rod
- The instrument used to measure the electric flow of current is Ammeter

- The flow of electric charges is called Electric Current
- The SI unit for measuring the quantity of Electrical charges is Coulomb
- One coulomb = 6.3×10^{18} electrons
- The work done in bringing a unit positive charge from infinity to a point in the electric field is Potential at that point.
- The SI unit of electrical potential at any point is Joule / Coulomb
- The amount of work done in moving a unit positive charge from one point to another is Potential difference
- The SI unit of potential difference is Volt
- The instrument used for measuring electric current is Ammeter
- The SI unit of electric current is Ampere
- A path along which electric current flows is Electrical Circuit
- The formula to find the potential difference is $V = \frac{W}{Q}$
- The formula to find Electric current is $I = \frac{Q}{t}$
- The energy required to maintain potential difference between ends of a conductor is Electromotive Force
- The property of conductor to obstruct the flow of electrons through it is Electric resistance
- The SI unit of electric resistance is Ohm
- The value of V / I is a constant
- The relation between current and potential difference is $V = RI$
- A potential difference of 20V is applied across the end of a resistance 5Ω then the amount of current is 4 ampere
- A resistance of 20Ω has a current of 2 ampere flowing in it the potential difference between its ends is 40V
- A current of 5 ampere flows through a wire whose ends are at a potential difference of 3V then the resistance is 0.6Ω
- An iron box is used in an electrical circuit having a voltage of 220V if a current of 3.5 ampere flows through it then the resistance of Iron box is 62.8Ω
- The rate at which work is done by the electrical energy is Electrical Power
- One horse power = 746 watts
- The energy consumed in units when a radio marked 60W is used for 50 hours is 3 units

- The current that flows in single direction is Direct current
- The current that changes its direction of flow at regular intervals of time is called Alternating current
- A device that converts mechanical energy into electrical energy is called Dynamo
- A device that converts electrical energy into mechanical energy is called Electric Motor.
- A dynamo that produces alternating current is called AC Dynamo
- A dynamo that produces direct current is called DC dynamo
- An electric motor, which works on direct current, is called DC Motor.
- The rotating part of a dynamo or motor is called Armature.
- The source of electrical energy required to produce an electric current in the circuit is called Electromotive force.
- The SI unit of electromotive force is called Volt.
- Michael Faraday discovered the phenomenon of Electromagnetic induction.
- Electromagnetic Induction is the working principle of a dynamo.
- The device that detects electric current in a circuit is called Galvanometer.
- The emf induced in electromagnetic induction does not depend upon the Length of the magnet.
- In electromagnetic induction the induced emf is directly proportional to the rate of change of magnetic field linking to the conductor.
- The dynamo rule was discovered by John Ambrose Fleming
- Dynamo rule discovered by Fleming is used to find the direction of motion of coil when the directions of induced current and the direction of the magnetic field are known.
- A Commutator is used in a DC dynamo to change the direction of the current induced in the coil
- The induced emf produced when a magnet is inserted into a coil does not depend upon the resistance of coil
- To induce an emf in a closed coil, the magnetic flux linked with it must change
- Electromagnetic induction is a phenomenon in which an emf is induced in a coil when lines of force of a magnetic field linked with the coil changes.
- The two ends of a coil are connected to the terminals of a galvanometer, if a magnet is pushed in the coil; the galvanometer shows a momentary deflection.

- The mechanical force on a current carrying conductor in a magnetic field is highest when the direction of current flows through the conductor is perpendicular to the direction of magnetic field.
- The type of current that can be transformed over very long distance easily is Alternating current.
- The AC supplied to our homes has a frequency of 100 hertz. This means the armature of the generator producing the current rotates 50 times per second.
- While applying the motor rule we use the first three fingers of the left hand only.
- While applying the dynamo rule we use the first three fingers of the right hand only.
- The current induced in the coil of a dynamo changes for every half rotation of the armature.
- The type of magnet used in Faradays experiment is bar magnet.
- The SI unit of potential difference is Volt.
- The cloth used in between the twines in Faradays Experiment is Calico cloth.
- The main finger in the dynamo rule indicates the direction of motion of the conductor.
- The central finger in the dynamo rule indicates the direction of the induced current.
- The Forefinger in the dynamo rule indicates the direction of magnetic field.
- The Fleming's right hand rule is also called as Dynamo Rule.
- The main finger in the motor rule indicates the direction of mechanical force.
- The central finger in the motor rule indicates the direction of electric current.
- The forefinger in the motor rule indicates the direction of magnetic field.
- The Fleming's left hand rule is also called as Motor Rule.
- Two equal and parallel forces acting on a body at two different points in opposite directions constitute a Couple.
- An electric current passing through a conductor produces the magnetic field around it.
- The metal that Faraday used to construct insulated wire is copper.
- The direction of wave propagation is perpendicular to the planes of electric and magnetic fields.
- The induced emf in a coil increases as the number of turns of the increases.
- According to Faraday's second law the induced emf is proportional to the rate of change of the magnetic field.

- The scientist who discovered that a magnetic field produces an electric field around it is Michael Faraday.
- In electric motor, the current flows in one direction.
- When a magnet is moving relative to a coil of conductor the rate of change of magnetic field depends on the speed of the magnet.
- The law that gives the relationship between the directions of magnetic field, induced current and the direction of motion of the coil is Fleming's right hand rule.
- The law that gives the relationship between the direction of magnetic field, electric current and the direction of mechanical force is Fleming's left hand rule.
- The electric current supplied to our homes and industries is Alternating current.
- The device that helps the current to flow in the external circuit in the same direction is called Commutator.
- When a magnetic field linking with a circuit changes an emf will be induced in the circuit this phenomenon is called Electromagnetic Induction.
- The frequency of Ac supplied for domestic use is Fifty cycles per second
- Relative motion between the conductor and the magnet produces the electric field
- The best method of getting maximum emf during electro magnet induction is by increasing the rate of change of magnetic field linked to the conductor.
- Rotating part of a dynamo is called Armature
- The nature of couple is tends to rotate the body
- DC dynamo speed is increased by increasing magnetic field
- A conductor carrying current is kept in a magnetic field then it forms an external circuit.
- Electromagnetic radiations of frequency higher than that of radio waves and lower than that of visible light is called Infrared radiation.
- Electromagnetic radiation of frequency higher than visible light and lower than that of X rays is called Ultraviolet radiation.
- Electromagnetic waves having the wavelength from 0.2 mm to about 10cm are called Microwaves.
- The phenomenon of spontaneous emission of electrons by a metal surface when it is irritated with photons is called Photoelectric effect.

- The emission of a photon on its own by an excited atom when it is stimulated by another photon is called Stimulated emission.
- The emission of a photon on its own by an excited atom, which occurs, spontaneously is called Spontaneous emission.
- The process of increasing the proportion of atoms in higher energy state is called Population inversion.
- The device that produces the high intensity monochromatic light is called LASER.
- If f is the frequency and λ is the wavelength then the velocity of the wave ' v ' is given by $v = f\lambda$.
- The speed of light in empty space is $3 \times 10^8 \text{ ms}^{-1}$
- The SI unit of wavelength is metre 'm'
- The SI unit of frequency is Hertz 'Hz'
- The wavelength of visible light extends from 400nm to 750nm
- 1 nanometer = 10^{-9} meter
- 1 angstrom = 10^{-10} meter
- Ultraviolet rays were discovered by J.W. Ritter in 1801
- Infrared spectroscopy is used to study the composition and structure of molecules in a compound
- Infrared radiations were discovered by William Herschel in 1800
- X rays were discovered by William Roentgen in 1895
- The diagnostic technique of studying an object with the help of its photographic image taken using high frequency waves like X rays is called Radiography.
- High energy electromagnetic radiations of frequency higher than those X rays are called gamma rays
- The value of Planck's constant is equal to $6.626 \times 10^{-34} \text{ Js}$
- A quantum of electromagnetic radiations such as light is called Photon
- Einstein used Max Planck theory to explain the phenomenon of Photoelectric effect.
- A device that converts light energy into electrical energy by using photoelectric effect is called Photoelectric Cell
- LASER stands for Light Amplification by Stimulated Emission of Radiation
- The energy incident on unit area in one second is called Power density.
- The power density of Laser light is 10^8 W/cm^2

- The process of increasing the number of atoms in excited state by supplying them with energy from an external source is called Optical pumping.
- Laser works on the principle of amplification of light stimulated emission of radiation.
- The technique of determining the distance between two objects using laser light is called Laser Ranging.
- The process of sending and receiving messages with the help of laser light using optical fibers is called Optical communication.
- Vitamin D is synthesized in our body with the help of low frequency ultraviolet rays.
- The electromagnetic waves used in radio and television transmission are radio waves.
- The only pair, which does not overlap in the complete electromagnetic spectrum, is Visible light and Radio waves.
- The range of wavelength of electromagnetic waves varies from about 10^{-15} to 100km.
- Electromagnetic waves having wavelength from about 0.2mm to about 10cm are known as microwaves.
- The frequencies in the visible region of the electromagnetic spectrum lie between those of Ultraviolet and Infrared rays.
- Electromagnetic waves used as carrier waves in radio broadcasting and telecasting are known as Radio waves.
- According to Planck's law the energy of a photon is directly proportional to its frequency.
- Carrier waves used in television broadcasting have frequency of $<10^9$ Hz.
- The quantum theory of light was developed to explain the phenomenon of spectrum of black body radiations.
- The energy E of a photon of frequency ν is given by $E = h\nu$
- The phenomenon of photoelectric effect was correctly explained by Einstein
- Ultraviolet radiations emitted by the sun are observed by Ozone in the atmosphere
- Gamma rays has the highest power of penetration through the matter
- If the frequency of the incident photon is increased, the kinetic energy of the photoelectron will increase
- The photoelectric effect cannot occur when the frequency of the incident photon is below a certain minimum.
- Einstein was awarded noble prize for his explanation about photoelectric effect.

- A photon of energy E falls on a metal and causes the emission of an electron from the metal. How many electrons are emitted from the metal surface if the incident photon has energy $6E$? Only one electron.
- Photoelectrons are emitted from a metal surface when the metal is irradiated with photons of suitable frequency.
- When the frequency of the incident photon is equal to the threshold frequency., the kinetic energy of the photoelectron will be Zero
- Photoelectric effect establishes that electromagnetic radiations consist of packets of a definite quantity of energy.
- The strength of the photoelectric current depends upon the intensity of incident radiation.
- Light emitted by the laser light is example for coherent light
- An example for solid laser medium is Ruby
- A source of gamma radiation is radioactive nuclei
- Einstein gave correct explanation about photoelectric effect by using Quantum theory of Radiation
- For effective lasing action to take place the number of atoms in excited state should be higher than in ground state.
- The photons in laser light will have identical frequency
- We can distinguish between real gems and artificial gems by using UV radiations.
- The photoelectric cell is used to reproduce the sound in cinematography.
- Bloodless surgery can be performed by using Laser light.
- For lasing action we can use stimulated emission only.
- Photoelectric effect establishes the particle nature of light.
- The electromagnetic waves used in locating fracture of bones is X rays
- Ultraviolet waves are used in the treatment of Rickets.
- The rays that is most suitable for long distance photography is Infrared rays.
- The rays that are used to stimulate blood circulation are Infrared rays.
- The radiation detected on account of its heating effect is Infrared rays.
- The electromagnetic radiations discovered on account of its photographic action are Ultraviolet rays.
- Light is made up of tiny packets these packets are called Photons.

- The rays that are used to examine old paintings are Infrared rays.
- The rays that are used, as efficient sterilizers are Ultraviolet rays.
- Radiations having frequency below this does not produce photographic effect Threshold frequency.
- The electromagnetic waves that were discovered due to its radioactive property are Gamma rays.
- Laser light is used in Laser Raman spectroscopy to understand Molecular structure.
- The technique used to locate flaws in the parts of machines is Radiography.
- The range of wavelength of Infrared radiations is 750nm to 0.4mm
- The range of wavelength of the X rays extends from 0.1A to 100A.
- The range of wavelength of the gamma rays extend from 0.01A to 0.1A
- The range of wavelength of the radio waves is >0.1m
- The range of the wavelength of the microwaves extend from 0.2mm to 10cm
- The order of frequency of radio waves is $<10^9$ Hz
- The order of frequency of the microwaves vary from 10^{12} to 10^9 Hz
- The order of frequency of the infrared rays vary from 10^{14} to 10^{10} Hz
- The order of frequency of the visible light is 10^{14} Hz
- The order of frequency of the ultraviolet ray vary from 10^{16} to 10^{14} Hz
- The order of frequency of the X rays vary from 10^{19} to 10^{16} Hz
- The order of frequency of the gamma rays vary from 10^{20} to 10^{19} Hz
- The radiations used to control different settings in TV remote handset are Infrared radiation.
- The radiations used in the study of crystal structure are X rays.
- The Quantum hypothesis was proposed by Max Planck in 1900
- The device that used in the operation of burglar alarms is Photoelectric cell.
- The process of raising the atom in a lower energy state to a higher energy state is called Excitation.
- The first LASER was constructed by T.H.Maiman in 1960
- The technique that helps in taking complete three-dimensional images of a given object is called Holography.
- An example for gas laser is Helium Neon Laser
- The elements used in continuous gas laser are He and Ne

- The most energetic of all electromagnetic waves is Gamma rays

DYNAMICS

- The change of position of a body when compared with that of another body is called Motion
- The branch of physics that deals with the behavior of matter under the action of force is called Mechanics
- The study of behavior of matter under the action of forces that produce motion of changes in motion is called Dynamics
- A branch of mechanics concerned with measurement and precise description of motion is called Kinematics
- The branch of mechanics which deals with the state of rest or of equilibrium is called Static's
- An example for invisible motion which can be experienced is moving air
- An example for invisible motion which cannot be experienced is motion of Earth
- An example for visible motion is flight of birds
- The actual path traversed by the body is called Distance traveled
- The least distance between the initial position and final position of the body is called Displacement
- Distance traveled is a Scalar quantity
- Displacement is a Vector quantity
- The SI unit of measurement of distance traveled is Meter
- The SI unit of measurement of displacement is Meter
- The distance traveled by a body in unit time is called Speed
- The SI unit of speed is m/sec
- The speed of a body moving with a uniform motion travels 100km in $2\frac{1}{2}$ hours is 40km/h
- 1km/h is equal to $\frac{5}{18}m/s$
- 1m/s is equal to $\frac{18}{5}km/h$
- The speed calculated on the total distance and total time is called Average Speed
- The rate of displacement of a body in unit time is called Velocity
- The SI unit of velocity is m/s

- The rate of change of velocity is called Acceleration
- If the initial velocity of the body is u , final velocity of the body is v , time taken is t , then acceleration is given by $a = \frac{v-u}{t}$
- The SI unit of acceleration is $\frac{m}{s^2}$
- If the value of acceleration is positive, the velocity Increases
- If the value of acceleration is negative, the velocity Decreases
- The velocity of a body at rest is Zero
- Any motion that repeats itself in equal intervals of time is called Periodic motion
- The SI unit of Frequency is Hertz
- The number of oscillations in unit time is called Frequency
- The time taken by a body to perform one oscillation is called Period
- The maximum displacement of the oscillating body from its equilibrium is called Amplitude
- The laws of simple pendulum were discovered by Galileo Galilei
- When the amplitude is small the period of simple pendulum does not depend on the amplitude, this is first law of Simple pendulum
- When the amplitude is small the period of the pendulum does not depend on the size and the density of the bob, this is second law of Simple pendulum
- The distance between the point of suspension and the centre of bob is the Length of the bob
- The amplitude of simple pendulum is directly proportional to the square root of the length of pendulum
- When the amplitude is small the period of the pendulum is directly proportional to the square root of the length of the pendulum, this is third law of simple pendulum
- The vibratory motion is also called as Periodic motion
- The first pendulum clock was invented by Christian Huygen
- The distance between any two successive similar points on the wave is called Wavelength
- The velocity of the can be calculated with the help of formula $V = n\lambda$
- The ability to do work is called energy
- The amount of work done when a force of 1 newton moved a body through 10m is 10N

- The amount of work done when a stone is pushed through 5m by a force of 2N in the direction of force is 10Nm
- The SI unit of Work is Newton–Meter
- The SI unit of force is Newton
- 1Joule is equal to 1Newon – meter
- The earth is rotating on its axis from West to East
- The physical quantities which have both the direction and magnitude are called Scalar
- The physical quantities which have only magnitude but no direction are called Vector
- An example for Scalar quantity is Distance
- An example for Vector Quantity is Force
- If the body travels equal distance in equal intervals of time it is said to be Uniform motion
- If the body travels unequal distance in unequal intervals of time is said to be Non Uniform motion
- A graph obtained by plotting distance traveled along the Y axis and the time along the X axis is called Distance–Time graph
- A graph obtained by plotting velocity of a body along the Y axis and time taken along the X axis is called Velocity–Time graph
- A heavy bob suspended to a stand using a thin thread is called Simple Pendulum
- A periodic disturbance traveling in a medium carrying energy is called Wave
- The pattern of motion of wave is called Wave motion
- If the particles of the medium in which the wave is traveling at right angles to the direction of propagation of the wave are called Transverse wave
- If the particles of the medium in which the wave is traveling vibrate in the direction of the propagation of the wave is Longitudinal wave
- The distance time graph of a body in variable motion is Curved line
- The slope of the curve in distance time graph gives the velocity of the body
- When a body is traveling with constant speed the acceleration is Zero
- A train is 45m long it takes 30s to cross a bridge moving at a speed of 18km/h the length of the bridge is 150m
- The time taken by the swinging bob to move from one extreme position to another extreme position is equal to T/4

- The period of simple pendulum varies directly to the square root of the length of the bob
- The product of force acting on the body and displacement caused is called Work
- The product of force acting on the body and displacement caused is given as $W = F \times S$
- The factors on which the period of simple pendulum depends are Length and acceleration due to gravity
- The laws of motion were proposed by Issac Newton
- The forces which are responsible for motion are Mechanical forces
- Every body continues in its state of rest or of uniform motion in a straight line unless it is compelled to change the state by forces impressed on it is Newton's First law of motion
- The tendency of body to be in state of rest or in uniform motion unless and until an external force acts upon it is called Inertia
- The group of forces whose resultant is zero is called Forces in equilibrium
- The acceleration given to a body by a force applied to it is directly proportional to the force and is in the same direction as the force and inversely proportional to the mass of the body is Newton's Second law of motion
- The relation between Force, Acceleration and Mass is $F = ma$
- The acceleration gained by a body of mass 2kg when a force of 100N acts is 50m/s^2
- The force applied on a body of mass 100kg so that it moves with an acceleration of 5m/s^2 is 500N
- The product of mass x velocity is Momentum
- The SI unit of vector quantity is kgm/s
- To every action there is always an opposed and equal reaction is Newton's third law of motion
- The acceleration gained by the bodies due to the gravitational force is Acceleration due to gravity
- If the height of the tower is 78.4m then time required for a bob to reach ground when it is dropped from the top of the tower is 4 seconds
- A body dropped from the top of a tower reaches the ground with a velocity of 48.9m/s after 5 seconds then the acceleration due to gravity at that place is 9.78m/s^2
- The energy possessed by a body by the virtue of its motion is Kinetic Energy
- Kinetic Energy = $\frac{1}{2} mv^2$
- The energy possessed by a body by virtue of its position is Potential Energy

- Potential Energy = mgh
- A body moves through a distance of 10m when 500N of force is applied on for 5 seconds then the power required to do the work is 1 kilowatt
- The power required to carry a body of mass 350kg vertically upwards from the earth to a height of 180m in 40 seconds is 15435 watt.
- The radial force acting on a body in circular motion and directed towards the centre of the circular path is called Centripetal force
- A body moving along a circular path is accelerated towards the centre of the circular path due to the centripetal force acting on it is called Centripetal acceleration
- A force equal and opposite to the centripetal force that arises as a reaction to the centripetal force is called Centrifugal reaction
- The force of attraction between two bodies that arises due to their masses is called Gravitational force
- A spinning device that uses centrifugal force to separate particles of different densities is called Centrifuge
- The simplest type of motion is Motion along a straight line
- If the trajectory is a Curve then motion of a body is said to be Curvilinear
- The simplest Curvilinear motion is Motion along a curved path
- The motion of a body along a circular path with constant speed is called Uniform circular motion
- A body moving along a circular path accelerated towards the centre of the circular path is called Radial acceleration
- The formula to find the magnitude of the centripetal force acting on a body in circular motion is $f = mv^2/r$
- The value of acceleration experienced by the moon due to the gravitational force exerted by the earth on it is $2.72 \times 10^{-3} \text{ms}^{-2}$
- The force that provides the centripetal acceleration to the moon and planets is Gravitational force
- The objects moves in a tangential path once the centripetal force is removed from the circular motion
- Cream is separated from milk in a cream separator by using Centrifugal force

- A body of mass m moving in a circular path of radius r with a constant speed v will have centripetal force equal to $\frac{mv^2}{r}$
- For a body in circular motion the direction of the velocity changes continuously
- A body in uniform motion is acted upon by a centripetal force
- The centripetal force acting on a body in circular motion depends upon its mass, velocity and radius of path
- The centripetal force on a cyclist negotiating a curve on a level road is provided by friction between the roads and wheel
- Roads and railway tracks are banked at curves in order to provide the necessary Centripetal force
- A body in uniform circular motion is accelerated along the radius towards the centre
- When a force responsible for keeping a body in circular motion is suddenly withdrawn, the body moves along the tangent to the circular path
- An orbiting satellite gets the centripetal force from the gravitational attraction of the planet on the satellite
- Centrifugal force on a body in circular motion does not have real existence
- A cyclist negotiating a curve leans towards the centre of the curved path to obtain the necessary centripetal force
- The device in an engine which controls the speed of the engine is called Governor
- The banking of a railway track is done to eliminate wear and tear of the wheels
- An object moves along a straight line if the net force acting on it is zero
- The agent which exerts a centripetal force is subjected to Centrifugal reaction
- If an automobile is moving fast along a curve then a person inside it feels pushed outwards
- Centrifugal force cannot be created but it is due to the inertia of rotational motion
- The speed of an engine can be controlled by Centrifugal governor
- For transferring large quantities of liquids from low pressure regions centrifugal pump is used
- The equation for the force acting on a body $f = \frac{mv^2}{r}$, where m is Mass
- The equation for the force acting on a body $f = \frac{mv^2}{r}$, where v is Velocity
- A device which dries clothes is Drying machine

- What will happen when a dish containing water and mercury are rotated rapidly about the vertical axis mercury will be surrounding water
- The passenger sitting in a car moving fast along a curve felt pushed outwards due to inertia of rotational motion
- Governor was devised by James Watt
- The device where centrifugal pumps are used is blowers and Exhaust fans
- Centrifugal force can be experienced only
- In the case of a train taking a turn along a curved path the centrifugal reaction is lateral thrust if the wheels of the outer rails
- A stone is tied along a string, and held whirling around. If the string snaps, the stone moves along the tangential direction
- An example of circular motion is Merry go round
- When an object is moving in a circular path, the net force acting on it is angular to the direction of motion
- According to Newton's Third Law centrifugal reaction is equal and opposite to centripetal force
- Centrifuge is used to separate proteins, Hormones and vitamins in different liquid media
- While a spacecraft is orbiting the earth, the gravitational pull is providing the necessary centripetal force
- The device used to separate the minute particles of different densities is Centrifuge
- The gravitational force exerted by the body on earth is called Weight of a body
- The force that keeps the moon in nearly circular orbit around the earth is Gravitational force
- The universal law of gravitation was proposed by Sir Isaac Newton
- The force that keeps the planets in nearly circular orbit around the sun is Gravitational force
- Law of gravitation is called universal because it is valid for small and large masses and distances
- The weight of a body is equal to the product of mass and acceleration due to gravity
- The acceleration due to gravity on earth decreases with the increase in height
- We experience less weight than normal when we are moving downwards in a giant wheel
- The value of g vary from place to place because it depends on the radius of earth
- The laws of planetary motion were discovered by Johannes Kepler

- If r is the average distance of the planet from the sun and T is the period of revolution, then r^3 is proportional to T^2
- If the distance between the two bodies is doubled the Gravitational force decreases to four times
- The SI unit of Weight is Newton (N)
- The unit of universal gravitational constant is $\text{Nm}^{-2}\text{kg}^{-2}$
- The part of the earth in which the radius of the earth is higher is Near the equator
- The shape of the orbit of the planet around the sun is Elliptical
- The tides are due to gravitational attraction between the sun and the moon
- Gravitational force between two bodies arises due to their masses
- Gravitational force exists between any two masses
- The gravitational force between two bodies depends upon their masses and distance between them
- According to universal law of gravitation the force of gravity between two masses is inversely proportional to the square of the distance between them
- If two bodies of masses p and q are separated by the distance r then force of gravity between them is given by $F = \frac{pq}{r^2}$
- The force of gravity between two masses m_1 and m_2 when they are at a distance d apart is F , if the mass m_1 is replaced by another body of mass $6m_1$, the gravitational force now would be $6F$ Newton
- The force of gravity between two masses is 4 Newton's, if the distance between them is doubled, then the force of gravity between them would be 2 Newton's
- The value of universal gravitational constant is $6.67 \times 10^{-11} \text{Nm}^2\text{kg}^{-2}$
- The value of the universal gravitational constant is a constant everywhere in the universe
- The value of gravitational constant is equal to the force of gravity between any two masses of 1kg each and 1m apart
- The weight of an object on earth is the gravitational force exerted by the body on earth
- To calculate the value of acceleration due to gravity we need the values of mass of the earth, universal gravitational constant and radius of the earth
- If M is the mass of the earth, R is the radius of the earth and G is the gravitational constant, then the value of acceleration due to gravity is given by $g = \frac{GM}{R^2}$
- The value of acceleration due to gravity on earth is highest at the poles
- A person standing in the lift accelerated upwards experience increase in weight
- A person standing in the lift accelerated downwards experience decrease in weight
- The value of acceleration due to gravity is less at Equator

- When a lift is falling freely a person experiences weightlessness because there is no reaction force acting on the person inside the lift
- The value of acceleration due to gravity on the earth depends upon the Shape
- An imaginary line drawn from the sun to a planet sweeps equal areas in equal intervals of time, this is known as Keplers second law of planetary motion
- A planet moving around the sun will have the highest speed when it is nearest to the sun
- 1 Astronomical unit is equal to $1.5 \times 10^8 \text{Km}$
- The planet with the highest period of revolution is Uranus
- The first planet whose existence was predicted much before its discovery is Uranus
- The force that binds us towards the earth is Gravity
- Newton showed that Kepler's laws can be derived from his laws of motion
- The deviations observed in the orbit of Neptune led to the discovery of planet Pluto
- Universal law of gravitation cannot give the correct meaning for the freezing of water near the polar region
- When the medium between the two masses changes the force of gravity between them will not change
- When an apple falls from a tree both apple and earth are attracted
- The value of acceleration due to gravity changes from place to place
- Bodies of different mass are falling freely. They have the same acceleration
- According to universal law of gravitation $F = G \frac{m_1 m_2}{d^2}$
- Weight W of an object is given by $W = mg$
- The acceleration due to gravity is given by $\frac{GM_E}{(R_E)^2}$
- Gravitational force is independent of the intervening medium and mass
- The condition of zero reaction on a person who is an occupant of a free falling body is Weightlessness
- The value g at a distance of $3.84 \times 10^5 \text{ Km}$ is 2.7×10^{-3}
- According to their law of planetary motion $r^3 \propto T^2$
- The law of gravitation successfully predicted the existence of planets Neptune and Pluto
- The planet Pluto was discovered in the year 1930
- In the equation $g = GM_E/R_E$, G refers to Gravitational constant
- An example for a person feeling weightlessness is Standing in a freely falling lift
- The scientist who examined the motion of celestial bodies is Newton
- The planet Pluto was discovered by Cycle Tom Baugh
- The planet Neptune was discovered by Johannes Galle
- The keplers third law is used to find the distance of planets from the sun
- In the equation $F = m_E m_o / d^2$, the m_E refers to Mass of the earth
- The planet Neptune was discovered in the 19th century

- Every object on the surface of the earth are attracted by the earth towards its Centre
- Astronauts when they travel around the space experience weightlessness
- The shape of the earth is Geoids
- The value of acceleration due to gravity on the surface of earth is 9.8m/s^2
- The law that predicted the existence of planets beyond Uranus is Newton's law of gravitation
- The value of g does not depend on mass of the earth
- The law most suitable to find the mass of the sun is Kepler's third law
- Moon with the mass m_o and m_E revolves around the earth with distance d , the centripetal force acting towards the centre of the earth is $G m_o m_E / d^2$
- According to Kepler's third law $r^3 = \text{constant} \times T^2$, the constant is $G_m / 4\pi^2$
- According to Keplers third law the cube of the average distance is directly proportional to the square of a period of revolution
- The law the Newton used to show evidence to his law of gravitation is Kepler's third law of motion
- The weight of a body is measured by the reaction excreted on the body
- The planets move in elliptical orbits around the sun, with the sun at one focus is Kepler's first law
- There are 3 laws of Planetary motion proposed by Kepler

ELECTRONICS

- A substance whose conductivity lies in between that of conductor and insulator is called Semiconductor.
- The vacancy of an electron created in a semiconductor material is called a Hole.
- The process of adding an impurity to a pure semiconductor with the object of increasing the electrical conductivity is called Doping.
- A impurity which increases the electrical conductivity of a semiconductor is called Dopant
- Pure semiconductors containing equal number of electrons and holes are called an extrinsic semiconductor.
- The process of changing alternating current into direct current is called Rectification.
- The process of strengthening weak signals is called Amplification.
- The process of impressing the audio or video signals on the carrier wave is called Modulation.

