BRAIN BUILDER Series

Science & Technology

Teacher's Manual

Class VII

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Chapter 1 : Food and Nutrition

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Recap Question

A.1 Food is something, that provide us energy. Its main role is to provide energy to do work and perform various metabolic activities.

A.2 Extra energy is stored in the form of ATP (Adenosine Tri-phosphate) which is utilized in the bodies of living organisms when needed.

A.3 ***Autotrophic Mode of Nutrition :***

The mode of nutrition in which, green plants make food by their own by the process of photosynthesis is known as Autotrophic mode of nutrition. For ex. green plants.

Heterotrophic Mode of Nutrition :

The mode of nutrition in which the living organisms are not able to make food by their own but depends on others for their food is known as Heterotrophic mode of nutrition.

For Example : Non green plants, animal, human beings etc.

A.4 Green plants are called as autotrophs because they are able to make food by their own by the process of photosynthesis.

A.5 ***The basic difference between an Omnivore and Carnivore is :***

Omnivore : Animals or creature that eat both plant and animal products are called omnivores. Example : Crow, dog, bear, ant etc.

Carnivore : Animals or creatures that eat meat or flesh of other animals are called Carnivores. Example : Lion, tiger etc.

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Recap Questions

A.1 ***Photosynthesis :*** It is a process by which the green plants make food with the help of carbon dioxide, water, chlorophyll and sunlight.

Carbon dioxide + Water $\xrightarrow[\text{Chlorophyll}]{\text{Sun light}}$ glucose + Oxygen

A.2 Intensity of light affect the rate of photosynthesis as more the intensily of light, more will be the rate of

photosynthesis. Too strong intensity may also hinder the process.

Quality of light : Blue and red regions of the light spectrum only are used for photosynthesis, whereas other decrease the rate of photosynthesis.

A.3 In darkness, the plant does not get sunlight and thus do not able to synthesize food and becomes yellow and weak.

A.4 Potassium Hydroxide (KOH) Solution has the property to absorb carbon dioxide, so it absorb the carbon dioxide to hinder photosynthesis in the activity of photosynthesis.

A5. The plants be kept in darkness for 2-3 days before any experiment of photosynthesis so that all the food present in the leaf is consumed.

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Part "A"

D. Answer in one or two words :

1. Leaf
2. Chlorophyll
3. Carbon dioxide
4. Stomata
5. Decomposers

Part "B"

A. Answer in three or four sentences :

1. The type of nutrition in which both the partners get benefited is called symbiosis. Example : Lichens.

2. The factors which affect the basic requirement for life are :

i. Intensity of light.
ii. Quality of light.
iii. Carbon dioxide.
iv. Water.
v. Temperature.
vi. Internal Factors.

3. Food is regarded as the basic requirement for life because food

is the basic need of all living organisms. It provides energy which is essential for growth, development & proper functioning of the body.

4. The plants which eat insects are called insectivorous plant. Example : Venus fly trap, Pitcher Plant etc.

5. (a) Cow, goat

(b) Lion, tiger

(c) Crow, bear

(d) Cuscuta, Some fungi

(e) Mushrooms, Lactobacillus

Difference Between

1. ***Autotrophs and Heterotrophs :***

Autotrophs : Green plants, which are able to prepare their food by their own are called autotrophs. Eg. green plants.

Heterotrophs : Living organisms which are not able to prepare their food by their own and depend on others for their food are called heterotrophs. Example : all animals

2. ***Parasite and Saprophyte***

Parasite : The organism which live on or inside the body of other organisms to get its nutrition is called parasite.

Example : Cuscuta.

Saprophyte : The organism which get its nutrition from dead and decaying organic matter is called saprophyte.

Example : Fungi, bacteria etc.

3. ***Saprophyte and Symbiont***

Saprophyte : The organism which gets its nutrition from dead and decaying matter is called saprophyte.

Symbiont : The two organisms living together and are benifited from each other are called symbionts.

C. Answer in detail :

1. Role of food in the life of living organisms :

i. Food is the basic need for life as it provides energy for proper growth, development and proper functioning of our body.

ii. It helps to maintain body temperature.

iii. It helps to repair or replace the worn out dead cells and tissues.

iv. It provides materials for growth and reproduction.

v. Food keeps us disease free and resistant towards infections.

2. The different types of mode of nutrition are :

1. Autotrophic Nutrition
2. Heterotrophic Nutrition :

Autotrophic Nutrition : Green plants are able to make food by their own by the process of photosynthesis, hence they are called Autotrophs and their mode of nutrition is called as Autotrophic Nutrition.

Example : Green plants.

Heterotrophic Nutrition : Living organisms that are not able to make their food by their own and depend on others for their food are called Heterotrophs and their mode of nutrition is called Heterotrophic Nutrition.

Example : Non green plants, animals, humans.

3. ***Photosynthesis :*** It is the process by which the green plants make food by their own in the presence of carbondioxide, water, chlorophyll and sunlight.

The carbon dioxide enters the leaf of the plant through the tiny holes present on the lower surface of leaf and get water from the soil by their roots. The solar energy of sun is trapped by the Chlorophyll and converted into chemical energy of Carbohydrates i.e. sugar. As a result of this, oxygen gas is also released.

4. An activity to show that sunlight is necessary for photosynthesis, is as follows :

Take a potted plant and keep it in darkness for 2 to 3 days. Cover one of the leaves partially with a black paper held with clips. Put the plant in sunlight for a few days.

Pluck the leaf which was covered with black paper, remove

the paper and perform the starch test. The covered portion of leaf will not turn blue-black whereas the area which was exposed to sunlight turned blue-black with the iodine solution.

This shows that sunlight is necessary for photosynthesis.

5. The various methods by which non green plants take food from outside sources are :

(1) Saprophytic mode of nutrition.

(2) Parasitic mode of nutrition.

Saprophytic mode of nutrition : In this type of nutrition, the organisms get their nutrition from the dead and decaying organic substances.

For ex. : Bacteria like lactobacillus, fungi like mucor, mushrooms etc. get their nutrition by this method.

Parasitic mode of Nutrition : In this type of nutrition the organisms get their nutrition by living in or on other living organisms.

For example : Cuscuta, some bacteria etc.

Chapter 2 : Nutrition in Animals and Human Beings

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Recap Questions :

A.1 The various steps involved in nutrition are Ingestion, Digestion, Absorption, Assimilation and Egestion.

A.2 Difference between feeding and nutrition :

The method of intake of food is known as feeding.

Whereas Nutrition is the supply of food– materials required by organisms and cells to stay alive.

A.3 Amoeba captures its food with the help of false-feet- pseudopodia.

A.4 Different kinds of teeth in human beings are :

i. ***Incisors :*** They are the front teeth. They are 4 in each jaw.

ii. ***Canines :*** Next to incisors, there is one canine. They are 2 in each jaw.

iii. ***Premolars :*** There are 4 premolars in each jaw.

iv. ***Molars :*** There are 6 broad molars in each jaw.

A.5 ***Assimilation :*** It is a step in the digestion of food, by which absorbed food is utilized to produce energy in the body.

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Part "A":

D. Match the following :

	A	B
i.	Digestion of proteins	Stomach
ii.	Tongue	Muscular Organ
iii.	Elimination of undigested food	Egestion
iv.	Unicellular organ	Amoeba
v.	Finger like outgrowth in small intestine	Villi

E. Answer in one or two words :

1. Saliva

2. Incisors

3. 32 teeth

4. Oesophagus

5. Digestion

F. Difference

1. Ingestion and Egestion

Ingestion : The process by which food is taken in or eaten is called ingestion.

Egestion : The process by which undigested food is eliminated from the body is called egestion.

2. ***Milk Teeth And Permanent Teeth***

Milk Teeth :

(1) They are 20 in number.

(2) They appear in early childhood stage.

Permanent Teeth :

(1) They are 32 in number.

(2) They replaces the milk teeth at the age 6-9 years.

3. ***Incisors And Canines***

Incisors :

(1) They are 4 in number in each jaw.

(2) They are used for cutting and biting the food.

Canines :

(1) They are 2 in number in each jaw.

(2) They are used for tearing the food.

Part "B"

A. Answer in detail :

1. ***Heterotrophic mode of Nutrition :*** It is a type of nutrition in which living organisms are not able to make their food by their own and they depend on others for their food. Organisms like non green plants, fungi, animals and human beings show this kind of nutrition.

2. Different kinds of animals have adopted different methods to take food. They have special structures on their body to get food into their body. For ex. : In amoeba, food is engulfed by false-feet called pseudopodia.

In hydra, tentacles are present on its body to kill the prey.

3. Method of utilization of food in human beings is as follows : Utilization of food in human beings is done by digestive system which has various parts like mouth, oesophagus, stomach, small, intestine and large intestine Associated glands are liver and pancreas.

(1) The food is first taken in the mouth. It has muscular tongue, which helps in tasting, mastications and swallowing of food. The Saliva secreted by salivary glands help in digestion of starchy part of food.

(2) After that food passing through Oesophagus, reaches stomach, where mostly digestion of protein takes place.

(3) The semi-digested food enters into small intestine where final digestion of food takes place. It has finger like projection called villi for maximum absorption.

The blood carries the digested nutrients to all the cells of the body.

(4) Undigested food passes to large intesting from where it is removed in the form of faeces.

4. The type of nutrition, in which digestion of food takes place inside the cell is known as Intracellular mode of nutrition.

Amoeba is a unicellular animal. It surrounds the food particles by the help of pseudopedia. The two false feet join to form a cavity inside the body of amoeba. The food inside this temporary cavity is digested by the digestive juices poured over it from the cytoplasm. The soluble digested food is absorbed by the cytoplasm which is assimilated to give energy.

5. Digestion of food is completed in small intestine, with the help of juices from the wall of intestine, pancrease and liver. Digestive food is absorbed by the finger like projections called villi.

The undigested food passes from the small intestine into the large intestine. Extra water is absorbed here and semi-solid excretory waste material the faeces is passed out through the opening anus of the rectum. This process of expelling out of faeces is called egestion.

Chapter 3 : Materials : Wool and Silk Fibres

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Recap Questions

A.1 In ancient time man used various plants, leaves, bark of trees and animal materials to cover and protect himself.

A.2 In summers, light coloured, loose cotton clothes should be worn because they reflect back heat and allow air to circulate through them and thus help to keep the body cool. They also help to absorb sweat and protect the skin from irritation.

In winters, dark coloured, thick clothes made up of wool and fur to be used because they help to conserve the heat of the body.

A.3 Some man made fibres are Rayon, Nylon, Acrylic, Polyester etc.

A.4 Artificial fabrics have become quite popular because :

(1) They are strong and wrinkle free.

(2) They are elastic and they are easy to wash and dry.

5. Animals like rabbit, camel, sheep, goat, yak, larva of silk moth etc. provide us fibres.

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Part "A"

D. Answer in one word :

1. Shearing

2. Wool

3. Nylon

4. Cocoon

5. Rayon

E. Difference between :

1. ***Natural Fibres And Man made or artificial Fibres***

Natural Fibres : The fibres which are obtained naturally from plants or animals are called Natural Fibres.

Example : Cotton, jute etc.

Man made Fibres : The fibres which are made by man are called man made fibres.

Example : Nylon, Rayon etc.

2. ***Shearing And Reeling***

Shearing : The removal of wool from the sheep is called shearing.

