SCIENCE WORK BOOK

CLASS - VIII

State Council of Educational Research and Training
Govt. of Tripura

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SCIENCE WORK BOOK

Class - VIII

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রতন লাল নাথ
মন্ত্রী
শিক্ষা দপ্তর
ত্রিপুরা সরকার

বার্তা

শিক্ষার প্রকৃত বিকাশের জন্য, শিক্ষাকে যুগোপযোগী করে তোলার জন্য প্রয়োজন শিক্ষাসংক্রান্ত নিরন্তর গবেষণা। প্রয়োজন শিক্ষা সংশ্লিষ্ট সকলকে সময়ের সঙ্গে সঙ্গে প্রশিক্ষিত করা এবং প্রয়োজনীয় শিখন সামগ্রী, পাঠ্যক্রম ও পাঠ্যপুস্তকের বিকাশ সাধন করা। এস সি ই আর টি ত্রিপুরা রাজ্যের শিক্ষার বিকাশে এসব কাজ সুনামের সঙ্গে করে আসছে। শিক্ষার্থীর মানসিক, বৌদ্ধিক ও সামাজিক বিকাশের জন্য এস সি ই আর টি পাঠ্যক্রমকে আরো বিজ্ঞানসম্মত, নান্দনিক এবং কার্যকর করবার কাজ করে চলেছে। করা হচ্ছে সুনির্দিষ্ট পরিকল্পনার অধীনে।

এই পরিকল্পনার আওতায় পাঠ্যক্রম ও পাঠ্যপুস্তকের পাশাপাশি শিশুদের শিখন সক্ষমতা বৃদ্ধির জন্য তৈরি করা হয়েছে ওয়ার্ক বুক বা অনুশীলন পুস্তক। প্রসঙ্গত উল্লেখ্য, ছাত্র-ছাত্রীদের সমস্যার সমাধানকে সহজতর করার লক্ষ্যে এবং তাদের শিখনকে আরো সহজ ও সাবলীল করার জন্য রাজ্য সরকার একটি উদ্যোগ গ্রহণ করেছে, যার নাম 'প্রয়াস'। এই প্রকল্পের অধীনে এস সি ই আর টি এবং জেলা শিক্ষা আধিকারিকরা বিশিষ্ট শিক্ষকদের সহায়তা গ্রহণের মাধ্যমে প্রথম থেকে দ্বাদশ শ্রেণির ছাত্র-ছাত্রীদের জন্য ওয়ার্ক বুকগুলো সুচারুভাবে তৈরি করেছেন। ষষ্ঠ থেকে অষ্টম শ্রেণি পর্যন্ত বিজ্ঞান, গণিত, ইংরেজি, বাংলা ও সমাজবিদ্যার ওয়ার্ক বুক তৈরি হয়েছে। নবম দশম শ্রেণির জন্য হয়েছে গণিত, বিজ্ঞান, সমাজবিদ্যা, ইংরেজি ও বাংলা। একাদশ দ্বাদশ শ্রেণির ছাত্র-ছাত্রীদের জন্য ইংরেজি, বাংলা, হিসাবশাস্ত্র, পদার্থবিদ্যা, রসায়নবিদ্যা, অর্থনীতি এবং গণিত ইত্যাদি বিষয়ের জন্য তৈরি হয়েছে ওয়ার্ক বুক। এইসব ওয়ার্ক বুকের সাহায্যে ছাত্র-ছাত্রীরা জ্ঞানমূলক বিভিন্ন কার্য সম্পাদন করতে পারবে এবং তাদের চিন্তা প্রক্রিয়ার যে স্বাভাবিক ছন্দ রয়েছে, তাকে ব্যবহার করে বিভিন্ন সমস্যার সমাধান করতে পারবে। বাংলা ও ইংরেজি উভয় ভাষায় লিখিত এইসব অনুশীলন পুস্তক ছাত্র-ছাত্রীদের মধ্যে বিনামূল্যে বিতরণ করা হবে।

এই উদ্যোগে সকল শিক্ষার্থী অতিশয় উপকৃত হবে। আমার বিশ্বাস, আমাদের সকলের সক্রিয় এবং নিরলস অংশগ্রহণের মাধ্যমে ত্রিপুরার শিক্ষাজগতে একটি নতুন দিগন্তের উন্মেষ ঘটবে। ব্যক্তিগত ভাবে আমি চাই যথাযথ জ্ঞানের সঙ্গে সঙ্গে শিক্ষার্থীর সামগ্রিক বিকাশ ঘটুক এবং তার আলো রাজ্যের প্রতিটি কোণে ছড়িয়ে পড়ুক।

(রতন লাল নাথ)

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CONTENTS

Chapter - 1
Crop Production and Management

Workbook

Key Notes:

- Same kind of plants cultivated at one place on a large scale constitute a crop.
- In our country, based on the seasons of cultivation, crops can be broadly categorised into two types; Rabi crop (October - March i.e. winter season) and kharif crop (June - September i.e, rainy season). Some examples of Rabi crops are wheat, gram, pea, mustard etc. and some examples of kharif crops are paddy, maize, soyabean, groundnut, etc.
- Agricultural practices for crop production are - preparation of soil, sowing, adding manure and fertilizers, irrigation, protection from weeds, harvesting and storage.
- To prepare the soil tilling or ploughing is done for turning and loosening the soil. The main tools used for this purpose are plough, Hoe and cultivator.
- Before sowing it is very important to select good quality, clean, and healthy seeds of a good variety.
- For sowing seeds a funnel-shaped structure with two or three pipes having sharp ends is used as traditional tool. But now a days seed drill is used for sowing which ensure sowing of seed uniformly at equal distance and depth.
- Manures and fertilizers are added to the soil as nutrients for healthy growth of crops. Manures are organic, whereas fertilizers are inorganic in nature. Examples of manure- plant or animal wastes, cow dung etc. and examples of fertilizer-urea, super phosphate, potash, NPK etc.
- As fertilizers do not provide any humus to the soil, so its long term use can make the soil sterile. On the other hand manures provide lot of humus to the soil and maintains soil fertility.
- Irrigation is the supply of water to crops at regular intervals, which varies according to crop, soil and season. Wells, river, dams, canal etc. could be the sources of water for irrigation.
- The traditional methods of irrigation are - Moat, Chain pump, Dhekli, Rahat etc. The modern methods of irrigation are - sprinkler system (water gets sprinkled on the crop as if it is raining) and drip system (water falls drop by drop directly near the roots)
- Weeds are the underised plants that may grow naturally along with the crops. As weeds compete with crop plants for water, nutrient, space and light, so the removal of weeds i.e. weeding is necessary. It can be done manually or by using certain chemicals called weedicide. Khurpi and seed drill is used for manual weeding and 2,4-D is used as weedicide.

- ❖ Harvesting is the cutting of mature crop manually by sickle or by using a machine called harvester. Combine is another machine which is used as a harvester as well as a thresher. Separation of the grains from the chaff is done by winnowing.
- ❖ Grains need to be dried properly before storage. Jute bags or metallic bins or silos and granaries (large scale) are used for storage of grains.
- ❖ Food is also obtained from animals. For which they are reared either in small scale or on a large scale (Animal husbandry).

Now, let us practice some questions from this topic -

A. FILL IN THE BLANKS

1. When plants of the same kind are cultivated at one place on a large scale, it is called a …… . (Crop/weed)
2. . …… crops are grown from the month of June to September. (Rabi/Kharif)
3. …….. crops are grown from the month of October to March. (Rabi/Kharif)
4. Cultivation of leguminous crops and wheat or maize alternatively is an example of ……... (Crop rotation/irrigation)
5. In …… irrigation system the water falls drop by drop directly near the roots. (Drip / Sprinkler)
6. Weeds are also controlled by using certain chemicals, called..... (weedicides / pesticides)
7. …… is a practice of breeding and raising livestock. (Animal husbandry/animal science)
8. Weeds can be removed manually with a ……. (plough / khurpi)
9. …… is like artificial rain makers. (Spraying machine / sprinkler)
10. Fertilizers have become a source of ……. pollution. (Air/Water)

B. STATE WHETHER THE FOLLOWING STATEMENTS ARE TRUE OR FALSE :

1. Paddy is a Rabi crop.
2. Crop rotation helps in controlling weeds.
3. Cultivator is used for adding manure or fertilizers to the crop.
4. We get cod liver oil from fish.
5. Vegetable peels enrich the soil with nitrogen.
6. The agricultural practice called storage comes after harvesting.
7. Dried neem leaves are used for weeding.
8. Combine is a harvester as well as a thresher.

9. Farmers should not cover their nose and mouth with a piece of cloth during spraying of chemical.

10. Separation of grain and chaff is done by winnowing machine.

C. MATCH THE ITEMS IN COLUMN A WITH THOSE IN COLUMN B

Column - A	Column - B
1. Sprinkler system	(a) Sowing
2. Hoe	(b) Irrigation
3. Sickle	(c) Harvesting
4. Seed drill	(d) Ploughing
5. Organic substances obtained from decomposition of plant and animal wastes	(e) Weeds
6. Process of transferring seedlings from a nursery to the main field	(f) Agriculture
7. Process of loosening and turning the soil	(g) Weedicides
8. The process of growing plants and rearing animals for food, clothing and other useful products	(h) Transplantation
9. Undesirable plants that grow with the crops	(i) Manure
10. The chemical substance that controls the growth of weeds.	(j) Tilling

D. MULTIPLE CHOICE QUESTIONS

1. Which of the following is not a rabi crop?

   (a) Wheat (b) Peas (c) Mustard (d) Sugarcane.

2. Which of the following crop would enrich the soil with nitrogen?

   (a) Potato (b) Beans (c) Apple (d) Paddy

3. Which one of the following condition is not essential to grow maize?

   (a) Moderate temperature (b) Low temperature (c) humidity (d) Rainfall

4. The term used for the process of separation of the grain from chaff is

   (a) Winnowing (b) Threshing (c) Sieving (d) Hand picking.

5. Which of the following tool would a farmer use to remove weeds from the field?

   (a) Hoe (b) Cultivator (c) Plough (d) Axe

6. Which of the following is not true for fertilizers?

   (a) These increase the yield.

   (b) Excessive use of it disturbs the balance of nutrients in soil

(c) These are generally used in small quantity

(d) These are environment friendly

7. The monsoon season in our country is during the months from -

(a) April to December (b) January to May

(c) November to march (d) June to September

8. The system of irrigation where water is supplied drop by drop near the roots is called

(a) Drip system (b) Pulley system (c) Sprinkler (d) Lever system

9. An example of fertilizer is

(a) Cow dung (b) Urine (c) Urea (d) Plant waste

10. An example of manure is

(a) Cow dung (b) Super Phosphate (c) Urea (d) NPK

E. VERY SHORT ANSWER TYPE QUESTIONS (1 MARK)

1. What is crop?
2. What is tilling?
3. Name two primary cropping patterns in India.
4. Which is the first step in cultivation of crop?
5. Which step in the preparation of soil loosens and turns the soil in the fields?
6. Name two substances that are added to fields by farmers to maintain the fertility of soil.
7. Name two fertilizers.
8. Which crop is grown between two cereal crops in crop rotation?
9. What is crop rotation?
10. What are weedicides?
11. Name the chemical substances that are sprayed in the field to control weeds ?
12. Which agricultural practice is carried out with the help of sickle?
13. Name the process in which grains are separated from chaff with the help to wind.
14. Name the two ways in which farmers store food grains.
15. Name the machine used both for harvesting and threshing?
16. Name the nitrogen fixing bacteria that remain present in root nodules of leguminous plants.
17. Which activity of farmer can promote growth of earthworms and microbes in the field?

F. SHORT ANSWER TYPE QUESTIONS (2 MARK)

1. Differentiate between Rabi and Kharif Crop?
2. Write down the difference between fertilizers and manures
3. Why adding manure and fertilizer is considered to be an important step in agricultural practice?
4. What are Rhizobium bacteria? Why are they useful?
5. Which one is better: Manure or Fertilizer? Why?
6. Why grains are dried before storage?
7. How do weeds affect on the growth of crops?
8. What is the significance of irrigating the crops?
9. How grains are stored in big godowns?
10. Why turning and loosening of soil is important?
11. Why earthworms and microbes are regarded as friends of farmer?
12. Name two agricultural implements other than plough used for 1oosening and turning soil?
13. What are the advantages of sowing seeds at appropriate distance?
14. What is transplantation?
15. What are the advantages of transplantation?
    (Hints- Helps in selecting better and healthy seedling, can be planted with right spacing etc)

G. LONG ANSWER TYPE QUESTIONS (3 MARKS)

1. Discuss the role of water in the production of crops.
2. Why levelling is done after ploughing? What are the benefits of levelling?
3. Why damage seeds float on water surface and why healthier seeds sink to the bottom in a vessel? [Hints: Damage seeds are hollow from inside , hence they are lighter in weight whereas healthy seeds are solid]
4. How nitrogen fixations help in nutrient enrichment?
5. Define animal husbandry. Write the names of some food materials provided by animals?
6. What are the different methods of weeding ?
7. Which activity of the farmers can promote growth of earthworms and microbes in the field?
8. What are the methods of storing food grains for future?
9. Write the function of (a) Seed drill (b) Hoe (c) Combine
10. What will be the consequences if harvested grains are stored without drying?

H. ESSAY TYPE QUESTIONS (5 MARKS)

1. Write short notes on different methods of irrigation.
2. (a) Draw a diagram of a plough and label the following parts (i) Plough shaft
   (ii) Ploughshare
   (b) How a plough functions?
   (c) Name two animals used to draw the plough.
3. Explain various agricultural practices in sequential manner.
4. Discuss the role of water in the production of crops.
5. Paddy is a major cereal crop in our country. (NCERT EXEMPLAR)
   (a) In which season is paddy cultivated?
   (b) Discuss the method of sowing.
   (c) What measures must be taken to prevent spoilage and insect attack of harvested grains.

I. HOTS QUESTIONS

1. What will happen if the farmer grows Rabi crop during rainy season instead of winter?
2. What happens to the nutrients in soil after growing cereals repeatedly in same field for many years?
3. Why should weeding be done before flowering?
4. Why is excessive irrigation harmful to the crops ?
5. If we add manure plants grow at slower rate but if we add fertilizers in the soil the plants grow faster. Explain Why?
6. What will happen if ----
   (i) Excess fertilizer is added in the soil
   (ii) Excess manure is added in the soil.
7. Do leguminous plants require nitrogen fertilizers? Explain.
8. Despite favourable climatic conditions, a farmer's crop failed to give good yield. Give the possible reasons for this. (NCERT EXEMPLAR)
9. Beera, wants to practice crop rotation in his field. Suggest a Rabi crop and a Kharif crop which will replenish his field with nitrogen. Which type of crop replenishes nitrogen in the soil and how ? (NCERT EXEMPLAR

ANSWERS

A. 1| Crop 2| kharif 3| Rabi 4| Crop rotation 5| Drip 6| Weedicides 7| Animal husbandry 8| Khurpi 9| Sprinkler 10| Water

B. 1| False 2| False 3| False 4| True 5| False 6| True 7| false 8| True 9| False 10| True

C. 1|b 2|d 3| c 4|a 5|i 6|h 7| j 8|f 9|e 10|g

D. 1| d 2| b 3| b 4| a 5| a 6| d 7| d 8| a 9| c 10| a

E. 3|Kharif & Rabi 4| Soil preparation 5| Ploughing 6| Manure & Fertilizers
7| Urea & Ammonium Sulphate 8| Leguminous crops 11| 2,4-D
12| Harvesting 13|Winnowing 14| Jute bags, Silos, Granaries
15| Combine 16| Rhizobium bacteria 17| Manuring

Chapter - 2
Micro-organisms: Friend and Foe

Key Notes:

- Microbes are tiny organisms that are not visible to the unaided eye. They may be unicellular or multicellular. Microorganisms are classified into four groups i.e. Bacteria, Fungi, Protozoa and some algae.
- Viruses are also a type of microorganisms which are quite different from other microorganisms as they reproduce only inside the cells of host organisms like bacterium, plant or animal.
- Microorganisms can live in all types of habitats and environmental conditions. some of them are free living and some are parasitic in nature.
- A wide range of microorganisms are used for comercial production of medicines, alcohol and food items. For example Lactobacillus bacterium is used to prepare curd from milk. Yeast is used for production of alcohol and wine. It is also used in baking industry for making breads and cakes.
- Antibiotics are the medicines used to kill or stop the growth of disease causing microbes within host body. Streptomycin , tetracycline and erythromycin are some common antibiotics manufactured by growing some specific fungi and bacteria.
- Some microorganisms decompose the dead organic waste of plants and animals into simple substances. These substances are again used by other plants and animals. Thus, microorganisms clean up the environment.
- Disease - causing microbes i.e. pathogens can enter into the host body through air, water or food. If pathogens transmit from the body of an infected person to a healthy person then it is treated as communicable disease. Cholera, common cold, chicken pox etc. are some examples of such diseases.
- Some insects and some animals can act as carriers of disease causing microbes. Female Anopheles mosquitoes and female Aedes mosquitoes act as carrier of malerial parasite Plasmodium and dengue virus respectively.
- Some microorganisms like Anthrax (a bacterium) cause disease in humans as well as in cattles also. There are a group of microorganisms that cause diseases in plants and reduce the yeild of crops.

- Some of the microorganisms grow on our food, make the food poisonous and cause serious illness. Different food preservation methods are used to save food from the attack of microbes. Use of preservatives (sodium benzoate, sodium metabisulphite), common salt, sugar, oil, vinegar and pasteurisation are some of the common preservation methods.
- A bacteria named Rhizobium shows symbiotic relationship with leguminous plants. They live in the root nodules of such plants and fix atmospheric nitrogen as compounds of nitrogen.
- Certain soil borne free-living bacteria and blue green algae can also fix nitrogen from atmosphere and increase soil fertility.
- Some bacteria can convert nitrogenous compounds into nitrogen gas which is released into the atmosphere.

Now, let us practice some questions from this topic -

A. FILL IN THE BLANKS

1. Common cold is a/an ……borne disease.(water/air)
2. Paramecium is a slipper shaped …….(bacteria/protozoa)
3. Raw mangoes and tamarind can be preserved by……(sugar/salt)
4. The causative microorganism of disease, measles is a……..(protozoa/virus)
5. ….....teaches our immune system to fight against microbe.(Vaccine/Antibiotic)
6. ……..spread by the bite of female Anopheles mosquito.(Malaria/Dengue)
7. ….can reproduce and multiply only inside the cells of other organisms.(Bacteria/Virus)
8. An edible fungus is ……(Penicillium / Mushroom)
9. ……..is a nitrogen fixing bacteria.(Lactobacillus / Rhizobium)
10. Under unfavourable conditions microorganisms form a ….....around themselves. (vesicle / cyst).
11. Carrier of specific microorganisms are called……..(vectors/pathogens)
12. Disease causing microorganisms are…….(pathogens/vectors)

B. STATE WHETHER THE FOLLOWING STATEMENTS ARE TRUE OR FALSE :

1. All microorganisms are harmful.
2. Bacteria and fungi have the ability to decompose organic matter.
3. Microorganisms live only in air.
4. All microbes are disease causing.
5. Foot and mouth disease is a bacterial disease in animals.
6. All blue green algae have the ability to fix nitrogen.
7. Rabies is a fatal disease caused by bacteria.
8. Viral fever can be treated by giving antibiotics.
9. Viruses are non cellular organisms.
10. Microorganisms can be seen with necked eyes.
11. Algae are able to convert sugar into alcohol and carbon dioxide.
12. Rennin converts milk into curds.
13. Viruses can only multiply in a living cell.
14. Viruses can be seen by simple microscopes.
15. The element nitrogen cannot be utilized by the living organisms.

C. MATCH THE ITEMS IN COLUMN A WITH THOSE IN COLUMN B

COLUMN A	COLUMN B
(i) Bacteria	(a) Yeast
(ii) Protozoan	(b) Fungus which is used to make drug
(iii) Viruses	(c) Plasmodium
(iv) Penicillium	(d) HIV
(v) Fungi	(e) Staphylococci

D. MULTIPLE CHOICE QUESTIONS

1. Which of the following organisms is considered to be on the borderline of living and non-living

   (a) Bacteria (b) Algae (c) Virus (d) Fungi

2. The disease caused by a protozoan and spread by an insect is-

   (a) Dengue (b) Malaria (c) Polio (d) Measles

3. Which of these do not have a regular cell structure-

   (a) Bacteria (b) Viruses (c) Protozoa (d) Algae

4. The mode of transmission of dengue is-

   (a) Air (b) Contact (c) Water (d) Vector

5. Infectious diseases can spread -

   (a) From one person to another (b) By eating only frost fruit

(c) From washing your hand (d) By inheritance

6. Which micro organism is smaller than bacteria-
(a) Protozoan (b) Virus (c) Fungi (d) Algae

7. The gas released during fermentation of sugar by yeast cells is-
(a) Carbon dioxide (b) Carbon monoxide (c) Hydrogen (d) Oxygen

8. Which disease is caused by virus-
(a) Tuberculosis (b) Common cold (c) Typhoid (d) Malaria

9. What is the most important way to stop infections from being spread-
(a) Cleanliness (b) Heating (c) Eating (d) Taking tablets

10. Which of these elements help to increase the soil fertility-
(a) Hydrogen (b) Nitrogen (c) Carbon (d) Oxygen

11. What does your stomach use to kill microbes-
(a) Acid (b) Water (c) Salt (d) Alkali

12. Most bacteria can be killed by-
(a) Cooking (b) Refrigeration (c) Freezing (d) Salting

13. Amoeba and paramecium belongs to group -
(a) Bacteria (b) Algae (c) Fungi (d) Protozoan

14. Which of the following is not preventive measures for water borne diseases -
(a) Proper disposal of sewage (c) Maintenance of good sanitary habits
(b) Drinking boiled water. (d) Covering mouth or nose while sneezing

15. Which microbe is used to make curd from milk-
(a) Bacteria (b) Virus (c) Fungi (d) Protozoan

E. VERY SHORT ANSWER TYPE QUESTIONS (1 MARK)

1. Which pathogen causes anthrax?
2. A gas is responsible for increase in volume of dough. Name it.
3. Two special chemicals are used as food preservatives. What are these?
4. Write the name of two groups of microorganisms which live in colonies.
5. A popular vaccination programme was launched in India in 1995.Name it.
6. Write the name of one viral disease in cattle.
7. Name the scientist who discovered fermentation.
8. Name two communicable diseases.
9. Who discovered antibiotics?
10. Who discovered the vaccine for small pox?
11. Which type of mosquito is the carrier of the dengue virus?

12. Name a disease which is common in human and other animals.
13. Name the instrument which is used to see microorganisms.
14. Name a food product prepared by the action of bacteria.
15. Which one among these two is a spherical bacteria? Coccus or bacillus?
16. Which microorganism is used in the production of alcohol from sugar?
17. Name an antibiotic manufactured from fungi.
18. Name two plant diseases caused by fungi.
19. To which category of microorganisms do the given organism belongs - mushroom and yeast?
20. Write the name of any two antibiotic.
21. Name two mutli cellular organisms.
22. Name two single celled microorganisms.
23. Name two habitats of microorganisms?
24. What do you understand by 'Expiry date' written on packed food items?
25. Mention two human diseases caused by bacteria.

F. SHORT ANSWER TYPE QUESTIONS (2 MARK)

1. How do microorganisms act as a cleaning agent in nature?

[Hints: Microorganisms are used in cleaning up of the environment .The organic wastes like vegetables peels and remains of animals are broken down into harmless and usable substances by the action of microorganisms.]

2. What are viruses? Name some common diseases in human caused by virus.
3. What is vaccine? What do you mean by vaccination?
4. What is pasteurization?
5. How does bacterium Lactobacillus helps in curd formation?
6. How Rhizobium helps in nitrogen fixation?
7. Which two microorganisms act as decomposer? How does this activity useful to us?
8. How does nitrogen utilized by living organisms?
9. All fungi are not microscopic? Do you agree? Explain.
10. What is the role of yeast in baking industry?
11. It is advised to wash hands before handling food. Give reasons.
12. Microorganisms are essential part of our life. Justify the statement.
13. Describe the role of bacteria in fertility of soil.

G. LONG ANSWER TYPE QUESTIONS (3 MARKS)

1. What are food preservatives? Explain the use of some common food preservatives.

[Hints: The chemical substances which are used to check or stop the growth of harmful microorganisms in food are called food preservatives.

Some common food preservatives are:

i. SALT: Common salt is used to preserve meat, fish, amla, raw mangoes, tamarind etc.
ii. SUGAR: Jams, jellies and squashes are preserved by sugar.
iii. OIL: Edible oils are used as preservatives in vegetables and pickles.
iv. VINEGAR: It is used to preserve fruits, vegetables, fish, meat etc.]

2. What are viruses? Name some common diseases caused by virus?
3. Define antibodies and antibiotics. What precautions should be taken while taking antibiotics?
4. Elucidate the use of fungi and their harmful effects?
5. Explain some commercial use of microorganisms.
6. What are communicable diseases? Explain with examples.
7. What are pathogens? Explain with the help of two examples.

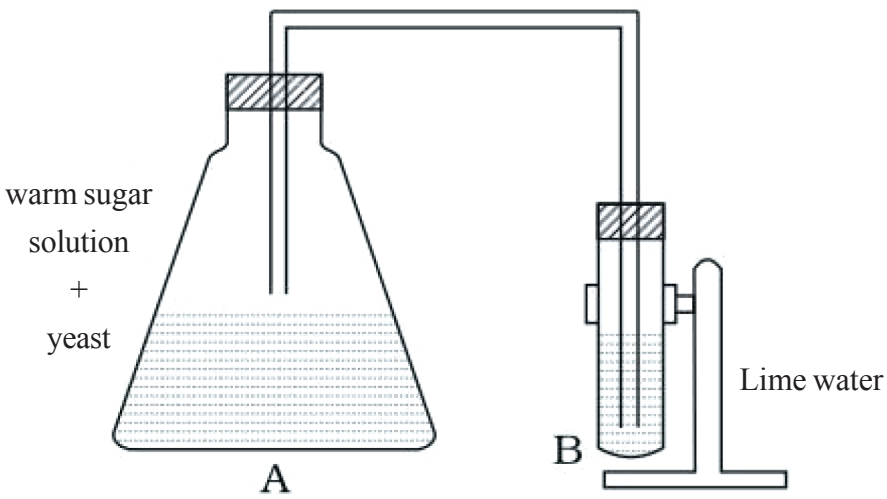
H. ESSAY TYPE QUESTIONS (5 MARKS)

1. Explain the uses of Fungi, and Bacteria.
2. Write three ways by which bacteria are useful to us and three ways by which they are harmful?
3. Write down preventive measures for
   (a) Air borne disease
   (b) Water borne disease
   (c) Vector borne disease
4. What is carrier of disease causing microbes? Explain with the help of two examples.
5. Explain some indications which help to detect the spoilage of food.

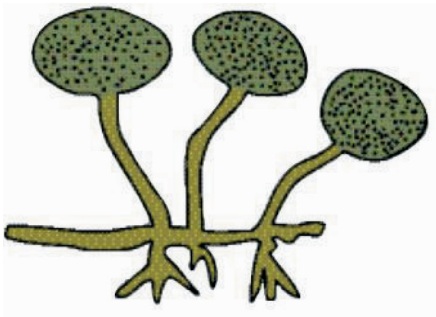
I. HOTS QUESTIONS

1. Give reasons for the following.
   (a) Fresh milk is boiled before consumption while processed milk stored in packets can be consumed without boiling.
   (b) Raw vegetables and fruits are kept in refrigerators whereas jams and pickles can be kept outside.
   (c) Farmers prefer to grow beans and peas in nitrogen deficient soils.
   (d) Mosquitoes can be controlled by preventing stagnation of water though they do not live in water. Why? (NCERT EXEMPLAR)

2. How can we prevent the following diseases? (NCERT EXEMPLAR)
   (a) Cholera (b) Typhoid (c) Hepatitis A
3. Observe the set up given below and answer the following questions



   (a) What happens to the sugar solution of A?
   (b) Which gas is released from A?
   (c) What changes will you observe in B when the released gas passes through it?
4. Paheli watched her grandmother making mango pickle. After she bottled the pickle, her grandmother poured oil on top of the pickle before closing the lid. Paheli wanted to know why oil was poured. Can you help her understand why? (NCERT EXEMPLAR)
5. While returning from the school, Boojho ate chaat from a street hawker. When he reached home, he felt ill and complained of stomach ache and fell ill. What could be the reason? (NCERT EXEMPLAR)
6. What will happen to 'pooris' and 'unused kneaded flour' if they are left in the open for a day or two? (NCERT EXEMPLAR)
7. Observe the figure given below and answer the following questions.



