(3) SCIENCE: FOR CDS, NDA, AFCAT & CAPF.

PHYSICS:

IMPORTANT FACTS.

⊛ LIGHT.

- ⊛ It lies between 3900A° to 7800A°.
- ⊛ It propagates as electromagnetic waves.
- ⊛ It is a transverse wave.
- ⊛ It has dual nature as it behaves as wave and particle both.
- ⊛ Speed of light = 3×10^8 m/s. (In vaccum).
- ⊛ $\mu = \frac{c}{v}$ μ = Refractive Index.
  c = speed of light in vaccum.
  v = speed of light in medium.

  i.e, $\mu \propto \frac{1}{v}$

- ⊛ Speed of light.

V.V.I. vaccum > Glass > water > Terpeutine oil.
(3×10^8 m/s.)

- ⊛ It takes 8 min 19 sec. to reach from Sun to Earth.
- ⊛ **V.V.I** When a light reflect from Plane Mirror:-
  - ⊛ Image will be virtual, laterally inverted.
  - ⊛ Size of image = Size of object.
  - ⊛ Distance of image from the mirror is equal to the distance of object from the mirror.

(3). USES OF CONVEX MIRROR. (V.V I).

1) As a rear view mirror in vehicle.

2) In Sodium reflector lamp.

(*) REFRACTION OF LIGHT.

(*) The refractive Index of medium is different for different colours.

$\mu \propto \frac{1}{\lambda}$ $\quad \mu = R.I$

λ = wavelength.

→ R.I of a medium decreases with the increase in wavelength. Hence. (V.V I)

R.I of a medium is maximum for violet colour and minimum for red colour.

$\lambda_{red} > \lambda_{violet}$.

$\mu \propto \frac{1}{T}$ $\quad \mu = R.I$

T = temperature.

→ The R.I of a medium decreased with the increase in temperature.

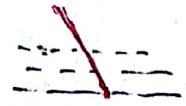
(*) (V.V I) when a ray of light enters from one medium to the other, its frequency and phase donot change, but wavelength and velocity change.

④ ILLUSTRATIONS OF REFRACTION (MUST DO V.V.I.)

1) Twinkling of stars.

2). Oval shape of sun in the morning and evening.

3) Bending of a linear object when it is partially dipped in a liquid inclined to the surface of liquid.



4). An object in a denser medium when seen from a rarer medium appears to be at smaller distance.

Denser medium = Air.
Rarer medium = water.

V.V.I

a). A fish in a pond when viewed from air appears to be at a smaller depth then actual depth.

b) A coin at the base of a vessel filled with water appears raised.

⑤ Total Internal Reflection:-

Illustrations. (MUST DO V.V.I) MOST IMPORTANT.

1) Sparkling of diamond.
2) mirage and looming.
3). Shining of air bubble in water.
4) Increase in duration of sun's visibility. (Sun visible before and after sunrise & sunset).
5) shining of a smoked ball on which lamp soot is deposited when dipped in water.).

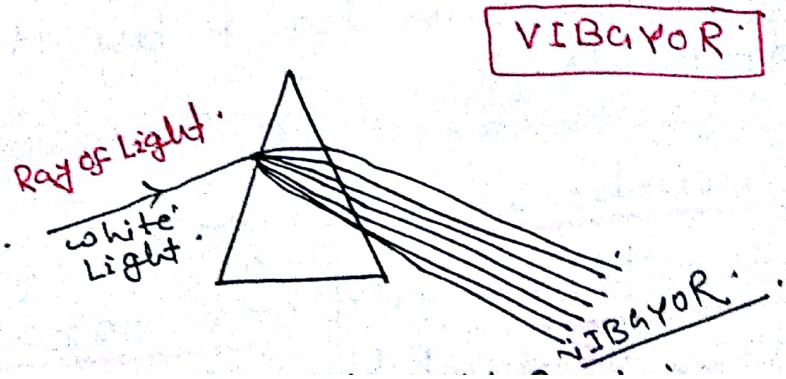
5 ⊛ APPLICATIONS OF OPTICAL FIBRE.

⊛ For transmitting optical signals & electr-
⊛ -ical signals.
used by doctors for visualising the internal sites of the body in endoscopy

⊛ Change in power of a lens:-

If a lens is dipped in a liquid, its focal length and power both change.

