

General Science and Ability.

(Part II)

(Section no I)

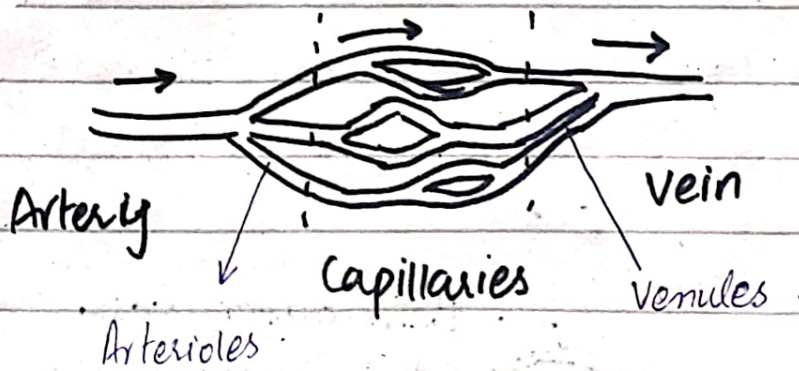
Q no. 2:

(a)

Function of Arteries, Veins and Capillaries

Blood vascular system:

Arteries, veins and capillaries collectively forms the network of blood vessel called vascular system.



Art Function of Arteries:-

They carry oxygenated blood from heart toward body tissues (with exception of pulmonary artery). Arteries are thick

walled, elastic fibers and muscles with small lumen. They don't have valves because blood flow due to high pressure by the heart.

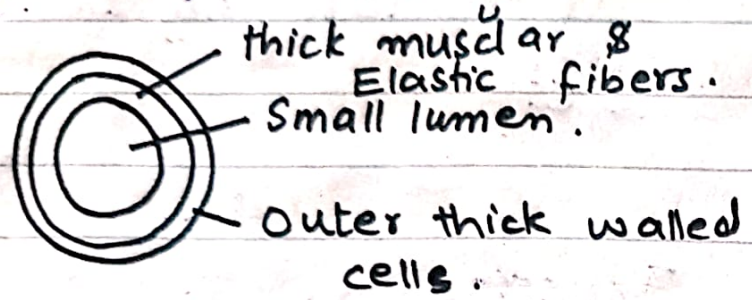


Fig: Arteries
(cross section)
view

Function of veins:

Veins do carry deoxygenated blood from the body tissues towards the heart (except pulmonary vein). They are thin walled - blood vessels with large lumen and thin less elastic fibers and muscles. They have valves that prevents the back flow of the blood.

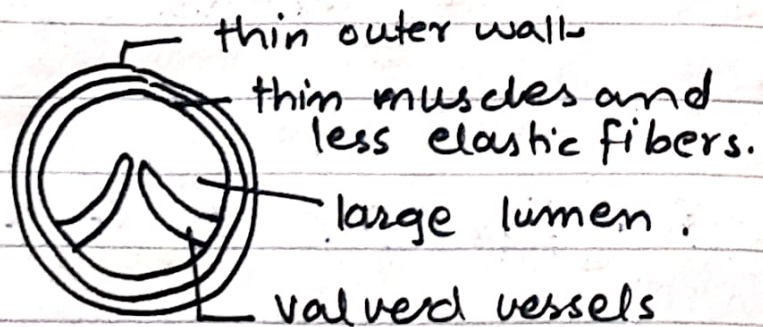


Fig: Cross Section
view of vein.

Small vessels from capillaries are called venules. # Venules collectively

join to form^a veins.

Function of Capillary:

Capillary ~~is~~ One celled smallest blood vessels that allows the exchange of material between the ~~body~~ tissues and blood. They are one celled vessels with very small lumen. The exchange of material occurs through diffusion. Capillary are spread throughout the body and are in direct contact with body tissues.

Fig: Cross section of Capillaries.



1 cell thick walled

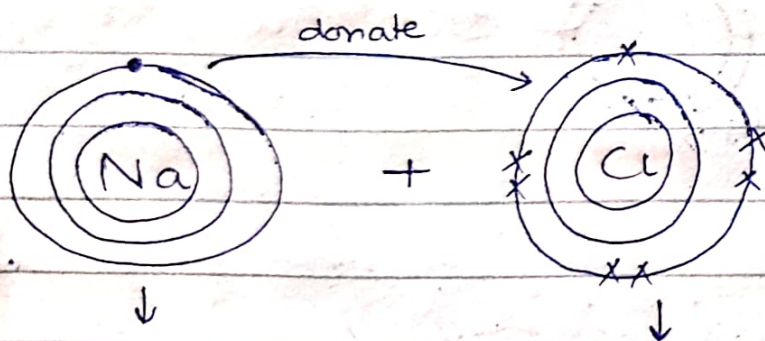
~ (C) ~ Why do atoms form Chemical bond?