(a)Name the microorganism and the group to which it belongs.
(b) Name the food item on which the organism grows. \
(c) Does it grow well in dry or in moist conditions?
(d) Is it safe to eat contaminated bread? (NCERT EXEMPLAR

ANSWER

A. 1| air 2| Protozoa 3| Salt 4| Virus 5| Vaccine 6| Malaria 7| Virus 8| Mushroom 9| Rhizobium 10| Cyst 11| Vectors 12| Pathogens

B. 1| False 2|True 3|False 4| False 5| False 6|false 7| False 8| False 9|True 10|False 11| False 12|False 13|True 14| False 15| True

C. i| e ii| c iii| d iv| b v| a

D. 1|c 2|b 3|b 4|d 5|a 6|b 7|a 8|b 9|a 10|b 11|a 12|a 13|d 14|d 15|a

E. 1| Bacterium 2|CO_2 3|Sodium benzoate and Sodium metabisulphate
4| Bacteria and fungi 5| Pulse polio 6| Foot and mouth desease 7| Louis Pasteur
8| Cholera and chicken pox 9|Alexander Fleming 10| Edward Jenner
11|Female Aedis mosquito 12|Anthrax 13| Microscope 14| Curd 15| Coccus
16|Yeast , a fungus 17| Penicillin 18| Rust of wheat and rust of rice 19|fungi
20| Streptomyein, erythromycin 21| Fungi, algae 22|Bacteria, some algae
23| Soil and water 24| It refers to the date which the supplier intended the food to be consumed 25|Typhoid and tuberculosis

Chapter - 3
Synthetic Fibres and Plastics

Chapter at a glance:

1. Natural fibres are obtained from plants or animals. For example, cotton, wool, silk etc.
2. Synthetic fibres are made by human beings. That is why these are also called man-made fibres.
3. Like natural fibres, synthetic fibres and plastics are made of very large units called polymers.
4. The word 'polymer' comes from two Greek words- 'Poly' and ' mer'. poly means many and mer means part/unit.
5. Polymers are made up of many smaller repeating units. These repeating units are known as monomers.
6. The monomer of cellulose is glucose.
7. Synthetic fibres are obtained by chemical processing of petrochemicals.
8. Synthetic fibres are of many types like rayon, nylon, polyster and acrylic.
9. Rayon or artificial silk was obtained by chemical treatment of wood pulp.
10. Rayon is cheaper than silk. It is mixed with cotton to make bed sheets and mixed with wool to make carpets.
11. Nylon was the first fully synthetic fibre. It was made from coal, water and air in 1931.
12. Nylon is used for making many articles such as socks, ropes, toothbrushes, tents, car seat belts, curtains, parachutes, and ropes for rock climbing.
13. The repeating unit of polyester is ester. Polyester is suitable for making dress material because fabric made from it does not get wrinkled easily.
14. Terylene is a popular polyester.
15. PET (Polyethene terephthalate) is a very familiar form of polyster. It is used to make bottles, utensils, films, wires etc.
16. Polycot is a mixture of polyester and cotton. Whereas, polywool is a mixture of polyester and wool.

17. Sweaters, shawls or blankets are made from another type of synthetic fibre called acrylic. Clothes made from acrylic are relatively cheap.

18. Since synthetic fibres melt on heating, therefore we should not wear synthetic clothes while working in a kitchen or in a laboratory.

19. Synthetic fibres dry up quickly. They are durable, less expensive, readily available and easy to maintain.

20. Plastic is also a polymer. They have linear or cross-linked arrangements of units.

21. Plastic can be recycled, reused, coloured, melted, rolled into sheets or made into wires.

22. Polythene (Poly + ethene) is an example of a plastic. It is used for making polythene bags.

23. Plastic which gets deformed easily on heating and can be bent easily are known as thermoplastics. For example, polythene, PVC etc.

24. Thermoplastics are used to make toys, combs and different type of containers.

25. Such plastics which when moulded once, can not be softened by heating are known as thermosetting plastics. For example, bakelite, melamine etc.

26. Bakelite is used for making electrical switches, handles of various utensils etc. Melamine is used for making floor tiles, kitchenware and uniforms of firemen.

27. Due to light weight, lower price, good strength and easy handling, plastics are used to make buckets, mugs, household articles, furnitures, parts of cars, aircrafts, containers and many more.

28. Plastic is non-reactive. Plastics are poor conductors of heat and electricity. Due to this, electrical wires have plastic covering and handles of screw drivers and pressure cooker are made up of plastic.

29. Plastics are also used in healthcare industry for making medicine wraper, syringes and other medical instruments.

30. Teflon is a special plastic used for non - stick coating on cookwares.

31. Materials which get decomposed by natural processes are known as biodegradable and materials which are not easily decomposed by natural processes are known as non-biodegradable.

32. Plastic is not environment friendly. It causes environmental pollution. On burning, it releases lots of poisonous gases into the atmosphere and causes air pollution.

33. We should follow "5R Principle"- Reduce, Reuse, Recycle, Recover & Refuse.

34. We should use synthetic fibres and plastics in such a way that we can enjoy their good qualities.

Let us practice some questions from this topic -

A. FILL IN THE BLANKS

1. A large single unit of a synthetic fibre is called…….(Polymer/ fabric).
2. Polymer present in cotton is……. (Cellulose/glucose).
3. Another name of artificial silk is .....(Nylon/rayon).
4. Rayon is mixed with ..... to make carpets (Silk/wool).
5. Fabric made from.....does not get wrinkled easily (Rayon/Polyester).
6. .....is a mixture of polyester and cotton (polycot/terry cot).
7. PVC is an example of ..... (Thermoplastic/Thermosetting plastics).
8. Polythene bag is an example of .....(synthetic fibre/plastic).
9. Plastics are .....(Biodegradable/non-biodegradable).
10. Woollen clothes are ..... (Biodegradable/non-biodegradable).

B. TRUE AND FALSE

1. Silk is a natural fibre.
2. Tooth brushes, tents are made from rayon.
3. Nylon is a manmade fibre.
4. Blankets, Shawls are made from synthetic fibre called polyester.
5. Synthetic fabrics take more time to dry than natural fabrics.
6. Bakelite is a poor conductor of heat and electricity.
7. Plastics are used in making aircrafts and space crafts.
8. Tin, Aluminium and other metal cans are biodegradable.
9. Use of plastic is not environmental friendly.
10. We should avoid the use of plastic as far as possible.

C. MATCH THE COLUMN

Column A	Column B
(1) Wool	(a) Use for making ropes
(2) Silk	(b) Thermosetting plastic
(3) Nylon	(c) Discovered in China
(4) Melamine	(d) Used for non-stick coating on cookware's
(5) Teflon	(e) Natural Fibre

D. MULTIPLE CHOICE QUESTIONS

1. Which of the following is not man-made fibre
   (i) Rayon (ii) Nylon (iii) Polycot (iv) Wool
2. Fabric made from fibre does not get wrinkled easily
   (i) Cotton (ii) Silk (iii) Polyester (iv) None of the above
3. Which of the following is not true for synthetic fibres
   (i) Dry up quickly (ii) Durable
   (iii) Less expensive (iv) Soak more water
4. Which of the following is not true for thermosetting plastics.
   (i) Poor conductor of heat and electricity.
   (ii) Can be softened by heating.
   (iii) Resists fire.
   (iv) Bakelite and melamine are examples of it.
5. Special Plastic used for non-stick coating on cookware's is
   (i) Bakelite (ii) PET (iii) PVC (iv) Teflon
6. Full form of PET is
   (i) Polyethylene Terephthalate (ii) Polythene Terecot
   (iii) Polyester Terephthalate (iv) None of the above
7. Which of the following is Eco-friendly
   (i) Polythene (ii) Tin cans
   (iii) Woollen clothes (iv) Aluminium foils
8. Which of the following is Thermosetting Plastic
   (i) Polythene (ii) PVC (iii) Rayon (iv) Melamine
9. Which of the following is Thermoplastic
   (i) Melamine (ii) Bakelite (iii) Teflon (iv) PVC
10. The name of Polymer present in cotton
    (i) Ester (ii) Ethylene (iii) Cellulose (iv) Glycerol

E. VERY SHORT ANSWER TYPE QUESTIONS (1 MARK)

1. What is polymer?
2. Name the polymer present in cotton?
3. What is the monomer present in polyester?

Think :
A bucket made of plastic does not rust like a bucket made of iron. Why?

4. What is the other name of artificial silk?
5. How is rayon obtained?
6. What was the first fully synthetic fibre?
7. How was nylon prepared?
8. What is rope for rock climbing made of?
9. What is the speciality of fabric made from polyester?
10. Give the uses of PET.
11. What is the full form of PET?
12. What is acrylic synthetic fibre used for ?
13. What is the monomer present in polythene?
14. Give examples of thermoplastics.
15. Give examples of thermosetting plastics.
16. Which plastic is used for non-stick coating on cook wares?
17. Name the monomer present in cellulose.
18. What is that plastic which can resists fire and can tolerate more heat?
19. What is biodegradable material?
20. What is the approximate time taken to degenerate tin and aluminium cans?
21. What makes plastic harmful for our environment?
22. What measure can we take to avoid the use of plastic in shopping?
23. Why do electrical wires have plastic covering?
24. Why handles of frying pans are made of plastic?
25. Why are recycled plastics not advisable for storage of food?

F. SHORT ANSWER TYPE QUESTIONS (2 MARKS)

1. What are the advantages of synthetic fibre over natural fibres?
2. Why is it not advised to wear synthetic clothes while working in the kitchen?
3. Give reasons why melamine is used for making kitchen ware and fabrics which resist fire.
4. Why do we choose plastic containers for storing food items?
5. How are plastics used in the healthcare industries?
   [Hint: Packaging of tablets, threads used for stitching wounds, syringes, doctor's gloves and a number of medical instruments.]
6. A responsible citizen should remember the 5R principle, what do these five Rs stand for?
   [Hint : (i) Reduce (ii) Reuse (iii) Recycle (iv) Recover (v) Refuse]
7. Name any four things which are biodegradable.

8. Name any four things which are non - biodegradable.
9. Write any two ways by which we can reduce the use of plastics.
10. Show by drawing.
    (i) Linear arrangement in plastic.
    (ii) Cross linked arrangement in plastic.

G. ESSAY TYPE QUESTIONS (5 MARKS)

1. What are synthetic fibres? Discuss various types of synthetic fibres with their uses.
   [Hints: Synthetic fibres are manmade fibres. They are usually made from chemical substances. Various types of synthetic fibres with their uses are discussed here.
   a) Rayon: This is also called Artificial silk and is obtained by chemical treatment of wood pulp.
   Uses - It is used in making bed sheet and carpets.
   b) Nylon: It is the first fully synthetic fibre. It is prepared from coal, water and air.
   Uses - It is used in making socks, ropes, tents, tooth brushes, curtains etc.
   c) Polyester. Fabric made from this fibre does not get wrinkled easily. It remains crisp and easy to wash.
   Uses - It is used in making shirts and other dresses. PET another form of polyester is used for making bottles, utensils, films and wires.
   d) Acrylic: It is the synthetic wool. It is more durable and affordable than natural wool.
   Uses - It is used in making sweater, blankets, shawls etc.]
2. What are plastics? How are the plastics classified? Discuss their uses in our daily life.
3. "Plastics are good as well as bad to us". Explain.
4. Suggest some measures we can contribute towards reducing the use of plastics.
5. "Plastic and Synthetic fibres are not environment friendly" give some comments to support the statement.

I. HOTS QUESTIONS

1. "Manufacturing synthetic fibres helps in the conservation of forest" why is it said so?
2. Animals are eating garbage in a dump. What may be the consequences of this?
3. Mina and her friend Sheela went to market. Mina carries cotton bag but Sheela carries no bag. Who is more conscious about environment? Explain by giving reason.
4. A lady went to the market to buy a blanket. The shopkeeper showed her blankets made of acrylic fibres as well as made of wool. She preferred to buy an acrylic blanket. Can you guess why?

5. PVC (polyvinyl chloride) is a thermoplastic and is used for making toys, chappals, etc. Bakelite is a thermosetting plastic and is used for making electrical switches, handles of various utensils, etc. Can you write the major difference between these two types of plastics?
6. Despite being very useful it is advised to restrict the use of plastic. Why is it so? Can you suggest some methods to limit its consumption?

ANSWERS

A. 1| Polymer 2| Cellulose 3| Rayon 4 | Wool 5| Polyester 6| Polycot 7| Thermoplastic 8| Plastic 9| Non-Biodegradable 10| Biodegradable

B. 1| True 2| False 3|True 4|False 5| False 6|True 7| True 8| False 9| True 10|True

C. 1|e 2| c 3|a 4|b 5|d

D. 1|iv 2|iii 3| iv 4|iv 5|iv 6|i 7|ii 8|iv 9|iv 10|iii

E. 1| Small units combine to form a large single unit of synthetic fibre. This large single unit is called polymer. 2| Cellulose 3| Ester

4| Rayon 5| By Chemical treatment of wood pulp 6| Nylon 7| It was prepared from coal, water and air 8| Nylon 9| It does not get wrinkled easily and easy to wash 10| PET are used for making bottles, utensils, films and wires 11| Polyethylene Terephthalate 12|Acrylic fibres are used as wool for making winter clothes. 13| Ethene 14| Polythene and PVC 15|Bakelite and melamine 16| Teflon 17| Glucose 18| Melamine 19| A material which gets decomposed through natural process 20| 100 to 500 years 21| Plastic takes several years to decompose 22| To carry bags made of cotton or jute 23| Plastics are bad conductor of electricity 24| Plastic are poor good conductor of heat

25| Recycled plastics contain colouring agents.

Chapter - 4
Materials: Metals and Non-Metals

Chapter at a glance :

1. Till now scientists have discovered 118 different tyes of elements. Many of them are found in nature whereas some of them have been made by artificial methods. Based on their properties, elements have been classified into two categories called metals and non-metals. There is a third category of elements which shows properties of both metal and non- metals. These elements are called metalloids.

a) Metal : Metals are hard, lustrous, malleable, ductile, sonorous and good conductors of heat and electricity. Example:- Iron, copper.

b) Non- Metals : Non-metals are soft non sonorous, non lustrous, non malleable, non ductile and are poor conductor of heat and electricity. Example :- Carbon, oxygen, nitrozen.

c) Metalloids : A metalloid is an element which have properties common to both metals and non-metals. Example:- Boron, silicon, Arsenic.

2. Physical properties of metals :-

Some physical properties of metals are given below -

1) Metals are malleable.
2) Good conductor of heat and electricity.
3) Metals are ductile, sonorous and lustrous.
4) Maximumn metals are solid at room temparature . [Except mercury (Liquid metal)]
5) Few metals are soft in nature. Example- Sodium.

3. Physical properties of non - metals :-

Some physical properties of non-metals are given below -

1) Non-metals are found in difffrent states, i.e solid, liquid and gases.
2) Non-metals are not malleable & ductile.
3) Non-metals are not lustrous and sonorous.
4) Non-metals are poor conductor of heat and electricity. (Except- Graphite)

4. Chemical properties of metals:-

1) Metal when reacts with oxygen it forms metal oxide. Example - $2Mg\,(s) + O_2\,(g) \rightarrow 2MgO$
2) Metals when reacts with water it forms metal hydroxide.
   eg. - $Mg\,(s) + 2H_2O(l) \rightarrow Mg(OH)_2 + H_2\uparrow\ (g)$
3) Metal when reacts with dilute acid it forms salt and release H_2 gas.
   eg.- $Mg\,(g) + 2HCl\,(l) \rightarrow MgCl_2\,(s) + H_2\uparrow\,(g)$

5. Chemical properties of Non-metals:-

- Non-metals when reacts with oxygen it forms Non-metalic oxide.
  Eg.- 1) $C + O_2 \rightarrow CO_2$ (Carbon dioxide)
  2) $4P + 5O_2 \rightarrow 2P_2O_5$ (Phosphorous Pentaoxide)
  - Non-Metal + Water → No reaction.

eg.- Sulphur + water → No reaction.

- Non- Metal + dil Acid → No reaction.

eg.- Sulphur + Hydrochloric acid → No reaction.

6. Some important reactions of metal and Non-metal:

1) Reactions of metal with oxygen is observed in day to day life.

- In case of rusting of iron; the iron reacts with the oxygen present in air and moisture and develops rust.

$2Fe\ (s) + 3O_2\ (g) + XH_2O(l) \rightarrow 2Fe_2O_3 . XH_2O$ (Rust).

2) Reaction of metal with water:-

Sodium being very reactive reacts vigorously with water to produce sodium hydroxide and hydrogen. Thats why sodium stored in kerosene.

Reaction - $2Na(s) + 2H_2O(aq) \rightarrow 2NaOH(aq) + H_2\ (g)$

3) Reactions of Non-metal with oxygen:

Non-metals react with oxygen to produce non-metalic oxides that are acidic in nature.

eg.- $S + O_2 \rightarrow SO_2$

7. Reactivity order of metals: Metals are more reactive. Tendency of metal to react with different elements is called reactivity of metal. Reactivity order of metals are as follows -

Potassium (K)	↑ Most reactive
Sodium (Na)	
Calcium (Ca)	
Magnesium (Mg)	
Aluminium (A1)	Reactivity increases
Zinc (Zn)	
Iron (Fe)	
Tin (Sn)	
Lead (Pb)	
Copper (Cu)	less Reactive

8. Uses of Metals:

1. Metals being hard tough are used in manufacturing automobiles, machinary, satellites, trains. aeroplanes etc.
2. Due to its characteristic of being a good conductor of electricity and ductility it is used in making wires, electrical appliances.
3. Being a good conductor of heat it is used in making utensils.

9. Uses of Non-metals :

1. Non-metal is used for the basic requirement of life. Oxygen is inhaled while breathing.
2. Nitrogen is used in fertilizers to enhance the fertelity of soil.
3. Chlorine is used for water purification.
4. It is used in fire crackers.
5. It is used as disinfectant.

Let us practice some questions from this chapter -

A. FILL IN THE BLANKS

1. The only liquid metal is ……(Sodium/ Mercury)
2. Copper is …..reactive than Zinc.(less/ more)
3. …..……is stored in kerosene.(Calcium/Sodium)
4. Metal react with oxygen to form ……..(Carbonate/Oxides)
5. The nature of metallic oxides is ……(acidic/basic)
6. …….are used in making machinery.(Metals/Non metals)
7. Nitrates of ……..find use in photography.(Gold/Silver)
8. ……is used in making mirrors.(Silver/Copper)
9. ……foils are used to wrap food items.(Aluminium/Iron)
10. A solution of ……..in alcohol has antiseptic properties.(Iodine/Bromine)

B. TRUE AND FALSE

1. All metals exist in solid form at room temperature.
2. Phosphorus is used in the water purification process.
3. Non metal can be converted into wires.
4. Metal reacts with water.
5. Iron is used in constructing bridges and houses.
6. Non metals are found in all the three states namely solid, liquid and gas.
7. Chlorine is a very reactive metal.
8. Red litmus paper turns blue when it is dipped in a basic solution.
9. A less reactive metal displaces a more reactive metal from its salt solution in water.
10. Gold is alloyed with copper to make it hard.

C. MATCH THE COLUMNS

Column 'A'	Column 'B'
1. Non metallic oxide	(i) Carbon
2. Graphite	(ii) Acidic in nature
3. Magnesium	(iii) Kept in water
4. Nitrogen	(iv) For making fertilizers
5. Phosphorus	(v) For making chlorophyll

D. MULTIPLE CHOICE QUESTIONS

1. The most reactive metal is-
   (a)Iron b) Gold c) Zinc d) Potassium
2. The non metal which is liquid in a room temperature-
   (a) Iodine b) Chlorine c) Carbon d) Bromine
3. The metal which can be cut with a knife is-
   (a)Barium b) Potassium c) Calcium d) Mercury
4. Which metal is present in Hemoglobin-
   (a)Magnesium b) Iron c) Carbon d) Zinc
5. Which of the following reacts with cold water vigorously-
   (a) Carbon b) Sodium c) Magnesium d) Sulphur
6. A non metal used in making glass is -
   (a)Carbon b) Silica c) Graphite d) Sulphur
7. The metal which is not corroded by air, water, acid is-
   (a) Copper b) Zinc c) Aluminium d) Gold
8. Materials having qualities of both metals and nonmetals are-
   (a) Alloys b) metalloids c) Noble metals d) None of these
9. The best electrical conductor is-
   (a)Gold b) Copper c) Silver d) Aluminium
10. Iron is galvanized by coating it with -
    (a) Chromium b) Sodium c) Magnesium d) Zinc

E. VERY SHORT ANSWER TYPE QUESTIONS (1 MARK)

1. Are the ringing bells in temples made of metal or nonmetals?
2. What metals are used in making cooking utensils and water boilers?
3. Why is Aluminium nowadays replacing copper for use in electrical cables?
4. Name the metals which are used to make ornaments?
5. Which liquid metal is used for making thermometers?
6. A given non metal forms Sulphuric acid on reacting with nitric acid .Identify the non metal.
7. A purple coloured non metal form a brown solution in alcohol which is applied on wounds as an anticeptic. Name the non metal.
8. Name the property which enables metals to be drawn into wires.
9. Which non metal is essential for our life and all living beings inhale it during breathing?
10. Name two major non metals which are present in fertilisers and enhance the growth of plants.

11. Name two metals which are good conductors of both heat and electricity.
12. Which type of materials we used for making fine electrical contacts in supercomputers and solar cells?
13. Which non metal is used to disinfect water?
14. If a metal coin is dropped on a hard floor, it produces a ringing sound. What is this property of metals known as?
15. Name the gas which is liberated when metal reacts with acids.
16. When copper utensils are kept in moist air, then a layer deposits on it. Write the color of the layer.
17. Name the very reactive non metal which catches fire when comes in contact with air.
18. Mostly non-metals do not conduct electricity but one non metal can. What is its name?
19. Metals are malleable, but some metals are highly malleable. Name the most malleable metal.
20. Name two most ductile metals.
21. You are given the following materials. Classify them into metals and non metals.
(Iron, Coal, Sulphur, Aluminium, Copper)
22. Coal and pencil lead do not show the property of malleability. Can we call them metal?
23. What is the chemical name of rust ?
24. Give a chemical equation when iron reacts with air oxygen.
25. Name the product formed by the reaction of Sulphur and oxygen.
26. What is the effect of Sulphurous acid on blue litmus?
27. What is the nature of non metallic oxides?
28. Write the balanced chemical equation when Sulphur dioxide is dissolved in water.
29. Give two examples of coinage metals.
30. Name the elements which shows both the properties of metal and non-metals.

F. SHORT ANSWER TYPE QUESTIONS (2 MARKS)

1. Give reason why sodium metal is stored in kerosene but not in water.

[Hint: Sodium metal is highly reactive metal. When exposed in air, it starts to burn to form oxide. In the same way, it forms hydroxide with water but it does not react with kerosene. So, to prevent it, it is kept in kerosene, not in water.

2. Give reason why copper cannot displace Zinc from its salt solutions?
3. Define: i)Malleability ii) Ductility
4. Phosphorus is kept in water- why?
5. Bells used in temples are not made up of wood-why?
6. Give two reasons why gold is used in making jewellery?

7. Generally silver foils are used for the decoration of sweets. Are they harmful for us? If yes, then in what manner?
8. Why Aluminium is used in making cooking utensils?
9. Copper is used to make electric wires. Why?
10. Why metals are called sonorous?
11. What are oxides? What is the nature of metallic and non metallic oxides?
12. What do you mean by rusting of iron?
13. Why is tincture iodine applied on wounds?
14. What happens when a solution of metallic oxide tested with i)blue litmus and ii) red litmus?
15. What do you mean by conductivity?
16. Give reason why-Immersion rods for heating liquids are made up of metallic substances.
17. What happens when Iron nails are placed in copper sulphate solution?
18. What makes Aluminium useful for wrapping of food items?
19. Why does an Aluminium vessel lose its shine so soon after use?
20. What happens when sodium reacts with water?\

G. LONG ANSWER TYPE QUESTIONS (3 MARKS)

1. What happens when a Magnesium Ribbon is heated in presence of air?

[Hint: When a Magnesium Ribbon is heated in presence of air on a burner flame, after some time, it starts burning with a white flame and white powder is formed which is called Magnesium Oxide.

$$2Mg + O_2 \rightarrow 2MgO$$

(Magnesium) (Oxygen) (Magnesium oxide)

2. What are metalloids? Name two metalloids.
3. What is the displacement reaction? Write the example also .
4. Can you store lemon pickle in an Aluminium utensil? Explain
5. What happens when copper vessels are exposed in moist air?
6. What happens when metals and nonmetals react with oxygen separately? What is the nature of the products formed?
7. Iron and Aluminium both react with oxygen. Why is Aluminium considered better than iron for a number of purposes?
8. Give some uses of nonmetal.
9. Name a metal that replaces silver from silver nitrate solution. Give its equation and reason also.

H. ESSAY TYPE QUESTIONS (5 MARKS)

1. Write five uses of metals in our daily life.
2. Compare the metals and nonmetals on the basis of their properties.
3. Explain the reaction of metal and nonmetal with
   i) Acids ii) Air iii) Water
4. Write the conditions under which rusting takes place.
5. Mina took a piece of burning charcoal and collected the gas evolved in a test tube.
   i) How will she find the nature of the gas?
   ii) Write down the word equation of all the reactions taking place in this process.

I. HOTS QUESTIONS

1. We should not store food stuff in containers which are made up of metals such as copper, zinc, Aluminium etc - why?

[Hint: Some food stuffs which have acidic nature such as citrus fruits, lemon pickles and curd should not be stored in container made up of metals such as copper, zinc, Aluminium and iron. This is because acid present in food stuffs reacts with these metals to produce toxic compounds which cause food poisoning.]

2. A more reactive metal displaces the less reactive metal from its salt solution. What do you mean by this reaction?
3. Aluminium is a highly reactive metal, yet it is used to make utensils for cooking -Give reason.
4. Paheli prepared a blue coloured solution of copper sulphate in beaker A and placed an iron nail in it. Boojho prepared a yellowish green solution of ferrous sulphate in beaker B and placed a copper wire in it. What changes will they observe in the two beakers after an hour?

ANSWERS

A. 1|Mercury 2| Less 3|Sodium 4|Oxides 5|Basic 6| Metals 7|Silver 8| Silver 9| Aluminium 10|Iodine

B. 1|False 2| False 3| False 4| True 5| True 6|true 7|false 8| True 9| False 10|true

C. 1|ii 2| i 3| v 4 |iv 5 | iii

D. 1|d 2| d 3| b 4| b 5| b 6| b 7| d 8| b 9| C 10|d

E. 1|Metal 2|Aluminium 3| It is more flexible and less expensive than copper 4|Gold, silver 5|Mercury 6|Sulphur 7| Iodine 8|Ductility 9|Oxygen 10|Nitrogen and phosphorous 11|Aluminium and copper 12| Copper and aluminium 13|Chlorine 14|Sonority 15|Hydrogen 16|Green 17|Phosphorous 18|Graphite 19|Gold 20|Gold and platinum 21|Iron,aluminium ,and copper are the metals, Coal, sulphur are nonmetals 22|No, these are non metals 23| Iron oxide 24| $4Fe + 3O_2 = 2Fe_2O_3$ 25|Sulphur dioxide 26| It turns red 27|Acidic in nature 28| $SO_2 + H_2O = H_2SO_3$ 29| Copper and silver 30|Metalloids

Chapter - 5
Coal and Petroleum

Workbook

Chapter at a glance :

1. Coal, Petroleum and natural gas are fossil fuels.
2. Natural resources are broadly classified into two categories:
   i) Inexhaustible natural resources :- These are present in unlimited quantity in nature and are not likely to be exhausted by human activity. Examples are - air, sunlight.
   ii) Exhaustible natural resources :- These are present in limited quantity in nature. They can be exhausted by human activities. Examples are - Forests, Minerals, Coal, Petroleum etc.
3. Exhaustible natural resources like coal, petroleum and natural gas were formed from the dead remains of living organisms (fossils) and hence these are called fossil fuels.
4. Coal is one of the fuels used to cook food. Under high pressure and high temperature, dead plants and animals got slowly converted to coal.
5. Coal contains mainly carbon. The slow process of conversion of dead vegetation into coal is called carbonisation.
6. Coke, Coal tar and Coal gas are the products of Coal.
7. Coke is almost pure form of carbon.
8. Coal tar is a black, thick liquid with an unpleasent smell. It is a mixture of about 200 substances.
9. These days, bitumen, a Petroleum product, is used in place of Coal-tar for metalling the roads.
10. Coal gas is obtained during the processing of Coal to get coke. It is used as a fuel in many industries.
11. Petroleum is a dark oily liquid. It is a mixture of various contituents like petroleum gas, Petrol, diesel, lubricating oil, paraffin wax etc.
12. Over million of years, absence of air, high temperature and high pressure results the transformation of dead organisms in the seabed into Petroleum and natural gas. Natural gas is compressed to CNG (Compressed Natural Gas) at high pressure. CNG is a clean fuel.
13. The process of separating the various contituents of petroleium is known as 'Refining'. It is caried out in a Petroleum refinary.

14. Constituents of petroleum and their uses:-

Constituents of Petroleum	Uses
i) LPG (Liquified Petroleum Gas)	Fuel for home and industry
ii) Petrol	Motor fuel, solvent
iii) Kerosene	Fuel for stoves, lamps
iv) Diesel	Fuel for heavy motor vehicles, electric generator.
v) Lubricating Oil	Lubrication
vi) Paraffin wax	ointments, Candles, Vaseline.
vii) Bitumen	Paints, road surfacing.

15. Coal and Petroleum resources are limited. we should use them judiciously.

Let us practice some questions from this chapter -

A. FILL IN THE BLANKS

1. An in-exhaustible natural resource is .....(air/coal).
2. An exhaustible natural resource is ..... (Sunlight/petroleum).
3. .....was used in railway engines to produce steam (coal/wood).
4. The process of conversion of dead vegetation into coal is called……. (carbonisation /conservation)
5. .....is almost pure form of carbon (coal tar/coke).
6. .....is used in manufacturing of synthetic dyes. (coke/ coal tar).
7. .....is used in manufacturing paints (coke/coal tar).
8. .....was formed from organisms living in the sea (coal/petroleum)
9. .....is used as fuel for heavy motor vehicles (petrol/diesel).
10. The fuel used for aviation is .....(petrol/kerosene).

B. TRUE AND FALSE

1. When heated in air, coal produces mainly carbon dioxide gas.
2. Coal tar is used in the manufacture of steel.
3. The layer containing petroleum oil and gas is below the layer of water.
4. Coal, petroleum, CNG cannot be prepared in the laboratory.
5. Fossil fuels are inexhaustible resources.