⊛ Dispersion of Light:- when a ray of white light is passed through a prism, it gets splitted into its constituent colours.



6

VIBGYOR

↳ Maximum wavelength.
Maximum velocity in a medium.
Minimum deviation.
Minimum R.I.

↳ Minimum wavelength.
Minimum velocity in a medium.
Maximum deviation.
Maximum Refractive Index.

✳ RAINBOW :-

Rainbow is formed due to dispersion and refraction of sun light by the suspended water droplets.

✳ primary rainbow is formed due to -
two refractions and one total internal reflection of light falling on raindrops.

✳ Secondary Rainbow :- formed due to
two refractions and two internal reflections of light falling on rain drops.

✳ SCATTERING OF LIGHT.

when light waves fall on small bodies such as dust particles; water particles in suspension they are thrown out in all directions. This phenomenon is called scattering of light.

✳ Scattering of light is maxm. in violet colour and minimum in red colour.

* C.V RAMAN got nobel prize for scattering of light.

ILLUSTRATIONS: (MUST DO, VVI).

1) Blue colour of sky is due to scattering of Light.

2) The brilliant red colour of rising and setting sun is due to scattering of light.

* Diffraction of Light.

It is the process by which a beam of Light or other systems of wave is spread out as a result of passing through a narrow opening or across an edge.

* Polarisation is the only phenomenon which proves that light is a transverse wave.

*

HUMAN EYE.

* Least distance of distinct vision is 25 cm.

MYOPIA:- (short sightedness):-

⇒ A person cannot see far objects clearly.

⇒ Diverging or concave lens is used for remedy.

Causes:- 1) Elongation of eye ball
2) Shortening of focal length of eye lens.
3) over stretching of ciliary muscles.

(8) ✱ HYPERMETROPIA or Longsightedness.

⇒ A person cannot see near objects.

⇒ converging or convex lens is used.

causes:- 1) Shortening of eye ball.
2) Increase in focal length of eye lens.
3) stiffening of ciliary muscles.

✱ PRESBYOPIA.

✱ Generally found in elderly person.

✱ As a result a person cannot see distinct as well as nearby objects.

✱ causes:- due to stiffening of cilliary muscles.

✱ for its remedy two separate lens or a bifocal lens is used.

Astigmatism :-

➡ For its remedy cylindrical lens is used.

✱ There are two kinds of vission cell in Retina.
1) Rods 11) cones.

➡ Rods decides the intensity of light where as cones distinguish colour of light.

✱ MICROSCOPE.

Simple Microscope:- It is simply a convex lens of small focal length.

compound Microscope:- It consists of two convex lens.

✱ Astronomical telescope consists of two convex lens.

(*) Some Important points related to CURRENT:

(9) Ammeter:- It is a device used to measure electric current in a circuit.

⇒ connected in series.

Voltmeter:- It is a device used to measure the potential difference. betⁿ two points in a circuit.

⇒ connected in parallel.

Electric Fuse:- It is a small conducting wire of alloy of copper, tin and lead having low melting point.

V.V.I

⇒ pure Fuse is made up of tin.

Transformer:- It is a device used to convert ~~mechanical energy~~. low voltage A.C into high voltage A.C and high voltage A.C into low voltage A.C.

V.V.I

⇒ It is based on electromagnetic induction.

⇒ It can be used only in case of alternating current.

(*) A.C dynamo (generator) and microphone work on the principle of electromagnetic induction.

(*) ## ATOMIC & NUCLEAR PHYSICS.

Radioactivity:-

It was discovered by Henry Becquerel, madame curie and Pierre curie for which they jointly win Nobel Prize.

10

* The nucleus having protons 83 or more are unstable. They emit α, β & γ particles and become stable. The Elements of such nucleus are called radioactive Elements and the phenomenon of emission of α, β and γ particles is called radioactivity.

* Robert Pierre and his madame curie discovered a new radioactive Element "RADIUM".

* The End product of all natural radioactive Element after Emission of radioactive rays is "lead".

* properties of α, β & γ particles.

