MODERN SCIENCE - 8

CONTENTS

1. Crop and Food Production

(I) Answer the following questions :

1. What are crop plants ? List some examples of common crop plants in the form of a table.

Ans. Plants grown in a field on large scale are known as crops or crop plants.

Some crop plants:-

1.	Cereals of grain crops	Rice, Wheat, maize, barley, bajra, jawar and ragi
2.	Fiber crop	Cotton, hemp and jute
3.	Oil seeds	Mustard, groundnut sunflower and seasame
4.	Root crops	Sweet potato
5.	Tuber crops	Potato and topicca
6.	Sugar crops	Sugarcane and beetroot
7.	Plantation crops	Coffee, tea, rubber and coconut
8.	Medicinal crops	Mint, tulsi, cinchona and belladonna.

2. What is herbarium and what activities will you perform to prepare a herbarium file ?

Ans. A herbarium is a systematically arranged collection of dried plants. To prepare a herbarium file.

1. **Looking for plants :-** Almost all natural environments are suitable for looking plants for the herbarium.
2. **Picking up plants :-** Pick up only fresh crop plants with the help of a handy spade. Press the speciemen gently between the newspaper.
3. **Collecting information :-** To identify the specimen collect some important information about them.
4. **Drying :-** Dry the specimen into a press made up of heavy cardboard.
5. **Mounting the specimen :-** Mount the specimen after it had dried.
6. **Putting labels :-** Put label of name on the speciman.
7. **Organizing :-** Place all the sheet one upon the other.

3. What are the measurements for obtaining better crop production by the farmers ?

Ans. The various agricultural practices which a farmer performs to cultivate a crop are :

1. Preparation of soil.
2. Selection and sowing of seeds.
3. Applying nutrients and fertilizers.

4. Manures.
5. Irrigation.
6. Fertilizers.
7. Weeding
8 Harvesting,
9 Crop protection.

4. What is irrigation and what are the different methods of irrigation.

Ans. The supply of water to crops at different intervals is called irrigation. Methods of irrigation.

1. Flood Irrigation
2. Basin Irrigation
3. Deep Irrigation
4. Furrow Irrigation
5. Sprinkler Irrigation
6. Lift Irrigation

5. Give an account of preservation and storage of grains. What are the important features of storing grains on large scale.

Ans. Keeping the harvested crops till they are finally taken to the consumer is called storage. Following are important feature of good storage structure for storing grains on a large scale.

1. It should be easy to clean.
2. It should be water proof.
3. It should be well protected from rodents etc.
4. It should protect the grains against variation in temperature or humidity.
5. It should be located at a convenient place so that transportation become easy.
6. It should be convenient of regular check up of stored food materials.
7. It should be convenient for the use of pesticides and also for the control of other micro-organisins.

6. Explain in detail the meaning of corp rotation ?

Ans. Growing different crops in the same land by rotation such that manuure dependence is reduced and weeds are vendered ineffective is called crop rotation. In the first year, shallow rooting cereal crop are grown. In the second year deeper rooting crops are grown such as potatoes. In the third year, barley or oats may be grown such that patato blight the disease in curtailed. Forth year, leguminous plants like pea are grown so as to replenish the nutrients by fixing nitrogen of the air in the soil another practice of crop rotation is called multiple cropping. Growing of two or more crops in the field,At a time is called multiple cropping.

7. What do you under stand by the terms nitrogen fixation and nitrogen cycle ?

Ans. Nitrogen Fixation :- The process of converting atmospheric nitrogen into compounds which can be used by plants is called nitrogen fixation.

Nitrogen Cycle :- Once the nitrogen has been fixed it is absorbed by the roots of the plants Animal eat these plants when animals or plants die, bacteria decompose their bodies and the nitrogen is released in the atmosphere. Thus the cycle goes on and it is known as nitrogen cycle.

II Write whether the following statements are true or false :

1. T, 2. T, 3. F, 4. T, 5. F, 6. T, 7. F, 8. T, 9. T.

III Fill in the blanks with suitable words :

1. A *Herbarium* is a systematically arranged collection of dried plants.
2. Manures are rich in *Organic* nutrients.
3. Ploughing is also called *Manuring.*
4. The organisms which damage the crops are called *Pest and insects.*
5. The process of seperating grains from the chaff is called *Winnowing.*
6. Simultaneous growing of teo or more crops in a field is called *Multiple cropping*
7. Harvesting is done by a machine known as *Combine and thresher.*
8. *Nitrogen* enters the soil through a process called nitrogen fixation.

IV Define the following terms : -

1. **Agriculture :-** It is the science of growing plants and raising aimals useful to human.
2. **Crop plants :-** Crop plants are cultivated by the farmers in various forms like cereals, vegetables and fruits of their own use and also for profits.
3. **Tilling :-** Tilling or ploughing is the process in which soil is turned over by a few inches. It is the first necessary stage for cultivation.
4. **Crop yield :-** The harvested crop called 'produce' represents crop yield.
5. **Nitrogen cycle :-** Continuous circulation of nitrogen among the soil, water, air and living organisms is known as nitrogen cycle.
6. **Weeding :-** Weeds are undesirable plants in crop fields which start growing along with the crop plants. The removable of weeds is called weeding.
7. **Horticulture :-** It is the branch of agriculture and is the science of growing vegetables, fruits and ornamental plants.
8. **Pesticides :-** Pesticides are sprayed on the plants to keep off the pests.
9. **Broadcasting :-** The Practice of sowing seeds by hand is called broadcasting.

V. Write short notes on the following :-

1. **Preparation of Soil :** The first necessary stage for cultivation of crops in

the preparation of soil. The soil is turned over by a few inches by the process of ploughing or tilling. The ploughs are chosen according to the type of soil. For hard soil, the plough must have sharp iron blades to break the soil, preparation of soil is helpful for water distribution and for its productivity.

2. **Sowing of seeds :** Sowing is the process of putting the seeds into the soil. Seeds need to be swon at a praticular depth which varies from crop to crop. Seeds sown too deep into the soil may not germinate due to non availability of air and moisture. There are two methods of sowing the seeds. The first method is by scattering seeds in the field by hand. Known as broadcasting it is used for planting crops like wheat and rice. The second method is done by using seed drills. Seeds of rice and many vegetables are not sown directly into the soil. Instead, they are first sown in a small plot called nursery and allowed to grow into small plants called seedlings. Healthy seedlings are then picked out and transferred to the field. This is called transplanting.
3. **Winnowing :** After threshing seeds or grains are separated from the chaff (hey) by the wind. The chaff being lighter is blown a little far away by the wind than the grain or seeds which being heavier fall straight to the ground.
4. **Irrigation :** For the survival and proper growth and development of crop plants water is necessary. The supply of water to crops at different intervals is called it irrigation.
5. **Transplanting :** Healthy seedlings are picked out and transferred to the field. This is called transplanting. It helps in slecting healthy seedlings and increasing crop yield. Proper distance is kept between plants and rows so that plant could get enough air water and sunlight.
6. **Water logging :** Excess water supply to the plants such as wheat and maize results in a condition called water logging. Water logging reduces air in the soil and damages the roots. If water logging persists for a long time period, even the soil organisms are killed.

VII Match the statement :-

1.	Rice	Cereal
2.	Bean	Legume
3.	Cotton	Fibre
4.	Honey	Honey bee
5.	Hatching	Incubator

VIII Name the following :-

1. **Any two tools used for picking up plants.**

Ans. a. Thresher b.Combine

2. Two types of crops grown in India.

Ans. a. Rabi b. Kharif

3. Any three cereals grown in India.

Ans. a. Rice b. Wheat c. Maize

4. Two sugar crops.

Ans. a. Sugarcane b. Potato

5. Two methods of sowing

Ans. a. Broadcasting b. By using drills

6. Any two weed killing chemical.

Ans a. 2, 4D. (2, 4-dichtoro phenony active acid.)

b. MCPA (4-Chlora- 2 methyl phenoxy acetic acid.)

7. One Rabi and one Kharif crop

Ans. Wheat, Rice

IX Tick the Correct answer :-

Ans. 1. - a. 2. - d. 3. - b. 4. - b. 5. - a.

2. Micro-Organisms

(I) Answer the following questions :

Q 1. Write about micro organisms and their occurrence in detail ?

Ans. Micro organisms are defined as those living organisms which can be seen only through a powerful microscope. They are also called microbes. Microbes exists in all kinds of environment. They are found in the soil, mud, water, air, plants, animals, food products and utensils. They are also found on dead weeds, clothes, books, jams, pickles, dung shoes etc.

In human they are found on skin, mouth cavity, gastro intestinal tract, respiratory tract, urinogenital tract and eyes.

Q 2. Write in short about the major groups of micro organisims ?

Ans. There are 5 major groups of micro organism :

1. **Bacteria :** Unicellular without chlorophyll.
2. **Fungi :** Unicellular or multicellular without chlorophyll.
3. **Protozoans :** Unicellular animals
4. **Viruses :** Minute particles.
5. **Algae :** Unicellular or multicellular with chlorphyll.

Q 3. Write in detail account of algae ?

Ans. Algae are simple plants that have no roots, stems or leaves. Algae are classified in plant kingdom because it has several plant like properties like other plants, the algae have cell wall and chloroplasts. The size of algae ranges from 1 micron to serval metres in length Algae contain different types of pigments which give them their characteristic colours algae can be classified into following types :-

i. Red algae.

ii. Green algae.
iii. Blue green algae.
iv. Brown algae.

Algae reproduce sexually as well as asexually. They also reproduce by fragmentation or binary fission which enables to multiply them quickly.

Q 4. What are bacteria and where are they usually found ? whar are the different types of bacteria ?

Ans. Bacteria are considered as plants. They are unicellular and most occur single some of them occur in groups. Bacteria are found in the air, food and soil. They are almost in all places where life is possible a large number of bacteria. Occur in human and animal bodies. They can survive in extremely cold and hot conditions and can live both in the presence or absence of oxygen.

According to their size and shape, bacteria are classifed as follows :

1. **Cocci :** Oval or spherical in shape.
2. **Bacilli :** There are rod shaped.
3. **Spirilla :** Spiral shaped bacteria.
4. **Vibrio :** Incomplete short and comma shaped bacteria.

Q 5. In what ways bacteria are supposed to be useful to man Describe ?

Ans. Bacteria play a very important role in the economy of nature and in the human economy as well as. Bacteria decompose the oraganic matter of dead organisms and organic wastes into its basic inorganice parts with the result carbon-di-oxide, water, nitrogen and sulphur are returned to the soil and atmosphere. This cycling of materials can only occur in presence of certain bacteria. Important uses of bacteria are as follows :

i. **Nitrogen fixation :** Nitrogen fixing bacteria are found living on small nodules in the roots of leguminous plants. There bacteria pick up free nitrogen of the atmosphere and convert its solublenitrates. These nitrates are used by host plants and also by other plants shown later in the same soil.
ii. **Nitrification :** Plants need nitrogen for making protein but they are unable to make use of the free nitrogen of the atmosphere. The bateria first convert dead remains of plants and animals into ammonium ammonia is first converted into ammounium compounds which after wards convert into nitrites and then into nitrates. In food chain, in antibiotics in sewage disposal, in dairy products bateria are very usefull.

Q 6. Write a note on differnet type of viruses ?

Ans. Viruses are objugate parasities. The relationship between the host and the viruses in known as parasitism as the viruses (parasite) benifits and the host is harmed. They are so small that they can not be seen with naked eye. They are found inside the cells of plants, animal and humans.

Viruses can be classified as follow :

i. **Bacterial viruses :** The viruses that attack bacteria are called bacteriophage (meaning bacteriumeater). It was bacteria as a host cell.

ii. **Plant viruses :** The viruses that use a plant body as a host are called plant viruses.

iii. **Animal viruses :** The viruses that use an animal as a host are called animal viruses.

Q 7. What are fungi ? How do they reproduce and from where do they get their food ?

Ans. Fungi are large group of organisms they are plant like heterotrophs. They are like plants but are heterotropic because they do not have chtorophyll and cannot synthesize their own food. They obtain their food from dead organic matter or living orgnisms. Fungi occur almost everywhere in nature. They grow in water, soil, air,onfood, leather, cloth optical instruments etc.

Reproduction : Reproduction in fungi takes place both by sexual and asexual means. Most fungi reproduce asexually by producing spores, that grow into new fungi. Some fungi such as yeast, reproduce asexually by budding. Others split by fission. Most fungi also have a asexual reprodution stage during their life cycles, producing apores that act like gametes. They combine to form a zygoe. Which develops a new fungus.

Q 8. Give uses and harms of various types of fungi ?

Ans. Economic importance of fungi :-

i. Some fungi such a mushrooms are eaten raw or cooked.

ii. Yeast being rich in amino acids and proteins.

iii. Some fungi produce antibiotic that are used to treat infections and diseases.

iv. Another funges as per gillus is used for producing large quantities of citric acid.

v. In bread making yeast is added to the uncooked. dough to make the dough rise.

vi. Helpful in controlling plant diseases caused by insects, viruses and other fungi.

Harmful fungi :

i. **Decay of wood :** Some fungi grow on timber yeilding plants such as sal, teak, deodar etc.These fungi secrete decomposing enzymes and heart.

ii. **Animal diseases :** Fungi cause a number of human and animal diseases.

iii. **Plant diseases :** Some fungi infect many economically important plants

and minimize the yield of food to a great extent.

Q 9. Write a short note on protozon ?

Ans. Protozon are tiny unicellular organisms with lack cell wall and chhlorophyll and so are included in animal kingdom. Protozon live in water and soil and in the decaying organic matter. Some protozoan live in the body of other organism as parasites.

A paramaceium is covered with short hair like structure called cilia. It uses cilia for movement. It moves through water by beating its cilia. Amoeba is the most common and simplest form of protozoan. It moves by changing its shape by sending out psendopodia which are finger like cytoplasm.

II. Write whether the following statements are ture or false :-

1. F. 2. F. 3. T. 4. F. 5. F. 6. F. 7. T. 8. T.

III. Fill in the blanks with suitable words :-

1. Algane can make their food because they contain *Chlorophyll* .
2. Bacteria cannot survuve at very *high* temperature.
3. The size of protozoans varies from 2 to *2oo* microns.
4. Bacteria generally reproduce *asexually*.
5. The fungus that grows on bread is called *saprophytes.*
6. The virus that attacks bacteria is called *bacteriophage*.
7. Cells of diatoms are a reich source of *Silica*.
8. The diasease causing bacteria are called *Pathogenic*.
9. The plant body in multicellular fungi is made up of *hyphae*.

IV. Match the statements :-

1.	The simplest protozoan	:	Amoeba.
2.	Yeast	:	Reproduces by building.
3.	Autitrophs	:	Which can make their food.
4.	Protest	:	All simple microbes.
5.	Germs	:	Disease can make thier food.

V. Name the following :-

1. Two bacteria causing food poisoning.
   i. Salmonella ii.Clostriclum.
2. Two fungi causing food poisoning.
   i. As per gillus. ii.Penicellium.
3. A nitrogen fixing bacteria.
   i. Small nodules in the roots of leguminous plants.
4. A fungus used in bread industry.
   i. Yeast.

5. Two disceases each caused by bacteria, fungi. protozoan and viruses.

Diseases by bacteria	:-	i.	Tetanus	ii.	Tuberculosis.
Fungi	:-	i.	Rust	ii.	Smut.
Protozoan	:-	i.	Amoebia Dysentry	ii.	Malaria.
Viruses	:-	i.	Polio	ii.	Aids.

6. A specialized cell found in blue green algae.
   Spirogyra.
7. A Bacteria that hepls in the curdling of milk.
   Lactobasicillus Bacteria.
8. A micro organism used in the production of alcohol
   Yeast.
9. Two food items prepared using yeast.
   i.Bread making ii.Idli and Dosa.
10. Two food stuffs for which oil is used as a preservative.
    i.Pickles. ii.Chutneys.
11. Two saprophytic fungi.
    i.Mucor ii.Pin mould.

VI. Do yourself.

VII. Define the following :-

1. **Diatoms :**

Ans. Diatoms are microscopic and unicelluar organisms. They have hard, sculp tured cell walls containing silca. They are comman in salt and fresh water and some in damp soil. A diatom has an outer shell with two parts. One part fits over the other like a lid on the box.

2. **Food- preservation :**

Ans. Micro organisms, insects and enzymes spoil the foodpoisoning by multiple growth and toxins produced. So food preservation is done by proving conditions in which micro organism cannot live. This process is known as food preservation.

3. **Pasteuriztion :-**

Ans. Milk is preserved by this method. First the milk is boiled to kill bacteria. Then it is cooled very fast to prervent bacteria from growing. It is finally stored at low temperature. This method of preservation is called pasteurization. It kills the bacteria present in the milk and does not affect its flavour.