ReelingThe process of twisting silk fibres with other fibres to make a thread and wound on a reel is called Reeling.

3. ***Wool And Silk :***

Wool :

(1) It is obtained from sheep.

(2) It helps us to keep our body warm.

(3) It burns with bad smell.

Silk :

(1) It is obtained from silk moth.

(2) It does not provide us heat.

(3) It does not burn with bad smell.

Part "B"

A. Answer in tree or four sentences :

1. The breeding and management of silk worms to obtain silk is called sericulture.

2. Artificial Fibres : The fibres which are made by man are called artificial fibres.

Ex. : rayon, nylon, polyster etc.

Natural fibres : The fibres which are obtained from plants and animals sources are called natural fibres.

Ex. : silk, wool, cotton etc.

3. Any three properties of artificial fibres are.

(i) They are strong and wrinkle resistant.

(ii) They do not absorb water.

(iii) They are elastic.

4. Headache, fever neck and body pain are common complaints with workers of semiculture.

B. Answer in detail :

1. Climate plays an important role in the selection of fabric to be worn, so that we can feel comfortable.

During summers, light coloured loose cotton clothes are very comfortable to wear as they help to let the heat of the body to escape, absorb sweat and protect the skin from irritation on the other hand, woollen clothes in winter help to keep our body warm by conserving the heat of our body.

2. Silk is obtained from the silk worm by the process called Sericulture. It involves the following steps :

i. Tiny eggs are incubated till they hatch to produce larva.

ii. These larva feed on chopped mulberry leaves for about one week.

iii. After the feeding period, the larva climb on branches of trees or shrubs provided to them and start spinning continuous thread to form cocoons. This is called pupal stage.

iv. The cocoons are collected and boiled to kill the larva inside them.

v. A few silk fibres are twisted and combined with a number of other similarly twisted filaments to make a thread wound on a reel. This process is called reeling. The silk, so obtain is known as raw silk.

3. The problems related with health of sericulture workers are:

i. Workers may suffer from respiratory problems due to inhalation of vapours from boiling of cocoons.

ii. Breathing disorders may also caused due to poor ventilation at the working place.

iii. Skin infections and scabies like diseases may also occur to them.

iv. Headache, fever, neck and body pain are common problems with them.

4. The following are the observations when pieces of silk, wool and nylon are heated separately :

i. ***Silk :*** It burns itself, a dull black residue in the form of hollow bead which crushes, remain.

ii. ***Wool :*** It burns with a smell of burning hair, leaves a dull black, hollow bead like residue which crushes.

iii. ***Nylon :*** It melts with a characteristic odour, melted residue drops on the ground, a dark hard bead like residue remains.

5. Method of obtaining wool from sheep involves the following steps :

i. Wool is removed from the body of sheep by the process called shearing. It is done either by hands using razor or by sheering machines.

ii. The raw sheered wool is cleaned by washing with soap or detergent to remove dirt, oil/grease and sweat.

iii. The washed wool is then rinsed with acidic solution and dried under low heat.

iv. The long and short fibres are separated. The long fibres are oiled, straightened, washed, twisted and spun into yarn.

Chapter 4 : Heat

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Recap Questions

A.1 Heat is the energy transferred from one body to another due to temperature difference between them.

A.2 Hot coffee feels hot and ice feels cold to us due to temperature difference which relates to the sensation of hotness and coldness.

A.3 SI unit of heat is 'Joule'. It is denoted by the letter 'J'.

Non S.I. units of heat is Calorie. It is denoted by Cal.

A.4 Two important effects of heat are :

i. It causes changes in temperature.

ii. It also affects change of state i.e. from solid state to liquid or liquid to vapoure etc.

A.5 **T**emperature is measured by an instrument called 'Thermometer'.

Differences between laboratory and Clinical thermometers are :

Laboratory Thermometer :

i. It is used in laboratories.

ii. It is used to measure the boiling point, melting point etc. of different substances.

Clinical Thermometer:

i. It is used in doctor's clinic, hospitals, homes etc.

ii. It measures the temperature of human body.

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Recap Questions

A.1 ***Thermal Expansion :*** The increase in the size of an object on applying heat is called as thermal expansion.

For example : Expansion of metallic wire or rod on heating.

A.2 The different kinds of thermal expansion in solids are :

i. ***Linear expansion :*** Expansion in one dimension causes Linear dimension. Ex. expansion of metallic rod.

ii. ***Superficial expansion :*** Expansion in two dimensions

causes Superficial dimension. Eg. – increase in area of a sheet or plate.

iii. ***Cubical expansion :*** Expansion in three dimension causes cubical expansion.

Cubical expansion is observed in liquid and gases.

A.3 Gaps are left between the two railways lines while laying because the iron rails expand during hot summer days and could curve, so the gap allows the space for the expansion.

A.4 A bimetallic strip is one which is made up of two metals like brass and iron reverted together two.

It is used in thermoswitches in the appliances like electric irons, ovens, automatic fire alarm etc.

A5. We can remove a stuck stopper from the neck of a glass bottle by pouring hot water over the mouth of bottle. The glass expands on heating and the stopper slips out the neck easily.

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Part "A"

D. Answer in one words :

1. Thermometer

2. Insulators

3. Conductors

4. Temperature

5. Celcius

E. Give reasons :

1. We wear light coloured clothes in summer because they absorb very less heat and give us cooling effect.
2. Houses should have ventilators in them because air is kept fresh and circulating due to convection currents which set in through the ventilators.
3. Mercury is used in thermometres because it is good conductor of heat and have uniform expansion and contraction over a wide range of temperature.
4. Doors of refrigerators have double walls because an

insulating material is filled up to prevent escape or entry of heat.

Part "B"

A. Answer in three or four sentences :

1. Woollen clothes keep us warm in winter because the pores in the woolen clothes trap air in them and thus do not allow outside cold temperative to reach our body.

2. Radiation : It is the transfer of heat from a hot body to a cold body without having any contact and help of medium between them.

3. One application of expansion in solid is fixing iron rim on bullock cart wheel.

4. Some animals undergo long winter sleep to avoid the adverse effects of severe temperatures.

B. Answer in detail :

1. There are mainly two units for the measurement of heat :

i. SI unit of heat is Joule. It is denoted by the letter J.

ii. Non S.I. Unit of heat is Calorie. It is denoted by 'Cal'.

The bigger unit of heat are Kilo Joule and Kilo Calorie and they are denoted as KJ and K.Cal.

2. Some application of expansion of solid, liquid and gases are :

i. Fixing iron rim on bullock cart wheel is due to expansion of iron wheel, on heating.

ii. Use of bimetallic strip in thermoswitches.

iii. The working of mercury thermometer is due to expansion of mercury due to the heat of body.

3. Thermometer is a device to measure the temperature.

There are two kinds of thermometer :

i. Laboratory thermometer.

ii. Clinical thermometer.

Making and working of these thermometers :

Laboratory thermometer : It consist of a thick walled fine bore glass capillary tube which has a small thin glass bulb at the lower ent. These two are filled with pure and dry

mercury liquid to some level in the capillary tube. The upper end of the tube is sealed after the air above the mercury is evacuated. The capillary tube above the bulb is1 graduated in degrees (from 10°C to 110°C).

Clinical Thermometer : It has a narrow constriction or a kink in the capillary tube just above the bulb.

It is used to measure the temperature of body. The mercury expands due to higher temperature in the capillary tube.

4. There are three kinds of thermal expansions :

These are linear expansion, Superficial expansion and Cubical expansion.

Linear expansion : The type of expansion, in which expansion in one dimension takes place.

Example : Expansion of metallic wire or rod.

Superficial expansion : The type of expansion in which expansion in two dimensions takes place.

Cubical expansion : The type of expansion in which expansion in three dimension takes place. It is observed in all the three states of matter.

5. An experiment to demonstrate that solid expands on heating is as follows :

Take two metal rods of iron or copper and place them between two wooden blocks on a table. Fix one end of the rod firmly on one of the blocks having a raised side. Place a round pencil under the other end of the rod to which a pointer is fixed. On heating the rod, the pointer turns towards right due to the expansion of the rod. It shows that the length of rod increases on heating.

It shows the expansion of solids on heating.

6. ***Good Conductors of Heat :*** The materials which allow the heat fast and easily to pass through them are called good conductor of heat.

For Example : All metals etc.

Bad Conductors of Heat : The materials which do not allow the heat to pass through them easily, are called bad conductor of heat.

For example : wood, plastic etc.

Their applications in daily life are :

i. Materials like brass, steel are used for making utensils as they heat up very fast.

ii. Bad conductors like plastic, wood etc. are used to make handles of the untensils.

iii. As jute and saw dust are bad conductors of heat. They are used to cover big ice slabs.

Chapter 5 : Acids, Bases and Salts

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Recap Questions

A.1 Acids are named so as the word 'Acid' is derived from Latin Word acidus meaning sour as all the acids are sour in taste.

Two major properties of acids are :

i. They turn blue litmus red.

ii. They are produced when non metallic oxide reacts with water.

A.2 The Chemical compounds which are used to test the presence of acids and bases are called Indicators.

Litmus, phenophthalene are some indicators which can test the presence of acids.

A.3 Turmeric remains yellow in acids but changes to red in bases.

A.4

Food Material	Acid Present
Lemon	Citric acid
Yea	Tannic acid
Vinegar	Acetic acid

A.5 The acids react with metal and carbonates as follows :

i. Reaction with Metals

Dilute acids react with some metals to form salt and hydrogen gas is released.

eg. $Mg + 2HCl \longrightarrow MgCl_2 + H_2$

Magnesium + hydrochloric acid ——> Magnesium Chloride + Hydrogen

ii. Reaction with Carbonates :

Dilute acids react with carbonates of sodium and Calcium to form salt and carbon dioxide.

Na_2Co_3 + H_2So_4 ———> Na_2So_4 + H_2O + Co_2

Sodium Carbonate | Sulphuric Acid | Sodium Sulphate | Water | Carbon dioxide

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Part "A"

D. Match the following :

	A	B
i.	Lemon	Citric acid
ii.	Vinegor	Acetic acid
iii.	Apple	Maleic acid
iv.	Milk	Lactic acid
v.	Tea	Tannic acid

Part "B"

A. Answer in three or four sentences :

1. An anti acid tablet is taken when we suffer from acidity to neutralize the acidity in stomach.

2. Two uses of sulphuric acid are :

i. Used in automobile batteries.

ii. Used in the manufacture of fertilizers and chemical reagents.

3. Three properties of acid are :

i. They have sour taste.

ii. They turn blue litmus red.

iii. They are good conductors of electricity.

4. ***Alkalies :*** Soluble bases are called alkalies. Eg. sodium hydroxide.

5. Metals react with acids to form salt and hydrogen gas.

Example : Zn + 2Hcl ———> Zncl2 + H2

Zinc | Hydrochloric acid | Zinc Chloride | Hydrogen gas

B. Answer in detail :

1. Chemical compounds are categorized into main three categories. These are acids, bases and salts.

Acids : These are the substance which are sour in taste. They turn blue litmus red.

Bases : They have bitter taste. They turn red litmus blue.

Salts : They are formed by the neutralization reaction between acid and base.

Properties of Sulphuric acid are :

i. It is a strong acid.

ii. It is used in the manufacture of fertilizers and chemical regent like copper sulphate, alum etc.

iii. It turns blue litmus red.

iv. It reacts with carbonate of sodium and calcium to form salt and carbon dioxide.