Atoms are the small unit of matter. It forms chemical bond to attain stability. Atoms have electrons in their orbitals. protons and neutron in their nucleus. protons have positive charge

and electron have negative charge. Their are equal no. of electrons and protons in a neutral atoms but the atom is not stable until it has valency in its outer shell

Octet Rule: According to Octet Rule, the outer shell of ee atom have eight electrons. ~~and~~

When the outer shell of atom is completely with electron having opposite spin it is stable form of atom.



Na with one electron in outer shell

Cl with seven electrons in outer shell.

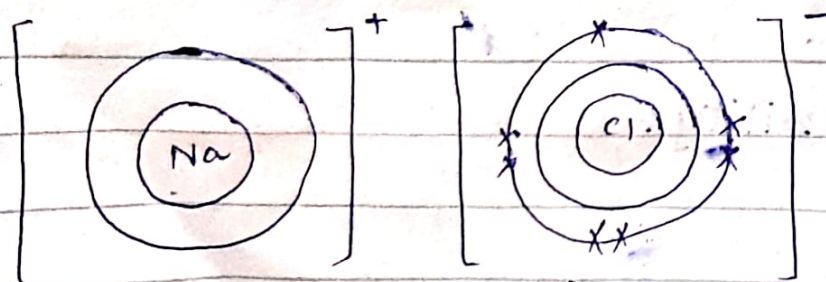


Fig: Dot and cross model of Ionic

bond between Sodium and Chlorine.

Nature of Atom determine Nature of Chemical

bond: Atoms forms different types of chemical bonds such as **Ionic bond** between Metal and NonMetal, **Covalent bond** between Non metals and **Metallic bond** between both Metal atom **Hydrogen bond** between Hydrogen and partial negative atom. (O, F, Cl).

Structure of H_2O :

In Water molecules two hydrogen atom each with partial positive charge combine makes a hydrogen bond with Oxygen atom having partial negative charge.

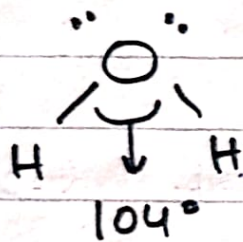
Hydrogen bonding between Hydrogen and Oxygen atom is formed due to high electronegativity difference between them.

- ① The Hydrogen atom has One Electron.
- ② The Oxygen atom has Six electrons.

In valance shell. Two of them are lone pairs and two are bond pairs.

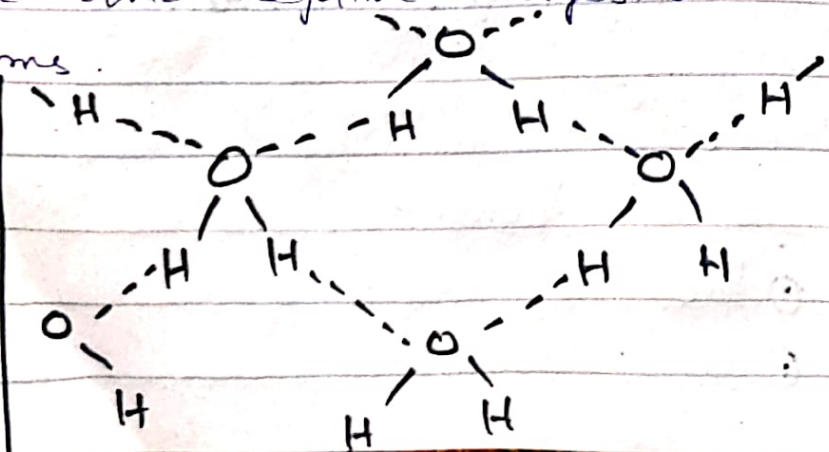
⊙ Coordinate covalent bond within H_2O molecules, forms gives the molecules triangular structure with two lone and two bond pairs with Hydrogen. The structure is due to Electron pair repulsion theory.

Fig: Coordinate Covalent bond.



⊙ Hydrogen bonding between water molecules: Hydrogen bonding exist between H_2O molecules, forming partial positive and negative charges on respective atoms.

Fig: H-bonding between water molecules.



~ (d) ~

What are Conductors, semi-conductors, metals, plastics, and ceramics? Give Examples?

Conductors :-

The material through which Electric current ^{or heat} can pass is called Conductors. They have free electrons for movement of current energy.

Examples:

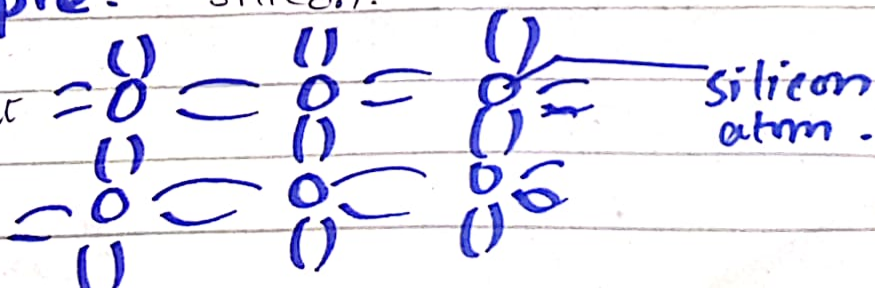
Metals are conductors such as Iron, Copper.