4. **Food Poisoning :-**

Ans. If food is not preserved propely. It can lead to poisoning. Micro organisms like bacteria and fungi are responsible for food poisoning. Salmonella and clostridium are examples of food poison causing bacteria.

5. Hyphae :-

Ans. Multicellular fungi consists of long threads are hyphae that grow close together. Hyphare collectivelly form a interwoven compact mass called mycelium.

6. Micro- organisms :-

Ans. A micro-orgainsms is a microscopic organism. Which consists of usually one cell or a very few cells. It can be seen only through a powerful microscope.

VIII. Write the correct answer :-

1. C, 2. C, 3. C, 4. A, 5. D, 6. C, 7. C.

3. Material used in Daily life

I. Answer the following questions :

1. What are synthetic plastics and what are their characteristics ?

Ans. A material which can be easily moulded into various forms is called synthetic plastics. They are of very high molecularmas.

Characteristics of synthetic fibres :-

1. Toughnes or tensile strength.
2. Appearance.
3. Light weight.
4. Chemical resistance.
5. Weather resistance.
6. Insulation.

2. Give an account of the kinds of synthetic plastics in detail ?

Ans. Type of synthetic plastic :-

1. **Polythene or Polyethylene :-** It is a man made polymer. It is tough but flexible and strong. It can be rolled into thin sheets and moulded into desired shapes.
2. **Polyvinyl chloride (PVC) :-** It is another polymer which is a plastic. It is very strong and durable and is tougher than polythene.
3. **Polystyrene :-** It is a lighter polymer of polythene. It can be easily moulded on heating. When air is blow through motten polythene, it forms a very light foam.
4. **Teflon :-** It is prepared by the polymerisation of tetra fluoro ethene molecules. It remains unaffected by heat and chemicals. It has a very high melting point.
5. **Polypropence :-** It is prepared by the polymerisation of propence gas molecules.
6. **Acrylic :-** It is a clear transparent plastic used to replace glass in some situation. It is soft and can be easily scrutched. It dissolves in organic solvents.

7. **Celluloid :-** It is commonly used plastic which is highly in flammable.
8. **Polypropylene :-** It is rough and rigid plastic.

3. What are thermosetting plastics and what are their uses ?

Ans. Thermosets are also plastics which once set do not soften on heating. They return the shape in which were orginally mould. They are harder and stiffer. Then thermoplastics uses.

1. Bakelite is used for making electrical accessories such as plugs and switches, handles of ketlles and saucers pans radio and television castings.
2. Melamine is used for making cups saucers and other crockery.
3. Formica is used to form a smooth surface on articles of furniture.

4. How are plastics useful to us in our daily life ? Give a detailed account of it ?

Ans. Plastics are used in many ways. Plastic is used in almost every sphere of life starting from automobiles to small capsules of medicines.

Usefulness of plastic are :-

1. Textile industry use plastics to replace natural fibres like cotton, silk and wood.
2. Plastic parts are replacing metals in aeroplanes, cars and many mechanical devices. Plastic parts neither rust nor they dent as usually and easily metal do.
3. Plastics have replaced wood and stones in some applications.
4. Plastics are used to pack a variety of items.
5. Dentists often use plastic fittings because unlike metal fillings the plastic onces can match the patient tooth colour.
6. Surgeons mend broken bones with plastic parts rather than metal ones, because the plastics are less likely to trigger a harmful reaction.

5. What do you know about polymers ? Explain in detail ?

Ans. The monomers join in large number to form a long chain of molecules are called polymers. All polymers contain molecules of same substance, joined together to form a large chain of bigger molecules. Polymers are Carbon-compounds eg jute cotton and wool. Polymers are long and strong.

Polymers of are of two types :-

1. Natural polymers 2. Synthetic Polymers.

6. What are fiberes ? Write in detail about any two synthetic fibres.

Ans. A fiber is a thread like structure which is strong and flexible enough to make ropes, nets and clothes etc. Fibres are of two type natural fibres and artifical fibre or synthetic fibre

Synthetic fibre :-

1. **Rayon or Artificial silk :-** Pure cotton or wood cellulose is the raw material for the production of rayon. Rayon is also called regenerated fibre because it is obtain by modifying the natural fibre.

2. **Nylon :-** Nylon is a superior type of synthetic fibre. It is truely artifical, as it does not use any natural fibre as its raw material. It is prepared by the polymerization of amide molecules. Which are obtained from petroleum products by complex chemical processes. The nylon fibres consist of a very long chain of polyamide molecules. They are strong, elastic and water resistant.

7. Give an account of advantages and disadvantages of synthetic fibres.

Ans. Advantages of synthetic fibres :-

1. Cheaper than other fibres becauser they can be produced on a large scale.
2. Strong, durable and beautiful.
3. Need less care and and do not need frequent ironing, as they are wrinkle free.
4. They are easy to clean and dry quickly.
5. They have a high lustre and do not yellow with age.

Disadvantage of synthetic fibres :-

1. They easily melt and burnt to form small sticky beads at a very high temperature. So there is always a risk of getting burns specially in kitchen.
2. They get electrically charges in dry weather. This electric charge causes skin problems in some persons.
3. They do not absorb sweat. So they are very uncomfortable in summer and rainy season.

8. Make a table which shows the buring behaviour of some fibres :-

Ans.

Fiber	:	Result of burning
Cotton	:	Burns vigorously. No beat is formed
Rayon	:	Burns readily with smell of buring paper.
Wool & Silk	:	Burns slowly with smell of burning hair. No bead is formed.
Nylon	:	Burns with difficulty, shrinks from flame. forms hard beads and produces smell of burning hair.
Terylene	:	Burns with difficulty, produces black smoke on burning and forms hard beads.
Aerylic	:	Shrinks from flame forming a black bead and produces a sooty flame.

9. Write short note on polythene or polythylene ?

Ans. Polythene is a man made (synthetic) polymer. It is tough but flexible and strong. It can be rolled into thin sheets and moulded into desired shapes on heating but retains its properties on cooling. This makes it possible to mould polyethine articles into new shapes. Due to this property, polythene is classified as a thermoplastic. Polythene is chemically made almost insect and water resistant polythene is used for making bags for milk, tank for storage of water.

II. State whether the following statements are ture or false :-

Ans. 1. T. 2. T. 3. T. 4. F. 5. T. 6. F. 7. T. 8. T.

III. Fill in the blanks with suitable words :-

Ans.
1. *Terylene* is also called dacron.
2. Jute and cotton are *Natural* polymers.
3. Teflon has a very *high* melting point.
4. Polythene is an extremely poor condutor of *heat*.
5. Nylon thred is strong, shiny and water *resistant*.
6. The polymer in vinylchloride is *Plastic*.
7. *Koroseal* is the trade name of high polymer of vinylchloride.
8. Nylon thread was first developed simultaneiously in Newyork and *London*.

IV. Name the following :-

Ans.
1. Carpel, socks.
2. Polyethylene, PVC.
3. Bag of milk, tanks for water storage.
4. Backclite, formica
5. Polythene.
6. Terene, dacron.
7. Water pipe, sole of shoe.
8. Polystyrene, Thermocole.

V. Match the statement :-

Ans.

1.	Trade name of high polymer of bunylchoride	: Koroseal.
2.	A light polymer of polythene	: Polystyrene.
3.	A reginerated Cotton fibre	: Rayon.
4.	A fibre burn vigorously with a smell of burning paper and form very lillte ash	: Nylon.
5.	A fire burn poorly with a smell of burning hair	: Wool.
6.	A pure synthetic fibre	: Cotton.
7.	A Polymer of acrylonitrite	: Acrylon.

VI. Tick the correct answer :-

Ans. 1. b. 2. b. 3. b. 4. c. 5. b. 6. d. 7. a. 8. b.

4. Metals and Non Metals

I. Answer the following questions :

1. Write a note on the occurrence of elements and their characteristics ?

Ans. Elements may occur naturally or may be prepared artificially. Out of 115 element known today 95 are naturally occurring and the remaining are prepared by man under normal conditions. Most of the elements are silver- copper, gold, iron and lead etc.

Characteristics of metals :- The properties of an element depend on the arrangement of the electrons in its shells. This is because when atom of an element react with each other form a bond. Elements are divided into metals and non metals.

2. What are the physical properties of metal ?

Ans. Physical properties of metals are :-

1. **State :** At room temerature metals are usually solids. They have very high melting and boiling points mercury and Gallium are liquid at room temperature.
2. **Lustre :** Metals have brilliant shine.
3. **Hardness :** Metals are generally hard.
4. **Density :** Metals generally have a high density.
5. **Colour :** Usually all metals have a silvery grey colour except gold and copper. Which are of yellow and reddish orange colour respectively.
6. **Ductility :** Metals are usually ductite it can be drawn into thin wire the process is called ductility.
7. **Mallaebility :** The property due to which metals can be beaten into thin sheets is called malleability metals are generally makeable except Zinc, Arsenic and autimony.
8. **Tensite Strength :** The property due to which a subtance can bear a lot of strain without breaking is called tensile strength. Metals have tensite strength except Zinc, arsenic and antmony,
9. **Contuctivity :** Metals are good conductors of heat and electricity.
10. **Melting and boiling point :** Metals have high melting and boiling points.
11. **Opacity :** Metals are opaque in nature we can not see through them.
12. **Solubility :** Metals are genrally insoluble in liquids.
13. **Sonority :** Metals are usally sonorous. They make a ringing sound where strick.

3. Describe the reaction of metals with oxygen, water and acids with the help of examples ?

Ans. 1. **Reaction of metals with oxygen :** Metals on heating generally react

with oxygen to form their respective oxides. These oxides react with acids to from salt and water and hence called basic oxides examples :-

i. $4Na + O_2 \rightarrow 2Na_2O$

ii. $4K + O_2 \rightarrow 2K_2O$

iii. $2Ca + O_2 \rightarrow 2CaO$

2. **Reaction with water :-** When metals react with water, they form hydroxides and hydrogen gas is evolved in the reaction.

examples :-

i. $2Na + 2H_2O \rightarrow 2NaOH + H_2\uparrow$

ii. $2K + 2H_2O \rightarrow 2KOH + H_2\uparrow$

iii. $Ca + 2H_2O \rightarrow Ca(OH)_2 + H_2$

iv. $Zn + H_2O \rightarrow ZnO + H_2$

v. $3fe + 4H_2O \rightarrow Fe_3O_4 + 4H_2$

3. **Reaction with acids :-** Metals react with dilute HCl forming respective. Chorides and evolving H_2 gas. But with dilute sulphuric acid (H_2So_4) they give sulphate and hydrogen gas.

i. $Mg + 2HCL \rightarrow MgCl + H_2$

ii. $Zn + 2HCL \rightarrow Zncl_2 + H_2$

iii. $Mg + H_2So_4 \rightarrow MgSo_4 + H_2$

iv. $Zn + H_2So_4 \rightarrow ZnSo_4 + H_2$

Copper does not react with dilute HCl.

4. Give a brif account of uses of metals ?

Ans. Three forms of metals useful to mankind are :-

1. Pure Metal.
2. Mixed Metal.
3. Mixed Metal and Metal Compounds.

Copper and aluminium are goods conductors of electricity and are used in preparing electric wires. Gold and silver are used for making ornaments and highly costly utensils Domestic tools utensils and machine parts are made from iron, aluminium and copper Aluminium foil for packing material. Mercury is used in thermometers. Zinc is used in making the casing of the battery used in the torch. Titanium and its alloys have good hardness and high melting points. Metalic compounds like Sodium Chloride are very useful to human. So metals are useful for mankind in one way or other.

5. Write about the chemical properties of non-metal?

Ans. Chemical properties of non- metal :- Non-metals have the tendency to accept electrons from metals and get converted into negative ions. Non-metals can combine with other non- metals by sharing elements.

1. **Reaction with oxygen :-** Non metals react with oxygen to form their oxides. from acids when dissolved in water

$$C + O_2 \rightarrow CO_2$$
$$CO_2 + H_2O \rightarrow H_2CO_3$$

2. **Reaction with acids :-** Non metal accept electrons. They do not remove hydrogen from acids.
3. **Reaction with hydrogen :-** Non metals form hydrides with Hydrogen by sharing of electrons.
4. **Reaction with chlorine :-** Non-metals form chlorides by reaction with chlorides.

$$P_4 + 6CL_2 \rightarrow 4PCL_3$$

5. **Reaction with metals :-** By the reaction with metals they form ionic compounds.

$$CL_2 + 2Na \rightarrow 2NaCL$$

6. What are the important uses of non-metals ?

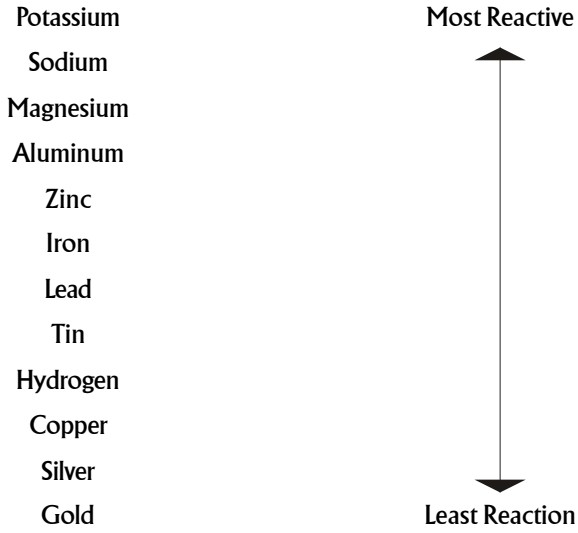
Ans. Uses of non-metals :

1. Phosphorus is useful in killing rats and for preserving food grains.
2. Red Phosphorus is used in preparing match sticks and fire works.
3. A phosphorus compound is very useful in chemical fertilizers.
4. Sulphur is used in the manufacture of sulphuric acid and ointments for skin diseases and disinfectants.
5. Sulphur is also used in making fireworks and preparing instecides for agricultural purposes.
6. Carbon in the form of diamond is used in making jewellery, cutting and grinding devices. In the form of graphite it is used in making pencil lead.
7. Silicon is used as a semi cunductor and for making glass and cement.
8. Silicon carbide, being a very hard substance is used in making tools for hard metals and rocks.

7. What do you understand by reactivitive series of metal? Explain with the help of a table.

Ans. From reaction of metals with water, chemists have resulted that reactivity of different metals is different. By studing the reaction of metals with chlorine, oxygen and acids, they evolved a table of their reactivity. This table is called reactivity series. The metal at top of the list is more reactive and at the bottom is least reactive.

Reactivity series of metals



8. What are displacement reactions of metals? Give at least 3 examples of displacement reactions.

Ans. It has been found that a metal more reactive in metal activity series displaces another metal less reactive in metal activity series and forms its salt soultion. Such a chemical reaction is called dispacement reaction.

Examples

1. $Fe + CuSo_4 \rightarrow FeSo_4 + Cu$

2. $Zn + PbNo_3 \rightarrow ZnNo_3 + Pb$

3. $Cu + AgNo_3 \rightarrow CuNo_3 + Ag$

9. What are noble metals? Write in details about any one noble metal.

Ans. Unreactive metals are called noble metals. Silver, platinum and gold are some typical noble metals.

Silver :- Silver is a scarce and highly valued metal. Its chemical symbol is Ag. Silver is fairly unreactive. It is sometimes found in free state in the earth's crust. It is also found in compounds. Most commonly found silver compounds are Silver Sulphate and Silver Chloride. Silver is also found in lead ore galena in small quantity.

10. What is corroion of metals? What are different ways of preventing corrosion?

Ans. Corrosion is a chemical process by which metals get destroyed and became of no use. Rusting of iron is a common example of corrosion. It takes place in moist air.

Prevention of corrosion.

To prevent a metal from corrosion the best way is to coat it with paint or

varnish.

In some cases to protect a metal from corrosion, a layer of oil is better than a layer of paint. A coat of Zinc or tin on iron also stops it from rusting. Iron or steel can also be coated by Zinc. This process is called galvanization.

II. State the following as True of False :-

Ans. 1. F, 2. F, 3. T, 4. T, 5. F, 6. F, 7. T, 8. T, 9. F, 10. T

III Fill in the blanks :-

Ans. 1. Elements which exhibit the properties of metals as well as non-metals are called *Alloys*.
2. Metals are generally *good* conductors of heat and electricity.
3. Metals usually displace H_2 from acids.
4. The coating of steel or iron by zinc is called *galvanization*.
5. A carat is equal to *1/24 th* of the total weight of the alloy.
6. Bronze is a mixture of copper and *Zinc, Tin*.
7. Potassium is the most reactive metal in the reactivity series.
8. A *Phosphours* compound is very useful in chemical fertilizers.
9. Non-metal do not remove *hydrogen* from acids.
10. The solution of *lime* in water is used for white-washing the walls.

