Ans-1 → **Atmosphere →**

The coven of various gases found over the lithosphere (earth's crust) and hydrosphere (aquatic component) is known as atmosphere. It is divided into following parts :-

1) Troposphere
2) Stratosphere
3) Mesosphere
4) Ionosphere
5) Exosphere.

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Ans-2 → **Combustion →**

Combustion is a process of burning of a substance in the presence of oxygen in which heat and light are produced.

Example →

$CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O + 890.3\,KJ$.

Methane Oxygen Carbondi oxide water Energy.

Ans-3 →

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The process of respiration is known as biological oxidation because during this process oxidation of glucose occurs to produce energy in the form of ATP that regulates all the biological processes within an organism. Every organism requires energy for his metabolic process and this energy is evolved during respiration therefore it is called biological oxidation.

CHEMICAL EQUATION -

$C_6H_{12}O_6 + 6O_2 \longrightarrow 6CO_2 + 6H_2O + 2880k$

Glucose Oxygen → Carbon dioxide, water, energy

ANS-4> A device which converts sunlight into electricity is called solar cell. Ordinarily solar cells are manufactured from:-

1) Silicon
2) Germanium

ANS-5> Placenta →

The intimate connection between the embryo and uterine walls of mother is called placenta.

Significance →

1) It provides nutrition to embryo.
2) It acts as endocrine gland and secretes hormone HCG.
3) It helps in digestion of protein and also help in removing nitrogeneous waste from foetus.
4) It allows exchange of respiratory gases between foetus and mother.
5) It stores glycogen for foetus before the formation of liver.

ANS-6> Insuline is a hormone secreted by β cells of islets of Langerhans of pancreas gland.

Function →

The main function of insulin is that it converts excess glycogen into glucose.

Ans-7→

Technology increases the rate of development in an area. It also changes man's way of life and his abilities to do things. Human life has been changed by technology in the following way:-

1) Technology has brought about industrial revolution which has improved the social, health and financial life of Human. Means of transportation has undergone a great change.

2) Technology has greatly contributed to agriculture also. New tractors, sprinkles pesticides, weedicides were developed. It, in turn, has greatly increased the food production which bettered the condition of man.

3) Vast tropical diseases like cholera, plague, typhoid, malaria has been brought under control with the introduction of technology. This, in turn, has improved the death rate and infant mortality rate.

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Ans-8→

Number of divisions on circular scale of Screw gauge:-

$n_1 = ?$

least count = 0.0005 cm

pitch = 1 m

= 0.1 cm

We know that

$$\text{least count} = \frac{\text{pitch}}{\text{No. of divisons on circular scale}}$$

$$\Rightarrow 0.0005 = \frac{0.1}{n_1}$$

$$\Rightarrow n_1 = \frac{0.1}{0.0005}$$

$$n_1 = 200 \text{ divisons}$$

Number of divisons on circular scale of IInd spherometer

$n_2 = ?$

pitch = 0.5 mm

= 0.05 cm

least count = 0.0005 cm

We know that

$$\text{least count} = \frac{\text{pitch}}{\text{No. of divisons on circular scale}}$$

$$\Rightarrow 0.0005 = \frac{0.05}{n_2}$$

$$\Rightarrow n_2 = \frac{0.05}{0.0005}$$

$$\Rightarrow n_2 = 100 \text{ divisons}$$

∴ number of divison on circular scale of Ist spherometer = 200

∴ number of divison on circular scale of IInd spherometer = 100.

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Ans-9→ Following three precautions should be considered while using vernier callipers:-

1) The cylinder should not be too tight nor too loose in between the jaws.
2) While taking the reading eyes must be placed parallel to perpendicular to vernier callipers.
3) The readings should be taken at different places of cylinder so as to avoid errors due to non-uniformity of errors.

Ans-10→ Lymph →

Lymph is a colourless fluid connective tissue found between blood capillaries and surrounding tissue. It is made up of:-

1) plasma
2) WBC

Similarities between blood and lymph.

(1) Both contain protein, calcium and phosphorus.
(2) Both contain WBC i.e. the blood and lymph are phagocytic in nature.
(3) Both are in liquid form and both helps in the process of transportation.