- The process of separating the audio frequency signals from the carrier wave is called Demodulation.
- A negatively charged particle with negligible mass found revolving around the nucleus of all atoms is called Electron.
- The charge of one electron is 1.6×10^{-19} coulomb
- The mass of one electron is 9.1×10^{-31} Kg
- The branch of science that deals with the study of behavior of electrons, their control and use is called Electronics.
- The electrical conductivity of impure semiconductors caused due to unequal number of electrons and holes is called Electrical conductivity.
- A semiconductor crystal doped with a p type impurity at one end the n type impurity at the other is called a Junction diode.
- Transmission of speech or music over long distances, using radio waves is called Radio Broadcasting
- A wave consisting of strong electromagnetic waves of suitable frequency for carrying audio signals is called Carrier wave
- The device that converts sound waves into electrical signals of the same frequency is Microphone
- The device that converts electrical signals into sound waves is Loudspeaker
- The carrier frequency used in TV transmission range from about 40MHz to 600MHz
- The majority charge carriers in p type semiconductor are Holes
- The majority charge carriers in n type semiconductor are Electrons.
- The device that which produces electrical oscillations of desired frequency is called Oscillator.
- A transistor in which a p region is sandwiched between two n regions is called nnp transistor
- A transistor in which a n region is sandwiched between two p regions is called pnp transistor
- The electrical conductivity of semiconductor is greater than that of insulator but less than the conductor.
- The charge carriers in a semi conducting material are both electrons and holes
- An example of Semiconductor is Germanium

- If silicon has to be doped by an acceptor impurity, the dopant should be trivalent
- Heating a semiconductor material will increase its electrical conductivity.
- The electrical conductivity of semiconductor can be increased by both doping and heating
- We can obtain a n type semiconductor by doping a pure semiconductor with an element of valency 5
- We can obtain a p type semiconductor by doping a pure semiconductor with an element of valency 3
- By doping an intrinsic semiconductor with a pentavalent impurity, we get n type semiconductor.
- Doping a pure semiconductor by trivalent impurity yields a p type semiconductor
- An example of a Donor impurity is arsenic
- An example of a acceptor impurity is Boron
- Pure semiconductors are also known as intrinsic semiconductors.
- Impure semiconductors are also known as extrinsic semiconductors.
- A hole can be considered equivalent to a positive charge.
- The most commonly used semiconductors are Germanium and Silicon
- A germanium atom contains four valence electrons
- At absolute zero temperature an intrinsic semiconductor is a perfect insulator
- A semiconductor that is electrically neutral has equal number of holes and electrons.
- The electrical conductivity of intrinsic semiconductors like germanium and silicon can be increased by doping them by either trivalent or pentavalent impurity
- Addition of a small amount of antimony to pure germanium will increase the number of free electrons in a germanium crystal
- The junction potential in an unbiased semiconductor diode stops the flow of charge carriers across the junction
- In a semiconductor diode the junction potential offers opposition to only majority charge carrier in both the regions.
- A p-n junction is said to be forward biased when a potential difference is applied across the junction by making p region positive and n region negative.
- A p-n junction is said to be reversed biased when a potential difference is applied across the junction by making p region negative and n region positive.

- A forward biased given to a junction diode overcomes the barrier potential
- The region of a junction diode containing neither free electrons nor holes is called Depletion region.
- When a p-n junction is forward biased the current flows from the p region to the n region
- In a junction there will be no appreciable current if p region is made negative and n region is made positive.
- Forward biased applied to junction diode decreases the resistance.
- Reverse biased applied to a junction increases the resistance.
- Rectification can be achieved by using a junction diode
- The conventional arrow in the circuit symbol of a semiconductor diode indicates The direction of flow of conventional current
- A device that converts alternating current into unidirectional current is called Detector.
- A p-n diode can be used as a rectifier.
- A transistor consists of two p type regions and one n type region
- The middle region of a transistor is called Base
- The base region in a transistor controls the flow of charge carriers into the collector
- The emitter region in the PnP junction transistor is more heavily doped than the base region so that the flow across the base region will be mainly because of holes.
- When a transistor is used as a voltage amplifier, the output voltage is taken across the load in the collector emitter circuit
- A small input voltage can be changed into large output voltage by using a transistor.
- A modulator in a radio transmitter mixes the audio frequencies with the carrier waves.
- The detector in radio set separates the audio frequency from radio frequency.
- The radio waves sent by all stations are received in radio receiver by Antenna.
- The number of electrons in the outer most orbit of the silicon is four.
- A device that converts information energy into electrical signal is Transducer.
- The impurity required to make germanium into a n type semiconductor is arsenic
- The p side of a diode is called Anode
- The n side of a diode is called Cathode.
- In npn transistor electrons are sent by emitter into base
- The impurity added to germanium to make it p type semiconductor is boron

- Radio waves of suitable frequency are generated in RF Oscillator.
- The output voltage taken across a resistor in the collector is called Load
- In PnP transistors holes are emitted into base.
- AF signals cannot be transmitted over a long distance because they have low energy.
- The junction potential for silicon is 0.7V
- The junction potential for germanium is 0.3V
- The Indian scientist who is credited with the construction of radio transmitter is S.K.Mitra.
- AM radio signals have carrier frequencies from 530 to 1600KHz
- FM signals have carrier frequencies between 88 to 108MHz-

ROCKET AND ARTIFICIAL SATELLITES

- The momentum of a body is defined as the product of its mass and velocity
- The radial force acting inwards on a body which keeps it along a circular path is called Centripetal force
- A space vehicles that carries propellants is called Rocket
- The fuel and the oxidant used in rocket are together called Propellants
- The velocity of a satellite which enables it to remain in orbit round the earth or any celestial body is called Orbital Velocity
- The minimum velocity a body must possess so that it escapes from the gravitational field of the earth is called Escape Velocity
- An object which is made to orbit around the earth or any celestial object is called Artificial satellite
- An orbit around the earth which is parallel to the equator is called Equatorial orbit
- An orbit around the earth which passes over the north and the south poles of the earth is called Polar orbit
- A satellite whose period of revolution is equal to the period of rotation of the earth is called Geostationary Satellite
- The principle of working of rocket is Law of conservation of Momentum
- Rockets can operate even in vaccum because they carry their own oxidant
- The ratio of payload mass to the fuel mass is called Payload Ratio
- The mass of the useful material sent in a rocket is called Payload

- A rocket system consisting of two or more stages placed one behind the other which are designed to trigger sequentially is called Multistage rocket
- The orbital velocity of a body in an orbit around the earth is about 8Km per second
- The value of escape velocity on earth is 11.2Km/s
- The escape velocity is equal to root two times the orbital velocity
- The principal use of Geostationary satellites is for Communication purpose
- ISRO was established in the year 1969
- ISRO has its headquarters located in Bangalore
- ISRO stands for Indian Space Research Organization
- The INSAT programme was started in the year 1977
- INSAT stands for Indian National Satellite
- The first satellite of INSAT programme is INSAT-1A
- ASLV stands for Augmented Satellite Launch Vehicle
- SROSS stands for Stretched Rohini Satellite Series
- GSLV stands for Geostationary Satellite Launch Vehicle
- PSLV stands for Polar Satellite Launch Vehicle
- The abbreviation of APPLE is Ariane Passenger Pay Load Experiment
- The IRS means Indian Remote Sensing
- The first IRS satellite was launched in March 1988
- The satellite INSAT-1B was launched in August 1983
- The satellite INSAT-1D was launched in June 1990 from USA
- The latest satellite of INSAT programmes INSAT-3E was launched on 28th Sept 2003
- The vehicle which can function even beyond the atmosphere of earth is Rocket
- With reference to the earth Escape velocity is higher than Orbital velocity
- The period of revolution of Geostationary satellite is 24 hours
- The rocket launching station in India is located at Thumba in Kerala
- The first ever Indian Satellite is Aryabhata
- The first Indian Geostationary Satellite is APPLE
- The total momentum of a system of interacting bodies is always remain unchanged
- The law of conservation of momentum states that the total momentum of bodies in a system are conserved
- The law of conservation of momentum is embedded in Newton's third law of motion

- Newton's third law of motion encompasses the law of conservation of momentum
- When a rocket launched into space lower atmosphere offers resistance to its motion
- A body of mass m is moving with a velocity v , the momentum of a body would be mv
- A bullet of mass m is fired from a rifle of mass M with a velocity v . If the rifle recoils back at a velocity V then $mv = -MV$
- The thrust provided to a rocket is given by the product of rate of fuel consumption and exhaust thrust
- If R is the rate of fuel consumption and V_{ex} is the exhaust velocity, then the thrust on the rocket is RV_{ex}
- Multistage rockets are essential to launch satellites because a single rocket cannot by itself lift a heavy load
- The velocity of a body along a circular path is called Linear velocity
- If G is the gravitational constant, R is the distance between centre of the earth and the satellite and g is the acceleration due to gravity, then orbital velocity of a satellite around the earth is given by $V_o = Rg/G$
- The radius of the orbit of a satellite is R , the orbital velocity is V_o of the satellite is proportional to $1/R$
- If R is the radius of the earth and g is the acceleration due to gravity of the place, then escape velocity V_e is given by $V_e = 2Rg$
- If V_e and V_o denote the escape velocity and orbital velocity respectively then the relation between them is given by $V_e = 2V_o$
- If the escape velocity on earth is 11.2Km/s then the orbital velocity of a satellite around the earth should be about 8Km/s
- The minimum number of communication satellites required to achieve communication all over the globe are 3
- The present chief of ISRO is G Madhavan Nair
- A geostationary satellite is placed in the orbit at a height of 36000Km
- The first satellite fabricated in India was Aryabhata
- The acceleration due to gravity varies with the height of the object above the earth
- Rocket works on the principle of Newton's III law of motion
- The mass of the rocket includes the mass of the Propellants and mass of Payload
- The payload ratio is given by m/M

- Payload is placed at the front portion of the rocket
- The sounding rocket used to study atmosphere was Rohini-RH-75
- The advent of television and internet is the impact of Satellites
- The launch vehicle that had put IRS-P6 in the orbit is PSLV-C5
- While launching rocket acceleration due to gravity changes continuously
- As the rocket consumes fuel at every instance its mass goes on decreasing
- The satellite Bhaskara was launched in 1979
- According to law of conservation of momentum the net external force acting on the system is Zero
- The Master Control Facility is located at Hassan
- The 27 tonne INSAT 3E has an operation life time of 15 years
- Thrust is the product of Mass and acceleration of body
- Larger the mass of the rocket lesser will be the acceleration
- As the rocket ascends into the sky acceleration due to gravity changes continuously
- A multistage rocket gets rid of its first stage when it reaches the height of 100Kms
- Escape velocity is independent of the mass of the body
- Escape velocity depends upon the radius of the body and acceleration due to gravity
- Indian space programme was started in 1963
- The satellite INSAT-3A was put into orbit in 19th April 2003
- Any object revolving round the planet under the influence of the gravitational force of the planet is called Satellite
- The time taken by a satellite to complete one revolution around the planet is called Period of satellite
- The vehicle Rocket was established in 1969
- The first IRS satellite of India is Bhaskara
- The space vehicle that launched APPLE was Arian from French Guiana
- There are 4 different types of launch vehicles built by ISRO
- In the case of a bullet firing from a rifle, when the bullet as well as the rifle are at rest, the total initial momentum is Zero
- Orbital velocity is independent of mass of the body
- Artificial satellites are launched using Multistage rockets

- Geostationary satellites are placed at a fixed position at a specific height above the Equator
- The massive first stage in a multistage rocket is called Booster
- The satellite that carried the dog named Laika into space is Sputnik II
- A satellite revolves around the planet in Elliptical path
- The collection of information about the various objects present in outer space is called Space exploration
- The first man to go in space was Yuri Gagarin
- The name of the satellite that carried the first man into space is Vostok I
- The first artificial satellite in space is Sputnik I
- The first communication satellite put into space is Score
- The first communication satellite for commercial use put into space is INTELSAT-I
- The first experimental space station established is Soyuz-4
- The first human being to set foot on moon was Neil Armstrong on 20th July 1969
- The first satellite dedicated to remote sensing work is LANDSAT-I
- The first international link up of satellite in outer space is Apollo-Soyuz test project
- The spacecraft that carried the human being to moon is Apollo-11
- The first space probe to explore the asteroid belt is Pioneer-10
- The first landing of a space probe on the planet Mars is Mars-2
- The first satellite Sputnik I weighed about 84 Kgs
- The space vehicle rocket was developed by the scientists Konstantin Tsiolkovsky, Robert Goddard, Herman Oberth
- An object which is given an initial velocity in any direction and then allowed to travel freely under the action of gravity is called Projectile
- The historian who used the missiles to destroy the British army was Tippu Sultan
- The devices that escape from the earth are called Space Vehicles
- The sophisticated remote sensing satellite placed in the polar orbit by PSLV is RESOURCESAT-1

RADIOACTIVITY

- The phenomenon of spontaneous disintegration of certain unstable atomic nuclei with the emission of certain radiations is called Natural Radioactivity
- Any substance that emits radioactive radiation is called Radioactive substance

- The changing of one classical element into another is known as Transmutation
- The time taken by a sample to get reduced to half of its initial amount is called Half life
- The phenomenon by which non radioactive substance is rendered radioactive is called Induced radioactivity
- The atoms of the same element having different mass number is called Isotope
- An isotope of an element which is radioactive is called Radioisotope
- The central massive part of Atom is called Nucleus
- The three fundamental particles present in atom are Protons, Electrons and Neutrons
- The Protons and Neutrons together are commonly known as Nucleons
- The number of protons present in an nucleus of an atom is called Atomic Number
- The sum of Protons and Neutrons present in an nucleus of an atom is called Atomic Mass number
- A nucleus X with mass number A and atomic number Z is symbolically represented as ${}_Z\text{X}^A$
- The phenomenon of Radioactivity was discovered by Henry Becquerel
- The radioactive rays emitted by a radioactive substance are called Becquerel rays
- The radiations emitted by the radioactive substance is called Radioactive radiations
- All chemicals having atomic number 81 to 92 are Radioactive
- The charge present on Alpha particles is +2
- The charge present on Beta particles is -1
- The time taken by a radioactive sample to disintegrate completely is Infinite
- A fundamental particle having 1 unit of positive charge and negligible mass is called a Positron
- A radioactive isotope of iron with the mass number 59 is called Radio Iron
- The two naturally occurring radioactive element are Uranium and Radium
- A nuclei which is made radioactive artificially is Phosphorous 30
- The parent nuclei for obtaining radioactive phosphorous is Aluminium 27
- The most massive of the radioactive rays is Alpha Particles
- The isotope of hydrogen which is radioactive is Tritium
- The isotope of Hydrogen with the mass number 2 is deuterium
- The radio-isotope used to study the action of medicines is Radio-Sodium
- The radio-isotope commonly used to estimate the age of fossils is Carbon-14

- The daughter nucleus that is formed when radium²²⁶ emits an Alpha particle is Radon-222
- The element formed when Carbon-14 emits a beta particle is Nitrogen
- The number of Nucleons present in the nucleus of Helium are Four
- An atom that consists 11 protons, 11 electrons and 12 neutrons has atomic number 11, mass number 23
- An example for electrically neutral particle is a Neutron
- A fundamental particle with one unit of positive charge and 1 unit of mass is known as a Proton
- A particle with negative charge and negligible mass is an Electron
- Radioactivity was first discovered in a mineral of Uranium
- The fact that the radioactive rays consists of three type of radiations was established by Rutherford
- Radioactive rays consists of Alpha, Beta and Gamma rays
- The mass of a Alpha particle is 4amu
- Gamma rays are not influenced by electric field
- During beta decay, the newly formed daughter nucleus will have its atomic number increased by 1
- The half life of Radium 226 is 1600 years
- The half life of a radioactive element is 16 days, A sample after radioactive decay will be left with 25% of the atom after 32 days
- The half-life of a radioactive element is 25 days. If the original amount of the substance is 25gm. What is the amount of substance after 100 days? 1.5625gm
- The half-life of Radium 226 is 1600 years. 1 mg of radium through radioactive decay becomes 0.125 mg in 4800 years
- The half life of radioactive element is independent of the initial mass
- ${}_{13}\text{A}^{27} + {}_2\text{He}^4 \rightarrow {}_{15}\text{P}^{30} + \text{X}$, the X represents a proton
- The half life of ${}_{15}\text{P}^{30}$ is 3 minutes
- A nucleus of Aluminum can be rendered radioactive by bombarding it with an Alpha particle
- Phosphorous 30 undergoes a beta decay to form a nucleus of silicon
- The mass of Tritium the isotope of hydrogen is 3

- The two common isotopes of Uranium are Uranium-235 and Uranium-238
- The radio isotope used in the treatment of hyperactive thyroid glands is Radio Iodine
- The radio isotope used in the treatment of Cancer is cobalt-60
- When we represent the nucleus in the form ${}_Z X^A$, A represents the mass number and Z represents the atomic number
- When an alpha particle is emitted from a nucleus, the mass number of daughter nucleus will decrease by 4 units
- Isotopes are the elements having the same atomic but different mass number
- Isotopes of an element will have same number of protons but different number of neutrons
- A beta particle is Negatively charged
- A alpha particle is Positively charged
- The most massive radioactive rays is Alpha
- A beta particle is represented as ${}_{-1}e^0$
- A radioactive sample of half life T years has N number of atoms in the beginning is represented as N/2 atoms left after T years
- When ${}_{13}Al^{27}$ is struck by an alpha particle a neutron is ejected along with nucleus of atomic number 15
- The smallest particle of an element which cannot be divided further by retaining the property of the element is Atom
- Madam curie and her husband discovered Polonium and Radium
- Radioactivity produced artificially is called Induced
- Beta rays are a stream of electrons
- Atomic number of Alpha particle is 1
- Atomic mass number of Alpha particle is 4
- ${}_{88}Ra^{226} \rightarrow {}_{86}Rn^{222} + {}_2He^4$
- The half life of ${}_{92}U^{238}$ is 4.5 billion years
- ${}_{13}Al^{27} + {}_2He^4 \rightarrow {}_{15}P^{30} + {}_1n^0$
- ${}_{15}P^{30} \rightarrow {}_{14}Si^{30} + {}_{+1}e^0$
- The isotope of carbon are ${}_6C^{12}$ and ${}_6C^{11}$
- The name of the isotope of hydrogen ${}_1H^2$ is Deuterium
- The name of the isotope of hydrogen ${}_1H^3$ is Tritium

- The most unstable radio isotope of Uranium is U-235
- The scientist who was awarded Noble prize for the extraction of radium in its purest form is Madam Curie
- Half life of polonium-214 is 164 μ
- Half life of radium is 1622 years
- The Uranium has 2 isotopes
- The number of isotopes of Carbon are 4
- The number of isotopes of Hydrogen are 3
- Radium 226 is represented by the symbol ${}_{88}\text{Ra}^{226}$
- The extrinsic research in the field of Radioactivity was conducted by Henry Becquerel
- The isotope used in the field of Agriculture is Radio-phosphorous
- The number of nucleons in the nucleus of helium are 4
- The name of the isotope of hydrogen ${}_{1}\text{H}^1$ is Normal hydrogen
- The symbol of Radio Iodine is I^{131}
- The symbol of Radio Iron is Fe^{59}
- The symbol of Radio Sulphur is S^{35}
- The symbol of Radio phosphorous is P^{30}
- The induced radioactivity was discovered by curie Joliot and Frederick Joliot
- The induced radioactivity was discovered in the year 1934
- The products obtained from artificial radioactivity are called Radio-Nuclides
- The number of neutrons released in every nuclear fission in Uranium 235 are 2 or 3
- Two nuclei of deuterium combine together to form Tritium nucleus

ENERGY

- The particles present in the nucleus of an atom are called Nucleons
- The strong force that binds the nucleons together is called Nuclear force
- The energy released during the nuclear reactions is called Nuclear energy
- The atoms of the same element having the different mass number are called Isotopes
- A nuclear reaction in which a heavy nucleus splits up into two or more fragments with the liberation of enormous amount of energy is called Nuclear Fission
- A nuclear reaction in which two or more light nuclei combine together to form a heavy nucleus with the liberation of energy is called Nuclear Fusion

- The minimum size of the fissionable material required to sustain fission reaction is Critical size
- The process of increasing the proportion of Uranium-235 in a sample of naturally occurring Uranium is called Enrichment
- The substance used to slow down the neutrons in a nuclear reactor is called a Moderator
- The nuclear fusion reactions that proceed to very high temperature are called Thermonuclear reactions
- The capacity to do work is called energy
- The SI unit of energy is Joule
- The number of elements with atomic number Z and mass number A are represented by ${}_Z X^A$
- The two common isotopes of Uranium are U-235 and U-238
- The reactions involving changes in the nuclei of atom are called Nuclear reactions
- Nuclear energy is also called as Atomic energy
- A nuclear reaction which is allowed to continue at a steady rate is called Controlled Chain reaction
- A system of apparatus used to convert the energy produced by nuclear fission into electricity is called Nuclear power plant
- Shield that gives protection to workers and materials from dangerous radiation Concrete shield
- The rods that are used to maintain the fission reaction at a steady rate by controlling the number of neutrons are Control rods
- The enclosure for fuel assembly that helps to withstand the pressure created by fission Steel Vessel
- The material commonly used as a Moderator is Graphite
- The Control rods are commonly made up of Cadmium
- The coolant usually used in a nuclear reactor is Liquid sodium
- The cadmium is used as a material for control rods because they have ability to absorb neutrons
- The most penetrating nuclear radiation are Gamma rays
- The Einstein's mass energy equation is given by $E = mc^2$
- The process by which energy is released in a nuclear bomb is Nuclear fission

- The source of energy in the stars is Thermonuclear reaction
- The principle of nuclear reactor is Controlled fission
- The energy produced by the conversion of 1 mg mass yields energy equal to 9×10^{10} J
- An ideal particle for initiating a fission reaction is a Neutron
- Chain reaction in nuclear fission is possible due to neutrons produced during each fission
- The major constituent of naturally occurring Uranium is U-238
- The mass-energy equation was proposed by Einstein
- Boron rods are used in nuclear reactor because they can absorb neutrons
- An atom bomb is based on the principle of Nuclear fission
- The material best suited for fission is enriched Uranium-235
- An ideal fissionable material is Plutonium-239
- Two materials that are suitable fuels for nuclear fission reaction Plutonium and enriched Uranium
- Heavy water is used in a nuclear reactor to slow down the neutrons
- The energy released in the stars is due to nuclear fusion of light nuclei
- The core of a nuclear reactor consists of Control rods, moderator and reactor fuel
- An example of nuclear fusion is formation of helium from hydrogen nuclei
- In the reaction ${}_1\text{H}^2 + {}_1\text{H}^2 \text{-----} \text{X} + {}_1\text{H}^1 + \text{energy}$, X represents tritium nucleus
- Nuclear fusion of 1gm of hydrogen yields energy of 6×10^{11} J
- Fusion reaction takes place in high temperature because high temperature helps to overcome the repulsion between nuclei
- Exposure to high frequency of ultraviolet light may cause Skin cancer
- The most harmful of the radiation is Gamma rays
- The nuclear fission reaction was discovered by Otto Hahn and Fritz strassmann
- The isotope which is not radioactive is considered as Stable
- The minimum energy required to separate the nucleons is called Binding Energy
- The binding energy is calculated by using the formula B.E/A
- The stability of nucleus is measured in terms of Binding energy per nucleon
- The instrument used for accurate measurement of nuclear masses is Mass Spectrographs
- The mass of nucleus is lesser than the sum of the masses of the Constituents (protons and neutrons) is called Mass defect
- The scientist who started the atomic energy era in India is Dr.H.J.Bhabha

- The scientist who is regarded as the architect of the India's atomic energy programme is Dr. Homi Jehangir Bhabha
- The product nuclei of fission reaction are called Fission fragments.
- The radiations that causes skin burns are UV rays
- The entire reactor is enclosed in a concrete shield building with Lead sheets covered inside to prevent radiations being released in the environment
- During nuclear reactions the sum of the masses of the product particles is lesser than the sum of the masses of reactant particles
- ${}_{92}\text{U}^{235} + {}_0\text{n}^1 \text{-----} {}_{56}\text{Ba}^{141} + {}_{36}\text{Kr}^{92} + 3{}_0\text{n}^1$
- ${}_{92}\text{U}^{235} + {}_0\text{n}^1 \text{-----} {}_{54}\text{Xe}^{139} + {}_{38}\text{Sr}^{95} + 2{}_0\text{n}^1$
- ${}_{92}\text{U}^{235} + {}_0\text{n}^1 \text{-----} {}_{57}\text{La}^{153} + {}_{35}\text{Br}^{81} + 2{}_0\text{n}^1 + \text{energy}$
- 1gm of uranium 235 releases $8.5 \times 10^{10}\text{J}$ of energy during Nuclear fission
- A self sustained fusion reaction is called Chain reaction
- If the built up fission neutron is kept constant then it is a controlled Chain reaction
- The radiant energy we receive from the sun in the form of Light and Heat is Solar energy
- A device which cook food using the solar energy is called Solar Cooker
- A device which converts solar energy into electrical energy is called Solar Cell
- A device which heats the water using solar energy is called Solar Water Heater
- A panel consisting of large number of solar cells connected together in form of series Solar Panel
- The technique that helped to determine the composition of the sun is Spectrum Analysis
- The main component of sun is Hydrogen
- The fuels formed from the remains of animals and plants which were buried in the earth millions year ago is called Fossil fuel
- The devices that are used to harness solar energy are called Solar devices
- The converter that convert solar energy into heat are called Thermal converters
- The converter that converts solar energy into electrical energy is called Photovoltaic converter
- The first solar cell was fabricated in 1954
- The copper tubes are used in solar water heater to increase the area of absorption of heat
- The scientists who gave the correct explanation for the source of energy of sun Were Hans Bethe and C.Von Weisacker

- The type of reflector used in box type solar cooker is Plane reflector
- The semiconductor material used in solar cell is silicon
- The voltage produced by the single solar cell is about 0.5volt
- The type of energy possessed by the wind is Kinetic energy
- The component of solar radiation that heats up the material is Infrared radiations
- The energy of the sun is due to nuclear fusion
- The two kinds of nuclear reactions responsible for the energy of the sun are Proton-Proton cycle and Carbon cycle
- In carbon cycle taking place in sun, the carbon acts as a catalyst for the fusion of hydrogen nuclei
- The device used to make the radiations fall directly on the solar cooker is Plane mirror
- The inner surface of the solar cooker is coated black because to ensure the better absorption of heat
- The power produced by the single solar cell is about 0.7Watt
- Solar cooker traps Infrared radiations
- The function of glass plate in the solar cooker is to trap the infrared radiations
- Bending copper pipes helps to increase the area of absorption of solar energy
- The main field of use of solar panels is in Artificial satellites
- Heat from the sun reaches us in the form of infrared radiations
- Light from the sun reaches us in the form of Visible light
- The one of the use of solar cells is to light the street lights and Traffic signals
- The part of the solar cooker that reflects the radiations is Plane mirror
- The main disadvantage of solar devices is Low efficiency
- During proton-proton chain reaction two nuclei fuse into one helium
- The color used in painting the inside surface of the solar devices like solar cooker is Black
- Solar devices are classified into different types based on their principle of working
- We receive the solar energy in the form of Heat and Light
- The energy radiated by the sun per second is 4×10^{26} J/s
- The type of the mirrors used in solar water heater are concave or Parabolic
- The concave mirrors are used in solar water heater because to absorb more radiations in small area
- The form of energy used to run the traditional boats is Wind Energy