Na_2So_3 + H_2So_4 ———> Na_2So_4 + H_2o + Co_2

Sodium Carbonate — Sulphuric acid — Sodium Sulphate — Water — Carbon dioxide

2. Indicator tests for acids, bases and salts are :

Indicator test for Acids :

i. Acids turn blue litmus to red litmus.

ii. Phenophthalein remains colourless in acidic solution.

iii. Methyl orange turns yellow to red in acidic solution.

Indicator test for Bases :

i. Bases turn red litmus to blue.

ii. Phenophthalein turns pink in basic solution.

Indicator test for Salts are :

i. Litmus remain blue, unchanged in contact with salt.

ii. Phenophthalein remain colourless.

3. ***Properties of bases are :***

i. They have bitter taste.

ii. They turn litmus to blue

iii. They are hydroxide of metals.

iv. They are soapy to touch.

v. They reacts with acids to form salt and water.

vi. Some bases like sodium hydroxide reacts with acidic oxides to produce salt and water.

vii. They also react with ammonium slats.

Uses of bases are :

i. Sodium hydroxide :

a. It is used in the manufacture of soap and detergents.

b. It is also used in making paper and pulp industry, rayon, textiles, drugs etc.

ii. Calcium hydroxide :

a. It is used in making of bleaching powder.

b. It is also used for white washing of buildings.

c. It is used for softening of hard water.

iii. Ammonium hydroxide :

a. It is used for the manufacture of fertilizers.

b. It is used as cleansing agent.

c. It is used in the manufacture of dyes, plastic, nylon etc.

4. Salts are prepared from Metals and metallic carbonates in the following ways :

i. ***Preparation of Salts from Metals***

Metal when reacts with acid, salts are obtain, with evolution of hydrogen gas.

$$\underset{\text{Zinc}}{Zn} + \underset{\text{Hydrochloric acid}}{2HCl} \longrightarrow \underset{\text{Zinc Chloride}}{ZnCl_2} + \underset{\text{Hydrogen}}{H_2}$$

ii. ***Preparation of Salts from metallic carbonates :***

Metallic carbonates, when reacts with acid, salt is obtain, with the evolution of carbon dioxide gas also.

$$\underset{\text{Magnesium Carbonate}}{MgCo_3} + \underset{\text{Hydrochloric acid}}{2HCl} \longrightarrow \underset{\text{Magnesium Chloride}}{Mgcl_2} + \underset{\text{Water}}{H_2O} + \underset{\text{Carbon dioxide}}{Co_2}$$

5. The strength of acids and bases are measured by a scale called pH. The term pH is derived from a French word puissance hydrogen means power of hydrogen.

Significance : It plays a significant role in finding the pH

value of any solution.

The solution having pH below 7.0 are acidic in nature, whereas the solution having pH above 7.0 are basic. Neutral solution has pH equal to 7.0.

Chapter 6 : Chemical Changes And Reactions

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Recap Questions

A.1 ***Desirable Changes :*** The changes which are beneficial are known as desirable changes.

For example, Growth of plants, Ripening of fruits.

Undesirable Changes : The changes which may harm us in one or the other way are called undesirable changes.

For example : Flood and droughts.

A.2 Differentiate between periodic and non-periodic changes is as follows :

Periodic Changes : The changes keep repeating themselves.

For example : Swinging of a pendulum of clock.

Non–Periodic Changes : These Change do not keep repeating themselves.

For example : Burning of wood.

A.3 ***Man Made Changes :*** Rusting of iron, Making of curd and Burning of match stick.

Natural Changes : Water cycle, earthquakes, thunder–Storm.

A.4 Yes, freezing of ice is a physical change because no new substances are formed.

A.5 Two characteristics of a chemical change are :

i. It results in the formation of new compounds.

ii. These changes are permanent, hence cannot be reversed.

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Recap Questions

A.1 Water shows inter conversion of state of matter as follows :

Water on cooling changes into ice and on heating it again

changes into water, no change in chemical composition and chemical properties takes place. On heating water changes into vapours and on condensation it again changes into water.

A.2 Evaporation is a surface phenomenon as factors affecting evaporation include surface area of the liquid also. So it is also called surface phenomenon.

A.3 ***Sublimation :*** The process of conversion of solid into vapours directly on heating is known as Sublimation.

Ammonium Chloride is a substance which can be purified by sublimation.

A.4 ***Water cycle in nature :*** It is circulation of water between Ocean and land.

In the cycle, water first changes into vapours due to heat of the sun. These vapours (gaseous form) again changes into droplets of water (liquid form) by condensation on going high up in the sky.

$$\text{Water} \underset{\text{condensation}}{\overset{\text{evaporation}}{\rightleftharpoons}} \text{water vapour}$$

A.5 Some example of chemical changes are :

i. Bursting of cracker

ii. Rusting of iron

iii. Digestion of food

iv. Respiration

A.6 The factors affecting chemical change are :

Temperature : Many changes take place only on heating.

Light : It also affects the chemical change. Green plants make their food by the process of photosynthesis in the presence of sunlight.

Contact : The reactants must come in contact with each other to bring about a change.

Pressure : Bursting of crackers may happen when pressure is applied. It also brings chemical change.

Catalyst : It also increases the rate of chemical reaction to bring about a change.

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Part "A"

D. Match the following :

	A	B
i.	Ammonium Chloride	Sublimation
ii.	Vinegar	Acetic acid
iii.	Copper Sulphate solution	Blue in colour
iv.	Burning of paper	Chemical change
v.	Evaporation	Physical change

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Part "B"

A. Answer in three or four sentences :

1. It is so because in coastal areas the air is very much humid so iron when comes in contact of moisture it get rusted.

2. Burning of wood is a chemical change because wood is converted into ash after burning but cutting of wood into small pieces is a physical change as no new substance is formed.

3. ***Exothermic reactions :*** The reactions in which heat is evolved are known as exothermic reactions :

$$\underset{\text{Carbon}}{C} + \underset{\text{Oxygen}}{O_2} \longrightarrow \underset{\text{Carbon-dioxide}}{Co_2} + \text{heat}$$

Endothermic reaction : The reactions in which heat is absorbed.

$$\underset{\text{Carbon}}{C} + \underset{\text{Sulphar}}{S_2} \xrightarrow{\text{heat}} \underset{\text{Carbon-disulfide}}{CS_2}$$

4. Setting of curd is a chemical change because milk is change into curd and curd cannot be reversed back into milk.

5. Two characteristics of chemical change are :

i. New substances are formed.

ii. It cannot be reversed back.

6. ***Sublimation :*** It is the process of changing a solid directly into vapours on heating.

B. Answer in detail :

1. ***Man Made Changes :*** These are the changes which are brought about by man for his benefit are called Man Made Changes.

For Example : Cooking of food, making of curd from milk are all man made changes which are brought about by man.

Natural Changes : The changes which are natural and are brought naturally by their own are called Natural Changes. For example : Floods, droughts, eruption of valcanoes etc.

2. ***Crystallization :*** The process by which the dissolved substance can be obtained back in solid form by heating slowly is known as crystallization.

Difference between Evaporation and Crystallization is as follows :

Evaporation is a process by which liquid changes into vapours but by the process of Crystallization dissolved substance changes back in its solid form.

3. Some examples of Chemical Reactions which involve change of colour evolution of gas and oxidation are :

i. ***Change of Colour :*** When green coloured copper carbonate is heated strongly black coloured copperoxide is produced.

$$\underset{\text{Copper Carbonate (green)}}{CuCo3} \xrightarrow{\text{heat}} \underset{\text{Copper Oxide (black)}}{Cuo} + \underset{\text{Carbon dioxide}}{Co_2}$$

ii. ***Evolution of gas :*** Gas is evolved when metals or their compounds react with acids or are heated.

$$\underset{\text{Zinc}}{Zn} + \underset{\text{Sulphuric Acid}}{H_2So_4} \longrightarrow \underset{\text{Zinc Sulphate}}{ZnSo_4} + \underset{\text{Hydrogen}}{H_2\uparrow}$$

iii. ***Oxidation :*** Addition of oxygen or removal of hydrogen is called oxidation.

$$\underset{\text{Magnesium}}{2Mg} + \underset{\text{Oxygen}}{O_2} \longrightarrow \underset{\text{Magnesium Oxide}}{2Mgo}$$

4. Differences between Physical and Chemical Changes are :

Physical Changes :

i. It is always reversible.

ii. No new substances are formed.

iii. The changes are temporary.

iv. It does not involve evolution or absorption of energy.

For example : Tearing of paper, melting of ice.

Chemical Changes :

i. It is always irreversible.

ii. New Substances are formed.

iii. The changes are permanent.

iv. It is usually accompanied by evolution or absorption of large amount of energy.

For example - Rusting of iron, digestion of food.

5. Factors affecting the chemical changes are :

i. ***Temperature :*** Many changes take place only on heating.

ii. ***Light :*** Certain chemical changes are affected by light.

For example : Photosynthesis in green plants.

iii. ***Contact :*** The reactant must come in contact with each–other to bring about a change.

iv. ***Pressure :*** It also bring about chemical change in many case. Ex. - Bursting of crackers.

v. ***Catalyst :*** It also increases the rate of chemical reaction. Medium, electricity are some other factors affecting chemical reactions.

Chapter 7 : Our Surroundings

Page : 94

Recap Questions

A.1 The three layers of the earth are crust, mantle and core. Life exists on the top soil because only top soil is suitable for the growth of plants on which the entire living organisms depend.

A.2 Anacrobic unicellular organisms first appeared on the earth. Approximately. 3.5 billion (350 crores) years ago.

A.3 The conditions necessary for life are :

Oxygen, food, water, soil and solar energy.

A.4 The gravitational pull of the earth is helpful to substain life by holding its atmosphere i.e. does not allow the gases like carbon dioxide.

A.5 Large scale cutting of trees is not advisable as it results in increase of percentage of carbon dioxide leading to rise in earth's temperature causing global warming.

A.6 The difference between weather and climate is as follows :

Weather : It is the outcome of the condition and their variation. It may change day-to-day or hour to hour at a place.

Climate : It describes a general pattern of weather throughout the year of a place. Different places in a country and the world have different climate.

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Recap Questions

A.1 Plants and animals modify themselves in certain climates to survive best to varying kind of climates.

A.2 Hibernation is adopted by certain animals by which they reduce their body activity during winters to avoid heat loss Example - seals, polar bears, penguins etc. show this phenomenon.

A.3 These characteristics of animals adapted to cold climate are :

i. Animals have smaller ears, legs and tails to avoid heat loss from them.

ii. Some animals reduce their body activity by hibernating during winters to avoid heat loss.

iii. Some animals like seals have thick fat deposit called blubber to protect themselves from cold.

A4. Human activities affected the climate as urbanization and industrialization lead to cutting of trees on a large scale. Due to this the concentration of CO2 in air increases which leads to global warming.

A5. Small animals like birds, insects and large animals like elephants, giraffe, zebra etc. are found in tropical savannah

climate. Whereas tall grass and a few trees are found only in tropical savannah climate.