C. MATCH THE COLUMN

Column 'A'	Column 'B'
(1) World's first oil well	(a) Tripura
(2) India's first oil found in	(b) London
(3) For first time Coal gas used for Street lighting	(c) Pennsylvania
(4) Natural gas reserves in India	(d) Mumbai high
(5) One of main oil producers of India	(e) Makum

D. MULTIPLE CHOICE QUESTIONS

1. Which of the following is used as a solvent for dry cleaning
   (i) LPG (ii) Diesel (iii) Petrol (iv) Kerosene
2. Which of the following is inexhaustible Natural Resources
   (i) Coal (ii) Petroleum (iii) Sunlight (iv) Minerals
3. Which of the following is obtained from coal tar
   (i) Petrol (ii) Coke (iii) Coal gas (iv) Naphthalene balls
4. Which of the following statement is not correct
   (i) CNG is less polluting fuel than petrol.
   (ii) Kerosene is used as fuels.
   (iii) Fossil fuels can be made in the laboratory.
   (iv) Coal tar is a mixture of about 200 substances
5. The first oil well was drilled
   (i) USA (ii) USSR (iii) UK (iv) India
6. An example of fossil fuel is
   (i) Wood (ii) Animal waste (iii) Coal (iv) All of these
7. Which of the following products is not obtained from petroleum
   (i) Coal (ii) Diesel (iii) Paraffin wax (iv) Lubricating oil
8. 'A' is an exhaustible natural resource. It is tough and porous. It is an almost pure form of carbon. The substance 'A' is
   (i) Coal tar (ii) Bitumen (iii) Coke (iv) None of the above
9. Petroleum Conservation Research Association does not encourage
   (i) Driving at a very high speed
   (ii) Maintenance of vehicle by regularly servicing

(iii) Maintaining correct levels of pressure in the tyres

(iv) Switching off the vehicle engine at traffic intersections

10. Which of the following is man made resource

(i) Air (ii) Water (iii) Soil (iv) Parks

E. VERY SHORT ANSWER TYPE QUESTIONS (1 MARK)

1. What are inexhaustible Natural Resources? Give example
2. What do you mean by exhaustible Natural Resource? Give example
3. What are called fossil fuels?
4. Write one use of a coal.
5. What is the main product on burning coal?
6. Write the uses of coke.
7. What is used in place of coal tar for metalling the roads?
8. From what naphthalene balls are made?
9. What is the use of coal gas?
10. Where was the World's first oil well drilled?
11. What is refining of petroleum?
12. What is the full form of LPG?
13. What is the full form of CNG?
14. For what is paraffin wax used?
15. Give the uses of diesel.
16. What is used as solvent for dry cleaning?
17. CNG is used as fuel for transport vehicles nowadays. why ?
18. Why can fossil fuels not be prepared in the laboratory?
19. What is called 'black gold?
20. Name the petroleum product used as fuel for stoves, lamps and jet aircrafts.

F. SHORT ANSWER TYPE QUESTIONS (2 MARKS)

1. Differentiate between exhaustible and inexhaustible resources?
2. Why should we use fossil fuels judiciously ?
3. What does CNG stand for? What are the advantages of using CNG as fuels?
4. What is the main reason for coal to be used to generate electricity?
5. What are the suggestions given by PCRA to conserve petrol and diesel?

G. LONG ANSWER TYPE QUESTIONS (3 MARKS)

1. Explain how coal was formed?
   [Hint: Textbook Page No: 52.]
2. How was Petroleum formed?
3. Draw a diagram to show petroleum and natural gas deposits?
4. Mention the various uses of coal gas?
5. What are 'Petrochemicals'? Give some of their uses.

H. ESSAY TYPE QUESTIONS (5 MARKS)

1. What is fossils fuel? Explain how are they formed.
2. What is coal? What are the useful products of coal? Explain them giving their uses
3. What is petroleum refining? Explain the constituents of petroleum with their uses.
4. Write the advantages and disadvantages of using coal and petroleum as fuel.
5. Write some important uses of the various constituents of petroleum.

I. HOTS QUESTIONS

1. Find out the location of major thermal power plants in India and also write the reasons for being located at these places.
2. What could be the possible risk of using oil as fuel as a source of energy?
3. Petroleum is also called 'Black gold". Explain the statement.
4. Name the products obtained and their uses when coal is processed in industry.
5. We say fossil fuels will last only for a few hundred years. Comment.
6. We read in newspapers that burning of fuels is a major cause of global warming. Explain why.
7. While driving what are the tips we must follow to save petrol/ diesel/natural gas?
8. Imagine that all the exhaustible natural resources are exhausted by human activities. Do you think survival of living beings would be possible? If yes, why? If not, why not?
9. Why petrol is exhaustible natural resource, whereas sunlight is not? Explain.
10. Coal reserves are said to be enough to last for another hundred years. Do you think we need to worry in such case? If yes, why? If not, why not?
11. What steps would you suggest for the judicious use of fossil fuels?

ANSWERS

A. 1|Air 2|Petroleum 3|Coal 4|Carbonisation 5|Coke 6|Coal tar 7|Coal tar 8| Petroleum 9|Diesel 10| Kerosene

B. 1 |True 2|False 3|False 4|True 5|False

C. 1| c 2| e 3| b 4| a 5| d

D. 1|iii 2| iii 3| iv 4| iii 5| i 6|iii 7| i 8| iii 9| i 10| iv

E. 5| Carbondioxide. 7| Bitumen 8| coal tar 10| Pennsylvania, USA 19| Petroleum 20| Kerosene

Chapter - 6
Combustion and Flame

Chapter at a glance:

1. We use different types of fuel for different purposes at home, in industry and for running automobiles. These are cowdung, wood, coal, charcoal, petrol, diesel, compressed natural gas (CNG), liquefied petroleum gas (LPG) etc.
2. Some fuels burns with a flame. For example wax, petrol, diesel etc. But some fuel burn without a flame, for example charcoal.
3. A chemical process in which substance react with oxygen to give off heat is called Combustion. The substance that undergoes combustion in presence of oxygen is called combustible substance. It is also known as fuel.
4. Fuel can be classified into three classes on the basis of their physical state. These are -
   a) Solid fuel: Physical state of these fuel at room temparature is solid. For example: wood, charcoal, cowdung etc.
   b) Liquid fuel: Physical state of these fuel at room temperature is liquid. For example: petrol, diesel, kerosene etc.
   c) Gaseous fuel: Physical state of these fuel at room temperature is gas. For example: CNG, LPG etc.
5. In case of combustion, air (oxygen) is necessary. The candle burns freely when air can enter the chimney from below but when air does not enter the chimney from below, the flame flickers and produces smoke and the flame finally goes off due to absence of air (oxygen).
6. The lowest temperature at which a combustible substance catches fire is called its ignition temperature. The ignition temperature of different combustible substance are different.
7. The substances which have very low ignition temparature and can easily catch fire with a flame are called inflammable substances. For example: petrol, alcohol, LPG etc.
8. When a fire brigade arrives, they pours water on the fire. Water cools the combustible substance so that its temperature is brought below its ignition temperature. This prevents the fire from spreading. Water vapours also surround the combustible substance, helping in cutting off the supply of oxygen. So, the fire is extinguished.

9. **Type of Combustion:-**

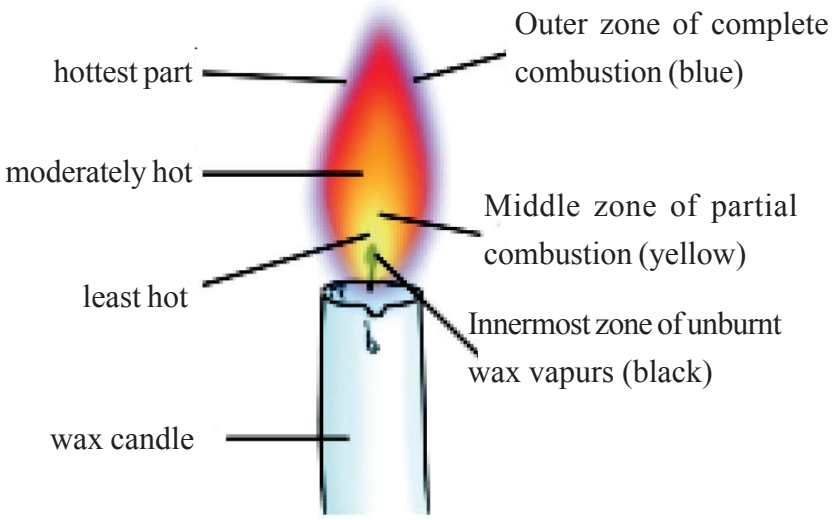
a) Rapid Combustion : When the combustible substance burns rapidly and produces heat and light then it is called rapid combustion. For example: Combustion of CNG, LPG, Petrol etc.

b) Spontaneous combustion : When the combustible substance suddenly burst into flames, without the application of any apparent cause is called spontaneous combustion.

For example: combustion of phosphorous in air.

c) Explosion: when in a combustible substance, a sudden reaction takes place with the evolution of heat, light and sound is called explosion. In explotion a large amount of gas is formed during the reaction. Explosion can also takes place, if pressure is applied on the combustible substance. For example: Combustion of fire cracker.

10. There are three different zones of a flame. These are dark zones, luminous zones and non luminous zone.



11. The amount of heat energy produced on complete combustion of 1 kg of a fuel in presence of excess air is called its calorifie value. The calorifie value of a fuel is expressed in a unit is called kilojoule per kg (kj/kg).

Calorifie values of some fuels are given as follows -

Fuel	Calorifie value (kj/kg)
cow dung cake	6000 - 8000
wood	17000-22000
Coal	25000-33000
Petrol	45000
Kerosene	45000
Diesel	45000
Methane	50000
CNG	50000
LPG	55000
Biogas	35000-40000
Hydrogen	150000

12. An ideal fuel is cheap, readily available, readily combustible and easy to transport. It has high calorifie value. It does not produce gases or residues that pollute the environment.
13. The increasing fuel consumption has harmful effects on the environment. These are -
    a) Carbon fuels release unburnt carbon particles which are dangerous pollutants causing respiratory diseases, such as asthma.
    b) During incompete combustion of carbon contaning fuel, carbon monoxide gas is formed which can kill a sleeping person.
    c) Combustion of most of the fuels releases carbon dioxide in the environment. Increased concentration of this gas in the air is believed to cause global warming.
    d) Burning of Coal, petrol, LPG, diesel etc releases sulphur dioxide gas. It is highly suffocating and corrosive gas. Petrol engines give off oxides of nitrogen. These gases when disolve in rain water , form acid. This is known as acid rain. It is very harmful for cropes, building and soil.
14. Global warming is the rise in temperature of the atmosphere of the earth. This results, in the melting of polar glaciers, which leads to a rise in the sea level, causing floods in the coastal areas.

Let us practice some questions from this chapter

A. FILL IN THE BLANKS

1. For combustion ..... is necessary (nitrogen/oxygen).
2. In combustion substance reacts with oxygen and give off..... and light (heat/fuel).
3. Smoke produced during combustion is due to unburnt ..... particles (phosphorus/carbon).
4. In our body.....is broken down in reaction with oxygen (food/tissue)
5. In the sun, heat and light are produced by ..... reactions (chemical/nuclear).
6. When a fire brigade arrives, it pours..... on the fire (water/nitrogen).
7. The gas in the fire extinguisher is ……..(carbon dioxide /nitrogen).
8. Gas burns rapidly and produces heat and light. Such type of combustion is known as ..... (rapid combustion/spontaneous combustion).
9. Wood, paper, CNG are ……substances (Non-combustible/ combustible)
10. Increased concentration of .....in the air is the main cause of global warming (carbon dioxide /nitrogen).

B. TRUE AND FALSE

1. Heat and light are given out during combustion.
2. Coal burns with a flame.
3. Charcoal is an non-combustible substance.
4. Ignition temperature of kerosene is more than that of wood.
5. The most common fire extinguisher is water.

C. MATCH THE COLUMN

Column - A	Column - B
(1) Oxygen	(a) innermost zone of unburnt wax vapours
(2) Carbon-dioxide	(b) By-product of combustion
(3) Least hot	(c) Required for combustion
(4) Carbon-monoxide	(d) Acid rain.
(5) Oxides of sulphur and nitrogen	(e) In complete combustion

D. MULTIPLE CHOICE QUESTIONS

1. Which one of the following has the highest calorific value
   (i) Kerosene (ii) LPG (iii) Biogas (iv) Petrol
2. The burning of LPG is an example of
   (i) Rapid combustion (ii) Explosion
   (iii) Slow combustion (iv) Spontaneous combustion
3. The amount of heat energy produced on complete combustion of 1 kg of a fuel is called
   (i) Calorific value (ii) Significant value (iii) Heat value (iv) Internal energy
4. Which zone represents the partial combustion in candle flame
   (i) Outer zone (ii) Middle zone (iii) Inner zone (iv) Lower zone
5. Substances which catch fire are called
   (i) Acids (ii) Bases (iii) Combustible (iv) Burners
6. Out of these which is able to control fires
   (i) NH_3 (ii) H_2 (iii) CO_2 (iv) F_2
7. The substance that does not burn with flame is
   (i) LPG (ii) Dry grass (iii) Camphor (iv) Charcoal
8. The substances which have very low ignition temperature will
   (i) Catch fire easily (ii) Will not catch fire
   (iii)Catch fire after some time (iv) None of these
9. LPG is an example of
   (i) Solid fuels (ii) Liquid fuels
   (iii)Gaseous fuels (iv) They are not fuels
10. The products of combustion are
    (i) Carbon dioxide and water (ii) Oxygen and water
    (iii)Only carbon-dioxide (iv) Only oxygen

E. VERY SHORT ANSWER TYPE QUESTIONS (1 MARKS)

1. What is the fuel for our body?
2. By which process the Sun produces heat and light?
3. Write the name of chemicals present in a matchstick?
4. In which form, CO_2 can be stored in cylinders?
5. What is rapid combustion?
6. What is the best fire-extinguisher for fires in electrical equipments?
7. Which type of combustion takes place in burning of LPG?

8. Which types of combustion takes place in disastrous fires in coal mines?
9. Which zone is the hottest zone of a flame?
10. Where does partial combustion take place in a burning flame?
11. Why do goldsmiths use the outermost zone of a flame?
12. Give two examples of fuel for domestic use.
13. Define global warming.
14. What happens when magnesium burn?
15. What does coal produce during its combustion?
16. Give two examples of liquid fuel.
17. Name the most common fire extinguisher.
18. What does incomplete combustion of fuel give?
19. What is the main cause of global warming?
20. Give one immediate effect of global warming.
21. What is the full form of CNG?
22. What is the unit of Calorific value?
23. What does smoke contain?
24. When a fire-cracker is ignited, a sudden reaction takes place with the evolution of heat, light and sound. Name the type of combustion occurring here.

Think :
Anu wants to boil water quickly in a test tube. On observing the different zones of the flame, she is not able to decide which zone of the flame will be best for boiling water quickly. Which zone is the suitable one for her???

F. SHORT ANSWER TYPE QUESTIONS (2 MARKS)

1. Classify the given substances as combustible and non-combustible.
(Charcoal, chalk, stone, iron-rod, straw, cardboard, glass and paper)
Hints:

Combustible substances	Non-combustible substances
Charcoal, straw, cardboard and paper	Stone, iron-rod and glass

2. What is fuel? Give some examples of fuel.
3. What is ignition temperature?
4. Food is a fuel for our body. Explain
5. What are inflammable substances? Give some examples.

G. LONG ANSWER TYPE QUESTIONS (3 MARKS)

1. Define calorific value of a fuel. What is the calorific value of domestic fuels wood and LPG.
(Hint: The amount of heat energy produced on combustion of 1 kg of a fuel is called calorific value of that fuel. It is expressed as kilo Joule per kg.

Calorific value of wood = 17000-22000 KJ/kg

Calorific value of LPG = 55000 KJ/Kg]

2. What is acid rain? What causes acid rain?
3. Burning of wood is harmful for human beings. How?
4. Give two examples each for a solid, liquid and gaseous fuel along with some important uses.
5. Water filled in a paper cup gets boiled. Explain the phenomenon.
6. How is carbon-dioxide the best extinguisher for inflammable substances?

H. ESSAY TYPE QUESTIONS (5 MARKS)

1. What things are used as fire extinguisher? Explain how they can act a fire extinguisher in different cases?
2. What is combustion? Explain
3. What is pollution? Explain how burning of fuel leads to environmental pollution.
4. Which substances give flame during burning? Explain the different zones of flame with a neat diagram
5. Forest fire produces a lot of air pollution. Write in brief about the reasons of forest fires.

I. HOTS QUESTIONS

1. Wood has a very high calorific value, but we discourage the use of wood as a fuel. Why?
2. Shila was heating cooking oil to fry potato chips. The cooking oil suddenly caught fire. She pours water to the pan. Is it right? If not, explain the reasons.
3. You are provided with three watch glasses containing milk, petrol and mustard oil, respectively. Suppose you bring a burning candle near these materials one by one, which material(s) will catch fire instantly and why?
4. What are the three essential requirements to produce fire? How fire extinguisher is useful for controlling the fire.
5. The calorific values of petrol and CNG are 45000 kJ/kg and 50,000 kJ/kg, respectively. If you have vehicle which can run on petrol as well as CNG, which fuel will you prefer and why?

ANSWERS

A. 1|Oxygen 2|Heat 3|Carbon 4|Food 5|Nuclear 6|Water
7|Carbon-dioxide 8|Rapid combustion 9| Combustible
10| Carbon-dioxide

B. 1|True 2|False 3|True 4|False 5|True

C. 1|c 2| b 3| a 4| e 5| d

D. 1|ii 2| i 3| i 4| ii 5| iii 6| iii 7|iv 8|i 9|iii 10| i

E. 1|Food. 2| Nuclear Reaction 3| Antimony trisulphide and Potassium chloride 4| Liquid form
6| Carbon dioxide 7| Rapid Combustion 8| Spontaneous combustion 9| outermost zone
10| Middle zone 11| Being hottest part 12| LPG and CNG 14| Magnesium oxide, heat and light
15| Carbon dioxide 16| Kerosene and Petrol 17| Water 18| Carbon monoxide gas
19| Increase concentration of CO2 20| Increase in temperature 21| Compressed Natural Gas
22| Kilojoules per kg 23| Un-burnt carbon particles 24| Explosion

CHAPTER - 7
CONSERVATION OF PLANTS AND ANIMALS

Key notes:

- ♦ Deforestation refers to the cutting of trees and cleaning of forests for the purpose of agriculture, urbanisation, mining activities etc. which lead to the decrease in forest areas across the world.
- ♦ Global warming, reduced rainfall causing drought and desertification are some of the vital effects of deforestation.
- ♦ To maintain the balance of nature conservation of forest and wildlife is necessary. Wildlife sanctuary, national parks and biosphere reserves are the protected areas meant for conservation of flora, fauna and their habitats. Felling trees, hunting and poaching are strictly prohibited at that areas.
- ♦ Biosphere reserves help to conserve and protect the biodiversity and culture of that area. A biosphere reserve may also contain other protected areas in it. Pachmarhi Biosphere Reserve of Madhya Pradesh consists of one national park named satpura and two wildlife sanctuaries named Bori and Pachmarhi.
- ♦ National parks are large and diverse enough to protect the whole sets of ecosystem along with the historic objects of that area. The finest Indian teak plant and a number of rock shelters carrying evidences of prehistoric human life of that area are found in the Satpura National Park, the first reserve forest of India.
- ♦ Wildlife Sanctuaries are the pretected forest areas that provide suitable living conditions to wild animals. People living in wildlife sanctuaries are allowed to utilise the forest resource with limitations.
- ♦ Species means a group of population that can interbreed. The plant and animal species that are found exclusively in a particular area (a zone/a state/ a country) are known as Endemic species. Wild mango, Sal, Bison, flying squirrel are the examples of endemic flora and fauna of pachmarhi Biosphere Reserve.
- ♦ Due to destruction of natural habitats, increasing population and introduction of new species if the population of some animals start decreasing drastically facing the chance of extinction, then they are treated as endangered animals.

- ♦ Project Tiger was launched by the gevernment of India to protect the population of tiger from the risk of extinction.
- ♦ Small animals are much more in danger of extinction than the bigger animals. The decreases in their population effects the food chains and food webs of ecosystem.
- ♦ Red data book contains a record of all the endangered plants and animals.
- ♦ Migration is a phenomenon of adaptation in which a species move from its own habitat to some other habitat for a particular time period of every year for a specific purpose like breeding.
- ♦ We should save, reuse and recycle papers to save trees. Paper can be recycled five to seven times for use, which also save the energy and water needed for manufacturing papers.
- ♦ Reforestation is restocking of the destroyed forests by planting new trees of the same species which were found in that forest.

Now, let us practice some questions from this topic -

A. FILL IN THE BLANKS

1. The cutting of trees is called ……(deforestation/reforestation)
2. Red Data Book contain a record of …… species.(endangered/exinct)
3. Plants found in a particular area are termed as ……(fauna/flora)
4. Conversion of fertile land into desert is called …….(deforestation / desertification)
5. ……...species do not exist anymore. (Extinct/ Rare)
6. Group of populations which are capable of interbreeding are called…….(genus/species)
7. Revised Forest Policy of 1952 is called….(Forest Act 1980/Wild life Protection Act, 1972)
8. A paper can be recycled ……times (5-8/5-7)
9. The growing of new plants in place of cut trees is called …….
   (reforestation / deforestation)
10. Pachmarhi is an example of ……(biosphere reserve/ national park)
11. In a wildlife sanctuary , poaching of animals in ……(prohibited/ allowed)
12. ……..results in depletion of wildlife .(Deforestation/Aforestation)
13. Animals whose numbers are rapidly falling are called ……... species (endangered/ extinct)
14. Illegal hunting of animals for their valuable body parts is called……
    (poaching / catching)

B. TRUE AND FALSE

1. Dinosaurs are the extinct animal.
2. Deforestation is the major threat to survival of organisms.
3. Pachmarhi biosphere reserve consists of one national park and two wildlife sanctuaries.
4. Soil erosion leads to loss of humus.
5. Global warming is rise to temperature due to NO_2.
6. Protected forests are completely safe for wild animals.
7. Increase in rainfall causes droughts in that area.
8. Endangered animals are those whose numbers are very large.
9. Deforestation leads to an increase in the water holding capacity of the soil.
10. Bison is an endemic fauna of Pachmarhi biosphere reserve.
11. Aforestation can cause desertification.
12. Tiger is an endangered species.
13. Saving papers means saving trees.
14. An animal that is widely distributed over the earth is said to be endemic.
15. Migratory birds fly to far away places every year during a particular time for a holiday.

C. MULTIPLE CHOICE QUESTIONS

1. The place of an living organism in environment is called:

(a) Home (b) Resort (c) Habitat (d) Reservoir

2. The animals which are exclusively found in a particular area only are called-

(a) Extinct species (b) Endemic species (c) Rare species

(d) Migratory species

3. Sanctuary is a place where

(a) Animals are protected

(b) Plants are protected

(c) Office of forest department

(d) None of these.

4. Project Tiger was launched on -

(a)1st April 1973 (b) 23rd May 1973 (c)21st September 1973

(d) 25 December 1973

5. Snake are killed in large numbers because

(a)They are very poisonous.

(b) They kill rats

(c) Their skin is expensive

(d)They damage the crops.

6. Fauna indicates for-

(a) Plants (b) Animals (c) Both plants and animals (d) None of these

7. What do black buck , elephant, python, and golden cat together represent in a forest-

(a) Fauna (b) Ecosystem (c) Flora (d) Species

8. Deforestation increases the level of one of the following in the atmosphere-

(a) Ozone (b) Carbon dioxide (c) Oxygen (d) Water vapour

9. Part of earth which supports the biodiversity is called -

(a) Biosphere reserve (b) Sanctuary

(c) Ecosystem (d) Biotic community

10. The Siberian crane comes to India every year in winter for a few months-

(a) To escape the severe summer

(b) To escape the severe winter

(c) To escape the heavy rains.

(d) To escape from predators

11. The Kaziranga wildlife sanctuary preserves-

(a)Elephant (b) Rhinoceros (c) Asiatic lions (d) Royal Bengal Tiger

12. The human activity that is responsible for loss of biodiversity-

(a) Urbanisation (b) Aforestation

(c) Establishment of biosphere reserve respiration (d) Respiration

13. Which is not a consequence of deforestation?

(a) Desertification (b) Global warming (c) Poaching (d) Floods

14. World wild fund for nature works in the field of -

(a) Wildlife conservation (b) Forest conservation

(c) Water conservation (d) Soil conservation

D. MATCH THE ITEMS IN COLUMN A WITH THOSE IN COLUMN B

COLUMN - A	COLUMN - B
1. Zoo	(a) Deforestation
2. Record of animals and plants	(b) Killing of animals
3. Satpura	(c) Red data book
4. Cutting of forest	(d) National park
5. Poaching	(e) Protects animals

E. VERY SHORT ANSWER TYPE QUESTIONS (1 MARK)

1. Which is the First Reserve Forest of India?
2. Mention what is considered as the answer to deforestation?
3. Name any two endangered species protected in our wildlife sanctuaries?
4. Name the plant found in the Satpura forest?
5. Write two natural causes of deforestation.
6. Write the name of an extinct animal.
7. How many rock shelters are found in Pachmarhi biosphere reserve?
8. Write the name of two wildlife sanctuaries hosted by Pachmarhi biosphere reserve.
9. Name the book which keeps record of endangered animals and plants.
10. Name two threatened wild animals.
11. What is the purpose of biosphere reserve?
12. Name the part, built to support biodiversity?
13. Endemic fauna is restricted to a particular area. Name few endemic fauna of pachmartion Bishphere reserve..
14. Paper should be recycled. Can you suggest how many times it can be recycled?
15. Kanha biosphere reserve is located in which state of India?
16. 'Variety of all forms of life found in a region' is known by a specific name, what is it?
17. If we cut 17 full grown trees, how much paper can we obtain?
18. Give two examples of migratory birds.
19. Name the term related to the plantation of new plants.
20. Give examples of two endemic flora of pachmarhi Biosphere Reserve.
21. Name two sanctuaries of India.
22. Give examples of two flora of the Pachmarhi biosphere reserve.
23. What is the information provided by rock shelters?
24. Name any two national parks of India.
25. What are the animals facing the danger of extinction called?
26. Name one international organization that aims at conservation of nature.
27. What does 'RED' in Red Data Book stands for?

F. SHORT ANSWER TYPE QUESTIONS (2 MARKS)

1. What do you mean by Biosphere Reserve?
   [Hints: The large areas of protected land for conservation of wildlife, plant and animal resources and traditional life of the tribals living in that areas are called biosphere reserves.]

2. What do you mean by Forest Conservation Act?
3. What is biodiversity?
4. What are flora and fauna?
5. What do you mean by endemic species?
6. How does deforestation cause a decrease in rainfall?
7. What is a zoo?
8. What do you mean by species?
9. What are rock shelters?
10. What do you mean by desertification?
11. Why do birds migrate?
12. Write a short note on Project Tiger.
13. How forest reserves help in conserving biodiversity?
14. List four ways in which forests are useful to us?
15. Why did IUCN prepare the Red Data Book?

Do you know ???

Although children make up 10% of the world's population, over 40% of the global burden of disease falls on them. Environmental factors contribute to more than 3 million children under age five dying every year.

G. LONG ANSWER TYPE QUESTIONS (3 MARKS)

1. Soil erosion and desertification are the consequences of deforestation- justify
   [Hints: Deforestation causes soil erosion, i.e. removal of top layer of soil. It also changes the physical properties of soil. Thus, exposing the lower hard and rocky layers of soil that has less humus and is less fertile gradually, the fertile land gets converted into deserts. This is called desertification.
2. How can we protect wildlife?
3. Explain the term ecosystem?
4. How does recycling and saving of papers relate to deforestation?
5. What do you mean by migration? Write the causes of migration of birds?

H. ESSAY TYPE QUESTIONS (5 MARKS)

1. What do you mean by deforestation? Explain the -
   (i) Man made causes of deforestation. (ii) Natural causes of deforestation.
2. How does deforestation lead desertification?
3. Discuss the steps which are necessary for wildlife conservation.
4. We need to save papers. Explain the sentence with reasons.
5. What are the consequences of deforestation? Explain
6. How can you contribute to the maintenance of green wealth of your locality? Make a list of actions to be taken by you.

H. HOTS QUESTIONS

1. Is deforestation associated with global warming? Explain.
2. A new species X is introduced in a forest. How is it likely to affect the local species of that area?
   [Hint: Introduction of a new species may affect the existence of local species due to competition.]
3. How are even small animals important in an ecosystem?
4. Why are endemic organisms in greater danger of becoming extinct?
5. Arrange the following in order to show how deforestation leads to water pollution

a) The roots of the trees no longer have a firm grip on the soil.
b) Rainfalls on to the ground.
c) The trees of a forest are cut down.
d) The loose soil gets washed away into a nearby water body.

6. A gas is utilized by the trees and plants in photosynthesis. The same gas also traps the heat rays reflected by the earth and also given out by humans during respiration. Name the gas and the phenomenon of increase in temperature for which it is responsible.
7. A group of cats are found in a forest that interbreeds freely. What is the term used for them?

ANSWERS

A. 1|Deforestation 2|Endangered 3|Flora 4|Desertification 5| Extinct 6|Species 7|Forest act 1980 8|5-7 9| Reforestation 10| Biosphere reserve 11|Prohibited 12|Deforestation 13|Endangered 14| Poaching

B. 1|True 2|True 3|True 4|True 5|False 6|True 7|False 8|False 9|False 10|True 11|False 12|True 13|True 14|False 15|False

C. 1|c 2|b 3|a 4|a 5|c 6|b 7|a 8|b 9|a 10|b 11|b 12|a 13|c 14|a

D. 1|e 2|c 3|d 4|a 5| b

E. 1|Satpura national park 2| Reforestation 3| Black buck and golden cat 4| The finest Indian teak 5| i)Forest fire ii) severe droughts 6|Dinosaurs 7|55 8| Bori and Pachmarhi 9| Red Data Book 10| Black buck, Rhinoceros 11| Biosphere reserves are the areas meant for conservation of biodiversity 12|Biosphere reserve 13| Bison and flying squirrel one endemic fauna 14|5-7 times 15| Madhya Pradesh 16|Biodiversity 17| One tonne of paper 18|Siberian crane, Surkhab 19|Reforestation 20| Sal and wild mango 21| Bharatpur sanctuary, Lokchao sanctuary 22|Sal , mango, jamun 23| It gives us an idea of the life of primitive people 24|Kaziranga and Satpura national park 25|Endangered animals 26|WWF (worldwide fund for nature) 27| RED stands for danger.