	α	β	γ
Nature →	positively Charge.	Negatively charge.	Neutral

penetrating power:-

$$\gamma > \beta > \alpha$$

Ionising power.

$$\alpha > \beta > \gamma$$

velocity:-

$$\gamma > \beta > \alpha$$

* Radioactive carbon-14 is used to measure the age of fossils and plants.

* carbon Dating method:- In this method age is decided by measuring the ratio of C^{12} & C^{14}

Nuclear Fission:-

The nuclear reaction in which a heavy nucleus splits into two nuclei of nearly equal mass is nuclear fission.

(11)

- It was first demonstrated by Strassmann and O. Hahn.
- U^{235} and Pu^{239} are used as fissionable material in nuclear Fission.

components of nuclear Reactor:- (V.v.I)

moderator:-

⇒ It decreases the energy of neutrons.

⇒ D_2O (Heavy water) and graphite are used as moderator.

control rod:-

Rods of cadmium or boron are used to absorb excess neutrons or in another word it control the chain reaction.

- The energy released by sun and other stars is by nuclear Fusion.

coolant:-

⇒ It absorbs the heat and prevents excessive rise in the temperature during fission.

⇒ D_2O, He & CO_2 are used as coolant.

Rectifier:- It is a device which converts alternating current into direct current.

V.v.I

- Atom Bomb is based on nuclear Fission where as Hydrogen Bomb is based on nuclear Fusion

WAVE (SOUND)

* Light, Heat are the Examples of non-mechanical wave. In fact all the electro-magnetic waves are non-mechanical.

* The wavelength range of electromagnetic wave is 10^{-14} m to 10^{4} m.

* cathode rays, canal rays, α rays, β rays, V.V.I Sound wave and ultrasonic wave are not electromagnetic waves.

SOME IMPORTANT ELECTROMAGNETIC WAVES

E.M waves	V.V.I Discoverer
γ-Rays.	Henry Becqueral.
X-Rays.	Rontgen.
Uv Rays.	Ritter.
visible Radiation.	Newton.
Infra-red rays.	Hershel.
short radio waves.	Heinrich hertz.
Long Radio waves.	marconi.

FREQUENCY Range of Electromagnetic waves.

V.V.I γ rays > X-Ray > U.v Rays > V.Rays > I.red rays > Short Radio waves > long radio waves.

WAVELENGTH Range.

Radio wave > I.red ray > v.rays > U.v rays > X-ray > γ-rays.

(13) $v = n\lambda$ velocity = frequency × wavelength

v = velocity.
n = frequency.
λ = wavelength.

* Sound waves are longitudnal waves.

* Audible wave or sound waves.

It lies between 20 Hz to 20,000 Hz.

Infrasonic waves:-

⇒ frequencies less than 20 Hz are called Infrasonic waves.

⇒ It is produced by bigger size such as Earthquakes, volcanic eruptions, ocean waves, elephants and whales.

Ultrasonic waves.

⇒ frequencies greater than 20,000 Hz are called ultrasonic waves.

⇒ Human ear cannot detect these waves. But certain creatures like dog, cat & bat, mosquito can detect these waves.

⇒ Bat not only detect but also produce ultrasonic.

V.V.I

V.V.I Applications of Ultrasonic waves.

1) For sending signals.
2) For measuring depth of sea.
3) For removing lamp soot.
4) In sterlizing of liquid.

14

Speed of sound is different in different medium. it basically depends on density of medium.

* Speed of sound is maximum in solids and minimum in gases.

* When sound enters from one medium to another medium, its speed and wavelength changes but frequency remains unchanged.

V.V.I

or In a medium the speed of sound is independent of frequency.

* Effect of pressure on speed of sound.

The speed of sound is independent of pressure.

EFFECT on speed of sound:-

Temperature:- Increases with increase in temperature. The speed of sound in air increases by 0.61 m/s when the temperature is increased by 1°C.

Humidity:- speed of sound is more in humid air than in dry air. because the density of humid air is less than the density of dry air.

* Due to intensity; a sound appears loud or faint to the ear.

* Pitch distinguishes a sharp or shrill sound from a grave (dull or flat) sound.

Pitch ∝ frequency

15 ⊛ To hear echo, the minimum distance between the observer and reflector should be 17m

⊛ persistence of Ear (Effect on sound on Ear) is 1/10 sec.