- The natural transformation of solar energy that is fast depleting is Energy in fossil fuels
- The natural transformation of solar energy that supports life on earth is Energy in Food
- According to Bethe, hydrogen nuclei form to provide Helium nuclei is the source of solar energy
- In typical solar cell, the material that absorbs light energy is made up of Silicon
- The solar device used in traffic lights is Solar Cell
- An example of solar device that converts light energy into electrical energy is Solar cell
- An example of a solar device that directly absorbs heat is Solar cooker
- The solar cells are made up of semi conductors silicon and Germanium
- The capacity to do work is called Energy
- The SI unit of energy is Joule
- 1 Calorie is equal to 4.18 Joules
- The energy sources that do not depleted on their continuous use are called Renewable sources
- The energy sources that get depleted on their continuous use are called non Renewable sources
- The perennial source of energy is Solar Energy
- The situation arising out of energy demand for exceeding its supply is called Energy Crisis
- The type of lights which are more energy efficient are fluorescent Lamps
- The transmission loss of electrical energy in our country is about 20 to 40%
- A bio waste material is Animal dung
- The device which gives biogas from biomass is called Biogas Plant
- The energy consumed in India as a percentage of the total energy consumption of the world is 3%
- The acute shortage of energy due to ever increasing demand is called Energy Crisis
- To avert energy crisis we must encourage the use of mass transport system
- To avert energy crisis we must use renewable source of energy
- According to the estimation our coal reserves may last about 200 to 300 years
- The problem created due to the fear of running out of earth's energy resources is Energy Crisis
- The most important factor responsible for the energy crisis is Population Explosion

- The amount of energy consumed by a single person is called Per capita energy consumption
- The trend of consumption of energy is more in the period 1995–2010 in Industrialized countries
- An example for non renewable source of energy is Natural gas
- An example for renewable source of energy is wind
- The main cause for wastage of energy is Luxurious way of living
- The source of energy which is depleting is Petroleum
- America and Russia together consume about 50% of the total energy of the world
- Largest producers of the energy in the world are Developed countries
- The good indicator for the living standard of the people is consumption of energy
- India has a population of about 1/6th the world population
- The wastage of energy is due to improper use of energy resources
- A suitable measure for saving fuel is improving the quality of roads
- The reason for high consumption of electricity is Luxurious living standard
- A good solution for the energy crisis is higher use of solar energy
- Gobar gas is produced using the biowaste materials and animal dung
- The main effect of bad condition of roads is Increased fuel consumption
- The incandescent bulb compared to fluorescent bulb has low efficiency

HYDROCARBONS

- The compounds of carbon with hydrogen are called Hydrocarbons
- The ability of carbon atom to have covalent links with its own atoms forming a chain is called Catenation
- Hydrocarbons whose molecules have an open chain structure are called Aliphatic hydrocarbons
- Hydrocarbons whose molecules have only single bonds between their carbon atoms are called Saturated hydrocarbons
- Hydrocarbons whose molecules have double or triple bond between their carbon atoms are called Unsaturated hydrocarbons
- The Aliphatic hydrocarbons whose molecules have single bonds between their carbon atoms are called Alkanes
- The Aliphatic hydrocarbons whose molecules have double bonds between their carbon atoms are called Alkenes

- The Aliphatic hydrocarbons whose molecules have triple bond between their carbon atoms are called Alkynes
- The organic compounds having the same molecular formula but different molecular structure are called Isomers
- The existence of two or more different organic compounds with the same molecular formula but different structure is called Isomerism
- The process of separating various fractions of petroleum is called Refining of petroleum
- The chemical substance obtained from petroleum or natural gas are called Petrochemicals
- The branch of chemistry which deals with the study of compounds of carbon is called Organic chemistry
- The atomic number of carbon is 6
- The electronic configuration of carbon is $1s^2 2s^2 2p^2$
- The simplest hydrocarbon is Methane
- The molecular formula of Methane is CH_4
- The formula of a compound which shows not only the atoms present in its molecule but also gives an indication of its structure is called Structural Formula
- The molecular formula of Ethane is C_2H_6
- The molecular formula of Ethene is C_2H_4
- The molecular formula of Acetylene is C_2H_2
- The molecular formula of Pentane is C_5H_{12}
- The molecular formula of Hexane is C_6H_{14}
- The molecular formula of Heptane is C_7H_{16}
- The molecular formula of Nonane is C_9H_{20}
- The molecular formula of Decane is $C_{10}H_{22}$
- The general formula of Alkanes is C_nH_{2n+2}
- The general formula of Alkene is C_nH_{2n}
- The general formula of Alkyne is C_nH_{2n-2}
- Alkanes are paraffin's because they have little affinity for chemical reactions
- The molecular formula of Propane is C_3H_8
- The molecular formula of Butane is C_4H_{10}
- The molecular formula of Propene is C_3H_6
- The molecular formula of Butene is C_4H_8
- The molecular formula of Propyne is C_3H_4
- The molecular formula of Butyne is C_4H_6
- The hydrocarbons containing a closed ring of carbon atoms in their molecule are called Carbocyclic hydrocarbons

- The general formula of carbocyclic hydrocarbons is C_nH_{2n}
- The hydrocarbons in which the carbon chain forms the ring and there is a single bond between the carbon atoms is called Alicyclic hydrocarbons
- The molecular formula of Cyclopropane is C_3H_6
- The molecular formula of Cyclohexane is C_6H_{12}
- The hydrocarbons whose molecules contain a hexagonal ring structure of the benzene type are called Aromatic hydrocarbons
- The molecular formula of Benzene is C_6H_6
- The molecular formula of Toluene is $C_6H_5CH_3$
- The dark brown liquid which occurs at various depths below the surface of earth under the rocks is called Petroleum
- The process of decomposing higher hydrocarbons of petroleum fraction into lower hydrocarbons with boiling points by strong heating is called Thermal cracking or Pyrolysis
- CNG stands for Compressed Natural Gas
- The chief constituent of petroleum gas is Butane
- The chief constituent of natural gas is Methane
- LPG stands for Liquid Petroleum Gas
- LPG is called as efficient fuel because it has high calorific value
- The gases liberated during combustion are called Exhaust gases
- The test conducted to determine the percentage of carbon monoxide released by an automobile is called Emission test
- The alkene that contains four carbon atoms in its molecule is Butene
- The alkyne that contains five carbon atoms in its molecule is Pentyne
- The simplest aromatic hydrocarbon is Benzene
- A toluene derivative which is used as an explosive is TNT
- TNT stands for Trinitrotoluene
- The most poisonous gas present in the automobile exhaust is Carbon monoxide
- The smelling agent added to LPG to facilitate quick detection of leakage is Ethyl Mercaptan
- The two classes of hydrocarbons having the same general formula are Alkenes and Acyclic hydrocarbons
- The number of carbon atoms in the molecule of Ethane is 2
- The chief constituent of LPG is Butane
- The process of cracking or higher hydrocarbons into shorter hydrocarbons is called Pyrolysis
- The thermal cracking of octane yields Hexane and Ethene

- The naturally occurring compounds like oil and fats are called Lipids
- In 2p level of carbon there are 2 unpaired electrons
- The first member of aromatic hydrocarbon is Benzene
- Benzene was first isolated by Michael Faraday
- The structure of Benzene was proposed by Kekule in 1865
- The instrument used to determine the amount of carbon dioxide released is called Gas Analyzer
- The position of carbon in the periodic table is 2nd period and 14th group
- The molecular formula of normal butane and Isobutane is C₄H₁₀
- In normal state the valency of carbon is 2
- In excited state the valency of carbon is 4
- The acidic impurities present in the petroleum are removed by washing it with dilute H₂SO₄ and NaOH
- The temperature at which the petroleum cracking is done is 650^oC
- The byproduct obtained during petroleum cracking is Alkenes
- The another name of Methane gas is Marsh gas
- The hydrocarbon used in the preparation of explosives is Toluene

SYNTHETIC MATERIALS

- The materials that are not available in nature but are prepared by humans by using naturally occurring raw materials is called Synthetic materials
- The compounds formed by the union of several molecules of a simple compound are called Polymers
- The plastics which lose their shape on heating are called Thermoplastics
- The plastics which set on heating and become irreversible hard on cooling are called Thermosetting plastics
- The method of hardening cement concrete structures by continuous treatment with water is called Curing
- The process of reducing the brittleness of the glass by slow cooling is called Annealing
- A substance formed by the chemical union of two or more elements combined in definite proportion by weight is called Chemical compound
- The bakelite is also called Thermosetting plastic because It cannot be hardened and softened the second time

- The synthetic material which is the mixture of calcium silicate, calcium aluminate with a small amount of gypsum is known as Cement
- The chemical name of gypsum is Calcium sulphate ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$)
- The amorphous, transparent synthetic material which is essentially the mixture of super cooled mixture of silicates is Glass
- The raw material used for making glass are sand, limestone and sodium carbonate
- The chemical composition of ordinary glass is homogenous mixture of Sodium silicate and Calcium silicate
- The amount of gypsum added to cement to prevent quick setting of cement is 3%
- The soda glass is the mixture of sodium silicate and calcium silicate
- The type of glass used to make laboratory wares is Borosilicate glass
- The lead glass is also known as Flint glass
- The type of glass used to make prisms, lenses and window panels in nuclear installations is Lead glass
- The metallic oxide added to give green color to the glass is Chromium oxide
- The metallic oxide added to give violet-red color to the glass is Manganese dioxide
- The metallic oxide added to give deep blue color to the glass is Cobalt oxide
- The metallic oxide added to give Red color to the glass is Cuprous oxide
- The glass used to make fire proof curtains, dresses and glass wool is Fiber glass
- The material used to prepare porcelain is White clay, Feldspar and Sand (quartz)
- The natural substance used for cleaning is Shikakai
- The two synthetic materials used for making fibres are Polyster and Terylene
- A simple compound whose molecule build up a polymer is called Monomer
- The polymer prepared from ethene is Polyethene
- The polymer commonly used to make gaskets and seals is Thiokol
- The polymer used to give coating to non stick cooking wares is Teflon
- The monomer used to prepare nylon is Carbolactum
- The monomer used to prepare Polyster is Esters
- The monomer used to prepare Poly vinyl chloride is Vinyl chloride
- The monomer used to prepare Teflon is Tetrafluroethene
- The monomer used to prepare Neoprene is Chloprene
- The monomer used to prepare Thiokol is Ethylene chloride and Sodium Polyhifide

- The polymer that is commonly used to make household articles is Plastic
- The chemical name of Soda ash is Sodium carbonate
- The type of glass used to make optical instruments is Lead glass
- The materials made of clay are commonly known as Ceramics
- The chemical name of limestone is Calcium carbonate
- An example of natural polymer is Cellulose and starch
- An example of thermoplastics is Polysterene
- An example of thermosetting plastic is Bakelite
- Gypsum is added to cement to control the setting rate of cement
- The process of second stage of setting of cement is Exothermic
- The raw materials used to manufacture glass are sand, limestone and sodium carbonate
- Glasses are imparted the desired color by adding a suitable metallic oxide
- An example of ceramic material is Chinaware, brick, Porcelain
- Porcelain materials are given glazing to plug the pores in the fired porcelain articles
- The chemicals commonly used for imparting glazing to porcelain articles are Boron and Alumina
- The type of glass used to manufacture wind shields of vehicles is Safety glass
- An example for naturally existing polymer is Carbohydrates
- The polymers prepared from unsaturated monomers are called Additional polymers
- The polymers obtained by condensation reaction between monomers are Condensation Polymers
- An example of condensation polymer is Nylon
- The process of using the material again by reprocessing is called Recycling
- The homogenous mixture of finely powdered ground clay and limestone is called Slurry
- Colloidal gel is the mixture of Calcium silicate and aluminate of cement
- The mixture of cement, gravel and sand in the ration 1:2:4 or 1:3:6 is called Concrete
- The chemical formula for Calcium silicate is CaSiO_3
- The chemical formula for Sodium silicate is Na_2SiO_3
- The chemical composition of Feldspar is $\text{K}_2\text{O Al}_2\text{O}_3 6 \text{SiO}_2$
- The type of glass used to manufacture decorative materials is Colored glass
- The type of glass used in preparation of bottles, tumblers is Soda glass
- The special additive found in Borosilicate glass is Boron

- The special additive found in Soda glass is Aluminum oxide
- The word Ceramics means Earthen pot
- The homogenous mixture of finely powdered white clay, sand and feldspar is called Slip
- The pores of fine articles are plugged by Glazing
- The articles used as ornamental building material are Terracotta articles
- A process in which several molecules join together to form a giant molecule is called Addition polymerization
- Several monomers forms a polymer with the elimination of some simple molecules during the reaction Condensation polymerization
- The simple compound that builds up the polymers are called Monomers
- The type of polymer used in preparation of medical articles is Neoprene
- The characteristic property of lead glass is it is highly transparent and has high refractive index
- The characteristic property of Borosilicate glass is It withstands high temperature fluctuations
- The characteristic property of Soda glass is It fuses easily at relatively low temperature
- The characteristic property of Safety glass is it withstands high stress and sharp edges are not formed when braked
- The characteristic property of fiber glass is Light, strong and fire proof
- The type of polymer used to make parts of electrical devices is Tetrefluroethene
- The type of glass that has high absorption radiation is Lead glass
- The polymer used in the manufacture of irrigation pipes is Polyvinyl chloride
- The type of polymer used for making fibers, brushes, ropes is Nylon
- The type of polymer nearest to natural rubber used in household articles is Neoprene
- The type of polymer used in making bags, films is Polythene
- The process of hardening of cement with water is called Setting
- The temperature at which glass is manufactured is 1973K
- The articles prepared from slip is heated in a furnace at a temperature of 1873K
- Polymer used in synthetic fibres is polyester
- The polymer that is compound of our food is Vitamin
- Starch is formed by polymerization of glucose
- Handles of cooking vessels are made up of bakelite because it melts at high temperature

- Cement flooring is treated with water after it is laid to avoid cracking
- The porcelain is used in electric devices because it is an Insulator

SOAPS AND DETERGENTS

- The metallic salts of long chain fatty acids that have cleaning action in water are called Soaps
- The materials used in the preparation of soap is Vegetable oil, Sodium hydroxide and Sodium chloride
- The chemicals required to prepare Sodium oleate are Oleic acid and Sodium hydroxide
- The property of water which makes it an excellent solvent is Polar nature
- The process of preparation of soap using a vegetable oil or animal fat is called Saponification
- The two alkalies that are commonly used in the manufacture of Soap are Sodium hydroxide and Potassium hydroxide
- The molecular formula of Sodium stearate is $C_{17}H_{35}COONa$
- The molecular formula of Sodium Oleate is $C_{17}H_{33}COONa$
- The molecular formula of Sodium Palmitate is $C_{17}H_{31}COONa$
- Soft water gives lather with soap because it does not contain ions of either calcium or magnesium
- The common salt is added in preparation of soap to reduce solubility of soap and help in precipitation
- The detergents are preferred over soaps because they readily form lather in the scum
- The fatty acid from which sodium palmitate is prepared is Palmitic acid
- The byproduct of soap industry is Glycerol
- The chemical used to precipitate soap during saponification is Sodium chloride
- Detergents are called as Soap less soaps
- The cleaning agent that gives lather readily even in hard water is Detergent
- The chemicals required to prepare potassium oleate is Oleic acid and potassium hydroxide
- An example of long chain fatty acid is stearic acid
- An example of soap Sodium Stearate
- An example of a detergent is Sodium dodecyl sulphate

- The one of the disadvantage of detergent over soap is it pollutes water and soil
- The substance used to remove dirt are soaps and detergents
- The organic compounds containing a carboxyl ($-\text{COOH}$) group are called Fatty acids
- The fatty oils and fats are commonly called as Glyceryl esters or Glycerides
- The molecular formula of Paalmilic acid is $\text{C}_{17}\text{H}_{31}\text{COOH}$
- The molecular formula of Oleic acid is $\text{C}_{17}\text{H}_{33}\text{COOH}$
- The molecular formula of Stearic acid is $\text{C}_{17}\text{H}_{35}\text{COOH}$
- An example of inorganic salt is Sodium chloride
- An example of organic salt is Sodium stearate
- The chemical formula of Glycerol is $\text{CH}_2\text{OH}-\text{CHOH}-\text{CH}_2-\text{OH}$
- The sweet viscous liquid soluble in water is called Glycerol

SOUND

- The sound of frequency greater than 20000Hz is called Ultrasonic sound
- A devise that uses the ultrasonic sound to determine the distance, speed and direction of underwater objects is SONAR
- SONAR stands for Sound Navigation and Ranging
- A instrument which uses the ultrasonic sound to display the images of the internal organs of the human body is called Ultrasonic Scanner
- The apparent change in frequency of wave motion due to relative motion between the source and observer is called Doppler effect
- The technique for recording the electrical activity of heart is called Electrocardiography
- ECG stands for Electrocardiography
- EEG stands for Electroencephalography
- The technique of using ultrasound to investigate the heart is called Echocardiography
- An instrument usually used by traffic inspectors to detect the speed limit of the vehicles is Radar Gun
- A periodic disturbance propagating through a medium carrying energy is called a Wave
- The relationship between the frequency f , wavelength λ and velocity V is given by the equation $V = f\lambda$
- The sound which can be heard by human ears is called Audible sound
- The frequency range of audible sound is 20Hz to 20000Hz

- The range of frequency of ultrasonic sound is from 20KHz to 5×10^5 KHz
- The range of wavelength of Ultrasonic sound is from 1.65cm to about 6×10^{-5} cm
- The branch of science that deals with the study of ultrasonic sound is called Ultrasonic
- The energy of a wave is proportional to its Frequency
- The ultrasonic sound has high frequency because their frequency is quite high
- The type of waves used in dry cleaning of clothes is Ultrasonic waves
- The type of waves used to treat neuralgic and rheumatic pains is Ultrasonic waves
- The type of used in bloodless surgery is Ultrasonic Waves
- The type of waves used to break gallstones in Kidneys are Ultrasonic waves
- The Waves that are used as insect repellants are Ultrasonic waves
- The waves used in SONAR devices is Ultrasonic waves
- The technique used in SONAR is called Echo ranging
- Doppler effect is applicable to both Light and Sound
- The speed of sound in air is 330m/s
- The branch of science that deals with the study of infrasonic sound is called Infrasonic
- Sound requires a material medium for its propagation
- Sound is produced by the Vibrations of bodies
- Human ears cannot hear sounds of frequency greater than 20,000Hz
- The wavelength of ultrasonic is less than 1.65cm
- Ultrasonic waves can be used to detect cracks and flaws in metal castings
- If the ultrasound waves from a SONAR take t seconds to reach a submarine and the speed of sound in water is V then the distance of the submarines from the SONAR is equal to $\frac{vt}{2}$
- SONAR can be used to detect submarines
- Ultrasonic waves travel through water at a speed of 1500m/s if these waves take 3s to reach an object and come back to the sonar device, the distance of the under water object is 2250m
- When a source of waves and the observer are approaching each other the observer feels that the frequency of the wave is Increasing
- When the source of waves and the observer are moving away from one another the observer feels that the frequency of waves is Decreasing
- Doppler effect is more pronounced for light waves than for sound waves

- A railway engine is stationed between two people A and B the engine is whistling and is closer to A than B, the frequency of the whistle remains constant for both A and B
- Radar gun usually employ Radio waves
- Doppler effect can be used to determine the speed of stars and galaxies
- The spectral lines of receding galaxies show red shift, the Red shift is due to Speed of the recession of the galaxy concerned
- The device SONAR was invented by Paul Langevin
- Infrasonic sound have the frequency below 20Hz
- In the equation $v = f \lambda$, f is Frequency
- The ultrasonic sound sent by the SONAR takes 5s to return from an object the distance of the object from the device Sonar is 3.75Kms
- ECG is used to diagnosis of Heart disease
- When $d = vt/2$, d represents Depth
- Echoes are produced by Reflection of sound
- Supersonics is used for velocities greater than sound
- The effect of red shift is due to shifting of light towards Red end
- The source of sound is Vibrations of Bodies
- The velocity of sound in water is 1.5Kms/hr
- Doppler effect is used in tracking of artificial satellites
- The rotation period of sun's disc is measured by Doppler effect
- The tool used to diagnosis of fluid filled organs like Bladder, Kidneys is Ultrasonic waves
- The unit of frequency of waves is Hertz
- Ultrasonic waves are used in the manufacture of emulsions for photographic film

HEAT

- The primary source of heat energy is Sun
- The rate of expansion is least in Solids
- The rate of expansion is more in gases than in liquids
- The volume of water decreases as its temperature increases from 0°C to 4°C
- The anomalous expansion of water is useful for Aquatic animals
- The volume of water increases as its temperature decreases from 0°C to 4°C
- As the total heat of the body increases the temperature also increases
- The SI unit of heat is Joule
- The SI unit of temperature is Kelvin

- As the quantity of matter increases the quantity of heat also increases
- The direction of transfer of heat depends upon the temperature
- The direction of transfer of heat does not depend on the quantity of heat
- The sum of the energies of all molecules is called Heat
- The average kinetic energy of the molecules is called Temperature
- The celcius scale of temperature was first proposed by Celcius of Sweden
- The freezing point of the pure water in celcius temperature scale is 0°c
- The boiling point of the pure water in celcius temperature scale is 100°c
- The interval between the freezing and boiling points in Celsius scale are divided into 100 equal divisions
- The fahrenheit scale of temperature was first proposed by Fahrenheit
- The freezing point of pure water in Fahrenheit scale of temperature is 32°F
- The boiling point of pure water in Fahrenheit scale of temperature is 212°F
- The interval between the two fixed points in Fahrenheit scale are divided into 180 equal divisions
- An example for freezing mixtures is Sodium chloride
- The Kelvin scale of temperature was proposed by William Thomson
- The freezing point of pure water in Kelvin scale of temperature is 273K
- The boiling point of pure water in Kelvin scale of temperature is 373K
- The mercury thermometer was developed in the year 1714
- The mercury thermometer was invented by Gabriel Daniel Fahrenheit
- The device used to measure the humidity of air is Hygrometer
- The device Galvanometer was devised by Lord Kelvin
- The temperature of human body according to Celsius scale of temperature is 37°c
- The temperature of human body according to the Fahrenheit scale of temperature is 98.6°F
- The temperature of the human body according to the Kelvin scale of temperature is 310K
- The relationship between the Fahrenheit and Celsius scale of temperature is given by $F = 9/5^{\circ}C + 32$
- The relationship between Celsius and Fahrenheit scale of temperature is given by $^{\circ}C = 5/9(^{\circ}F - 32)$
- If the boiling point of water is 100oC, then the temperature in Fahrenheit scale is 212°F
- The relationship between the celcius and Kelvin scale of temperature is given by $^{\circ}C = K - 273$
- The relationship between Kelvin and celcius scale of temperature is given by equation $K = ^{\circ}C + 273$
- The type of thermometers used by the Doctors are Clinical thermometers

- The bulb of the maximum thermometer is filled with Mercury
- The bulb of the minimum thermometer is filled with Alcohol
- The contact between the lower part of indicator and surface of mercury is Minimum
- 1 Calorie is equal to 4.18 Joules
- The quantity of heat required to raise the temperature of one gram of water by one degree celcius is called Calorie
- The melting point of Iron in Celcius scale is 1535°C
- The boiling point of Iron in Kelvin scale of temperature is 3273K
- The melting point of Copper in celcius scale of temperature is 1083°C
- The boiling point of Copper in Kelvin scale of temperature is 2840K
- The melting point of Mercury in Kelvin scale is 234K
- The boiling point of mercury in Celcius scale is 357°C
- The melting point of Gold in celcius scale is 1063°C
- The boiling point of Gold in Kelvin scale of temperature is 3239K
- The melting point of Oxygen in Celcius scale of temperature is -219°C
- The boiling point of Oxygen in Kelvin scale is 90K
- The temperature at which the solid substance melts is called Melting point
- The temperature at which the liquid starts boiling is called Boiling point
- The first person to declare that heat is type of motion was Thomson Rumford
- Two strips made of different metals and bound together with rivets is called a Bimetallic strip
- 35°C in Kelvin scale is equal to 308K
- 73K is equal to -200°C in Celsius scale of temperature
- The Celsius scale and Fahrenheit thermometers show the same readings at -40°C
- A device used to measure the temperature of a body is called Thermometer
- The principle of working of mercury thermometer is Liquid expand on heating and contract on cooling
- A thermometer that is designed to measure the both maximum and minimum temperature in a day is Maximum-Minimum thermometer
- The substance changes from solid to liquid form during Melting
- The substance changes from liquid to solid during Freezing
- The substance changes from liquid to gaseous during Boiling
- The speed of the molecules of a substance at absolute zero is Zero
- The chief principle of mercury thermometer is mercury expands on heating
- Heat produced by rubbing two hands is conversion of Mechanical energy into Heat energy
- The number of metals usually used in Bimetallic strip are 2

- The increase in the size of a substance due to heating is called Thermal expansion
- The increase in length of a wire or a rod on heating is called Linear Expansion
- In linear expansion the increase in length is directly proportional to its initial length
- The increase in the length of a solid rod of length 1m when its temperature is increased by 1°C is called Co efficient of linear expansion
- The co efficient of linear expansion of Iron is 12×10^{-6}
- The co efficient of linear expansion of Copper is 17×10^{-6}
- The co efficient of linear expansion of Ice is 51×10^{-6}
- The co efficient of linear expansion of steel is 11×10^{-6}
- The co efficient of linear expansion of Brass is 18×10^{-6}
- The co efficient of linear expansion of Silver is 19×10^{-6}
- The co efficient of linear expansion of Nickel is 13×10^{-6}
- The co efficient of linear expansion of Invar steel is 0.9×10^{-6}
- The co efficient of linear expansion of Aluminum is 23×10^{-6}
- The co efficient of linear expansion of Lead is 29×10^{-6}
- A rod of iron of length 50cm becomes 50.12cm when its temperature is increased form 12°C to 212°C then the co efficient o linear expansion of Iron is $12 \times 10^{-6}^{\circ}\text{C}^{-1}$
- The quantity of heat required to increase the temperature of 1kg of a substance by 1°C is called Specific heat
- The SI unit of Specific heat is joule / kilogram/ degree Celsius ($\text{Jkg}^{-1}\text{C}^{-1}$)
- A lead block weighs 500gm then the amount of heat to be given to increase the temperature from 30°C to 80°C is 3500J
- The specific heat of brass is $380 \text{ Jkg}^{-1}\text{C}^{-1}$. A brass vessel weighing 5kg is at 20°C then the amount of heat required to rise the temperature of vessel to 100°C is 152KJ
- The mass of a ball of Iron is 100gm, the ball gives up 30 to 20 joule of heat when it is cooled from 373K to 303K then the specific heat of Iron is $460 \text{ Jkg}^{-1}\text{C}^{-1}$
- The conversion from the liquid to vapour is Evaporation
- The quantity of heat required to completely change 1kg of a substance from solid state to liquid state without increasing its temperature is Latent Heat of melting
- The unit of Latent heat of melting is Joule / kilogram
- Specific heat $Q = mst$
- The latent heat of melting of Iron is 270 KJkg^{-1}

- The latent heat of melting of Copper is 210 KJkg^{-1}
- The latent heat of melting of Mercury is 12 KJkg^{-1}
- The latent heat of melting of Silver is 87 KJkg^{-1}
- The latent heat of melting of Lead is 59 KJkg^{-1}
- The latent heat of melting of Ice is 336 KJkg^{-1}
- A device that converts heat energy into useful mechanical energy is called Heat Engine
- A heat engine in which the fuel is burned outside the cylinder of the engine is called External Combustion engine
- A heat engine in which the fuel is burned inside the cylinder of the engine is called Internal Combustion Engine
- The movement of the piston inside the cylinder of an engine from one dead centre to another is called Stroke
- The proportion of heat energy converted into useful mechanical energy by heat engine is called Efficiency of Work done
- The first person to construct the commercially successful heat engine is Thomas Savery in 1698
- An example for External combustion engine is steam Engine
- An example for Internal combustion engine is Petrol Engine
- An internal combustion engine which uses diesel as the fuel is called diesel engine
- In diesel engine the fuel is ignited by the heat generated by the compression
- In petrol engine the fuel is ignited by the Spark Plug
- The part of a steam engine that changes the linear motion into circular motion is Crankshaft
- The fuel commonly used in a steam engine is Coal
- An actual mechanical work is done in an internal combustion engine in Expansion Stroke
- The inlet valve is open in internal combustion engine during the Intake stroke
- The component that produces the fuel mixture in a petrol engine is Carburetor
- An component of external combustion engine which produces and stores steam is Boiler
- The efficiency of an external combustion engine is 15%
- The sum total of the kinetic energies of all molecules of a substance is measure of the heat contained by it
- In a steam engine the steam that is led in contains more heat than that comes out of it