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D. Match the following :

	A	B
i.	Penguins	huddle together
ii.	Polar bear	white fur
ii.	black soil	regur
iv.	Removal of top soil	soil erosion
v.	Aquatic animal	fins

E. Answer in one or two words :

1. Camel

2. Polar bear

3. Climate

4. Adaptation

5. Soil

Page : 107

Part "B"

A. Answer in three or four sentences :

1. Soil is formed by the weathering of rocks due to the action of wind, water temperature, rain etc.

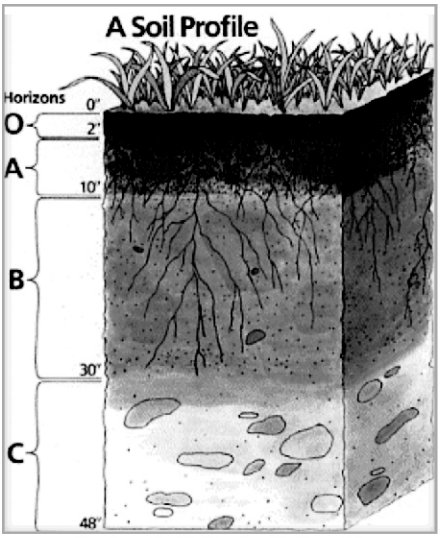
2. It is due to various adaptations adopted by the animals living there so as to make them comfortable in that area.

3. (i) White fur on its body.
(ii) Thick layer of fat below skin.

4. Three causes of soil erosion are :
(i) Deforestation
(ii) Floods
(iii) Forest fires

5. Various layers of soil as seen in soil profile are :
(i) Top Soil (A-horizon)
(ii) Subsoil (B-horizon)

(iii) Parent rock (C-horizon)



Section of soil showing Soil-profile

B. Answers in detail :

1. The adoptation of animal to high temperature and hot climate are :

i. Animals spend hot days hiding in cool shady places like cervices, burrows etc. They come out at night in search of food.

ii. They sweat, pant or lick to keep themselves cool.

iii. Some desert animals like Fennes fox have big ear pinna have blood vessels near the surface to give coolness to the body.

2. Soil is considered as significant natural resource because it plays an important role in the lives of plant and animals. Soil provides water for photosynthesis and minerals for growth of plants and we depend on plants for our food, shelter, clothing and many other needs.

3. An activity to show that different types of soils have different water holding capicities is as follows :

Place about 50 gms of sandy, loamy and clayey soil each in three different funnels placed over three flasks. Pour 50 ml.

of water over each soil in the flasks through funnels. Let the water stop dripping from the funnels. Measure the quantity of water filtered through different soils.

It is observed that sandy soil has maximum water holding capacity, where as loamy soil has little less and clayey soil has least water holding capacity.

4. ***El-Nino effect :*** Irregular warming of surface water in the pacific causes El-Nino effect which affects rainfall and wind patterns.

   Various phenomenon affected by it are floods, droughts, monsoon rains, Tornadoes, forest fires, Smog etc.

5. ***Soil Profile :***

   Different layers of soil, which can be classified as Topsoil (A-Horizon), Sub soil (B-horizon) and parent rock (C-horizon).

   Topsoil : It consists of humus and smallest particles of soil. Soil is porous and rich in nutrients for the growth of plants.

   Subsoil : It is below to topsoil and consists of less humus and nutrients and not fit for plant growth.

   Parent Rock : It is the lowest layer of the soil and composed of pieces of rocks with cracks derived from weathering of big rocks.

Chapter 8 : Breath of Life : Respiration

Page : 111

Recap Questions

A.1 ***Respiration :*** It is a process in living organisms in which food is oxidized by the oxygen inhaled to give simpler compound like carbon dioxide and water with the production of energy

Glucose + Oxygen $\longrightarrow$ Carbon dioxide + Water and energy (Food)

A.2 We can say that carbon dioxide produced during respiration is helpful in nature as it is taken by the plants for the process of photosynthesis.

A.3 ***Anaerobic respiration :*** It is a type of respiration in which breakdown of glucose take place in the absence of oxygen. It is also called as fermentation. It takes place in yeast and some bacteria.

$$\underset{\text{Glucose (in the cell)}}{C_6H_{12}O_6} \xrightarrow{\text{absence of air}} \underset{\text{elthyl alcohol}}{2C_2H_5OH} + \underset{\text{carbon-dioxide}}{2Co_2} + \text{Energy}$$

A.4 Respiration is necessary because food is oxidized to give energy by this process. This energy is utilized by all living beings to survive and perform metabolic activities.

A.5 Anaerobic respiration can be demonstrated by an experiment as follows :

Take two conical flasks and half fill them with boiling water. Dissolve glucose in both the flasks. Now add live yeast in one of the flasks and cover the surface of water with oil. Oil will prevent oxygen of the air from getting dissolved in water. Put hold corks in the mouths of the flasks through which bent delivery tubes are passed. The free ends of the delivery tubes dip in test-tubes having lime water. After sometime lime-water turns milky in the set up having yeast.

It is therefore concluded that the carbon dioxide turned lime water milky which was produced by the anaerobic respiration of yeast.

Page 117

Part "A"

D. Match the following :

a.	Fish	i.	gills
b.	Plants	ii.	stomata
c.	Earthworm	iii.	skin
d.	Humans	iv.	lungs
e.	Cockroach	v.	air holes

E. Answer in one word :

1. Breathing

2. Gills

3. Mitochondrion

4. Photosynthesis

5. Aerobic respiration

Page : 118

Part "B"

A. Give Reasons :

1. Tiny hair are present in the nose so as to trap the dust particles from the inhaled air.

2. It is so because food particles may get into the wind pipe and breathing may be choked.

3. We cannot survive under water because we can't breathe under water.

4. It is so because energy is released as a result of respiration which is needed for doing various activities.

B. Answer in detail :

1. There are two kinds of respiration. These are Aerobic respiration, and Anaereobic respiration.

Aerobic respiration : It is the type of respiration in which oxygen is utilized to oxidize glucose to give rise to carbon-dioxide and water with the production of energy.

Anaerobic Respiration : It is the type of respiration in which breakdown of glucose takes place in the absence of oxygen.

2. ***Differences between Breathing and Cellular respiration are :***

Breathing :

i. It is inhalation and exhalation of air.

ii. It involves nose, trachea, lungs, rib cage and diaphragam.

iii. It is a physical process.

iv. No enzymes are involved.

v. There is no energy released.

Respiration :

i. It is the break down of food in the presence of oxygen to release energy.

ii. It involves cells only.

iii. It is a biochemical process.

iv. Enzymes are involved.

v. Energy is released in this process.

3. The release of carbon dioxide during respiration can be demonstrated as follows :

Take a small amount of lime water in a bottle. Place a small live insect on a wire guage inside the bottle. Close the mouth of the bottle with a cork. Leave the set up undisturbed for about 10-12 hours.

We will observe that the lime water inside the test tube turns milky showing that the insect gives out carbon dioxide during respiration.

4. The organs of respiration in human beings are :

Nostrils, trachea (wind pipe), bronchi and lungs.

The air we inhale enters through nostrils and passes into trachea from where it enters the two-bronchi.

Trachea bronchi and bronchioles are convered by incomplete cartilaginous rings which prevent the collapsing of the tubes.

The branches of bronchioles end up into minute bug like structures called the air sacs or alveoli. Air sacs are surrounded by blood capillaries which give away carbon dioxide to the inhaled air inside the air sacs and take in oxygen from it. The CO_2 is exhaled out through the lungs outside from the nostrils. The oxygen is utilized for breakdown of food.

5. ***The different ways of respiration in various kinds of animals are :***

i. Through skin or cell membrane : In unicellular organisms like amoeba exchange of gases take place through cell membranes and in hydra, earthworm respiration through their skin takes place.

ii. ***Through air holes :*** In cockroaches and other insects, respiration takes place through air holes called spiracles.

iii. ***Through gills :*** Animals living in aquatic habitat respire through their gills.

iv. ***Through lungs :*** Respiration through lungs takes place in frogs, birds and other animals.

Chapter 9 : Movement of Substances Transportation and Excretion

Page : 122

Recap Questions :

A.1 Transportation is necessary in plants as it helps in the movement of water, minerals and to prepare food in the plants.

A.2 One Difference between herbs, shrubs and trees is :

Herbs : These are small plants with soft stem.

Example : Grass, maize etc.

Shrubs : These are medium sized plants with woody stem.

Example : Rose, Henna etc.

Trees : These are tall plants having hard and woody stem.

Example : Mango tree, Peepal tree etc.

A.3 Xylem and phloem tissues are the vascular tissues which make well developed transport system in plants.

Page : 126

Recap Questions

A.1 There is a requirement of circulator system in human beings to transport food, oxygen, metabolic wastes and some other substance like enzymes from one part of the body to another.

A.2 The function of the heart in human beings is to pump blood to different organs of the body.

A.3 One difference between an artery and a vein is :

An artery : It is a thick walled blood vessel that carry oxygen rich blood away from the heart to various organ of the body.

A Vein : It is a thin walled blood vessel that carry blood without oxygen to the heart from the various organs of the body.

A.4 Pulse : The pressures felt on the inner side of the wrist or the side of the neck as throbbing. It is called as pulse.

A.5 Sphygmomanometer is an instrument used to measure blood pressure. Where as 'stethoscope' is used to hear the sounds of heart beat in man.

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Part "A"

D. Match the following :

	A	B
i.	Artery	carry oxygenated blood
ii.	Uric acid	birds
iii.	Sweat	water and salts
iv.	Nephron	kidneys
v.	RBC	Red blood cells
vi.	WBC	fight diseases

E. Answer in one word only :

1. Blood

2. Nephron

3. Haemoglobin

4. Heart

5. Platelets

Part "B"

Answer in three or four sentences :

1. The process by which body wastes are removed by putting the patient on a machine, when the kidneys are not working is called dialysis.

2. The excretory organs of human body are kidneys, ureters,

urinary bladder and urethra.

3. It is so because metabolic wastes are very toxic in nature. So, they can harm our body.
4. Capillaries are thin walled, branched blood vessels forming a network to supply the blood.
5. It is so because blood has platelets which form a clot at the site of injury.

B. Answer in Detail :

1. ***Transportation of Materials in plants :***

Transportation of materials in plants take place with the help of vascular tissues : xylem and phloem, which form the well developed transport system in plants.

Xylem : It is made up of thick walled cells placed end to end from the root, tip to tip of the stem and leaves. It helps to transport water and minerals salts from the roots to stem and leaves of the plant.

Phloem : It is made up of cells having perforations in the cross walls. The food prepared by the leaves is transported by phloem to the different parts of plant.

2. Transpiration is the process by which the excess of water is removed through the stomata of the leaves in the form of water vapour.

Factors Affecting it are :

i. ***Temperature :*** Higher temperature promotes transpiration.

ii. ***Humidity :*** It reduces the rate of transpiration.

iii. ***Light :*** It promotes transpiration by opening and closing of stomata.

3. ***Internal Structure of heart :*** It is divided into four chambers internally. There are two upper right and left auricles and two lower right and left ventricles.

Right Auricle receives the deoxygenated blood from the whole body and sends it to right ventricles.

Left Auricle receives oxygenated blood from the left and right lungs and sends it to left ventricle.

Right ventricle receives blood from the right auricle and

sends to the lungs.

Left ventricle receives blood from the left auricle and send it to the whole body. Valves are present between auricles and ventricle to flow the blood in one direction only.