IV. Make a table of ores of some common metals :-

Ans.

Metals	Ore	Chemical Formula
Iron	Haematile	Fe_2O_3
	Limonite	$2Fe_2O_3 3H_2O$
	Magnetite	Fe_3O_4
	Iron Pyrites	FeS_2
Aluminium	Bauxite	$Al_2O_3.2H_2O$
	Cryolite	Na_3AlF_6
Copper	Cuprite	Cu_2o
	Copper Pyrites	$CufeS_2$
	Copper glance	Cu_2S
Lead	Galena	PbS
	Litharge	PbO

V. Name the following :-

Ans. 1. Metal, Non Metal
2. Potassium, Sodium
3. Iron, Aluminium
4. Hydrogen, Oxygen
5. Phosphorus, Sodium

6. Silver, Gold
7. Silver Sulphate, Silver Chloride
8. Iron, Zinc
9. Gold, Silver
10. HCl, CH_4

VI. Match the Statements :-

Ans. 1. An oxide of a metal which reacts with acids to form salt and water : Basic Oxides.
2. An oxide of a non metal which dissolver in water : Acidic Oxide.
3. A Metal which is a poor conductor of electricity : Tungsten.
4. A Metal which is in liquid state at room temperature : Mercury.
5. An allotrope of carbon which is as tensile as steel : Carbon Fibre.

VII. Tick the correct answer :-

Ans. 1. c. 2. d. 3. d. 4. c. 5. b. 6. a. 7. a. 8. b.

5. Combustion; Flame and Fuels

I. Answer the following questions :-

1. What is the meant by the term combustion and give the conditions required for combustion. Describe the types of conditions required for combustion.

Ans. The chemical process, in which a substance burns in air or oxygen with the release of heat and light energy is called combustion. For' the combustion substance. There must be (i) a combustion substance. (ii) a supporter of combustion and (iii) temperature of combustible substance must be above the ignition temperature.

1. **Combustible substance :-** A substance which on heating in air or oxygen catches fire easily with the liberation of heat and light energy.
2. **Supporter of combustion :-** A substance which helps in the combustion of combustible sustance is called a supporter of combustion. Such as oxygen and air.
3. **Ignition temperature or kindling temperature :-** The minimum temperature to which a substance must be heated before it catches fire, is called ignition temperature.
4. **Inflammable temperature :-** Substances which have a low ignition temperature are called inflammable substances. Vapours of these substance in air can easily catch fire.

2. What are combustible and non-combustible substances and what is meant by the supportes of combustion and ignition temperature ?

Ans. Combustible Substance :- A substance which on heating in air or oxygen

catches fire easily with liberation of heat and light energy is called a combustible substance.

Non-Combustion :- A substance which does not catch fire easil;y are called non-combustible substance. A substance which helps in the combustion of a combustible substance is called a supporter of combustion.

Ignitin temperature :- The minimum temperature to which a substance must be heated before it catches fire, is called ignition temperature.

3. What is meant by a 'flame' ? how does a candle burn ? Explain with the help of a diagram.

Ans. A region of burning gases is called a flame.

A candle is made of paraffin wax that contains hydrocarbon. When they are heated, the hydro-carbons melt. The Liquid hydro carbons are converted to vapour which catch fire and produce a flame.

At the base of the flame, quite close to the wick, the colour of the flame is blue. A region around the wick is dark grey another region surrounding the dark grey zone is luminous and yellow in colour. There is another zone surrounding the luminous zone which is hardly visible. It is known as luminous zone.

(i) **Dark Zone :-** Near the base of a flame the fresh air very rapidly mixes with wax vapour formed from the molten wax. A part of wax vapour almost completely burns and produce blue flame.

(ii) **Dark inner zone :-** This zone consists of unburnt wax vapour given off by the molten wax. It is the coldest part of the flame. It is slightly dark because a part of wax vapour decompoes on heating to form carbon particles.

4. Describe the different zones of a candle flame with the help of a labelled diagram.

Ans. A region of burning gases is called a flame.

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5. What are fuels ? What are the characteristics of a good fuel ?

Ans. Any substances which is available and burns in the air at a moderate rate, producting large amount of heat energy without leaving behind any undesirable residue is called a fuel.

Characteristics of a good fuel :-

1. It should have a high heat value (calorific value).
2. It should be cheap and easily available.
3. It should be easy to handle and convenient to store.
4. It should have low kindling temperature.
5. It should not produce any harmful product on burning.
6. It should cause minimum air pollution.
7. It should burn at slow rate and its combustion should be controllable .
8. It should produce very small amount of residues such as ash.

6. Classify fuels on the basis of their physical state. Give examples.

Ans. Classification of fuels on the basis of physical state of fuels, they as classified as :-

1. **Solid fuels :-** soil fuels occur in a solid state at room temperature. In rural areas, wood, agricultural wastes, coal, charcoal, coke, paraffin an cow dung etc.provide most of the domestic requirement of fuel.

a. **Coal :-** It is a naturally occuring black mineral and is a mixture of carbon and carbon compounds.

2. **Liquid fuels :-** The fuels which occur in a liquid state at room temperature are called liquid fuels. Petrol, kerosene oil, diesel etc.
3. **Gaseous fuel :-** Fuels which occur in a gaseous state at room temperature are called gaseous fuels. Such as L.P.G, Coal gas, Water gas, C.N.G. etc.

7. Write a note on petroleum and its products.

Ans. Petroleum is a dark viscous oily liquid. The word petroleum is derived from the Greek words petra meaning rock and oleum meaning oil. Thus petroleum means oil from rocks.

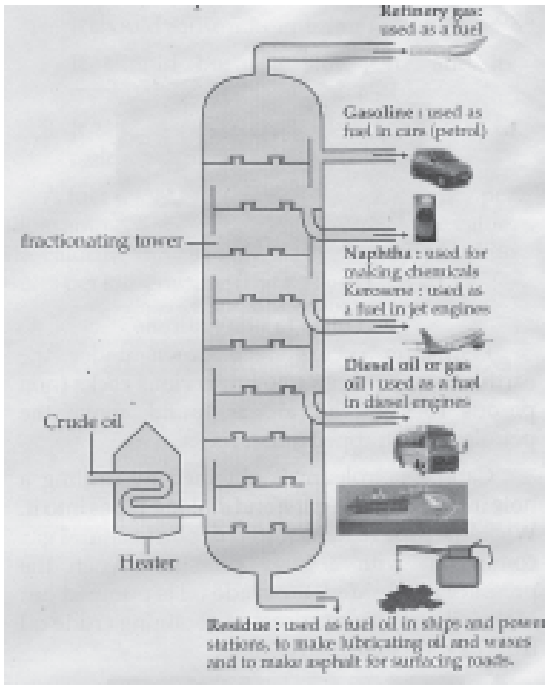
Petroleum is a fossil fuel formed in nature by the decomposition of animal and plant matter which got buried under the earth millions of

years ago.

Petroleum occurs deep down under the earth's crust between two impervious rocks. Nature gas found above the petroleum oil trapped under rocks.

8. Explain the process of refining of petroleum ?

Ans. Petroleum must be purified and separated into its various components, before it is used for different purpose. The process of separating petroleum into useful fractions and removal of undesirable impurities is called refining.



Fractional distillation of crude oil :- The various fractions of petroleum oil (crude oil) are separated by frational distillation. Main fractions obtained from petroleum are natural gases, petrol, naphtha, kerosene, diesel oil,lubricating oil, wax, fuel oil and asphalt. All these fractions have important uses.

9. What are gaseous fuels superior to solid or liquid fuels ? write about any two important gaseous fuels.

Ans. Gaseous fuels are superior to solid or liquid because :-

1. It neither produces smoke nor leaves residue.
2. It flows through pipes and tubes easily.
3. It has a high heat value.
4. It can be easily ignited
5. It undergoes complete combustion.

Important gaseous fuels :-

1. **Gobar gas or Biogas :-** Gobar gas is obtained by bacterial action on cattle dung and water in circular pits in the absence of air.
   It is cheaper than most common fuels.
   It has a high heat value.
   It is convenient to use.
   It is a clean fuel. It does not produce smoke.
2. **Natural gas :-** Natural gas is obtained from petroleum wells. It is also produced in plenty in marshy areas.

3. **CNG :-** It is the liquid form of natural gas. It is used as fuel for transport vehicles.

II. State whether the following statements are true or false :-

Ans. 1. F. 2. F. 3. F. 4. T. 5. T. 6. F. 7. F. 8. F. 9. F. 10. T.

III. Fill in the blanks :-

Ans. 1. The process of *burning* takes place as long as the fuel is available.
2. Producer gas is a mixture of *Nitrogen di-oxide Sulphur di-oxide* and carbon-monooxide.
3. The most commonly used liquid fuel in Indian homes is *Kerosene*.
4. The olaest coal is called *anthracite*.
5. Glowing charwood does not produce a *flame*.
6. The main constituent of biogas is *Methane*.
7. The *Luminous* zone of the candle flame is the hottest zone.
8. LPG is a mixture of butane and *Propane*.
9. Rusting of iron is an example of *Slow*.
10. The process of obtaining crude oil from its source is called *Mining*.

IV. Match the statement :-

Ans.

1. A gas produced during combustion which cause acid rain	Sulphur-dioxide
2. A gas produced during combustion which acts as plant food	Carbon-dioxide
3. A substance which burns in air on heating	Combustible
4. The burning region of gases	Flame
5. The fuel with least calorific value	Cow dung
6. A kind of fossil fuel	Petrol

V. Different between each of the following :-

1. Combustible and non-combustible substances.

Ans. Combustible :- A Substance which on heating in air or oxygen catches fire easily with the liberation of heat and light energy is called a combustible substance.

Non-Combustible Substance :- A substance which on heating in air or oxygen does not catch fire but can help is burning are non-combustible subtance.

2. Luminous and non-luminous zone of a candle.

Ans. Luminous zone :- In this zone partial combustion of wax vapour takes place with the liberation of lot of heat energy. There carbon particles get very hot and emit yellowish light. The luminous zone is hotter than the dark inner zone but not as hotas the luminous zone.

Non-luminous zone :- It is the zone of complete combustion of wax vapour and carbon particles. Air from the sides of the flame mixes with unburnt wax vapour and carbon particles from the luminous zone and completely burns there to form carbon-di-oxide gas and water vapour. It is the coldest part of the flame and is hardly visible.

3. Compressed natural gas (CNG) and Liquified petroleum gas (LPG).

Ans. Compressed natural gas :- It is the liquid form of natural gas. It is used as fuel for transport vehicles. It is an environment, friendly fuel compared to other fossil fuels.

Liquified Petroleum gas :- It is a mixture of butane (85%) and propane (15%). It is a commercial fuel as is marketed as indane. Bharat petroleum and Hindustan petroleum. A strong smelling substance called mercaptan that is inert is added to LPG, in order to detect any leakage.

4. Blue zone and Dark inner zone of a flame.

Ans. Blue Zone :- Near the base of a flame the fresh air very rapidly mixes with wax vapour formed from the molten wax. A part of wax vapour almost completely burns and produces blue flame in the same way as the blue flame is seen on LPG burner.

Dark inner zone :- This zone consists of unburnt wax given off by the molten wax. It is the coldest part of the flame. It is slightly dark because of apart of wax vapour decomposes on heating to form carbon particles.

VI. Name of each of the following :-

Ans.
1. Coke, coal Gas
2. Wood, paper
3. Air, Nitrogen
4. Biogas, Water gas
5. LPG, CNG
6. Mumbai
7. Methane, Ethane
8. Carbon-mono-oxide, Hydrogen
9. Wood, Coal
10. Heat and light energy

VII Tick the correct answer in the following:-

Ans. 1. c. 2. c. 3. b. 4. a. 5. a. 6. b. 7. e. 8. d. 9. d.

6. Conservation Of Biodiversity

I Answer the following questions :-

1. What is meant by the term 'Biodiversity' ? What factors threaten biodiversity ?

Ans. Biodiversity is the genetic, species and ecological diversity of the organisms in a given area. The most serious threat to biodiversity comes

from habital destruction, whichtlakes place due to deforestion, construction of dams, cities industries, crop lands, mines and many other activities.

2. What measures should be adopted and followed for the conservation of forests ?

Ans. Following measures should be adopted for the conservation of forests:-

1. To cover large area of land with appropriate types of trees.
2. Cutting and uprooting of trees should be made a punishable crime.
3. Falling of trees in the forests should be stopped. If should be essential to plant trees in well planned manner.
4. Forest should be protect against insect past and diseases.
5. Grazing of animals should be control.
6. Vanmahoastva should be observed every year by every one.
7. Pollution should be avoided.
8. Forest should be protected from fire.

3. How does over exploitation of forests affect animal species ?

Ans. Due to overuse of forests, many animals have become extinct and many others are facing danger of extinction because these animal did not get the enviroment to live they have to run towards the cities. Where they could not survice.

4. What is wild life and what should be taken by the government of India to conserve wildlife ?

Ans. **Wildlife :-** includes all non-cultivated and non-domesticated plant and animal life in its surrounding area and habital conservation of wild life.

1. The government should enact laws forbidding the hunting of rare and endangered animals like lion, tiger.etc
2. Animals and plants have a great relationship with their habital. so the natural habitats should be conserved.
3. Illegal hunting and trapping of animals should be prohabited.
4. project like Tiger project should be launched. The government has passed Distinct rule also so that the killing of animals may be stopped.

5. Write a note on project Tiger and project Elephant.

Ans. Project Tiger is centrally sponsored scheme launched in 1973 by the Indian Board of wild life to :-

1. Preserve the areas of such biological importance as a national heritage for the benefit, education and enjoyment of people
2. Ensure maintenance of available population of tiger in India.

Main activities of the project elephant are as follows:-

1. Ecological restoration of existing natural habitats of elephants.
2. Strengthening of measures for protection of wild elephants from

poachers and unnatural causes of death.

3. Development of scientific and planned management for observation of elephant habitats and viable population of wild Asiatic elephant in India.
4. Public awareness and education programme.
5. Veterinary care.

6. Give an account of wildlife reserves i.e. national parks and sancturies of India.

Ans. The government of India passed the wild life (protection) Act in 1972, under which protected areas like national parks and wildlife sanctuaries have been created since 1986. A national park is a habitat for particular wild animal species where foresting, grassing or cultivation is prohibited

some of the parks and sanctuaries developed in India are as follows :-

1. Kaziranga National park, Jorhal Assam.
2. Kanha National Park Mandla and Balaghat Madhya Paradesh.
3. Ghana Bird Sanctuary
4. Jim corbett Park, Garhwal Himalayas Uttarakhand.
5. Bandipur National Park, Mysore Karnataka.
6. Dudwa National Park, Lakhimpur Khiri Uttar Pradesh.
7. Hazaribagh National Park, Hazaribagh.
8. Mudumalai wild life sanctuary Nilgiris, Tamil Nadu.
9. Periyar Sanctuary Idukki Kerala.
10. Gir National Park, Junagarh, Gujarat.
11. Jaladpara Sanctuary, West Bengal
12. Chandraprabha sanctuary, Varanasi.
13. Nandankanan Biological park near Bhubaneshwar
14. National Botanical gardens, West Bengal
15. Sariska Sanctuary, Haryana

7. What are the effects of pollution on biodiversity ?

Ans. Pollution has made the atmosphere impure. By the pollution of fresh water plants and animals have been severely damaged. The ultraviolet radiations from the sun is very harmful to all the living organisims of the earth. The escessive use of pesticides and insecticides such as DDT spoil many sources of food. Pollution disturbs biological systems which renew natural reserves.

II. Write True or False :-

Ans. 1. F. 2. T. 3. F. 4. F. 5. F. 6. F. 7. F. 8. F. 9. T.

III. Fill in the blanks :-

Ans. 1. Corbett National Park is located in *Uttarakhand.*
2. Wise and judicious use of resources is termed as *conservation.*
3. In a sanctuary, only *wild life* are protected.
4. The Project Tiger was lanuched in *1973.*
5. Overgrazing by animals has resulted in *Loss of biodiversity*
6. Gir National park is located in *Gujrat.*
7. The species that have no living members present are called *exlinct* species.
8. A forest is a biological community.
9. The government of India has developed *15* Sanctuaries in India.