- The piston moves outwards inside the cylinder
- An external combustion engine uses 40000joules of heat to do 5000joules of useful mechanical work. The efficiency of the engine is about 12%
- The efficiency of heat engine is always less than 1
- A steam engine cannot be used in small engines because it is bulky
- The internal combustion engine has higher efficiency than external combustion engine
- A steam engine cannot start instaneously because it takes time to produce steam at high pressure
- The order of strokes is Intake stroke-Compression stroke-Power stroke-Exhaust stroke
- The spark plug in the petrol helps to inginite the fuel mixture
- Crankshaft in a heat engine converts the linear motion of piston into rotatory motion
- During the compression stroke of a four stroke internal combustion engine both the inlet valve and outlet valve are closed
- During the expansion stroke of the internal combustion engine the piston moves away from the heat engine
- During the intake stroke of the four stroke petrol engine the fuel mixture enters the cylinder
- Diesel engine uses the sprayer to spray the fuel into the cylinder
- The efficiency of an internal combustion engine is 40%
- A heat engine uses heat H to do work equal to W, now the efficiency E of the engine is given by $E = W/H$
- An engine has efficiency of 20%. How much heat does it consume to do 40,000J of work?
2000J
- A heat engine used 4800J of heat to do 1200J of work. The efficiency of the engine is 25%
- A heat engine does 3500J of work by using 10000J of heat, The engine is Petrol or Diesel engine
- The product of combustion consisting of carbon dioxide and water vapour expands suddenly in Power stroke
- The waste gases are pushed out of the cylinder through exhaust valve in Exhaust stroke
- Efficiency = work done/ heat supplied x 100
- The type of engine used in locomotives is steam engine
- Modern steam engine was invented by James Watt
- The main purpose of the heat engines in the olden ways was to lift water from the wells
- Petrol engine was invented by Nicholas otto
- Diesel engine was invented by Rudolf Diesel
- The toxic material emitted from the petrol engine is Carbon monoxide

- The device used in diesel engine in place of spark plug is Fuel injection pump
- According to second law of thermodynamics no engine is 100% efficient
- The function of pump in external combustion engine is transfer of content from condenser to boiler
- The petrol that minimize the air pollution is Oxidant petrol
- Diesel engine is not provided with a Spark plug
- Internal combustion engine was designed and constructed by Rudolf diesel
- Ignition in an internal combustion engine takes place between compression and power stroke
- Water kept in a closed vessel when boiled blows of the lid of the vessel , this is because of high pressure
- The stroke in which heat is liberated is Power stroke
- Diesel engine does not require Carburetor
- In petrol engine when both the inlet valve and outlet valve are closed, the mixture gets compressed
- A major product of combustion is Carbon dioxide
- The initial kinetic energy needed to start a petrol engine is provided by the Kick starter
- The risk of getting boiler busted is high because the steam is stored at a high pressure
- The single largest source of air pollution are Internal combustion engines
- The efficiency of a heat engine is 25% if 50000J of heat energy is supplied to the engine, the useful work done by the engine is 12500J
- Working of steam engine is due to latent heat
- The petrol that minimizes Air pollution is Load petrol
- The transfer of heat form the hotter end of the body to the cooler end is called conduction
- The transfer of heat that takes place through a medium due to the vibration of bodies is called conduction
- The transfer of heat that takes place by the actual movement of the particles in the medium is called Convection
- The transfer of heat that does not require any material medium is radiation

LIGHT

- The velocity of light in vaccum is 3×10^8 m/s
- The phenomenon of changing of direction of light when it passess from one medium to another is called Refraction
- The ratio between the sine of angle of incidence and sine of angle of refraction is always constant

- The incident ray and emergent ray are parallel to each other
- The ratio between the sine of the angle of incidence and sine of angle of refraction is constant is called Snells law
- The constant between the sine of angle of incidence and sine of angle of refraction is refractive index
- The refractive index is denoted by the symbol μ
- The refractive index of diamond is 2.417
- The refractive index of Ice is 1.31
- The refractive index of water is 1.33
- The refractive index of Crown glass is 1.43 to 1.61
- The refractive index of tint glass is 1.53 to 1.96
- The refractive index of Air is 1.00027
- The value of refractive index of light depends on the nature of medium and color of light
- The critical angles of Crown glass is 41.3°
- The critical angles of Water is 49°
- The critical angle of Diamond is 24°
- The total internal reflection takes place if light travels from a denser medium to rarer medium
- The angle of incidence is greater than the critical angle
- The minimum value of the angle of incidence required for the angle of refraction to be greater than 90° is called Critical angle
- The prism work on the principle of total internal reflection
- A spherical diamond is cut into 35 faces at the top
- A spherical diamond is cut into 25 faces at the bottom
- Bicycle reflector works on the principle of total internal reflection
- The optical illusion created by the total reflection of light is Mirage
- The optical fibres are used in Communication system
- The quantity of information that can be sent through the optical fibres is greater than the ordinary material
- The phenomenon of splitting of white light into its constituent colors is called Dispersion of light
- The set of seven colors of composite light is called Spectrum
- The phenomenon of splitting of light into seven colors was first observed by Sir Issac Newton
- During refraction the bending of red color light is least
- During refraction the bending of Violet color is maximum
- The naturally occurring spectrum of seven colors is Rainbow

- The color of the outer edge of primary rainbow is Red
- The color of the inner edge of the primary rainbow is Voilet
- The blue color of sky during day time is due to dispersion of light
- Angle of incidence is equal to angle of refraction
- The type of the mirror used as rear view in vehicles is Convex mirror
- The type of the mirror used in the headlights of the vehicles is Concave mirror
- The bulb should be placed at the principal focus of a concave mirror to make the light travel longer distance
- Refraction of light occurs due to change in the speed of light
- A ray of light that enters obliquely from a denser to a rarer medium will bend away from the normal
- A ray of light that enters obliquely from a rarer to denser medium will bend towards the normal
- A ray of light that enters at right angles to the surface of separation of two media will pass through without bending
- The bottom the coin placed in the plate filled with water appear raised due to refraction of light
- The bottom of the swimming pool appears raised due to refraction of light
- If the angle of incidence increases the angle of refraction increases
- The total reflection prisms are used in Optical instruments
- The sparking of diamond is due to total internal reflection
- The various colors present in white light are VIBGYOR
- The various colors present in solar spectrum are VIBGYOR
- Beautiful circular rings of colors formed in the sky due to the breaking of sunlight into its constituent colors is called Rainbow
- Rainbow forms when the water droplets are at the angular height of 40 to 40° from the horizon
- The refractive index of diamond is highest
- When a white light is passed through a triangular prism the refraction is highest for red and lowest for violet
- The refractive index of the medium is equal to the ratio between the speed of light in air and in the medium
- The angle of refraction when the light passes from one medium to another without bending is Zero
- The shape of the rainbow is Semicircular
- The phenomenon of bouncing back of light from a surface is called Reflection of light

- The phenomenon of bending of light when it travels from one medium to another is called Refraction of light
- The property of light to travel along straight lines is called rectilinear propagation of light
- The light of a single pure color is called Monochromatic light
- The light which consists of two or more colors is called Composite light
- The phenomenon of splitting of composite light into its constituent colors is called dispersion of light
- The band of colors obtained by dispersion of narrow beam of composite light is called Spectrum
- A device used to obtain pure spectrum of Polychromatic light using a prism is called a Spectroscope
- A spectrum in which the constituent colors of a composite light occupy their respective positions is called Pure spectrum
- A spectrum consisting of definite single lines against a dark background is called Line emission Spectrum
- A spectrum that has a number of dark lines or bands against the background of continuous spectrum is called line absorption Spectrum
- The several dark lines seen in the solar spectrum are called Fraunhoffer lines
- The phenomenon of scattering of light by molecules in which there is a change of frequency due to the molecules gaining or losing energy is called Raman scattering
- Sir Isaac Newton showed that sunlight is made up of Seven distinct colors
- A medium that brings about dispersion of composite light is called Dispersive medium
- The dispersive medium in which the dispersion of composite light does not take place is vaccum
- The range of wavelength of the visible spectrum is 400nm to 750nm
- The common unit of wavelength is Angstrom
- 1 Angstrom is equal to 10^{-10} m
- 1 nanometer is equal to 10^{-9} m
- The spectra formed from bodies emitting radiations is called Emission Spectra
- A spectrum that consists of a continuous series of overlapping frequencies is called a Continuous Spectrum
- An example for Line emission spectrum is Sodium vapour lamp
- The study of Fraunhoffer lines helps to study the elements in the solar atmosphere
- Rayleigh scattering is also called as Coherent scattering
- Rayleigh scattering is called as coherent scattering because there will be no change in the wavelength of light even after scattering

- The Intensity of scattered light is inversely proportional to the fourth power of its wavelength
- The change in the frequency of the incident light by certain molecules is known as Raman Effect
- Raman scattering is also called as Incoherent scattering
- Raman scattering is called Incoherent scattering because the scattered light contain certain lower and higher frequencies along with incident frequencies
- Raman explained his effect on the basis of Quantum theory of radiation
- Raman effect is useful in the study of molecular energy levels
- The National science Day is observed on 28th February
- The Raman Effect was discovered in the year 1928
- The speed of light in vaccum or air is 3,00,000 Km/s
- An example of spectrum formed in nature is Rainbow
- The type of spectrum we get from an arc lamp is Continuous emission spectrum
- In Visible spectrum, the color which has the highest wavelength is Red light
- In visible spectrum, the color which has the least wavelength is Violet light
- The width of the slit in spectroscop to obtain the pure spectrum is less than 0.05mm
- The lenses are placed before and after the prism in spectroscop to minimize overlapping to colors
- The part in the spectroscop that renders the light into parallel beams is Collimator
- The correct explanation for the Blue color of sky was given by Lord Rayleigh
- An example for incoherent scattering of light is Raman scattering
- An example for coherent scattering of light is Rayleigh Scattering
- The two organic liquids in which Raman scattering can be absorbed are Benzene and Toluene
- The C.V Raman was awarded the Noble prize in 1930
- When a ray of light travels from one medium to another there will be change in wavelength , velocity
- Refractive index is the ratio between the speed of light in vaccum and the medium
- Colors in the rainbow is due to Dispersion of light
- The order of Seven colors in a white light is VIBGYOR
- A device that helps to cause dispersion of a composite light is a Prism
- Dispersion of composite light caused by the prism is due to variation of refractive index with the color of light
- An example of Monochromatic light is Laser light
- In a spectrum, red color is deviated to lesser extent than all the colors, because its speed is not related

- An example for continuous emission spectrum is Candle flame
- In Rayleigh scattering the incident light and the scattered light will have the same frequency
- The nature of a visible spectrum depends on the kind of light emitted by the source
- A continuous emission spectrum consists of an unbroken series of all wavelength without any abrupt change in between
- A spectrum of very hot luminous body is a Continuous emission spectrum
- Light from a carbon arc lamp is passed through a sodium vapour lamp and then allowed to enter a spectrometer, now the resulting spectrum consists of two dark lines in the yellow region
- The element that was discovered in the sun by a study of Fraunhofer lines was Helium
- When monochromatic light is passed through benzene, the scattered light contains frequencies that are both higher and lower than that of the incident light
- Sir C.V.Raman was awarded Noble prize for his work on Incoherent scattering of light
- The light which give rainbow like spectrum is Continuous emission spectrum
- VIBGYOR is the component colors of white light
- The symbol for refractive indices is $\sin i / \sin r$
- The approximate wavelength of Electromagnetic radiation is 4×10^{-7} to 5×10^{-9}
- Every year is celebrated as National Science Day to commemorate Raman Discovery
- Collimator in a spectrometer helps the light to travel Parallely
- The telescope helps to observe the magnified image of the spectrum
- The angle of prism, refractive index and dispersion are measured by Spectrometer
- The dispersive medium for light is Prism
- A composite light is made to pass through a prism and then through an inverted prism, the color of light emerging out of the inverted prism is White
- If the colors in the spectrum are overlapping and are not distinct then it is called Impure spectrum
- A filament lamp produces continuous emission spectrum
- A composite light is made to pass through mercury, it produces line emission spectrum
- When a white light from carbon passes through sodium vapour, the spectrum does not show the yellow
- The background color of line emission spectrum is Black
- Line from a molten iron produces a Continuous spectrum
- A piece of transparent material that has at least one curved surface is Lens
- Lenses are named on the basis of the shape of their surfaces
- In convex lens the central portion is thicker than the edges
- In concave lens the central portion is thinner than the edges

- The phenomenon of rays of light refracted through convex lens meet at one point is Convergence of Light
- The centers of imagined spheres of which the surfaces of the lens are parts is Center of Curvature
- The imaginary line joining the centers of Curvature is Principal axis
- The radius of a sphere of which a surface of a lens is a part is radius of Curvature
- The geometric center of the lens is Optic center
- The rays of light parallel to the principal axis of the convex lens enter the lens and get refracted and then converge at a particular point on the principal axis is Principal focus of the convex lens
- The rays of light parallel to the principal axis of the convex lens enter the lens and get refracted and then diverge at a particular point on the principal axis is Principal focus of the Concave lens
- The distance between the optic center and the principal focus of a lens is Focal Length
- The focal length of a convex lens is always written as + sign
- The focal length of the concave lens is always written with - sign
- The angle of incidence when a ray of light passes through a optic center of lens is 90°
- The angle of incidence of light travelling along the principal axis is 0°
- The image formed by the concave lens is always Virtual
- The nature of image formed by the concave lens when the object is at infinity is Virtual, Erect, Small
- The nature of image formed by the concave lens when the object is Beyond $2F$ is Virtual, Erect, Small
- The nature of image formed by the concave lens when the object is at $2F$ is Virtual, Erect, Small
- The nature of image formed by concave lens when object is between F and $2F$ is Virtual, Erect, Small
- The nature of image formed by the concave lens when the object is at F is Virtual, Erect, Small
- The nature of image formed by the concave lens when the object is between F and optic center is Virtual, Erect, Small
- The nature of image formed by the convex lens when the object is at infinity is real inverted.
- The nature of image formed by the convex lens when the object is between F and $2F$ is real inverted.
- The defect of eye to see clearly the nearer objects but not the far away is Short sightedness
- The defect of eye to see clearly the far away objects but not the nearer is Long sightedness

- The lens used to rectify short sightedness is Concave lens
- The lens used to rectify long sightedness is Convex lens
- The instrument used to form a real image of an object on the screen using a convex lens is Camera
- The instrument used to see the micro organisms is Microscope
- The instrument used to observe the distance stars, planets and satellites is Astronomical telescope.
- If the light rays travelling in different directions form a source of light is called Divergent rays
- If the light rays travelling are meeting at a point is called Convergent rays

THE UNIVERSE

- The diameter of the earth is about 12800kms
- The objects in the sky are called Celestial objects
- The imaginary sphere that appears to meet the ground is called Horizon
- The imaginary sphere is called Celestial sphere
- The pole star appears in the same direction from the northern hemisphere of the earth
- The elevation above the horizon is called Altitude
- The brightest constellation which is easy to identify is Orion
- The group of seven stars in the north are called Saptharishi
- The brightest star is Sirius
- The brightest star Sirius is in the constellation Canis major
- The Indian name of constellation canis major is Lubdhaka
- The group of billion of stars is called Galaxy
- The stars which are visible to the naked eye belong to Milky way galaxy
- The natural satellite of the earth is Moon
- The average distance of the moon from the earth is 384,000kms
- The diameter of the moon is 3476kms
- The revolution period of the moon is 27.32 days
- The rotation period of the moon is 27.32 days
- Only one face of the moon is visible because its period of revolution and rotation is same
- The duration of full moon to full moon is 29.53 days
- When the full moon rises in the east the sun sets in the west at 180° away
- The moon rises at 9am on the day of Vinayaka chaturti
- The moon sets at 9pm on the day of Vinayaka Chaturthi
- The periodical variations in the shape of moon are called Phases of moon
- The crescent moon is visible in the evening in the direction of West

- The star seen in the month of Pushya is Pushya
- The star seen in the month of Ashwayuja is Ashwini
- The ocean swells in the direction of moon
- Moon is responsible of occurrence of high and low tides
- The radius of the sun is 6.9×10^5 km
- The average distance of the sun from the earth is 150,000,000kms
- The time taken by the light from sun to reach the earth is 8.3 min
- The angle between the celestial sphere and ecliptic is $23\frac{1}{2}$ degrees
- The vernal equinox is on march 21
- The Autumnal equinox is on September 22
- The sun appears to move towards the north of celestial equator after March 21
- The sun appear to move towards the south of celestial equator after September 22
- The number of planets in the solar system are 9
- 1 Astronomical unit is equal to 150,000,000kms
- The celestial objects that twinkle in the night are Stars
- The planet Venus appear to be in the constellation Taurus
- The planet Mars is in the constellation Pisces
- The planet Jupiter lies in the constellation Virgo
- The sun lies in the constellation cancer
- The planet Mercury lies in the constellation Leo
- The brightest planet is Venus
- The planet mercury is seen near the Horizon
- The Planet mercury is visible in the west after the sunset
- The planet Jupiter is visible slightly to the west of Zenith
- The size of full moon is $\frac{1}{2}$ degree
- The red color of the planet Mars is due to the Iron Oxide on the soil
- 1 degree is equal to 60(arc) minutes
- 1 minute is equal to 60(arc) seconds
- Venus in crescent phase has angular size of 64 arc seconds
- Venus at gibbous phase has angular size of 10 arc seconds
- The duration of Lunar eclipse is longer than that of the Solar eclipse
- Solar eclipse occurs on the New moon day
- Lunar eclipse occurs on the Full moon day
- The time taken by the moon to cross the umbral region of the earth is called Duration of Lunar eclipse
- The apparent daily motion of the celestial objects in the sky from east to west is called Diurnal motion

- The star located in the direction of the axis of the earth in the northern direction is called Pole star
- The star that does not show diurnal motion is Pole star
- The pole star is visible from the Northern Hemisphere
- The pole star is not visible from the Southern Hemisphere
- The pole star always appear in the same direction because the diameter of earth is smaller than the distance of pole star
- The constellation sapharishi is also called Ursa Major
- The orion nebula is located in the constellation Orion
- The solar system is located in Milky way galaxy
- The shape of Milky way galaxy is Spiral
- The stars that are engulfed in the structure are called Nebula
- The Indian name of Milky Way galaxy is Akashganga
- The first two stars of the constellation are called Pointer stars
- The visible stars in the sky are grouped into 88 constellations
- A group of stars in the sky that form a regular pattern in the sky at night is called a Constellation
- The angle between the sun and the moon on a full moon day is 180 degree
- The various phases of the moon are due to variation in the sunlit portion
- If the sunlit portion is towards the earth the phase of the moon is Full moon
- If the sunlit portion is not at all presented we have New moon phase
- The full moon occurs once in 29 days due to movement of the earth
- The moon remains in the horizon for 12 hours during a day
- The zodiac is divided into 12 equal parts
- A belt in the celestial sphere in which we find sun, the moon and the principal constellations is called Zodiac
- The stars twinkle due to reflection of light
- The brightness of the stars vary due to distance of them
- The period of revolution of the earth is 365 days
- The period of rotation of earth is 24 hrs
- The sun crosses the celestial equator 2 times in the course of a year
- The biggest planet in the solar system is Jupiter
- The planet nearest to the sun is Mercury
- The constellation used to identify pole star is Ursa Major
- The comet lies in the constellation Cassiopeia
- The planet Saturn lies in the constellation Aquarius
- A month in the Indian lunar calendar system is divided into 2 Pakshas

- If the half moon is visible in the Zenith in the morning it will be again visible in the evening in the zenith after 15 days
- The phase of half moon is called quarter
- The motion of the earth around the sun is called Annual motion
- The points where the celestial equator and ecliptic meet are called Equinoxes
- The imaginary circle in the sky representing the apparent path of the sun is called Ecliptic
- The average distance of the planet Mercury from the sun is 0.39AU
- The average distance of the planet Mars from the sun is 1.52AU
- The average distance of the planet Pluto from the sun is 39.81AU
- The phases of moon are 4
- The sun and the host of celestial objects revolving round it are together called Solar System
- The total amount of energy emitted by a source in 1second is called Luminosity
- The visible disc of the sun is called Photosphere
- The layer of the sun lying just above the photosphere is called Chromosphere
- The layer of the sun which is visible only during the total solar eclipse is called Corona
- The dark irregular patches on the surface of the sun are called Sun spots
- The distance traveled by light in one year is called Light year
- A system of stars comprising of hundreds or thousands of millions of stars held together by the force of gravity is called Galaxy
- The branch of science that deals with the study of universe is called Cosmology
- A celestial object in which the escape velocity is greater than the speed of light is called Black hole
- The velocity of recession of a celestial body is proportional to its distance from the observer is called Hubble's law
- The awesome explosion of the primordial fireball which marked the beginning of universe about 15–20 billion years ago is known as Big Bang
- The imaginary sphere on the inner surface of which the celestial bodies appear to attach is called Celestial Sphere
- The star nearest to the earth is Sun
- The distance of sun from the earth is 1.5×10^8 km
- The time taken by a light from the sun to reach the earth is 8.3min
- The mass of the sun is about 2×10^{30} Kg
- The surface temperature of sun is about 6000K

- The total amount of energy radiated by the sun per second is called Solar luminosity
- The solar luminosity of Sun is $3.9 \times 10^{26} \text{W}$
- The places in India where the two large telescopes are situated are Udaipur and Kodaikanal
- The period of rotation of the sun is 26 days
- The direction of rotation of the sun is from West to East
- The grain like pattern found on the photosphere of the sun are called Granulations
- The thread like structures found on the surface of the sun are called Spicules
- The short outbursts emerging from the solar surface are called Solar flares
- The temperature of the region of sunspots is about 4000K
- A display of streams of colored light seen in night sky in the polar regions of earth is called Aurora
- The source of energy of the sun are Thermonuclear reactions
- 1 light year is equal to 10^{16}m
- 1 parsec is equal to 3.26 light years
- Stars differ in color due to difference in their temperature
- The scale used to express the brightness of stars is Magnitude scale
- The magnitude of sun is -27
- The magnitude of the moon is -13
- The magnitude of the star Sirius is -1.4
- The magnitude of the star Vega is 0
- The magnitude difference of 1 is equal to the ratio of 2.5
- The magnitude difference of 2 is equal to the ratio 6.25
- The magnitude difference of 3 is equal to the ratio 15.6
- The magnitude difference of 4 is equal to the ratio 40
- The magnitude difference of 5 is equal to the ratio 100
- The value of luminosity of star depends upon the temperature and diameter of star
- The luminosity of star Sirius is $23.5L_{\odot}$
- The size of stars are determined from their luminosity and temperature
- The galaxy next to the Milky way galaxy is Andromeda
- The shape of the galaxy Andromeda is Spiral
- The number of galaxies estimated to be present in the universe are 10^{11} million

- The distance of farthest galaxy visible through a telescope is about 3×10^9 light years
- The process involved in entire life cycle of a star from its birth to death is called Stellar evolution
- Massive collection of gaseous matter which contracting under influence of its gravity Protostar
- The value of Chandrasekhar's mass limit is 1.4Mo
- The matter in the protostar is made up of Hydrogen
- Shell of glowing gaseous matter surrounding evolved star from which it ejected Planetary Nebula
- A star in the constellation Orion is Betelgeuse
- A helium star that is extremely dense, small and bright is called White dwarf
- The nuclear fuel in a White dwarf is Helium
- The nuclear fuel in a main sequence star is Hydrogen
- The spectacular explosion of the outer shell of a massive star that occurs at the end of the red giant phase is called Supernova
- A spinning neutron star that emits radio waves is called Pulsar
- A highly dense object collapsed under the influence of its own gravity, formed during supernova explosion is called Neutron star
- An aggregation of relatively small number of stars which are held together by gravity and move together are called Star Cluster
- The age of the universe estimated to be about 10 to 20 billion years
- The SI unit of luminosity is Watt (W)
- The temperature of the interior of the sun is about 20 million degrees
- An example of yellow star is Sun
- The star of magnitude 3 is 100 times brighter than the star of magnitude 8
- An example for a binary star is Sirius
- The galaxy in which the sun is present is Milky way
- The shape of the Milky way galaxy is Spiral
- The mass of Milky way galaxy is about 3×10^{41} Kg
- The final end stage of the star of mass 30Mo is Black hole
- The only star in the solar system is Sun
- The densest objects in the universe is Black holes

- Sun is the brightest star as seen from earth because of its temperature and proximity to the earth
- The mass of sun is 3 lakh times than the earth
- The force that keeps the planets to move around the sun is Gravitational force
- Existence of elements like sodium, calcium helium in sun is established by study Fraunhoffer lines
- The sunspots on the surface of sun have lower temperature than the surface of sun
- The polar lights are due to interactions between the earth's magnetic field and charged particles emitted by the sun
- The energy of the sun is due to nuclear fusion reactions taking place at the core
- The energy produced at the core reaches its surface by Convection and radiation
- A star's apparent brightness depends upon its actual brightness and distance
- A star of magnitude 2 is brighter than a star of magnitude 7 by a factor of 100 times
- A star of magnitude 1 is brighter than the star of magnitude 6 by a factor of 100 times
- A star of magnitude 5 is brighter than a star of magnitude 6 by a factor of 2.5 times
- The star of magnitude 1 is brighter than a star of magnitude 3 by a factor of 6.25 times
- The apparent brightness of the star is lower if its magnitude is higher
- The hottest star is a Blue star
- The range of radii of majority of the stars is 0.1 to 20 times the solar radius
- The luminosity of star usually increase with mass
- Sirius is a binary star, its components has masses 1.4Mo and 2.4Mo
- The number of stars in a Milky way galaxy are 10^{11}
- The diameter of Milky way is about 100000 light years
- The period of revolution of the solar system around the Milky way is about 250 million years
- The speed of the revolution of the solar system around our galaxy is about 250Km/s
- The central thickness of the milky way galaxy is about 6000ly
- The sun is at the Centre of the Milky way galaxy
- The mass of milky way is about $2 \times 10^{11}Mo$
- The matter at the core of the protostar is Hydrogen
- A massive gaseous cloud contracting under the influence of gravity is known as Protostar
- Pulsar is another name of a Neutron star

- Red shift for a galaxy indicates its recession
- The stars which orbit each other about a common centre of gravity are known as Binary stars
- The rate of recession of a body is directly proportional to the distance from us
- The sun would become a black hole if it is compressed to the radius of 3km
- Big Bang theory is supported by the recession of Galaxies
- The first stage of birth of star is Protostar
- Aurora are seen near the poles of the earth
- The temperature range of Red star is 2500-3500K
- The temperature range of Orange yellow star is 3500-5000K
- The temperature range of Yellow star is 5000-6000K
- The temperature range of Yellowish white star is 6000-10,000K
- The temperature range of Bluish white star is 10,000-50,000K
- An example for Orange yellow star is Arcturus
- An example for Yellow star is Sun
- An example for Yellowish white star is Sirius
- An example for Bluish white star is Rigel
- The magnitude scale of Naked eye is +5
- The magnitude scale of planet Pluto is +15
- The galaxies which are thousand times brighter than ordinary galaxies are Quasars
- The name of our galaxy is Milky Way
- The Big Bang theory was proposed by Edwin Hubble
- During supernova the materials are thrown at a speed of about 10^4 Kms/s
- The farthest star visible to naked eye has the magnitude +6
- The first supernova explosion occurred in 1006A.D
- The second supernova explosion occurred in 1054
- The third supernova explosion was observed by Tycho Brahe
- The fourth supernova explosion was observed by Johannes Kepler
- The supernova of 1572 is called Tycho's star
- The supernova of 1604 is called Kepler's star
- The star clusters are classified into different types based upon their appearance
- Solar telescopes are special telescopes designed to study the sun

- The elements that are present in sun are sodium, calcium and hydrogen
- The galaxy Milky way was observed by Galileo
- During supernova the materials are thrown out at the speed of 10^4 Km/s., A sphere of neutrons will remain at the centre
- Two stars have a magnitude difference of 6, the brightness ratio is 1:100
- The huge flares that often loop back into the atmosphere are Solar Prominence
- The system of measuring masses of stars based on their motion is called Binary star
- A brightness ratio of 2.5 corresponds to a magnitude difference of 1
- A brightness ratio of 6.25 corresponds to a magnitude difference of 2
- A brightness ratio of 15.6 correspond to a magnitude difference of 3
- A brightness ratio of 40 corresponds to a magnitude difference of 4
- A brightness ratio of 100 corresponds to a magnitude difference of 5
- One parse equal to 3×10^{13} Km
- The rotation movement of the sun can be confirmed based on the changing position of Sunspots
- In Red giant stage, clouds of hydrogen gas detached and thrown to space are Planetary Nebulae
- Immanuel kant was able to show that the nebulae are indeed galaxies similar to our galaxy
- An example for strange star is Red giants
- The vast surrounding place is called Universe
- 1 light year is equal to 9.46×10^{12} Km
- The two most common shapes of galaxies are Spiral and Elliptical
- The group of stars that resemble a certain shape are called Constellations
- The Indian name of Milky way galaxy is Akash ganga
- The nearest star to the earth other than sun is Alpha Centuari
- The exploding star is called Supernova
- A spinning neuron star emits Radio Waves
- The main source of heat and light to all members of solar system is Sun
- The sunspots are dark in color because the temperature is less than the temperature of photosphere
- The dark lines in the solar spectrum are Fraunhoffer lines