V.V.I ⊛ Due to Refraction, sound is heard at longer distances in nights than in day.

Speed of sound in different mediums.

V.V.I Aluminium > Granite > Glass > Iron

or, Steel > water > Air.

⊛ In Air speed of sound is 332m/s.

⊛ speed of sound is maximum in solids and minimum in gases.

HEAT.

$$\frac{C}{5} = \frac{F-32}{9} = \frac{R}{4}$$

⊛ F.P of mercury is $-39°C$.
F.P of alcohal is $= -115°C$.

⊛ measure temperature below $-39°C$. alcohal thermometer is used.

⊛ water in a earthed pot gets cooled in Summer due to Evaporation.

⊛ Boiling point of a Liquid increases with the increase in pressure.

B.P ∝ pressure

⊛ Relative humidity is measured by hygrometo.

⊛ Relative humidity increases with the increase of temperature.

MECHANICS.

NEWTON'S First law of motion:-

⇒ First law is also called law of Galileo or Law of Inertia.

⇒ First law gives the definition of Force.

Some Examples of Inertia:

1) when a car or train starts suddenly, the passengers bends backward.

2) when a running horse stops suddenly, the rider bends forward.

3) when a coat/blanket is beaten by a stick, the dust particles are removed.

Examples of Newton's third law of motion:

To Every action, there is an equal and opposite reaction.

1) Recoil of a gun.
2) motion of rocket.
3) Swimming.
4) while drawing water from the well, if the string breaks up the man drawing water falls back.

Centripetal Force:- when a body travels along a circular path, an external force always acts on the body towards the centre of path. this force is called centripetal force.

centrifugal Force:- It is Equal and opposite to centripetal force. i.e, acting away from the centre of path.

17

* centrifugal force should not be confused as the reaction of centripetal force because these forces act on same body.

* cream separator, centrifugal drier work. (V.V.I) (washing machine drier) work on the principale of centrifugal Force.

* SI unit of Energy is Joule.

* Example of potential Energy. (V.V.I)
  1) Energy of stretched or compressed spring.
  2) Energy of water collected at a height.
  3) Energy of spring in a watch.

* Kinetic Energy = $\frac{1}{2}mv^2$.

* principle of conservation of Energy says: Energy can neither be created nor can be destroyed. it can only be transformed from one form to another.

* **SOME EQUIPMENTS USED TO TRANSFORM ENERGY.** (REFER to LUCENT PHYSICS (DO it from Book) CHAPTER - WORK, ENERGY & POWER.
  Dynamo, Microphone ——

GRAVITATION

* Gravity is the Force by which Earth pulls a body towards its centre.

* Acceleration due to gravity (g) is independent of shape, size and mass of the body.

(18) VARIATION in g (V.V.I) (MUST DO)

1) value of g decreases with height or depth from Earth's surface.

2) g is maximum at poles and minimum at equator.

3) g decreases due to rotation of earth.

4) g decreases if angular speed of earth increases and increases if the angular speed of Earth decreases.

* Speed of a planet is maximum when it is at perigee and minimum when it is at apogee.

* Geo-stationary satelite revolves around the Earth at a height of 36000 km.

* Escape velocity is that minimum velocity with which a body should be projected from the surface of Earth so as it goes out of gravitational field of Earth and never return to Earth.

* Escave velocity is independent of the mass, shape and size of the body and its direction of projection.

For Earth, Escape velocity = 11.2 K/S.
For Moon, Escape velocity = 2.4 K/S.

* The period of revolution of satelite revolving near the surface of Earth is 84 minute.

(19)

PRESSURE

* Atmospheric pressure decreases with altitude (height from Earth's surface)

This is why—

V.V.I 1) It is difficult to cook on the mountain.

2) The fountain pen of a passenger leaks in aeroplane at height.

* Atmospheric pressure is measured by barometer, with the help of barometer, weather forecast can be made.

V.V.I 1) Sudden fall in barometric reading is the indication of ~~clear weather~~ storm.

V.V.I 2) Slow fall in barometric reading is the indication of rain.

DO 3) Slow rise in the barometer reading is the indication of clear weather.

* In a static liquid at some horizontal level, pressure is same at all points.

* pressure $\propto$ depth of the point from the free surface.

pressure $\propto$ density of the liquid.