IV. Name the following :-

Ans. 1. Wood, paper, rubber, gum
2. (a) Gir National park (b) Nandankanan Biological Park.
3. (a) Jaladpara Sanctuary, West Bengal
(b) Jim Corbett Park, Garhwal Himalayas, Uttarakhand
4. Golden langur, Blue Whale
5. Dodo, Cheetals
6. Vulture, Tiger
7. Golden langur, Chinkara deer
8. Nilgiri biosphere, Nanda Devi Biosphere

V. Full forms of following abbreviations :-

Ans. 1. IUCN : The International Union of Conservation of Natural Resources.
2. WCU : World Conservation Union
3. NGOs : Non-Government Organization.
4. TERI : Tata Energy Research Institute.
5. DNES : Department of Non-Conventional energy Sources.
6. DOEN : Department of environment forests and wild life.
7. UNEP : United Nation's Environment Programme.
8. IBWL : Indian Board of Wild Life
9. CITES : Convention on International trade in endangered species.
10. WWF : World Wide Fund

VI. Correct answer :-

Ans. 1. a 2. b. 3. c. 4. b. 5. a. 6. d. 7. a. 8. . 9. d.

7. The Cell and the Tissues

I Answer the following questions :-

1. What is cell ? Write a note on the discovery of the cell ?

Ans. Cells are regarded as the basic unit of which organisms are made or all

living things are made of very tiny living units called cell.

Discovery of cell was made by an english scientist. Rober Hooke in 1665. He observed slices of bark under this crude microscope.He found that the cork near the bark was made of box like compartments, forming a honeycomp structure as well.

2. What was the characteristics of cells ?

Ans. Characteristics of cells :-

i. Cell exists in many shapes and sizes. Some are microscope (very tiny) and others are macroscapic (large) Different cells differ considerably in the shapes. This variation is mainly due to the different fun claims of the cells.

ii. Cells secure food to get energy, remove waste products from the body, obtain oxygen and synthesize new living material. They produce necessary chemicals, regulate water balance, react to change in the environment and reproduce other cells.

3. With the help of diagrams describe the cell structure of a plant and an animal cell.

Ans. A cell can be divided into three structure parts :-

Cell membrane, nucleus and cytoplasm. Nucleus and cytoplasm are two district parts of protoplasm (for diagrme see Page 75 and 76.)

4. Differentiate between animal cell and a plant cell.

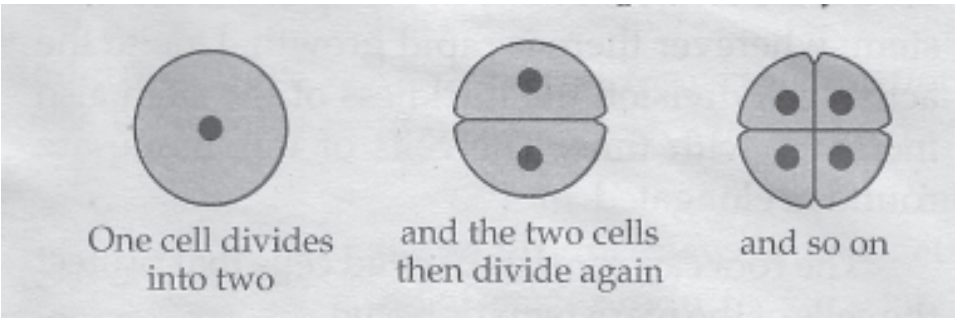
Ans.

Animal cell	Plant cell
1. The cell wall is absent. The outer most boundary of the cell is the plasma membrane.	1. A cell wall made of celluolse is present outside the cell membrane.
2. Plastids are absent	2. Plastids are present.
3. In most of the animal cells centro-some is generally present.	3. Except in a few plant cell centro-some is absent.
4.Animal cells mostly do not have vacuoles. If present, they are smaller in size.	4. Generally plant cells have large vacuoles.

5. What do you know about the cell division and cell growth ? Explain.

Ans. Each organism is made up of one or more cells. Cells are formed by an already existing cell each cell divides into two unicellular. Organisms begin and finish their lives as single cells only.

The growth of multicellular Organism is caused by the increase in number of cells. Cells usually divide and increase in number by splitting. This process is called cell division.



In cell division, a cell divides into two. The dividing cell is called the parent cell and the cells produced are called daughtes cells. The cells grow old and die.These cells are replaced by newcells produced by division.

6. What are tissues ? Give a short account of plant tissues.

Ans. In multicellular organism, Group of cells is organised to perform a particular function. These group of cells are called tissues.

Plant tissues :-

In multicellular plants there are mainly two type of tissues.

i. **Meristematic tissues or meristem :-** These tissues are located at the tip of root and stem where there is rapid growth. The cell of this tissue are round or elongaled.

ii. **Permanent tissue :-** Permanent tissues also develop from meristematic tissues. But their cells are larger than that of the meristematic tissues. Their power of cell division is lost Permanent tissues are of following types :

1. Simple Tissues 2. Complex Tissues.

7. Make a table of a comparative study of simple tissues ?

Ans. A Comparative study of simple tissues.

	Parenchyma	Collenchyme	Sclerenchyme
1.	It consists of living cell	It consists of living cell.	It consist of dead cells.
2.	It occurs mainly in the young roots stems, leaves, flowers and also in the epidermis cortex etc	It occurs mainly beneath the epidermis of dicot stem leaves, flower. Stalks.etc	It occurs in the epidermis endodermis and vascular bundles of dicotyledonous plants
3.	Its major functions are to take part in photosynthesis and to act as a storage tissue.	It function mainly as a mechanical tissue but may also act as a storage tissue	It fully acts as a mechanical tissue.

8. Write about the main kinds of animal tissues in brief ?

Ans. The main type of animal tissues are as follow :-

1. **Epithelial tissues :-** An epithelial tissues is a thin and protective layer of cells which covers the outer and inner lining of all hardy parts base upon their shape arrangement and functions, the epithelial tissues are of following four types :-

i. Columnar tissues
ii. Ciliated epithelial tissues
iii. Sqreamous epithelial tissues
iv. Glandular epithelial tissues

2. **Connective tissues :-** The connective tissues connect the various tissues and organs. Various kinds connective tissues are as follows :-

i. Tendons
ii. Ligaments
iii. Cartilage tissues
iv. Bones
v. Blood

3. **Muscular tissues or muscles :-** The muscular tissues form the muscles of the body. The contraction and relaxation of the muscles help the body for all movements. A muscular tissue is a bundle of long and cylindrical cells. Organ like the heart, stomach intestine, urinary bladder and the muscles of arms and legs etc formed of the muscular tissues.

Kinds of muscular tissues :-

i. Striated or voluntary muscles.
ii. Unstriated or involuntary muscles
iii. Cardiac muscles

4. **Nervous tissues or nerves :-** A nervous tissues is made of elongated cells called neurons or nerve cells. It constitutes the nervous system of the body.

   Each nerve cell consists of a cell body called the cylon. The cylon consists of a nucleus and one or more elongated hair like extensions called the dendrons or dendrities. one of these is long and is called anerve. The brain and the spinal cord are formed of the nervous tissues.

9. Give a detailed account of connective tissues in animals.

Ans. The connective tissues connect the various tissues and organ various kinds of connective tissues are as follow :-

i. **Tendons :-** They connect or attach muscles to bones. they are like strong, white cords and are protein. Tendons are enclosed in a layer of protective tissues.

ii. **Ligaments :-** They are bands of tough fibres tissues that hold organs of the body such as heart, in place and fastens bones together.

Tendons and ligaments serve for packing and binding most of the organs. They are called fibrous tissue; called fascia, binds our skin to the underlying structure. Adipose tissue which makes the human fat is also a fibrous tissue.

II. Write wether the following statements are true or False :-

Ans. 1. F. 2. F. 3. T. 4. T. 5. F. 6. T. 7. F. 8. T. 9. F. 10. F.

III. Fill in the blanks with suitable words :-

Ans. 1. The *Nucleus* is the control centre of the cell.
2. The smallest cell is of a bacterium called *My coplasma*.
3. In our body *Nerve* cells are the largest.
4. *Cell* includes the cell membrane, the cytoplasm and nucleus.
5. A *Cell* is the basic unit of living things.
6. The cytoplasm contains many tiny structures called *cell organelles*.
7. The term 'cell' was given by *Rober Hook*.
8. Cell wall is present in *plant* cells.
9. Collenchyma is a *simple* tissue.
10. *Cytoplasm* is the protoplasm outside the nucleus.

IV. Match the statements in column A and Column B.

Ans. 1.	Plant	Cell
2.	Jelly like substance between the cell membrane and nucleus	cytoplasm
3.	Green pigment present	chloroplasts
4.	Boss of the cell	nucleus
5.	Unit of living body	chromosomes
6.	Tiny structures inside the cells	organelles
7.	Cell scavenging	Cell wall
8.	Synthesis of ribosomes	Lysosomes
9.	Energy liberation	Mitochondria
10.	Protein synthesis	Ribosomes

V. Name the following :-

Ans. 1. Nucleoplasm, Chromosomes
2. Xylem tissue, Phloem tissue
3. Red Blood cell, White Blood cell
4. Epithelial tissues
5. Glycogen granules, Starch grains
6. Lysosomes

7. Cell membrane, Nucleus, Cytoplasm
8. Proteins, Lipids
9. Nucleoplasm, Cytoplasm
10. Unicellular, Organisms.

VI. Tick the correct answer in the following :-

Ans. 1. a. 2. b. 3. c. 4. b. 5. b.

8. Reproduction And Endocrine System

I. Answer the following question :-

1. What is reproduction and what are its different modes ? Explain.

Ans. Reproduction is the process by which a living organism is able to produce more of its own kind. There are two methods of reproduction.

i. Asexual reproduction
ii. Sexual reproduction

(i) **Asexual Reproduction :-** In this type of reproduction, only one single parent is involved.

(ii) **Sexual Reproduction :-** This type of reproduction involves two parents the male and the female. The male gametes called sperm and the female gametes are called eggs or ovum. The Process of fusion of the sperm and the ovam is called fertilization. The fertilized egg is called zygote.

2. Give an account of reproductive organs of humans ?

Ans. The organs which produce the gametes or sex cells are called primary Sex organs or gonads. The primary Sex organs in male are testes and in females. Ovaries Sperms are produced in the testes where as ovaries produce eggs (ova). The organs which do not produce gametes but are essential for reproduction are called secondary sex organs.

3. How do unicelluar organisms reproduce ? Explain with examples and diagrams.

Ans. Unicelluar organisms reproduce by two methods.

(i) **Binary fission :-** Amoeba, paramaecium, englene etc. reproduce through binary fission. Amoeba when matures simply splits into two amoeba.

(ii) **Budding :-** Hydra reproduces by budding. A new hydra grows out of the side. To begin with, the bud gets food from its parent. At last, the new hydra breaks away and becames independent.

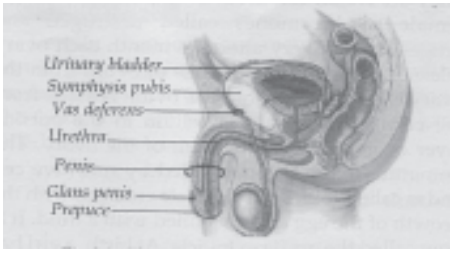
4. What is the mode of reproduction in multicellular organism ? How do frog, fish, birds, reptiles etc. reproduce ?

Ans. Most multicellular organism reproduce sexually. In these organism the individuals have a special organs which produce only one kind of gamtes either sperms or ovum.

Organisms which produce only one kind of gametes are called uni sexual. Those organisms which produce both gametes in the same individuals are called bisexual or hermaphrodite. Fish reproduce by the male and the female. They release their sperms and eggs into water. The sperms swim and fertilize the eggs. This is called spawning or external fertilization.

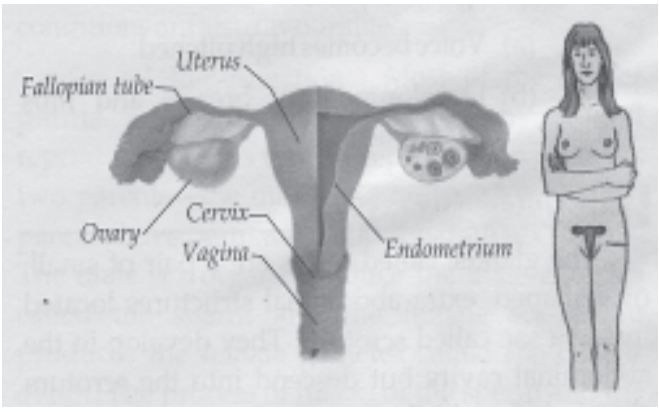
In frog male mates the female and fertilization takes place in water. Reptiles and birds lay eggs. The males and females mate and the sperms are put inside the body of the female. There they fertilize the eggs. This is called internal fertilization. The fertilized eggs are coated with produce shell.

5. Give an account of the reproductive system of man with the help of a labelled diagram.



Ans. The glander, called testes are a pair of small, oval- shaped extra abdominal structures. Structures located inside a sac called scrotum. Each tested is covered by a connective tissue covering and sends partitions inside dividing into lobules. Each lobule contains many seminiferons. Tubules from each testis originated a duct called urethra which is about 19-20 cm long. It is common duct for the passage of urine and spermatic fluid. So it is called inguinal canal or urcto-genital canal. In the abdomen, vas deference (Sperm duct) passes over the urinary bladder and joins the urethra from behind. The urethra runs through penis. The peins is used for ejecting male reproductive cells called sperm cells into the female genital tract.

6. Explain the reproductive system of woman with the help of a labelled diagram.



Ans. The human female reproductive system consists of a pair of ovaries, oviduct, uterns and vagina. The ovaries are a pair of small almond shaped structures. Situated near the front of the abdo-

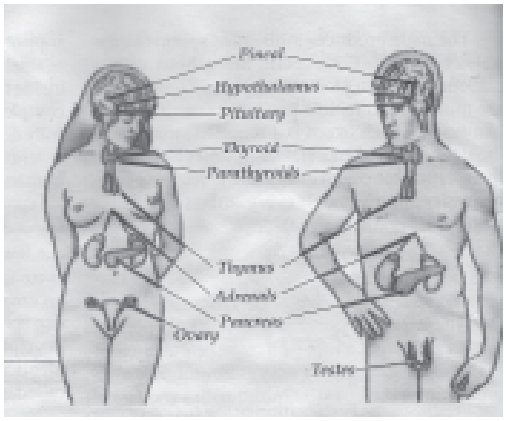
men. They produced ova and femal sex harmones called ocstrogen and progesterone. The release of ovum from the ovary is called ovulation.

7. Descrive the embryonic development after fertilization in human females ?

Ans. The pregnancy begins after the formation of the zygote and the embryonic moves down to thickned inner wall. The close attachment of the embroyo with the uterus is called implantation after implantation, special tissue develops between uterine and the embroy called placeula. The foetus is surrounded by a fluid filled sac whose inner membrane is called amnion. The amnion makes ammiotic fluid. The development od foctus inside the uterus till birth is called gestation. The gestation period in human females is about 280 days.

8. What is endocrine systems and what are endocrinic glands explain with the help of a labelled diagram ?

Ans. Certain chemicals are required for proper growth and development in animals including humans. These chemicals are called hormones. The hormones are produced in special organs called endocrine glands.



i. Endocrine glands have no ducts. So they are called ductless glands.

ii. The secreation of endocrine glands are poured directly into blood.

iii. The hormones are required in extremely small quantity increase or decrease in the specific quantity is harmful for the body.

9. What are hormones ? What are general properties and functions of hormones ?

Ans. Hormones are chemicals messengers which help in control and Co-ordinate various activities in the body. Hormones help in maintaing a constant environment inside the body, adjusting the amount of salt and water in the body tissues. Sugar in the blood and salt in the sweat. Hormones produce long term changes as well as a child's growth and sexual maturation. They bring about quick, drastic responses in the body whenever, illness or injury occurs.

10. Give a detailed account of reproductive health ?

Ans. Reproductive health forms an important part of the general health. It includes responsible, safe and satisfying reproductive life. Both males and females must beware regarding the fertility regulation methods the

choise of control child birth and the ability to prevent and control sexually transmitted diseases. World Health Organisation has prepared guidelines and considered reproductive health as a fundamental human right. The family planning programe of the Indian government has taken proper steps to creat awareness and provide relevant information about reproduction health.

II. Write wheather the following statements are ture or fasle :-

Ans. 1. T. 2. T. 3. T. 4. T. 5. F. 6. T. 7. T. 8. F. 9. T. 10. F.

III. Fill in the blanks with suitable words :-

Ans. 1. *placenta* nourishes the embroyo inside the womb.
2. The period of pregnancy is called *gestation*.
3. Fertilization of human eggnorally occurs in the *oviduct*.
4. *Adrenaline and corticoids* hormone helps in controlling blood, calcium and phosphours.
5. Pertide hormones are the most *numerous* group of hormones.
6. The master gland in the bady is *Pituitary*.
7. The hormone thyroxine is secreted by *Thyroid*.
8. The *inverted* red triangle has become as popular sign in India for family welfare.
9. In males sex chromosomes are of *XY* types.
0. The male produces millions of *Sperms* in his testes each day.