Chapter - 8
Cell - Structure and Functions

Key Notes :

- The body of a large group of organisms are made of some smaller parts called organs. Organs are made of some smallest structural units called cell.
- Cells were first observed by Robert Hooke in the year 1665 with the help of a simple magnifying device.
- As buildings are built with many bricks, similarly the body of all living organisms are also made with numerous cells.
- Cells are complex living structures. Number, size and shape of cell varies among different organisms and their organs. The smallest cell measures 0.1-0.5 micrometer, which belongs to the group of a bacteriaum. The largest cell in the egg of an ostrich (170 mm x 130mm).
- Organism made up of only one cell are known as unicellular organism (e.g.-Amoeba, Paramacium) and the organisms that are made of more than are cells are known as multicellular organism (e.g-Human, Banyan tree).
- A group of specialised cells arrange themselves in specific patterns to form tissues, which in turn form the organs.
- Cell membrane, cytoplasm carrying different cell organelles and Nucleus are the three main parts of a cell.
- Cell membrane encloses the cytoplasm and nucleus of a cell. The membrane separates cells from one another and also the cell from its surrounding medium. The membrane is porous so it allows movement of substances both inward and outward. Cell membrane provides shape to the cell. In case of plant cells an outer thick layer of cell wall surrounds the plasma membrane.
- Cytoplasm is a jelly like substance present between the cell membrane and the nucleus. Various cell organelles like Mitochondria, Golgi body, Ribosome, Lysosome etc. remain present in the cytoplasm.
- Nucleus is an important component of living cells that generally remain present in the centre of the cell. It consist of nuclear membrane, a nucleolus and some thread-like structures called chromosomes that carry genes.
- Chromosome helps in the inheritance or transfer of genetic characters from parental generation to their offsprings. chromosomes can be seen only during cell division.
- Gene is the unit of inheritance in living beings.
- Cells having well organised nucleus are known as eukaryotic cells and the organisms having such kind of cells are known as eukaryotes. Example - All the higher groups of organisms.

- Cytoplasm and the nucleus of a living cell together is known as protoplasm.
- The cells having nuclear material without nuclear membrane is known as prokaryotic cell and the organisms having such kind of cells are know as prokaryotes. Example- Bacteria, Blue green algae etc.
- Comparison of plant and animal cells -
  - → In case of plant cells cellwall surrounds the cell memberane externally. In case of animal cells only cell membrane encloses the cell.
  - → Different types of plastids remain present in the cytoplasm of plant cells but these are absent in animal cells.
  - → Plant cells carry large cell vacuole. Whereas in case of animal cells cell vacuole may be absent or very small in size.

Now, let us practice some questions from this topic -

A. FILL IN THE BLANKS

1. Plastids are present only in ……cells. (plant/animal)
2. Genetic material of plant and animal cell is found in…….(nucleus / mitochondria)
3. ……is the unit of inheritance in living organism. (Gene/ Mitochondria)
4. Cell was discovered in ……..(1765/1665)
5. Cheek cells do not have……(plastids / nucleus)
6. …….controls all the activities of cell.(Mitochondria/Nucleus)
7. Green plastids contain ..... pigment that help in photosynthesis. (chlorophyll / xanthophyll)
8. Cellular respiration occurs in …….part of cell.(mitochondria/chloroplast)
9. The instrument used to observe cells is …….. (microscope / bioscope)
10. ……..gives defined shape and protection to the plant cell.(Cell wall/Cell Membrane)

B. STATE WHETHER THE FOLLOWING STATEMENTS ARE TRUE OR FALSE :

1. Onion cells and cheek cells are the examples of prokaryotic cells.
2. Animal cells have cell wall and around that the cell membrane.
3. The living substance in the cell is called plasma membrane.
4. Vacuoles remain present in animal cells and are very big in size.
5. Ostrich egg is a cell which can be seen by naked eyes.
6. Plastids are found in plant cells.
7. All living organisms are made up of organ.
8. Pseudopodium is found in higher animals.
9. There is a rigid cell wall in animal cells.
10. Amoeba is a multicellular organism.
11. Nerve cell is branched and long.
12. Cell walls are made up of cellulose.
13. Chromosomes carry genes.

Note

Gene is the unit of inheritance in living organisms. It controls the transfer of hereditary characters from parents to offspring.

C. MATCH THE ITEMS IN COLUMN A WITH THOSE IN COLUMN B.

COLUMN A	COLUMN B
(a) Entry and exit of cellular materials.	(i) Mitochondria
(b) Control centre of cellular activities.	(ii) Chloroplast
(c) Site of photosynthesis.	(iii) Nucleus
(d) Production of energy.	(iv) Cell membrane
(e) Secretion of enzyme and proteins.	(v) Golgi apparatus

D. MULTIPLE CHOICE QUESTIONS

1. Smallest cell organelle is
   (a) Mitochondria (b) Ribosome (c) Vacuole (d) Lysosome
2. Cells that have high energy requirement generally have many
   (a) Ribosomes (b) Nucleus (c) Mitochondria (d) Chloroplast
3. Which of the following organelle is found in plant cells but not in animal cells
   (a) Nucleus (b) Mitochondria (c) Chloroplast (d) Golgi apparatus
4. The main constituents of cytoplasm is C, N, O, H. These are derived from
   (a) Protein (b) Carbohydrate (c) Water (d) None of these
5. The scientist who described cell as "many little boxes" was
   (a) Robert Hooke (b)Theodar Schwann
   (c) Anton Van Leeuwenhoek (d) None of these
6. Which of the following is not a plastid
   (a) Chloroplast (b) Chromoplast (c) Leucoplast (d) Ribosome
7. Cheek cells do not have a
   (a) Cell membrane (b) Golgi apparatus (c) Nucleus (d) Plastid
8. Which of the following is not a cell
   (a) Red blood cell (b) Bacterium (c) Spermatozoa (d) Virus
9. Which of the following cells does not have a nucleus
   (a)White blood cell (b) Red blood cell (c) Nerve cell (d) Muscle cell
10. How many cells are present in human body
    (a) One million cells (b) One billion cells
    (c) One trillion cells (d) More than a trillion cells.
11. The characteristic of a nerve cell that relates directly to its function is its
    (a) Long extensions (b) Flat shape

(c) Ability to change shape (d) Ability to engulf bacteria

12. Old organelles, viruses, bacteria are digested within a cell due to

(a) Ribosomes (b) RER (c) SER (d) Lysosomes

13. Among the following parts of a cell, name the part that is common to plant cell, animal cell and a bacterial cell

(a) Chloroplast (b) Cell wall (c) Cell membrane (d) Nucleus

14. Which of the following cell organelle is non membranous and found in both prokaryotic and eukaryotic cells

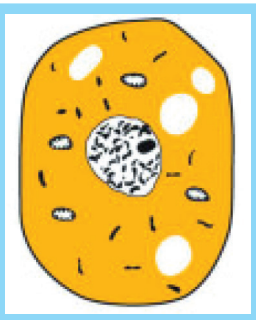
(a) Lysosome (b) Vacuoles (c) Ribosomes (d) Mitochondria

15. A cell that contain a cell wall, chloroplasts and a central vacuole is

(a) Plant cell (b) Animal cell (c) Yeast cell (d) Bacterial cell

E. VERY SHORT ANSWER TYPE QUESTIONS (1 MARK)

1. Name the scientist who had first observed cell under microscope.
2. Which cell organelle helps in transport of substances within the cell?
3. In which type of cell chloroplast remain presant?
4. Which cell organelle regulates the process of cell division?
5. Name the blood cell whose shape changes like amoeba?
6. Name a cell which can be seen by an unaided eye.
7. Name two cells which can change their shape.
8. Which cell has the ability to change its shape?
9. How can you define the shape of Amoeba?
10. What is the structural unit of an organ?
11. Where organelles remain embedded in a cell?
12. Who had developed the first microscope?
13. Give an example of unicellular eukaryotic organism.
14. What are the basic components of a cell?
15. Name the structural unit of an organism.
16. At which stage chromosomes can be observed within a cell ?
17. Name the outer protective covering of an animal cell.
18. What is called power house of the cell?
19. Name the longest cell in human body?
20. Is hen's egg a cell or group of cells?
21. Name two multicellular organisms.
22. Name the green coloured plastids?
23. What is called kitchen of the cell?
24. How many types of cell are there in living world ?
25. Name two unicellular organisms?



A. Does it represent a plant cell or an animal cell ?

B. Does it represent a prokaryotic cell or a eukaryotic cell ? (NCERT Examplar)

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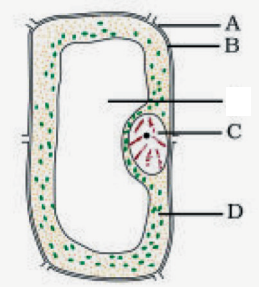
26. Who discovered the cell?
27. Name two blood cells?
28. What is cell division?

F. SHORT ANSWER TYPE QUESTIONS (2 MARKS)

1. What are the various types of organisms on the basis of number of cells.
   [Hints: There are two types of organism on the basis of number of cells.
   - Unicellular: The organisms that contain only single cell in their body are called unicellular organisms. For e. g., Amoeba and Paramecium.
   - Multi-cellular: The organisms made up of more than one cell are called multi-cellular organisms. For e.g., human, cat, dog etc.
2. Draw a well labelled diagram of an animal cell.
3. What are tissues? How tissues are formed ?
4. What are plastids? Write their functions.
5. Why chloroplasts are present only in plant cells?
6. Why mitochondria are called the powerhouse of the cell?
7. State the difference between prokaryotic and eukaryotic cells?
8. Draw a well labelled diagram of a plant cell?
9. How chromosomes carry genetic characters?
10. Write two characteristic features of nerve cell?
11. Where the ribosomes are found? Write their functions.
12. Label the parts A to D in the given diagram.



[Hint: Here, A is Cell wall. In plant, cell membrane surrounds the cytoplasm.

G. LONG ANSWER TYPE QUESTION (3 MARKS)

1. We read about various organelles present in a cell. Explain what is an organelle. Name the organelles that are found in most cells. What is the function of nucleus?
   [Hints: Organelles are distinct highly organized structures that perform specialized function within the cell. The organelles that are found in most cells are mitochondria, ribosomes and vacuole.
   Functions of nucleus :-

(i) It is concerned with the transmission of hereditary traits from the parent to offspring (i. e., inheritance).

(ii) It controls all the metabolic activities of the cell (i.e., control centre of cellular activities).

2. Write a short note on DNA.
3. Write the difference between plant cell and animal cell.
4. Write three differences between prokaryotic and eukaryotic cells.
5. Explain the structure of onion cell with the help of a slide.
6. What is Gene? What is its function?

H. ESSAY TYPE QUESTION (5 MARKS)

1. What are the main functional regions of cell? Write their functions.

[ANS: There are main three regions of the cell:

(i) Cell membrane (ii) Cytoplasm (iii) Nucleus

i) Cell membrane: It separate cells from one another. It also separate cell from the surrounding medium. The plasma membrane is porous which allows movement of substances from inside to outside and vice versa.

ii) Cytoplasm: It presents between cell membrane and nucleus. Various other components of cell are present in the cytoplasm. These are mitochondria, Golgi bodies, Ribosomes, and Plastids etc.

iii) Nucleus: It controls various activities of cell. It contains chromosomes which carry genes. Genes are the unit of inheritance, which transfer the characteristics from one generation to other generation]

2. What are chromosomes ? Write its function. Briefly describe the structure of nucleus.
3. Write the functions of the following-

(i) Mitochondria ii) Ribosomes iii) Cell wall iv) Plasitd v) Lysosame

4. Explain the structure of an eukaryotic cell.
5. Cells are the building blocks of the life. Explain.

I. HOTS QUESTIONS

1. Nucleus is removed from a cell. What is most likely to happen?

[Hints: It is said that the nucleus controls all the metabolic activities as well as formation of various cell organelles. Thus if the nucleus is removed,it will adversely affect the organism. In organisms such as Amoeba, removal of nucleus may even lead to death.]

2. A cell of a neem tree contains part A and B that are not present in a human. Part A Contains a pigment C that gives green color to its leaves. Part B gives shape and support to the cell and is made of D.

a) What is A and B?

b) Can you identify C and D?

c) Write functions of A and C?

3. In a multi-cellular organism, all cells have the ability to perform all life functions. State whether it is true or not. Give reasons for your answer.
4. Cells consist of many organelles, yet we do not call any of these organelles as structural and functional unit of living organisms. Explain. (NCERT EXEMPLAR)
5. Why do plant cells have an additional layer surrounding the cell membrane? What is this layer known as? (NCERT EXEMPLAR)
6. The size of the cells of an organism has no relation with the size of its body. Do you agree? Give reason for your answer.

ANSWERS

A. 1|plant 2|nucleus 3|Gene 4|1665 5|plastids 6|Nucleus 7|cholorophyll 8| mitochondria 9| microscope 10|Cell wall

B. 1|False 2|False 3|False 4|False 5|True 6|True 7|False 8|False 9|False 10| False 11|True 12|True 13|True

C. a| iv b|iii c|ii d|i e|v

D. 1|b 2|c 3|c 4|a 5| a 6|d 7|d 8|d 9|b 10|d 11|a 12|d 13|c 14|c 15|a

E. 1|Robert Hooke 2| Endoplasmic reticulum 3| Plant cell 4| Centrosome 5| White blood cells 6| Hen's egg 7| Amoeba cell, WBC 8| White Blood Cells 9|Irregular 10| cell 11|Cytoplasm 12| Anton Van Leeuwenhoek 13|Euglena 14| i) Cell membrane ii) Cytoplasm 15|Cell 16| At the time of cell division 17| Cell membrane 18|Mitochondria 19|Nerve cell 20| a Cell 21| Man, Dog 22| Chloroplast 23| Chloroplast 24| Prokaryotic and Eukaryotic cells 25| Amoeba, Paramecium 26| Robert Hooke 27| RBC, WBC 28| The process by which new cells are formed from parent cell.

Chapter - 9
Reproduction in Animals

Key Notes :

- Reproduction is an essential phenomenon for continuation of a species in the world. There are two modes by which animals reproduce. These are- (i) Asexual reproduction and (ii) Sexual reproduction.
- Sexual reproduction involves fusion of male and female gametes produced by the male and female individuals of a species.
- The male reproductive organs of human beings include a pair of testes, two sperm ducts and a penis. The female reproductive organs are a pair of ovaries, oviducts or fallopian tubes and the uterus.
- Testes produce the male gametes called sperms and the ovary produces female gametes called ova (eggs). Both types of gametes are single celled structure.
- The fusion of male and female gamete is known as fertilization which results in the formation of zygote.
- In case of humen, cows, dogs and hens fertilisatoin always takes place within the female body which is known as internal fertilisation.
- When fertilisation takes place outside the female body then it is known as external fertilisation. It is very common among frogs, fishes etc. Among these organisms large number of male and female gametes are produced.
- The zygote divides repeatedly to form a mass of cells that gradually develop into different tissues and organs of the baby. This developing structure is known as embryo which gets embedded in the wall of uterus for complete development.
- The stage of the embryo in which all the body parts are formed, is called a foetus.
- The animals in which development of embryo takes place within mother body and they give birth to young ones, are known as viviparous animals. Example-Human, dog, tiger etc. on the other hand those animals which lay fertilised or unfertilised eggs and the development of embryo takes place outside the mother body, they are known as oviparous animals. Example-Hens, duck, frogs etc.

- Animals like silkworm, Frog which undergo through different developmental stages in their lifecycle shows drastic changes during their transformation from larval stage to adult stage. This type of transformation is known as metamorphosis.
- Inasexual mode of reproduction a single parent is involved in the reproductive process.
- Hydra produces one or more bulges called buds in their body which gradually develop into new individuals and detach from the parent body. This method of asexual reproduction is known as budding.
- Amoeba also reproduce asexually through binary fission, where the parent organism divides itself to form two daughter organisms.
- IVF or in vitro fertilisation technique is developed for the women who can not bear babies naturally. In this technique after fertilisation under laboratory condition the zygote is allowed to develop for a week and then placed in the mothers uterus for further growth. Babies born through this technique are known as test-tube babies.
- Cloning is the technique of production of an exact copy of a cell or organ or an organism. The first mammalian clone was a sheep named 'Dolly' was born on 5th July 1996.

Now, let us practice some questions from this topic -

A. FILL IN THE BLANKS

1. _____is important for continuation of a species. (Respiration/ Reproduction)
2. Gametes fuse to form _____. (Zygote / Foetus)
3. Embryo embeds in the wall of _____ (Uterus/ Oviduct)
4. _____ are the cells involved in sexual reproduction (Gametes / Foetus)
5. _____ is the process of fusion of gametes. (Fertilization / Reproduction)
6. The process of reproduction involving fusion of male and female gametes called _____ reproduction (Asexual / Sexual)
7. The testes produce the male gametes called _____ (Ovum / Sperm)
8. Sperm is a _____ structure. (unicellular / multicellular)
9. _____ is a fertilized egg. (Foetus/ Zygote)
10. Babies born through _____technique is known as test-tube baby.(IVF/IMF)
11. _____ produce sperms in male. (Testes / Ovum)
12. In _____reproduction only a single parent is involved. (Sexual / Asexual)

B. State whether the following statements are ture or false :

1. Amoeba reproduces by budding.
2. Fertilization is not necessary in asexual reproduction.

3. Each sperm is multi-cellular.
4. A new young one is developed from a cell called gamete.
5. Cloning is a sexual reproduction method in any living organism.
6. Viviparous animals give birth to young ones.
7. Female gametes are ovum.
8. Two individuals are needed for sexual reproduction.
9. An embryo grows in uterus.
10. Development of test-tube babies takes place in uterus.

C. MATCH THE ITEMS IN COLUMN -A WITH THOSE IN COLUMN-B

Column - A	Column - B
1. Testes	a) Frog
2. Cloned sheep	b) Fertilization
3. Yeast	c) Lay eggs
4. Amoeba	d) Asexual reproduction
5. Primary female reproductive organ	e) Ovary
6. Single parent	f) Sperm
7. Oviparous	g) Ovum
8. Female Gametes	h) Binary fission
9. External fertilization	i) Budding
10. Fusion of male and female gametes	j) Dolly

D. MATCH THE ITEMS IN COLUMN-A WITH THOSE IN COLUMN-B

Column A	Column - B
1. Embryo	a. Ovary
2. Zygote	b. Oviduct
3. Egg	c. Uterus

E. MULTIPLE CHOICE QUESTIONS

1. Number of modes by which animals reproduce are -
   (a) Two (b) Three (c) Four (d) None of these
2. Binary fission is observed in -
   (a) Hydra (b) Yeast (c) Amoeba (d) Human being
3. Asexual reproduction is observed in -
   (a) Cow (b) Buffalo (c) Sponge (d) Hen

4. In hydra the mode of reproduction is -
   (a) Asexual (b) Sexual (c) Both a & b (d) None of these
5. The animals that give birth to the young ones are called -
   (a) Viviparous (b) Oviparous (c) Both a & b (d) None of these
6. Male gamete or sperm consist of -
   (a) Three Parts (b) Four parts (c) One parts (d) None of these
7. Ovum or eggs are formed in
   (a) Ovary (b) Testes (c) Penis (d) Oviduct
8. Internal fertilization takes place -
   (a) Inside male body (b) Inside female body
   (c) Outside female body (d) Outside male body.
9. In human the development of fertilized egg takes places in the -
   (a) Ovary (b) Sperm (c) Testes (d) Uterus
10. The cell formed after fertilization is called -
    (a) Embryo (b) Foetus (c) Zygote (d) Egg
11. The fusion of sperm and ovam usually occur in the -
    (a) Ovary (b) Uterus (c) Testes (d) Oviduct
12. Sets of reproductive terms are given below. Choose the set that has an incorrect combination
    (a) Sperm, testes, sperm duct, penis (b) Menstruation, egg, oviduct, uterus
    (c) Sperm, oviduct, egg, uterus (d) Ovulation, egg, oviduct, uterus.
13. Which one of the following shows external fertilization
    (a) Frog (b) Human being (c) Cow (d) Hen
14. Which one of the following is not a part of female reproductive organs -
    (a) Uterus (b) Ovary (c) Oviduct (d) Penis
15. In the list of animals given below hen is the odd one out - Human being, dog, cow, hen. The reason is
    (a) It undergoes internal fertilization (b) It is oviparous
    (c) It is viviparous (d) It undergoes external fertilization
16. Which is not a viviparous animal -
    (a) Human being (b) Cow (c) Dog (d) Butterfly
17. Budding occurs in -
    (a) Amoeba (b) Dog (c) Paramecium d) Yeast
18. Female gamete is called -
    (a) Ova (b) Sperm (c) Zygote (d) Uterus
19. Male gamete is called -
    (a) Sperm (b) Ova (c) Embryo (d) Zygote

20. Tadpole is developing stage of which of these -
(a) Dogs (b) Cats (c) Frogs (d) None of these

F. VERY SHORT ANSWER TYPE QUESTIONS (1 MARK)

1. Name the components of male reproductive organ in human?
2. During fertilization how many sperm can fuse with the egg?
3. Name some animals in which internal fertilization occur.
4. What kind of fertilization occurr in human being?
5. Name the cell that divide repeatedly to form an embryo.?
6. What are the structural components of sperm cell?
7. What do you mean by zygote?
8. What is a viviparous animal?
9. Define Oviparous animals.
10. What is bud?
11. Give the other name of oviducts.
12. Give another term for a fertilised egg?
13. The change from tadpole to frog is given a particular term. Name the term.
14. Name the two main types of reproduction prevalent in animals.
15. Where does an embryo grow in case of external fertilisation?
16. State whether human beings reproduce by sexual methods or asexual methods.
17. Name an unicellular and a multicellular animal which can reproduce by asexual methods.

NOTE

** The stage of the embryo in which all the body parts are identifiable is called foetus.

** The embryo gets embedded in the wall of the uterus for further development.

Workbook

G. SHORT ANSWER TYPE QUESTIONS (2 MARKS)

1. Define sexual reproduction.
2. What is internal fertilization?
3. What is external fertilisation?
4. What is asexual reproduction?
5. Define Embryo. What is foetus?
6. What is IVF (In Vitro Fertilization)?
7. Draw a labelled diagram of human sperm?
8. Write some examples of viviparous and oviparous animals.
9. Define fertilization. In which part of the female reproductive organ fertilization occur.
10. Human male gamete has a tail but female gamete does not. Why? [Hint: Textbook Page No: 103]
11. What is cloning? Is it a sexual or asexual reproduction?
12. Draw a schematic diagram of life cycle of frog.

Think
The term metamorphosis is not used while describing human development. Why?
(NCERT EXEMPLAR)

H. LONG ANSWER TYPE QUESTIONS (3 MARKS)

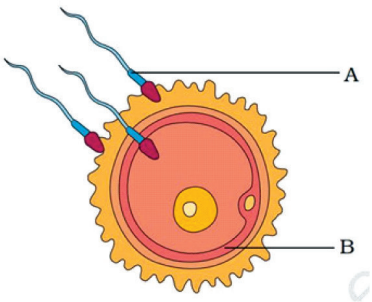
1. What do you understand by binary fission? Name an orgaism that can reproduce through binary fission.
2. Write three disadvantages of sexual reproduction.
3. Discuss the advantages of asexual reproduction.
4. A single cell becomes such a big individual. How?
5. Briefly describe the process of budding in Hydra.
6. Explain how a hen lays a fertilized egg?
7. Differentiate between internal and external fertilization.
8. Differentiate between viviparous and oviparous animals.
9. Name different stages of the life cycle of a frog and silk worm.
10. Draw a flow chart of human embryo development.

I. ESSAY TYPE QUESTIONS (5 MARKS)

1. Explain the process of metamorphosis with suitable example?
2. Elucidate the life cycle of frog with diagram..
3. Discuss about the structure of human male reproductive system.
4. Draw a labelled diagram of human female reproductive system.

J. HOTS QUESTIONS

1. The test tube babies are called so as they grow inside a test tube .Give your opinion.
2. Hens and frogs are both oviparous exhibiting different types of fertilisation. Explain.
3. How can we say that fish exhibits external fertilisation?
4. On the basis of the given diagram answer the following questions -



(a) Label A and B.
(b) Identify the process.
(c) What happens during this process and what is formed?

ANSWERS

A. 1|Reproduction 2|Zygote 3| Uterus 4| Gametes 5| Fertilization 6| Sexual 7| Sperms 8| Unicellular 9| Zygote 10|IVF 11|Testis 12|Asexual

B. 1|False 2|True 3|False 4|False 5| False 6|True 7|True 8| True 9| True 10| True

C. 1|f 2|j 3|i 4|h 5|e 6|d 7|c 8|g 9|a 10|b

D. 1|c 2|b 3|a

E. 1|a 2|c 3|c 4|a 5|a 6|a 7|a 8|b 9|d 10|c 11|d 12|c 13|a 14|d 15|b 16|d 17|d 18|a 19|a 20|c

F. 1| Pair of testes, two sperm ducts and a penis. 2| One 3| Humans, Cows, Dogs, Hens 4| Internal fertilization 5| Zygote 6| Head, Middle piece and a tail. 11| Fallopian tubes 12| Zygote 13| Metamorphosis 14| Asexual and sexual reproduction 15| Within egg coverings 16| Sexual method 17| Unicellular - Amoeba, Multicellular - Hydra.

Chapter - 10
Reaching the Age of Adolescence

Key Notes :

- Adolecence is the period of our life when the body undergoes through several changes and the individual become capable of reproduction. Children between the age of 11 to 19 years are called adolescents. The period of adolescence varies for boyes and girls and from person to person.
- When a childs body starts developing adult characters then it indicates the onset of puberty. Attaining reproductive maturity indicates the end of puberty.
- The changes that occur at puberty are :-
  - Increase in height
  - change in body shape
  - change in voice due to the growth of larynx or voice box
  - Appearence of acne and pimples on face due to increased activity of sweat and sebaceous glands.
  - Development of sex organs followed by the formation of gemetes.
  - Attaining mental, intellectual and emotional maturity.
  - Development of different secondary sexual characters among boys and girls.
- Development of breasts, growth of hair under the arms and in the pubic region are the secondary sexual characters developed among girls.Boys being to grow facial hair, body hair and pubic hair as their secondary sexual character.
- Hormones secreted from endocrine glands control all the changes that occur during adolescence. Testes secret testosterone hormone and ovary secret estrogen hormone. Hormone secreted from pituitary gland control the secretion of these hormones.
- The reproductive phase of life is longer in males than in females. In females, the begining of reproductive cycle i.e., menstrual cycle at puberty is known as menarche. The duration of one cycle is about 28 to 30 days. Stoppage of menstruatoin at 45 to 50 years of age is termed as menopause.
- Human body cells carry 23 pairs of chromosomes. Out of these one pair is responsible for sex determination. Gametes carry only one sex chromosome. Ovum always have one 'X' chromosome, but sperms are of two types, 'X' chromosome carrying and 'Y' chromosome carrying.
- If ovum fertilises with a 'X' chromosome carrying sperm then it will be a female (XX) child. But if fertilisation occur with 'Y' chromosome carrying sperm then it will be a male (XY) child. It proves that father is responsible for the gender determination of child but not mother.

- Thyroid, Pancreas and Adrenal glands are some other enocrine glands which secret thyroxine, insulin and adrenalin hormone respectively. Deficiency of thyroxine causes goitre and the reduced secretion of insulin causes diabetes. Adrenalin maintains salt balance in blood and helps the body to adjust with stressed condition.
- Iodine is essential for proper functioning of thyroid gland.
- Metamorphosis in frogs in controlled by thyroxine hormone.
- It is very important to take balanced diet during adolescence. Milk is a balanced food in itself.
- Everyone should maintain personal hygiene. Girls should keep track of their menstrual cycle and must use sanitary napkin or home made pads during period.
- Physical exercise is also essential for proper growth and development of body.
- AIDS is caused by a virus HIV that can transmit from the body of an infected person to the body of a healthy person through body fluids.
- Drug addiction during adolescence is very much harmul for physical as well as mental health.
- In our country the legal age for marriage is 18 years for girls and 21 years for boys. This is to reduce the cases of adolescent pregnancy and the related issues.

Workbook

Now, let us practice some questions from this topic -

A. FILL IN THE BLANKS

1. In females, the uterine wall thickens to receive the _____(fertilised egg/sperm)
2. The onset of puberty and maturity of reproductive parts are controlled by _____(hormones / enzymes)
3. Testosterone is the _____ hormone (male / female)
4. Growth hormone is secreted by _____ gland (thyroid/ pituitary)
5. Initially girl grow _____ than boys (slower/faster)
6. When a sperm containing Y chromosome fertilizes an egg with X chromosome the zygote develops into a _____ child. (male/female)
7. Hypo secretion of insulin causes _____ (diabetes / goiter)
8. _____ is a female hormone. (Estrogen/ Testosterone)
9. High pitched voice is the secondary sexual character of _____(male / female)
10. _____ egg is released per month by either ovary.(One / More than one)

B. Stae wheather the following statements are true or false.

1. Hormones are secreted from endocrine glands.
2. 23 pairs of chromosomes are found in nuclei of our cells.
3. Testis is responsible for production of sperm.
4. Stoppage of menstruation is called adolescence.
5. Mother is responsible for the sex determination of the baby.

6. Hypo secretion of thyroid hormone cause goiter.
7. Development of mammary gland is the primary sexual character of female.
8. Testis is the primary sex organ for male.
9. Voice becomes deeper in male is the secondary sexual character.
10. The sharing of syringes for injecting drugs spreads AIDS disease among the drug addicts.