Ans-11→

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Ans-11)

Arteries	Veins
(1) They carry blood away from heart	(1) They carry blood towards the heart.
(2) They mostly carry pure or oxygenated blood except pul. arteries.	(2) They mostly carry impure or deoxygenated blood except pul. veins
(3) Arteries are deep seated and has narrow lumen.	(3) Veins are superficial and has wide lumen.

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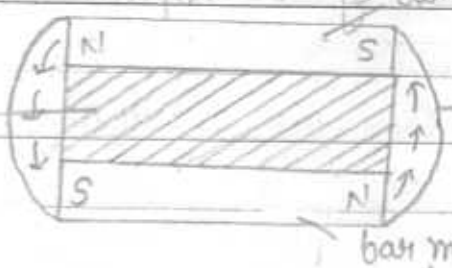
Ans-12) Magnetic keepers →

The substance which is used to protect magnet from outside magnetic influence is called magnetic keeper.

A magnetic keeper should have following properties:-

1) It should be made up of soft iron.
2) It should have high magnetic permeability i.e. it should be easily magnetised and demagnetized.
3) It should have low coercivity i.e. should be get quickly demagnetized quickly.



28 + 2 = 30

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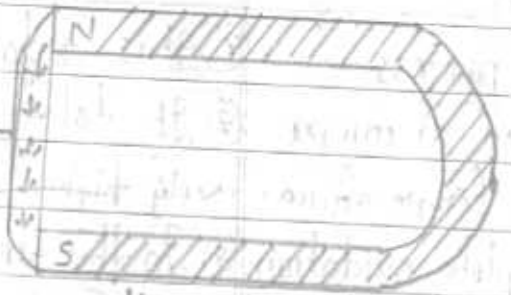

Horse shoe Magnet

Ans-13) (a) Chlorine with sodium

$2Na + Cl_2 \xrightarrow{Heat} 2NaCl$

Sodium Chlorine → Sodium chloride

(b) Hydrogen with calcium

$Ca + H_2 \xrightarrow[\text{pressure}]{Heat} CaH_2$

Calcium Hydrogen → Calcium hydride

(c) Oxygen with magnesium

$2Mg + O_2 \xrightarrow{Heat} 2MgO$

Magnesium Oxygen → Magnesium oxide

(d) Hydrochloric acid with zinc

$Zn + HCl \xrightarrow{dil.} ZrCl_2 + H_2\uparrow$

Zinc Hydrochloric acid → Zinc chloride + Hydrogen

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Ans-14)

Respiration	Combustion
(1) It is a slow process.	(1) It is a fast process.
(2) It takes place at compa-ratively lower temperature.	(2) It takes place at comparatively higher temperature.
(3) In this complete oxidation occurs and no side products are formed.	(3) In this incomplete oxidation occurs and side products such as CO_2 or CO are formed.
(4) It take is a continuous process which takes place inside the body.	(4) It is not a continuous process and it take place outside the body in the environment.

Ans-15) Water is essential for our body because it is responsible for :-

1) Homeothermy.
2) Transportation
3) Excretion.

1) Homothermy →

Water maintains constant internal temperature inside the body by sweating and evaporation. It regulates metabolic processes and provide medium for metabolism.

2) Transportation →

Water also plays an important role

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in transportation of nutrients like vitamins, glucose and amino acid in the body. It transports 23% of carbondioxide as carbonic acid. (H_2CO_3).

3) Excretion →

Water helps in the removal of non-gaseous nitrogeneous waste from the body. It removes urea through urine and uric acid, ammonia and lactic acid with sweat through skin.

Because of all these reason water is essential for our body.

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Ans-4) Endocrine Glands →

Those glands which pour their secretion directly into blood are called endocrine glands.

Example - pituitary gland, thyroid gland.

(1) THYROID GLAND →

It secretes:-

(1) Thyroxine
(2) Calcitonin

Functions of Thyroxine →

(1) It controls basal metabolic rate of the body and also it controls the working of kidney.
(2) It promotes growth of body tissue.
(3) It stimulates tissue differentiation.

(4) It develops mental faculties.

Functions of Calcitonin →

(1) It controls ~~sodium and potass~~ calcium and phosphorus level in ~~blood~~ body.