Semi Conductors:

The material that are partial conductors of electricity are called Semiconductors. This is because arrangement of electrons in the valence shell of atoms in semiconductors. They have 4 electrons in valence shell forming bond with other atom giving crystal shaped structure.

Example: Silicon.

Crystal arrangement in Semi-conductors



Metals:

The material having free moving electrons are called metal. They are malleable and ductile used in different industries as raw material.

Example:

Steel, Iron, Copper etc.

Plastics:

These are material made of long chain of carbon atom (large molecule polymers). They are vestile in nature, ^{mostly} non degradable, inorganic and easily moulded into any shape.

Example:

Acrylics, Resins, polystyrene.

Ceramics:

The inorganic material made of heating clay at high temperature is called ~~ceram~~ ceramics. They are solid and colorful in nature.

Examples:

Bricks, Tiles, and

(a) ^{global} Global warming ↑ Thread hitting developing and least developed world the most. What measure should be taken to counter in COP-29.

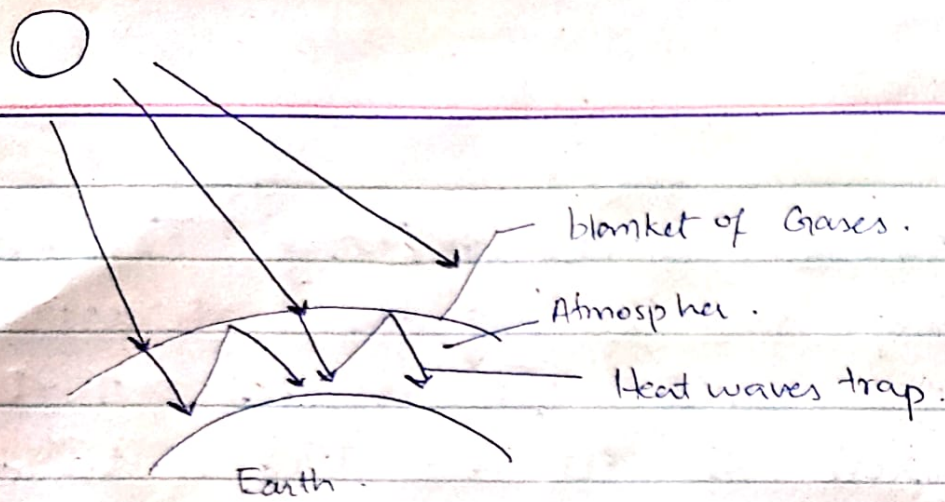
Introduction to Global Warming:

The increase in temperature of Earth due to trapping of Global Warming Gases (GWGs) in the atmosphere is called Global Warming Effect.

"According to Asian development bank, report on climate change²⁰¹⁷: The average temperature has increased 5 folds in past 30 years."

Some of gases causing global warming includes ~~CO₂, CH₄~~ Carbon dioxide (CO₂), Methane (CH₄), Nitrous and Sulphur Oxides and per Oxides (N₂O, S₂O) - HFC etc.

Pak a developing country is developing countries contributes only 1%. in these gases are as one of most vulnerable to global warming.