*

V.V.I · M.P $\propto$ pressure (Expands on fusion)

$\propto \frac{1}{\text{pressure}}$ (contracts on fusion)

B.P $\propto$ pressure.

* A body floats in a liquid if density of material of a body is less than or equal to the density of liquid.

29 **Surface tension**:- It is the property of liquid by virtue of which it has the tendency to have the area of its free surface minimum.

E.g:- A liquid drop or rain drop attains spherical shape due to surface tension.

V.V.I **Illustration of capillarity. (MUST DO)**

1) A piece of blotting paper performs capillarity.
2) The oil in the wick of a lamp rises due to capillary action.
3) The roots hairs of plants draws water from the soil through capillary action.
4) The soil is loosened and split into pieces by the farmers.
5) Action of towel in soaking up water from the body.
6) melted wax, in a candle rise up to wick by capillary action.

ILLUSTRATION OF SURFACE TENTION

1) If a clean and dry needle is kept slowly on the surface of water, it floats due to surface tension.
2) The addition of detergent or soap decreases the surface tension of water and thus increases the cleaning ability.
3) Bubbles of soap solution are big because addition of soap decreases the surface tension of water.

(21)

4) When kerosene oil is sprinkled on water, its surface tension decreases. As a result the larva of mosquitoes floating on the surface of water die due to sinking.

5) warm soup is tasty because at high temperature its surface tension is low. and consequently the soup spreads on all parts of the tongue.

(X) Time period of simple pendulum is.

$$T = 2\pi\sqrt{\frac{l}{g}}$$

UPSC

* The absolute zero temperature = -273.15°C or -459.67°F.

* The silvering of inner wall of a thermoflask is done to avoid heat transfer through radiation.

* The amplitude of a sound wave determines its loudness. A larger amplitude means a louder sound and a smaller amplitude means a softer sound. V.V.I

  ⇒ pitch and frequency are related with shrillness of sound.

* wavelengths of X-rays are the order of 10^{-9} m to 10^{-10}.

* In case of compound microscope the focal length of the eyepiece is larger than the focal length of the objective.

  ⇒ Image produced in normal optical microscope is virtual.

* For a convex lens 'f' is negative, so power will be negative and focal length of convex lens is positive, so its power will be positive. V.V.I

* wavelength of X-rays are more than the Y-rays.

* Diamond possesses high refractive index. when light enters into it, suffers multiple total internal reflections due to which it is very bright. V.V.I

(23)

⊛ A body weighs less on a hill top than on the Earth's surface even though its mass remains unchanged. Because the acceleration due to gravity of the Earth decreases with height.

V.V.I

⊛ While putting clothes for drying up, we spread them out. because the rate of evaporation increases with an increase in surface area.

V.V.I

⊛ Result of a surface tension.

V.V.I

1) Nearly spherical drop of rain.
2) capillary rise.
3) Removal of dirt by soap or detergent.

⊛ optical fibres work on the principle of total internal reflection. therefore light can travel through the fibres due to multiple total internal reflection.

V.V.I

⊛ when light goes from one medium to another, it is called refraction.

⇒ velocity of light decreases as the ray passes from a rarer to a denser medium because.

V.V.I

$$\mu_d > \mu_r.$$

$$\& \quad V \propto \frac{1}{\mu}.$$

⊛ During melting, temperature of solid remains constant.

⊛ A deep sea diver may hurt his ear drum during diving. because of high water pressure.

⊛ Thermal conductivity order.

Copper > Aluminium > Stainless steel.

V.V.I

- The sun is observed to be reddish when it is near the horizon i.e, in the morning and the Evening. because the red light is least scattered by atmosphere.
- Light waves are electromagnetic waves.
- optical glass used in the construction of spectacles is made by flint glass.
- ⟹ The reason behind using flint glasses are higher refractive index of these glasses than crown glasses.

V.V.I. MUST DO

Dispersion:- The phenomenon of splitting of white light (sunlight) into its constituent colours is called dispersion.

Reflection:- Reflection of Light is associated with returning of light in the same medium after striking a surface.

Diffraction:- Diffraction is bending of light due to obstacles of size comparable with wavelength of light.