C. MATCH THE ITEMS IN COLUMN 'A' WITH THOSE IN COLUMN 'B'.

Column 'A'	Column 'B'
1. XY Chromosomes	a. Boy
2. XX Chromosomes	b. Insulin
3. Adrenal Gland	c. Master gland
4. Pancreas	d. Girl
5. Thyroid gland	e. Adrenalin
6. Pituitary gland	f. Thyroxin

D. MULTIPLE CHOICE QUESTIONS

1. The period of life when the body undergoes changes, leading to reproductive maturity is called
   (a) Childhood (b) Adolescence (c) Grown up (d) Old age
2. The human body undergoes several changes during adolescence. These changes mark the onset of
   (a) Puberty (b) Prematurity (c) Post adolescence (d) Ageing
3. Adolescence period considered as -
   (a) 5-10 Years (b) 11-19 Years (c) 22-28 Years (d) None of These
4. Children gain height during
   (a) Adolescence (b) Childhood (c) 25-30 years (d) Againg
5. Testes secrets
   (a) Thyroxin (b) Estrogen (c) Testosterone (d) Iodine
6. Adam's apple is -
   (a) Enlarged larynx (b) Mammary glands (c) Apple of Adam d) None of these
7. The chemical substances which are secreted from endocrine glands are called -
   (a) Hcl (b) Hormones (c) Enzyme (d) None of these
8. Out of these which one determines the sex of the baby?
   (a) Hormones (b) Chloroplast (c) Chromosomes (d) Pituitary gland
9. What is the stoppage of menstruation cycle
   (a) Menarche (b) Menopause (c) Gametes (d) Insulin

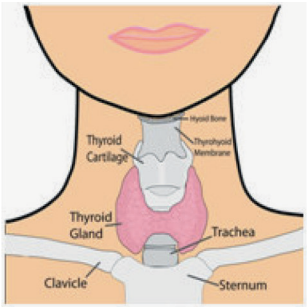
10. Which hormone is secreted by adrenal gland -
(a) Adrenalin (b) Insulin (c) Testosterone (d) Estrogen
11. Reproductive phase in women starts, when their
(a) Menstruation starts (b) Breast start developing
(c) Body weight increases (d) Height increases
12. Which are male gonads?
(a) Overy (b) Sperm duct (c) Oviduct (d) Testis
13. The beginning of menstruation is called
(a) Ovulation (b) Menstruation (c) Menarche (d) Menopause
14. In males, the sex chromosome consists of
(a) One X and one Y (b) Both X (c) Both Y (d) None of them
15. Acne and pimples on the face is due to secretions from
(a) Bile from liver (b) Oil glands during puberty
(c) Enzymes in the digestive tract (d) Tear from tear glands
16. Testosterone is a hormone found in human
(a) Children (b) Male and Female (c) Females only (d) Males Only
17. The egg is
(a) Male gamete (b) Female gamete (c) Both a and b (d) None of these
18. How many chromosomes are found in human cell
(a) 23 (b) 46 (c) 22 (d) 30
19. AIDS can spread from an infected person to another person through
(a) Sharing food (b) Sharing comb (c) Blood transfusion (d) A mosquito bite

E. VERY SHORT ANSWER TYPE QUESTIONS (1 MARK)

1. Name the male and female hormones secreted from testis and ovary at onset of puberty.
2. Name the time period of one's life when the brain has the greatest capacity for learning.
3. Name the female hormone produced by ovaries that helps in development of mammary glands.
4. Name the hormone which maintains the correct salt balance in the blood.
5. Mention a secondary sexual character that distinguishes between a boy and a girl.
6. The end of puberty is marked by a noticeable change. What is it?
7. How many pairs of sex chromosomes are found in human beings?
8. Name the medium by which endocrine gland release hormones?
9. Which hormone controls the metamorphosis in a frog?
10. Menstruation occurs once in about how many days?
11. What is the most prominent change during puberty?
12. Name the gland which secrets thyroxine hormones.
13. Which organ is known as voice box?

14. Write the location of Pituitary gland in our body.
15. Why we should say 'No to drugs'?
16. Name the two sex chromosomes of human being.
17. What are endocrine glands?
18. What is menopause?
19. Define menarche.
20. Define hormone.

Note



Thyroid gland is the largest endocrine gland in human body. Parathyroid gland is located on the posterior side of thyroid gland. It regulates the level of calcium ions in the blood.

F. SHORT ANSWER TYPE QUESTIONS (2 MARKS)

1. What is 'teenage'?
2. What is adam's apple?
3. Write the causes of AIDS.
4. Define Adolescence and Puberty.
5. Define secondary sexual character.
6. List the changes that occur in male body at puberty.
7. Why personal hygiene is necessary for girls?
8. What type of changes occur during puberty?
9. What are the main functions of Pituitary gland?
10. What are the causes of goiter in human beings?
11. What are the causes of diabetes in human beings?
12. How we can maintain personal hygiene?
13. Why is it important for an adolescent to have balanced diet?
14. Write the effect of increased activity of sweat and sebaceous gland.
15. Chips and packed or tinned snacks should never replace regular meals. Why?
16. Mention any two features each that are seen in boys and girls each to distinguish them from each other at puberty.
17. We should avoid taking medicines/drugs unless prescribed by a doctor. Give reasons.

(NCERT EXEMPLAR)

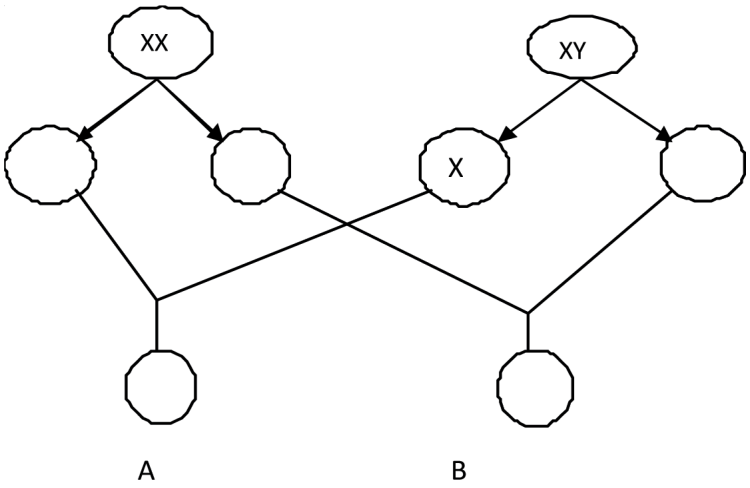
Note

Pituitary gland is also called as master gland of endocrine system and it simply carries the instruction of Hypothalamus to other endocrine glands.

G. LONG ANSWER TYPE QUESTION (3 MARKS)

1. How the sex of unborn baby is determined?
2. What is Menstruation, Menarche and menopause?
3. What are the different secondary sexual characters of male and female body?
4. Explain the role of hormone in completing the life cycle of frogs and insects.

5. List the components that should be included in a balanced diet? Give example of the sources.
6. Discuss various habits that adolescents should practice to have a good physical health.
7. What are the different endocrine glands found in human body? Write about their functions.
8. Fill the blank circles in the figure given below and identify the sex of child A and B.



H. ESSAY TYPE QUESTIONS (5 MARKS)

1.Write the various reasons for girls which early marriage and motherhood is harmful to the adolescent.
2. List out the primary and secondary sexual characteristics in human male and female.

I. HOTS QUESTIONS

1. It is believed that height of a child depends upon the genes inherited from parents. However, it is often seen that tall parents may have short children and vice-versa. What are the factors other than genes that can cause these variations? (NCERT EXEMPLAR)
2. Our government has legalised the age for marriage in boys and girls. Give reasons that why one should get married after a certain age. (NCERT EXEMPLAR)
3. Salma had a very soft and smooth skin during her childhood. As she entered adolescence, she developed pimples on her face. The skin specialist advised her to wash her face at regular intervals. Can you explain the reasons for the appearance of pimples on her face and suggest ways to prevent them? (NCERT EXEMPLAR)

4. In human females, each time during maturation and release of egg the inner wall of uterus thickens. Is this thickening permanent? Give reasons. (NCERT EXEMPLAR)

5. John and Radha were classmates since childhood. When Radha became eleven years old, she developed a little swelling on her neck. She visited the doctor who started medication for her. After a few years, John also developed a slight protrusion on his throat. He got worried and went to the doctor. But, the doctor assured him that it was a normal feature in boys while they are growing up. Can you think of any reasons for the difference in diagnoses? (NCERT EXEMPLAR)

6. Lila always eats only dal and rice in every meal. She often falls ill and has become prone to diseases. Can you suggest changes in her diet which can make her healthy and free from disease? (NCERT EXEMPLAR)

7. During adolescence, the body of boys and girls undergoes certain changes. Given below are a few of those changes.

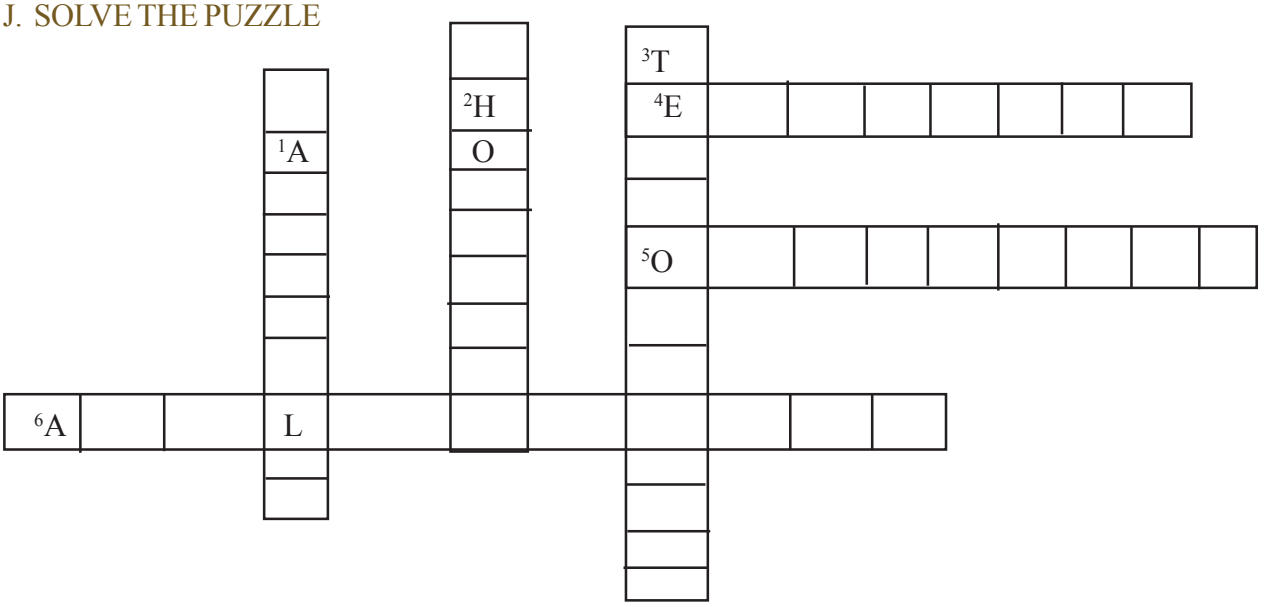
   (a) Broad shoulders (b) Wider chests (c) Wider region below waist (d) Development of muscles (e) Development of mammary glands (f) Growth of facial hair (g) Acne and pimples on face (h) Development of sex organs (i) High-pitched voice (j) Growth of pubic hair.

Categorise these changes into those that occur in boys and those that occur in girls and fill in the table given below. (NCERT EXEMPLAR)

Body changes during Adolescence

Boys	Girls

J. SOLVE THE PUZZLE



Down: 1. Hormone which maintains correct salt balance
2. Chemical substances secreted from endocrine glands
3. Primary male sex hormone produced by testes.

Across: 4. Primary female sex hormone
5. The process of release of ovum from ovary
6. The period of life when girls or boys attain reproductive maturity.

ANSWERS

A. 1|Fertilised egg. 2| Hormones 3| Male 4| pituitary 5| faster 6| Male 7| Diabetes 8| Estrogen 9| Female 10| One

B. 1|True 2|True 3|True 4|False 5|False 6|True 7|False 8|True 9|True 10|True

C. 1|a 2|d 3|e 4|b 5|f 6|c

D. 1|b 2|a 3|b 4|a 5|c 6|a 7|b 8|c 9|b 10|a 11|a 12|d 13|c 14|a 15|b 16|d 17|b 18|b 19| c

E. 1| Testosterone, Estrogen 2| Adolescence 3| Estrogen 4| Adrenalin 5| Moustaches and beard 6| Reproduction 7| 23 pairs 8| Blood stream 9| Thyroxine 10| 28 Days 11| Capability of reproduction 12| Thyroid gland 13| Larynx 14| Attached to the brain 16| X and Y chromosome

J. Down - 1|Adrenalin 2| Hormones 3| Testosterone Across - 4| Estrogen 5| Ovulation 6| Adolescence

Chapter-11
Force and Pressure

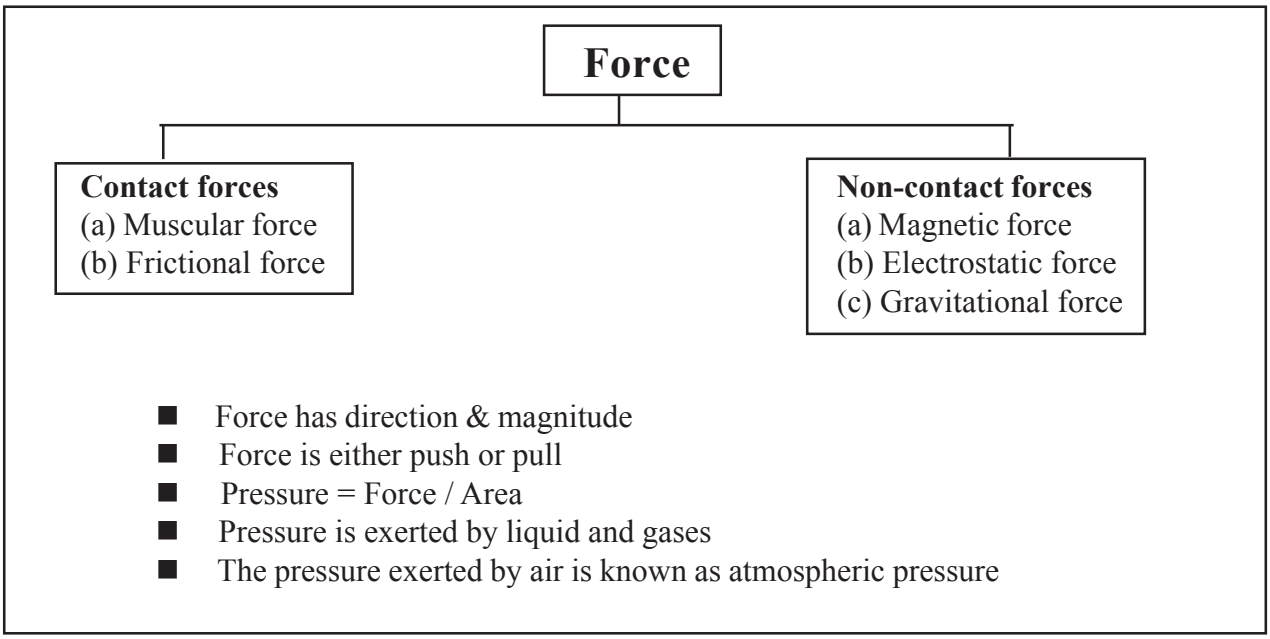
What happens when we push or pull anything? How can we change the speed, direction of a moving object? How can we change the shape of an object? This chapter is an attempt to address these issues. The idea of force-push or pull; change in speed, direction of moving objects and shape of objects by applying force; contact and non-contact forces etc are the key concepts of a student is expected to know from this chapter. This chapter consist of 10 sections covering basic characteristics of force and pressure, how living organisms use these concepts and how these concepts are being utilized by human beings to their benefits. In this chapter, we will also learn about various types of forces and their effects, pressure exerted by solids, liquids and gases including atmospheric pressure.
After going through this chapter, students will be able to -

1. Explain processes and phenomenon relating to force and pressure.
2. Relates processes and phenomenon with causes.
3. Conducts simple investigations to seek answers to queries.
4. Differentiate / classifies materials based on properties / characteristics.
5. Draws flowcharts and diagram, e.g., experimental set ups.
6. Constructs models using materials from surrounding and explain their working.

The processes / activities that can be used in understanding the key concepts of this chapter are observing and analysing the relation between force and motion in a variety of daily-life situations, demonstrating change in speed of a moving object, its direction of motion and shape by applying force, measuring the weight of an object, as a force (pull) by the earth using a spring balance etc.

As you all know from the textbook that force may impart motion to an object. A push or pull acting on a body is called force and the direction in which a body is pushed or pulled is called direction of force. Actions like pushing, pulling, hitting, lifting, kicking are kind of activities in our daily life we usually apply the forces. Then the force acting on a unit area of a surface is called pressure. So, Pressure = Force/(Area on which it acts) . That is why porters place a round piece of cloth on their heads, when they have to carry heavy loads. By doing this they increase the area of contact of the load with their head. So, the pressure on their head is reduced and they find it easier to carry the load.

Now, let us see the concept of Force and Pressure in a simplified manner in the next page



Let us practice some questions from this chapter -

A. FILL IN THE BLANKS

1. An example of a non-contact force is _____. (Magnetic Force/ Muscular force)
2. The pressure exerted by air around us is known as _____. (Atmospheric pressure/ weight of the air)
3. CGS unit of force is _____. (Newton / Dyne).
4. Force can change the _____ of an object. (shape / density)
5. Force exerted by our muscles is called _____force.(Muscular force / Magnetic force)
6. Direction of frictional force is always _____the direction of motion. (opposite to / along)
7. Droper and rubber sucker work on the principle of _____ pressure (Atmospheric/muscular)
8. As we go high on the mountain, the atmospheric pressure _____(Increase / Decrease)
9. The effect on a object is due to the …… force acting on it. (net / single)
10. If the force applied on an object is in the direction of its motion, the speed of the object _____(increases / decreases)
11. The pressure of a liquid column _____ with the depth of the column. (Increases /decreases)

B. TRUE AND FALSE

1. The SI unit of force is dyne.
2. Force has both magnitude and direction.
3. Pressure is directly proportional to area.

4. A man always exerts same pressure whether he is standing or lying on the ground.
5. School bags are provided with broad straps to reduce the pressure.
6. A blunt knife produces more pressure than a sharp knife.
7. Frictional force does not change the speed of a moving object.
8. Only the earth exerts gravitational force.
9. SI unit of pressure is N/m.
10. Pressure exerted by a liquid increases with depth.
11. Liquid exert equal pressure at the same depth.

C. MATCH THE COLUMN

Column A	Column B
1. Pressure	(a)Muscular force
2. Force	(b) Force on unit area
3. Opposite poles	(c) Push or pull
4. Contact Force	(d) Attract each other
5. Electrostatic Force	(e) Non-contact force

The above picture shows a car sticking to an electromagnet. Name the forces acting on the car? Which one of them is larger ? (NCERT Exemplar)

D. MULTIPLE CHOICE QUESTIONS

1. When two forces acts in same direction the net force will be the
   (a) Sum of the forces. (b) Product of the forces.
   (c) Difference of the forces. (d) None of the above.

2. Which of the following is not an affect of force?
   (a) Change of shape. (b) Change of speed. (c) Change of direction. (d) Change of mass.
3. Electrostatic force is an example of
   (a) Contact force. (b) Non contact force. (c) Both a and b. (d) None of the above.
4. Strength of force is expressed by
   (a) Weight. (b) Mass. (c) Magnitude. (d) Direction.
5. Gravitational force is
   a) Attractive b) Repulsive c) Both a and b d) None of the above.
6. An apple falls on the earth surface due to the force of
   (a) Electrostatic force (b) Muscular force (c) Magnetic force (d) Gravitational force.
7. At high altitudes atmospheric pressure
   (a) Increases (b) Decreases (c) Remains same (d) None of the above.
8. A ball rolling on the ground slows down and finally stops, this is because of

(a) Gravitational force (b) Frictional force. (c) Both a and b. (d) None of the above.

9. In a tug of war, when two teams pulling rope and it does not move in any side, this is because of
   a) Equal force is being applied in the same direction.
   b) Equal force is being applied in the opposite direction.
   c) No force is applied. (d) Cannot be explained.
10. A liquid exerts pressure
   (a) In all directions. (b) Only downwards. (c) Only upwards. (d) None of the above.

Workbook

E. VERY SHORT ANSWER TYPE QUESTIONS (1 MARK)

1. What is the value of force of gravity of the air column in area 15 cm × 15 cm above our head?
2. What is the least number of objects that has to interact for a force come into play?
3. Name the force due to which all objects fall to earth. [Ans: Gravitational force.]
4. While sieving grains, small pieces fall down. Which force pulls them down?
5. What is the name of the instrument used to measure atmospheric pressure?
6. How can we change the speed and the direction of a moving body?
7. Which force makes a charged comb attract small piece of paper?
8. What is the distance moved by an object in unit time called?
9. Does a force can change the direction of a moving object?
10. Name the force which acts between two charged particles.
11. What happens when two forces act in opposite direction?
12. Which type of force is used by a boy to kick a football?
13. Which force makes an iron to be attracted by a magnet?
14. What happens when two forces act in same direction?
15. Name the factors on which the pressure depends.
16. Can an object change its state of motion by itself?
17. Does a force can change the shape of an object?
18. Does a force can change the speed of an object?
19. What is the direction of force of friction?
20. How the strength of force is expressed?
21. Does gravitational force exist in space?
22. Does liquid and gases exert pressure?
23. Write down the SI unit of force?
24. How pressure is related to area?
25. Does force has a direction?
26. What is rigid body?
27. What is force?

FROM
NCERT EXEMPLAR

The above image shows a man with a parachute. Name the force which is responsible for his downward motion. Will he come down with the same speed without the parachute?

.....

F. SHORT ANSWER QUESTIONS (2 MARKS)

1. Why the tires of trucks and tractors are much wider than ordinary cars?
2. Give an example of a push and a pull.
3. What do you mean by State of motion?
4. Name the different types of forces.
5. Define contact force.
6. Define non contact force.
7. What is muscular force?
8. What is force of friction?
9. What is gravitational force?
10. Why force of friction is considered as a contact force?
11. What is electrostatic force?
12. What is magnetic force?
13. Why magnetic force is considered as a non-contact force?
14. What do you mean by force of gravity?
15. Define pressure.
16. Why gravitational force is considered as a non-contact force?
17. Why electrostatic force is considered as a non-contact force?
18. Why porters place a round piece of cloth on their heads?
19. Why a nail has a pointed end?
20. Why school bags or shoulder bags are provided with broad straps?
21. Why the cutting and piercing tools have sharp edges?
22. What is atmosphere?
23. What is atmospheric pressure?
24. Two thermocol balls held close to each other move away from each other. When they are released, name the force which might be responsible for this phenomenon. Explain. [Hint: Electrostatic force is responsible for this phenomenon. The two balls have similar charges that is why they move away due to repulsion between them.]
25. How an applied force does changes the speed of an object?
    [Hint: If the applied force is in the direction of motion, the speed of the object increases. But if the force applied in the direction opposite to the motion, then it decreases the speed of the object.]
26. What is the similarity between electrostatic and magnetic forces?
    [Hint: Both are non-contact forces, both are attractive as well as repulsive forces.]
27. Calculate the pressure produced by a force of 80 N acting on an area of 2.0 m^2.

Think
A sharp axe cuts the long earlier than a blunt axe. Explain why? (NCERT Exemplar)

28. If the area of head is 15 cm^2, how much air (in weight) would you carry on your head?
29. A force of 200 Newton is applied on an area of 20 metre square .What will be the pressure exerted by this force on that area?

G. LONG ANSWER TYPE QUESTIONS (3 MARKS)

1. How a rubber sucker sticks to a surface?
2. Why it is easier to walk on soft sand if we have flat shoes rather than shoes with sharp heels (or pencil heels)? [Hint: A flat shoe has a greater area in contact with the soft sand and exerts less pressure on the soft ground. Due to this the 'flat' shoes do not sink much in soft sand and it is easy to walk on it. On the other hand, a sharp heel has a small area in contact with the soft sand and exerts a greater pressure on the sand. Due to this, the sharp heels sink deep into soft sand making it difficult for the wearer to walk on it.]
3. Why we do not crush under the large atmospheric pressure?
4. How the atmospheric pressure changes with height?
5. Why nose bleeding occur at high altitudes?
6. Why astronauts wear a specially designed suit?
7. Why sea divers wear a specially designed suit?
8. How will you show that liquid exerts pressure on the walls of the container?
9. How will you show that gases exert pressure on the walls of the container?
10. Give an experiment to show that liquid exert equal pressure at the same depth.
11. Why a balloon gets inflated when air is filled in it?
12. An elephant weighs 20,000 N stands on one foot in the area of 1000 cm^2. How much pressure would it exert on the ground?
13. A stone weighs 500 N. Calculate the pressure exerted by it if it makes a contact with a surface of area 25 cm^2.

[Answer:
Given : Weight of a stone F = 500 N
Area, A = 25 cm^2 = 25 x 10^{-4} m^2
To find : Pressure P = ?

$$\text{Pressure } P = \frac{F}{A}$$

$$\therefore = \frac{\overset{20}{\cancel{500}}}{\underset{1}{\cancel{25} \times 10^{-4}}}$$

Solution:
Pressure P = 20 x 10^4 N/m^2 (or) 20 x 10^4 Pa]

14. A force of 1600 N acts on the surface of area 10cm^2 normally. What would be the pressure on the surface?

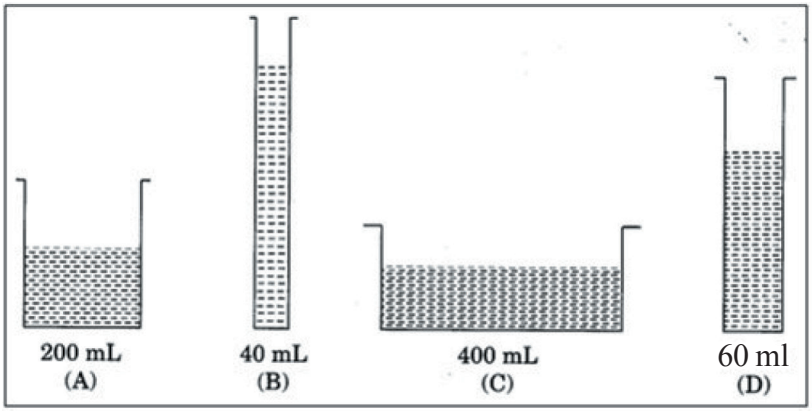
H. ESSAY TYPE QUESTIONS (5 MARKS)

1. Define the different types of forces?
2. Two women are of the same weight. One wears sandals with pointed heels while the other wears sandals with flat soles. Which one would feel more comfortable while walking on a sandy beach? Give reasons for your answer.
3. It is much easier to burst an inflated balloon with a needle than by a finger. Explain.

I. HOTS QUESTIONS

1. An archer shoots an arrow in the air horizontally. However, after moving some distance, the arrow falls to the ground. Name the initial force that sets the arrow in motion. Explain why the arrow ultimately falls down. (NCERT EXEMPLAR) [Hint:The initial force is muscular force which sets the arrow in motion. The force of gravity that acts on the arrow in the downward direction brings it to the ground.
2. Two rods: A and B, having same weight and equal length have different thickness. Rod A is thinner while Rod B is thicker. They are held vertically on the surface of sand. Which one of them will sink more? Why? (NCERT EXEMPLAR)
   [Hint: Rod A will go deeper as it has a smaller area of contact; therefore the same force produces more pressure. In case of rod B the same force produces less pressure.]
3. It is difficult to cut cloth using a pair of scissors with blunt blades. Explain.
   [Hint: Blunt blades have larger area compared to the sharp-edged blades. Thus, the applied force produces a lower pressure in case of blunt blades, which makes it difficult to cut the cloth.] (NCERT EXEMPLAR)
4. Why is it not advisable to take a fountain pen while travelling in an aeroplane?
   [Hint: Fountain pens are built in such a way that the pressure inside them balances the atmospheric pressure at sea level. Since atmospheric pressure decreases with an increase in height above sea level, the pressure inside the pen turns out to be much greater than the air pressure in an aeroplane and the pen starts leaking]
5. During dry weather, clothes made of synthetic fibre often stick to the skin. Which type of force is responsible for this phenomenon? (NCERT EXEMPLAR)

6. Observe the figures given below carefully.



Volume of water in each vessel is shown above. Arrange them in order of decreasing pressure at the base of each vessel. Explain the reason. [Hint: Pressure of a liquid column depends upon the height of the liquid column and not on volume of the liquid. Decreasing order of pressure at the base of each vessel is B>D>A>C.]

7. A girl is pushing a box towards east direction. In which direction should her friend push the box so that it moves faster in the same direction? (NCERT EXEMPLAR)
8. Does the force of gravitation exist between two astronauts in space? [Hint: Yes] (NCERT EXEMPLAR)
9. A book is placed on a chair. now the book is pushed slightly than it is again pushed hardly. what changes we can find ?
10. Two boys are pulling each other and other two boys are pushing each other. from that two example what we can say about the action of force.

ANSWERS

A. 1| Magnetic force 2| Atmospheric Pressure 3| Dyne 4| Shape 5| Muscular Force 6| Opposite to 7|Atmospheric 8| Decreases 9| Net 10| Increases 11| Increases

B. 1| False 2| True 3| False 4| False 5| True 6| False 7| False 8| False 9| False 10| True 11| True

C. 1|b 2|c 3|d 4|a 5|e

D. 1| a 2| d. 3| b. 4| c 5| a 6| d. 7| b 8| b. 9| b 10| a

E. 1| 2250 N 2| Two 4| Gravitational Force 5| Barometer 7| Electrostatic attraction force 8| Speed 9| Yes 15| Electrostatic force 16| No 17| Yes 18| Yes 19| Opposite 20| By its magnitude 21| Yes 22| Yes 23| Newton 25| Yes

Chapter - 12
Friction

What makes a ball rolling on the ground slow down? Why powder is sprinkled on the carom board? Why aeroplane and bird have similar shape? All these issues will be dealt in this chapter. Factors affecting friction, sliding and rolling friction, moving; advantages and disadvantages of friction for the movement of automobiles, airplanes and boats / ships; increasing and reducing friction are the key concepts a student is expected to know from this chapter. This chapter consist of 6 (six) sections ranging from force of friction, factors affecting friction, friction: a necessary evil, increasing and reducing friction, use of wheels to reduce friction to fluid friction.