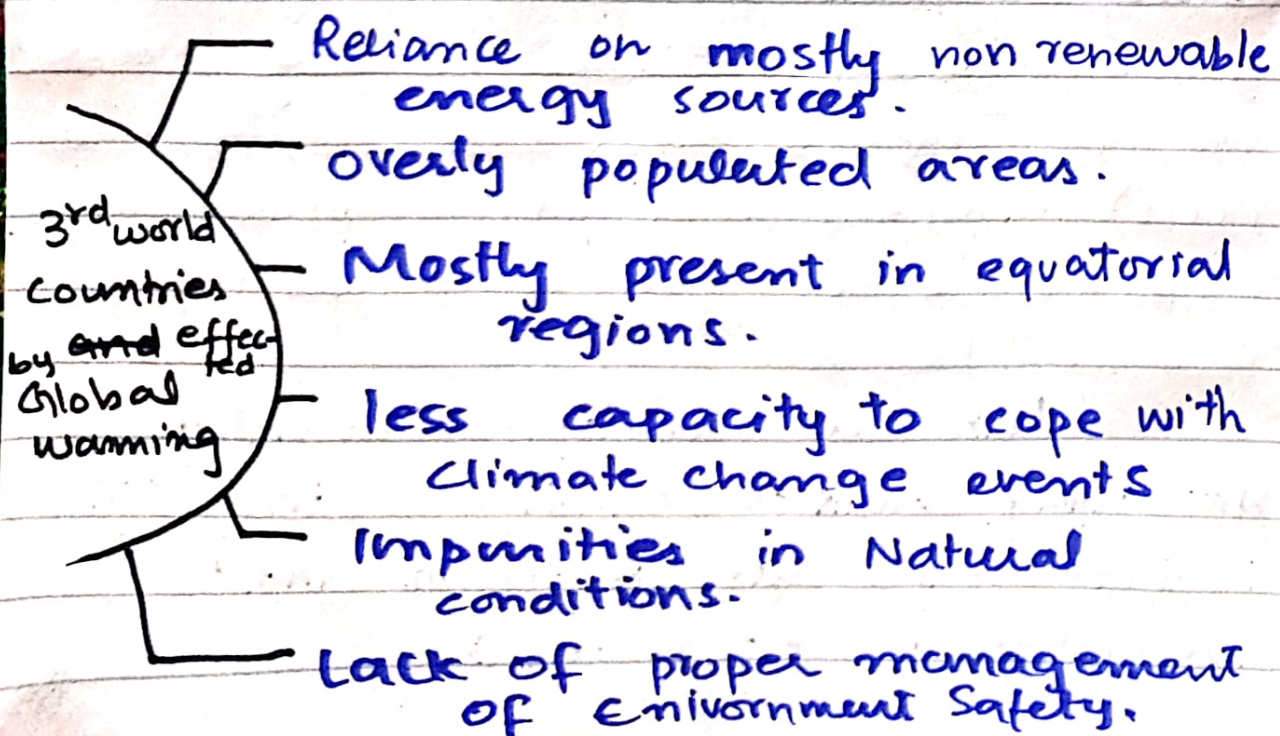


Green House Effect \rightarrow Global Warming.

Why developing countries are most suffering from Global warming.

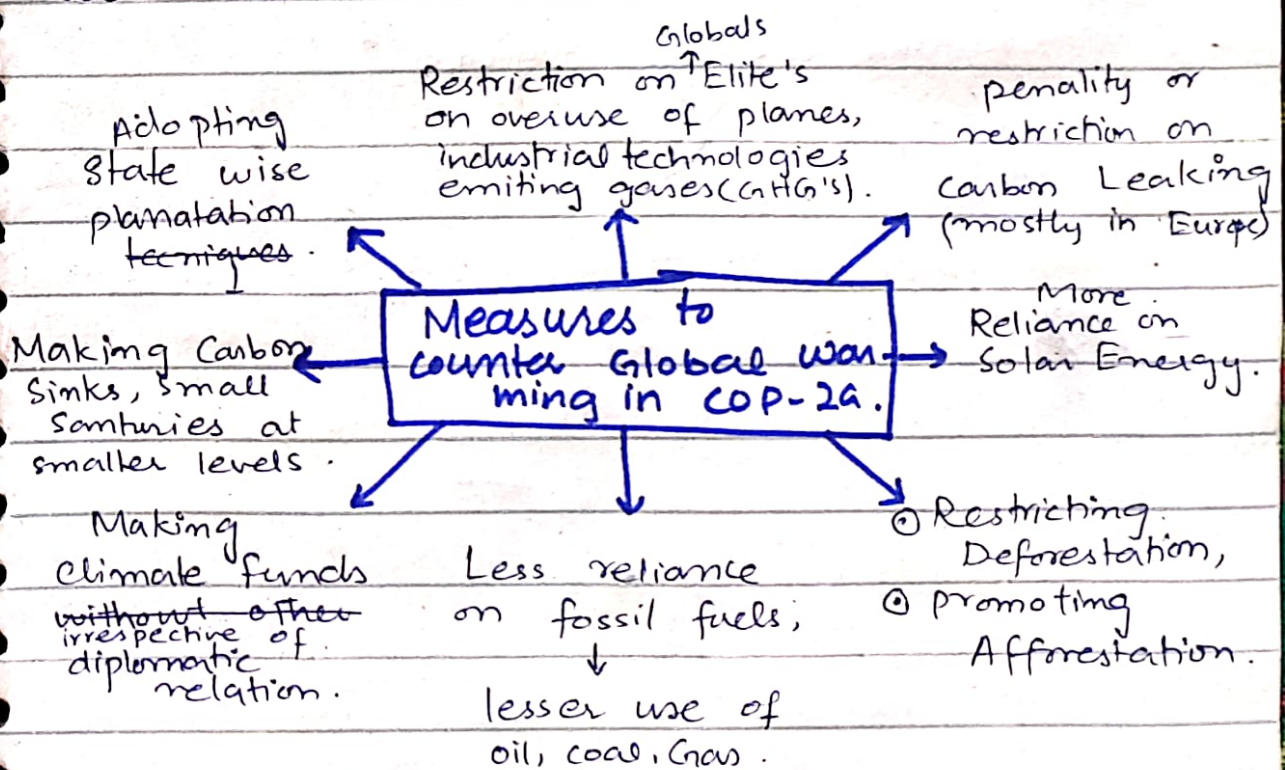
Developing or Developed countries are contributing very small to Global warming ~~due~~ as compared to developed countries but they are suffering a lot.

Some of the reason are depicted here.



Measures taken to counter in COP-29:

COP-29 is of major importance due to historically high temperature in June 2024 due to Global warming, rapid melting of Glaciers, Heat strokes - increasing rate etc.