IV. Define the following terms :-

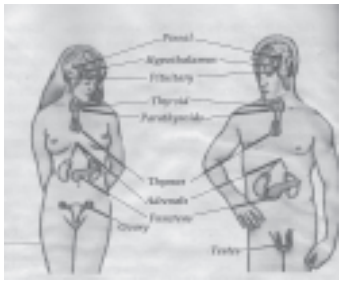
Ans. 1. **Fertilization :-** Fertilization or the fusion of egg with the sperm take place inside the female's body in the oviduct.
2. **Secondary Sexual Characters :-** The organs which do not produce gametes but are essential for reproduction are called Secondary sex organs. They are differentiated externally due to presence of specific features and are characterised as secondary or accessory sex organs.
3. **Unisexual Organ :-** Human beings are unisexual with distint male and female individuals. Individually the two sexes possess different types of sex organs internally.
4. **Endocrine System :-** Certain chemicals are required for proper growth and development in animals including humans. These chemicals are called hormones. The hormones are produced in special organs called endocrine glands.
5. **Hormones :-** The word hormone comes from a Greck word meaning set in motion. Therefore hormones inffuence and regulate many bodies such as metabolism, growth, mental developments, emotional behaviour. Hormones are of 3 types (i) Steriod hormones (ii) Amino acid derivatives (iii) Peplide hormones.

6. **Copulation :-** In human beings the fertilization is internal. The male gametes (sperms) are highly active and mobile. They are introduced inside the female genital tract by the process called copulation.
7. **Fraternal twins :-** If two eggs fertilized by two sperms they result in fraternal twins.
8. **Asexual reporduction :-** In this type of reproduction, only one single parent is involved.
9. **Sexual reproduction :-** This type of reproduction involves two parents the male and the female both the parents have permanent and separate sex organs.

V. Make fully labelled diagrams of the following :-

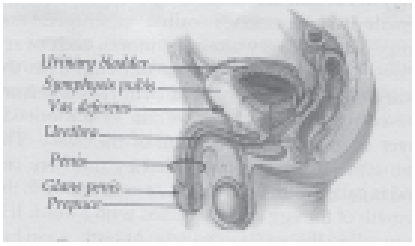
1. Endorine gland system in humans.

Ans.



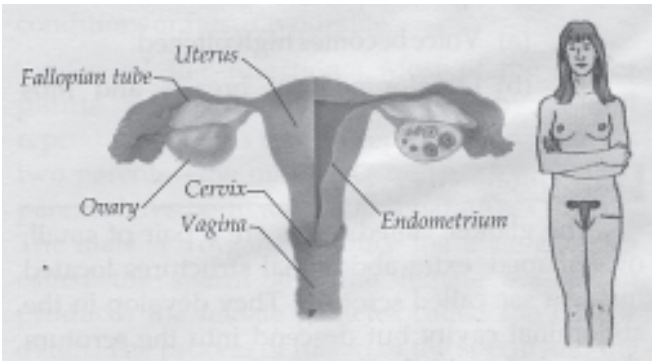
2. Male reproductive system in humans.

Ans.



3. Female reproductive system in humans.

Ans.



VI. Name the following :-

Ans. 1. Testis, Ovaries.
2. Ducts and glands

3. Scrotum.
4. Zygote.
5. Implantation
6. Insulin.
7. Oestrogen and Progesterone.
8. Oestrogen and progesterone.

VII. Tick the correct answer of the following :-

Ans. 1. c. 2. d. 3. a. 4. c. 5. a.

9. Force and its Effects

I. Answer the following questions :-

1. What is a force ? Give two examples of force applied to push or pull something ?

Ans. A force is a physical cause that tends to change or changes the state of rest or motion of an object. Examples :-

1. Pusing a table 2. Pulling a rope.

2. Give an account of the effects of force ?

Ans. Effects of force means what force can do or what changes a force can bring about.

i. Force can make a stationary object move. A force applied to an object at rest begins to move it. If you push a hand cart, in starts moving.
ii. Force can make a moving object move faster.
iii. Force can change the direction of moving object.
iv. Force can stop the moving objects or slow them down.
v. Force can change the shape or size of an object.

3. Write a note on contact and non contact forces ?

Ans. **Contact force :-** A force applied on an object by another object which is in direct contact with it is called a contact force.

Non Contact forces :- When a force is applied on an object by another object without coming in touch with other, it is said to be a non contact forces.

4. How many kinds of forces do you know about ? Explain.

Ans. Forces can be divided mainly into two types :-

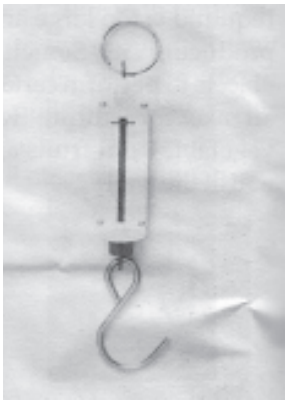
1. Contact force.
2. Non Contact forces are :-

(i) Magnetic force (ii) Electrostatic force (iii) Gravitational force, (iv) Mechanical force. (v) Muscular force (vi) Electrical force (vii) Magnectic force (viii) Frictional force or the force of friction.

5. What are the units of force ? Give in details ?

Ans. The unit of force is expressed in terms of the force of gravity. The SI unit of force is Newton 1 Kgf = 9.8 N.

6. What device is applied to measure force and what is the method of measuring it ? Explain with the help of labelled diagram.



Ans. A device, called spring balance is used to measure a force. A spring balance consists of a spring enclosed in a metallic frame.

The object whose weight is to be measured is attached to the hork. The spring is pulled downward by the force of gravity. The spring stretches. The amount of stretch indicates the measure of force, which can be directly read from the scale.

II. Write whether the following statements are true or false :-

Ans. 1. T. 2. F. 3. T. 4. F. 5. T. 6. T. 7. T.

III. Fill in the blanks with the suitable words :-

Ans.
1. The force of gravity is a *gravitational* force.
2. The force requried to lift a mass of 1 *gravitically* is called *gram force*.
3. The SI unit of force is *Newton.*
4. A *spring* balance measures force.
5. The length of a spring *pulled* on pulling an object.
6. The force with which earth pulls an object towords it is called *gravitational* force.
7. A body is said to be *contact force* if a force applied on it changes the shape of the object.
8. The collision between two objects results *collision* in a force.

IV. Match the statements in column A with those in column B :-

Ans.

1.	Force required to lift 1kg mass vertically, against the pull of gravity	:	kilogram force
2.	A force which does not need a connector	:	Push
3.	A force which cannot be applied through a non-rigid connector.	:	non-contact force
4.	A device used for finding weight.	:	spring balance
5.	A push or pull which causes motion.	:	force
6.	Force required to lift 100 g mass vertically, against the gravity.	:	newton
7.	The force produced by the muscles of living beings.	:	muscular force

V. Name the following :-

Ans. 1. State of rest, direction, shape

2. (a) Plastic comb, Hair (b) ball pen, paper

3. Iron, steel, cobat, nickel

4. Elephant, horse, bullocks.

5. Collision between car and truck.

VI. Tick the correct answer :-

Ans. 1. a. 2. c. 3. a. 4. a. 5. b. 6. d.

10. Friction

I. Answer the following questions :-

1. What do you understand by the term ' frictional force' and what is the cause of friction ?

Ans. Friction is the force that opposes the relative motion between two surfaces that are in contact with each other or we can say that when two surfaces slide over each other, the force which opposes the motion is called frictional force.

The more the irregularities on the two surfaces in contact, ie the more rough are the surfaces in contact, more is the force of friction. On the other hand lesser the irrerularities, lesser is the force required.

2. Which are the factors affecting friction ? Write in detail.

Ans. Friction depends upon the following factors :-

1. Force of friction dependson the nature of surface in contact with each other.
2. The force of friction is directly proportional to normal reaction. If F is the force of friction and R is the normal reaction then F x R or F = uR, where u is the coefficient of force of friction.
3. The force of friction is independent of area of contact.

3. What are the effects of friction ? Give an account of the various types of frictions.

Ans. Effects of friction :-

i. Friction opposes motion.

ii. Friction causes wear and tear. For example, the moving parts of machines wear out due to friction.

iii. Friction produces heat. For example rubbing of plams together produces heat due to friction. Also the moving parts in machines get very hot due to friction.

4. What are the disadvantages of friction ? How can you reduce the unwanted friction ?

Ans. In many human activities friction acts as a hindrance such as :-

1. Due to friction, wear and tear of machine parts is increased, reducing the life of the machines.
2. Due to friction, undesirable noise is produced. The heat can damage machine parts and produced besides reducing efficiency of machines can be a serious pollutant and effects the people living close to the source of noise.
3. When a body moves overanother body a part of energy is used in overcoming the force of friction. This energy dissipates in the form of heat energy.
4. If the engine of a car or scooter is not given a continuous supply of oil, the pistons of cylinders get so hot that they get jammed.

Ways of reducing friction :-

i. By polishing
ii. By using lubricants
iii. By streamlining
iv. By using ball bearings or roller bearings
v. By using soap solutions
vi. By using fine powders

5. What are the advantages of friction in humanlife ? Explain in detail.

Ans. Advantages :-

i. We will be unable to walk if there is no friction between the soles of our shoes and the ground.
ii. Friction is used in holding objects with our hands, gripping, climbing a ladder, sitting on a chair etc.
iii. Brakes of a vehicle depend on friction.
iv. Friction is also used in writing on a paper.
v. Friction between the belt and the pulley helps in the rotation of various parts of a machine.

6. Give an account of the various ways of increasing friction.

Ans. Friction can be increase by the following ways :-

i. Friction due to liquids and gases
ii. Friction due to water
iii. Friction due to air

II. Write whether the following statements are true or false :-

Ans. 1. F. 2. T. 3. F. 4. T. 5. T. 6. T. 7. F. 8. T.

III. Fill in the blanks with suitable words :-

Ans. 1. Friction always acts in the direction *opposite* to the directionof applied force.
2. The *dynamic* friction is 10 times the rolling friction.
3. The boats and aeroplanes are *streamlined* to reduce fluid friction.
4. Rolling friction is *less* than the sliding friction.
5. Moving parts of a machine get *wearout* due to friction.
6. *Static* friction is self-adjusting.
7. Friction helps screws and nails to hold in wood.
8. Friction is often called a necessary *evil*.

IV. Match the statements in column A with those in column B :-

Ans. 1.	The friction called into play when two bodies slide over one another at constant speed.	Static friction
2.	The special shape of the body due to which it experiences least fluid friction.	Streamlining
3.	The friction when two bodies in contact with each other, do not move on the application of force.	Limiting friction
4.	The friction called into play when one body just slides over another body.	Sliding friction
5.	The friction experienced when a body is made to move over rollers.	Rolling friction
6.	The opposite force called into play when two surfaces in contact with each other slide relative to one another.	Friction

VI. Give names of the following :-

Ans. i. (a) Nature of surface
(b) The force of friction is independent on area of contact.
ii. (a) Using Lubricants
(b) Polishing surface
iii. (a) Lubricants
iv. (a) Wear and tear of machine parts.
(b) Undesirable noise is produced.
v. (a) Static friction
(b) Dynamic friction
vi. (a) Due to friction, wear and tear of machine parts is increased, reducing the life of the machines.
(b) Due to friction, undesirable noise is produced.

vii. (a) Oil
(b) Grease
viii. (a) Noise polluton.
(b) Reduce the life of machines.

VI. Give reasons for the following :-

Ans. i. To minimise friction
ii. To minimise friction
iii. To minimise friction in the rotation
iv. So that they experience minimum friction while moving in the wales
v. Due to friction

VII. Tick the correct answer of the following :-

Ans. 1. d. 2. b. 3. a. 4. b. 5. b.

11. Pressure

I. Answer the following questions :-

1. Define 'pressure'. What are the SI units of pressure and factors on which pressure depends ?

Ans. The effect of force on a given area is called pressure. The SI unit of pressure is N/m^2 and is called pascal. The pressure depends on two factors.

1. **Magnitude of force :-** The greater the magnitude of the force, the greater is pressure.
2. **Magnitude of area :-** The greater the area of the surface the smaller is the pressure.

2. Give an account of some examples involving pressure.

Ans. 1. Movement of a camel can easily cross the desert as compare to donkeys and horse because they exert very little pressure on the ground as they have broad feet. hence when camel walks on sand, the pressure exerted by it on the sand is quite small and its feet do not sink much in sand.
2. High building on wide foundation base area of a high tower or a big movement is quite large so that the ground is able to withstand the pressure of the tower or the monument.

3. What is manometer and pressure detector ? Explain with the help of diagrams. also write that how this pressurs detector can be used to show that the presure in liquids increases with depth.

Ans. The manometer cosists of a U-tube containing water or

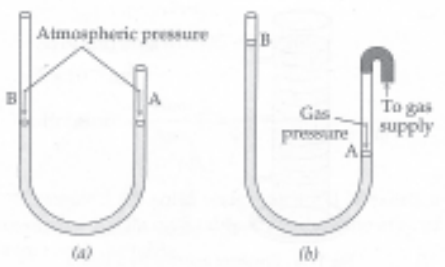


Fig 11.4 : The manometer

mercury. The same atmospheric pressure is exerted on the water surfaces of A and B and both arms are open to the atmosphere. In order to measure the pressure of a gas the side A is connected to a gas-tap by a length of rubber tubing. When the tap is turned on the gas exerts. pressure on the surface. A pressure detector can be used to show that pressure in liquids increases with depth.

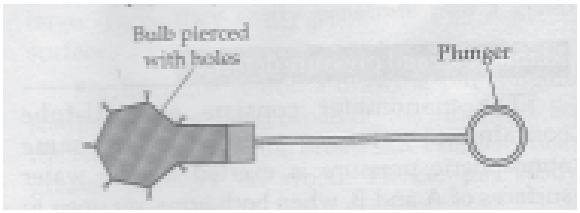
4. Give a detailed account of facts about pressure detetor can be used to show that pressure in liquids increases with the help of diagrams.

Ans. Facts about pressure in liquids

1. **Pressure increases with depth in a liquid :-** The connection between pressure and depth can be shown in the laboratory using apparatus (a cane with holes it different depth) as when this cane is filled with water, water spurts from the holes, pushed out by the pressure of water at the level. The deeper the hole the farther the water travels.
2. **A liquid finds its own level :-** when any liquid is poured into the communicating tubes it stands at the same level in each tube. This proves that water or any other liquid finds its own level.
3. **Pressure at one depth acts equally in all direction :-** A vessel containing water having similar holes all round it at the same level. Water comes and as fast and as far from each hole. This proves that pressure exerted by the water at this depth is the same in all directions.

5. What is pascal law ? With the help of a labelled diagram show the transmission of pressure in a liquid.

Ans. According to the pascal's law the pressure exerted on a confined liquid is transmitted equally in all directions through out the mass of liquid. An



apparatus which consists of a glass-barrel fitted with plunger and ending in a bulb pierced with holes of same size. It is filled with water by dipping the bulb in water and slowly raising the plunger. When the plunger is pushed in the water squirts equally from all this holes. This proves that pressure applied to the plunger has transmitted uniformly throughout water.

Hydraulic devices like hydraulic brakes etc. Work on the principle of transmission of pressure in liquids.

6. What is atmospheric pressure and what are its consequences ?

Ans. Atmospheric or air pressure is a measure of the force exerted by the weight of the air pressing down on each square unit of the earth's surface.

Consequences of atmospheric pressure :-

1. In a syringe, when plunger is pulled up, the atmospheric pressure

forces the liquid to rise up in the syringe.

2. When we suck a drink, with a straw the air of the straw goes into our lungs and thus the air pressure in the straw decreases. The atmospheric pressure on the surface of the drink forces it to move up into the straw which then reaches our mouth.

II. Numerical Problems :-

1. **A solid cube of dimension 25 cm * 25 cm * 25cm and weighing 625 N is placed on a table. Calculate the pressure exerted by the cube on the table.**

Ans. Solution :- Given area of the cube

$= 25 \times 25 = 625\ cm^2$

$= 625 \times 10^{-4}\ m^2$

$[\because 1\ cm^2 = 10^{-4}\ m^2]$

Force = 625 N

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

$$= \frac{625}{625 \times 10^{-4}}$$

$$= \frac{1}{10^{-4}} = 10^4 Nm^2$$

or 10^4 Pa

2. **A solid weighing 1000 N exerts a pressure of 10^5 Pa when placed on a box. Calculate the area of contact with the box top.**

Ans. Solution :- Given Force = 1000 N and pressure = 10^5 Pa

$$\text{Area of Contact} = \frac{\text{Force}}{\text{Pressure}}$$

$$\text{Area} = \frac{1000}{10^5} = 10^{-2}\ m^2$$

3. **A force of 50 N is applied on a pin. The area of the head of the pin is $0.005 * 10^{-4}\ m^2$. Calculate the pressure exerted on the head of the pin.**

Ans. Solution :- Given Force = 50 N

Area = 0.005×10^{-4}

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

$$= \frac{50}{0.005 \times 10^{-4}}$$

$$= \frac{50 \times 10000 \times 1000}{0.005}$$

$$= \frac{50 \times 10000000}{5}$$

= 10 x 10000000

= 10^8 N m^{-2}

III. Write wheather the following statements are true or false :-

Ans. 1. F, 2. F. 3. T. 4. T. 5. T. 6. F. 7. T.