4. ***Components of blood are :***

	i. Fluid part plasma :	**Functions**
(a)	Proteins Albumins	It acts as medium to carry substance like maintains osmotic pressure of blood, plasma, transport lipids.
(b)	Inorganic ions Sodium (Na^+), Chloride (Cl^-), bicarbonates (HCO_3^-)	Maintains osmotic pressure and fluid equilibrium, transport CO_2 from organs to heart.
(c)	Carbohydrates	provide energy.

ii. Blood Cells

(a) Red blood cells RBC (Erythrocytes)
It helps to transport oxygen from lungs to the organs.

(b) White blood all WBC (Leucocytes)
It destroys the germs, act against infections.

(c) Platelets : Help in clotting of blood at the site of injury.

5. ***Lymphatic System :*** The yellow coloured fluid which transport materials and network of lymphatic vessels in the whole body having lymph nodes at certain places forms the lymphatic system.

Its significance is as it provides immunity to the person. It also helps in transportation of fats, proteins and plasma.

Chapter 10 : Reproduction

Page : 136

Recap Questions

A.1 The mode of reproduction in which there is no participation of reproductive organs is known as vegetative propagation.

A.2 Reproduction is necessary for the continuation of species as offsprings are produced as the result of reproduction.

A.3 Spore formation is one of the method of asexual reproduction in plants. Spores are small, single celled asexual reproductive bodies having thick walls. Fore example : In bread moulds, it is best seen.

Budding : It is also a made of asexual reproduction. Commonly seen in hydra, yeast etc. A bud is a bulb like projection produce on the body of some organism.

A.4 When hydra is cut into pieces accidentally, it regenerates its every piece by the process of regeneration and develops into independent hydra.

A.5 Grafting : It is an artificial method of vegetative propagation in which a cutting of the desired plant is placed on or inserted into a cut in the stem of a rooted plant of the same species and tied together. In a few days, tissues of both get fused and new varieties of flowers and fruits are obtained. For example– Rose etc.

Page : 142

Part "A"

D. Answer in one word only :

1. Cotton plant seed

2. Xanthium

3. Reproduction

4. Rose

5. Dispersal

6. Budding

7.

8. Fertilization

E. Match the following :

i.	Eyes	a.	Potato
ii.	Fragmentation	b.	Spirogyra
iii.	Yeast	c.	Budding
iv.	Spores	d.	Bread mould
v.	Rose	e.	Stem cutting
vi.	Xanthium	f.	Hooks

Part "B"

A. Distinguish between these :

1. Asexual Reproduction and sexual Reproduction

Asexual Reproduction : It involves only one parent to produce offsprings. Example : spirogyra, amoeba etc.

Sexual Reproduction : It involves both parents to produce offsprings. Example : Frog, birds etc.

2. Self Pollination and Cross Pollination

Self Pollination : It takes place between the flowers of the same plant.

Cross Pollination : It takes place between the flower of different flowers of same species.

3. Unisexual flower and Bisexual flower

Unisexual flower : The flower having only one sex either male or female. Example : marigold.

Bsexual flower : The flower having both the sexes i.e. both male and female. Example : Rose.

B. Answer in detail :

1. ***Budding :*** It is a method of asexual reproduction in which new individual are produced from a bulb like projection produced on the body of some organism like hydra, yeast, etc. The parent nucleus divides into two nuclei, one of the nuclei enters the bud. This bud on maturity get separated from the parent body and become a new individual.

Regeneration : It is the process by which an organism regain its lost parts. Some lower organisms regenerate their lost parts. For example : Starfish regenerates its lost arm.

2. ***Spore formation in Rhizopus :*** Spore formation is best seen in Rhizopus. Spores are small, single celled asexual reproductive bodies having thick wall. When they fall on suitable substratum, under favourable conditions, the wall breaks, and spores germinate to form new organisms.

3. ***Hybridization :*** It is an artificial method of pollination by man to improve varieties and increase the crop production. The process of hybridization involves the following steps :

   i. Two flowering plants are chosen with desired qualities.

   ii. Pollen grains are collected from the anthers of a plant.

   iii. These pollen grains are spread on the stigma of other plant.

   iv. The flowers having pollination are covered by polythene bags till the seeds are produced.

   The seeds thus produced are collected and sown. These will give rise to plants having mixed characters.

   The newly produced plants are called hybrid varieties and the method is known as Hybridization.

4. ***Pollination :*** It is the transfer of pollen grains from the anther to the stigma of the same flower or between the flowers of the same plant.

   There are mainly two kinds of pollination :

   i. Insect Pollination : The type of pollination in which animals like insects, birds and other animals bring about pollination. Insects when visit the flower to collect nector the pollens get stuck to its body which may rub them off on some other flower of the same species.

   ii. Wind Pollination : The type of pollination, in which pollow are carried away by wind from one flower to another flower of same species.

   Example : Corn, grasses.

Chapter 11 :Motion and Time

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Recap Questions

A.1 Some objects do not change their position with time, these are said to be at rest. For example : building, roads.

Other objects which change their position with time, these are said to be in motion. For example : flying bird or aeroplane.

A.2 ***Reference Point :*** The point at which one object may be at rest with respect to one reference point and in motion with respect to another at the same point.

A.3 Sand clock gives time when a fixed amount of sand passes through a narrow passage in a fixed interval of time.

A.4 Pendulum is used in pendulum clock to measure the time accurately. It completes it to and fro motion in exactly the same time.

A.5 ***The different kinds of clocks known so far are :*** Sand Clock, Wrist Watch, Pendulum Clock, Table Clock, Stop watch, Digital Watch, etc.

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Part "A"

D. Answer in one word :

1. Sundial

2. Speed

3. Motion

4. Second

5. Bob

Part "B"

A. Differentiate Between :

1. ***Speed and Velocity***

Speed :

i. It is the distance covered by a body in a unit time.

ii. It is scalar quantity.

Velocity

i. It is distance travelled by a body per unit time in a given direction.

ii. It is vector quantity.

2. ***Uniform Motion and Non-uniform Motion***

Uniform Motion : When a body travels equal distance in equal interval of time, it is said to be in uniform motion.

Non-uniform Motion : When a body does not travel equal distances in equal intervals of time, it is said to be in non-uniform motion.

3. ***Distance and Displacement***

Distance :

i. It is the actual length of the path travelled by a moving body.

ii. It is scalar quantity.

Displacement

i. It is the change in position of a moving body in a particular direction.

ii. It is vector quantity

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B. Answer in detail :

1. Motion and rest are relative terms in relation to a reference point as one object may be at rest with respect to one reference point and in motion with respect to another at the same point. For example : People sitting in a railway compartment of a moving train seem to be in motion with respect to platform, trees etc. outside the compartment but at rest with respect to people sitting inside.

2. Sundial and Sand Clocks were the devices used in earlier time to measure time.

Sundial : It was used to know the time of the day.

Principle : It is based on the principle that length of the shadow cast by an object changes with the time of the day.

Sand Clock : It was first used by Romans, to measure the time.

Principle : It worked on the principle that a fixed amount of sand passes through a narrow passage in a fixed interval of time.

Pendulum Clocks : They are used to measure the time

accurately. It was established by Italian Scientist Galileo.

Principle : It is based on the principle that when a weight suspended with a string is allowed to swing, it completes its to and fro motion in exactly the same time.

3. The standard unit of measurement of time are seconds, minutes, hours days, years, decades, centuries and millenium.

Short time interval can be measured by watches which can be started or stopped at the precise time. Such watches are called stop watches. Many modern digital watches are also used to measure time in digits.

4. ***Difference between Uniform and Non-Uniform Motion is :*** A motion is said to be uniform when a body covers equal distances in equal intervals of time in a straight line.

But in non-uniform motion, a body do not covers equal distances in equal interval of time, as it slows down or speed up from time to time due to traffic or any other reason.

Example of uniform motion : A body is said to be in uniform motion, as it travels every 2 km in every 3 minutes interval of time.

Example of non-uniform motion : A body is able to cover different range of distances in every 3 minutes interval of time, it is in non-uniform motion.

5. ***Distance :*** It is the actual length of the path covered by a moving body irrespective of the direction.

Displacement : It is the change in the position of a moving body in a particular direction.

Their measurement : As distance is scalar quantity so it is calculated irrespective of the direction. If a body moves from Point A to B, then B to C and C to D, the distance travelled will be

$$= AB + BC + CD$$

Displacement is a vector quantity having megnitude and direction. It is taken as shortest distance between the initial and final position of a moving body.

Displacement in time $(t_2 - t_1)$ = (Final Position - Initial Position)

Chapter 12 : Electric Currents and Circuits

Page : 158

Recap Questions :

A.1 ***The different ways by which electricity may be produced are*** **:**

i. By using coal or natural gas as heat energy in thermal power house.

ii. Kinetic energy of water released from dams is used to produce hydroelectricity.

iii. Nuclear fission of materials like Uranium also produces electricity.

A.2 An electric current may be defined as electric energy that can light up electric bulbs, run fans, produce heat to cook or keep us warm and used in many other ways.

A.3 The components of electric Circuit are : bulbs, wires, key, dry cell, ammeter, resister etc.

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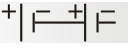
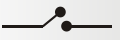
Part "A":

D. Match the columns A and columns B :

	A	B
i.	Bulb	
ii.	Battery	
iii.	Wire	
iv.	Electric Cell	
v.	Switch off position	
vi.	Switch on position	

E. Answer in one words :

1. Fuse or MCB

2. Insulator

3. Conductors

4. Battery

5. Filament

6. Alternator

Part "B"

A. Give Reasons for the following :

1. Fuse wire melts due to the heat produced on the passage of excessive current and breaks the circuit so it has low melting point.

2. Electromagnets are temporary magnets because it behaves as a magnet only when the electric current passes through it.

3. Plastic handle acts as insulator and prevents the electric shock while working with it.

4. To save electricity

B. Distinguish between these :

1. ***A Cell and A Battery***

A Cell : It is an electrical device having two terminals (+) and (-).

A Battery: It is a combination of two or more cells.

2. ***An Open Switch and Close Switch***

An open switch :

i. In an open switch circuit, electric path is broken.

ii. Bulb does not glow.

Close Switch

i. In a close switch circuit, electric path is completed.

ii Bulb glows.

C. Answer in detail :

1. The elements used in an electric circuit are :

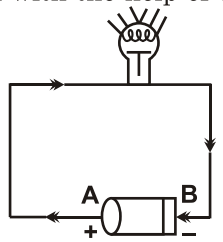
Bulbs, wires, key, drycell, ammeter, resister etc.

Their symbols and functions are as follows :

Elements	Symbol	Function
i. Bulb		It the bulb glows it shows the completion of an electric circuit.
ii. Wire		Used to connect the circuit.
iii. Key		Used to connect or disconnect the circuit.
iv. Cell		It makes the current move continously.
v. Ammeter		It measures electric current.
vi. Resister		It offers resistance to the flow of electric current.

2. Potential difference is the pressure difference between the two points having different potentials in an electric wire.

It can be explained with the help of diagram as follows :



Dry cell

When current flows from point A to B in wire, it means A is at higher potential than B and there is a potential difference between the two points.

3. There are two types of effects of electric current are observed. These are :

i. Heating effect of current.

ii. Magnetic effect of current.

Heating effect of current : The production of heat in a resistor when electric current passes through it is due to the heating effect of electric current.