Conclusion:

The continuous rise in temperature in previous years indicates climate change as Global Threat so, Irrespective of Diplomacy World have to take measure collectively to counter this. No one is safe from Global warming and there is no way except eradicating this effect.

— (Q # 5) —

Rocks Formation:

Rocks are formed by sedimentation of smaller particles at high temperature and pressure.

Types:

Types of Rocks.

Igneous

↓
by cooling of lava-magma.



Extrusive

Plutonic

Ext

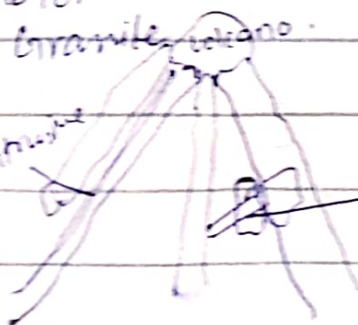
Basalt

Intrusive

Diorite

Granite, gabbro

Intrusive



Metamorphic

↓
by changing shapes of igneous rocks

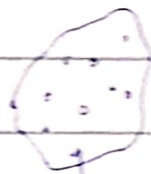


Foliated

Slate

Nonfoliated

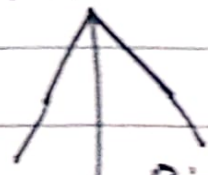
Marble



Spots on metamorphic rocks

Sedimentary

↓
by sedimentation of smaller particles of other rocks



Clastic (Sandstone)

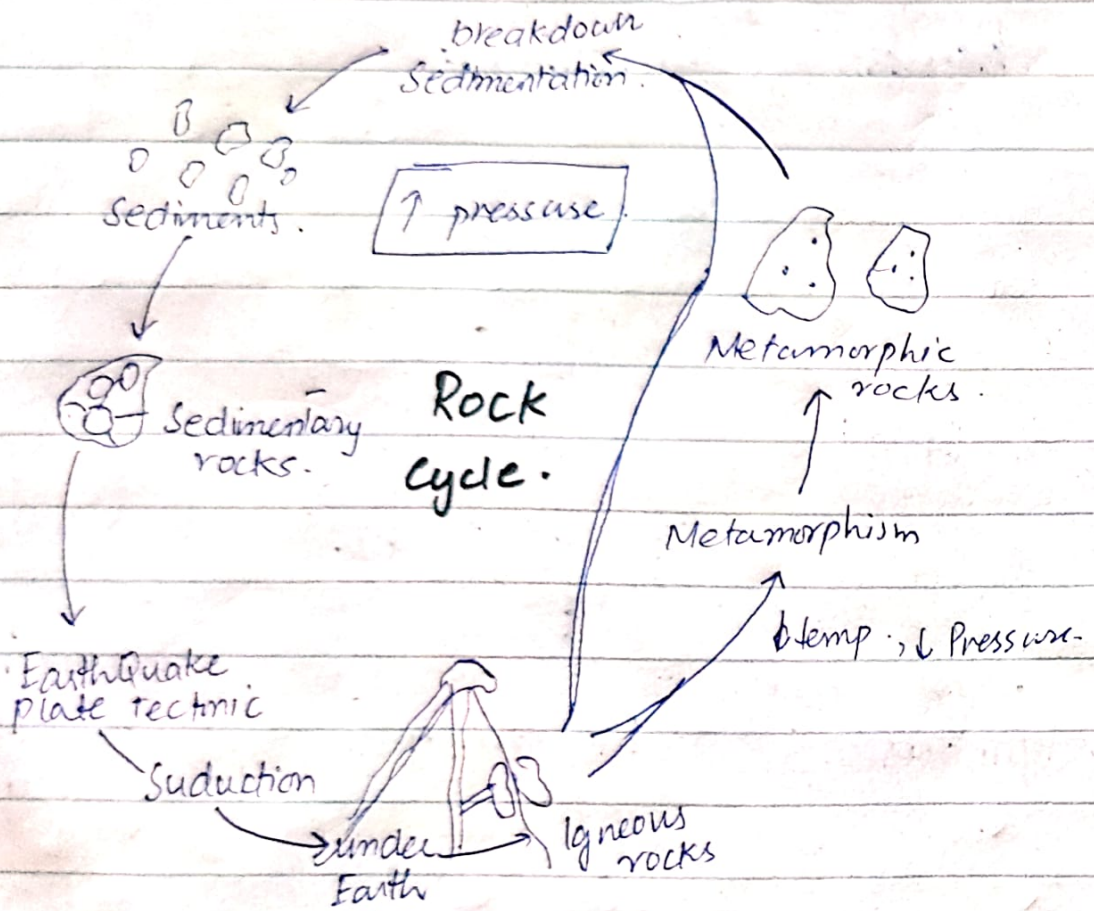


Biological (Coal)

Chemical (Limestone)