(2) Pituitary gland →

It is also known as master gland

It secretes:-

	Secretion	Function
1)	TSH	It regulates the secretion from thyroid gland.
2)	ACTH	It regulates the secretion from Adrenal cortex gland.

(3) Pineal Gland →

It secretes:-

(1) Melatonin

Functions of Melatonin →

(1) It regulates the synthesis, formation and dispersal of melanin pigments.

(2) It is supposed to be related with sleep.

(4) Gonad Glands → (Testis)

It secretes

1) Testosterone

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Functions of testosterone:-

(1) It stimulates the process of formation of sperms.
(2) It is responsible for development of secondary sexual organs and characters.
(3) It stimulates the formation of RBC.

Ans-17) Formation of Coal →

Coal was formed due to the decompositions of remains of ~~prehist~~ prehistoric forests which got burried in the earth's crust many years ago in the absence of oxygen.

In the early history of earth when the forests get burried in the earth, they underwent slow chemical change at a very high temperature and pressure to form coal.

Coal is obtained from the layers of sedimentary rocks.

Occurrence of coal in sedimentary rocks

Coal can be divided into following categories:-

(1) Peat -

Category	Carbon %	Colour
peat	25-35%	light yellow to brown
lignite	38%	brown
bituminous	65%	black
anthracite	96%	bright black.

Ans-18> Cause of Sun's Energy →

The cause of sun's energy was proposed by a German physicist scientist Hans Bathe, He proposed that the sun is a huge mass of hydrogen nuclei moving at very great speed. Whenever this nuclei fuses they form a bigger nucleus of heavier element such as Helium. During this fusion large amount of energy is released.

Thus the energy of the sun is due to the fusion of deuterium (isotope of hydrogen) nuclei into helium nucleus. The main nuclear reaction occurring inside the sun is :-

$$^{2}_{1}H + {}^{2}_{1}H \xrightarrow{\text{High temp.}} {}^{4}_{2}He + \text{enormous amount of energy}$$

Hydrogen nuclei + Hydrogen nuclei → Helium nucleus

Besides deuterium the sun also contains other isotopes of hydrogen

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like ordinary hydrogen ($_1^1H$) and tritium ($_1^3H$) these isotopes also fuses to release energy.

Reaction →

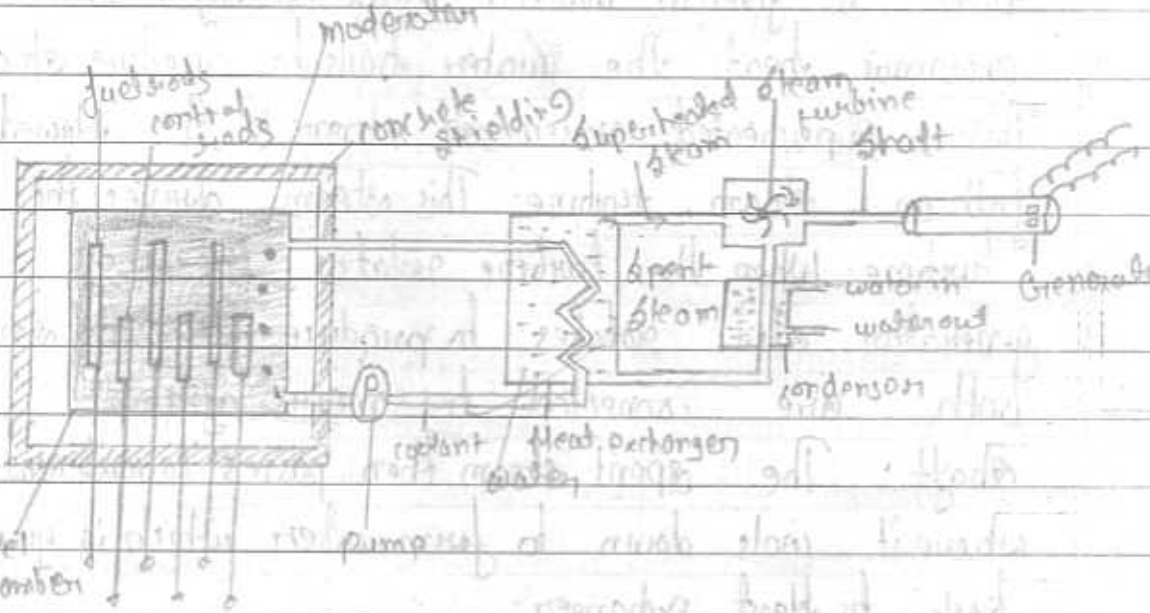
(1) $_1^1H + _1^2H \xrightarrow{\text{High temp}} _2^3He$ + enormous amount of energy