- The stellar distance is measured in Light year and Parsec
- The faint cloudy patches seen in the night sky is Nebulae
- The motion of galaxy is studied by Doppler effect
- The order of the stages of life cycle of medium size star is Protostar-Red giant-White dwarf

NATURE OF MATTER

- Any thing that has mass and occupy space is called Matter
- Einstein's mass energy relation is given by the equation $E = mc^2$
- The matter is classified into different types based on their physical properties
- The substance which consists of similar particles are called Homogenous mixtures
- The substances which can be divided into two or more simple substances chemically are called Heterogeneous
- The combination of two or more mixtures with indefinite proportion are called Mixtures
- The pure substances made by the chemical combination of two or more substances are called Compounds
- The minute particle of any element that takes part in the chemical reaction is called a Atom
- The cluster of atoms is called Molecule
- The molecules of helium are made up of Single atom
- The elements made up of single atom are called Monoatomic
- The molecules of oxygen consists of 2 atoms
- The elements made up of two atoms are called Diatomic
- A molecule of ozone consists of three atoms of oxygen
- The study of nature and properties of matter is called Macro study
- The study of particles in matter is called Micro study
- The speed of the particles in solids increases on heating
- A molecule of hydrogen consists of two hydrogen atoms
- The molecule of water consists of two hydrogen atoms and one oxygen atom
- A atom or cluster of atom either by gaining or losing electrons become electrically charged particle is called Ion
- The negatively charged ions are called Anions
- The positively charged ions are called Cations

- The atomic mass of oxygen is 16
- The ratio of the mass of one molecule to that of one-twelfth of the mass of carbon 12 atom
- The mass of water molecule is 18
- 1 Dalton is equal to 1.66×10^{-27} kg
- The ratio of the mass of one atom of the element to the mass of one atom of hydrogen is called Atomic mass
- The method of representing atoms by symbols was suggested by Berzellius
- The Avogadro number is denoted by the symbol N
- The value of Avogadro number is 6.023×10^{23}
- The quantity of a substance that contain Avogadro number of a particular species is called Mole
- The chemical symbol of Carbon is C
- The chemical symbol of Hydrogen is H
- The chemical symbol of Oxygen is O
- The chemical symbol of Sulphur is S
- The chemical symbol of calcium is Ca
- The chemical symbol of Barium is Ba
- The chemical symbol of Potassium is K
- The chemical symbol of Sodium is Na
- The chemical symbol of Gold is Au
- The chemical symbol of Iron is Fe
- The combining capacity of atoms is known as Valency
- Valency of different elements is decided based on the number of hydrogen atoms combine with one atom of that element
- The valency of HCl is 1
- The property of the same element that exhibit the different valence number in a compound and at another is called Variable Valency
- An example for monoatomic element is Sodium
- A group of elements which act as a single unit retaining its identity in chemical reaction is called Radical
- The molecular formula of Sulphuric acid is H_2SO_4

- The molecular mass of Hydrogen chloride is 36.5
- The percentage of oxygen present in Potassium Chlorate is 39.18
- The percentage of element magnesium in Magnesium Chloride is 25.26
- The molecular mass of Magnesium Chloride is 95
- The symbolic representation of chemical change is called Equation
- In equation the reactants are written on the left hand side
- In equation the products are written on the right hand side
- In an equation the gas liberated during chemical change is shown by upward arrow mark
- In an equation the solid formed during chemical change is shown by downward arrow mark
- The number of protons in an atom indicates its Atomic number
- The Atomic number is denoted by the letter Z
- The positively charged particles are called Protons
- The electrons are the negatively charged particles
- The Neutrons are the Neutral particles
- The total number of neutrons and protons in an atom is known as Atomic mass number
- Atomic mass number is denoted by the letter A
- The equation used to find the Atomic mass number is $A = N + Z$
- The formula used to find the number of neutrons in an atom is $N = A - Z$
- The atomic number of Oxygen is 8
- The imaginary path of electrons around the nucleus is called Orbit
- The central part of the atom bounded by protons and neutrons is called Nucleus
- Protons and Neutrons are commonly known as Nucleons
- The rearrangement of elements that occur between atoms is a Chemical reaction
- The electrons which take part in chemical reaction are called Valence Electrons
- The maximum number of elements that can be accommodated in any shell is $2n^2$
- The maximum number of electrons in the shell K are 2
- The maximum number of electrons in the shell L are 8
- The maximum number of electrons in the shell M are 18
- The maximum number of electrons in the shell N are 32
- The sub shells in the shell K are s

- The sub shells in the shell L are s, p
- The sub shells in the shell M are s, p, d
- The sub shells in the shell n are s, p, d, f
- Arrangement of electrons in different sub shells of an atom of the element is called Electronic Configuration
- The electrons in the sub shells are filled in the increasing order of energy level
- The electronic configuration of carbon is $1s^2, 2s^2, 2p^2$
- The electron shells around a nucleus were discovered by Neils Bohr
- The particle Electron was discovered by J.J.Thomson
- The particle Proton was discovered by Rutherford
- The particle Neutron was discovered by James Chadwick
- The electronic configuration of oxygen is $1s^2, 2s^2, 2p^4$
- On the basis of electronic configuration the elements are classified into four blocks
- The atom with electronic configuration ns^2, np^6 attain maximum stability
- The elements which do not participate easily in the chemical reaction are called Zero group elements
- The state of matter that has definite shape and definite volume is called Solid
- The kinetic energy of molecules is least in solids
- The state of matter that has no fixed shape but has fixed volume is called Liquid
- The distance between the molecules in solid is Least
- The distance between the molecules in liquids is greater than the solids
- The state of matter that has neither definite shape nor definite volume is called Gaseous
- The molecules of the gas has the highest freedom to move
- The distance between the molecules in gas is greater than the liquids
- On heating liquids the motion of the particles increases
- Pure substances are classified into 2 types
- Any pure substance that is made of only one kind of atoms is called an element
- An example for Element is Hydrogen
- A pure substance formed by the chemical combination of two or more substances in definite proportion by weight is called a Chemical compound
- An example for Chemical compound is Water
- An example for anion are Chloride ions (Cl^-)

- An example for cation are Hydrogen ions (H⁺)
- The atomic mass of sodium is 23
- The atomic mass of Chlorine is 35
- The atomic mass of Nitrogen is 14
- One a.m.u is defined as the mass of 1/12th the mass of carbon 12 atom
- The molecular mass of carbon monoxide is 28
- The molecular mass of carbon dioxide is 44
- The molecular mass of Hydrochloric acid is 36.5
- The molecular mass of Calcium Carbonate is 100
- The number of molecules present in mole of a substance is constant, the constant is called Avogadro number
- The chemical symbol of Platinum is Pt
- The chemical symbol of tungsten is W
- The valency in Nitric oxide (NO) is 2
- The short form of a molecule of an element or compound is called Molecular Formula
- The molecular formula of Nitric Acid is HNO₃
- The molecular formula of Washing soda is Na₂CO₃
- The molecular formula of Caustic soda is NaOH
- The molecular formula of Ammonia is NH₃
- The molecular formula of Calcium carbonate is CaCO₃
- The ratio of Hydrogen, Sulphur and Oxygen in Sulphuric acid is 1:16:32
- The molecular formula of Potassium hydroxide is KOH
- The molecular mass of potassium hydroxide is 56
- The molecular mass of Nitric acid is 63
- The molecular formula of Potassium chlorate is KClO₃
- The molecular mass of Potassium chlorate is 122.5
- The mass of Nitrogen in HNO₃ is 14
- The mass of Magnesium in MgCl₂ is 24
- The percentage of chlorine in MgCl₂ is 74.736
- NH₄OH + HCl ----- NH₄Cl + H₂O
- The Electronic configuration helps to the nature of chemical bond
- The Electronic configuration helps o know the magnetic property of element

- The Zero group elements are also called as Noble gas
- The atomic number of Helium is 2
- The atomic number of Neon is 10
- The atomic number of Argon is 18
- The atomic number of Krypton is 36
- The electronic configuration of Helium is $1s^2$
- The latin name of Iron is ferrum
- The Latin name of gold is Aurum
- The Latin name of Potassium is Kalium
- The Latin name of Lead is Plumbum
- The Latin name of Sodium is Natrium
- The number of valence electrons in the atom of chlorine are 7
- 2 moles of water are present in 36 gm of water
- The net charge on a normal atom is Zero
- The arrangement having eight electrons in the outermost shell of an atom are called Octet arrangement
- An example for mixture is Air
- The substances that react with both acids and bases are Metalloids
- The law of traids was given by Dobereiner
- When the element were arranged in the ascending order of their atomic mass the eight element resembled the first element in its properties is called Newton's law of octaves
- The atomic mass of Li is 6.01
- The atomic mass of K is 39.098
- The atomic mass of Na is 22.99
- The properties of elements are the periodic functions of their atomic masses is Mendeleev's periodic law
- The 7 horizontal rows in the periodic table are called Periods
- The 18 vertical rows in the periodic table are called Groups
- The 1 to 2 group elements are s block elements
- The 3 to 12 group elements are d block elements
- The 13 to 18 group elements are p block elements
- The elements with atomic number 21 – 30 are 3d block elements

- The elements with atomic number 39 – 48 are 4d block elements
- The elements with atomic number 57, 72 – 80 are 5d block elements
- The elements with atomic number 58 – 71 are 4f block elements
- The elements with atomic number 90 – 103 are 5f block elements
- The second period elements are called Representative elements
- The 14 elements after Lanthanum are called Lanthanides
- The electronic configuration of transitional elements is $(n - 1)d^{(1-10)}ns^2$
- The electronic configuration of inner transition elements is $(n - 2)f^{1-14}ns^2$
- The 14 elements after actinide are called Actinides
- The symbolic representation of a reaction with the help of symbols and formulae of respective reactants and products is Chemical Equation
- The process of equalizing the number of atoms on reactant side and the product side is called Balancing the chemical equation
- A type of chemical reaction in which two or more reactants combine chemically to form a single product is Chemical Combination
- A type of chemical reaction in which an element present in a compound is displaced by another element is Chemical Displacement
- A type of chemical reaction in which a single reactant decomposes to form two or more products is Chemical Decomposition
- A type of chemical reaction in which the reactants will exchange mutually their radicals to form two new compounds is Chemical Double Decomposition
- The chemical bond formed between the ions is called Ionic Compound
- The process in which Ionic compounds dissolve in water and disassociate into their Ions is Ionisation.
- The positively charged Ions are called Cations
- The negatively charged Ions are called Anions
- The type of chemical bond formed by sharing one or more electron pairs is called Covalent bond
- The bonds that usually does not dissolve in water is Covalent bond
- The lattice of positive ions of metal submerged in the electron flow is Electron gas model
- The force of attraction which exist between Hydrogen Positive end and negative end of polar molecules is Hydrogen Bond.

- The latin name of the element Potassium is Kalium
- The latin name of element Sodium is Natrium
- The latin name of element lead is Plumbum
- The latin name of Mercury is Hydrargyrum
- The oxide formed by the action of oxygen on non metals is Acidic oxide
- The oxide formed by the action of oxygen on metals is Basic oxide
- A compound having one or more replaceable hydrogen atoms is called Acid
- The compounds which react with acids and produce salt and water are called Bases
- The process of obtaining neutral solution by adding a definite quantity of an acid to a definite quantity of a base or a base to an acid is called Neutralization
- Basic oxides turns red litmus to blue
- Acid oxides turn blue litmus to red

METALS AND NON METALS

- Elements are classified into metals and non metals based on their general properties
- Egyptians were the first to start using gold
- The period around 2500 B.C was called Bronze age
- The element with highest atomic number is Uranium
- The number of naturally occurring elements are 90
- An example of Metalloid is germanium
- Metals are Good conductors of heat and electricity
- Non metals are bad conductors of heat and electricity
- The melting point of Metals is high
- The melting point of non metals is Low
- Metals react with oxygen to produce basic oxides
- Non metals react with oxygen to produce acidic oxides
- Metals react with hydrogen to produced Hydrides
- The non metals react with hydrogen to produce covalent compounds
- The valency of Carbon is 4
- The chemical symbol of carbon is C
- The atomic number of carbon is 6
- The atomic mass number of carbon is 12
- The abundantly available metal in nature is Carbon
- The property of elements to exhibit same chemical property but different physical property Allotrophy
- The hardest substance that occurs in nature is Diamond

- The diamond is the hardest substance because the atoms in it are closely packed
- Diamond is used to cut glass
- The material that is used to make Pencil lead is graphite
- The carbon atoms in graphite are arranged in regular Hexagonal form
- Graphite is used as moderator in nuclear reactors
- The only solid lubricant is Graphite
- The scientific study of the properties, composition, structure of matter and accompanying energy changes is called Chemistry
- The color of the graphite is Brownish black
- The density of Diamond is 3.52 g/cm^2
- The density of Graphite is 2.2 g/cm^2
- The atoms in the diamond are arranged as a single giant molecule
- The substance obtained by burning wood in limited supply of air is charcoal
- The apparent density of Charcoal is Low
- Charcoal is used in the preparation of Gun powder
- Charcoal is used to decolorize and deodorize
- Charcoal is used in Purification of water
- The absorbing capacity of charcoal is increased by heating it to high temperature
- The powder in a cracker is black due to the presence of Carbon
- The percentage of composition of carbon in Lignite is 60%
- The percentage of the composition of carbon in bituminous is 78%
- Anthracite is also called as Smokeless fuel
- The process of hardening of rubber is called Vulcanization
- The substance used in the preparation of shoe polish is Soot
- The substance used in the manufacture of black paints is Soot
- The allotropic form of carbon used in the manufacture of Typewriters ribbons is Soot
- The allotropic form of carbon used in the manufacture of Printing ink is Soot
- The allotropic form of carbon used to prepare calcium carbide is Charcoal
- The reducing agent used in the extraction of iron from its ore is Coal
- The substance used in steam engines and industries is Anthracite coal
- The type of coal used to make coal tar is Bituminous coal
- The substance used in preparation of water glass and producer gas is Coke
- When calcium oxide and coke are heated Calcium carbide is formed
- Calcium carbide react with water to form Acetylene
- The binary compound of silicon and carbon is Silicon carbide
- Silicon carbide is also called as Carborundum
- The material used to sharpen cutting tools as grinding stone is Silicon carbide

- The compounds of carbon are Carbonates and Bicarbonates
- When carbon dioxide dissolves in water carbonic acid is produced
- The carbonic acid reacts with calcium hydroxide to give calcium carbonate
- $\text{CaCO}_3 \text{-----} \text{CaO} + \text{CO}_2$
- Sodium carbonate is commonly known as Washing soda
- When carbonic acid is treated with sodium hydroxide, sodium carbonate is produced
- $\text{CO}_2 + \text{H}_2\text{O} \text{-----} \text{H}_2\text{CO}_3$
- The substance used in the manufacture of glass is Sodium Carbonate
- The sodium hydroxide reacts with carbonic acid to form Sodium bicarbonate
- The chemical used as an Antacid is Sodium Bicarbonate
- Baking soda is a mixture of Sodium carbonate and Potassium hydrogen tartarate
- Sodium carbonate when boiled gives Sodium carbonate + Carbon dioxide + Water
- Sodium bicarbonate is also called as Baking soda
- Sodium carbonate is also called as Sodaash
- A liquid metal is Mercury
- A liquid non metal is Bromine
- A soft metal is sodium
- A non metal which conducts electricity is Graphite
- The property of metals that enables them to be hammered into thin sheets is called Malleability
- The property of metals that enables them to be drawn into thin wires is called ductility
- A non metallic element with the atomic number 6 and valency 4 is carbon
- An example for carbon occurring in nature in free state is Diamond
- An example for carbon occurring in combined state is Natural gas
- An example for crystalline form of carbon is Graphite
- An example for Amorphous form of carbon is Charcoal
- The allotropic form of sulphur is Rhombic sulphur and Monoclinic sulphur
- The allotropic form of oxygen are ordinary oxygen and ozone
- The element which is the basis of life on earth is Carbon
- The apparent density of wood charcoal is less due to its porous nature
- The atoms in graphite are arranged in Hexagonal layers
- The atoms in the diamond are arranged in a rigid tetrahedral structure
- The allotropic form of carbon used to make gas masks is Charcoal
- The amorphous impure form of carbon found in earth's crust is coal
- The process of preparing coke by heating Bituminous coal to around 1573K in the absence of air is called Destructive distillation
- The allotropic form of carbon used in vulcanization of rubber is Soot

- The allotropic form of carbon which has heat resistant crucibles is Graphite
- The allotropic form of carbon used to drill holes is Diamond
- The allotropic form of carbon used in the manufacture of Synthetic petrol is Coal
- Calcium carbide is used for producing Ethyne
- The melting point of silicon carbide is high
- The chemical name of lime stone is Calcium carbonate
- The zinc carbonate is also called as Calamine
- The lead carbonate is known as Cerussite
- The copper carbonate is known as Malachite
- Lime water turns milky when carbon dioxide is passed through it due to the formation of insoluble carbonate salt
- Lime water is chemically called Calcium hydroxide
- Lime water is prepared by adding quick lime to water
- The purest forms of carbon are Diamond and graphite
- The only allotrope of carbon which is transparent is Diamond
- The chemical name of quick lime is calcium oxide
- A substance having a metallic luster, ductile and good conductor of electricity is called a Metal
- A mineral from which one or more metals can be extracted profitably is called Ore.
- The science and technology of extracting metals from their ores is called Metallurgy.
- The unwanted material present in the ore is called Gangue.
- A chemical compound that conducts electricity in its molten or solution state is called Electrolyte.
- Chemical decomposition of an electrolytic compound due to the passage of electricity through it is called Electrolysis
- A homogenous mixture of two or more metals is called Alloy.
- The earth's crust is the biggest source of metals.
- The metals that are available in Free State in nature are Gold, Silver and Platinum.
- A brownish hydrated oxide of iron that is formed on the surface of iron when it is exposed to moisture and air is called Rust.
- The chemical formula of rust is $\text{Fe}_2\text{O}_3 \cdot 2\text{H}_2\text{O}$
- The chief ore of Copper is Copper pyrites
- The symbol of copper is Cu
- The atomic number of copper is 29
- The mass number of copper is 64
- The electronic configuration of copper is $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^1$
- The chief sulphide ore of copper is Copper pyrites

- The molecular formula of copper pyrites is CuFeS₂
- The constituents of alloy Brass are copper and zinc
- The chemical symbol of Iron is Fe
- The atomic number of iron is 26
- The mass number of iron is 56
- The electronic configuration of iron is 1s²2s²2p⁶3s²3p⁶3d⁶4s²
- The gas produced when metals react with dilute mineral acids is Hydrogen
- The alloy of iron which is used for making magnets is Alnico
- The constituents of German silver are Copper, zinc and Nickel
- The Carbonate ore of iron is Siderite
- The constituents of Bronze are copper and tin
- Sodium is preserved in Kerosene
- Sodium is kept inside kerosene to prevent sodium from discoloring
- The metal that is highly reactive with air is Sodium
- When a copper foil is heated in a flame, a black layer is seen on the copper foil. This due to the formation of an oxide of copper on the foil
- Rusting occurs on a material of iron when it is kept in moist air
- The rust formed on a material of iron is nothing but hydrated oxide of iron
- The reaction between sodium and water liberates hydrogen
- Sodium reacts with water forming sodium hydroxide and hydrogen
- The metal that takes longer time to react with dilute hydrochloric acid is iron
- Metals react with concentrated nitric acid to produce metallic nitrates and nitrogen dioxide.
- Aluminum reacts with chlorine to form aluminum chloride.
- During the extraction of copper from its pyrites, the ore is concentrated by froth floatation
- Copper obtained from copper pyrites is purified by the method of Electrolysis
- Gun metal is the alloy that is used to make gears and castings
- The molecular formula of Siderite is FeCO₃
- The metal that can be extracted from hematite is Iron
- Coke is used in extraction of iron because it is a good reducing agent
- Calcium silicate produced during the extraction of iron is a Slag
- The melting point of iron is 1808K
- Iron displaces copper from copper sulphate solution, reaction indicates iron is reactive than copper
- Iron reacts with copper sulphate solution forming iron sulphate and copper
- The alloy that is commonly used to make heating coils is Nichrome.

- The alloy used to make pendulum of clocks is Invar steel
- The alloy of iron used to make surgical instruments is stainless steel
- Permanent artificial magnets are usually made from alnico
- The charge used in a blast furnace in extraction of iron consists of hematite, limestone and coke
- Iron is extracted by using the method Blast furnace
- The compound obtained when steam is passed over lead is Lead oxide
- The compound obtained when magnesium reacts with dilute hydrochloric acid is MgCl₂
- Metals when react with dilute nitric acid produce metallic nitrates and nitrogen dioxide
- The slag obtained at the bottom of the blast furnace is Calcium silicate
- When sodium burns in excess of oxygen, it produces Sodium peroxide
- Sodium reacts with water to produce sodium hydroxide and hydrogen.
- Magnesium reacts with oxygen in air to form Magnesium oxide
- Zinc react with nitric acid to form zinc nitrate and hydrogen
- The alloy of copper used to make statues is Bronze
- The constituent metals of alloy Gun metal are copper, tin and zinc
- The iron obtained from blast furnace is called Cast iron
- The components of alloy Nickel steel are iron and nickel
- The constituents of the alloy Alnico are iron, nickel, aluminum and cobalt
- The constituents of the alloy steel are iron and carbon
- The components of alloy Nichrome are iron, nickel and chromium
- The components of alloy invar steel are iron, nickel and carbon
- Calcium oxide reacts with silica to form calcium silicate
- The molecular formula of copper glance is CuS₂
- The molecular formula of Malachite is [CuCO₃ Cu (OH)₂]
- The molecular formula of Azurite is [2CuCO₃ Cu (OH)₂]
- The method used to concentrate copper ore is called Forth floatation
- The molecular formula of Hematite is Fe₂O₃
- The molecular formula of Magnetite is Fe₃O₄
- The molecular formula of limonite is Fe₂O₃ H₂O
- The alloy of copper used to make ornamental wares is German silver
- The metals that have tendency to donate electrons are called Electropositive
- The hydrated oxide of iron is called Rust
- The reducing agent used in the blast furnace to reduce Fe₂O₃ to Fe is Coke
- The slag obtained during the extraction of copper is Ferrous Silicate
- The black layer obtained on copper after heating in air is Oxide of copper
- The chemical formula of Sodium Peroxide is Na₂O₂

- The metals which do not react with any components of air are gold and Platinum
- The blisters so formed on the surface of copper is due to the escaping of Sulphur di oxide
- The charge is a mixture of hematite, limestone and coke in the ratio 8:1:4
- The impure copper obtained using froth floatation is Bliss copper
- The chemical elements not possessing the properties of metals are called Non metals
- The existence of a chemical element in two or more forms differing in their physical properties but having same chemical properties is called Allotropy
- The chemical symbol of silicon is Si
- The atomic number of silicon is 14
- The mass number of silicon is 28
- The electronic configuration of silicon is $1s^2 2s^2 2p^6 3s^2 3p^2$
- Sodium aluminum silicate is also called as Zeolite
- Naturally occurring compound of silicon is called Sodium aluminium silicate
- Silicon reacts with oxygen in air to form silicon dioxide
- When mixture of silicon and coke are strongly heated in electric furnace Silicon carbide is formed
- Silicon is the second most abundant element present in the earth's crust
- The gas produced when steam is passed over red hot silicon is Hydrogen
- The sand is chemically known as Silicon dioxide
- The compound commonly present in sand and quartz is Silicon dioxide
- The melting point of silicon is 1683K
- The Sodium silicate is commonly known as Water glass
- The compound of silicon used as an abrasive is Silicon carbide.
- The two most abundant element's in the earth's crust are oxygen and silicon
- The common constituent of garnet, zircon, topaz and opal is silicon
- Crystalline form of silicon can be obtained by reducing silica with coke
- The products formed when red hot silicon decomposes steam are silicon dioxide and hydrogen
- The electrical conductivity of pure silicon increases with increase in its temperature.
- The number of valence electrons in silicon are 4
- The electrical conductivity of pure silicon can be increases by doping it appropriately
- Silicon can be turned into n type semiconductor by doping it with pentavalent impurity
- Doping silicon with boron makes it a p type semiconductor
- Sodium aluminium silicate is used to soften hard water.
- The doped silicon is used to make diodes and transistors
- Silicon carbide is used as an abrasive for grinding glasses
- The compound that is main constituent of clay is sodium aluminium silicate

- The only non metal that is good conductor of electricity is Graphite
- The method that can be adopted to increase the conductivity of silicon is Doping
- The silicon compound that is used in making chemical apparatus, optical instruments is Quartz
- Sodium silicate is also called Water glass
- Sodium silicate is used in calico printing
- The stable isotope formed when phosphorous 30 decays by emitting a positron is Silicon
- The number of electrons that revolve in the outer most orbit of silicon atom are 4
- The element that converts silicon into a p type semiconductor is Boron
- Silicon was first isolated in 1824
- Silicon was found to be an element by John Berzellius
- The non metal which is the essential component of bones, teeth is Phosphorous
- The chemical symbol of Phosphorous is P
- The atomic and mass number of Phosphorous is 15 and 31
- The electronic configuration of Phosphorous is $1^2 2s^2 2p^6 3s^2 3p^3$
- The chemical formula of Phosphorite is $Ca_3 (PO_4)_2$
- The chemical formula of Apatite is $3 Ca_3 (PO_4)_2 CaF_2$
- The chemical formula of chlorapatite is $3 Ca_3 (PO_4)_2 CaCl_2$
- The allotropic forms of Phosphorous are Red and White Phosphorous
- The main phosphorous fertilizers are NPK
- The chemical symbol of Sulphur is S
- The transition temperature of Sulphur is $95.5^\circ C$
- The main component of gun powder and explosives is Sulphur
- The non metal used in the vulcanizing of natural rubber is Sulphur

WATER

- 70% of the earth's surface is covered with water
- The percentage of water present in oceans is 97.2%
- 0.005% of total quantity of water on the earth circulates through water cycle
- The density of water at $100^\circ C$ is $984.4 kg/m^3$
- The density of water at $0^\circ C$ is $998.87 kg/m^3$
- The density of water in the form of ice is $916.8 kg/m^3$
- The molecular formula of water is H_2O
- The molecule of water consists of 2 atoms of hydrogen and 1 atom of oxygen
- $2H_2 + O_2 \rightarrow 2H_2O$

- The person who proved that water is a compound of hydrogen and oxygen was Henry Cavendish
- The ratio of hydrogen and oxygen present in the molecule of water is 2:1
- The device that decomposes water with the help of electricity is Voltmeter
- The exact formula of the water molecule was established by S. Cannizarro
- The electrolytic cell used to measure the strength of current flowing through the circuit is known as Voltmeter
- The device voltmeter is also called as Coulombmeter
- Water reacts with sodium to give sodium hydroxide and hydrogen is liberated
- $\text{Ca} + 2\text{H}_2\text{O} \text{-----} \text{Ca}(\text{OH})_2 + \text{H}_2$
- The mixture of CO and H₂ in the ratio 1:2 is called Water gas
- $\text{SO}_3 + \text{H}_2\text{O} \text{-----} \text{H}_2\text{SO}_4$
- T.M.C is the measure of volume of water
- T.M.C is abbreviated as thousand Million cubic Feet
- The percentage of water available on earth for drinking purpose is 1%
- The earth appear as the blue ball when viewed from space
- The decrease in water content in our body below the certain level is called Dehydration
- The cyclic movement of water through the biosphere is called Water Cycle
- The water gets into the atmosphere through evaporation
- The boiling point of pure water is 100°C
- The freezing point of pure water is 0°C
- The density of water at 4°C is 1 kg/ltr
- Water is called as Universal solvent because it dissolves more number of substances in it
- When water freezes its volume increases
- The water contains Hydrogen and Oxygen in the ratio 1:8 by mass
- The water molecules which do not undergo any change and retain their characteristics even in the combined state, the compounds are called hydrates
- The impurities that are not soluble in water are called Floating impurities
- An example for floating type of impurity in water is Twigs
- The impurities that dissolve in water are called Dissolved impurities
- The process of removal of suspended impurities from potable water is called Coagulation