Polarisation:- It involves the phenomenon of restricting the vibration or propagation of light to a particular direction.

- Light waves projected on oil surface show seven colours due to the phenomenon of interference.
- Kerosene oil rises in a wick of lantern because of capillary action in the wick.

(25) A microwave oven uses microwaves, which are basically radio waves, to cook food.

(*) Bernoulli's principle is based on conservation of energy.
According to this theorem,

pressure Energy + kinetic Energy + Potential Energy = constant.

(*) A passenger in a moving train tosses a coin upward which falls behind him. It implies that the motion of the train is accelerated.

(*) In optical instruments like microscope and telescope, two lenses are used one of the lenses is called objective and the other is called eyepiece. Both these lenses form images due to refraction.

(*) Speed of light (in glass) = 2×10^8 m/s.

(*) when half of the lens is covered with a black paper. Light passes through remaining half part of the lens only. Therefore intensity of the image will reduce to half of the initial intensity. position or the size of the image remains unaffected.

(*) The ballon filled up with gas would only go up in air because it is filled up with a gas whose density is lower than air.

(*) A Fuse is used in an electric circuit to break the circuit when excessive current flows through the circuit.

26.

(*) A pressure cooker works on the principle of elevation of boiling point of water by application of pressure.

(*) The human eye is like a camera and hence, it contains a system of lens. The eye lens forms an inverted, real image of the object on retina.

(*) The spread in colours in a rainbow on SKY is primarily due to dispersion of sunlight.

=> A rainbow is an optical phenomenon that is caused by total internal reflection, refraction as well as dispersion of light in water droplets in the Earth's atmosphere.

(*) SONAR is mostly used by navigators.

(*) correct order of power consumption for light of Equal Intensity.

LED < CFL TUBE < FLuroscent Tube < Incandescent tube.

(*) Thermal conductivity

steel > water > wood.

(*) yellow colour of light is used as fog light because yellow colour has the longest wavelength among all colours except red and orange but the red colour is already used for brake light and stop light where as orange colour is avoided due to its similarity with red.

(*) The mirror used for the head light of a car is parabolic concave.

* According to Archimedes principle the volume of the immersed object will be exactly equal to the volume of the displaced water.

* A refracting telescope consists of two convex lenses of unequal focal lengths.

* metals are good conductor of heat while Gas and air are bad conductors of heat.

* Sound waves are longitudnal waves. These waves can show reflection, refraction as well as diffraction.

* Radio waves are used in telecommunication
  - ⇒ Micro waves are used in Radar.
  - ⇒ Infrared waves are used for heating.
  - ⇒ Ultraviolet waves are sun rays.

* Plane mirror is used to make periscopes.

* concave mirrors are used as shaving mirror.

* when a moving bus suddenly applies brakes, the passengers sitting in it fall in the forward direction. this can be explained by Newton's first law.

* A jet Engine works on the principle of conserv-ation of linear momentum.

* The material used for electric fuse is an alloy of tin and lead. and it has high specific resistance and low melting point.

* In a pressure cooker, cooking is faster because the increase in vapour pressure increase the boiling point.

  B.P ∝ pressure.

* The rate of change of momentum of a body is equal to the resultant force acting on the body.

* SI unit of Energy is Joule.

* Sum of kinetic energy and potential energy is called mechanical energy.

* Sound waves in gases are longitudnal in nature.

* Sound waves having higher amplitudes are louder.

* Sound waves with high audible frequencies are sharp.

* $P = \frac{1}{f}$ P = Power. f = focal length (m).

* If the focal length of lens is negative, so the lens is concave in nature.

* During the free fall of a body under the action of gravity of earth, total mechani-cal energy (K.E + P.E) remains constant.

* X-ray don't carry any charge that is why it is not deflected by an electric field and a magnetic field.

* Kinetic Energy is same for molecules of all gases at given temperature.

* The physical quantity which remains constant is acceleration due to gravity (g) of the Earth. (g).

during free fall of a body.

* Gravitational Force is attractive force where as the Electric and the magnetic forces are attractive as well as repulsive.

* Law of conservation of Energy:-

Energy can neither be created nor be destroyed. It can only be transferred from one form to another.

* Highly charged particles.

$\alpha > \beta > \gamma$.

* penetrating power.