For example : In the electric bulb, the nichrome filament gets heated up on passage of electric current and emits light.

4. ***An experiment to show the magnetic lines of force is as follows :*** Pass an electric wire through the centre of a smooth card sheet and sprinkle fine iron fillings uniformly on the card sheet. Connect the two ends of the wire to the two terminals of the battery. It is observed that the iron fillings get arranged in concentric rings, having centre at the point of insertion of the wire. These are the magnetic lines of force.

5. ***Electric Bell :*** The working of electric bell is based on the principle of effect of electromagnet on pressing the push button of the electric bell. The current starts flowing as the circuit is completed, it attracts the soft-iron armature towards the electromagnet leading to hitting of gong with the hammer. As soon as this happens, the circuit breaks at point A, stopping the flow of current. The electromagnet loses its magnetic power. The sequence begins again as the spring pulls the armature back to get in contact with the electromagnet.

Chapter 13 : Air, Storms, Cyclones

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Recap Questions

A.1 Atmosphere is the cover of air that surrounds the earth. There are four layers of the atmosphere. These are :

1. Troposphere
2. Stratosphere
3. Mesosphere
4. Thermosphere

A2. The pressure exerted by the air at any point on the earth is called the atmospheric pressure at that point.

Its unit are cm or mm of mercury in a mercury barometer.

A.3 Air has pressure. It can be demonstrated by a simple activity as follows :

Take an empty tin and fill it with water. Heat the can over a burner, till the water starts boiling. Seal the can with the cap and stop heating. Let it cool under water. We will observe that the can gets deformed. Initially the pressure in the empty can and outside is the same. On boiling water the steam is produced which forces the air out. But on cooling this steam gets condensed. The pressure decreases inside more than the outside pressure which deforms the can.

A.4 Mercury barometer is a device used to measure atmospheric pressure.

A.5 The movement of air from the area of high pressure to the area of low pressure causes the formation of wind.

It is different from air as wind is caused when air is at higher speed than normal. When in normal speed, it is air but when at higher speed it becomes wind.

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Part "A"

D. Match the following

	A	B
i.	Cyclone	a low pressure area surrounded by high speed wind.
ii.	Monsoons	wind carrying water.
iii.	Anemometer	measures wind speed
iv.	Wind	moving air
v.	Tornado	a dark funnel shaped cloud.

Part "B"

A. Answer in three or four sentences :

1. It is so because speed of light is more than the speed of sound.

2. ***i.*** People should be aware of safety guidelines provided by

the govt. agencies on T.V., radio, newspapers etc.

ii. Move to safer place.

3. Wind currents are produced due to uneven heating of land.

4. A calm condition prevailing in the centre of the cyclone is called the 'eye' of the cyclone.

5. i. Do not stand under a tree.

ii. Do not use an umbrella with a metallic handle.

B. Answer in detail :

1. The three layers of atmosphere are :

i. Troposphere

ii. Stratosphere

iii. Mesosphere

Troposphere : This layer comprises of clouds, rain and snow. It contains nitrogen (78%), Oxygen (20.9%) and other gases and water vapours (0.03%).

Stratosphere : It is the layer above the troposphere. It extends upto the height of 50 km. Ozone layer lies in the central part of this layer. It protects living organisms from UV rays.

Mesosphere : It has very thin air and extends from the height of 50 km to 80 km. The temperature may fall to -85° at the height of 80 km from the earth.

2. ***Significance of air pressure :*** Air pressure is significant to us in many ways. These are :

i. The difference in air pressure creates the formation of wind.

ii. Clouds, rains clear skies are due to difference in air pressure.

iii. It brings about changes in weather.

iv. The weather forecast also depends on changes in atmospheric pressure.

3. ***Lightning :*** Rapid flow of electric charge through the air between two oppositely charged clouds is called as lighting.

Thunder : It is a loud sound produced due to rapid expansion of air which creates disturbance through the air.

Thunder Storm : The heat produced during lightning causes the warm air from earth to move up. The droplets of water in the warm air moving up wards get frozen and fall. All this forms the thunder storm.

4. Cyclones : The circulatory movement of wind in tropical region is called as cyclone. It can be clockwise as in Southern Hemisphere or anticlockwise in Northern Hemisphere.

Destructive effects of cyclone are :

i. It causes floods due to pushing of water.

ii. It causes heavy loss of property and life.

iii. It also results in loss of fertility of soil.

iv. Trees get uprooted, houses collapse and telecommunication lines get disrupted.

5. ***INSAT :*** It is a satellite which helps in providing area specific services by the specially designed cyclone warning dissemination system. It works even giving when conventional communication channels fail.

Chapter 14 : Light

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Recap Questions

A.1 Luminous bodies are the bodies which emit light of their own. For example : Stars, Sun, burning candle etc.

Non luminous bodies are the bodies which do not have any light of their own but shine or are visible when light from the luminous body falls on them and is reflected to our eyes.

For example : Moon, earth, furniture etc.

A.2 Non luminous bodies shine or are visible to the human eye when the light from the luminous body fall on them and is reflected to our eyes.

A.3 Reflection is a phenomenon of light, in which the light rays are send back from the reflecting surface to our eyes.

A.4 Rought surfaces give dull image as they are bad reflectors of light.

A.5 We cannot see object behind opaque screen because the object behind opaque screen do not get light, hence no phenomenon of reflection takes place from it and thus it becomes invisible to us.

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Recap Questions

A.1 The difference between a convex and a concave mirror is that : Convex mirror has its reflecting surface on the outside of the sphere but a concave mirror has its reflecting surface on inside of the sphere.

A.2 When the object is at infinity the image formed by a concave mirror will be :

i. At the focus

ii. Very small

iii. Real

iv. Inverted

A3. A viretual image is a image formed when rays of light appear to meet a point after getting reflected from a plane mirror.

A.4 ***Uses of concave mirror are :***

i. It is used as looking glasses for shaving, make up.

ii. It is used as reflectors in search lights head lights etc.

iii. It is also used by dentists.

iv. In solar heating devices it is used as radiation collectors.

A.5 Ray diagram to show the image formation by a convex mirror is as follows :

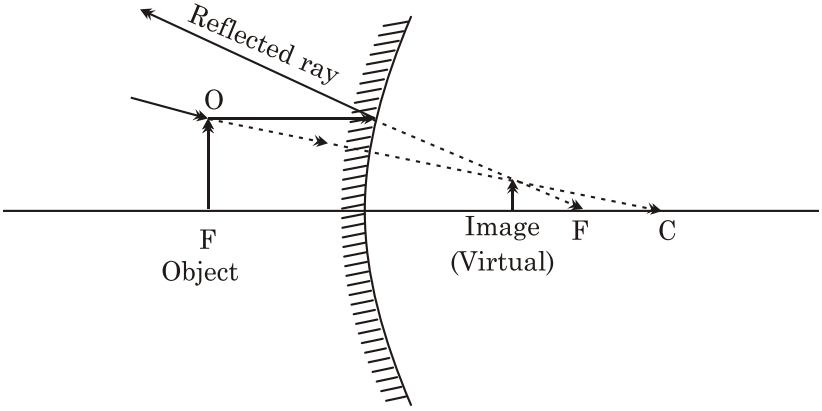

Image formed by convex mirror is : Very small, erect and virtual.

Image formation in convex lenses depends upon the distance of the object from the optical centre of the lens.

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Part "A"

D. Match the following :

	A	**B**
i.	A plane mirror	the image is erect and of the same size as the object.
ii.	A convex lens	the image is always inverted and magnified.
iii.	A concave mirror	used by dentists to see enlarged image of teeth.
iv.	A concave lens	can form image of objects spread over a large area.
v.	A convex mirror	the image is erect and smaller in size than the object.

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E. Answer in one or two words :

1. Dispersion

2. Rainbow

3. Concave

4. Convex

5. Regular reflection

6. Rainbow formation

Part "B"

A. Give reasons :

1. Light is not unisitle through a bent pipe because light always travels in a straight line.

2. Concave mirrors are used by doctors to see enlarged image of teeth.

3. Convex lens is also called as magnifying glass because this lens is utilized in the construction of microscopes.

4. Rainbow is seen in the sky after the rain due to dispersion of sun to rays.

B. Answer in detail :

1. ***Rectilinear Propagation of Light***

It is the property of light to travel in a straight line. An experiment to show this property of light is as follows :

Take three same sized cardboard pieces. Make holes in the centre in each one of them. Place a burning candle on one side of the table in such a manner that the flame is in straight line with the holes of the boards. See through the other side of the set up, the flame will be visible. But when we disturb any one of the boards, the flame will not be visible. This shows the rectilinear propagation of light.

2. ***The two laws of reflection are as follows :***

I Law : The angle of reflection $\angle r$ is equal to the angle of incidence $\angle i$

II Law : All the three rays incident ray, reflected ray and normal concide at a point and lie in the same plane.

An activity to show these laws is as follows :

Take a white card sheet and paste a small strip of plane mirror on it. Let this stand vertically with the help of some support on a white paper. Fine ray of light fall on the plane mirror through a ray box. We will observe another ray coming out of the mirror. Mark the position of both incident and reflected ray with points on the paper. Remove all the things from the paper. Join the points marked. Draw a perpendicular at the point of incidence. This is the normal. Now, on measuring the angles of incidence and reflection we find both the angles are equal to each other.

i. Angle of incidence $\angle i$ = angle of reflection ($\angle r$)

ii. Incident ray reflected ray and normal all lie in the same plane.

3. We can demonstrate the kind of image formed by a plane mirror as follows :

Stand in front of plane mirror we will observe :

i. The parts of our body eg. head is at the upper end of the body in the image as in our body, image is erect.

ii. Size of the image is the same as that of the body.

iii. The distance of the image from the mirror and that of the object from the mirror is equal in size.

iv. The image cannot be obtained on the screen, it is virtual.

4. Details of the images formed when the object is at infinity in a concave mirror :

Image will be :

i. At the focus (F).

ii. Very Small.

iii. Real and Inverted.

Details of the image formed when the object is at the centre of curvature :

Image will be :

i. At the centre of curvature (C).

ii. Same size as the object.

iii. Inverted and real.

5. Image formation in convex lens is :

Type of image formation in convex lens depends upon the distance of the object from the optical centre of the lens. Path of rays help in locating the image formation are :

i. A ray coming parallel to the principal axis after passing through a convex lens passes through a convex lens.

ii. A ray of light passing through the optical centre of the lens travels straight without any deviation.

iii. A ray coming from an object passing through the focus of a convex lens become parallel to the principal axis after emerging.

Chapter 15

Natural Resources : Water and Forests

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Recap Questions

A.1 Some renewable sources of nature are : Water, Air, Soil.

A.2 Water is indispensable for living beings as most of the metabolic functions of our body like digestion, excretion growth etc are water dependent.

A.3 Underground sources of water like well, springs and water dug out from ground by tube-wells after purification is utilized by man for his day to day requirements like drinking, washing clothes, cooking, agricultural purposes etc.

A.4 We can change the state of matter by changing the conditions of temperature.

An activity to explain it is as follows :

Water exists in three states of water : Solid (ice), liquid (water) and gas (steam).

Solid ice melts to form water on heating, whereas at 0°C temperature it freezes to form ice. On boiling the water at 100°C temperature liquid water changes into steam. So, we see that on varying the temperature the water changes its state.