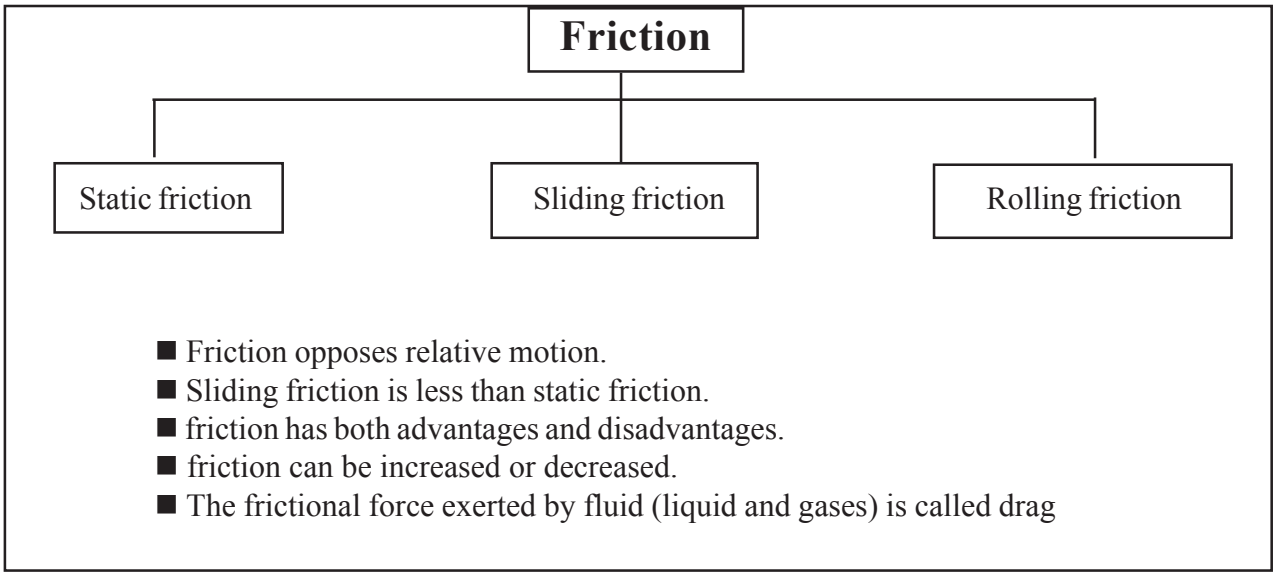
After going through this chapter, students will be able to

1. Explain processes and phenomena, e.g., factors affecting friction
2. Conduct simple investigations to seek answers to queries.
3. Relates processes and phenomenon with causes, e.g., similarity of shape of an aeroplane and birds.
4. Constructs models using materials from surrounding and explain their working.
5. Applies learning of scientific concepts in day to day life.
6. Exhibits values of objectivity, honesty and cooperation.
7. Differentiates / classifies materials on the basis of their properties, structure and functions, e.g., materials designed to increase and reducing friction.
8. Exhibits creativity in designing, planning, and making use of available resources etc.

Activities and processes that can be used to achieve these learning outcomes are demonstrating friction between rough / smooth surfaces of moving objects in contact, wear and tear of moving objects by rubbing (eraser on paper, card board, sand paper), activities on static, sliding and rolling friction, studying ball bearings, discussion on other methods of reducing friction and ways of increasing friction.

As we all know from the textbook that the force which opposes the relative motion between two surfaces in contact is called friction and it depends on the nature of surfaces in contact and how hard the two surfaces press together. We also know that static friction comes into play when we try to move an object at rest and sliding friction comes into play when an object is sliding over another. We also know about friction can be increased and decreased, when one body rolls over another body, rolling friction comes into play etc.

Before moving to the next segment, let us see some points of the topic 'friction'.



Now, let us practice some questions from this topic -

A. FILL IN THE BLANKS

1. Frictional force is an example of _____(contact force / non contact force)
2. Friction between two surface_____ be made zero. (can / cannot)
3. SI unit of friction force is _____(Newton / dyne)
4. Direction of force of friction is always _____to the direction of motion. (along/ opposite)
5. Lubricants are used to _____friction between two surfaces. (increase / reduce)
6. Sliding friction is _____ than the static friction. (greater / less)
7. A sprinkling of powder on the Carrom board _____ friction(increases / reduces)
8. Friction opposes the relative _____between the surfaces in contact with each other.(motion/ position)
9. Cars and speedboats are _____ to reduce drag. (Streamlined / reduced)
10. We apply oil on the hinge of door to _____friction (increase / reduce).

B. TRUE AND FALSE

1. Friction produces heat.
2. Friction is a necessary evil.
3. Friction can be reduced to zero.
4. Gases are only called fluids.
5. Soapy floor is slippery due to less friction.
6. Rolling friction is smaller than the sliding friction.

NOTE

There is friction in liquids between layers of a liquid. This is called viscosity. The more viscous a liquid is the more thicker the liquid will be. E.g - Honey is more viscous than water.

7. Friction depends on the nature of the surface in contact.
8. The sole of the shoes and tyres are treaded to reduce friction.
9. Irregularities between two surface interlocks to produce friction.
10. Friction enables vehicles to move on the ground.

C. MATCH THE COLUMN

Column A	Column B
a. Fluid friction	i. Two surfaces in contact
b. Wheels	ii. Measuring friction
c. Lubricants	iii. Drag
d. Polished surface	iv. Reduce friction
e. friction acts	v. Rolling friction

D. MULTIPLE CHOICE QUESTIONS

1. A ball rolling on the ground slows down and finally stops because of
   (a) Smoothness (b) Less force applied (c) Friction (d) None of the above
2. Which of the following is an example of a non-contact force?
   (a) The force exerted by us to lift a bucket (b) push a stationary car
   (c) The force exerted by magnets (d) Force due to friction
3. The co-efficient of friction between the two surfaces depends on
   (a) Nature of the surface in contact (b) Mass of the two bodies in contact
   (c) Applied force (d) Normal contact force between the surface
4. Which one of the following forces is a contact force?
   (a) force of gravity (b) magnetic force
   (c) force of friction (d) electrostatic force
5. Force of friction depends on
   (a) Smoothness of the surface (b) Roughness of the surface
   (c) Inclination of the surface (d) All of the above
6. An irregular surface will have
   (a) Zero Friction (b) Lesser friction
   (c) Greater friction (d) Lubrication
7. Which of the following material is likely to have least friction?
   (a) Wood (b) Plastic (c) Glass (d) Paper
8. Which of the following is used to reduce friction in a rotating machine?

(a) Wheels (b) Rollers

(c) Ball bearing (d) Polishing

9. In which of the following cases more friction is desirable?

(a) Movement of piston in a cylinder (b) Braking of a vehicle

(c) Running on a track (d) All of these

10. Which of the following statement is CORRECT?

(a) Rolling a body is easier than sliding (b) Sliding a body is easier than rolling

(c) Dragging a body is easier than sliding (d) Dragging a body is easier than rolling

E. VERY SHORT ANSWER TYPE QUESTIONS (1 MARK)

1. How lubricant help in reducing friction?
2. Why it is difficult to move on a wet marble surface?
3. Why our hands become warmer when we run them?
4. Why do we shape airplanes like that of a bird?
5. Does friction depends on the smoothness of the surface?
6. Can you be able to write on paper with a pen or pencil if there is no friction at all?
7. What is drag?
8. Can friction produce heat?
9. What do you mean by fluids?
10. Where does the frictional force act?
11. What do you mean by static friction?
12. What do you mean by sliding friction?
13. Could it be possible to tie a knot without friction?
14. Why do you slip when you step on a banana peel?
15. Why a vehicle slows down when brakes are applied?
16. Why it is difficult to walk on a wet smooth surface?
17. How friction between two surfaces can be reduced?
18. Can you be able to walk at all if there were no friction?
19. Could it be possible to make a building without friction?
20. How it is possible to write on white blackboard with chalk?
21. Is it easier to hold a kulhar (earthen pot) or a glass tumbler?
22. Could it be possible to fix a nail on the wall without friction?
23. How force of friction between two surfaces can be increased?
24. Name a device which can measure the force acting on an object.
25. Would it be possible to hold the glass at all if there is no friction?

In the figure, a boy is shown pushing the box from right to left. The force of friction will act on the box - from right to left, from left to right, vertically downward, vertically upward. (NCERT EXEMPLAR)

26. Do fluids exert force of friction on objects in motion through them?
27. Is it easier to move a box which is already in motion than to get it started?
28. What happened if there is no friction between the tyres of the automobiles and the road?

F. SHORT ANSWER TYPE QUESTIONS (2 MARKS)

1. What are lubricants?
2. How brake pads work?
3. Why the soles of shoes worn out?
4. Why the sole of shoes are grooved?
5. Why a few drops of oil are poured on the hinges of a door?
6. Why gymnasts apply some coarse substance on their hands?
7. Why tyres of vehicles are treaded? (Hint: To increase friction.)
8. The handle of a cricket bat or a badminton racquet is usually rough. Explain the reason?
9. Why Kabaddi players rub their hands with soil? (Hint: To increase friction.)
10. Why do we sprinkle some fine powder on the Carrom board? [To reduce friction.]
11. A pencil will write on paper but not on glass. Why?
12. What is used as a lubricant when it is not be advisable to use oil?
    [Hint: An air cushion between the moving parts is used to reduce friction.
13. Can we reduce friction to zero by polishing surfaces or using large amount of lubricants? [Hint: Friction can never be entirely eliminated. No surface is perfectly smooth. Some irregularities are always there.]
14. On what factors the frictional force on an object in a fluid depends? [Hint: The frictional force on an object in a fluid depends on its speed with respect to the fluid. The frictional force also depends on the shape of the object and the nature of the fluid.]
15. Will force of friction come into play when a rain drop rolls down a glass window pane? (NCERT EXEMPLAR)
16. Two blocks of iron of different masses are kept on a cemented floor as shown in the right side figure. Which one of them would require a larger force to move it from the rest position?

17. Imagine that an object is falling through a long straight glass tube held vertical. Air has been removed completely from the tube. The object does not touch the walls of the tube. Will the object experience any force of friction? Comment.

G. LONG ANSWER TYPE QUESTIONS (3 MARKS)

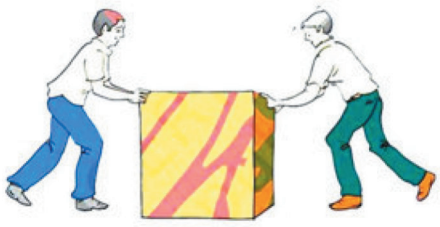
1. How force of friction occurs?
2. Why birds and fishes have special shapes?
3. Why sliding is replaced in most machines by rolling?
4. Why attaches and other pieces of luggage fitted with rollers?
5. Why sliding friction is slightly smaller than the static friction?
6. Why a motor mechanic uses oil, grease or graphite between the moving parts of machines?

H. ESSAY TYPE QUESTIONS (5 MARKS)

1. "Friction is a necessary evil"- explain.
2. Write down the advantages of frictional force?
3. Write down the disadvantages of frictional force?
4. Write down three ways of minimizing friction.
   [Hint: (1) By using lubricants: These are applied to surfaces to reduce the friction between the surfaces. Example Oil, wax, grease and castor oil. (2) With the help of polishing the surface: We sprinkle fine powder on the Carrom board and then we polish its surface to make smooth so that the striker slides easily on the surface. (3) By using ball bearing We use lead shots in bearing of a cycle hub because rolling friction is smaller than sliding friction]
5. Describe an experiment to prove that friction depends on the nature of a surface.

I. HOTS QUESTIONS (NCERT EXEMPLAR)

1. The image in the right side shows two boys applying force on a box. If the magnitude of the force applied by each is equal, will the box experience any force of friction? Explain.



2. While playing tug of war, Preeti felt that the rope was slipping through her hands. Suggest a way out for her to prevent this.
3. Cartilage is present in the joints of our body, which helps in their smooth movement. With advancing age, this cartilage wears off. How would this affect the movement of joints?

4. A father and son pushed their car to bring it to the side of road as it had stalled in the middle of the road. They experienced that although they had to push with all their might initially to move

the car, the push required to keep the car rolling was smaller, once the car started rolling. Explain.

5. A marble is allowed to roll down an inclined plane from a fixed height. At the foot of the inclined plane, it moves on a horizontal surface (a) covered with silk cloth (b) covered with a layer of sand and (c) covered with a glass sheet. On which surface will the marble move the shortest distance. Give reasons for your answer.
6. When the cutting edge of a knife is put against a fast rotating stone to sharpen it, sparks are seen to fly. Explain the reason.
7. We have two identical metal sheets. One of them is rubbed with sand paper and the other with ordinary paper. The one rubbed with sand paper shines more than the other. Give reasons.
8. While travelling on a rickshaw, you might have experienced that if the seat cover is very smooth, you tend to slip when brakes are applied suddenly. Explain.
9. Is there a force of friction between the wheels of a moving train and iron rails? If yes, name the type of friction. If an air cushion can be introduced between the wheel and the rail, what effect will it have on the friction?
10. Two boys are riding their bicycles on the same concrete road. One has new tyres on his bicycle while the other has tyres that are old and used. Which of them is more likely to skid while moving through a patch of the road which has lubricating oil spilled over it?
11. take some pencils. now putting a copy on them if we push it what we can find?

ANSWERS

A. 1| Contact Force 2| Cannot 3| Newton 4| Opposite 5| Reduce
6| Lesser 7| Reduces 8| Motion 9|Streamlined 10| Reduce

B. 1| True 2| True 3|True 4| False 5| True 6| True
7| False 8| False 9| False 10| True

C. a| iii b| v c| iv d| iv e| i

D. 1| c 2| c 3|a 4|c 5|b 6| c 7| c 8|a 9|d 10| a

E. 5| Yes 6| No 8| Yes 13| No 18| No 19| No 21| Yes 22| No 24| Tribometer
25| No 26| Yes 27| Yes

Class - 13
Sound

How do you communicate through sound? How is sound produced? Which type of characteristics make diffrence between diffrent types of sound? This chapter is an attempt to address these issues. Various types of sound; vibration as a cause of sound, frequency, medium of propagation of sound, idea of noise as unpleasant and unwanted sound and need to minimise noise are the key concepts, a student is expected to know from this chapter. This chapter is consist of 8 (eight) sections ranging from how sound is produced, sound produced by humans, the need of medium for propagation of sound, how do we hear sound through our ears, amplitude, time period and frequency of a vibration, audible and inaudible sound, difference between sound and noise to the effect of noise pollution.

After going through this chapter, students will be able to -

1. Explain processes and phenomena, e.g., production and propagation of sound.
2. Conducts simple investigations to seek answers to queries.
3. Relates processes and phenomenon with causes.
4. Constructs models using materials from surrounding and explain their working.
5. Applies learning of scientific concepts in day to day life.
6. Exhibits values of objectivity, honesty, cooperation.

The processes / activities that can be used to understand key concepts are demonstrating and distinguishing different types of sounds (loud and feeble, pleasant / musical and unpleasant /noise, audible and inaudible sound) producing different types of sounds using the same source, demonstrating that vibration is the cause of sound, identifying various sources of noise (unpleasant and unwanted sound) in the locality and thinking of measures to minimise noise and its hazards (noise pollution).

As you all are aware that sound is produced by the vibration of materials. In humans, the sound is produced by vocal cords and it travels through a medium (gas, liquid or solid). It cannot travel in vacuum. Our eardrum senses the vibration of sound. It sends the signals to the brain. Brain differentiates sound based on amplitude and frequency of sound. Larger the amplitude of vibration, louder is the sound and higher the frequency of vibration, the higher is the pitch and shriller is the sound.

Now, let us see the various terms of sound in a simplified manner for easy reference.

Sound

- Sound is produced by vibrating objects.
- In humans sound is produced by the voice box or larynx.
- Sound propagates through various medium like solid, liquid and gas.
- musical rounds is pleasing to the ear.
- unpleasant sounds are called noise.
- Frequency of inaudible sound < 20 HZ
- Frequency of audible sound is - greater than 20 HZ and less than 20000 HZ.
- Two main properties of sopund are frequency and amplitude.
- As the amplitude of sound wave increases, the intensity of sound also increases.

A. FILL IN THE BLANKS

1. Sound _____ a medium to travel. (needs / doesn't need)
2. The loudness of normal breathing of human is _____ dB (20 / 10)
3. Hertz is the unit of _____. (amplitude/ frequency)
4. Unwanted sound is called _____ .(music / noise)
5. Shrillness of a sound is determined by the _____of vibration. (amplitude/ frequency)
6. The to and fro or back and forth motion of an object is called_____ (vibration/ sound)
7. In sitar the vibrating part is its _____ (string/ membrane)
8. In humans, the sound is produced by the_____(larynx/wind pipe)
9. The frequency determines the _____of a sound.(pitch/amplitude)
10. Loudness of sound is proportional to the _____of the amplitude. (Square/cube)

B. TRUE AND FALSE

1. Sound is a form of energy.
2. Sound can travel in vacuum.
3. Loudness depends on frequency.
4. Man cannot hear the sound of bats.
5. The frequency is measured in hertz.
6. Larger is the amplitude, feeble is the sound.

We should plant trees along roadside. Comment why ???

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7. Regular vibrations produce musical sounds.
8. Female voice is shriller than the male voice.
9. Sound waves travel faster in air than in water.
10. Sound helps us to communicate with one another.
11. Sound can only be produced by vibrating bodies.
12. Plantation along roadside can reduce noise pollution.
13. Waveforms of two different stringed instruments can be the same.
14. A ticking clock sound is heard late when heard through a metal.
15. In human beings, the vibration of vocal cords produces sound.

Workbook

C. MATCH THE COLUMN

	Column A		Column B
a)	Vibrations cause	i.	Time period
b)	A high pitch sound	ii.	<20Hz
c)	dB is the unit of	iii.	sound
d)	Second is the unit of	iv.	Shrill
e)	Inaudible sounds have frequency	v.	Loudness

What do you feel when you touch a sound producing body?

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D. MULTIPLE CHOICE QUESTIONS

1. The vibrating part in a Veena is
   (a) Stretched string (b) Stretched membrane (c) Air column (d) None of these
2. A list of mediums is given below.
   (i) Iron (ii) Lemon juice (iii) air (iv) Vacuum
   In which of these mediums can sound travel?
   (a) i & ii only (b) i, ii & iii only (c) iii & iv only (d) ii, iii & iv only
3. Large amplitude of sound vibrations will produce
   (a) Weak sound (b) Loud Sound (c) Slow sound (d) Shrill sound
4. A simple pendulum makes 10 oscillations in 20 seconds. A list of statement are generated with the help of these information'
   (i) Time period of oscillations is 2 sec
   (ii) Frequency of oscillation is 1 Hz
   Which of the following is correct?
   (a) (i) only
   (b) (ii) only

Relationship between Time Period and Frequency is f = 1/T . What does this equation signify ???

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(c) (i) and (ii) both
(d) Both are incorrect

5. Pitch of the sound does not depend on
(a) Frequency of the sound (b) Time period of the sound
(c) Upon the amount of energy received by the ear (d) All the above

6. Which of the following is correct?
(a) Sound can travel in space (b) Larynx is also known as voice box
(c) Human can hear sound of every frequency (d) None of these

7. In order to reduce the loudness of a sound we have to
(a) Decrease its frequency of vibration of the sound.
(b) Increase its frequency of vibration of the sound.
(c) Decrease its amplitude of vibration of the sound.
(d) Increase its amplitude of vibration of the sound.

8. Sound propagates maximum in
(a) Gas (b) Liquid (c) Solid (d) All

9. Voice of which of the following is likely to have minimum frequency
(a) Baby boy (b) Baby girl (c) A man (d) A women

10. The ultrasound equipments works at frequencies
(a) > 20 kHz (b) < 20kHz (c) < 20Hz (d) None of this.

E. VERY SHORT ANSWER TYPE QUESTIONS (1 MARK)

1. What are infrasonic sounds?
[Hints: Sounds which have frequency lower than 20 Hz are called infrasonic sounds.]
2. Define Sound.
3. What is frequency?
4. Define amplitude.
5. What is eardrum?
6. What is noise pollution?
7. Write the unit of loudness?
8. What are ultrasonic sounds?
9. Write the function of eardrum?
10. What is called time period?
11. What is the unit of amplitude?
12. Can we hear sound on moon?
13. Can sound travel through water?

Boojho saw a cracker burst at night at a distance from his house. He heard the sound of the cracker a little later after seeing the cracker burst. Give reason for the delay in hearing the sound
.....
.....

14. What is the SI unit of frequency?
15. Can sound travel through a vacuum?
16. Is a sound need a medium to travel?
17. What do you mean by audible sound?
18. What determines the shrillness of sound?
19. What do you mean by inaudible sound?
20. Which part of the ear receives sound waves?
21. Write the two important properties of sound?
22. Name an animal which can hear ultrasounds.
23. What is the frequency range of audible sound?
24. What do you mean by noise? Give one example?
25. How a musical sound can be converted into noise?
26. What may happen if the eardrum is absent from our ear?
27. What do you mean by musical sound? Give one example?
28. What is the normal length of vocal cord in men and women?
29. Which characteristic of a vibrating body determines the loudness of the sound?
30. Which characteristic of a vibrating body determines the pitch of the sound?
31. Above which value of loudness a noisy sound physically painful?
32. What do you mean by oscillatory motion?
    [Hints: The to and fro motion of an object is called vibration. This motion in both the direction from its mean position is called oscillatory motion.]
33. Two astronauts are floating close to each other in space. Can they talk to each other without using any special device? Give reasons. [Hints: No, because in space there is no atmosphere and sound needs medium to travel.]
34. What do you mean by time period?
    [Hints: The time taken by a vibrating body to complete one oscillation is called the time period.]

In toy telephone, the sound travels through which medium?
.....
.....

Workbook

Does any part of our body vibrate when we speak? Name the part???
.....

F. SHORT ANSWER QUESTION (2 MARKS)

1. How is sound produced in Sitar?
2. How is pitch related to frequency?
3. How sound is produced in "jaltarang"?
4. Why sound can't travel through vacuum?
5. Why the voices of men differ from women?
6. What frequency can dogs hear but not humans?
7. How does sound of a bird differ from roar of a lion?

Ultrasound has frequency of vibration:
(a) Between 20 and 20,000 Hz
(b) Below 20 Hz
(c) Above 20,000 Hz
(d) Between 500 and 10,000 Hz
.....
.....

8. How does loudness depend on the amplitude of vibrations?
9. Which produces sound of a higher pitch: a drum or a whistle? Why?
10. A vibrating body completes 1000 oscillations in 5 seconds. Find the frequency of the sound.
11. The frequency of a given sound is 2 kHz. How many vibrations it is completing in one second?
12. Amplitude of a sound is increased by 4 times, how much the loudness will be increase?
13. How a child with impaired hearing can be able to communicate with others?
14. How can the noise pollution be controlled in a residential area?
15. Why a child with hearing loss may have defective speech?
16. Differentiate infrasonic and ultrasonic sounds.
17. What sources in the home may lead to noise?
18. What are the harms of noise pollution?
19. Write three sources of noise pollution?
20. How can we control noise?

1 hertz is equal to:
(a) 1 vibration per minute
(b) 10 vibrations per minute
(c) 60 vibrations per minute
(d) 600 vibrations per minute

.....
.....

G. LONG ANSWER TYPE QUESTIONS (3 MARKS)

1. How human ear works?
2. What are vocal cords? What is their function?
3. Differentiate between musical sound and noise.
4. Define vibrations with examples.
5. How the muscles attached to vocal cords regulate sound?
6. Why are the voices of men, women and children different?
7. Explain the reason of not putting the sharp or pointed things into the ear.
8. What is the property of vibration which determines the pitch of the sound?
9. On a stormy day Why Lightning is seen first than thunder is heard later?
10. A string musical instrument was first plucked with a force of smaller magnitude and then with a force of greater magnitude. In which case would the instrument produce a louder sound? [Hint: The loudness of sound depends upon the amplitude of vibration. The amplitude of string is larger when it is plucked with greater force and hence the sound will be louder in that case.]
11. A string of Veena is struck and it produces a sound of frequency 50 Hz. Find how may oscillations it completes in 1 minute?
12. A simple pendulum makes 20 oscillations in 40 seconds. What is the time period and frequency of oscillations?
13. Lightning can be seen the moment it occurs. Paheli observes lightning in her area. She hears the sound 5 s after she observed lightning. How far is she from the place where lightning occurs? (Speed of sound = 330 m/s). (NCERT EXEMPLAR)

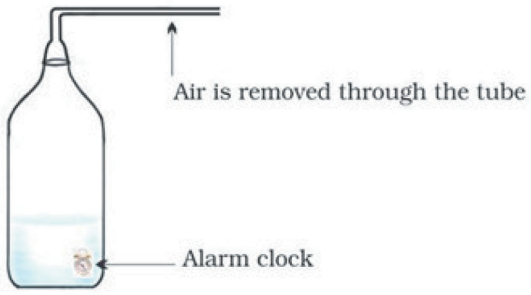
H. ESSAY TYPE QUESTIONS (5 MARKS)

1. Draw a diagram of larynx and explain how human produces sound.
2. Draw a diagram of human ear. Clearly points its different parts.
3. Give an experiment to show that sound can travel through liquids.
4. Name 10 (ten) musical instruments and write their vibrating parts.
5. What is the function of hair and wax in ear canal?
6. How is sound produced and how is it transmitted and heard by us? (NCERT EXEMPLAR)
7. How can you show that sound cannot travel through a vacuum?

Workbook

I. HOTS QUESTIONS

1. We have learnt that vibration is necessary for producing sound. Explain why the sound produced by every vibrating body cannot be heard by us?
2. The townhall building is situated close to Boojho's house. There is a clock on the top of the townhall building which rings the bell every hour. Boojho has noticed that the sound of the clock appears to be much clearer at night. Explain. (NCERT EXEMPLAR)
3. Touch a bell when it stops producing sound? Can you feel the vibration? What do you understand by this?
4. Suppose a stick is struck against a frying pan in vacuum. Will the frying pan vibrate? Will we be able to hear the sound? Explain. (NCERT EXEMPLAR)
5. An alarm bell is kept inside a vessel as shown in the below. A person standing close to it can distinctly hear the sound of alarm. Now if the air inside the vessel is removed completely how will the loudness of alarm get affected for the same person? (NCERT EXEMPLAR)



6. Why do our steps not produce loud sound if we walk on a carpet floor?
7. Write the applications of the ultrasound.

ANSWERS

A. 1| Needs 2|10 3| Frequency 4| Noise 5|Frequency
6| Vibration 7| String 8| Larynx 9| Pitch 10| Square

B. 1| True 2| False 3| False 4| True 5| True 6| False 7| True 8| True 9| False
10| True 11| True 12| True 13| False 14| False 15| True

C. a| iii b| iv c| v d| i e| ii

D. 1| a 2| b 3| a 4|a 5|c 6| b 7| c 8| c 9| b 10| a

E. 7| Decibel(dB) 11| Metre 12| No 13| Yes 14| Hertz 15| No 16| Yes
18| Frequency 20| Pinna 23| 20Hz to 20 KHz. 29| Amplitude
30| Frequency 31| 80 dB

Chapter - 14
Chemical Effects of Electric Current

Workbook

Why do we get a shock when we touch an electric appliance with wet hands? What happens to a conducting solution when electric current flows through it? How can we coat an object with a layer of metal? These are the main questions, this chapter tries to address. The key concepts of this chapter include: water conducts electricity depending on presence/ absence of salt in it, chemical effects of current and basic idea of electroplating. This chapter consist of 3 (three) sections and mainly discusses about basic concept of electricity.

After going through this chapter, students will be able to -

1. Explain processes and phenomena, e.g., chemical effects of electrical current.
2. Conduct simple investigations to seek answers to queries.
3. Relates processes and phenomenon with causes.
4. Constructs models using materials from surrounding and explain their working.
5. Applies learning of scientific concepts in day to day life.
6. Differentiates / classifies materials on the basis of their properties, structure and functions, e.g., liquids as electrical conductors and insulators.
7. Exhibits creativity in designing, planning, and making use of available resources etc.

These learning outcomes can be achieved through these proposed activities like activity to study whether current flows through various liquid samples (tap water, salt solution, lemon juice, kerosene, distilled water if available), emission of gases from salt solution, deposition of Cu from copper sulphate solution, electric pen using KI and starch solution and simple experiment to show electroplating and other activities mentioned in the textbooks.

We all know that the flow of charges in a particular direction is called electricity. Some liquids are good conductors of electricity and some are poor conductors. The passage of an electric current through a conducting liquid causes chemical reactions. The resulting effects are called chemical effects of currents. One of the most common applications of the chemical effects of electric current is electroplating. Electroplating is the process of depositing a thin layer of desired metal over a metal object with the help of electric current. One of the most common example of electroplating is shiny handlebar of bicycle, so if these are accidently scratched, then the shiny coating comes off revealing very less shining beneath.

Now, let us see the main topics of this chapter in the next page.

Chemical effects of electric current

- Some liquids are good conductor of electricity and some liquids are poor conductor.
- Good conducting liquids - lemon juice, vinegar, tap water, soda.
- Poor conducting liquids- milk, honey, kerosine oil, distilled water.
- the liquids that conduct electricity are solution of acids, bases and salts.
- Depositing thin layer of desired metal over a metal is known as electroplating.

Let us practice some questions from this chapter.

A. FILL IN THE BLANKS

1. Most liquid that conduct electricity are solutions of _____, _____ and _____.
   [Ans: Acid, base and salt.]
2. The passage of electric current through a solution causes _____effects. (chemical / magnetic)
3. If you pass current through copper sulphate solution copper gets deposited on the plate connected to the _____ terminal of the battery.(positive / negative)
4. The process of depositing a layer of any desired metal on another material by means of electricity is called_____.(electroplating/ tinplating)
5. The object to be electroplated is taken as_____ (Anode / cathode)
6. One of the most common applications of chemical effect of electric current is _____.(Electroplating/ Galvanization)
7. Small amount of mineral salt present naturally in water makes it a _____of electricity. (conductor / insulator)
8. Electroplating of _____ is done on objects like water taps and cycle bell to give them a shiny appearance. (zinc / chromium)

B. TRUE / FALSE

1. Electroplating is possible on plastic.
2. The terminal connected with positive lead of batteries called cathode.
3. Rubber is very poor conductor of electricity.

4. The device which can be used to detect small current flowing in an electric circuit is LED.
5. The decomposition produced by passing current through conducting liquid is called electrolysis.
6. Sugar solution does not conduct electricity.
7. Pure water conducts electricity.
8. Sea water is a better conductor than the normal water.
9. The current carrying wire behaves like a magnetic field object.
10. Rainwater can conduct electricity.
11. Voltmeter is an instrument where electrolysis is performed.