$\gamma > \beta > \alpha$

* In a dry cell chemical Energy is converted into Electrical Energy.

* In bi-focal lens consists of both concave and convex lenses. The upper portion consists of a concave lens where as the lower portion consists of convex lens.

* Tungsten is used for the construction of filament in electric bulb because of its high melting point.

* Inactive nitrogen and Argon gases are are usually used in electric bulbs in order to increase the life of a filament.

* In the phenomenon of dispersion of light the light wave of shortest wavelength refracted the most.

(*) X-rays, sound waves and gamma rays doesn't have charge.

(*) Image formed by a plane mirror and and a convex mirror is always erect.

(*) A mobile phone charger is a step-down transformer which converts high voltage of home supply to low voltage.

(*) A fielder in the ground gradually pulls his hands backwards with the moving ball to reduce the velocity to zero. This act represents Newton's second law of motion.

(*) when an incandescent electric bulb glows it convert less than 5% of the energy into visible light. the remaining Energy is converted into heat.

(*) Dirty cloths containing grease and oil stains are cleaned by detergent because if detergent reduces drastically the surface tension between water and oil.

(*) If a ray of white light strikes the surface of an object. if all the colours are reflected the surface would appear white.

(*) Light Emitting Diode (LED) converts electrical Energy into light Energy.

(*) when the gas expands, its volume increases and have temperature decreases.

(*) fountain pen uses capillary action in addition to gravity for flow of ink. we can use it in space.

(*) capacitor (condenser) is a passive electrical component used to store energy in an electrical field.

(51)

* It is difficult to cut things with a blunt knife because a blunt knife decreases the pressure for a given force because of its larger area.

* A rectifier is an electronic device used to convert Ac voltage into DC voltage.

* when ice melts and converted into water, its density increases, therefore its volume decreases.

* The best colour for a sun umbrella will be white on top and black on inside, because white colours reflects all the components of white light and black colour absorbs all the components of white light.

* Before X-ray examination of the stomach patients, are given suitable salt of barium because barium is a good observer of X-rays and helps stomach to appear clearly.

* SONAR (Sound navigation and ranging) is a technique that uses ultrasonic waves propagation to navigate usually under water.

* TVI

$$\text{pressure} = \frac{\text{Force}}{\text{Area}}$$

$$P \propto \frac{1}{A}$$

* Time period of a simple pendulum is $T = 2\pi\sqrt{\frac{l}{g}}$

l = length of the wire

g = gravi acc/n due to gravity.

* Mass is same on every planet where as weight will be differ from planet to planet.
* copper is a good conductor of heat and electricity.
* simple harmonic motion is directly proportional to the displacement and is directed towards the mean position.
* Sky appears blue during mid-day because blue light is scattered most.
* osmosis:- It is the process in which water molecules from a region of higher concentration moves towards a region of lower concentration through a semi-permeable membrane.
* Raw mangoes shrivel when pickled in brine.
* Blue colour of a sky on a clear day is due to the scattering of blue wavelength of visible light.
* In the absence of atmosphere; the would be no scattering of light and sky will look black.
* Hair of a shaving brush cling together when the brush is removed from water due to surface tension.

33

- The stars seem to be higher on the sky than they actually are due to atmospheric Refraction.

- When a ray of light is going from one medium to another its frequency remains same.

WISH YOU ALL THE LUCK.

SHIVAM RAJPUT.

(2)

(*) If an object moves towards or away from a plane mirror with speed v, the image moves towards or away with a speed 2v relative to the object.

(*) To see his full image in a plane mirror, a person requires a mirror of at least half of his height. (V.V.I).

(*) If two plane mirrors are inclined to each other at an angle θ. the number of images formed are.

a) If $\frac{360}{\theta}$ = Even then, $n = Even - 1$

n = no.. of Images.

b If $\frac{360}{\theta}$ = odd, then $n = odd$.

(*) SPHERICAL MIRROR.

1) Concave Mirror.

2) Convex Mirror.

(*) USES OF CONCAVE MIRROR. (MUST DO; V.V.I).

1) As a shaving glass.
2) In solar cookers.
3) In opthalmoscope to examine eye, Ear & Nose.
4) As a reflector for the head lights of a vehicle, search light.