IV. Fill in the blanks with the suitable words :-

Ans. 1. An instrument used for measuring altitude directly is called *altimeters*.
2. A camel can easily walk on a *sandy* ground.
3. *S.I* unit of pressure is kilopascal.
4. Simple *Barometer* was designed by Torricells in 1643.
5. Sudden fall in barometric height indicates the arrival of stroms.
6. The greater the area of surface, the *less* is the pressure.
7. Hydraulic machines work on *Pascal* law.

V. Name the following :-

Ans. 1. Kilopascal
2. Pascal
3. Hydraulic device
4. Barometer
5. Mercury
6. Altimeter

VI. Tick the correct answer :-

1. a. 2. d. 3. b. 4. c. 5. .

12. Sound

I. Answer the following questions :-

1. What is sound and how is it produced ?

Ans. Singing of birds, barking of dogs, songs on music system cries of street venders, horns of automobiles, rustting of leaves. Zooming of aeroplanes etc are all different types of sounds our speech which we communicate with each other is also a sound.

Sound is produced by a vibrating body. It is produced when an object performs a rapid to and fro motion.

2. What are the various sources of sound ? Explain in detail.

Ans. Sources of Sound :-

1. **Musical Instruments :-** There are several kinds of musical instruments such as stringed instruments percussion instrument and wind instruments.
2. **Wind instrument :-** Air is made vibrate as it is blown into the pipe by making it move fast at sharp edge. This edge causes waves in the air column.
3. **The human voice :-** Vibrations are produced when air blown over vocal cords. Our throat has larynx, in which voice is produced . It is also called the voice box.

3. What is a tuning fork and how does it produce sound ? Explain it with the help of acitivity.

Ans. A tuning forks is a U-Shaped steel fork provided with a steel handle. The two arms of the U are called prongs wherease the handle is called stem. The tuning fork is a convenient. Source of producing sound vibration in a laboratry Activity.

To prove that sound is produced only when the prongs are vibrating . Take a tuning fork and strike one of it prongs gently with a hammer having rubber padding. You will hear the sound. When you quickly bring it close to your ear.

The vibrating prongs have a hazy look suspend a small bead by the thread. Bring the bead near the edge of the prong of the sounding tuning fork. You will notice the head bouncing from the fork. It proves that the prong of the vibrating and sounding tuning fork strikes the bead repeatedly.

Now touch the prong with your finger. On touching, the sound stops and together with the motion of the bead also stops.

This proves that sound produced by a vibrating object stops as vibrations stop.

4. What are various characteristic of sounds ?

Ans. **Loudness :-** It is the property by which a large sound can be distinguished from a faint one having the same pitch.

Pitch :- The characteristic of sound by which an acute or shrill note can be distinguished from a grave or a flat note.

Quality or timber :- Thequality or timber is the property by which two notes of the same pitch and of the same loudness given by two different instrument can be distinguished from one another. The quality of a sound depends on which part of an instrument is vibrating.

5. What do you understand by the term audible and non-audible sounds ?

Ans. Human ear is not sensitive to all kindsvibration. It is able to respond to only those vibrations whose frequeney is between 20Hz to 20,000 Hz. This range of frequency is called the audible range and the frequency is called audible frequency. Variations above or below.

This frequency range do not produce sensation of sound to humann ear. If the frequency of the vibrations is less than 20Hz, then humann ear cannot perceive them. These vibrations are called infrasonic vibration.

6. Explain that how sound propagates through solids, liquids and gases.

Ans. 1. **Propagation of sound through solids :-** Sounds travels more quickly and strongly through solids a toy telephone can be used to explain the transmission of sound energy through solids.

2. **Propagation of sound through liquids :-** Sounds can be propagate through liquids also but it travels faster in liquids than in air and slower than in solids.

3. **Speed of sound in air :-** The speed of sound depends on the compressibility of the material through which it is travelling. The more compressible the material, the slower the sound waves moving through it. Air is more compressible than liquids and solids, So sound travels faster in solids and Liquids than in gases.

7. What are echoes and what are their applications in human life ?

Ans. Due to reflection of sound waves an interesting phenomeuon called 'echo' takes place. In echo the original and the reflected Sounds are heard seprately.

During a thunderstrom. You see the lightning and hear the thunder after a moment or two this is because light travels much faster then sounds. The walls ceiling and floor of good auditorium and cinema halls are covered by absorbing materials. Thus there is very little reflection of sound waves and the audience hear the sound coming only from its source but not the reflected one.

8. What are the noise hazards and what are the measures to prevent noise pollution ?

Ans. Noise Hazards :-

1. Noise produces headaches, irritability and nervous tension.
2. Noise can cause loss of night vision as well as colour blindness.
3. Noise pollution reduces concentration and results in the loss of work efficiency.
4. Noise in the surroundings interferes with conversation with another person.
5. Noise can cause anger, tension and interferes with the sleep pattern of individuals.
6. A long exposure to noise pollution may result in the loss of hearing.

Some of the measure to prevent noise pollutions are :-

1. The horns of motor vehicles should not be blown unnecssary.
2. Airports and noise making factories should be shifted away from the residential area of the city.
3. Radio, televisions and streo-system should not be played very loudly.
4. Ear plungs should not be used by mechanics and worker in the factories.

II. Write True or False :

Ans. 1. T. 2. F. 3. F. 4. T. 5. F. 6. T. 7. T. 8. F.

III. Fill in the blanks :

Ans. 1. The unit of frequency is *Hz*.
2. The sound travels is the fastest in *solids*.
3. *Noise* is a sound which has unpleasant effect on the ears.
4. Sound cannot travel through *vaccum*.

5. *Dogs* can hear upto the frequency of 40,000 Hz.
6. The number of oscillations per second is called *frequence*.
7. The speed of sound in air is *330* m/s.
8. Sound travels *faster* in steel than in water.

IV. Match the statements in column A with those in column B.

Ans.

1.	A medium through which sound cannot travel.	Vaccum
2.	A property which distinguishes a loud sound from a feeble sound of same frequency.	Loudness
3.	To and fro motion of s vibrating body about its mean position.	Vibration
4.	Number of vibration produced by a vibrating body in one second.	Frequency
5.	Time in which vibrating body completes one vibration.	Time period
6.	Maximum displacement of a vibrating body from its mean position.	Amplitude

V. Define the following terms :-

Ans. i) **Amplitude :-** The maximum displacement of a vibrating body from its mean position is called its amplitude.

ii) **Frequency :-** The number of vibrations produced by a vibrating body in one second is called its frequencuy.

iii) **Pitch :-** Pitch can be defined as the characteristric of sound by which an acute or shrill note can be distinguished from a grave or a flat note.

iv) **Echo :-** Due to reflection of sound waves an interesting phenomenon called echo take place.

v) **Vibration :-** The to and fro motion of the pendulum is called oscillatory motion or one vibration.

VI. Tick the correct answer :-

Ans. 1. a. 2. b. 3. d. 4. c.

13. Electric Current And Circuits

I. Answer the following questions :-

1. How will you prove that distilled water is a non-electrolyte ? Describe how distilled water can be made a conductor of electricity.

Ans. To show that distilled water does not conduct electricity. Take a Dry cell, copper wires A, B and C with bare ends, a I volt bulb fixed in a bulb holder, a beaker, cellotape and distilled water.

Half fill the beaker with distilled water and connect the bare ends of the

copper wires. A, B and C through a bulb with cellotape. Touch the bare ends of the wires A, B and C with one another you observe that the bulb glows showing that all the parts of circuit are conducting electric current Dip the bare ends of the wires B and C in the distilled water Now the bulb does not glow. This activity proves that distilled water does not conduct electric current.

2. What is an electrolyte and what is electrolysis ? What are the uses of electrolysis ?

Ans. A Solution of a chemical compound which conducts electric current and at the same time undergoes a chemical change is called an electrolyte.The process due to which a solution of a chemical compound conducts electric current and also undergoes a chemical change is called electrolysis.

Uses of Electrolysis :- Water can be decomposed into its constituents by passing an electric current through it.

3. Describe an experiment with the help of a diagram to show the chemical effect of electric current.

Ans. Take the solution of copper sulphate ($CuSo_4$) in a glass vessel. Place a carbon rod and copper strip in it. Connect the negative electrode of batter to the carbon rod and the positive electrode to the copper strip. Take care that the carbon rod and the copper strip do not touch each other complete the circuit by pressing the switch and observe the result after a period of time. A thin layer of copper is deposited on the carbon rod on passing a direct electric current through a solution of copper sulphate copper is liberated from the solution and is deposited on the carbon rod ie the negative electrode.

4. What is meant by electroplating and how is it performed ?

Ans. Electroplating is a method of cooling a metal that easily corrodes with a metal that does not corrode easily by using an electric current.The process of electroplating is carried out in a vessel containing the solution of compound of a metal that is to form a coal. A rod of plating metal and the object to be plated are immersed in the solution. The object to be electroplated is connected to the negative pole of a battery. The rod of plating metal is connected to the positive pole of the battery. The object serves as a cathode and the rod as anode. Electrolysis takes place by passing an electric current through the electrodes and the positive ions get deposited on the object forming a coaling.

5. What are the chemical effects of electric current and what are the uses of this effect of electricity in useful applications ?

Ans. The chemical effect of an electric current is the phenomenon of causing chemical changes by passing electric current when an electric current is

passed through a solution of an electrolyte, its negatively and positively charged ions undergo a chemical change at electrodes.

Useful applications :-

1. **Electrorefining :-** The refining or purification of metals such as gold, silver, copper and lead is done by using electricity.
2. **Extraction :-** Some metals like aluminium and sodium are extracted from their ores with the help of electric current.
3. **Electroplating :-** Electroplating is a process of cooling a metal that easily corrodes with a metal that does not corrode easily.

6. What is an electric current ? How will you test the electrical conductivity of some substances ?

Ans. Movement of electrons in a conductor is called an electric current. To show that distilled water does not conduct electricity. Take a dry cell, copper wires A, B and C with bare ends, a 1 volt bulb fixed in a bulb holder, beaker, cellotape and distilled water. Half fill the beaker with distilled water and connect the bare ends of the copper wires A, B and C through a bulb with cellotape.Touch the bare ends of the wires A, B and C with one another. You observe that the bulb glows showing that all the parts of circuit are conducting electric current.Dip the bare ends of the wires B and C in the distilled water. Now the bulb does not glow. This activity proves that distilled water does not conduct electric current.

7. What happens to a conducting solution when electric current flows through it ?

Ans. When electric currents flows through a conducting solution chemical reaction take place.

Such as when electric current is passed through water Hydrogen and Oxygen gas is evolved.

II. Write Ture or False :-

Ans. 1. F 2. T. 3. F. 4. T. 5. F. 6. F. 7. F. 8. T. 9. F. 10. T.

III. Fill in the blanks :-

Ans.

1. Electric current is a stream of flowing *Electrons*.
2. A substance which does not frunish ions in a solution is called a (an) *Non-eletrotyles*.
3. The articles of more reactive *metals* get rusted easily.
4. *Pure* water is a bad conductor of electricity.
5. *Ions* are particles that bear electric charges.
6. Electrolytes conduct electricity in their *Molten* state or water solution.
7. In chemical changes, *Aqueous Solution* is used to bring a change.
8. The anions in an electrolyte discharge at *anode*.
9. The process of *Electroplating* is used to obtain pure metals from impure metals.

IV. Match the following :-

Ans.

1.	The process of depositing thin layer of metal with the help of electricity	Electroplating
2.	The electrode connected to negative terminal of a cell	Cathode
3.	The positively charged ions	Cation
4.	The apparatus in which electrolysis is carried out.	Voltameter
5.	A solution which conducts electricity and at the same time undergoes a chemical change	Electrolytes
6.	The metal wire/ rod through which current enters or leaves an electrolyte	Electrode

V. Tick the correct answer in the following :-

Ans. 1. b, 2. c, 3. d, 5. a.

VI. Name the following :-

Ans.
1. Iron, graphide
2. Petrol, pure water
3. Electrorefining
4. H_2 and O_2
5. Gold and silver
6. Chromiun, Nicked
7. HCL, H_2SO_4

14. Rain,Thunder And Lightning

I. Answer the following questions :-

1. What is electrostatic attraction ? How charging of bodies is done by friction ? Explain with the help of an activity.

Ans. Some properties of electric charges at rest are known as electro static this aquire the strange property of attraction. Two bodies are rubbed together they got charged. This is known as friction.

Experiment :- Rub an ebonite rod with a cat's skin. Suspend it freely. by a silk thread from some support. Bring another ebonite rod, which has been rubbed with cats skin near this suspended ebonite rod. It is noticed that suspended ebonite rod is repelled. This shows that the body is charged.

2. How will you prove that like charges repel and unlike charges attract each other ?

Ans. Rub a glass rod with silk and suspend it freely from a silk thread bring

another glass rod rubbed with silk near this suspended charged rod. It is noticed that this suspended glass rod is repelled.Take a glass rod and rub it with silk and suspend it freely by a silk thread bring an ebonite rod which is rubbed with cat's skin. It is observed that the glass rod is attracted by the ebonite rod. This is because the charge on the glass rod are not similar to the charge on the ebonite rod. The charge produced on the ebonite rod is negative charge (-) and the charge produced on the glass rod is positive charge (+) so we see that like charge repulse and unlike charge attract each other.

3. Describe lightning and thundering in detail. Give diagram wherever necessary.

Ans. Lightning is a static electric charge that moves from a cloud to the ground, from ground to a cloud or from one cloud to another lightning usually strikes with thunder-storms. Lightning is a dazzling bluish white light produced in the clouds. It is followed by a loud noise called thunder. When the weather is humid and there is a wind blowing, clouds develop static electricity with in them. Some clouds get negatively charged and some get positively charged. The opposite charged clouds get attracted towards each other in the sky and come close to each other. When the oppositely charged clouds. Come close, the electrons from the negatively charged clouds move towards the positively charged. Clouds through the moist-air. As a result lightning occurs.

When lightning occurs, a lot of heat energy is produced. The heat energy heats up the air around it. The hot air expands, compressing the cold air nearby. Because of this a loud sound called thunder is produced.

4. What precautions should be taken during lightning ? What do you understand by sparking ?

Ans. Precautions during lightning :-

1. If caught outside, stand in the open, away from trees, building etc. Do not use an umbrella.
2. Avoid holding or touching metallic objects like T.V. antenna.
3. Avoid Standing under or near trees or tall buildings.
4. Disconnect your computer, Television, telephone etc.
5. If you are travelling in a car or bus, stay inside only.

When two oppositely charged bodies are brought close to each other, an electric field is developed between them. If the air gap is quit small, the strong field can pull the electrons out of the atoms of the air molecules forming the ions and hence, insulation, of air breaks down. Due to breaking of insulation, charges jump from one body to another i.e. discharging takes place which is seen as a flash with cracking sound.

This phenomenon of discharge is called sparking.

5. Write about the construction of a lightning conductor. Draw a labelled diagram of lightning conductor.

Ans. A lightning conductor is a device which is used to protect the tall buildings against lightning during a thunderstorm. It works on the principle of conduction of electricity through metallic object.

It consists of a metal rod with many sharp spikes fitted on its top. The rod is fixed along with the outside wall of the building with sharp spikes pointing towards the sky above the building. The lower end of this rod is connected to a large sized metallic plate which is buried deep into the earth to dissipate any charge received by it.

6. How does a lightning counductor help in the prevention and control of damage due to lightning ?

Ans. When clouds charged negatively at their lower side pass over a building, they induce a positive charge on the highest part of the buildings, trees and other nearby objects and negative charge on the earth plate. Negative charge induced is immediately conducted to the surrounding earth. The pointed ends of the spikes acquire a very high charge density. Due to this high charge density, high electric field is produced near the pointed ends. This, in turn, ionizes the air particles producing positive ions. These positively charged ions on reaching the negatively charged clouds, neutralize them, and reduce the chances of lightning.