Ordinary Hydrogen nuclei | deuterium nuclei | isotope of Helium

(2) $_1^3H + _1^2H \longrightarrow _2^4He + _0^1n$ + enormous amount of energy.

tritium Hydrogen (deuterium) | Helium proton

Because of the evolution of this large amount of energy released during fusion of deuterium, ordinary hydrogen and tritium the sun is extremely hot and shiny.



Nuclear Reactor

(ii) Mechanism →

First of all the control rods made up of cadmium are or boron are inserted inside the graphite core. Then fuel rods are put in the core and reactor is sealed. After that the control rods are gradually withdrawn from the graphite core so that only some part of this rod remain inside the core. These rods are withdrawn so much till a controlled fission reaction is set up inside the reactor. At this stage the fission reaction takes place which produces energy at a steady rate.

The energy produced is taken out by coolant (liquid sodium). This heat is given to water in heat exchanger. Due to enormous heat the water boils to produce steam. This superheated pressurized steam is then allowed to fall on steam turbine. This steam drives the turbine. When the turbine rotates the coil of generator also rotates to produce electricity since both are connected by means of a shaft. The spent steam then passes to condenser where it cools down to form water which is given back to Heat exchanger.

Ans-20→ No other element exists in several forms and state as carbon and since carbon compounds are found in nature in a large numbers therefore carbon is called an unique element.

Reason→ Carbon compounds (organic compounds) exist in large numbers due to only combining capacity in branch chain, open chain and in cyclic form. This property by virtue of which carbon compounds exist in large numbers is known as catenation. Carbon compounds exists in nature in:-

1) Free state → Carbon compounds exist in free state as
a) crystalline forms → graphite, diamond.
b) amorphous forms → coal, coke, charcoal.
2) Combined state → Carbon compounds exist in combined state as constituent of marsh gas. Carbon is also present in methane and biogas etc.
3) In Atmosphere → Carbon exists in atmosphere as carbondioxide (CO_2) and (CO)
4) In Rocks → It is found in rocks as carbonates of calcium (limestone) and magnesium (dolomite)
5) Constituent of living beings → Carbon is also the main constituent of living beings like human, animals, plants decomposers etc. It is also the main constituent of LPG and natural gas

Therefore carbon compounds exist in large numbers.

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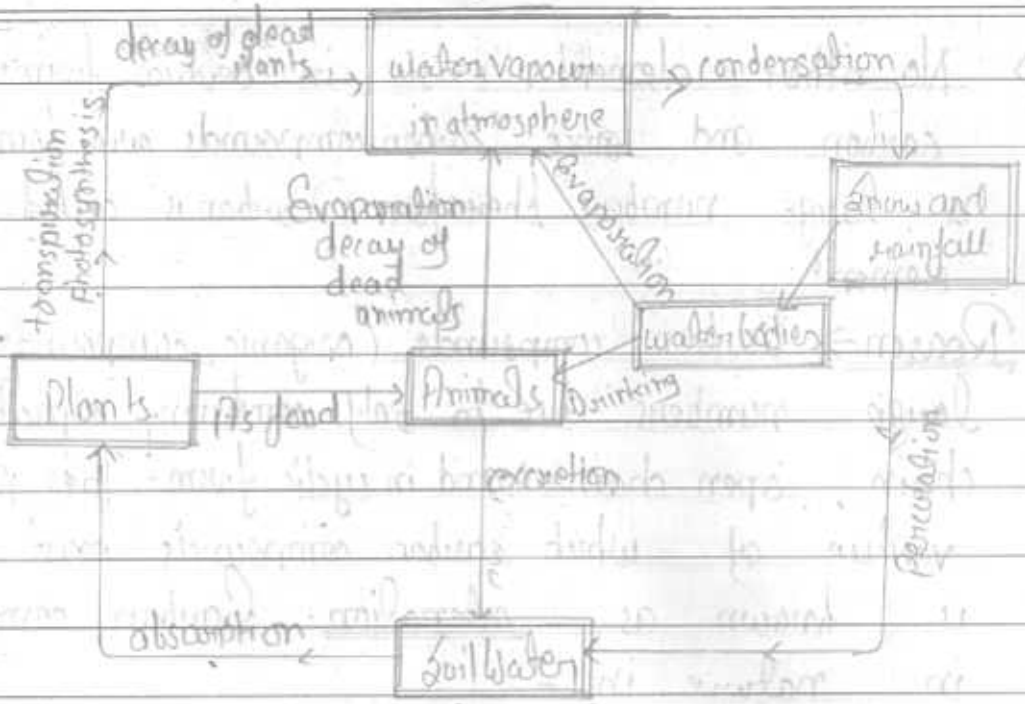
Ans-21→