A.5 ***Water Cycle in Nature :***

It is the continuous circulation of water in nature from earth to air and back to earth.

Water, due to the heat of sun evaporates into water vapours which go high up in the sky and condense to form tiny droplets of water, which form the clouds. The clouds cause the rain and the water again reaches the earth.

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Recap Questions

A.1 The term water pollution refers to water which is not fit for drinking and cooking purposes due to some harmful substances and germs present in it.

A.2 Water at home can be purified by the following methods :

i. Filtration : Fine muslin cloth is used to filter suspended impurities.

ii. By Boiling : It kills the germs and bacteria present in the water.

iii. By chemical treatments : Clorine tablets, bleaching powder, potassium permanganate are also used to kill the germs.

iv. By exposure to ultra violet radiations : Domestic water purifiers like aqua guards are used to kill the germs present in water by exposing water to ultra voilet radiation.

A.4 Water should be conserved as the usable water is very limited. Therefore, we should use it wisely.

A.5 Forests and availability of water are inter-related because

forests bring rain and prevent soil erosion. This rain water seeps down under the ground and increases the ground water level.

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D. Answer in one word :

1. Plants

2. Water Cycle

3. Rain

4. Rain water harvesting

5. Boiling

Part "B"

A. Answer in three or four sentences :

1. The effects of water scarcity on life are :

i. Shortage of water for daily needs like drinking, washing, bathing etc.

ii. Crop cultivation will be affected due to less availability of water for irrigation.

2. Forests are helpful to us in the following ways :

i. They bring rain.

ii. They prevent soil erosion and also modify climate.

3. ***Flora :*** Flora means the plants and trees of a particular region.

Fauna : Fauna means the animal species of a particular region.

4. Water can be conserved as follows :

i. Avoid wastage of water by using it only when required.

ii. By Rain water harvesting.

5. ***Water Cycle :*** The continuous circulation of water in nature from earth to air, and back is called as water cycle.

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B. Answer in detail :

1. Water is considered as renewable source of energy because only 0.01% of total water is used by us. A big part of fresh

water is in the form of glaciers which are not used by us.

So, fresh water for us is limited on the earth.

2. Water is indispensable for living organisms because most of the metabolic functions of our body like digestion, excretion, growth etc. are water dependent.

Moreover plants also need water for photosynthesis on which all living organisms depend.

3. Natural sources of water are rain, ground water, wells, springs, sea, river, ponds etc.

Rain Water : It is the purest form of water as it occurs due to condensation of water vapours. As it comes down, it gets mixed up with dust particles and various gases of the atmosphere.

Wells, Springs : These are also the natural sources of water. These are underground sources of water. It should be purified before using as impurities and germs are present in it.

4. ***Scarcity of water :*** The deficiency of water due to depletion of ground water and going down of water table at many places lead to scarcity of water.

Conservation of Water

The usable water is very limited on the earth so it should be used very wisely and carefully conserved, which is known as conservation of water.

5. Biotic and Abiotic Components interact with each other in a forest as living organisms can live best when the abiotic components like temperature, air, water, soil, etc. are at their optima. Plants depend on air, water and sunlight for photosynthesis. Similarly, all animals need air, water and food to live.

Living Organisms also contribute in the modification of weather and climate. Thus, all the biotic and abiotic components interact each other and be in equilibrium for their survival.

6. ***Forests can be conserved by adopting the following measures :***

i. Cutting of trees should be stopped.

ii. More seedlings should be planted to get more forests.

iii. Forests should be protected.

iv. Methods of controlling plant diseases used be adopted.

v. Overgrazing should be avoided.

vi. Air, water and soil pollution should be controlled.

Model Test Paper I

Part "A"

A. Multiple Choice Questions :

1. (c)
2. (a)
3. (c)
4. (a)
5. (c)

B. True or False :

1. T
2. F
3. T
4. F
5. F

C. Fill ups :

1. nitrogen
2. cilia
3. excretion
4. pashmina
5. cubical

D. One word answer :

1. Respiration
2. Jute
3. Thermometre
4. 7
5. Enamel

Part "B"

A. Very Short Answer

1. Good food means food that contains all the essential nutrients in required amount.

2. The animals whose body temperature does not changes with respect to the surroundings temperature are called Homothermal animals.

3. Herbivorous Animals : Cow, Goat.

Carnivorous Animals : Lion, Tiger.

4. Tentacles, in hydra help in capturing the prey.

5. The process by which digested food is obserbed by the body to release energy is called Assimilation.

6. Enamel is the hardest substance of tooth.

7. Jute Fibres.

8. Two properties of bases are :

i. Bases are hydroxides of metals.

ii. Bases turn red litmus to blue.

9. Hydrogen gas.

10. Basic salts are the salts produced when bases reacts with acidic oxides.

B. Short Answer Type Questions

11. Photosynthesis is the name of the process of manufacture of food in green plants. The raw materials for it are carbondioxide, water, the presence of Chlorophyll and sunlight. The end products are glucose (food) and oxygen.

12. Difference between Saprophyte and Parasites :

Saprophytes : The organisms which get their nutrition from the dead and decaying organic substances.

For example : fungi like mucor.

Parasites : The organisms which get their nutrition by living in or on the other living organisms.

For example : Cuscuta plant.

13. The different parts of typical human tooth in vertical section are :

i. Root : The base of the tooth embedded inside the gum.

ii. Neck : It is the connecting part between the embedded root and the exposed crown.

iii. Crown : Upper part of the tooth outside the jaw which is exposed and used for eating.

14. ***Differences between wool and Silk fibres are :***

Silk Fibre :

(1) It is obtained from the cocoons of the silk moth.

(2) It does not give heat to our body.

Wool Fibre:

(1) It is obtained from the hair fleece of animal like sheep.

(2) It gives heat to our body.

15. Heat is transferred from our body to another when :

i. The two bodies are in contact.

ii. The body at higher temperature to the body at lower temperature.

iii. Heat is transferred till the temperature of both the bodies become uniform.

The ways by which it is transferred are :

a. Conduction

b. Convection

c. Rediation

16. ***Uses of Calcium hydroxide are :***

i. It is used for the preparation of bleaching powder.

ii. It is also used for white washing of buildings.

iii. It is also used for neutralizing acidity of soil.

iv. It is used for softening of hard water.

C. Long answer type questions :

17. The term nutrition describes the food taken by the living organism. It may be of many types like heterotrophic nutrition, Autotrophic nutrition etc.

18. The conditions necessary for the process of photosynthesis are :

i. Raw materials like carbon dioxide, water.

ii. Chlorophyll.

iii. Light intensity.

iv. Quality of light.

i. ***Raw Material, Carbon dixoide and water :*** These are essential for photosynthesis as the first step in photosynthesis is the breaking of water chemically CO_2 is also essential as rate of photosynthesis decreases with the decline in CO_2 Level.

ii. Chlorophyll is also an essential factor for it.

iii. Intensity of light also affects the rate of photosynthesis, more the intensity of light, more will be the rate of photosynthesis.

iv. Quality of light affects the rate of photosynthesis. Only blue and red regions of light are used for photosynthesis.

19. Tooth care should be taken by us in the following ways :

i. Brushing teeth every morning and night.

ii. Massaging of gums with soft brush.

iii. Washing the mouth with water after every eating.

iv. Avoid eating sugary, starely and oily foods.

v. Self cleansing vegetables and fruits should be consumed.

20.

	Fibres	***Source***	***Part Used***	***Quality***
i.	Alpaca	Members of camel family	hair	light, soft warm
ii.	Mohair	Angora goat	Fleece	very light weight, good insulater
iii.	Cashmere	Cashmere goat of Tibets and China	bellies of goat	Weaker than wool, soft, take dys easily.
iv.	Wool	Sheep	Fleece	durable, warm elastic,

	Fibres	*Source*	*Part Used*	*Quality*
				good insulators.
v.	Silk	Silk moth	thread from cocoon	Smooth, fine and silky to touch.

21. ***Strong Bases :*** The bases which reacts with acidic oxides to produce salt and water are known as strong bases.

For example :

i. Sodium hydroxide (NaOH) is strong base. It reacts with acidic oxide (Co_2) to produce salt and water.

$2NaOH + Co_2 \longrightarrow Na_2Co_3 + H_2O$

ii. Potassium hydroxide (KOH).

Uses of Sodium hydroxide :

i. It is used in the manufacture of soap and detergents.

ii. It is used in the manufacture of paper and pulp industry rayon, textiles, drugs etc.

Weak bases : Ex. : Magnesium hydroxide, Aluminium hydroxide.

22. When Copper Sulphate, ammonium chloride and sodium carbonate are treated with blue and red litmus solutions. They show following changes :

		Blue litmus	Red litmus
i.	Copper Sulphate	Red	No change
ii.	Ammonium Chloride	Red	No change
ii.	Sodium Carbonate	No change	Blue

D. Very long answer type questions :

23. Some plants which grow in soil deficient in hidrogen consume insects as supplement to nutrition from soil and

atmosphere, are known as Insectivorous plant. They have special structures which secrete enzymes to digest the insects.

For example : Pitcher plant, Venus fly tray.

They are different from other plants as they feed on insects but other plants do not.

Symbiosis is a kind of relationship between two living organisms which benefit from each other for their nutritional requirements.

For example : Lichens show symbiotic relationship between algae and fungi living together.

24. ***An activity to show that liquids expand on heating is as follows :***

Take a flask and fill it with water up to the brim close the flask with a rubber stopper having a hole in it. Introduce a narrow tube into the hole tightly. The water will use in the tube a little, note the level. Now, heat the liquid. First the level in the tube will fall first due to expansion of glass then it will start rising as the heat reaches the liquid. The level goes down again when the liquid is cooled back to normal temperature.

Model Test Paper II

Part "A"

A. Multiple choice questions :

1. (b)
2. (c)
3. (b)
4. (b)
5. (c)

B. Fill ups :

1. day
2. Herbs
3. asexual
4. carbon dioxide
5. loamy

C. True or False :

1. T
2. T
3. T
4. T
5. F

D. One Word :

1. Budding
2. Black soil
3. Chemical
4. Elephant
5. Clayey

Part "B"

A. Very short answer :

1. One basic difference between exothermic and endothermic reaction is heat is evolved in exothermic reaction but absorbed in endothermic reaction.

2. A change which result in the formation of new compounds, is known as chemical change.

3. Two examples of chemical change are :

i. Bursting of crackers.

ii. Rusting of iron.

4. Crust to the layer of the earth where life exists.

5. Silt and Clay are very fine particles settle with a fine layer of silt between clay and sand.

6. Stomata are the small openings present on the lower surface of leaves, through which excess of water is removed by the process of transpiration.

7. Blood vessel lining the nose, makes the inhale air warmer.

8. Organs of human excretory system are a pair of kidney, a pair of ureters, urinary bladder, urethra.

9. One basic difference between asexual reproduction and sexual reproduction is that in asexual reproduction only one parent is required to produce the offspring.

But in sexual reproduction both male and female parents are involved to produce the offspring.

10. Lotus, Coconut.

B. Short Answer :

11.

Tearing of Paper	Physical Change
Crystallization	Physical Change
Germination of Seed	Chemical Change
Melting of ice	Physical Change

12. Curdling of milk is a chemical change because new product is formed and it can not be reversed back into milk.

13. Existence of life on earth was appeared approximately 3.5 billion (350 crores) years ago. The first aerobes appeared between 3.5 to 2 billions years ago.