- The process of Removal of bad odour and color, if any from potable water is called Aeration
- The process of removal of floating impurities from potable water is called Filtration
- The process of destroying the disease causing germs in potable water is called Chlorination
- The process of converting a liquid into vapor by heating and condensing the vapour into liquid form collecting the condensed liquid is called Distillation
- The discharge of super heated water into water bodies causes Thermal pollution
- The chemical decomposition of a compound by water is called Hydrolysis
- A chemical used to sterilize drinking water is Chlorine
- Alum is used while treating potable water for removing the suspended impurities
- About 70% of our body weight is water
- The solvent which is known as universal solvent is Water
- The chemical compound which occurs in the nature in all the three states of matter is Water
- The process by which the water in the atmosphere turn into snow is called Condensation
- The process by which sea water is changed into pure water is Distillation
- The device in the electrolysis takes place is Voltmeter
- The unit that denotes the quantity of water flow is Cusecs
- Hardness of water is due to presence of dissolved calcium and magnesium salts
- The chemical name of heavy water is Deuterium oxide
- Distilled water is used in the manufacture of medicines
- The form of water used in the manufacture of chemicals is Distilled water
- The water that readily gives lather with soap is called soft water
- The water that does not readily gives lather with soap is called Hard water
- The water that is composed of only H_2O molecules is called Pure water
- The water that is safe and fit for human consumption is called Potable water
- The water that contains dissolved bicarbonates of calcium or magnesium or both is called Temporary hard water
- The water that contains the one or more dissolved chlorides or sulphates of calcium and magnesium is called Permanent hard water
- Naturally occurring sodium aluminate silicate is called Zeolite

- Artificially prepared sodium aluminum silicate is called Permutit
- The chemical compound made up of oxygen and hydrogen is Water
- The water is classified based on the way it reacts with soap
- The pure water from sea water can be obtained by Distillation
- The chemical formula of calcium carbonate is CaCO_3
- The chemical formula of magnesium carbonate is MgCO_3
- The salt that does not cause hardness in water is Sodium chloride
- The movement of water through the biosphere is called Water cycle
- A simple way of softening temporary hard water is Boiling
- A salt of sodium that has properties of soap is Sodium stearate
- A salt of potassium that has the properties of soap is Potassium stearate
- The main cause for the lowering of the storage capacity of water is Silt collection
- The ions that cause hardness of water are Ca^{++} and Mg^{++}
- The use of hard water in industrial boilers can cause scaling on the inner walls of the boilers
- The scaling on the inner walls of the boilers is generally due to the deposition of carbonates
- Boiling of hard water results in removal of temporary hardness only
- When temporary hard water is boiled soluble bicarbonates are converted into insoluble carbonates
- In soda process of softening water, the chemical added to remove hardness is Sodium carbonate
- In soda process, the salts that cause hardness are converted into their respective carbonates
- Permutit process of softening water removes all types of hardness
- In permutit process the dissolved salts of calcium and magnesium are converted into insoluble permutits
- The one of the method of obtaining pure water from sea water is Sand filtration
- The substance that dissolve in water in highest number are Inorganic ionic compounds
- The scientist who showed for the first time in 1781, water is produced when hydrogen burns in air is Sir Henry Cavendish

- The scientist who proposed that water is not an element but compound made of oxygen and hydrogen is Lavosier
- The water is classified depending on the negative ions present along with Ca⁺⁺ and Mg⁺⁺
- The type of water that is not suitable for daily activities is Hard water
- The permutit is present in the form of Porous Gel
- The Permutit process is also known as Base exchange process
- The element which is not removed by the permutit process is Lead
- The advantage of permutit process is it is Economical
- The effort made by society towards the rational use, prevention of pollution and recycling of water is called Water conservation
- Water is called universal solvent because it dissolves highest number of compounds in it
- The salts of iron present in hard water form a yellow stain on clothes
- The permutit process is useless if it contains the salts of Fe and Mn
- The practice of collecting, storing and utilization of rain water is known as Rain water harvesting
- The substance which is insoluble in water is Calcium carbonate
- The substance that is soluble in water is Sodium chloride
- Electrolytes when dissolved in water are completely dissociated into ions is Strong Electrolyte
- Electrolytes which partially dissociate into ions when dissolved into ions is Weak Electrolyte
- An example for Strong Electrolyte is Sodium Chloride
- An example for Weak Electrolyte is Acetic Acid
- The substance which conducts electricity either in liquid form or in solution form is Electrolyte
- The substance that does not conduct electricity in molten or solution state is Non Electrolyte
- The mass of substance liberated at each electrode is proportional to the quantity of electric charge passed through the electrolyte is Faradays first laws of Electrolysis'
- Is the same quantity of electric charge is passed through different electrolytes the mass of substance liberated at different electrodes are proportional to their respective chemical equivalentents is Faradays second law of Electrolysis

- Atomic mass of copper is 63.55amu valency of copper is 2 then the chemical equivalent of copper is 31.77
- The process of depositing a thin layer of one metal over the other metal by electrolysis is Electroplating
- A mixture in which the size of particles is between the particles that are found in a true solution and suspension is Colloid
- The example for the Disperse phase solid and medium solid is Coloured glass
- The example for the Disperse phase solid and medium Liquid is starch
- The example for the Disperse phase solid and medium gas is smoke in air
- The example for the Disperse phase liquid and medium solid is Butter
- The example for the Disperse phase liquid and medium Liquid is Milk
- The example for the Disperse phase liquid and medium gas is mist in air
- The example for the Disperse phase gas and medium solid is air bubbles in silicate
- The example for the Disperse phase gas and medium Liquid is water vapours in air.

THE LIVING WORLD

- A branch of science that deals with the study of living organisms is called Biology
- The basic and structural and functional unit of all living beings is called Cell
- An example for microscopic organism found on earth is amoeba
- The chief purpose of respiration is production of energy
- The organ of respiration in Fish are Gills
- The organ of respiration in Insects are trachea
- The organ of respiration in Frog is Skin and lungs
- The organ of respiration in human beings is Lungs
- The organ of respiration in plants are Stomata in leaves
- The process by which green plants prepare their own food is called Photosynthesis
- The organisms which feed on other organisms are called Carnivores
- The organisms which feed on plants only are called Herbivores
- An example for Herbivore is Deer
- An example for Carnivore is Tiger
- The increase in size of an organism is called Growth
- The growth in living beings in Internal

- The growth in living beings is caused by Cell division
- The organs of locomotion in Ameoba are Pseudopodia
- The organs of locomotion in Euglena are Flagella
- The organs of locomotion in Paramecium are Cilia
- The organs of locomotion in Cow are limbs
- The organs of locomotion in Bird are wings
- The organs of locomotion in Fish are Fins
- The organs of locomotion in Hydra are Tentacles
- An example for animal which does not show movement is Coral
- An algae which shows the bodily movement is chlamydomonas
- The change in the environment that is perceived by an organism is called Stimulus
- The reaction of an organism to the Stimulus is called Response
- An example of plant that shows response to stimuli is touch me not
- The period between the birth and the death of an organism is called Life span
- The systematic grouping of organisms based on their similarities and differences is called Classification
- The branch of biology that deals with the classification, identification and naming of living organisms is called Taxonomy
- A book written by Parashara which gives detail about plant science is Vrukshayurveda
- Aristotle is known as the father of biology
- The first person to follow the method of observation and experimentation in the study of living organisms was Aristotle
- The book written by Charaka that gives detail about medicine is Charaka Samhithe
- Charaka is known as the father of Ayurveda
- Carollus Linnaeus is called the father of modern taxonomy
- The system of naming organisms given by Carollus is called binomial Nomenclature
- The smallest unit of classification of organism is called species
- The scientific method of naming organisms with two words the first word which refers to the genus and the second to the species is called Binomial nomenclature
- The binomial nomenclature of Horse is Equus Caballus
- The binomial nomenclature of Donkey is Equus asinus
- The binomial nomenclature of Humans is Homo sapiens

- The binomial nomenclature of Grasshopper is Poecilecera Picta
- The binomial nomenclature of Tiger is Felis tigris
- The binomial nomenclature of Frog is Rana hexadactyla
- The binomial nomenclature of Cat is Felis Domestica
- The binomial nomenclature of Lion is Felis leo
- The binomial nomenclature of Cow is Bos Taurus
- The binomial nomenclature of Mango is Mangifera indica
- The binomial nomenclature of Orange is Citrus reticulate
- The binomial nomenclature of Onion is Allium cepa
- The binomial nomenclature of Coconut is Cocos nucifera
- The binomial nomenclature of Amoeba is Amoeba Proteus
- The binomial name of Typhoid bacteria is Eberthella typhosa
- The organisms in which the nuclei of cells are bounded by a definite nuclear membrane are called Eukaryotes
- The organisms in which the nuclei of cells are not bounded by a definite nuclear membrane are called prokaryotes
- An example for Prokaryote is Bacteria
- An example for Eukaryote is Amoeba
- The living organisms are classified into 5 major kingdoms
- An example of organism belonging to kingdom monera is Blue green algae
- Blue green algae are usually found in fresh water
- An example for blue green algae is nostoc
- A example for free living protozoa is Amoeba
- A example for parasitic protozoa is Plasmodium
- An example for Unicellular algae is Diatoms
- An example for filamentous algae is Spirogya
- An example for Colonial algae is Volvox
- An example for Multicellular algae is Sargassum
- The mushrooms belong to the kingdom called Fungi
- Volvox belong to the group Protista
- The organisms that feed on death and decaying matter are called Saprophytes
- An example for Saprophytes is Mushroom

- An example for plant virus is TMC
- HIV stands for Human immuno Virus
- TMC stands for Tobacco Mosaic virus
- An example for Bacteria virus is Bacteriophage
- Coconut belongs to the species nucifera
- Humans belong to the genus Homo
- Humans belong to the species Sapiens
- The undifferentiated body found in Algae is known as Thallus
- The root like structures found in bryophytic plants are called Rhizoids
- The structures found in adult gametophytic phase of bryophytes which produces male gametes are called Antheridium
- The structures found in adult gametophytic phase of bryophytes which produces female gametes are called Archegonium
- The plants that have vascular tissues such as xylem and phloem are called Tracheophytes
- The reproduction in organisms that occurs by the fusion of gametes is called Sexual reproduction
- The plants that bear seeds enclosed inside a structure called fruits are Angiosperms
- The flowering axis of a plant body in which a cluster of flowers are found together is called Inflorescence
- The rapid transformation of an organism from larval to adult form is called Metamorphosis
- The type of fertilization in which the union of gametes takes place outside the body of parents is called External fertilization
- The type of fertilization in which the union of gametes take place inside the body of the parents is called Internal fertilization
- The hollow, light bones filled with air sacs found in the body of birds are called Pneumatic bones
- An example for unicellular algae is Diatoms
- An example for red algae is Polysiphonia
- An example for brown algae is Sargassum
- An example for green algae is Ulothrix
- The red pigment present in the body of red algae is Phycoerythin

- Bryophytes are called as amphibians of the plant kingdom
- An example for bryophytes is Funaria
- The vascular plants without seeds are called Pteridophytes
- The vascular plants with seeds but no fruits are called Gymnosperms
- The first terrestrial plant to develop vascular tissue is Pteridophytes
- An example for pteridophytes is Nephrolepis
- A fully formed gametophyte of a fern which has an independent structure is called Prothallus
- An example for gymnosperms is Cycas
- An example for angiosperms is Mustard plant
- Angiosperms are classified based on the general organization
- The reproductive organs in angiosperms are Flowers
- The plants which bear seeds that contain only one cotyledon are called Monocotyledon
- An example for monocotyledon is maize
- The plants which bear seeds that contain two cotyledons are called Dicotyledons
- An example for dicotyledon is Groundnut
- The type of root system found in monocot plants is fibrous root system
- The type of root system found in dicot plants is Tap root system
- The solid, unjointed stiff rod located on the dorsal side of chordate is called Notochord
- An example for cold blooded animal is Fish
- An example for limbless amphibian is Ichthyophis
- A class of vertebrates characterized by feathers, warm blood and wings are called Birds
- The voice box of birds is called Syrinx
- The chief organ of respiration in birds are Lungs
- The warm blooded vertebrates whose body is covered with hair and mammary glands are present in females are called Mammals
- An example for egg laying mammals is Echinda and Platypus
- The green pigment present in green algae is Chlorophyll
- The pigment that gives brown color to the brown algae is Xanthophylls
- The two kind of spores produced in gymnosperms are Microspores and Megaspores
- The locomotory structures found in fish are fins
- The type of fertilization seen in fish and frog is external fertilization

- The animals that require both the land and water to complete their life cycle are called Amphibians
- The number of digits usually present in each limb of the reptiles are 5
- An example for limbless reptile is Snake
- The heart of a fish is 2 chambered
- The heart of the amphibians and reptiles is 3 chambered
- The heart of aves and mammalian is 4 chambered
- The pairs of carnial nerves found in the nervous system of birds are 12
- The type of fertilization found in reptiles, birds and mammals is Internal fertilization
- The chief excretory organs in vertebrates are a pair of Kidneys
- The organ of respiration in fish are Gills
- The multicellular cone like structure is found in gymnosperms
- Kelps are good example for multicellular algae
- The pigments present in red algae are phycoerythin and phycocyanin
- The cell wall of algae is composed of cellulose and pectin
- Asexual reproduction in algae occurs through production of spores
- Riccia is the bryophyte that grows horizontally in the soil
- Mosses is the bryophyte that grows vertically to the soil surface
- The dependent generation in bryophytes are known as Sporophyte
- Gametophyte generation of bryophytes manufacture their own food
- Reproduction in bryophytes takes place by sexual and vegetative method
- Antheridium and Archegonium are found in adult gametophytes
- The walking ferns are salvenia and Azolla
- A common gymnosperm found in the Himalayan forests is Cedrus deodara
- The microsporophyll present in cycas produce male spores
- The multicellular reproductive structures in gymnosperms are called Cones
- A single formed by the fusion of male and female gamete is called Zygote
- The most dominant group of plants on earth today are Angiosperms
- Angiosperms are commonly called Flowering plants
- An example for monocot is Ragi
- An example for dicot is Green gram
- Coconut tree and paddy plants are monocots

- The most advanced group of angiosperms are monocots
- A paddy plant has fibrous root system and parallel venation in leaves
- The part of the seed from which the root system arises is Radicle
- A single central root is present only in dicotyledons
- In monocots, we find a fibrous root system
- Animals which have back bone are called vertebrates
- The vertebrates have openings in the pharynx called Gill slits
- The fins in the fish helps in balancing the body
- The number of digits in the forelimbs of an amphibian is usually 4
- The nervous system in a frog has 10 pairs of cranial nerves
- Each limb of the mammal usually have 5 fingers
- The multicellular cone like structure is found in Bryophytes
- The presence of diaphragm in between the thoracic and abdominal cavities is found in Mammals
- Red, Brown and green algae belong to the group called Metaphyta
- The fins which are useful for locomotion are Paired fins
- Female sex cells in gametophytes are produced by Megasporophyll
- Poikilothermic animals are also called the animals of Cold blood
- The first vertebrate to appear on the land are Amphibian
- Streamlined body system is found in Pisces
- The type of chlorophyll pigments present in red algae are a and b
- Pteridophytes are also called as Tracheophytes
- The Japanese food prepared by using algae is called Kombu
- Dicot leaves show reticulate venation
- The technique of growing the dwarf of trees is called Bonsai
- The function of scales found on the body of fish is to protect the skin
- The inactive period or winter sleep of frogs is called Hibernation
- The inactive period or summer sleep of the frogs is called Aestivation
- The group of creeping or crawling vertebrates are called Reptiles
- The egg laying animals are called Oviparous animals
- The animals giving birth to young ones are called Viviparous animals
- Algae are capable of photosynthesis because of presence of Chlorophyll
- The mammal called Beaver is an excellent architect of the animal world
- The mammal that walks and sleep upside down is Sloth
- The two types of sexual reproduction found in multicellular algae is spore formation and fragmentation

- The sporophytes of bryophytes are parasitic because they do not have chlorophyll
- Pteridophytes are called Tracheophytes because they possess vascular tissue
- The multicellular cone like structures are found in Gymnosperms
- The diploid cell formed by fertilization is Zygote
- The female reproductive structure of the flower is Stigma, ovary and style
- The skin of frog is soft and moist because mucous glands secrete mucous
- The muscular membrane that separates thorax from abdomen in mammals is Diaphragm
- The vertebrate which possesses external pinna are mammals
- The animals that possess back bone are Vertebrates
- The animals that do not possess back bone are called Invertebrates
- The members of the phylum porifera are commonly called Sponges
- The numerous pores on the surface of porifera are called Ostia
- The large central cavity in the body of porifera are Spongocoel
- The internal skeleton in the form of crystalline structures in sponges is called Spicules
- The animals having the internal cavity are called Coelenterata
- The body walls of coelenterate is made up of two layers Ectoderm and Endoderm
- The group of animals with long and flat body are called Flatworms
- An example for a flat worm found in water or moist soil is Planaria
- An example for the flat worms found inside the body of vertebrates is tape worm
- The animals whose body made up of two layers is called Diploblastic animals
- The animals whose body is made up of three layers is called Triploblastic animals
- The group of animals having elongated, cylindrical and unsegmented bodies are Aschelminthes
- The common name of Aschelminthes is Round Worms
- The group of animals having elongated body consisting of partitions is Annelida
- The cavity that exists between the body wall and the digestive tube is Coelem
- The largest phylum in the animal kingdom is Arthropoda
- The unique system of canals containing appendages is Tube feet
- An example for sponges is Sycon

STUDY OF CELLS

- The compounds of carbon are called Organic compounds
- The elements present in Ammonia are Nitrogen and Hydrogen
- Glucose is made up of carbon, hydrogen and oxygen
- The basic organic molecules from which biological molecules are formed Basic building blocks

- The early life on the earth emerged in the form of cells
- The word cell was first coined by Robert Hook
- The branch of biology that deals with the study of cells is called Cytology
- The first person to suggest that living beings are made up of cells was Robert Hook
- The cell theory was proposed by M.J.Scheilden and Theodor Schwann
- The device that is used to reveal the ultra structure of a cell is Electron Microscope
- The thin membrane surrounding the living cell is called Cell Membrane
- The main function of the cell membrane is to maintain the shape of the cell
- The two important process involved in movement of materials in and out cells is Osmosis, Diffusion
- The movement of molecules from the region of higher concentration to the region of lower concentration is called Diffusion
- The movement of molecules from the region of lower concentration to a region of higher concentration is called Osmosis
- The movement of molecules from a region of lower concentration with the expenditure of energy is called Active transport
- An example for active transport is the movement of sodium ions across cell membrane
- The function of cell wall is to give protection the plant body
- The cell organelles are classified based on their structure
- An example for membranous organelles is Golgi complex
- An example for non membranous organelles is Centrioles
- The organelles in the cytoplasm that are bound by membranes are called Membranous organelles
- The organelles of a cell that are neither bound by nor consists of membranes are called Non membranous organelles
- A sac like organelle having a number of flattened membranous structures stacked one above the other is called Golgi complex
- The two types of endoplasmic reticulum are Rough and Smooth Endoplasmic reticulum
- A gel like material found inside the cell membrane is called Cytoplasm
- The network of membranes scattered throughout the cytoplasm extending from the plasma membrane to the nucleus is called Endoplasmic Reticulum
- The finger like projections in the inner membrane of the mitochondria are called Cristae

- DNA stands for Deoxyribonucleic acid
- RNA stands for Ribonucleic acid
- ATP stands for Adenosine triphosphate
- The energy is stored in Mitochondria in the form of ATP
- The respiratory centers of a cell are located in the Mitochondria
- The power house of the cell is Mitochondria
- The organelles that contain powerful enzymes capable of breaking or digesting all organic material are called Lysosomes
- The lysosomes are known as Suicide bags
- The protein factories of the cell are Ribosomes
- The centrioles with transparent cytoplasm around them are called Centrosomes
- The organelles generally found in the cytoplasm consisting of proteins and usually found RNA attached to Endoplasmic reticulum are Ribosomes
- The human body cells consists of 46 chromosomes
- The various chemicals found in the cytoplasm are called Cell inclusions
- The shape of the plant cell is generally box type
- The function of ribosome's is to synthesize the proteins
- The function of lysosomes is to help in the digestion of chemical substances
- Chloroplast helps in the conversion of solar energy into chemical energy
- Plasma membrane controls the movement of materials in and out of the cell
- The spherical bodies consisting of RNA and present inside the nucleus of the cell is called Nucleolus
- The organ concerned with the secretory function of cells is Golgi complex
- According to Schleiden, Schwann cells are the basic structural and functional unit of living beings
- The cell which contains the cell wall is Plant cell
- The part of the cell which controls and co-ordinates the functions of the cell is Nucleus
- The carriers of hereditary characteristics are called genes
- Chloroplast is called the Kitchen of the cell
- The non living things present in the cell organelle are called Cell Inclusions
- The nucleolus is made up of RNA
- The layer that surrounds the nucleus is called Nuclear membrane

- The fluid present inside the cell membrane is Cytoplasm
- Organisms whose body is made up of only one cell is called Unicellular Organisms
- Organisms whose body is made up of many cells is called Multicellular Organisms
- A group of cells which have common origin with similar structure and function is called Tissue
- A group of similar tissues performing a particular function constitutes an Organ
- A group of related organs performing a set of common functions is called an Organ system
- A branch of biology which deals with the study of tissues and their organization in organs is called Histology
- The plant tissue in which active cell division is taking place is called Meristematic tissue
- Tissues that are derived from the meristems are called Permanent tissues
- The plant tissues composed of cells that are similar in structure and function is called Simple permanent tissue
- The water conducting tissues found in vascular plants is called Xylem
- The food conducting tissue found in vascular plants is called Phloem
- A waxy substance found on the epidermis of plants is called Cutin
- The muscles which are not under the control of organisms are called Involuntary muscles
- The connective tissue consisting of hard matrix are called Dense connective tissue
- The fluid matrix of the blood tissue is called Plasma
- The muscles which are under the control of organisms is called Voluntary muscles
- The plant tissues consisting of unspecialized cells is called Parenchyma
- A simple permanent tissue consisting of cells whose cell wall contains lignin is called Collenchyma
- The tissue that provides the elasticity and support to the growing organs is called Collenchyma
- The tissues that gives mechanical support to the plant is called Sclerenchyma
- The thick walled cells found in the hard shells of seeds and fruits is called Scleireids
- The cell wall of sclerenchyma is made up of Cellulose
- The plant tissues consisting of both living and non living cells are called Complex permanent tissue
- Xylem tissues are also called as Water conducting tissues

- Phloem tissues are also called as Food conducting tissues
- The cells that control the passage of food through phloem are called Companion cells
- The fiber that provide the tensile strength to the plant body is Phloem fibres
- The xylem and phloem are together arranged in a plant body in form of bundles is Vascular bundles
- The elongated tubular structures made of dead cells found along with the xylem vessels are Tracheids
- The tissue found in the outer most layer of the plant body are called Epidermal tissue
- The layer containing cutin is called Cuticle
- The several minute openings found on the epidermis of all the green aerial plants are known as Stomata
- The tissues found in the outer and inner walls of the skin of the animals is called Epithelial tissue
- A simple epithelial tissue consisting of flat plate like cells is called Endothelium
- The simple epithelial tissues consisting of elongated cells are called Columnar epithelium
- The fluid secreted by most of Columnar epithelium is Mucus
- The columnar epithelium bearing hair like structures called cilia are called Ciliated epithelium
- The simple epithelial tissue consisting of cube shaped cells are called Cuboidal epithelium
- The tissues concerned with the movement of the body are called Muscle tissues
- The muscle tissues are also called as Myofibres
- The muscles which are made up of elongated unbranched cylindrical fibres with striations are called Striped muscles
- The muscles that are responsible for locomotion are Striped muscles
- The special type of muscles that constitute the heart are called Cardiac muscles
- The tissues that connect the various other tissues of the body are called Connective tissue
- The tissues in which the fibres in the matrix are loosely arranged are called Loose connective tissues
- The tissues that are found below the skin are Aerolar tissues
- The connective tissue that is present beneath the skin, around the kidneys and in bone marrow is Adipose tissue

- A loose connective tissue consisting of very fine intercellular fibres are called Reticular tissue
- A band of connective tissue consisting of collagen fibre is called a Tendon
- A dense elastic fibrous connective tissue which connects the bones at the joints as called a Ligament
- The connective tissue consisting of cells embedded in a hard matrix are called Dense connective tissue
- A dense connective tissue that is flexible and elastic is called a Cartilage
- The shape of cartilage found in trachea is C shaped
- The fibres present in the cartilage tissue found between the vertebrae is called Collagen
- The solid, rigid and strong connective tissue that make up the skeleton is called Bone tissue
- The hallow cavities or spaces found in the long and strong bones of our body is called as Marrow Cavities
- The connective tissues having a fluid matrix are called fluid connective tissue
- The liquid connective tissue present in our body are Blood and Lymph
- The chief function of the red blood cells is to transport Oxygen
- The chief function of the white blood cells is to help in body defence
- The main function of the platelets is clotting of blood
- The fluid connective tissue whose constituents are same a that of blood minus RBC is called Lymph
- The capillaries through which the lymph flows are called Lymph capillaries
- A small organ on the main course of a lymphatic vessel is called Lymph gland
- A tissue made up of nerve cells is called Nerve tissue
- The structural and functional unit of the nervous system is called Neuron
- A nerve cell consisting of a large cell body that has few brushes like structures are called Dendrites
- The tiny gap between the two successive neurons is called Synapse
- A knot like structure formed by several neurons together is called Ganglia
- The fluid matrix of the blood tissue is called Plasma
- In animals, fat is stored in adipose tissue
- Meristems are cells that help divide to produce cells

- Meristematic tissues are found in plants at the apex of the stem
- The main function of the collenchyma is to provide mechanical support to the plants
- The main function of sclerenchyma is to provide mechanical support
- The cell wall of sclerenchyma is made up of lignin, cellulose and hemicellulose
- The plant tissue that lacks protoplasm at maturity is Sclerenchyma
- The cellular layer covering the organs of a plant body is called Epidermis
- Epidermis in a plant protects the inner tissue of the plant
- Tracheids and vessels are elements of Xylem
- Loss of water vapour from the surface of leaves is called Transpiration
- Stomata on the epidermis of a plant body are made up of guard cells
- Stomata on the epidermis of a plant body control the rate of transpiration
- The entire body surface and the cavities inside the body of an animal are lined by Epithelial tissue
- An epithelial tissue consisting of single layer of cells is called Simple epithelium
- We find ciliated epithelium in the inner walls of our Nose
- The salivary ducts, sweat ducts and pancreatic ducts are lined with Cuboidal epithelium
- The epithelial tissue on the walls of the blood capillaries consists of Squamous epithelium
- Rhythmic contraction are noticed in Cardiac muscles
- Striated muscles are found in Leg muscles
- Striped muscles are also known as Skeletal muscles
- Unstriated muscles are also known as Smooth muscles
- The muscles involved in the movement of arm are Striped
- Voluntary muscles in our body help in locomotion of the body
- The tissue which is under the control of our will is Striped muscle
- The muscle which works throughout one's life without undergoing fatigue is Cardiac muscle
- Tendon is a structure that connects a muscle to a bone
- A ligament connects bone to bone
- The bone marrow helps to produce blood cells
- The large extension from the cell body of a neuron is known as Axon
- The tissue that provides the framework for the organs such as liver, spleen, bone marrow is Reticular tissue

- The function of axon is to carry the message away from the cell body
- Unstriped muscle help in the peristaltic movement in digestive system
- The type of cells that remove carbon di oxide from different parts of the body and bring it to the lungs are RBC
- The main function of bone tissue is to withstand the stress and strain
- The flowed tissue without RBC and proteins is called Serum
- The essential part of the immune system of the body produced by the lymph is Aerolar tissue
- The gap myelin sheath that covers the axon of the neuron is made up of Fatty sheath
- The elongated hollow cells found in xylem are called Xylem trachea
- The mucus producing cells in the epithelium are called Goblet cells
- The special type of cells present in epithelium of sense organs are Receptor cells
- The type of cells present in the stomata of the leaf are guard cells
- Reticular tissues are present in the respiratory tract and the alimentary canal
- The protective organ of digestion, excretion and reproduction is Pelvic griddle
- The type of WBC present in the lymph are called Phagocytes
- An neuron the axon is covered by a fatty sheath called as Myelin sheath
- The function of dendrites is to carry the impulses towards the cell body
- The two types of connective tissue are Cartilage and Bone
- The organ which contain elastic fibres in the matrix are Larynx
- The blood cells are produced in the fluid called Matrix
- Fibres used to make gunny bags, ropes and textile treads are formed by tissue called Sclerenchyma
- The muscles which do not fail easily are called Striped muscles
- The connective tissue which provides insulation against cold and protects the body from shock absorbers is called Adipose tissue
- The fluid that squeezes out of the blood through blood capillaries is called Lymph
- The essential part of immune system of the body produced by the lymph is called Antibodies
- The striped muscles that are usually attached to the bones are called Skeletal muscles
- The fluid tissue without RBC and proteins is called Lymphatic