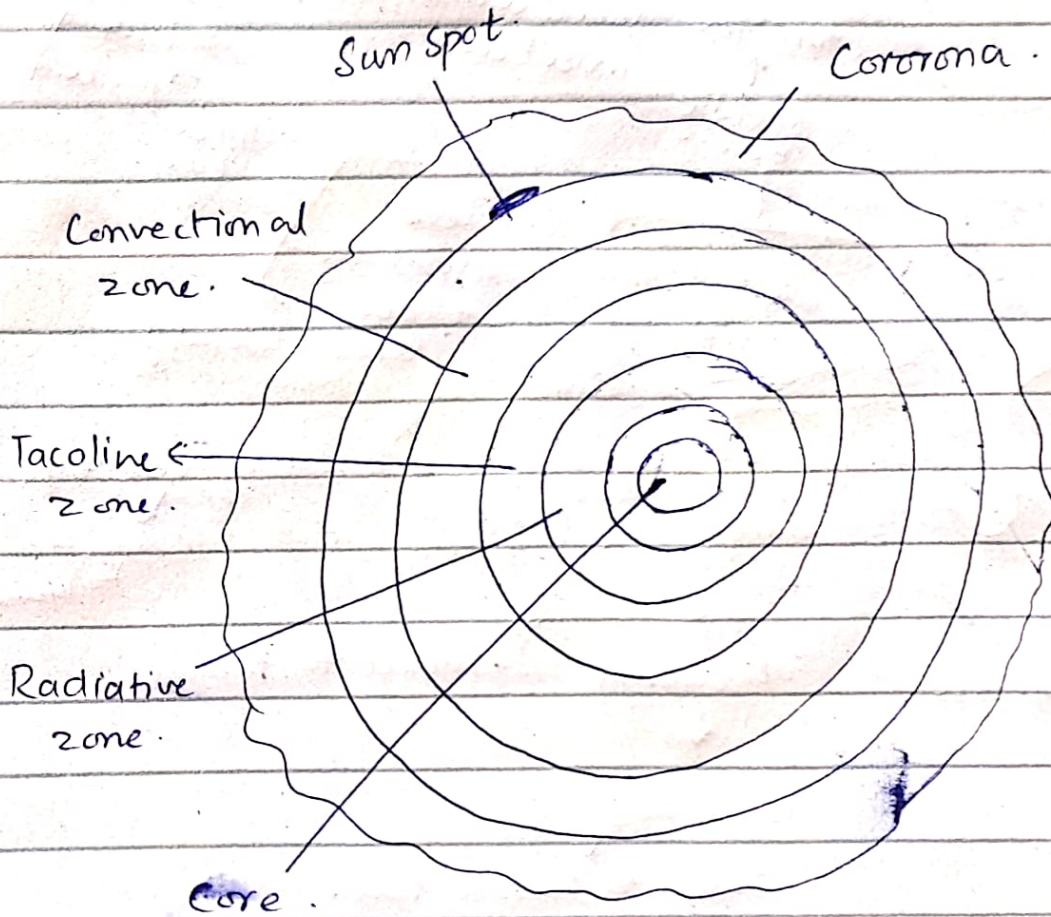


Rock Cycle:



~ (b) ~

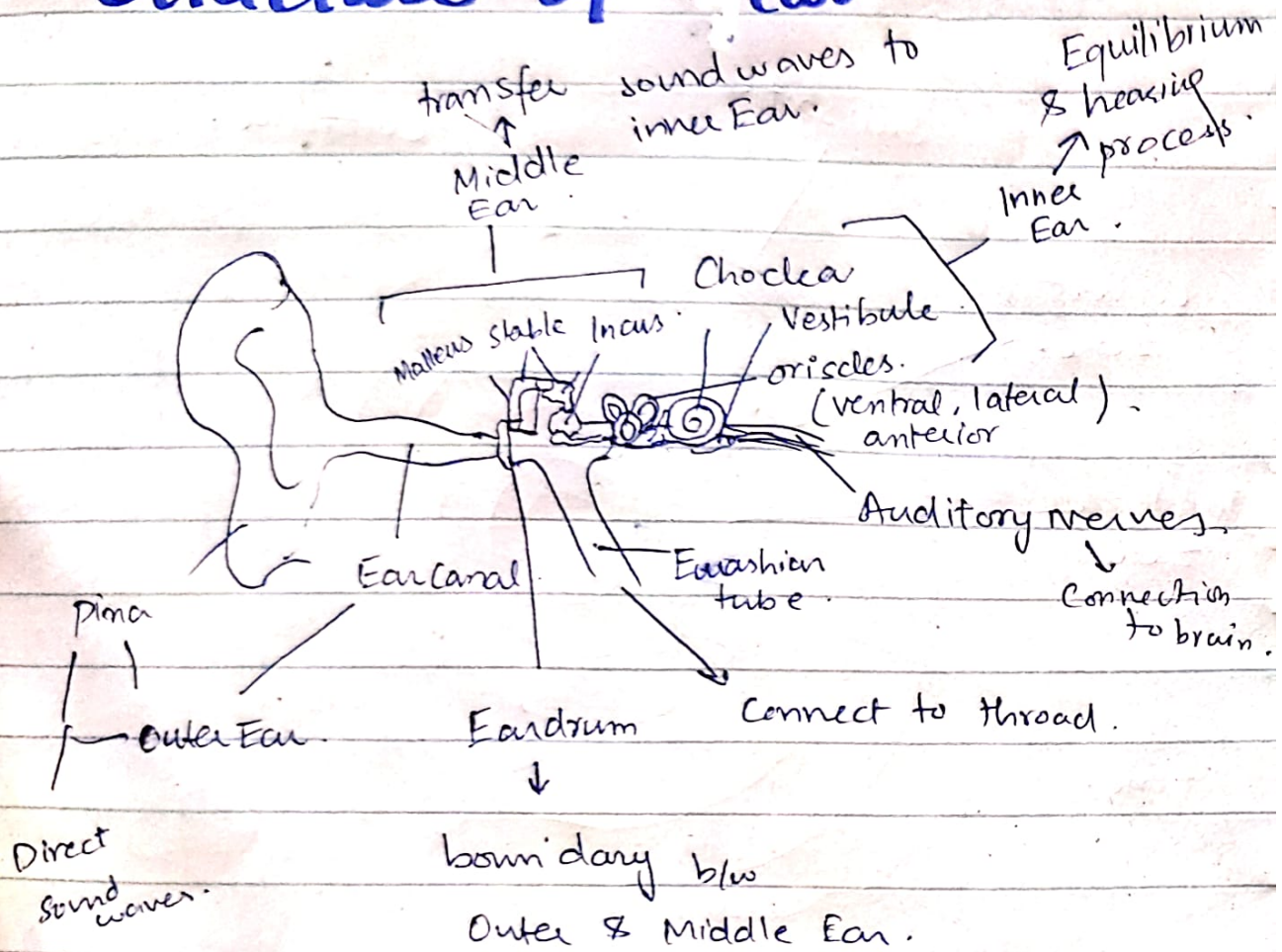
Structure of Sun.