C. MATCH THE COLUMN

Column A	Column B
1. Electroplating	(a) Light Emitting Diodes
2. Insulator	(b) Detect the current
3. Lemon juice	(c) Added to water to increase the conductivity
4. LED	(d) Prevents rusting
5. A tester	(e) Rubber

D. MULTIPLE CHOICE QUESTIONS

1. An electric current can produce
   (a) Heating effect only (b) Chemical effect only
   (c) Magnetic effect only (d) All of them
2. Bhojho's uncle has set up in electroplating factory near his village. He should dispose off the waste of the factory
   (a) In the nearby river (b) In the nearby pond (c) In the nearby corn field
   (d) According to the disposal guidelines of the local authority
3. When electric current is passed through a conducting solution, there is a change of colour of solution. This indicates
   (a) The chemical effect of electric current (b) The heating effect of electric current
   (c) The magnetic effect of electric current (d) Lightning effect of electric current
4. Which one of the following solution does not conduct electricity
   (a) Lemon juice (b) Vinegar (c) Water (d) Vegetable oil
5. Which of the following metal is used in electroplating for making shining objects
   (a) Iron (b) Copper (c) Chromium (d) Aluminium
6. An electrolyte is
   (a) A metal (b) A liquid that conducts current (c) A solution (d) An insulator

7. In an activity to check the conduction of electric current through liquids labelled 'A' and 'B' by using a bulb, it is observed that the bulb glows brightly for liquid A while it grows very dimly for liquid B-
   (a) Liquid B is a better conductor
   (b) Conducting properties of liquids cannot be measure in this manner
   (c) Equally conducting (d) Liquid A is better conductor than B
8. Which one is electroplated on Tiffin box-
   (a) Copper (b) Chromium (c) Silver (d) Tin
9. Which of the following compounds manufactured by chemical effect of electric current
   (a) Ammonium hydroxide (b) Sodium carbonate
   (c) Magnesium hydroxide (d) Sodium hydroxide
10. Electrolytes conduct electricity due to the movement of
    (a) Electrodes (b) Atoms (c) Electrons (d) Ions
11. Decomposition by passing current through a conducting liquid is called
    (a) Dialysis (b) Hydrolysis (c) Electrolysis (d) Electroplating
12. Which one is not used for electroplating metal articles
    (a) Sodium (b) Chromium (c) Nickel (d) Silver

E. VERY SHORT ANSWER TYPE QUESTIONS (1 MARKS)

1. What is conductor?
2. What are poor conductors?
3. How many types of electrodes are there in a battery?
4. Why electric bulb glow when the electric current passes through it?
5. Write the full form of LED?
6. Give two examples of liquid conductor.
7. How to connect a LED in the electric circuit?
8. When salt is dissolved in water is the solution conduct electricity?
9. During electrolysis of water where oxygen and hydrogen bubbles are formed?
10. What happens when electric current passed through a conducting solution?
11. When positive and negative terminal of a battery connected by into a Potato where the greenish blue spot is found?
12. When electric current is passed through the copper sulphate solution what will happen?
13. Where Copper gets deposited when electric current pass through CuSO4 solution?
14. What do you mean by electroplating?
15. Generally which layer is given on iron material by electroplating?

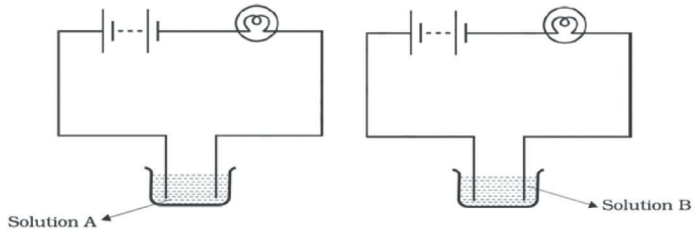
16. What is the advantage of LED over general light bulbs and fluorescent tubes?
17. Why a layer of zinc is coated over iron?
18. Is the solution of sugar in distilled water conduct electricity?
19. Name the effect of current responsible for the glow of bulb in an electric circuit?
20. Vinegar is a sour solution but why it is a poor conductor?
21. Name the metal which is usually electroplated on automobile parts.
22. Name the most common applications of chemical effect of electric current.
23. What is the polluting waste generated by electroplating in factories?
24. Name two metals which are purified by electrolysis.
25. Give two examples of objects around you which are electroplated.

F. SHORT ANSWER TYPE QUESTIONS (2 MARKS)

1. Why is tin electroplated on iron to make cans used for storing food?
2. An electric current is passed through a conducting solution. List any three possible observations.
3. What happens to the needle of a compass kept nearby when electric current is switched on in a wire? Why does this happen?
4. Does pure water conduct electricity? If not, what can we do to make it conduct electricity?
5. In case of fire, the fireman shut off the main electrical supply of the area. Why they do so?
6. Paheli had heard that rainwater is as good as distilled water. So she collected some rainwater in a clean glass tumbler and tested it using tester. To her surprise she found that the compass needle showed deflection. What could be the reason?
7. Is it safe for the electrician to carry out electrical repairs outdoors during heavy downpour?
8. We need magnetic compass to test the conduction of electric current. Why?
9. What are the advantages of electroplating?
10. What is LED? What are the advantages of LED over ordinary electric bulb?

G. LONG ANSWER TYPE QUESTIONS (3 MARKS)

1. Boojho and Paheli performed experiments taking similar bulbs and cells but two different solutions A and B as shown in the following figure



Boojho's Experiment - 'A' Paheli's Experiment - 'B'

They found that the bulb in the setup A glows more brightly as compared to that of the setup B. What you would conclude from the options given below and why

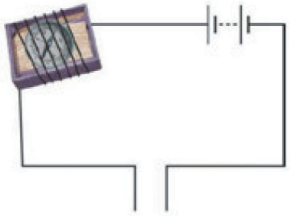
(a) Higher current is flowing through the circuit in setup A.

(b) Higher current is flowing through the circuit in setup B.

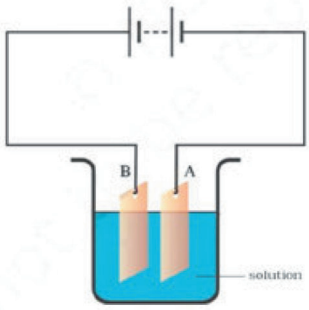
(c) Equal current is flowing through both the circuits.

(d) The current flowing through the circuits in the two setups cannot be compared in this manner.

2. Observe the circuit given below Current does not flow in the circuit if there is a gap between the two wires. Does it indicate that a poor conductor of electricity? Does air never conduct electricity explain?



3. Observe the circuit given in figure in right side. Bojho setup this circuit for purification of copper. (a) What will be the nature of -
   (i) Plate A (ii) Plate B (iii) The solution.
   (b) Explain the process of purification

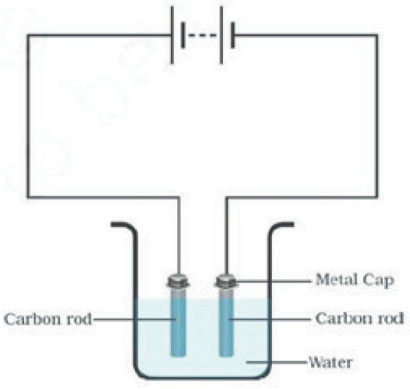


H. ESSAY TYPE QUESTIONS (5 MARKS)

1. Prove that lemon juice and vinegar are good conductors of electricit
   [Hint: See Textbook Page No: 173]
2. An electric current is passed through a conducting solution. List any three possible observations. (NCERT EXEMPLAR)
3. Write the applications of electrolysis.

I. HOTS QUESTIONS

1. You are provided with a magnetic compass, an empty match box, a battery of two cells and connecting wires. Using these objects how will you make a tester for testing an electric circuit?
   Draw the necessary circuit diagram and explain.



2. If a strip of impure copper metal is given to you, how you will purify it?
3. Boojho made the circuit as shown in the right side figure. He wanted to observe what happens when an electric current is passed through water. But he forgot to add a few drops of lemon juice to water. Will it make any difference to his observations? Explain.

ANSWERS

A. 2| Chemical 3| Negative 4| Electroplating
5| Negative 6| Electroplating 7| Conductor 8| Chromium

B. 1| False 2| False 3| True 4| True 5| True 6| True 7| False 8| True 9| True 10| True
11| True

C. 1| d 2| e 3| c 4| a 5| b

D. 1| d 2| d 3| a 4| d 5| c 6| c 7| d 8| d 9| d 10| d 11| c 12| a

E. 3| Two (Anode & cathode) 5| Light Emitting Diode 6| Tap water and salt solution 8| Yes
10| It causes chemical reaction 11| Positive terminal 13| Negative electrode 15| Zinc
18| No 19| Heating effect of electric current 21| Chromium 24| Copper and gold
25| Kitchen utensils, car parts etc

Chapter - 15
Some Natural Phenomena

What is lightning? How the electric discharge between clouds and the earth or between different clouds causes lightning? What is an earthquake? What happens during an earthquake? How it is measured? What safety measures should we take against lightning strikes and earthquakes? These are the main questions of discussion in this chapter. This chapter consist of 7 (seven) sections covering wide range of topics of lightning and earthquakes and how these events impact human lives and ways to minimize the impact of these events. The key concepts of this chapter are: Clouds carry electric charge, positive and negative charges, attraction and repulsion, principle of lightning conductor, phenomena related to earthquake.

After going through this chapter, students will be able to -

1. Explain processes and phenomena of lightning and earthquakes.
2. Conduct simple investigations to seek answers to queries.
3. Relates processes and phenomenon with causes.
4. Constructs models using materials from surrounding and explain their working.
5. Applies learning of scientific concepts in day to day life.
6. Differentiates / classifies materials on the basis of their properties, structure and functions.
7. Exhibits creativity in designing, planning, and making use of available resources etc.
8. Discusses and appreciates stories of scientific discoveries.

To attain these learning outcomes, activities like discussion on sparks, experiments with comb and paper to show positive and negative charge, discussion on lightning conductor, looking at structures / large objects and guessing what will happen to them in the event of an earthquake; activities to explore stable and unstable structures etc.

In this chapter, the main topics of discussion are two natural phenomena, lightning and earthquakes. All you from previous classes / chapters know that there are two kinds of charges - positive and negative charge. The process of electric discharge between clouds and the earth or between different clouds causes lightning and it could destroy life and property. Another destructive natural phenomenon is earthquake. It is caused by a disturbance deep inside the earth's crust and tends to occur at the boundaries of earth's plate. Earthquake measuring 7 or more on Richter scale can cause severe damage to life and property.

Let us know the main topics of discussion of this chapter in next page

Natural Phenomena

- Some objects can be charged by rubbing with other objects.
- Charges are of two types - positive charge and negetive charge.
- The process of transfer of charge from a charged object to the earth is called earthing.
- An earthquake is a sudden shaking or trembling of the earth.
- Richter scale measures the strength of earthquake.
- Lightning conductor is a device used to protect buildings fromj the effect of lightning.
- Necessary precautions should be taken by us for protection from sudden lightning and earthquake.

Let us practice some questions from this chapter -

A. FILL IN THE BLANKS

1. When charges move through a conductor they constitute an _____ current (Electric / Magnetic)
2. Like charges_____ each other.(Repel/ attract)
3. Combing your hair produce a_____ charge on the comb. (Positive/ negative)
4. The negatively charged particles which are transferred from one object to another during charging by friction are called _____. (Electron/ ion)
5. Charging of an object by rubbing it with another object is called charging by_____ (induction/ friction)
6. Lightning is nothing but an _____ spark.(Magnetic/ electric)
7. Each fragment of earth crust is called a _____. (Mantle/ Plate)
8. Nitrogen fixation occurs during _____ (Storm / Lightning)
9. Lightning always follows_____ (Thunder / storm)
10. Seismograph is an instrument that records _____(Magnitude / Seismic waves)
11. Richter scale used to express the _____(Power / Effects)

B. TRUE AND FALSE

1. Earthquakes occur all the time all over the world.
2. The plates of the outermost layer of the earth are always in continuous motion.
3. Tremors on the earth can also be caused by eruption of volcano.

4. The process of electric discharge cannot occur between clouds and the earth.
5. Bathing outdoors should be avoided during thunderstorm.
6. Opposite charges attract each other.
7. Lightning conductor can protect a building from lightning.
8. The plates of earth's crust are continuously moving.
9. Earthquake is measured and recorded using an instrument called electroscope.
10. Earthquake can be predicted in advance.

C. MATCH THE COLUMN

Column A	Column B
1. Tsunami	a) Conductor
2. Insulator	b) Earthing
3. Electroscope	c) Earthquake under sea
4. Transfer of charge to the earth	d) Plastic
5. Copper	e) Charge detecting device

D. MULTIPLE CHOICE QUESTIONS

1. Which of the following cannot be charged easily by friction?
   (a) A plastic scale (b) A copper rod (c) A woollen cloth (d) A inflated balloon
2. When a glass rod is rubbed with a piece of silk cloth the rod -
   (a) And the cloth both acquire positive
   (b) Becomes positively charged while the cloth has a negative charge
   (c) And the cloth both acquire negative charge
   (d) Becomes negatively charged while the cloth is a positive charge
3. An electroscope is a device which is used to find if an object is -
   (a) Charged (b) Magnetic (c) Free of cracks (d) Hot
4. Electric current is to be passed from one body to another for this purpose the two bodies must be joined by-
   (a) Cotton thread (b) Copper (c) Plastic string (d) Rubber band
5. The movement of the earth's plate causes-
   (a) Cyclones (b) Lightning (c) Earthquakes, d) Thunderstorm
6. Two charged objects are brought close to each other. Choose the most appropriate statement from the following
   (a) They may attract (b) They may repel (c) There will be no effect.
   (d) They may attract or repel depending on the type of charges they carry
7. Which of the following is not likely to cause Tsunami?
   (a) A major nuclear explosion under sea (b) Earthquake

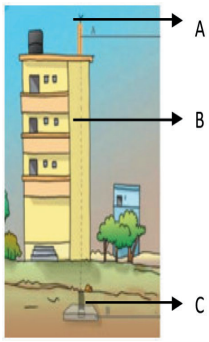
(c) Volcanic Eruption (d) lightning.

8. The earth's plate responsible for causing earthquakes is -
   (a) The crest of the earth. (b) The mantle of the earth.
   (c) The inner core of the earth. (d) The outer core of the earth.
9. The outer most layer of earth's called-
   (a) Mantle (b) Outer core (c) Crust (d) Inner core.
10. Consider the list of terms given below
    (i) Seismic zone (ii) Fault zone (iii) Mental (iv) Inner core.
    The boundaries of the earth's plate are known as-
    (a) i & ii (b) i & iii (c) iii & iv (d) ii, iii & iv.
11. Major earthquake are less likely to occur in
    (a) North east India (b) Rajasthan (c) Rann of Kutch (d) Orissa.
12. Consider the list of terms given below-
    (i) Tsunami (ii) Landslide (iii) Floods (iv) Lightning
    Earthquake can cause-
    (a) i, ii & iii (b) ii & iii (c) ii, iii & iv (d) iii & iv.

E. VERY SHORT ANSWER TYPE QUESTIONS (1 MARK)

1. What is tsunami?
2. What is fault zone?
3. What is electroscope?
4. What is static charge?
5. What is seismograph?
6. What is richter scale?
7. What is an earthquake?
8. Write the full form of CBRI?
9. What do you mean by earthing?
10. Write the importance of earthing?
11. What are the effects of earthquake?
12. How much magnitude of earthquake is destructive?
13. Name the device to detect electric charge on a body.
14. Give two examples of destructive natural phenomena?
15. Name the scientist who showed that lightning is electric in nature.
16. What is the nature of charge acquired by a glass rod when it is rubbed with silk?

IdentifyA, B and C in the image



17. Give an example of natural phenomena which are not yet able to predict accurately?
18. Name the instrument which is used for measuring magnitude of earthquake?
19. If a charged plastic straw is brought near another uncharged plastic straw what will happen?
20. Plastic straws A and B are rubbed with dry cotton cloth, what will happen if they are brought near each other?

F. SHORT ANSWER TYPE QUESTIONS (2 MARKS)

1. During the construction of a building the lightning conductor was left hanging in the air by mistake. Would the lightning conductor be still effective? Explain.
   [Hints: No, it will not be effective. Since lightning conductor was not connected properly to the ground. Therefore the charge will not pass through the lightning conductor to the earth.]
2. Explain how does lightning conductor protects a building from getting struck by lightning?
3. Sometimes a crackling sound is heard while taking off a sweater during winter. Explain?
4. Suggest three measures to protect ourselves from lightning?
5. List three states in India where earthquake are more likely to strike?
6. Suppose you are outside of your home and then earthquake strikes then what precautions would you take to protect yourself?
7. What are the causes of sparking?
8. Explain why a charged balloon is repelled by another charged balloon whereas an uncharged balloon is attracted by another charged balloon?
9. Explain why a charged body loses its charge if we touch it with our hand?

G. LONG ANSWER TYPE QUESTIONS (3 MARKS)

1. Explain how lightning takes place? (NCERT EXEMPLAR)
2. Mention three precautions that you will take to protect yourself if earthquake strikes when you are inside the house?
3. What is Seismograph? Explain its construction and functioning? [See Textbook page No: 194]
4. Explain why it is safer to use a wireless telephone instead of a landline telephone during lightning?
5. What steps should be taken if someone becomes a victim of lightning? [Hint: Give first aid by performing CPR (Cardiopulmonary Resuscitation), and mouth to mouth breathing. Cardiopulmonary Resuscitation (CPR) is an emergency procedure that combines chest compressions often with artificial ventilation in an effort to manually preserve intact brain function until further measures are taken to restore spontaneous blood circulation and breathing in a person who is in cardiac arrest. It is recommended in those who are unresponsive with no breathing or abnormal breathing].
6. What precautions would you take if lightning occurs while you are outside the house?

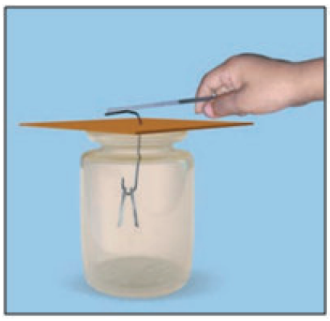
7. Describe with the help of a diagram and instrument which can be used to detect a charged body?

H. ESSAY TYPE QUESTIONS (5 MARKS)

1. How is the power of an earthquake estimated? At what strength it becomes destructive?
2. What safety measure will you take to protect yourself from any spark when you are inside your home? [Hint: (a) Contact with telephone cords, electrical wires and metal pipes should be avoided. It is safe to use mobile phones (b) Bathing should be avoided. (c) Computer, TV etc should be unplugged. See Textbook Page No: 189]
3. What are the reasons behind the lightning that we see in the sky in the rainy season?
4. What are Seismic zones? Where are the main seismic zones located in our country?

I. HOTS QUESTIONS

1. What suggestions will you give to the people living in seismic areas so that the destruction due to earthquake may be minimized? [Textbook Page No: 194]
2. Indian Meteorological Department (IMD) has predicted that a thunderstorm is likely to occur on a certain day. Suppose you have to go out on that day. Is it a good idea to carry an umbrella? Explain. [Hint: See textbook Page No: 189]
3. If the metal clip used in the electroscope is replaced by an ebonite rod and a charged body is brought in contact with it, will there be any effect on the aluminium strips? Explain. [Hint: The aluminium strips will not show any repulsion. The charged body will not transfer any charge to the ebonite rod as ebonite rod is an insulator. As a result there will be no charge on the aluminium strips and no repulsion will occur.]
4. In an electroscope if a negatively charged body is brought in contact with the metal clip, the strips of the electroscope diverge. If now another charged object carrying equal amount of positive charge is brought in contact with the clip, what will happen?
5. If air and cloud were good conductors of electricity, do you think lightning could occur? Explain. (NCERT EXEMPLAR)
6. If the materials used for constructing a building were good conductors, do you think lightning will strike the building. Will the lightning conductor be still required to be installed in the building? (NCERT EXEMPLAR)
7. You might have observed on a dry day that when you touch the screen of a television or computer monitor (with picture tube), you get a slight shock. Why does it happen?
8. The aluminium strips in an electroscope as shown in the left side are replaced by plastic strips and a charged body is brought in contact with the metal clip. What will happen? (NCERT EXEMPLAR)



ANSWER

A. 1| Electric 2| Repel 3| Negative 4| Electron 5| Friction
6| Electric 7| Mantle 8| Lightning 9| Thunder 10| Seismic waves
11| Power

B. 1| True 2| True 3| True 4| False 5| True 6| True
7| True 8| True 9| False 10| False

C. 1|c 2|d 3|e 4| b 5|a

D. 1|b 2| b 3| a 4| b 5| c 6| d 7| d 8| a 9| a 10| c
11| d 12| a

E. 8| Central Building Research Institute 12| more than 7 13| Electroscope
14| Lightning and earthquake 15| Benjamin Franklin. 16| Positive charge. 17| Earthquake.
18| Richter scale. 19|They will attract each other. 20| They will repel each other.

Chapter - 16
Light

Workbook

What are the differences between the images formed on a new utensil and an old one? Why is there this difference? When you see your image in the mirror it appears as if the left is on the right -why? Why don't we see images on all surfaces around us? What makes things visible? How do we see images of our back in a mirror? Why do we sometimes see colours on oil films on water? What is inside our eye that enables us to see? Why are some people unable to see? We shall try to find the solution of these questions from the chapter. This chapter consist of 10 segments ranging from basic concept of light like laws of reflection, regular and diffused reflection, multiple images, the actual colour of sunlight, different components of our eyes, care of the eyes, Braille system etc.

After going through this chapter, students will be able to

1. Explain processes and phenomena, e.g., formation of multiple images.
2. Conduct simple investigations to seek answers to queries.
3. Relates processes and phenomenon with causes.
4. Measures angles of incidence and reflection etc.
5. Constructs models using materials from surrounding and explain their working.
6. Applies learning of scientific concepts in day to day life.
7. Differentiates / classifies materials on the basis of their properties, structure and functions, e.g., materials designed to increase and reducing friction.
8. Exhibits creativity in designing, planning, and making use of available resources etc.

Activities and processes that can be used to achieve these learning outcomes are exploring laws of reflection using ray source and another mirror, locating the reflected image using glass sheet and candles, observing multiple images formed by mirrors placed at angles to each other, observing spectrum obtained on a white sheet of paper / wall using a plane mirror and activities with Braille sheet etc.

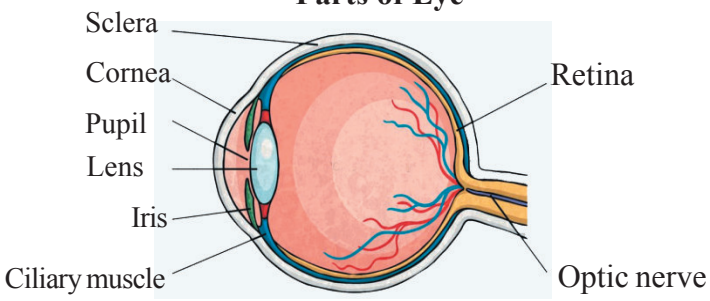
We need a source of light to make the objects visible. From the textbook, we know that light is reflected from all sources, reflection takes place when light is incident on smooth, polished and regular surfaces, image formed in a plane mirror undergoes lateral inversion. Moreover, sunlight consists of seven colours, splitting of light into its constituent colours is known as dispersion and we receive light sensation through our eyes and is consist of cornea, iris, pupil, lens, retina and visually impaired persons cannot see things clearly and have to depend on other methods to read and right like Braillie system.

Let us see the important points of this chapter as shown below:

Light

- Light reflects from every surface.
- Two types of reflection are there - (a) Regular reflection (b) Irrregular reflection.
- Laws of reflection : (a) Angle of incidence is equal to angle of reflection.
- The incident ray, the reflected ray and the normal to the surface- all lie in same plane.
- Two mirror inclined to each other give multiple images.
- Sunlight, called white light consists of seven colours.
- Virtually impaired persons can read and write using Braille system.

Parts of Eye



Let us practice some questions from this chapter-

A. FILL IN THE BLANKS

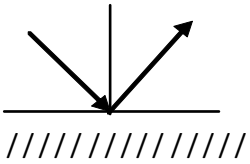
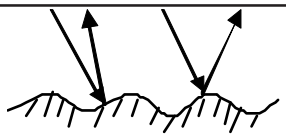
1. A person 1 m in front of a plane mirror seems to be_____ away from his image. (1m/2m)
2. If you touch your ear with right hand in front of a plane mirror it will be seen in the mirror that your right ear is touched with ____ hand (right/ left).
3. The size of the pupil becomes ____ when you see in dim light. (Large/ small).
4. Night birds have ____ cones than rod cells in their eyes. (Less/ more).
5. Angle of incidence is ____ the angle of reflection (Greater/ equals).
6. In a movie still pictures in proper sequence are projected on the screen usually at the rate of _____ pictures per second. (16/24).
7. _____ protect eyes from outer accident. (Cornea/ pupil).
8. In the Periscope two mirrors are placed at an angle of ____ with each other. (60°/45°)
9. The method of educating blind child is called_____(Braille/Vaidik).
10. Visual sense is not occur at_____.(Blindspot / Cornea)

B. TRUE AND FALSE

1. Both incident ray and reflected ray lie in the same plane.
2. Irregular reflection takes place from rough surface.
3. Visually challenged people can read and write with hearing aid.
4. The image formed by plane mirror is laterally inverted.
5. Rods and cones are the light sensitive cells.

6. The iris is the white part of the eye.
7. An eye lens focuses light behind the eye at cornea.
8. The image formed by a plane mirror is real.
9. Changing of the thickness of the eye lens is called accommodation.
10. Pupil is a small opening in the cornea.

C. MATCH THE COLUMN

Column A	Column B
1. Bands of seven colours	a. . 
2. Blind spot	b. 
3. Regular reflection	c. Spectrum
4. Irregular reflection	d. Image formed
5. Retina	e. No image formed.

D. MULTIPLE CHOICE QUESTIONS

1. Part of eye which controls the amount of light entering in the eye
   (a) Iris (b) Cornea (c) Retina (d) Lens
2. We can see a non luminous object when light
   (a) Emitted by the object falls on the eye
   (b) Is reflected from the object towards the eyes
   (c) Completely passes through the object (d) Gets completely absorbed by the object
3. Which of the following statement is correct regarding rods and cones in the human eye
   (a) Cones are sensitive to dim light (b) Cones are sensitive to bright light
   (c) Rods are sensitive to bright light (d) Rods can sense colour.
4. The angle of incidence and angle of reflection equal
   (a) Always (b) Sometimes (c) Depends on conditions (d) Never.
5. The nature of image formed by plane mirror
   (a) Virtual, behind the mirror and enlarged.

(b) Virtual, behind the mirror and of the same size of the object.
(c) Real, same size. (d) Real and enlarged.

6. The least distance of clear vision for normal eye
(a) 2.5 m (b) 250 cm (c) 25 cm (d) 2.5 cm

7. Name a device which works on the reflection of light from two plane mirrors arranged parallel
(a) Stethoscope (b) Kaleidoscope (c) Periscope (d) Electroscope.

8. Images formed of an object placed between two plane mirrors incline at 90 degree
(a) 4 (b) 5 (c) 2 (d) 1

9. Deficiency of which vitamin causes night blindness
(a) Vitamin D (b) Vitamin B12 (c) Vitamin A (d) Vitamin C

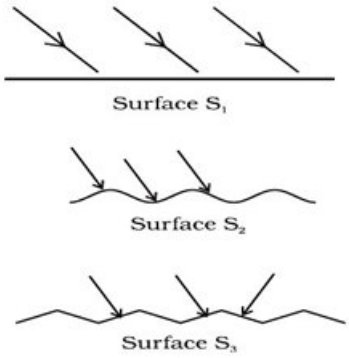
10. Which of the following is not a part of human eye
(a) Auditory nerve (b) Ciliary muscle (c) Optic nerve (d) Retina.

11. Human eye forms the image of an object at its
(a) Cornea (b) Retina (c) Iris (d) Pupil

12. Size of the pupil of the eye is adjusted by
(a) Cornea (b) Ciliary Muscles (c) Optic nerve (d) Iris

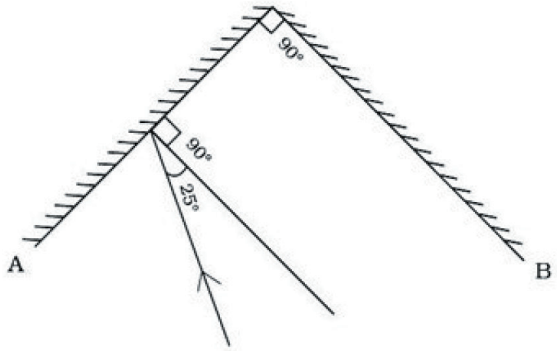
13. The defect in blurred vision is called
(a) Myopia (b) Night blindness (c) Cataract (d) Hypermetropia

14. Light is falling on surface S1, S2, S3 as shown in the below figure. Surfaces on which the angle of incidence is equal to the angle of reflection is/are-



(a) S1 only
(b) S1 and S2 only
(c) S2 and S3
(d) All the three surfaces

15. Two mirrors A and B are placed at right angles to each other as shown in the figure. A ray of light incident on mirror A at an angle of 25° falls on mirror B after reflection. The angle of reflection for the ray reflected from mirror B would be
(a) 25° (b) 50°
(c) 65° (d) 115°



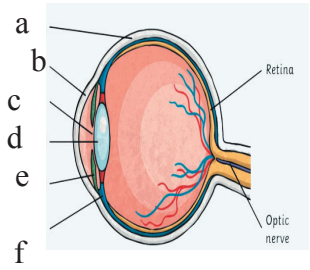
E. VERY SHORT ANSWER QUESTIONS (1 MARKS)

1. What is iris?
2. What is cornea?
3. What is pupil?
4. What is retina?
5. What is spectrum?
6. What is blind spot?
7. What is incident ray?
8. What is reflected ray?
9. What is incident angle?
10. What is reflected angle?
11. What is Braille system?
12. What is lateral inversion?
13. Define regular reflection.
14. Define diffused reflection.
15. Define luminous object.
16. Where Periscope is used?
17. What is scattering of light?
18. What is the function of iris?
19. Define non luminous object.
20. What controls the size of pupil?
21. What is the characteristic of rod cells?
22. What is the characteristic of cone cells?
23. Name an eye problem occur at old age.
24. Which kind of reflection creates image?
25. What is the chemical name of vitamin A?