- It is believed that the passage of food through the phloem is controlled by Companion cells
- The tissue which works as a shock absorber in our body is Adipose tissue
- The seeds that have only one cotyledon are called Monocots
- The seeds that have two cotyledons are called Dicot
- Monocot plants have a fibrous root system
- Dicot plants have a tap root system
- The ability of the body to defend itself against infectious diseases is called Immunity
- The WBC present in our body that produces antibodies are T-Lymphocytes
- Meristematic tissues are also called Growing tissues
- Meristematic tissues are composed of cells called as Embryonic cells
- Dendrites carry the impulses towards the cell body
- The skeletal system consists of hard rigid structures called Bones
- Dense connective tissue forms the skeletal system of the body providing an internal supporting frame work
- The connective tissues are classified on the basis of their nature of matrix
- The tissue found in all parts of herbs is Parenchyma
- The reason for decrease in rate of transpiration during the winter season is Partial closing of Guard cells
- A wound is bleeding continuously without clotting, it may be due to lack of Platelets
- The kind of epithelium found in the External auditory canal, oesophagus and vagina is Stratified squamous epithelium
- The muscles are classified into different types based upon their structure function and location
- The minute hair like, short protoplasmic processes are called Cilia
- The longest bone of the body is Femur or Thigh bone
- The smallest bone of the body is middle ear bone
- The double layered membrane surrounding the nucleus is Nuclear membrane
- The clear jelly like ground substance in nucleus is Nucleoplasm

MICRO ORGANISMS

- The organisms which cannot be seen with naked eye but can be seen in the microscope are called Microorganisms

- The branch of biology that deals with the study of microorganisms is called Micro biology
- The scientist who has made pioneering contribution the field of micro biology are Louis Pasteur and Robert Koch
- The first person to show that organisms come only from pre existing living organisms was Louis Pasteur
- The technique of killing microorganisms by using appropriate heat treatment is called Pasteurization
- The pasteurization method is used to Preserve milk
- The method of getting resistance to the disease causing microorganism by introducing killed germs in the body is called Vaccination
- The vaccination against the disease Cholera was invented by Louis Pasteur
- The vaccine against the disease Chicken pox was invented by Louis Pasteur
- The scientist who played a important role in the development of Bacteriology was Robert Koch
- The steps suggested by Robert Koch to determine whether a certain germ causes a particular disease is called Koch's postulate
- Robert koch was awarded Noble prize in 1905
- Robert Koch was awarded noble prize for discovering the cause of tuberculosis
- The bacteria responsible for the disease Anthrax was identified by Robert Koch
- The bacteria that causes the disease Anthrax ix Bacillus Anthrasis
- The scientist who developed the technique for culturing bacteria in nutrient media was Robert Koch
- There are 5 major group of microorganisms
- Bacteria is used to turn milk into curds
- The bacteria which helps to enrich the soil with nutrients is Rhizobium
- The disease Whooping cough is caused by the bacteria Bordella Pertusis
- The disease Cholera is caused by the bacteria Vibrio Cholerae
- The disease Diptheria is caused by the bacteria Corynebacterium diptheriae
- The bacteria Mycobactetrium tuberculosis causes the disease Tuberculosis
- The bacteria Mycobactterium Leprae causes the disease Leprosy
- An example for unicellular microscopic protozoan is Amoeba
- The vacuole present in amoeba that helps in the storage of food is food vacuole

- The vacuole present in amoeba that helps in the contractile excretion is Contractile vacuole
- An example for unicellular organisms of reproduction is Algae
- The simple aquatic microorganisms having chlorophyll are Algae
- The protozoa that causes the disease malaria is Plasmodium
- The disease Amoebic dysentery is caused by the protozoa Entamoeba histolytica
- The protozoa Trypanosoma gambiense causes the disease Sleeping sickness
- The disease Giardiasis is caused by the protozoa Giardia lamblia
- The cell wall of Chlamydomonas is made up of cellulose
- The multicellular microscopic organisms not having chlorophyll are called Fungi
- The fungi usually grow on the dead and decayed organic matter
- The microbial plants having no chlorophyll are Fungi
- An example for fungi is Mushroom
- The unicellular saprophytic organisms are yeast
- The antibiotic produced from the yeast mold is Penicillin
- The disease Athlete's foot is caused by Fungi
- The common fungal disease that affect the humans is ring worm
- The locomotory structure of chlamydomonas is flagellum
- Fermentation is caused by Yeast
- The bread or dosa dough rises due to the action of yeast cells
- The father of microbiology is Louis Pasteur
- The locomotory organs in amoeba are Pseudopodia
- The microorganism used in the bakery and beverage industry is Yeast
- The microorganism used to produce antibiotics and vaccines is Bacteria
- The disease typhoid in human beings is caused by Bacteria
- An example for protozoa is Euglena
- The microorganism which is used as the food material for aquatic organisms is Algae
- The extract of algae that is used in the preparation of medicines is Agar
- A virus that is capable of converting RNA into DNA is called Retrovirus
- The enzyme present in HIV which helps in the conversion of RNA into DNA is Reverse Transcriptase
- The ability of a body to fight infections is called Immunity

- Inflammation of the liver caused by infection or due to toxic substance is called Hepatitis
- HIV means Human Immunodeficiency Virus
- AIDS means Acquired Immuno Deficiency Syndrome
- ELISA means Enzyme Linked Immuno Sorbent Assay
- PCR means Polymerase chain reaction
- HBV means Hepatitis B Virus
- A WBC present in our body plays an immense role in immune system of body are Lymphocytes
- A person infected with HIV are termed as HIV Positive
- The incubation period in HIV infected adult is 8-10years
- A disease of the liver characterized by yellowing of skin and whites of the eye is called jaundice
- The disease in which the defence mechanism of the human body is destroyed is AIDS
- The causative organism of AIDS disease is HIV
- The most dangerous of hepatitis virus is Hepatitis B
- The genetic material of HIV is RNA
- The city in which the first infected HIV person was detected in India at Chennai (1987)
- The confirmatory test for HIV is Western Blot
- AIDS was first recognized in USA in the year 1981
- AIDS was first identified in 1981 in India
- The enzyme reverse transcriptase present in HIV helps to convert RNA into DNA
- HIV in the human body kills T lymphocytes
- The primary effect of HIV infection is reduction in immunity
- Polymerase Chain Reaction is a test for HIV
- ELISA test is used to screen blood samples for HIV
- Hepatitis means the inflammation of Liver
- The disease that has no vaccine is AIDS
- The group of symptoms and signs which when taken together characterize a pathological condition is called Syndrome
- The name HIV for AIDS virus was suggested by international committee on nomenclature of viruses
- An disease causing agent may be a microbe or vaccine is called Intruder

- The chemical factory of the body is Liver
- The pigment found in RBC is Bilirubin
- The countries more affected by Hepatitis B are India and china
- The 50% of HIV injected people are known to develop AIDS
- World AIDS foundation is in Switzerland
- The incubation period of HIV infected children may be about 18 to 24 months
- HIV belongs to the retrovirus group of viruses
- Common secondary infection of HIV patient is Herpes
- About 1% of the total death all over the world is due to Hepatitis B
- A drug addict is more prone to affect with AIDS because he becomes weak
- Liver is the organ that carries the function of metabolism of digested food
- During jaundice the persons skin and eyes turns yellow because of excess of Bilirubin
- Hepatitis B spread through blood plasma
- As soon as HIV infects a person it destroys WBC
- The vaccination for small pox was given by Dr Edward Jenner
- The size of virus varies form 0.015 to 0.2 micron
- The size of Bacteria varies form 0.2 to 10 micron
- The conditions required for the growth of bacteria are optimum temperature and humidity
- The link between the living and non living things is Virus
- The polio vaccine in 1953 was given by Janas salk
- The sixe of protozoans vary from 2 to 200 microns
- The parasite that causes amoebic dysentery is Entamoeba
- The parasite that causes sleeping sickness is Trypanosoma
- The parasite that causes malaria is Plasmodium
- The mass of algae in the sea is called Sea weeds
- The two algae useful in the biological nitrogen fixation is Azolla and Nostoc
- Pencilium notatum is used to prepares the antibiotic pencillin
- The disease that spreads through different medium from one person to another are called Communicable diseases
- The disease tetanus is caused by Clostridium tetani
- The disease tuberculosis is caused by Mycobacterium tuberculosis

- The disease cholera is caused by vibrio cholera
- The disease Typhoid is caused by Salmonella typhi
- The disease Leprosy is caused by Mycobacterium leprae
- The disease plague is caused by Yersinia pestis
- The disease Anthrax is caused by Bacillus anthracis
- The disease Rabies is caused by Rabdo Viridae
- The disease mumps is caused by mumps virus
- The part of the body affected by the polio is brain and spinal cord
- The blast disease is seen in paddy and ragi crops
- The disease sheath blight is seen in Paddy
- The disease Ring spot is seen in Sugarcane
- The microorganism used in the tanning of leather is Bacteria
- The microorganism which is the food for aquatic animals is Algae.

LIFE PROCESS CONTROL AND CO ORDINATION

- The basic functions carried out by all living beings to support and sustain life is called Life process
- The living beings need energy to sustain life process
- The process by which the organism obtain their food, digest and assimilate is called nutrition
- The method of nutrition in which the organisms prepare their own food is called Autotropic nutrition
- The process by which the green plants prepare their own food is called Photosynthesis
- The mode of nutrition in certain type of bacteria in which food is obtained from chemical energy is called Chemosynthesis
- The organisms that prepare their own food are called Autotrophs
- The organisms that depend on others for food are called Heterotrops
- The raw materials needed for the process of photosynthesis are Carbon dioxide and water
- $\text{Carbon dioxide} + \text{water} \rightarrow \text{Glucose} + \text{water} + \text{oxygen}$
- The pigment in geen plants that helps in photosynthesis is chlorophyll
- The phase of photosynthesis that takes place in the absence of sunlight is called Dark reaction

- The dark reaction occur in the stroma of the Chloroplast
- The dark reaction of photosynthesis is known as Calvin cycle
- The phase of photosynthesis that takes place in the presence of sunlight is called Light reaction
- The light reaction takes place in the grana of Chloroplast
- The rate of photosynthesis is found to be optimum between the 30°C and 35°C
- The method of nutrition in which the organisms obtain their food from other organisms is called Heterotrophic Nutrition
- The phenomenon of organisms obtaining food from other organisms is called Heterotrophism
- An example for Autotrophs is Green plants
- An example for Heterotrophs is Animals
- An example for Herbivore is Rabbit
- An example for Carnivore is Lion
- An example for Omnivore is dog
- An example for Saprophytes is Bacteria
- An example for Parasite is Tapeworm
- The organisms living in or on the other organisms and obtain their food are called Parasites
- An example for semiparasites is Viscum
- An example for Total parasites is Cuscuta
- The plants that obtain the nitrogenous substance from insects are called Insectivorous plants
- An example for insectivorous plants is Drosera
- The green plants that grow on trees for support are called Epiphytes
- An example of Epiphytes is Orchids
- The association of dissimilar organisms in which they live together for mutual benefit is called Symbiosis
- An example for symbiosis is the relation between the algae and fungi
- The digestive organs in hydra are Gastro vascular cavity
- The digestive organs in Earthworm is Digestive canal
- The process of taking food in the body is called Ingestion

- The process in which the food in the form of complex organic molecules is broken down into simple molecules in the body of an animal is called Digestion
- The process in which the digested food gets into the blood stream is called Absorbtion
- The process of converting the digested food into protoplasm is called Assimilation
- The process by which the undigested food is eliminated from the body of an organism is called Egestion
- The human beings are called Omnivores because they consume both plants and flesh
- The process in which the food is broken into smaller particles and is converted into a fine paste with the help of teeth and tongue is called Mechanical digestion
- The process of breaking up of complex food molecules into simple food molecules through chemical action is called Chemical digestion
- A long tube in the human body that extends from the mouth to the large intestine that helps in the digestion of food is called Alimentary canal
- The glands that are located in the buccal cavity and secretes salivary juice are called salivary glands
- The digestive enzyme present in saliva is Amylase
- Amylase converts starch into maltose
- The tooth is made up of hard material called Dentine
- The projected part of the teeth are covered with Enamel
- In humans there are 4 kinds of teeth
- The kind of teeth that helps to cut food are Incisors
- The function of canines is to help to tear the food
- The kind of teeth molar are mend to grind the food
- The food we consume is converted into soft ball which can be easily swallowed is called Bolus
- The common passage for food and air in the throat that leads to the aesophagus is called Pharynx
- The larynx is located in the Aesophagus
- The beginning of the wind pipe is called Larynx
- The cartilaginous flap present in larynx is Epiglottis
- A part of the alimentary canal that extends from the pharynx to the stomach is called Aesophagus

- The movement caused by the contraction and relaxation of muscles in the alimentary canal is called Peristalsis
- The enzyme in the gastric juice that act upon the food in the stomach is Pepsin
- The two enzymes present in Gastric juice are Pepsin and Rennin
- The digestive juice that does not contain enzymes is Bile juice
- The part that connects the stomach and small intestine is Deudenum
- The finger like structure located at the junction of small and large intestine is Appendix
- The digestive juice secreted by the Gastric glands is Gastric juice
- The digestive juice secreted by Pancrease is Pancreatic juice
- The digestive juice secreted by Inner walls of small intestine is Intestinal juice
- The digestive juice secreted by liver is Bile juice
- The acid present in gastric juice is HCl
- Villi is located on the walls of small intestine
- The finger like structure that helps to absorb the digested food by blood present on the walls of small intestine is Villi
- The chief cause for the disease Jaundice is Addiction to alcohol and drugs
- The chief cause for the digestive disease Obesity is over eating
- The chief cause for the disease Constipation is inadequate roughage in food
- The respiration that uses oxygen to break down organic compounds is called Aerobic respiration
- The respiration that takes place with out oxygen is called Anaerobic respiration
- The exchange of gases that take place during respiration between the medium and blood is called External respiration
- The exchange of gases that take place during respiration between the blood and the body cells is called Internal respiration
- The wind pipe that leads from throat starting from the larynx to the point where it bifurcates into two branches is called Trachea
- The finest branch of bronchiole that ends in structures are called Sacs
- The chief organ of respiration in human beings is Lungs
- A sheet of muscle located below the lungs is called Diaphragm
- The function of Diaphragm is to help in breathing movements
- The process of breathing of air into the lungs is called Inspiration

- The process of breathing of air out of lungs is called Expiration
- The inspiration process is also known as Inhaling
- The expiration process is also known as exhaling
- The normal rate of breathings in adults are 18–20times per minute
- The gas that is liberated during photosynthesis is Oxygen
- Fungi absorb food through Hyphae
- The tissue that covers the aerial root of epiphytes is Valamen
- Lichen is a combination of Algae and fungi
- The exchange of gases in lungs takes place by the diffusion
- The enzyme in the stomach that converts proteins into poly peptides is Pepsin
- The organ directly affected by jaundice is Liver
- The mode of nutrition in green plants is called Holophytic
- The part of our nervous system consisting of the brain and the spinal cord together is called Central nervous system
- The part of our nervous system consisting of 12 pairs of cranial nerves and 31 pairs of spinal nerves is called Peripheral nervous system
- The part of our nervous system which controls and co-ordinates the functioning of internal organs of the body is called Autonomic nervous system
- The glands which have ducts for discharging their secretion to the target organs are called Exocrine glands
- The glands that lacks ducts and pass their secretion into the surrounding blood for transport to the site of action is called Endocrine glands
- The chemical substances secreted by endocrine glands are called Harmones
- The peripheral nerves arising from the brain are called Cranial nerves
- The peripheral nerves arising from the spinal cord are called Spinal nerves
- The three membranes covering the brain and spinal cord are together are called Meninges
- Male or female reproductive organs which produce sex cells are called Gonads
- A disease caused by the deficiency of iodine in our body is Goiter
- The characteristics of living beings to respond to the changes in their environment is called Irritability
- The three general components of nervous system are receptors, effectors and conductors

- The component of nervous system which receives the stimulus is called Receptor
- The organ which a visible response is called Effectors
- The tissues which carry messages between the receptors and effectors are called Conductors
- The receptors in higher order animals are Sense organs
- The effectors in higher order animals are muscles and glands
- The conductors in higher order animals are Nerves
- The brain is protected by the bony case called Cranium
- The dark colored tissues of the central nervous system composed mainly of nerve cells is called Grey matter
- The light colored tissues of the central nervous system composed of mainly nerve fibers is called White matter
- The ability of the central nervous system to store the information and recall it in the later time is called Memory power
- The three main parts of the hind brain are Ponsvaroli, cerebellum and medulla oblaganta
- The part of the hind brain that connects the medulla oblongata and the thalamus is called Pons
- A long and cylindrical structure that extends from medulla oblongata and runs through the vertebral column is called Spinal cord
- The path traveled by an impulse in a reflex action is called Reflex arc
- The nerves which contain both sensory and motor fibres are called Mixed nerves
- The organs which assist us to sense changes in our environment are known as Sense organs
- The nerve that carries information from the rod cells and cone cells of the retina to the brain are called Optic nerve
- The screen of eye on which the images of the objects are formed is Retina
- The muscular coat of the eye ball is Sclera
- The pigment present in rods is Rhodopsin
- The pigment present in cones is Iodopsin
- The cells associated with the sense of taste are called Taste buds
- The tube that connects the middle ear to the throat (pharynx) is called the Eustachian tube

- The taste buds for sweetness are located at the front of the tongue
- The taste buds for the salt taste are located at the anterior margin of the tongue
- The taste buds for sour taste are located at the sides of the tongue
- The taste buds for the bitter taste are located at the posterior region of the tongue
- A cell, tissue or an organ which secretes useful chemicals required for various functions of the body are called a Gland
- The excessive secretion of the hormones by an endocrine gland is called Hyper secretion
- The inadequate secretion of the hormones by an endocrine gland is called Hypo secretion
- A pea shaped gland located beneath the hypothalamus in a body cavity at the base of the brain is called Pituitary gland
- Pituitary hormone is also called as Growth hormone
- The abnormally short stature due to the under secretion of growth hormone is called Dwarfism
- The abnormally long stature due to the over secretion of growth hormone is called Gigantism
- The disease caused by the excessive secretion of growth hormone in adults by pituitary gland is called Acromegaly
- Thyroid gland is located close to the trachea in the neck
- The hormone secreted by thyroid gland consisting of amino acid in combination with iodine is called Thyroxin
- Thyroxin is also called as Personality hormone
- The under secretion of thyroxin by the thyroid gland is called Hypothyroidism
- The disease characterized by swelling in the neck due to the enlargement of the thyroid gland is called Simple goiter
- A very low output of thyroxin by the thyroid gland in a new born baby leads to a disease Cretinism
- The excessive secretion of thyroxin by thyroid gland due to the over activity of the thyroid gland is called Hyperthyroidism
- The parathyroid glands are situated in the tissues of the thyroid gland
- The hormone secreted by the parathyroid glands is Parathromone
- Adrenal glands are located at the top of the kidneys
- The hormone secreted by the adrenal cortex is Cortisone

- The hormones secreted by the adrenal medulla are Adrenaline, Noradrenaline and Dopamine
- The important hormone secreted by the medulla of the adrenal gland is Adrenaline
- A small group of cells of the endocrine pancreas are together called Islet of Langerhans
- The sex hormones secreted by testis are called Androgens
- The male gonad is called Testis
- The female gonad is called Ovary
- The most common male sex hormone is Testosterone
- The sex hormones secreted by ovary is called Estrogens
- A female sex hormone produced by corpus luteum of the ovary is called Progesterone
- The most common female sex hormone is Estradiol
- The hormone that converts glucose into glycogen is Insulin
- The hormone produced by the endocrine pancreas is Glucagon
- The part of the brain that is concerned with the maintenance of the balance of the body is Cerebellum
- The quick response to stimulus produced without the involvement of the brain is called Reflex action
- The transparent covering in front of the eye is called Conjunctiva
- Ear is the sense organ in which the bone called Stirrup is associated
- The ability of the eye to adjust its focal length is called Power of accommodation
- The number of cranial nerves in human beings are 12
- The screen of the eye is called Retina
- The glands that produce tears are Lachrymal glands
- The type of lens used to rectify Astigmatism is Cylindrical lens
- The receptor cells that are responsible for colored vision is Cone cells
- The fluid filled in the chamber between the cornea and the eye lens is called Aqueous humour
- The part of the ear that converts sound waves into electrical signals is organ of corti
- The fluid that surrounds the inner ear is Perilymph
- The number of parathyroid glands in our body are 4
- Adrenal gland is also called as Suprarenal gland
- The chemical messengers in our body are Hormones

- The hormone that is often called the emergency hormone is Adrenaline
- The organs on which hormones act are Target organs
- The structure that controls reflex action is Spinal cord
- The gland embedded in another gland is Parathyroid
- The number of membranes covering the brain and spinal cord are 3
- The outer most layer of the meninges is called Durameter
- The middle layer of the meninges is called Arachnoid
- The inner most layer of the meninges is called Piameter
- The watery fluid that fills the space between the meninges is called Cerebro Spinal Fluid
- The cerebro spinal fluid in the central nervous system circulates between brain and spinal cord
- The part of human brain associated with thinking, reasoning and intelligence is Cerbrum
- The brain of adult human being weights about 1400gm
- The spinal cord is extension of Hind brain
- The two regions of the cerebrum are cortex and medulla
- The part of brain that is called the seat of consciousness is Cerebrum
- The folding in the cerebral cortex has increased the surface area
- The two major parts of diencephalons is Upper thalamus and Hypothalamus
- The body temperature, water balance, appetite and sleep are regulated by Hypothalamus of diencephalons
- The relay station for the transmission of messages is Mid brain
- Medulla oblongata is a reflex centre for respiration
- The part of brain that is mainly associated with involuntary activities is Medulla Oblongata
- The structure that controls reflex action is Spinal cord
- The center of reflex action is spinal cord
- Autonomic nervous system regulates all functions except learning and memory
- An activity controlled by autonomic nervous system is Peristalsis of the intestine
- The nerves carrying impulses to the central nervous system are known as Sensory nerves
- The largest cranial nerve is Vague nerve
- The two components of the autonomic nervous system which have opposing influence on the same organ are Sympathetic system and parasympathetic system

- Sympathetic nervous system causes secretion of saliva
- Parasympathetic nervous system causes decrease in heart beat
- The transparent portion of the sclera is called Cornea
- The jelly like fluid called Vitreous humor is filled in the eye ball between eye lens and retina
- Aperture that controls the light entering into the eye is pupil
- Cone cells are sensitive to colour and brightness
- The external ear which is a cartilaginous organ is called Pinna
- The part of ear that helps in balancing the body is semicircular canals
- Eustachian tube helps to equalize the pressure on either side of the ear drum
- The external ear is separated from middle ear by Tympanum
- Olfactory nerve connects nose to the brain
- Skin helps to perceive sensation of touch
- An example for endocrine gland is Salivary gland
- Deficiency of insulin causes increase in blood sugar
- Under secretion of thyroxin in adults causes Myxoedema
- The hormone that regulates the calcium level in the blood is Parathormone
- The development of secondary sexual characteristics in males is due to Testosterone
- A gland is an organ whose cells are specialized for producing a particular secretion
- The cortex is composed of Cytos
- The mid brain receives impulses from Eyes and Ears
- The number of cranial nerves originating from Pons are 4
- The nerves that carry responses from brain to the muscle are called Motor nerves
- The layer of tissue which binds the pupil above and below is Iris
- The spot which does not perceive any image is called Blind spot
- The inability to see in dim light is called Nyctopia
- The fluid present in the entire inner ear is Endolymph
- Deficiency of estrogen causes Infertility or sterility
- The average weight of the brain of new born child is 350gms
- The average weight of the brain of Adult woman is 1260gms
- The average weight of the brain of the one year child is 1000gms
- The part of the brain where we find convolutions is Cerebral cortex

- The receptor cell that are responsible for colored vision is Gustatory receptor cells
- The left part of the body is controlled by right part of the brain
- The right part of the body is controlled by left part of the brain
- The activity of progesterone secreted by the corpus luteum is influence urine changes necessary for pregnancy
- The disease caused due to the unevenness of the refractive surface of cornea or the lens is called Astigmatism
- The entering of blood into the vitreous humour of eye is due to the disease called Diabetic Retinopathy
- The motor fibres of spinal cord originate from the Ventral horn
- The area on the retina opposite to the pupil, containing large number of cones and some what depressed is called Yellow spot or Fovea
- The relatively thick fluid filling space behind the lens is called Vitrous humour
- Midbrain serves as the relay station through which the impulses move from hindbrain to the forebrain
- The middle layer of the eye is Choroid
- The defect due to the bulging of eye ball or increased convexity of eye lens is called Myopia
- The defect in the accommodation of the eye due to the loss of elasticity of eye lens is called Presbyopia
- Deficiency of paratharmone hormone leads to painful muscle cramps
- Pituitary is a tiny gland of size of the pea, situated at the base of the brain
- The bacteria which produces human insulin is Escherichia coli
- The harmones secreted by islet of langerhans are Insulin and Glucogon
- A man becomes deaf after a head injury. Deafness in him is due to the damage of specific area of cerebrum
- The gland which is situated in the eye is Lachrymal gland
- The disorder caused due to hardening of eye ball is Glaucoma
- The nerve which connects ear to brain is auditory nerve
- A man is frightened by seeing a Snake the hormone secreted during that period is adrenaline
- The reason for injecting insulin to the diabetic patients is to maintain glucose level

- The organ system that transport the materials require by the organs to all the cells of the body is Transport system
- The transportation of water and dissolved salts through xylem against gravitational pull is Ascent of sap
- The transportation of food from the leaves to the stem and to storage regions through phloem is Organic translocation
- The proteins of plasma helpful in clotting of blood are Fibrinogen and Prothrombin
- The iron containing pigment in RBC is Haemoglobin
- The amount of RBC produced in bone marrow per second are 1.5 to 2 million
- The life span of RBC is 120 days
- The life span of WBC is 12 hours to 300 days
- The number of platelets in a cubic millimeter of blood are 2.5 to 5 lakhs
- The double layered sac that encloses the heart is Pericardium
- The fluid filled between the layers of Pericardium is Pericardial fluid
- The two upper chambers of heart are Auricles
- The two lower chambers of heart are Ventricles
- The muscular layer between the right and left parts of heart is Septum
- The valve between the right auricle and right ventricle is Tricuspid valve
- The valve between the left auricle and left ventricle is Bicuspid valve
- Aorta carries oxygenated blood to different parts of the body arises from the left ventricle
- Pulmonary artery carries the deoxygenated blood to the lungs
- The heart is made up of Cardiac muscles
- The contraction of heart muscles is called Systole
- The relaxation of heart muscles is called Diastole
- In an individual the number of heart beats are 72 per minute
- The instrument used to count the heart beat is Stethoscope
- The circulation of blood in the body is called Double circulation
- The course taken by blood between heart and lungs is Pulmonary circulation
- The course taken by blood between the heart and tissues is Systemic circulation
- The process by which the metabolic wastes are eliminated from the body is called Excretion.
- The process by which a plant loses water by evaporation is called transpiration.

- The excretory system of man includes two kidneys
- The tough connective tissue capsule covering each kidney is Renal Capsule
- The structural and functional unit of kidney is Nephron
- The cup shaped structure at the beginning of Nephron is Bowman's capsule
- The coiled tubule which contains a U shaped tubule in Nephron is called Henle's loop
- A branch of renal artery that enters the Browman's capsule breaks to form a tuft of capillaries is called Glomerulus
- The process of filtration of urine from blood is called Glomerular filtration.
- About 1.5 lts of urine is formed per day in every individual.
- The technique by which the patients suffering from kidney failure are treated is Dialysis
- The substance present in the hair is Keratin
- The pigment that gives colour to the skin is Melanin
- The blood pressure of a healthy individual is 120 / 80 mm Hg.
- An respiration that takes place by using oxygen is Aerobic respiration
- An respiration that takes place without the help of oxygen is Anaerobic respiration
- Taking in air through the nose into the lungs is called Inspiration
- Giving out air form the lungs into the atmosphere through nose is Expiration
- The instrument used to measure the blood pressure is Sphygmomanometer
- The flow of de oxygenated blood from the heart to the lungs giving up carbon di oxide observing oxygen and returning to the heart as oxygenated blood is Pulmonary circulation
- The flow of oxygenated blood from the heart to the cells of the body providing oxygen observing carbon di oxide and returning to the heart is called Systemic circulation
- The four types of blood groups are A, B, AB, and O.