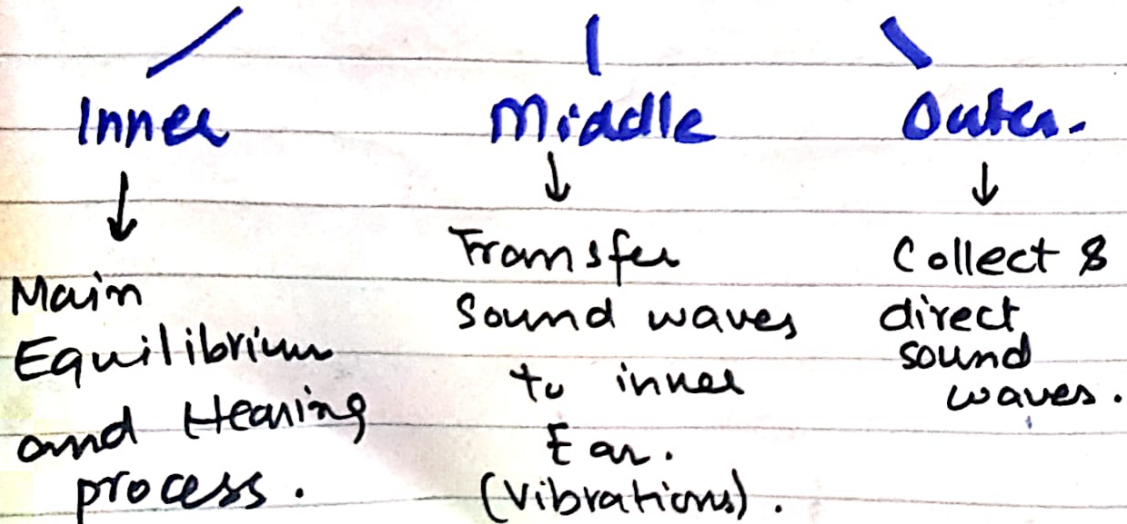
Sun is star present in center of solar system and burning from billion of year having its own magnetic and gravitational field.

The structure of sun is spherical in shape divided in different layers as shown in fig.

(d) Structure of ear.



Function of Parts of Ear.



Ear Drum:

Membraneous Structure between ~~the~~ Outer & Middle Ear. Prevent Contamination entering in the Ear and pass sound waves by vibrations

Eustachian Tube:

Connection to Throat by Middle Ear - pathway for air passage and pressure maintenance.

Auditory Nerve:

Connection to brain for detection of hearing (sound) by Chemical Signaling.

(Section II)

Given,

Qno-6: (a)

Total increase in pop: 18,000 to 22,000.

In 10 years, Initial pop. = 18,000.

In 10 years, Final pop. = 22,000

Req:

% increase in 1 year = ?

Sol:

$$\% \text{ increase in 10 years} = \frac{22,000 - 18,000}{18,000} \times 100$$

$$= \frac{4,000}{18,000} \times 100$$

$$= \frac{200}{11}$$

$$\% \text{ increase in year} = \frac{200}{11} \times 10$$

$$= \frac{200 \times 10}{11}$$

$$= 181.81$$

$$\begin{array}{r} 181.8 \\ \hline 11 \overline{) 2000} \\ \underline{11} \\ 90 \\ \underline{88} \\ 20 \\ \underline{11} \\ 90 \\ \underline{98} \\ 2 \end{array}$$

(6)

Given:

Soap factory make = 900 units with 20 machines in 9 days.