II. Write True or False :-

Ans. 1. F. 2. T. 3. T. 4. T. 5. T. 6. F. 7. F. 8. F.

III. Fill in the blanks :-

Ans. 1. Repulsion is the surest test of electrification.
2. *Sparkling* is produced when oppositely charged clouds get discharged.
3. Lightning *conductor* protects tall buildings from the damage caused by lightning.
4. The soil nitrates are excellent *fertilizer* and help in plant growth.
5. Speed of light is *more* than that of sound.
6. An ebonite rod when rubbed with wool becomes *negatively* charged.
7. Opposite charges *attract* each other.
8. Lightning usually goes with thunder.

IV. Match the statements in column A with those in column B

Ans.

1. A device which protects tall buildings from the damages caused by lightning.	Lightning conductor
2. A phenomenon due to which a dazzling white light is produced in the clouds.	Lightning
3. A kind of force acting between the two similarly charged bodies.	Repulsion

4. A charge produced on a glass rod on rubbing with silk. — Positive
5. A kind of force acting between the two oppositely charged bodies. — Attraction
6. A chage produced on an ebonite rod on rubbing with fur. — Negative

V. Tick the correct answer in the following :-

Ans. 1. a. 2. b. 3. b. 4. b. 5. b.

15. Light

I. Answer the following questions :-

1. State four charcteristics of an image formed by a plane mirror ? Draw a heat labelled diagram for the formation of an image in a plane mirror when a pencil is held horizontally infornt of it ?

Ans. Charactieristics of images formed by a plane mirror.

1. Image formed is virtual. It means it cannot be taken or a screen.
2. Image is of the same size as that of the object.
3. Image is formed as far behind the mirror as the object is in front of it.
4. Image is laterally inverted.
5. Image is always erect. Images formed in a pair of mirror placed parallel to each other.

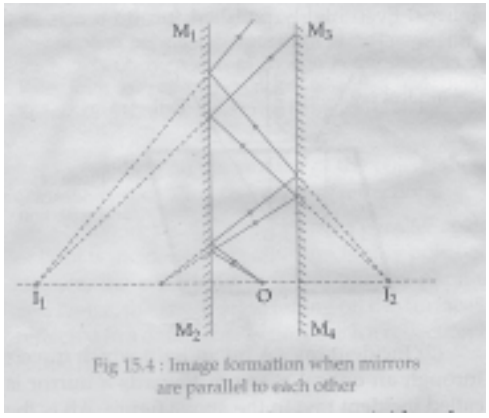


Fig 15.4 : Image formation when mirrors are parallel to each other

When two mirror are kept on a rigid surface such that they are parallel to each other, angle between them is zero and infinite numbers of images are formed of an object kept between them. On a rigid surface keep two plane mirrors M_1 M_2 and M_3 M_4 parallel of each other. Image I_1 is formed by direct reflection of rays from mirror M_1 M_2. These rays can be further reflected from mirror M_3 M_4 forming the image I_2. Image I_2 can be visualised as the image for virtual object I_1. After several reflections a number of images are formed but only a few of them are visible due to absorption of light. Also last few images are quite dim.

2. What is reflection of light and what are its laws ? State the different kinds of reflection ?

Ans. The phenomenon of bouncing of light in the same medium after striking a surface is called reflection of light.

Law of Reflection :- There are two laws of reflection.

1. The incident ray, the reflected ray and the normal at the point of

incidence all lie in the same plane.

2. The angle of incidence is equal to the angles of reflection i.e. Li=<r depending on the surface of the object, there are usually following two types of reflection.

i. Regular reflection when a parallel beam of light is incident on a plane and highly polished surface, the reflected beam will also be parallel and hence the whole light falling on th surface direction. Such a reflection is called regular reflection.

ii. Irregular reflection when a parallel beam of light is incident on a rough or irregular surface such as a piece of wood or a stone, the ray of light get reflected in all direction and spread over a wide area such a reflection is called diffused or irregular reflection.

3. What is meant by lateral inversion ? with the help of an activity show that a plane mirror ?

Ans. The Phenomenon due to which left hand side of an object appears as right hand side and vice versa is called lateral inversion.

If you write letter `P' and the word LIGHT on a paper and hold the paper in front of a mirror you will see that the letter and word light appers as 9 and THGIL respectively.

4. What are the uses of a plance mirror ? How are images formed when two plane mirrors make an angle of 60^0 with each other ?

Ans. Uses of plane mirror :-

1. Plane mirrors are used as looking glasses.
2. They are used to produce optical illusions on a stage.
3. They are used in showrooms barber saloons etc.
4. They are used in the construction of reflection instruments periscope and kelcidoscope.

5. What are the major defects of vision of human eyes and what are their correction. explain with the help of diagrams.

Ans. There are two types of defects of vision of the human eye.

1. Short sightedness or Myopia.
2. Long sightendness or Hypermetropia.

Myopia : In this a person cannot see distant objects clearly. In such cases the image of the distant object falls infront of the retina. This defect is caused when the eye ball has elongated or the focal lenght of the eye lens is shortened.

The defect of short sightedness can be corrected by using spectacles with concavlenses of appropriate focal lenght.

Long Sightendness or Hypermetropia : When a person cannot see the nearby objects usually this defect of vision is seen in old people. In this case, the image of the object falls, behind the retina. Long sightedness

defect can be correct by convexlenses.

6. Why are some people unable to see and what is the role of nutrition in relation to blindness ?

Ans. The poor vision or poor night blindness is due to the deficiency of vitamin A in our dielt, Vitamin A is present in good quantity in milk, chease, tomatos, carrots, clod liver oil and all kinds of yellow fruits. We must take good amount of these substances so as to maintain normal sight.

Care of eyes :- To protect our eyes following simple precautions are to be taken.

1. Wash your eyes twice everyday with clear and cold water.
2. Blink your eyes time to time while reading, watching television or doing any work which need concentration.
3. Do not read in a moving train or bus.
4. While playing never be careless as you can hurt your eyes. In case of an injury to eye, consult a doctor.
5. Do not rub your eyes when something or insect gets into them, either wash your eyes with clean water or consult the doctor.

II. Write Ture or False :-

Ans. 1. T. 2. T. 3. T. 4. T. 5. F. 6. F. 7. T. 8. T. 9. T. 10. F.

III Fill in the blanks :-

Ans.
1. Light is an invisible *energy* which causes sensation of vision in us.
2. The ange between the reflected ray and the *incident* ray is called angle of reflection.
3. *Corena* acts as window to the world.
4. *Braille* scrip is used by visually challenged people.
5. The image that can be taken on the screen is called *real* image.
6. The human eye forms the image of an object at its *Retina*.
7. A ray of light which falls on the mirror is called the *incident* ray.
8. The phenomenon of splitting white light into its component colours is called *Spectrum*.
9. At the junction of the choroid and the iris is the *vitreous* body.
10. The eyes is set within a socket in the skull called *orbit*.

IV. Define the following terms :-

Ans.
1. **Power of accommodation of an eye. :-** There is a limit to the power of accomodation of the eye. It may accomodate to see a distance object clearly but if the object is too close to the eye it is not clearly visible. If the object is at a distance less then 25 cm to 30 cm it cannot be seen clearly without a strain on the retina. This distance25 cm to 30 cm is called the least distance of distinctvision. The ability

of the eye to focous the object at different distances on the retin by changing this focal lenght of its lens is called power of accomodation of the eye.

2. **A Prism :-** A Prism is a transparent refracting medium bounded by two plane surface.
3. **The rainbow :-** During monsoon after the rain or when the sky is cloudly with unnumerable droplets of water a curved band of seven colours is often seen in the sly. The band of colours is known as rainbow.
4. **Light and reflection of light :-** Light is the form of energy which affects the eyes in such a way as to produce the sensation of version.
5. **Real and virtual images :-** The image which can be obtained on a screen is called a real image. The image whichcannot be obtained on a screen is called virtual.

V. Match the statements :-

Ans.

1.	A defect in the eye when a person can see nearest objects but not far off	:	Myopia
2.	A Special scripl designed for reading for visually challended people	:	Braille
3.	A divice used for seeing hexahonal image of an object	:	Kaleidoscope
4.	A jelly like fluid found in the posterior	:	Vitrous humans.
5.	A Part of eye which forcuses rays on the retina	:	Crystalline lens.
6.	A highly sensitive part on the retina of human eye	:	Regular reflection
7.	A mirror used in solar cookers	:	Plane mirror.
8.	The phenomenon of spliting white light	:	Dispersion.
9.	Reflection taking place from the walls of a room	:	Diffused reflection
10.	A kind of reflection in which reflected rays travel parallel to one another	:	Regular reflection

16. Night Sky

I. Answer the following questions :

1. Give an account of universe and Milky way ?

Ans. The universe consists of every thing that exists anywhere is space. It includes the earth and everything on it. It also includes everything in the solar system. All the stars, of which the sun is one, are parts of the

universe. The sun is one of the more than too millions stars grouped together in a grant sprial galaxy. When there is no moon in the sky you see a bright band of stars stretching accross the sky from north to south. This band looks like a milky cloud of stars and is called the milky way.

2. What is Moon ? Describe the different phases of moon with the help of a diagram ?

Ans. The moon is one of the important member of the celestial bodies. It is a natural salellite of the earth.

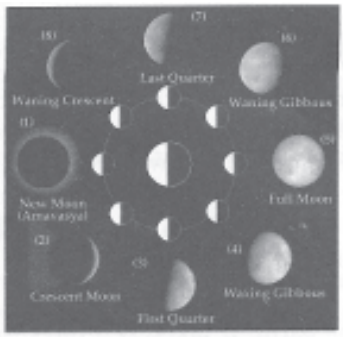


Fig 16.3 : Phases of the Moon

Phases of the moon :- The moon has no light of its own. It reflects the Sun's light which is visible from the earth in varying amounts during periods called phases. When the moon is in between the sun and the earth, the side of the moon facing the sun is lit only. The unlit side faces the earth in a phase called the new moon. After a week half of the moon is visible after another week, the full moon is visible from the earth. Then again after 7 days only 1/2 the moon is visible and then again after 7 days the moon returns to the new moon phase.

3. Define planets. What are the characterstics of planets ?

Ans. A solid heavenly body which revolves around the sun in a well defined orbit is called a planet. The characteristic of the planets depend on their distance from the sun. The planet closer to the sun have higher temperature then the distant planet. Earth has rich atmosphere of oxygen. Mercury has a very thin surface Venus is closed to the earth. Venus and earth are of equal size. Venus is called this evening star or morning star. Because it is the evening sky. Mars is the second closest neighbour of earth after Venus. A coating of dust stained by iron-oxide gives the planet a Raddish look. Jupiter, Saturn, Uranus and Neptune are all much larger than any of the other planets.

4. How many planets are known today ? Give the account of all the planets in serial order ?

Ans. There are eight planets in the orbit known todays.There are :-

1. Mercury
2. Venus
3. Earth.
4. Mars
5. Jupiter
6. Saturn
7. Uranus
8. Neptune

The planets are divided into two main groups :-

1. Terrestrial Planets : Terrestrial planets are Mercury, venus, earth and mars. They are similar in size and have solid rocky surface.
2. Jovian Planets : Jupiter, saturn, uranus and neptune are very large and consists mainly of gases.

5. Give a detailed idea of comets meters and meteorites ?

Ans. A comet is a celestial body that has a long tail which is very bright comets revolve around the sun. They are made of dust, gases and ice when the comet moves closer to the sun gases vaporise to form a cloud which is called coma. The sunlight reflecting on the coma makes the comet visible. Comets develop tails and become bright only if they approach the sun.

Meteors and Meteorites :- Meteors are metallic or stony bodies which move around the sun whenever a meteor enters eath's atmosphere, the heat is caused by the friction with air. The heat causes the meteor to glow most meteors burns fally at attitues of 70-100 km avove reach earth's surface. If a metor reaches earth's surface it is called a meteorite. Meteorites are usually very large because small meteors burn up before reaching Earth's surface.

6. What are constellation ? Describe any three well known constellation ? Give diagrams also.

Ans. A group of stars which forms a recognisable pattern or shape is called a constellation. There are 88 constellations in the sky. Each is assigned a name of the object to which is closely.

1. Ursa Major or big Dipper or Vsihat Saptrishi :-This constellation consists of 7 bright stars arranged in this shape of a big bear. The ursa Major constellation is likened to the following objects.

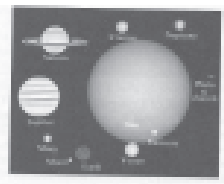
i. It looks like a kite having a long tail.

ii. It looks like an oversized todle.

2. **Ursa Minor or Laghu Saptarishi or Dhruva Matsaya :- Ursa minor is also a group of seven stars, similar to that of ursa major. The stars in ursa minor are closer and dimmer as compared to stars of ursa major. They from an outline of ladle or kite. At the tail of this constellation is a star of average brightness. It is called the pole star or Dhurva Tara.**

3. Orion or Hunter or Mriga :- Orion is also a constellation of 7 stars and is most prominent constellation of winter sky. It looks like a hunter with his shield and club upraised. In the orion, four stars from a kind of rectangle in a corner of which is situated the largest star called Betelgiuse. Whereas another bright star called Rigel is situated on the opposite corner.

7. Describe the Solar system ? Draw labelled diagram of this system ?



Ans. The solar system consists of the sun and all the bodies that revolve around it including planets, comets, meteors, meorites and moons together with dust particles

8. What do you understand by artificial satellites. Write about a few important artifical satellites ?

Ans. Satellites is an object that orbit another large body. A Satellites may be either natural or artificial. An artificial satellite is made by humans and is lauched into orbit around planets such as the earth. Artificial satellites perform various functions such as transmitting radio, telephone and television signals, sending back informtion. Helpful for weather forecasting, millitary surveillance and sending back scientific information about earth and space. Russia launched the first artificial satellite, sputnik I on October 4, 1957. The united states launched its first arificial satellite Explorer I on January 31st 1958. Aryabhatta was India's first artificial satellite launched in 1975. Second satellite Bhaskar Rohini Apple and INSAT are some other very important Indian satellites.

II. State whether the following statement ar ture or false :-

Ans. 1. T. 2. F. 3. T. 4. F. 5. F. 6. T. 7. F. 8. F. 9. F. 10. T.

III. Fill in the blanks :-

Ans. 1. The celestail body/ bodies revolving around the plant\ets is/ are called *Satellites*.
2. The unburnt part of the meteor whiuch reached the earth is called *Meteorite*.
3. The unlit side of the moon faces the earth in a phase called the *New* moon.
4. A large group of stars is called a *constellation*.
5. *Russia* launched the first artificial setellite sputnik I.
6. The *Venus* is also known as the morning star.
7. The farthest planet from the sun is *N*.
8. The *Sun* apperars to move in the sky from east to west.
9. *Earth* is tahe only planet on which life exists.

IV. Match the statements in Column A with those in Column B :-

Ans.

1.	The star nearest to the solor system	: Alpha centuary.
2.	A night when moon is not visible	: New Moon.
3.	A cluster of billions of stars	: Galaxy.
4.	A planet which is commonly called Evening star	: Venus.
5.	A planet which does not revolve in the same plane as other planets	: Pluto
6.	A cluster of stars resembling some	: Constellation
7.	A Gas chiefly found in the atmosphere of stars	: Hydrogen

8. An unburnt piece of meteor which reaches the earth : Meteorite
9. A natural satellite revolving around the earth : Moon

V. Name each of the following :-

Ans. 1. Planet
2. Star
3. Terrestrial planet, Jovian planet
4. Jupiter
5. Moon, Satellite
6. Halley's comet
7. Moon
8. Aryabhetta

VI. Tick the correct answer in the following :-

Ans. 1. b. 2. b. 3. a. 4. a. 5. b. 6. a. 7. a. 8. a.

17. Earth quakes

I. Answer the following questions :-

1. Give an account of the structure of the earth. Take help of a labelled diagram.

Ans. The planet as a whole is called geosphere. The outer rocky part of the earth is called earth's crust or lithosphere. On the crust live plants and animals which together form the biosphere. The depressions of the crust are filled with vast oceans and the watery part is called hydrophere.

Inside of the earth is made up of a number of iron under a very very pressure and temperature. The outer core, Surrounds the inner core. The outer core is liquid in nature and is mostly made up of iron. Surrounding the outer core is mantle made up of molten solid rocks called magma.

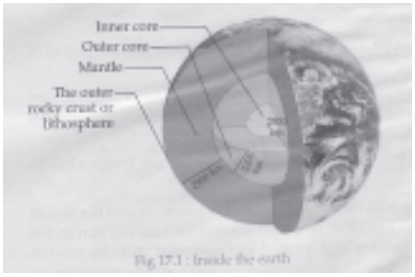


Fig 17.1 : Inside the earth

The magma contains dissolved hot gases at high pressure.