Water Cycle

Water Cycle :-

The circulation of water through lithosphere, hydrosphere and Atmosphere is called water cycle. It occurs in following two steps :-

Absorption of Water :-

(1) The water evaporates from the water bodies and reaches in the atmosphere in the form of clouds. Water also evaporates from the surface of living organisms. Plants take water from the soil and release it in the atmosphere by the process of transpiration and photosynthesis. When plants and animals die they undergo decomposition and releas water vapour in atmosphere. The water from all the sources condense to form clouds.

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Giving Off water →

(2) The clouds come down as rain and snow and thus water goes back into water bodies. Some of this water percolates in the soil as soil water. Animals also excrete water in the soil. From the water bodies the the water goes back again in the atmosphere.

In this way water cycle is completed.

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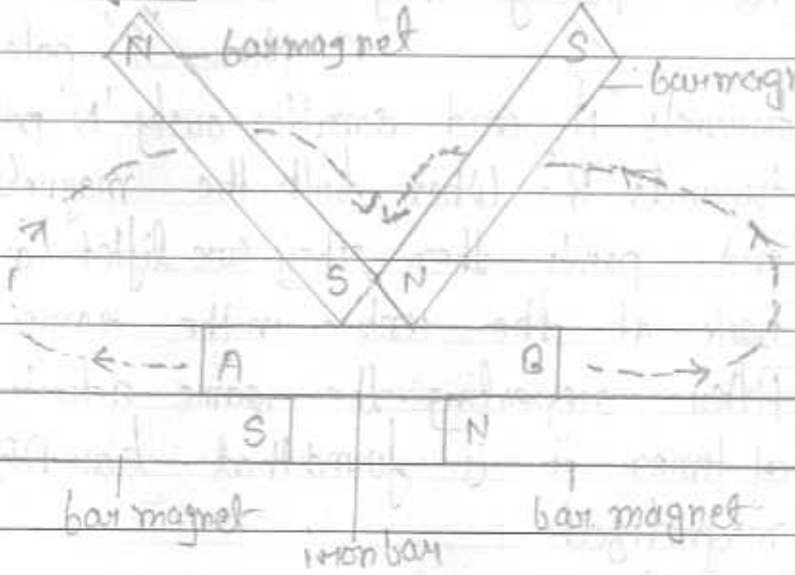
(Ans. 22) Labelled Diagram →



Divide Touch Method of Magnetization.

Description →

Two bar magnets of equal strength are placed on a table in the same line with their

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opposite poles facing each other. A bar ~~magnet~~ of soft iron is kept on the poles of these magnets in such a way that end A rests on south pole of magnet and end B rests on north pole of another magnet. After this two equally strong bar magnets are taken and their opp. poles are kept in the centres of iron bar AB in such a way that south pole of magnet NS are is towards end A and north pole of magnet SN is towards end B.

Now 'S' pole is rubbed towards 'A' and simultaneously 'N' pole is rubbed towards 'B'. When both the magnets reach the end points then they are lifted and kept back at the centre in the same direction. After repeating the same activity a number of times it is found that bar AB gets magnetized.

Position of Poles →

End 'A' of the iron bar becomes north pole and end 'B' becomes the south pole.

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