Req:

Soap factory make = x units with 18 machines in 12 days.

Sol:

Using Arrow Method.

| Days | Machines | Units |
|------|----------|-------|
| 9 | 20 | 900 |
| 12 | 18 | x |

$$\frac{x}{900} = \frac{12}{9} \times \frac{20}{18}$$

$$\frac{x}{900} = \frac{12}{9} \times \frac{20}{18} \times \frac{900}{3}$$

$$x = \frac{400}{3}$$

- (c) -

Given:

Car distance = 450 m. \rightarrow time = 1 min. ^{60s.}

Train distance = 6900 m \rightarrow time 45 min

Req:

Ratio of Speed = ?

$45 \times 60s.$

= 270

Sol:

$$\text{Speed} = \frac{\text{distance}}{\text{time}}$$

$$\begin{array}{l} \text{Car} \quad : \quad \text{Train} \\ \frac{450 \text{ m}}{60 \text{ s}} \quad = \quad \frac{6900 \text{ m}}{270 \text{ s}} \end{array}$$

$$27 \overline{) 69}$$

$$\frac{45}{6} \quad = \quad \frac{2300}{9}$$

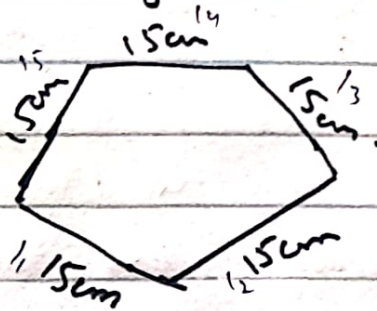
$$7.5 \quad = \quad 255.5$$

(d)

Perimeter of Pentagon.

Given:

length of
each side = 15cm.



Req:

Perimeter of Pentagon = ?

Sol:

Perimeter is sum of all lengths.

$$P = l_1 + l_2 + l_3 + l_4 + l_5$$

$$P = 15 + 15 + 15 + 15 + 15$$

$$P = 75$$

Ans:

Hence perimeter of Pentagon is
75cm.

(Qno-7)

IQ =

"IQ called Intelligent Quotient,
is the ability of ^{brain} person to solve
a problem"

Factors that affect IQ:

(a) Age:

The increase in age cause increase in IQ. The IQ level of child is always less than a young man.

(b) Gender:

By Nature, the IQ level of man is higher than woman.

(c) Diet:

A person with balanced diet have higher IQ level than the person with unbalanced diet.

(d) Life Routine:

The Sleep and Wake cycle, Exercise routine, meditation, regularity are few habit that make the IQ level of person higher than the other.

(e) Work-Life balance:

A highly stressed

person with tough routine have less IQ than a person with balance un-stressful work-life balance.

(f) - Genetics:

Intelligence is God gifted ability present in genes and passed within generation i.e; its heredity.

(g) - Abnormal cond. (Stress, diabetes):

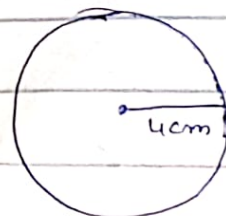
Some abnormal conditions such as diabetes do affect the intellectual capacity of person. A diabetes have lesser IQ as compared to Normal person.

~~~~~ (b) ~~~~~

### Circumference of a Circle;

Given,

Radius = 4cm.



Req,

Circumference = ?

Formula F

$$\text{Circumference of Circle} = 2\pi r$$

Sol:

$$\text{Circumference of Circle} = 2 \left( \frac{22}{7} \right) (4)$$

$$\begin{array}{r} \textcircled{1} \\ 3.14 \\ \times 32 \\ \hline 628 \\ 942 \times \\ \hline 100.48 \end{array} \quad \begin{array}{r} 3 \\ 3.14 \\ \times 8 \\ \hline 25.12 \end{array} \quad \begin{array}{l} = 2(3.14) \times 4 \\ = 8 \times 3.14 \\ = 25.12 \end{array}$$

Hence Circumference of circle is 25.12.

~(c)~

Age of 5 students:

Given,

Age = 20, 22, 21, 21, 23.

No. of students # = 5.

Req:

Median, Mean, Mode.

Sol:

$$\text{Mean} = \bar{X} = \frac{20+21+21+22+23}{5}$$

$$\begin{array}{r} 21.4 \\ 5 \overline{) 107} \\ \underline{10} \\ 7 \\ \underline{5} \\ 20 \\ \underline{20} \\ 0 \end{array}$$

$$\bar{X} = \frac{107}{5} = 21.4$$





— (Q#5) —

## Rocks Formation:

Rocks are formed by sedimentation of smaller particles at high temperature and pressure.

### Types:

#### Types of Rocks.