2. What is an earthquake ? What are the sequences of earthquakes ?

Ans. A naturally caused shaking of a part of the earth's surface is called an earthquake. Earth quakes are some times proceded by foreshocks and major ones are often followed by many after shocks.

Effects of earthquakes :-

1. Buildings, roads, bridges and other structures often suffer severdamges during earthquake.

2. The earthquake of moderate intensity can create fissures and cracks in the ground. As a result, roads, property, lives are usually destroyed.
3. The courses of rivers are sometimes affected by earthquakes.
4. Fires often accompany earthquake, in cities.

3. Write the causes which are responsible for the occurrence of earthquake.

Ans. Two major types of earthquakes are tectonic and volcanic. Almost all major earthquakes are of the tectonic type.All most all major earthquakes are of the tectonic type. They occur by sudden movement of rocks along an existing fault. A fault is a crack in the earth's outer shell. Where sections of rocks slide past each other repeatedly.The interior point where an earthquake first begins is called its focus or seismic focus. Deep earthquake are produced by as sudden collapse of a small portion of rocks.

4. What is the method of detecting earthquakes ? Where do earthquakes occur ?

Ans. To determine the strength and location of earthquakes, an instrument called seismograph is used seismographs record the different shockwaves of the earthquakes.In india the entire Himalyan region, parts of Northern Indian plains and part of Gujarat belong to highest risk category. The remaining parts of the northern plains and western coastal areas fall in moderate risk zone. A large part of peninsular India lies in the low risk zone.

5. Write about the prediction and control of earth quakes.

Ans. Scientists are trying to make better predictions through animal's behaviour. Animal sometimes act strangely in the hours before an earthquake strikes. Animals are more sensitive to human beings. To physical changes that precede a quake. These changes include a shift in the angle or height around surfaces, ionization of air, vibrations, shifts in the earth's magnetic field and the rise or fall of lakes, ponds or rivers levels.Safety precautions are vital during an earthquake. people can protect themselves by sitting under a table until shaking stops. They should not go outdoors untill the shaking has stopped completely. People who are outdoors, when an earthquake hits, should move away from tall trees and buildings, steep slopes and power lines.

6. What is the magnitude of earthquakes ? Give an idea of the scale of earth quake intensity.

Ans. The intensity of an earthquake is an evaluation of the severity of ground motion at a given location. It is measured in relation to the effects of the earthquake on human life.By measuring the amplitide of the waves, the strength of the earthquake is determined by using Richter scale. On

this scale, each successive number stands for an earthquake about ten times stronger than one represented by the preceding number an earthquake of magnitude 5 releases about 10 times more energy than an earthquake of magnitude 4.

II. Write True or False :-

Ans. 1. T. 2. T. 3. F. 4. T. 5. T. 6. T. 7. F. 8. T.

III. Fill in the blanks :-

Ans. 1. *Volcanic* eruptions are major cause of earthquakes.
2. Seismograph measures and rrecords the intensity of *seismo* waves.
3. Nearly all major earthquake are of the *two* type.
4. Shckwaves are known as *seismic* waves.
5. An earthquake is a sudden vibration of the *rocks*.
6. Faults occur in the *weak* areas of the earth's rock.
7. The point from which an earthquake orginates is called the *focus*.
8. Solid hard crust of the earth is called *magma*.

IV. Match the statements in column A with those in column B :-

Ans.

1.	An instrument used for recording earthquake.	:	Seismograph
2.	A point directly above hypocentre on the surface of earth during an earthquake.	:	Epicentre
3.	Giant plates of lithosphere floating over mantle of the earth.	:	Tectonic plates
4.	A gaint sea wave produced due to an earthquake under sea.	:	Tsunami
5.	Scale for measuring the intensity of An earthquake.	:	Richter

V. Name each of the following :-

Ans. 1. Focus or seismic focus
2. (a) Primary or Longitu dinal waves
(b) Secondary waves
(c) Transverse waves
3. Long wave
4. (a) Oceanic spreading ridges
(b) Subduction zones
(c) Transform faults places
5. Seismograph
6. (a) Tectonic
(b) Volcanic

7. (a) Fault

VI Tick the correct answer of the following :-

Ans. 1. a. 2. d. 3. a. 4. d.

18. Natural Resources

I. Answer the following questions :-

1. What is forest and what are the problems created by deforestation ?

Ans. A forest is a natural resource. It is not only a valuable, renewable economic resource for mankind but it is very important for maintaining the ecological balance of life on earth.Problems caused by deforestation large forest areas are cut by man which has resulted in upsetling the natural ecosystem causing following ill effects :

1. There is less rain, with the result there is a problem of drinking water and water for irrigation.
2. Water table has gone down.
3. There is a lot of soil erosion as there are no roots of the plants to hold the soil.
4. WIld animals do not get enough space to feed them.
5. There is not enough firewood or timber wood available for various industrial activities.

2. What steps should be taken for the conservation of forests ?

Ans. For the conservation of fertile soil following steps should be taken :-

1. Big or small dams should be made on the rivers to check flooding in rainy season.
2. Deforestation should be checked firmly to prevent floods and strong winds
3. Tall trees should be planted along the boundaries of the fields. They check the speed of fast moving winds.
4. Animals should not be allowed to graze in the fertile soil fields.

3. What are the reasons of degradation of fertile soil ? Explain in detail.

Ans. Reasons of degradation of fertile soil :-

1. **Natural factors :-**

(i) Floods in the rainy season, carry away the top layer of fertile soil.

(ii) Stormy winds, dust stroms carry away the fertile soil.

2. **Man-made factors :-**

(i) Grazing of cattle in the fields results in the loss of top soil.

(ii) After harvest the crops, the stems of those plants are left in the soil. For burning which kills micro-organisms present in the soil and destroy the fertility of the soil decreases.

(iii) Deforestation near cultivable land causes floods and strong winds

and causes infertility of the soil.

(iv) Dumping of agricultural or industrial wastes in the fertile soil makes it infertile.

4. How would you conserve soil ?

Ans. For the conservation of fertile soil following steps should be taken :-

1. Big or small dams should be made on the rivers to check flooding in rainy season.
2. Deforestation should be checked firmly to prevent floods and strong winds.
3. Animals should not be allowed to graze in the fertile soil fields.
4. Tall trees should be planted along the boundaries of the fields.
5. The canals and water channels should be made with bricks so that water does not percolate.

5. What are mineral resources ? Describe the formation and uses of coal.

Ans. The resouces inside the earth which can be utilized by human beings are called minerals. Minerals are non-renewable. Man has been extrating coal, Petroteum natural gas and metal ores as minerals to put to various uses after modification.When huge forest areas got buried under the surface of the earth. Then in hot and humid conditions anaerobic bacteria attacked on it progressively removing hydrogen and oxygen and leaving behind carbon. Due to extremely high temperature and pressure of the earth, the carbon got compacted to form stony resi due called coal.

Uses of Coal :-

1. It is used in the manufacture of synthetic petroleum.
2. It is used in the manufactureof coke, coal, gas etc.
3. It is used as a source of organic compounds eg. benzene, phenol, aniline etc.
4. It is used as a fuel.

6. Write a note on petroleum. Give detailed description of origin, occurrence and refining of petroleum products.

Ans. Petroleum is a complex mixture of solid, liquid and gaseous hydrocarbon mixed with salt water and earthly particles. It is formed by anaerobic decomposition of very small sea animals and plants, which got buried millions of year ago. The bodies of the dead plants and animals decayed in the absence of air under very high temperature and pressure of the earth. The product of the decay was petroleum and natural gas. The product got trapped between the two layers of non porous rocks forming an oiltrap. Natural petroleum is mixed from oil wells and then taken to refineries. There it is heated strongly at 450^0C to change it into vapour. This vapour form is then cooled at different tempratures and the following useful products are out from it.

1. **Petroleum Wax :** Its vapour do not liquify when highly compressed they change into liquid petroleum gas. used as domestic fuel.
2. **Paraffin Wax :** Its vapour cool between 425°C and 450°C used for making candles, vaselin, grease etc.
3. **Lubricanty Oil :** Vapour cools between 425°C and 400°C.
4. **Diesel Oil :** Its vapour cools between 250°C to 350°C.
5. **Fuel Oil :** Its vapour cool between 350°C to 400°C.
6. **Karosene Oil :** Its vapour cool between 170°C to 250°C.
7. **Petrol or Carosine Oil :** Its vapour cool at 70°C to 170°C.
8. **Naptha or Petroleum ether :** Its vapour cools between 30°C to 70°C.

7. What are the uses of petroleum products ?

Ans. Petroleum products are used in many ways in the form of :
Petroleum gas, Paraffin gas, Lubricating oil, Diesel oil, Fuel oil, Kerosene oil, Petrol or Gasoline, Naptha or Petroleum ether

8. What are natural resources into how many categories these resources are classified ?

Ans. The gifts which are given to us by nature and which are extremely valu able are called natural resources. Natural resources are classified in two types :

1. **Renewable Resources :** These are the sources which are replenished through natural cycles such as oxygen, air, water etc.
2. **Non Renewable Resources :** Non renewable resources are not re placed in the environment after their utilisation. Their natural formation taken millions of year. Coal, Oil, Natural gas are all non-renewable resources. All these resources depend on each other.

9. Descibe the formation and consequences of over extraction of fossil fuels ?

Ans. Coal petroleum and natural gas are classified as fossil fuels Though the formation of these fuels is going on, but people use the fuels thousands of times faster then they form. The rapid growth of energy use threatens to exhaust the world's supply. Petroleum may become the first fuel to give out growing scare in the early 2000. When people have removed all the oil and natural gas from the earth would have used up the easy energy, supplied by the nature. After that they will have to use such fossil fuel as coal. Eventually people will have to find different sources of energy all together.

II. Ture or False :

Ans. 1. T. 2. T. 3. T. 4. T. 5. F. 6. F. 7. F. 8. T. 9. T. 10. F.

III. Fill in the blanks :-

Ans. 1. Coal is a *Non renewable* resource.
2. When trees are burnt, they release *carbon-di-oxide* gas into the

atmosphere.

3. The period of fosil fuels formation began about *200 to 250 million* years ago.
4. *Petrol* is used for running light vehicles.
5. Deforestation leads to a decrease in *soil* fertility.
6. Soil *erosion* can be checked by making dams on streams.
7. *Minerals* deposits are usually found mixed with salt water.
8. LPG is used as *Domestic* fuel.
9. Upper most layer of the earth is known as *top layer.*
10. Too much release of carbon-di-oxide in air is leading to *global* warming.

IV. Mach the statements in column A with those in column B. :-

Ans.

1.	Loss of soil due to flood	:	Soil-erosion.
2.	A gas product when fuels burn at a very high temperature	:	Nitrogen-dioxide.
3.	The maximum amount if a gas present in air.	:	Nitrogen.
4.	A gas produced by burning fuel to & insufficient supply of air	:	Carbon monoxide.
5.	A substance very essential for cultivation	:	Water.
6.	A dark coloured viscons and foul smelling fossil fuel	:	Petroleum.

V. Name each of the following :-

Ans.

1. Renewable, Non renewable.
2. Coal, Petroleum, Natural Gas.
3. Carbon-di-oxide.
4. Wood, Timber, Paper, furniture.
5. World bank, Connection International development authority.
6. Petroleum gas, Paraffin Wax.
7. Synthetic petroleum, coke phenon.
8. Lubriate oil, Kerosin Oil.
9. Wood.
0. Water air, sunlight, animals.

VI. Tick the correct answers :-

Ans. 1. a. 2. b. 3. c. 4. b. 5. c.

19. Air and Water Pollution

I. Answer the following questions :-

1. What is pollution ? What is air pollution and what are its causes ?

Ans. Pollution is the addition to the environment of the substance that makes

it harmful for living organisms. Due to scientific progress new gases are being released into the atmosphere. As a result of increasing population use of fuel has also increased and a producst of buring fuel carbon di oxide is released into the air. The air in ever increasing quantitive and there unwanted material in the air pollute the air.

Causes of Air Pollution :-

1. Industries
2. Automobiles.
3. Smog.

2. What are the effects of air pollution ?

Ans. Effects of air pollution :-

1. Sulphur dioxide (SO_2) released from coal and oil Combustion causes headaches, irritation in the respiratory, vomiting and chest constriction etc.
2. Excess of Co_2 casuses suffocation.
3. Carbon mono oxide reduses oxygen carrying capacity of blood in human's body.
4. Sulphur-di-oxide and nitrogen oxide react with rain water and produce acid rain.
5. The greenhouse gases (methane and carbon- di- oxide) which are produced by the burning of fossil, fuels, agricultural activity and deforestation trap the heat radiated from the earth due to which earth temperature increases.

3. How can air pollution be controlled ?

Ans. The effect of air pollution can be minimzed by adopting the following methods. :-

1. Factories should use fuel that cause lesser pollution and should change the methods of manufacture.
2. Factories should be established some distance away from the residential area.
3. Burning of vegetable material should be banned.
4. Green plants should be planted.
5. Smoking also should be banned completely.
6. Environmental awareness should be created through education.
7. Particulate air pollutant can be controlled by the use of selting tankes.

4. What is water pollution and what are its causes ?

Ans. Addition of harmful and unwanted materials into water is called water pollution.

Causes of water pollution :-

1. Industrial sewage.
2. Domestic sewage.

3. Oil leakage.
4. Agriculture wastes.

5. What measures are taken to prevent water pollution ?

Ans. 1. The sewage and factory wastes have to be cleaned before they flow into water resources.
2. Biological treatment for the sewage should be carried out.
3. Septic tanks treatment should be used for individual houses of communities.
4. Human and animal dead bodies should not be thrown in the river.
5. A large number of trees should be planted along the river banks.

6. How does impure water affect bodly on soil and living organisims ?

Ans. Effect on human health Impure water can cause many diseases like diarrhoea, dysentry, typhoid, Jaundice, hepatitic etc. effect on quality of water of rivers tanks and oceans. Domestic sewage, industrial wastes and agricultural effluents decrease the quality of water. A lake can become dead in due cource of excessive dumping of wastes in it. The same way rivers may also suffer by water pollution.

7. What is potable water ? Draw a neat and well labelled diagram of supply of drinking water to a town ?

Ans. The water that is fit for drinking is called drinking or potable water such

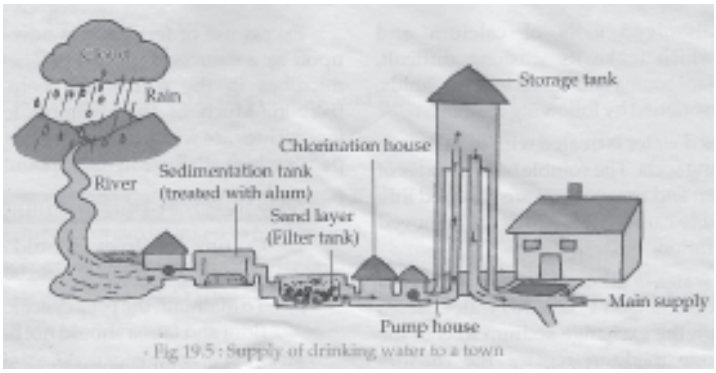


Fig 19.5 : Supply of drinking water to a town

water does not cause any water borne disease and is fit for drinking.

8. Explain the various ways of water treatment in detail ?

Ans. **Water treatment :** Water treatment processes are divided into following categories.

1. Physical Treatment
   i. Filtration.
   ii. Screening.
   iii. Floe-culation.
   iv. Sedimentation.
   v. Aeration.

2. Chemical Treatment
   i. Coagulation.
   ii. Disinfections.
   iii. Water softening.
   iv. Absorption.

II. True or false :-

Ans. 1. T. 2. F. 3. F. 4. F. 5. F. 6. T. 7. F. 8. T.

III. Fill in the blanks :-

Ans.. 1. Sewage is a major cause of *water* pollution.
2. Water which is fit for drinking is called *potable* water.
3. In the purification of water *chlorine* is added to kill bacteria.
4. *So_2 and No_2* is resposible for acid rain.
5. Automobiles contribute to about *60* persent of air pollution.
6. Water from natural resources contains both suspended and harmful impurities.
7. *Lead* exhaust from automobiles cause anaemia.
8. Hardness of water is due to dissoloved salts of calcium and *Magnisium* in it.

IV. Match the statement in column A with those in column B.:-

Ans.

1.	Water pollution	:	Sewage.
2.	Sewage	:	Biodegradable pollutant.
3.	Lead	:	Non biodegradable pollutant.
4.	Green house effect	:	Burning of fossil fuel.
5.	Acid Rain	:	Carbon dioxide.
6.	Depletion of ozone layer	:	Chlorofluoro carbons.