14. Laterile soil of India is suitable for growing crops of coffee, tea and coconut as it is rich in nutrient content.

It is found in regions of heavy rainfall. It is red in colour.

In India, it is found in Tamil Nadu, Western Ghats, Andhra Pradesh and Orissa.

15. An activity to show that temperature rises due to respiration is as follows :

Take some gram seeds and soak them in water overnight. Boil half of them for about 15 minutes. Keep the boiled seeds in a thermo flask (A) and the other half seeds which are not boiled in another thermo flask (B). Now, insert thermometers in both the flasks. Note down the initial temperature and leave both the flasks without disturbing for a day or two. We will see that temperature in flask (B) slowly uses having unboiled seeds and become constant after sometime but there is no change in temperature of flask (A).

This shows, that temperature rises due to respiration in flask (B) as it has live seeds which respire and results in increasing the temperature.

16. Unit of excretory system consists of following organs :

i. A pair of kidneys.

ii. A pair of ureters.

iii. Urinary Bladder.

iv. Urethra.

The main function of excretory system is to excrete metabolic waste from the body, as they are very toxic for our body.

C. Long Answer Type Questions

17. The development of seed into seedling on getting favourable conditions of air, water and temperature is known as germination of seed.

18. Climate is greatly affected by the seas as coastal areas are cooler and humider as compared to inland areas. Sea breeze and land breeze causes the formation of clouds. Hot ocean current makes the climate warm and wet whereas cool ocean current makes the climate cool and dry.

19. ***Different agent in nature brings about weathering as follows :***

i. The force of wind breaks bigger rock pieces into smaller particles.

ii. Water enters into the crevices of rock which increases in volume.

It exerts pressure on the rocks to break them.

iii. Constant changes in temperature causes expansion and contraction of rocks.

iv. Oxidized form of minerals crimble to form soil.

20. ***Blood Groups :*** Blood is a fluid connective tissue, which has different type of antigens on the basis of which blood is categorised into different groups known as blood groups.

There are mainly four types of blood groups. These are A, B, AB and O.

Different blood groups have the different types of antigend on red blood cells :

Blood group A : Antigen A

Blood group B : Antigen B

Blood group AB : Antigen A and B

Blood group O : No antigens

21. Two artificial methods of vegetative propagation are :

i. Layering

ii. Cutting

Layering : In this method, the lower branch of the stem is bent to the ground and covered with moist soil. After some days the roots arise from the part of stem buried into the soil and small leafy stem is also produced giving rise to new plant after being separated and planted. Example Jasmine.

Cutting : A portion of a stem of a plant having a bud is planted in the soil. The new plant is produced by producing roots first. For example : Rose, Sugarcane etc.

22. The flower is the reproductive part of a plant. A flower may be unisexual having either male or female part or

may be bisexual having both male and female parts on the same flower.

A flower is complete when all the four whorls are present and incomplete when any one or more whorls are absent.

Its four whorls are :

i. ***Calyx :*** It is the outermost whorl of flower in the form of green leafy structures called the sepals.

ii. ***Corolla :*** It is the second whorl of flower composed of colourful leafy structures called the petals.

iii. ***Adroecium :*** Inner to corolla, a whorl of filaments bearing anthers at the top are present called stamens. Anther have pollengrains inside them which produces the male gametes.

iv. ***Gynoecium :*** It forms the innermost whorl of flower. It consists of basal broader part ovary which continues into a tubular structure the style ending into stigma. Ovules are present inside the ovary which produce female gametes.

D. Very long answer type questions :

23. Soil is considered as a very useful natural resource for mankind as :

i. It plays an important role in the lives of whole mankind. All the green plants, on which we depend upon food and other needs take water and minerals from the soil. Soil holds the plants firmly in it by the help of roots.

ii. Coal, petroleum are obtained from soil.

iii. Clay is also used in making bricks, pottery, toys, tiles etc.

iv. Minerals are also obtained from the soil.

v. Sub soil water is stored for our use in drinking and other ways.

Following methods should be employed for its conservation. These are :

i. Step farming : To hold run off water and soil, step

farming is done in hilly areas.

ii. Afforestation : Growing small plants and trees also help to bind soil on bare land areas.

iii. River embankment and dams : The flowing water is prevented from coming in contact with the neighbouring soil by river embankment. Dams check the free flow of water.

iv. Prevention of overgrazing also protect the green cover of land.

24. Urine in human body is formed by the pair of kidneys. Each kidney consists of numerous coiled tubes called nephrons. Each nephron has coiled network of capillaries containing blood called the glomerulus. This filters the incoming blood to form filtrate containing water, glucose, salts and nitrogeneous waste substances. The urine formed comes out of the kidneys and passes into the urinary bladder via the ureter. It is passed through urethra.

Dialysis : When kidneys are not working or are damaged the body wastes can be removed by putting the patient on a machine called dialyzing machine. So, this artificial method of remaining wastes from the blood of patient is called Dialysis.

Model Test Paper III

Part "A"

A Multiple choice questions :

1. (d)
2. (b)
3. (d)
4. (b)
5. (b)

B. Fill ups :

1. filtration
2. water cycle
3. dispersion
4. wind
5. alternating.

C. True or False :

1. T
2. F
3. T
4. F
5. F

D. One Word Answer :

1. Chlorine
2. Mirror
3. Troposphere
4. Copper
5. Second

Part "B"

A. Very Short Answers :

1. Rest.

2. Watch.

3. Distance is the actual length of the path travelled or covered by a moving body without taking direction into consideration.

4. Conductors are the materials that allow an electric current to pass through them.

But insulators do not allow an electric current to pass through them.

5. Sand Clock is a device used to measure time in which fixed amount of sand passes through is narrow passage in a fixed interval of time.

6. Fast blowing air from the area of high pressure to low pressure area is called wind.

7. Two precautionary measures to be taken during a thunder storm are :

i. Do not use an umbrella with a metallic handle.

ii. Do not sit under a tree.

8. i. A ray coming parallel to the principal axis after passing through a convex lens passes through a convex lens.

ii. A ray of light passing through the optical centre of the lens travel straight without suffering any deviation.

9. On mountain top water exists in solid form in the form of snow and in air it exists in gaseous form i.e. in the vapour form.

10. Indiscriminate use of pesticides and fertilizers affect water bodies by polluting it.

The water becomes unsafe for our use. It also affects the aquatic animals and plants also.

B. Short Answer Type Questions

11. Distance Covered = 300 km

Time taken = 6 hours

Speed = ?

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}} = \frac{\cancel{300}^{50}}{\cancel{6}_{1}} = 50 \text{ km/h}$$

12. Differences between speed and velocity are :

Speed

i. It is the distance covered by a body in a unit of time.

ii. It is a scalar quantity.

Velocity

i. It is the distance travelled by a body per unit time in a given direction.

ii. It is a vector quantity.

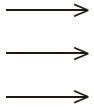
13. Solenoid : It is prepared by twining insulated wire on a hollow cylindrical plastic tube. It shows magnetic properties when electric current is passed through it.

14. An activity to show that air expands on heating is as follow :

Take an empty narrow necked thin glass bottle. Fix a deflated balloon over the mouth of the bottle. Place the bottle with the balloon in boiling water. We will observe that the balloon gets inflated as the bottle gets heated up.

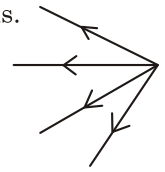
This shows the expansion of air in heating.

15. ***Parallel beam of light :*** Whewn the rays of light travel in straight line.



parallel beam of light

Divergent Beam of Light : When the light rays diverge in all the directions.



Convergent beam of light : When the light rays appear to focus at a point.

16. Advanced forecasting and warning systems are issued to central and state government officials for disaster management and relief for general public, fishermen, farmers etc. Two warnings are issued, one cyclone Alert before 48 hours and the Second, 'Cyclone warning' 24 hours in advance.

C. Long Answer Type Questions

17. Motion along a straight line is the simplest kind of motion when it is in a straight line.

It may be of two types : 1. Uniform motion
2. Non-uniform motion

Relative speeds :

Snail	0.05 km/h
Deer	36 km/h
Horse	60 km/h
Cheetah	90 km/h
Jet plane	3600 km/hr

18. ***Electric Diagram :*** The arrangement of different components in an electric circuit using their symbol is known as electric circuit or diagram.

 is battery

 is key or switch (open)

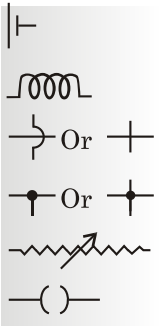
 bulb or lamp

 is fixed resistance (or conductor)

 is milliammeter.

 is connecting wire

Other symbols used in electric circuit are :



Electric Diagram

Various elements with their symbols and uses are as follows :

i.		Battery	
ii.		Key	to connect or disconnect the electric current.
iii.		Bulb	If the bulb glows, it shows the completion of electric circuit.
iv.		Resistor	It offers resistance to the flow of electric current.
v.		Milliameter	measures small current
vi.		Connecting wire	used to connect the components in circuit.

19. ***Domestic Electric Circuits :***

The electric circuits that are used to supply electric current for domestic uses.

They are utilized at home for running fans, for heating, lighting keep homes warm and cool, cooking, washing and ironing clothes etc.

Electric fuse and MCB are the devices used to protect any electrical device from overloading of current.

20. Dispersion of white light : Splitting of white light into seven colours is called Dispersion.

Rainbow in sky is formed by natural phenonenon usually after the rain. Rain droplets act as small prisms, when rays of sunlight fall on these drops, the light disperses into seven colours. This together forms a colourful band of seven colour spectrum.

21. ***All the living organisms depend on water in many ways these are :***

i. Metabolic functions of our body like digestion, excretion, growth etc. are water dependent.

ii. It regulates body temperature by evaporation and sweating.

iii. It provides medium for transportation of materials in living organisms.

iv. It acts as a solvent for many substance to undergo biochemical reactions.

v. If is the main raw material for photosynthesis by green plants.

vi. It also helps in germination of seeds, growth and translocation of materials, movements etc. in plants.

vii. Many living organisms live in water also.

22. The interaction between animals and plants in the forests is as follows :

i. They depend on each other in many ways in forests.

ii. Plants prepare food by the process of photosynthesis and the animals depend on them for food.

iii. Animals find their shelter in plants.

iv. Direct heat and rain is avoided due to trees and thus protect animals.

v. Animals help in dispersal of seeds.

vi. Animals breathe out carbon dioxide, which is used by plants for photosynthesis.

vii. Dead remains of animals with plants help in formation of humus and provide minerals to the plants.

D. Very Long Answers :

23. An activity to demonstrate magnetic effect of electric current is as follows :

Make an electric circuit with AB in the north south direction. Place a magnet needle near AB and let it be steady in the north south direction. When the electric current is passed the needle show deflection but their is no deflection in the needle when the current does not pass. It shows the magnetic effect of electric current.

24. The precautionary and safety measures taken against the cyclone are :

i. People should be aware of the safety guidelines provided by the government agencies on T.V., Radio, Newspapers etc.

ii. We should try to move to safer places or shift essential and valuable items away from the cyclone hit area.

iii. People should be equipped with emergency phone numbers like fire brigade, Police, Hospitals etc.

iv. People should not drive especially on wet roads submerged by flood waters.

Notes