FOOD PRODUCTION AND MANAGEMENT

- The nutrients that are required in large quantities are called Macro nutrients
- The nutrients that are required in small quantities are called Micro nutrients
- An example for macro nutrient is Carbon
- An example for micro nutrient is Sodium
- A group of organic compounds consisting of Carbon , hydrogen and oxygen are called Carbohydrates
- The general formula of carbohydrates is $C_x(H_2O)_n$

- Carbohydrates are classified based on the number of sugar units in them
- One gram of carbohydrate produce 1.7KJ of energy
- The sugar containing single sugar molecule are called Monosaccharides
- The carbohydrates consisting of more than one but a few monosaccharide molecules are called Oligosaccharides
- The molecular formula of Glucose is $C_6H_{12}O_6$
- The molecular formula of Monosaccharide Fructose is $C_6H_{12}O_6$
- The molecular formula of Ribose is $C_5H_{10}O_5$
- The carbohydrates containing more than hundred monosaccharide molecules are called Polysaccharide
- The polysaccharide consisting of numerous monosaccharide molecules is called Glycogen
- An example for Monosaccharide is Cellulose
- An example for Oligosaccharide is Sucrose
- An example for polysaccharide is Starch
- A mixture of copper sulphate, sodium citrate and sodium carbonate is called Benedict's solution
- The long chain organic compounds consisting of carbon, hydrogen and oxygen and containing $-COOH$ group are called Fats
- The amount of fat desirable per day in an adult is 75gms
- The products produced by the hydrolysis of fats are Fatty acids and Glycerol
- An example for unsaturated fatty acid is Groundnut oil
- An example for Saturated fatty acids is Butter
- The fatty acids that are solid at room temperature are called Saturated fatty acids
- The fatty acids that are liquids at room temperature are called Unsaturated fatty acids
- The organic compounds made up of carbon, hydrogen, oxygen and nitrogen are called Proteins
- The essential building blocks required for the growth are Proteins
- The proteins are classified into various kinds based on the composition
- An example for simple protein is Albumin of Egg
- An example for Conjugate protein is Lipoprotein
- The molecules of protein that are made up of only amino acids are called Simple proteins
- The molecules of protein made up of both the amino group and non amino group are called Conjugate proteins
- Amino acids consist of an amino group and Carboxyl group
- An example for essential amino acid is Valine
- an example for non essential amino acid is Glycine
- One of the source of protein is wheat

- The science of crop cultivation or farming is called Agriculture
- The various activities involved in getting the good crops through agriculture are called Agricultural practices
- The upper most part of the earth's crust that supports the plant life is called Soil
- The top layer of the soil is called Feeding zone of the plants
- The process of turning and loosening of the soil in agricultural land is called Ploughing
- The tool used for loosening and turning of soil in agricultural practices is Plough
- The preparation of soil for sowing after turning the soil is called Leveling
- The process of placing the seeds in the soil for germination is called Sowing
- The sowing of seeds manually into soil is called Broadcasting
- The funnel like instrument having a long tube and tied to the back of plough is Seed drill
- The practice of growing seeds in nursery and transferring the seedlings from the nursery to the main field is called Transplantation
- A small plot of land where seedlings are grown for transplantation is called Nursery
- The tiny crop plants grown in nursery are called seedlings
- A natural organic substance that is used to enrich the soil is called Manure
- The commonly used manure by the Indian farmers is Animal dung
- The cultivation done using organic manure is called Organic farming
- The natural manure is Compost
- The chemical compounds that enrich the soil with nutrients essential for growth of plants are called Chemical fertilizers
- An example for nitrogenous fertilizer is Urea
- An example for Phosphatic fertilizer is Superphosphate
- An example for Potassium fertilizer is Potassium nitrate
- The over use of fertilizers causes Soil pollution
- The over use of chemical fertilizers causes Environmental pollution
- The living organisms which enrich the fertility of soil are called biofertilizers
- The bacteria Rhizobium is found in the root nodules of the leguminous plants
- The process of storing water and supplying it to the crops is called Irrigation
- The crop better irrigated by check basin method is Maize
- The crop better irrigated by sprinkler method is Coffee
- The crop better irrigated by Ridges and Furrows method is Cotton
- The crop better irrigated by the Drip irrigation method is mango
- The unwanted plants that grow along with crop plants are called Weeds
- An example of weeds is Parthenium
- The process of removal of unwanted plants from the agricultural land is called Weeding

- The process of removing the unwanted plants from agricultural land by hands is called Mechanical method
- The process of removing weeds by using certain type of chemicals is called Chemical weeding
- The process of removing weeds by employing other organisms is called Biological Weeding
- The chemical compounds that destroy the unwanted plants that grow along with crops are called Weedicides
- An example for Weedicide is MCPAS
- The insect that get rid of the weeds like Opuntia is Cochineal
- The method of control of growth of weeds by agricultural practices is called Cropping method of weeding
- The practice of growing different agricultural crops in the same field alternatively is called Crop rotation
- The practice of growing two or more crops simultaneously in the same agricultural land is called Mixed cropping
- Any organism that destroys or damages the crops are called Pests
- A common example of pests is Rats
- An example for soil borne disease is Smut patches and groundnut
- An example for air borne disease is Wheat rust due to fungus
- An example for seed borne disease is Leaf spot of paddy
- The plant disease are classified depending the mode of spreading
- The plant disease that spread through soil are called Soil borne disease
- The plant diseases that spread through air are called Air borne disease
- The plant diseases that spread through seed are called Seed borne disease
- Any chemical compound that is used to kill pests, rodents are called Pesticides
- An example for pesticide is DDT
- In India 70% of people are engaged in Agriculture
- The important occupation of the people of India is Agriculture
- A seed drill is used for sowing seeds
- The chief plant nutrients are Phosphorous, Potassium, Nitrogen
- The two common weeds are Grass and Amaranthus
- An example for mixed farming is Growing banana in coconut fields
- The process of changing the raw food materials into conveniently storable and readily usable is called Food Processing
- Any substance that lowers the quality of food is called Adulterant
- The instrument used to measure the density of milk is Lactometer

- The disease caused by the consumption of edible oil adulterated with argemone oil is Dropsy
- The movement of food materials from the producer to the consumer is known as Transportation
- The common adulterant used in Tea powder is Colored tea leaves
- The common adulterant used in Black pepper is Dry Papaya seeds
- The common adulterant used in Honey is Jaggery-Sugar
- The common adulterant used in cooking oil is Argemone oil
- The common adulterant used in Turmeric powder is Metanil Yellow
- The common adulterant used in Pulses (Tur dal) is Kesari dal
- The common adulterant used in Chilli powder is Colored saw dust
- The common adulterant used in sweets are Prohibited colors
- The common adulterant used in Rice are Sand, Soap Stones and Marble Chips
- The common adulterant used in Wheat flour is Talc powder and Chalk powder
- The common adulterant used in Coffee powder is Tamarind seed powder
- The common adulterant used in Milk is Water
- The common adulterant used in Soji is Sand, Soap stones and Marble chips
- The common adulterant used in Ghee and Butter is Vanaspathi
- ISI stands for Indian Standards Institution
- Prevention of Food Adulteration Act was promulgated by the government of India in 1954
- The complex activity of preserving the produced food and ensuring its proper distribution for use throughout the year is called Food Management
- Food adulteration is the process of lowering the nutritive value of food by adding substances of inferior quality
- The presence of argemone oil in the cooking oil can be tested by using nitric acid
- CFTRI stands for Central Food Technological Research Institute
- The adulterant vanaspathi in ghee and butter can be identified by using concentrated HCL
- FPO stands for Food Processing Organization
- AGMARK means Directorate of marketing and Inspection
- The density of pure milk is 1.026
- The adulterant of soji and iron filings can be separated by using a Magnet
- The washing soda in sugar affect our health causing intestinal disorders
- The Crimson red color is formed when HCl is added to the adulterated Ghee or butter
- The Reddish brown color is formed when HNO_3 is added to the adulterated Cooking oil

- The metanil yellow the adulterant used in Turmeric powder may cause the disease Cancer
- The spoilage of food during transportation may occur due to the exposure of food to Heat and Frost
- The density of the unadulterated milk must give 1.026 reading on the lactometer
- The food stored in gunny bags get spoiled the reason for this is Humidity
- A man develops gastro intestinal disorder after eating sweets in fair the reason for this is Food Poisoning
- The general symptom of food poisoning is Vomiting and diarrhea
- The major energy releasing nutrients are Carbohydrates and Lipids
- The chief constituents require for the formation of tissues are Proteins, minerals and water
- Vitamins and minerals are called as Regulators
- The macromolecules which are stored in the body are Lipids
- The nutritional disorder that occurs due to excess intake of carbohydrates is Obesity
- The energy required by the average adult are provided by Carbohydrates
- Fats and Oils are called Dietary Lipids
- An example for non essential fatty acid is Glycine
- An example for essential fatty acid is Linoleic acid
- The defect caused by the excess of cholesterol in the body is Atherosclerosis
- The disease caused by the deficiency of Lipids in the diet is Phynoderma
- The most common protein deficiency disorders seen in the developing countries are Kwashiorkor and Nutritional Marasmus
- The fat soluble vitamins are Vitamin A, D, E and K
- The water soluble vitamins are Vitamin B complex and C
- The disease that occurs due to the deficiency of Vitamin A is Night blindness
- The disease that occurs due to the deficiency of Vitamin D is Osteomalacia
- The disease that occurs due to the deficiency of Vitamin E is Sterility in rats
- The disease that occurs due to the deficiency of Vitamin K is Spontaneous bleeding
- The disease that occurs due to the deficiency of Vitamin B₁ is Beri Beri
- The disease that occurs due to the deficiency of Vitamin B₂ is Photophobia
- The disease that occurs due to the deficiency of Vitamin B₃ is Pellagra
- The disease that occurs due to the deficiency of Vitamin B₆ is Dermatitis
- The disease that occurs due to the deficiency of Vitamin Folic Acid is Reduction in number of RBC
- The disease that occurs due to the deficiency of Vitamin B₁₂ is Acute Anemia
- The disease that occurs due to the deficiency of Vitamin C is Scurvy

- The minerals reach the human body through salts in our diet
- The minerals play an important role in the metabolic activities
- The chief constituent of Teeth and bones is Calcium
- The deficiency of calcium cause Rickets
- The chief source of calcium are milk and milk products
- The deficiency of Iron causes Anemia
- The hormone secreted by the endocrine gland is Thyroxin
- The deficiency of Iodine causes Goiter
- The mineral required for the cardiac muscle functioning is Sodium
- The mineral that regulates the acid base balance in the body is Potassium
- The medium for all metabolic activities is Water
- The body temperature is regulated by Water
- The electrolyte balance in the cells and tissues is maintained by Water
- A diet which contains various nutrients in right proportions and include water and dietary fibers required by the body is called Balanced Diet
- The process if deterioration of food losing its nutritive value is called Food Spoilage
- The temperature favorable for the growth of microorganisms is 20 to 35°C
- The storage of food in cold temperature in the range of 6 to 8°C is called Cold Storage
- The storage of food below 0°C is called Freezing
- An example for food substance which are preserved by using salting is Lemon
- An example for food item stored using coating or wrapping is Egg
- An example for food item preserved using hot air drying is Grapes
- An example for food item preserved using vaccum drying is Milk powder
- An example for food item preserved using sun drying is Cereals
- An example for food item preserved using irradiation method is Fruits
- The storage of grains on a large scale in storage bins is called Grain silos.

ENVIRONMENTAL SCIENCE

- Removal of fat from is also adulteration because the milk becomes less nutritive
- The living organism and their physical surrounding together constitute Environment
- The branch of biology that deals with study of interaction between the living organisms and environment is called Environmental science
- The living components of the environment are called Biotic components
- The non living components of the environment are called Abiotic components
- An example for biotic component is Animals

- An example for abiotic component is Soil
- An example for interaction between two abiotic components is temperature and Humidity
- As the temperature increases the humidity decreases
- Food spoils in summer faster due to increased activity of micro organisms
- The chief constituent of Protoplasm is Water
- The various sources available in the environment are called Natural resources
- An example for natural resource is Water
- The resources that get exhausted by their continuous use are called Renewable resources
- The resources that do not get exhausted by their continuous use are called Non Renewable resources
- An example for renewable resource is Water
- An example for non renewable resource is Petroleum
- The destruction of forests for various reasons is called Deforestation
- The main reason for desertification is Deforestation
- The species of plants and animals that are fastly depleting due to certain factors are called endangered species
- An example of species that is already extinct is Dodo
- IBWL stand for Indian Board of Wild Life
- The abbreviation of WPSI is Wild life prevention Society of India
- WWF stands for World Wild life fund for Nature
- Expand SBWL-State Boards for Wild Life
- IUCN stands for International Union of Conservation of Nature and Natural Resources
- NWAP stands for Nation Wild Life Action Plan
- The water that is fit for drinking is called Potable water
- The main source of water to us is Rain
- The water available in the interior of the earth's crust is Ground water
- The main reason for the acute shortage of water is Increasing population
- The principal source of minerals is earth's crust
- The important constituent of food are Minerals
- The process of converting biodegradable and non biodegradable wastes into reusable form is called Recycling

- The waste materials that can be converted into simple non toxic materials by microbial activity are called Biodegradable waste
- The waste materials that cannot be converted into simple substances by microbes are called Non biodegradable waste
- An example for biodegradable waste is Vegetable peels
- An example for Non biodegradable waste is Plastic pipe
- Most of the organisms live in the temperature range of about 10 to 40°C
- An example for the endangered species is Asiatic lion
- The judicious use and management of resources is called Conservation
- The project undertaken by the government of India to increase the population of Tigers is Project Tiger
- The uncultivated plants and non domesticated animals are called Wild Life
- The physical and biological world that an organism lives in and with which it interacts is called as Environment
- The part of earth and the atmosphere which is inhabited by living beings is called Biosphere
- The microscopic organisms which feed on the dead remains of other animals are called decomposers
- The cyclic movement of various nutrients in the biosphere is called Bio-geo chemical cycle
- The process of converting free gaseous nitrogen of the atmosphere into useful forms of compounds of nitrogen is called Nitrogen Fixation
- The undesirable changes in the physical, chemical and biological characteristics of the environment is called Environmental pollution
- The interacting system of organisms together with the environmental factors with which they interact is called Ecosystem
- The movement or entry of a chemical substance from the reservoir pool to the exchange pool is called Fixation
- The movement or entry of chemical substances from the exchange pool to the reservoir pool is called recycling
- The process of conversion of complex organic compounds like proteins into ammonium salts by the action of microorganisms is called Ammonification

- The process of conversion of ammonium salts into water soluble nitrates and nitrites by the action of bacteria is called Nitrification
- The process of conversion of nitrates in the soil into free gaseous nitrogen by the action of bacteria is called Denitrification
- The organism involved in the process of nitrogen fixation are Rhizobium and Blue green algae
- The organism involved in the process of Ammonification is Ammonifying bacteria
- The organism involved in the process of conversion of ammonia into nitrites is Nitrosomonas
- The organism involved in the process of conversion of nitrite into nitrates is Nitrobacter
- The organism involved in the process of Denitrification is Pseudomonas
- ATP stands for Adenosine triphosphate
- NADP stands for Nicotinamide Adenine Dinucleotide Phosphate
- The reservoir pool for phosphorous is Lithosphere
- Phosphorous cycle is also called as Imperfect cycle
- The pollutants which can be converted into harmless form either by quick dilution or by bacterial degradation are called Biodegradable pollutants
- The pollutants which cannot be changed into harmless forms by any known means are called Non-degradable pollutants
- The combination of smoke and fog is called Smog
- The layer of atmosphere that prevents the harmful radiations is Ozone layer
- A disease caused by the mercury pollution is called Minamata
- An example for insectivorous plant is Drosera
- The most abundant gas in the atmosphere of the earth is Nitrogen
- The bacteria that lives in the root nodules of the leguminous plants is Rhizobium
- An example for non biodegradable pollutant is DDT
- The chemical that kills pest is called Pesticide
- The two sulphur compounds that cause acid rain are Sulphur di oxide and sulphur tri oxide
- The gaseous product formed when organic materials are decomposed by bacteria is Carbon di oxide
- An example for sedimentary cycle is Phosphorous cycle

- The percentage of nitrogen in the atmosphere is about 79%
- The byproduct of respiration by plants and animals is Carbon dioxide
- The byproduct of photosynthesis is Oxygen
- Carbon dioxide is released into atmosphere during volcanic eruptions
- The movement of materials is very slow in the reservoir pool
- An example of a gaseous cycle is Carbon cycle
- Gaseous cycles are perfect cycles
- Nitrogen cycle is example for Perfect cycle
- The reservoir pool for gaseous cycle is atmosphere
- The life on earth is carbon based
- The carbon is fixed into the nutrient pool during photosynthesis
- Nitrogen fixation refers to the conversion of free nitrogen into useable chemical compounds
- Anabena and Nostoc can directly use atmospheric nitrogen
- The process which does not help in returning of nitrogen back to the reservoir pool is Nitrogen fixation
- Ammonifying bacteria converts nitrogenous waste into ammonium compounds
- An example for nitrifying bacteria is Nitrosomonas
- An example for denitrifying bacteria is Pseudomonas
- The amount of oxygen present in the atmosphere of the earth is about 20%
- The second most constituent of the atmospheric air is Oxygen
- The process of combustion of fuels draws oxygen from the reservoir pool
- The decomposition of organic matter releases carbon dioxide
- An example of a micronutrient is Phosphorous
- Phosphorous is required by the living organisms in minute quantities for building up of RNA and DNA
- Phosphorous is required by organisms for the formation of nucleic acids
- Phosphorous is found in the earth's crust as phosphate rocks and in bone deposits
- An example for biodegradable pollutant is Vegetable peel
- Photochemical smog in the atmosphere is usually caused by oxides of nitrogen
- Acid rain inhibits the growth of lichens on the trees

- Increase in the temperature of the earth due to excessive accumulation of gases like carbon dioxide and methane in the atmosphere is known as Greenhouse effect
- Excessive accumulation of chlorofluorocarbons in the atmosphere causes ozone layer depletion
- The chief source of air pollution in cities is Automobiles
- Ozone in the upper atmosphere are destroyed by Chlorofluorocarbons
- The group of plants that act as a indicator of sulphur dioxide pollution in air is Epiphytic lichens
- The molecule which has the greater affinity with hemoglobin of the blood is carbon monoxide
- Most hazardous metal pollutant present in automobile exhaust is Lead
- Release of superheated liquids into water bodies cause thermal pollution
- The progressive increase in the concentration of a chemical pollutant in higher tropic levels is known as Biomagnifications
- The disease caused by consumption of polluted water is Ameobiasis
- Cholera spreads due to consumption of polluted water
- BHC and DDT are chemical pesticides
- The abiotic factor in the atmosphere is Temperature
- The most abundant gas on the atmosphere of the earth is Nitrogen
- Replacing of old machines into new ones is the measure to check Noise pollution
- The air pollution that can oxidize rubber goods is chloro flouro carbons
- The cyclic movement of the elements in the ecosystem from abiotic to biotic and vice versa is called Biogeochemical cycle
- The cycles in which the reservoir pool is the hydrosphere is called Perfect cycles
- The cycles in which the reservoir pool is the lithosphere is called Imperfect cycles
- The process by which the nitrogen is fixed by non biological or natural means is called Electro chemical fixation
- The energy rich compound which require phosphorous, an essential micronutrient is ATP
- Major source of mineral nutrient is the decomposition of dead animals
- The blue green algae that is found in ponds and paddy fields which can absorb nitrogen is called Anabaena

- An increase in any constituents of the atmosphere which is harmful to the living beings and their environment are called Air pollution
- A typical biogeochemical cycles has 2 major components or pools
- The ozone layer is becoming thin due to the gases CFCs
- The poisonous gas released during the Bhopal gas incident was Methyl Isocyanate
- Nepenthes obtains its nitrogen supplement by digesting insects
- Biogeochemical cycles are interdependence between the living and non living components
- Phosphorous is an example for imperfect cycle because major part of the phosphorous forms sediments in the sea
- The insectivorous plants engulf insects in order to obtain Nitrogen
- Farmers grow pulses along with the food crops in order to maintain the fertility of the soil
- Phosphorous is essential requirements for the animals for the development of Bones
- The natural process by which phosphorous enters the exchange pool is by weathering of rocks
- Green house effect is caused due to the increased Carbon dioxide
- One of the steps of effluent treatment is neutralization of acids and alkanes
- Pesticides and insecticides must be used with more care because they may lead to biomagnifications
- People working in factories or industries should use ear plugs in order to protect the ear from high intensity sound
- The major component of the earth are Atmosphere, Hydrosphere, Lithosphere and Biosphere
- The functional component of the biosphere is known as Ecosystem
- The collection of individuals of a species that inhabit a given place at a given period of time is Population
- The large ecosystems which have occupied vast geographical areas that show identical climate condition is Biome
- The microorganisms that are found freely floating on the surface of water are called Planktons
- The members of algae which are capable of photosynthesis are Phytoplanktons
- The consumers which feed on phytoplanktons are Zooplanktons

- The part of sea upto where sunlight can penetrate is Euphotic Zone
- The part of sea or ocean where sunlight cannot penetrate is Abyss
- An ecosystem where water forms the living medium is Aquatic ecosystem
- Aquatic ecosystem where salt concentration is high is called Marine ecosystem
- Aquatic ecosystem where the salt concentration is less is called fresh water ecosystem
- An aquatic ecosystem where water is stationary or stagnant is Lentic Ecosystem
- An aquatic ecosystem where water is of flowing type is Lotic ecosystem
- An ecosystem where land forms the living medium is Terrestrial ecosystem
- The living components are known as Biotic
- The non living components are known as Abiotic
- The animals which obtain their food by directly feeding on the producers are called Primary consumers
- The animals which obtains their food by feeding on primary consumers are Secondary consumers
- The animals which feed on the secondary consumers are Tertiary consumers
- The organisms which obtain their food from dead and decay of other orgtanisms are Decomposers
- The transfer opf food energy from one level to another is called Food Chain
- The inter dependence and inter relationship between the different food chains of an ecosystem is called Food Web
- A pyramid that is constructed on the basis of the number of indiduals that occupy each tropic level in a given area of ecosystem at a given period of time is Pyramid of numbers
- A pyramid that is constructed on the basis of the total body weight of individuals that occupy each tropic level is Pyramid of biomass
- A pyramid that is constructed on the basis of the amount of food energy available to each tropic level is Pyramid of Energy
- The phenomenon of increasing the concentration of certain chemical substances from one tropic level to another is called Biomagnfication.

EVOLUTION OF LIFE

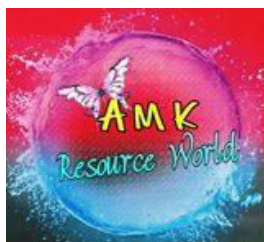
- The continous and gradual change from simple life forms to complex organisms is called Organic evolution
- The earliest organisms to emerge on earth were Protozoa

- Lamarck's theory of evolution is called the theory of use and disuse
- The first scientist to give the scientific theory on organic evolution was Charles Darwin
- The famous book written by Charles Darwin is Origin of Species
- The book origin of species written by Darwin was published in 1859
- The scientist who propounded the theory of organic evolution by natural selection was Charles Darwin
- The one of the basis of darwins theory was Struggle for existence
- The feature of Darwin that the organisms which have favourable variations will succeed and survive is called Survival of fittest
- The remains of an ancient organism preserved in earth's crust are known as Fossils
- The branch of science that deals with the study of fossils is called Paleontology
- The first bird known to live during the late jurrasic period was Archaeopteryx
- The organs of different group of organisms having fundamental similarity of structure and position are called Homologous organs
- The organs of different groups having different structure and performing similar functions is called Analogous organs
- The age of earth is estimated to be approximately 5 billion years
- The age of Invertebrates is called Proterozoic era
- The age of amphibians and fishes is called Paleozoic era
- The age of reptiles is called Mesozoic era
- The mammals belong to the age Coenozoic era
- The seed bearing plants emerged on the earth during the Mesozoic era
- The flowering plants emerged on the earth during the Coenozoic era
- Archaeopteryx is a link between reptiles and birds
- Darwin's theory of evolution is best described as Evolution by Natural selection
- Dinosaurs are ancient reptiles
- The competition amongst the organisms for resources is called Struggle for existence
- The Lamarckian theory of evolution was refuted by August Weismann
- The geographical era in which the first life emerged on earth was Proterozoic era
- The algae, fungi, protista emerged on the earth during the Mesozoic era
- The region where we find the remains of the ancient elephant that lived 1000 years ago Siberia
- The life emerged on earth in the oceans
- The technique of effecting the suitable changes in the genetic material is called Genetic Engineering
- A population of identical genes, cells or organisms derived from same the same parent by an asexual process is called Clone

- The process of producing genetically similar genes, cells or organisms from a common precursor is known as Cloning
- The hereditary determinant of an organism is Gene
- The technology used to manipulate genes in the laboratory is called recombinant DNA technology
- The technique of biotechnology used to identify the genetic relationship is called DNA finger print technology
- The cloning of first animal was done by Wilmot
- The first cloning was done in the year 1997
- The first cloned sheep is Dolly
- The application of biological process is called Biotechnology
- The scientist who gave the correct explanation of lactic acid fermentation was Louis Pasteur
- The person who invented the technique of fermentation of alcohol by yeast was Edward Bubner
- The term biotechnology was first used in Britain
- The cultivation of mushrooms was first introduced in France
- A technique of producing yeast on a large scale for bakery was developed in 1915 by Germans
- DNA finger print of two individuals are always different
- The technique of producing plants using a portion of it or just a few cells is called Tissue culture
- The one of the disadvantage of the genetically modified plants is sterility of seeds
- Tissue culture is helpful in producing new varieties of plants
- DNA finger print technology is more useful in the field of Forsenic science
- The branch of biology which deals with the study of microorganisms including their culture, economic importance and pathogenicity is called Microbiology
- The branch of biology which deals with the study of heredity and variation is called Genetics
- The substance produce by the distillation process is Alcohol
- The artificial cultivation of mushrooms was introduced by France in 1650
- The country in which the yeast is used in large scale in bakery is Germany
- National biotechnology board was established in 1982
- The department of biotechnology of India was established in 1986
- The DNA fragments are separated by using Gel Electrophoresis method
- The kind of laboratory required for Tissue culture is Sophisticated laboratory
- The biological processes taking place within the body of an organism is called In vivo

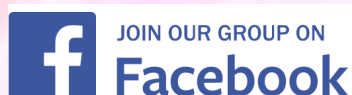
- The biological processes taking place in a cultural vessel or plate is called In vitro
- Production of daughter cells by strawberry runners is an example for Cloning
- Louis Pasteur explained lactic acid fermentation in 1857
- NBTB stands for National Bio Technology Board
- Separating a desirable gene from a cell and introducing it in another cell is called Recombinant DNA technology
- The application of technology using the characteristics of living organisms to obtain useful product is called Bio Technology
- Plant cells have the capacity to produce plants of their own kind' is the principle behind Tissue Culture
- It is possible to obtain high yielding and disease resistance plants by using Tissue culture
- Through the application of tissue culture it is not possible to maintain the balance in the nature
- The technique followed to develop large number of plants in a limited space is Tissue culture.
- The theory which explains the evolution in the light of natural selection of inherited characteristics is NeoDrawinism
- The carriers of heredity are Genes
- The term genetics was coined by Bateson in 1905
- The father of modern Genetics is Gregor Johann Mendel
- The mendelian factors are now called Genes
- The plants selected by Mendel to carry out his experiments was Pea plant
- A cross between two plants carrying one pair of contrasting characters is called Monohybrid cross
- A cross between two plants carrying two pair of contrasting characters is called dihybrid cross
- The checker board for F₂ generation was first designed by Punnett
- The ratio of the dihybrid cross of the Mendel experiment is 9:3:3:1
- The pair of factors for a given character separates in equal ratio at the time of gamete formation during meiosis is Law of Segregation
- When two organisms possess more than one set of traits, each pair of trait is inherited quite independently of the inheritance of the other pairs of factors is Law of independent assortment.
- The man belongs to the order Hominidae
- The ratio between the weight of brain and spinal cord in cat is 4 : 1
- The ratio between the weight of brain and spinal cord in Monkey is 8 : 1
- The ratio between the weight of brain and spinal cord in Man is 55 : 1

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