THINK

Can the image of the child in it be obtained on a screen? [NCERT EXEMPLAR]

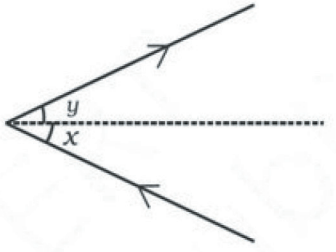
26. What are the plant sources of vitamin A?
27. What are the animal sources of vitamin A?
28. Name the cells which are found in retina.
29. Write down one application of kaleidoscope?
30. What type of image is formed in plane mirror?
31. When a still image seems to be a moving image?
32. Name a natural phenomenon of dispersion of light.
33. Which disease occurs due to deficiency of Vitamin A?
34. Which is responsible for the special colour of eyes?
35. If incident angle is 45°, then what will be the reflected angle?
36. Deficiency of which vitamin is responsible for eyes problem?
37. How much time the impression of an image persists in our brain?
38. If a ray incident normally then what will be the angle of reflection?
39. Name an instrument which works on the basis of reflection of light.
40. If the angle between incident and reflected ray is 90°, then what is the value of incident angle?
41. When you stand in front of plane mirror your left hand seems to be right hand, which phenomenon is responsible for this?
42. If two plane mirrors placed parallel in front of each other and a ray of light is allowed to fall on it then how many reflections are take place?
43. An object is placed 10 cm in front of a plane mirror what will be the distance between image and object?



Identify a,b,c,d,e and f

F. SHORT ANSWER TYPE QUESTIONS (2 MARKS)

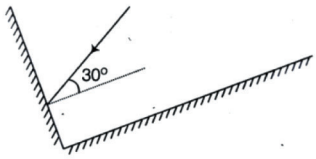
1. What happens to light when it gets dispersed? Give an example.
   [Hint: Light is split into its constituent colours. Example: rainbow.]
2. Eyes of the nocturnal birds have large cornea and a large pupil. How does this structure help them?
3. What kind of lens is there in our eyes? Where does it form the image of an object?
4. Which part of the eye gets affected if someone is suffering from cataract? How is it treated?
5. Draw the figure showing the position of the plane mirror as shown in the bellow image. Also level the angle of incidence and angle of reflection on it.



6. Write the difference between regular and diffuse reflection?
7. State the laws of reflection.
8. Write some uses of periscope?
9. How does eye adjust itself to deal with light of varying intensity?

10. Explain why a book lying on a table in a room can be seen from all the parts of the room?
11. The right side figure shows the word REST written in two ways in front of a mirror. Show how the word would appear in the mirror.

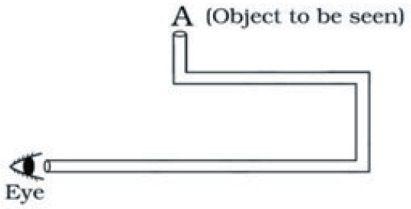
12. Observe the below figure. Two mirrors meet at right angles. A ray of light is incident on one at an angle 30 degree as shown in the figure. Draw the reflected ray from the second mirror.



15. Boojho while waving his hand very fast in front of his eyes observes that his fingers appear blurred. What could be the reason for it?
16. Difference between rod and cone cells.
17. Define mirror.
18. Why do we need a shiny surface for regular reflection?

G. LONG ANSWER TYPE QUESTIONS (3 MARKS)

1. Boojho planned an activity to observe an object A through pipes as shown in the below figure so that he could see objects which he could not directly see.
   (a) How many mirrors should he use to see the objects?
   (b) Indicate the positions of the mirrors in the figure.
   (c) What must be the angle with respect to the incident light at which he should place the mirrors?
   (d) Indicate the direction of rays in the figure.
   (e) If any of the mirrors is removed, will he be able to see the objects?



2. Name of some non optical and optical aids.
3. Explain the process which enables us to perceive motion in a cartoon film? [NCERT]
4. Draw a diagram to show the reflection of light from a plane mirror. Label the following on the diagram: (i) Plane mirror (ii) Incident ray (iii) Reflected ray (iv) Point of incidence (v) Angle of incidence (vi) Angle of reflection.
5. What is inside our eyes? Describe with a lebelled diagram.
6. What are the natures of rod and cone cells? What are their importances?
7. A man stands 20 metre in front of a large plane mirror. How far must he walk before he is 5 metres away from his image?

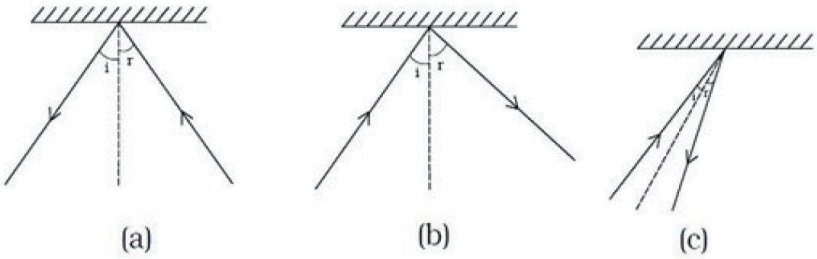
8. Why one should include the vitamin - A rich eatables in their diet? What are the main sources of vitamin - A.
9. A safety vest helps keep the workers working by the highways or roadsides safe especially during nights. Why? [Hint: The reflectors in the safety vest reflect light at night, hence alert the motorists about presence of workers]
10. How do ciliary muscles affect the functioning of eye? [Hint: It can contract and relax eye lens and can change its focal length].
11. How do we see various objects? Explain. [Hint: Due to reflection - when light reflected from different objects enter our eyes]
12. How many kinds of nerve endings are found in human eye? What are their functions?
13. What are the characteristics of image formed by plane mirror?

H. ESSAY TYPE QUESTIONS (5 MARKS)

1. Write an essay on Braille system.
2. Briefly describe various parts of eye.
3. Sunlight - white or coloured? Explain with an activity.
4. How is the phenomenon of reflection used in making a kaleidoscope? What are the applications of a kaleidoscope? (NCERT EXEMPLAR)
5. Give an account of structure of eyes of the following-
   (a) Crab (b) Butterfly (c) Owl (d) Eagle [See Textbook Page No: 208]

I. HOTS QUESTIONS

1. There is a mistake in each of the following ray diagrams given below. Make the necessary correction(s). (NCERT EXEMPLAR)



(a) (b) (c)

2. Here are given capital letters of English alphabets. Encircle the letters which will not show lateral inversion on facing a plane mirror.

A	B	D	C	F	E	L	H	G	K	I	J	T	V
		Q	R	X	W	S	N	Y	O	Z	U		

ANSWERS

A. 2m 2| Left 3| Large 4| More 5| Equals, 6| 24 7| Cornea 8| 45° 9| Braille 10| Blindspot

B. 1| True 2| True 3| False 4| True 5| True 6| False 7| False 8| False 9| True 10| True

C. 1| c 2|e 3|a 4| b 5| d

D. 1| a 2|b 3| b 4| a 5| b 6| c 7| c 8| a 9| c 10| a 11| b 12| d 13| c 14| d 15| c

E. 23| Cataract 24| Regular reflection 25| Retinol 26| Carrot, green leafy vegetables, broccoli etc 27| Cod liver oil, eggs, milk, butter etc 28| Rod cells & Cone cells 30| Virtual image 32| Rainbow 33| Night blindness 34| Iris. 35| 45° 36| Vitamin A 37| 1/16th second 38| Zero degree 39| Periscope 40| 45° 41| Lateral inversion 42| Infinite 43| 20 cm

Chapter - 17
Stars and the Solar System

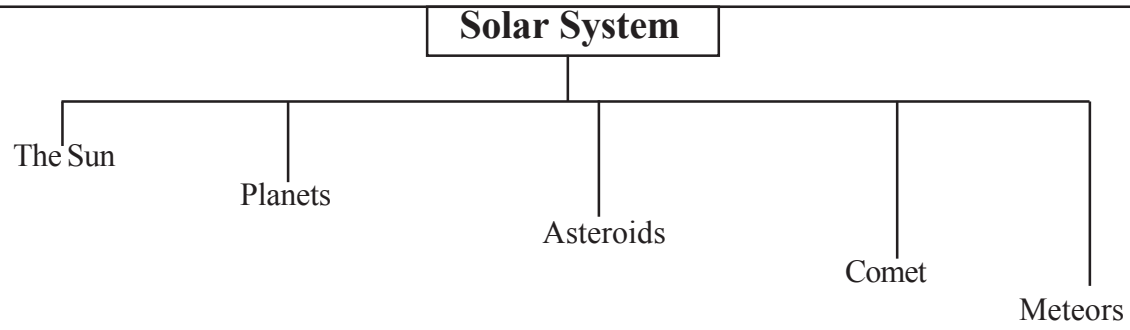
What do we see in the sky at night? How can we identify stars and planets? Is there a change in the shape of the moon every day? How far the stars exist? What are the components of solar system? What are satellites? These are some of the questions this chapter discusses about. The main concept of this chapter are idea about heavenly bodies/celestial objects and their classification - moon, planets, stars, constellations, motion of celestial objects in space; the solar system. This chapter consist of 5 (Five) segments ranging from basic information on the moon, the stars, constellations, the solar system to the satellite and artificial satellites. This chapter deals with various celestial objects which exist in the big surrounding space called the universe.

After going through this chapter, students will be able to

1. Explain processes and phenomena.
2. Conduct simple investigations to seek answers to queries.
3. Relates processes and phenomenon with causes.
4. Constructs models using materials from surrounding and explain their working.
5. Applies learning of scientific concepts in day to day life.
6. Differentiates / classifies materials on the basis of their properties, structure and functions, e.g., moon, planets, stars, celestial objects.
7. Exhibits creativity in designing, planning, and making use of available resources etc.
8. Discusses and appreciates stories of scientific discoveries.

To achieve these learning outcomes, these activities / processes can be conducted in the classrooms. These includes observing and identifying the objects moving in the sky during the day and at night, observing and identifying some prominent stars and constellations, observing and identifying some prominent planets, visible to the naked eye, (Venus, Mars, Jupiter) in the night sky and their movement, designing and preparing models and charts of the solar system, constellations, etc, role-play and games for understanding movement of planets, stars etc.

When we look at the sky in a dark and clear night, we will notice that the entire sky dotted with countless star, some bright and some not so bright. We know from the textbook that stars are celestial bodies that emit light of their own. The constellations are group of stars that appear to form recognizable shapes and can be observed with the help of naked eye. In space, a body revolving around another body is called a satellite. The earth has one natural satellite (Moon) and many more artificial satellites. Let's see the main topics of this chapter .



- The stars have own light. The sun is the nearest star of earth.
- Constallations are the stars forming a group of recognisable shape. Ex - Ursa major, Orion.
- The moon is a natural satellite.
- The man made satellites are called artificial satellite. Ex - INSAT, KALPANA-I etc.

Let us practice some questions from this chapter.

A. FILL IN THE BLANKS

1. The path of planets is known as_____.(Orbit / Circle)
2. A group of stars is called____.(Constellation / comets)
3. First artificial satellite launched by India is called_____(INSAT /ARYABHATTA)
4. Hally's comet appear after nearly every_____ years. (76 / 96)
5. The celestial body that reaches the earth is called_____(asteroids/ meteorite)
6. _____ is the star which appears to be stationary near the northern horizon. (Pole star/ Sirius)
7. _____Are the bright objects that revolve around the sun(planet/ satellite)
8. One light year is the distance travelled by light in one year is equal to_____
   (9.46×10^{12} Km / 3×10^{8} Km)
9. The planet which appears reddish in colour is_____.(Mars / Venus)
10. Shooting star actually not _____.(Planet/ star).

B. TRUE AND FALSE

1. The planet nearest to Earth is Jupiter.
2. Planet emits light of their own.
3. Stars twinkle at night.
4. Orion can be seen during summer in the late evening.
5. There are 9 planets in our solar system.
6. The day one who each moon is not visible is called full moon day.

7. Edwin Aldrin is the first man landed on moon's surface.
8. Proxima Centauri is a star.
9. Pluto is the farthest planet of our solar system.
10. Aryabhatta is one of the well known astronomers of ancient India.

C. MATCH THE COLUMN

Column A	Column B
1. Inner planet	(a) Mercury
2. Outer planet	(b) Great Bear
3. Constellation	(c) Mars
4. Satellite of the Earth	(d) Moon
5. Smallest planet	(e) Saturn

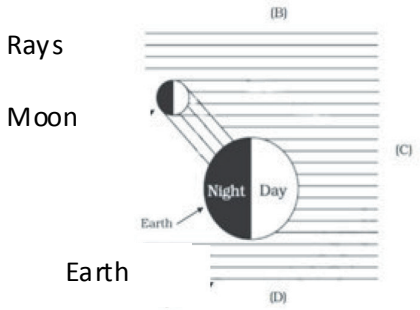
D. MULTIPLE CHOICE QUESTIONS

1. Nearest planet to the sun is
   (a) Neptune (b) Mars (c) Mercury (d) Earth
2. The largest planet is
   (a) Mercury (b) Mars (c) Saturn (d) Jupiter.
3. The tilting of the Earth is responsible for
   (a) Change of days (b) change of sun rays (c) Change of season (d) None of the above
4. Morning star is the name given to
   (a) Polestar (b) Star Sirius (c) Planet Jupiter (d) Planet Venus
5. Ursa major is a
   (a) Star (b) Constellation (c) Seen only with telescope (d) Satellite.
6. Which small objects revolve between the orbits of Mars and Jupiter?
   (a) Satellites (b) Comets (c) Asteroids (d) Meteorites.
7. Our galaxy is known as
   (a) Earth galaxy (b) Sun galaxy (c) Milky way (d) Constellation.
8. The brightest planet is
   (a) Mercury (b) Venus (c) Earth (d) Saturn
9. A planet which appears yellowish
   (a) Venus (b) Mars (c) Uranus (d) Saturn
10. INSAT is a
    (a) Natural satellite (b) Planet (c) Star (d) Artificial satellite.

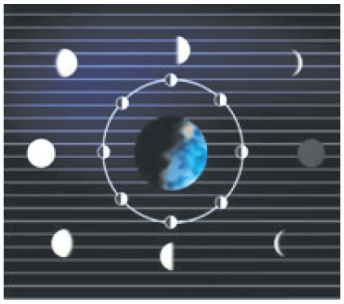
E. VERY SHORT ANSWER TYPE QUESTIONS (1 MARK)

1. Define orbit.
2. Define light year.\
3. Define satellite.
4. What is shooting star?
5. Is life exists on the moon?
6. What is the speed of light?
7. Define period of revolution.
8. Define period of rotation?
9. What form solar system?
10. Name the full form of ISRO.
11. Which planet called red planet?
12. Is mornig star is actually a star.
13. What is the other name of Orion?
14. How moon becomes visible to us?
15. Is there any atmosphere on moon?
16. What do you mean by astronomy?
17. Give an example of celestial objects.
18. How Venus rotates on its own axis?
19. How earth rotates on its own axis?
20. Name the brightest star in the sky.
21. Name some Indian artificial satellites?
22. Which planets are called inner planets?
23. Which planets are called outer planets?
24. Name the next nearest star after the Sun.
25. What are the other names of Ursa Major?
26. What is the distance of Alpha Centauri?
27. Name the only planet in which life exists.
28. Name the nearest star from the Earth.
29. Name the first Indian artificial satellite.
30. How much large is Jupiter than the earth?
31. Which planet appears yellowish in colour?
32. Name a planet which is nearest to the earth.
33. Cassiopeia looks like which English letter?
34. Name the farthest planet of the solar system.
35. How solar eclipse and lunar eclipse occurs?

In A, B, C & D ; indicate the position of the Sun…..



Mark the arrows (?), (?), (?), or (?) to show the direction of sunlight.



36. Name the planet which is nearest to the Sun.
37. Name the star which does not appear to move.
38. How many stars are present in the Ursa Major?
39. What is the name of the satellite of the earth?
40. Name the smallest planet of our solar system.
41. Which objects are twinkle in the sky at night?
42. Which objects do not twinkle in the sky at night?
43. Which is the brightest object in the night sky?
44. On which day the whole disc of moon is visible?
45. On which day the moon is not visible in the sky?
46. Do we see the back side of moon from the Earth?
47. Can we hear the sound on the moon?
48. How many planets are there in our solar system?
49. On which day mission Mangalyaan start in India?
50. When was Hally's comet was last visible?
51. Write one application of artificial satellite.
52. Which planets have large number of moons?
53. Name the India's first Mars Orbiter Mission.
54. Which planets have rings system around them?
55. In which year Hally's comet will be visible again?
56. Name the planet which is brightest in the night sky.
57. What is the distance between the sun and the earth?
58. What is the time period between two full moon days?
59. Which planet is called morning star or an evening star?
60. What is responsible for the changes of season in the earth?
61. How much time the sunlight takes reaches to the earth?
62. Name a comet which appears after nearly every 76 years?
63. In which season Orion constellation can be seen in the sky?
64. Name a planet which does not have any satellite of its own?
65. Name the astronaut who landed on the moon for the first time?
66. Name the unit by which we measure the distances between two stars?
67. How many days are there in between a full moon day and new moon day?
68. Which country become the first in the world to complete Mars Orbiter Mission in its first attempt?

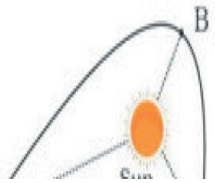
Write the names of all planets

.....
.....
.....
.....

F. SHORT ANSWER TYPE QUESTIONS (2 MARKS)

1. What are comets?
2. What are Asteroids?
3. What are Meteorites?
4. Why phases of moon occur?
5. What are phases of the moon?
6. Why pole star does not appear to move?
7. What astronauts found on moon's surface?
8. Why stars are invisible during the day time?
9. What makes existence of life on earth surface?
10. Why do stars appear to move from east to west?
11. Write the name of the planets according to their distance from the Sun?

Figure shown below shows comets without their tail. Show the tails of the comets at position A, B, and C. In which position will the tail be longest



Workbook

G. LONG ANSWER TYPE QUESTIONS (3 MARKS)

1. Why we cannot hear any sound on the moon?
2. Write down different applications of artificial satellites?
3. Explain why we see always the same side of the moon?
4. Meteors are not visible during the daytime. Explain the reason?
5. What is Pole star? How do you locate the position of Pole star?

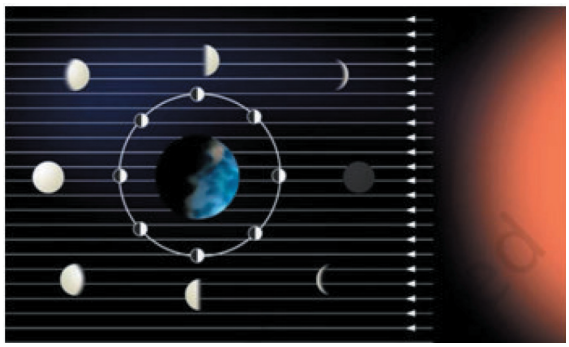
H. ESSAY TYPE QUESTIONS (5 MARKS)

1. What is meteor and meteorite? What is the difference between them? Meteorites are not visible during the day time. Explain.
2. What do you mean by planet and stars? Write down some differences between them?
3. What are the phases of the moon? Why phases of moon occur? How are the phases of moon related to our day to day life?
4. What do you mean by natural and artificial satellite? Write the difference between them.
5. What do you mean by eclipse? Briefly describe solar and lunar eclipse.
6. What are constellations? Explain the constellation Ursa Major along with name of some prominent constellations with their Indian names.

I. HOTS QUESTIONS

1. Suppose the moon emits light of its own. Would it still have phases? Justify your answer?
2. Suppose the distance between earth and sun becomes half of its present distance. What is likely to happen to life?

3. Paheli saw the moon through a glass window at 8:00 p.m. She marked the position of the moon on the glass pane. She got up at 4 a.m. in the morning. Will the moon be visible at the same position?
4. A star is ten light years away from the earth. Suppose it brightens up suddenly today. After how much time shall we see this change?
5. Meteors are not visible during the daytime. Explain the reason.
6. Why does the moon change its shape daily?
7. Look at the below figure carefully and answer the following question:
   (a) In which part of the sky would you see the full moon in the evening?
   (b) In which part of the sky would you see the crescent moon in the evening?



ANSWERS

A. 1| Orbit 2|Constellation 3| Aryabhatta 4|76 5| Meteorites
6| Pole star 7|Planet 8| 9.46 X 10^{12} Km 9| Mars 10| Star

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

C. 1| c 2|e 3|b 4|d 5|a

D. 1| C 2| D 3| C 4| D 5| B 6| C 7| C 8| B 9| D 10|D

E. 5| No 6| 3×10^8 m/sec 10| Indian Space Research Organization 11| Mars 12| No 13| Hunter 15| No 17| Moon 20| Sirius 21| Aryabhatta, INSAT, IRS, KALPANA -1, EDUSAT 22| Mercury, Venus, Earth, and Mars 23| Jupiter, Saturn, Uranus and Neptune 24| Proxima Centauri 25| Saptarshi, Great bear, Big dipper 26| 4.3 Light Year 27| Earth 28| The Sun 29| Aryabhatta 30| Nearly 1300 times 31| Venus 32| Venus 33| M or W 34| Neptune 36| Mercury 37| Polar star 38| 7 Stars 39| Moon 40| Mercury 41| Stars 42| Planets 43| Moon 44| Full moon day 45| New moon day 46| No 47| No 48| 8 Nos. 49| 5 November 2013 50| 1986 52| Outer planets 53| Mangalyaan 54| Outer planets 55| 2062 56| Venus 57| 150 million Km 58| 29 days 59| Venus 60| Tilting of earth 61| 8 Light Minutes 62| Hally's comet 63| Winter 64| Mercury 65| Neil Armstrong 66| Light Year 67| 14 Days 68| India.

Chapter - 18
Pollution of Air and Water

Workbook

Key Notes:

- Different types of pollutions are mainly responsible for the drastical changes in our environmental conditions now a days.
- We are suffering from the effects of air and water pollution mainly.
- Presence of pollutants in air when effect the living beings and the non living substances of our surroundings then it is known as air pollution.
- The substances which contaminate the air are known as air pollutants. For example; carbon monoxide, nitrogen oxide, carbon di oxide, methane, sulpher di oxide, chlorofluorocarbon (CFC) etc. Among these CFC is a major air pollutant.
- Forest fires or volcanic eruptions are the natural sources of air pollutants. pollutants are also added to the atmosphere by certain human activities. for example, factories, power plants, automobile exhausts etc. are the man made sources of air pollution.
- Air is a mixture of differnt gases. It contains 78% nitrogen, 21% oxyzen and a very small quantities of other gases like CO_2 argon, methane, ozone and water vapour.
- Asthma, coughing, breathing problems are the most common effects of air pollution on human.
- CFC damage the ozone layer that protects us from harmful ultraviolet rays of the sun.
- Sulphur di oxide (SO_2) and nitrogen di oxide (NO_2) released from different industries react with the water vapour present in the atmosphere to form sulphuric acid (H_2SO_4) and nitric acid (HNO_3) respectively. these acids drop down to the earth with rain water as acid rain.
- Acid rain corrodes the white marble of Taj Mahal, located in Agra. This phenomenon is known as marble cancer.
- Sun rays warm the earth's surface through radiation. A part of this radiation is absorbed by earth and a part is reflected back into the space. A part of the reflected radiation is trapped by the atmosphere, which further warms the earth. This is known as greenhouse effect.
- Due to deforestation and many more reasons the concentration of CO_2 in the atmosphere is significantly increasing which trap more heat into the atmosphere and does not allow it to escape into space. As a result the average temperature of the atmosphere is gradually increasing. This is known as global warming.
- Gaseous substances like CO_2, methane, nitrous oxide (N_2O), water vapour that are mainly responsible for the greenhouse effect are known as greenhouse gases.
- Many countries have reached an agreement called Kyoto protocol to reduce the emission of greenhouse gases.

- What we can do to reduce air pollution ?

  - Use of CNG and unleaded petrol instead of petrol and diesel.

  - Use of solar energy, hydroelectric power and wind energy have to be used as alternative source of energy to fulfill the energy requirement.

  - To develop more awareness on plantation.

- Whenever substances like fecal matter, sewage, toxic chemicals etc. get mixed with water, the water becomes polluted. Many industries discharge harmful chemicals into the river and cause water pollution. The chemicals released include arsenic, lead, fluoride etc.
- Due to water pollution the dissolved oxyzen level of water get reduced which cause death of aquatic animals. Microorganisms present in polluted water are responsible for the various water borne diseases like cholera, typhoid, jaundice etc.
- Water which is pure and suitable for drinking is called potable water. We can adopt some tehniques to make water potable, such as ;

  - Use of filter for purification

  - Boiling of water to make it germ free

  - Use of chlorine tablets or bleaching powder to the water for purification. This technique is known as chlorination.
- Water is a precious natural resource that we must have to conserve. Regarding conservation of water reduce, reuse and recycle should be our mantra.

Now, let us practice some questions from this chapter

A. FILL IN THE BLANKS

1. CFCs deplete the…….(Stratosphere/Ozone)
2. The……of carbon dioxide in the atmosphere may be responsible for global warming. (Increase/ Decrease)
3. Air contain the highest percentage of ……(Nitrogen/Oxygen)
4. An odd combination of smoke and fog is called……..(Aerosol/Smog)
5. The solid or liquid particles dispersed in air are called……(Fog/Aerosol)
6. Most of the atmospheric air is contained in the atmospheric layer called…… (Stratosphere/ Troposphere)
7. Cholera is a……...borne disease.(Air/water)
8. Water is a precious…….resource.(Natural/ Artificial)
9. ……percent of oxygen is present in air. (45%/21%)
10. ……..is produced from incomplete burning of fuel.(CO/NO)

B. State whether the following statements are true or false :

1. Global warming is a serious threat for life on earth.
2. Sun's rays do not warm the earth's surface.
3. Acid rain does not affect the soil and plants.
4. Corrosion of marble is also known as marble cancer.
5. Potable water is translucent.
6. Carbon monoxide is a greenhouse gas.
7. A brick kiln emits lot of smoke and other harmful gases causing air pollution.
8. Water which is suitable for drinking is called soft water.
9. Chlorination is a commonly used chemical method for killing germs in water.
10. Sulphur dioxide and nitrogen dioxide gases are responsible for acid rain.

C. MATCH THE ITEMS IN COLUMN A WITH THOSE IN COLUMN B :

Column A	Column B
a) Asthma	i) Contamination of water
b) Dysentery	ii) Absored by CO2
c) IR radiation	iii) Caused by smog
d) Condensed water vapour in air	iv) Smoke and fog
e) Smog	v) Fog

D. MULTIPLE CHOICE QUESTIONS

1. The source of Chloroflurocarbon is
   (a) Refrigerators (b) Air conditioners (c) Aerosols sprays (d) All
2. CNG is a-
   (a) Polluted fuel (b) Pollution free fuel (c) Harmful fuel (d) None
3. One of the most eangered river in the world is-
   (a)Yamuna (b) Cauvery (c) Howrah (d) Ganga
4. Which of the following is a non biodegradable pollutant?
   (a) Sulphur dioxide (b) DDT (c) Nitrogen oxide (d) Hydrogen oxide
5. Which of the following is not a greenhouse gas?
   (a) Carbon dioxide (b) Sulphur dioxide (c) Methane (d) Nitrogen

6. Ganga Action Plan was launched to reduce the pollution levels in the-
   (a) Ocean (b) River (c) Lake (d) Pond
7. Air pollution causes-
   (a) Dysentery (b) Respiratory diseases (c) Soil erosion (d) None of these
8. The Tajmahal is being affected due to-
   (a)Noise pollution (b) Air pollution (c) Water pollution (d) None of these
9. Biological pollution in water is caused by -
   (a) Coal mines (b) Domestic sewage and animal excreta
   (c) Oil spills (d) Chemicals like paint
10. Which of the following gases combines with the blood and prevents it from carrying oxygen?
    (a) CO (b) CO_2 (c) NO_2 (d) NO_3

E. VERY SHORT ANSWER TYPE QUESTIONS (1 MARK)

1. Write the full form of CNG.
2. Which fuels are pollution free?
3. What is the cause of global warming?
4. Which radiation can be absorbed by CO_2?
5. What is the percentage of Nitrogen in atmosphere?
6. Which gases are responsible for acid rain?
7. What is the impact of acid rain on Tajmahal ?
8. When was Ganga Action Plan launched?
9. Name two natural pollutants.
10. What is the full form of CFC?
11. Which rays are harmful for us?
12. Which chemical substance can damage the ozone layer?
13. What percentage of world's population is without safe drinking water?
14. What is the other name of corrosion of white marble?
15. Which chemical is used to purify water?
16. Give one example of biological water pollutants?
17. What pollutes Ganga?
18. What is the plan implemented to save river Ganga called?
19. Respiratory problems are caused by which type of pollution?
20. Name one alternative renewable fuel?
21. Which radiations are absorbed by ozone?
22. Name the main air polluting gases?

Think
Why is it advised that industries should switch over to cleaner fuels such as CNG and LPG in the Taj Mahal Zone in Agra?????

23. What is the full form of LPG?
24. What is the percentage of CO2 in atmosphere?
25. When did Van Mahotsav start in India ?
26. Name one common water borne disease.
27. Name one of the poisonous elements present in the exhaust of automobiles?

Workbook

Explain the traditional way of purifying water to make it fit for drinking.
[NCERT EXEMPLAR]
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F. SHORT ANSWER TYPE QUESTION (2 MARKS)

1. Define smog?
2. What is air pollution?
3. What do you understand by Van Mohotsav?
4. Decrease in the level of oxygen in a water body is harmful- why?
   [Hint: Decrease in the oxygen level in the water body may cause death of aquatic organisms, because organisms will not get sufficient dissolved oxygen in the water.]
5. We need to filter water before drinking -Give reason.
6. Groundwater also gets polluted by sewage- How?
7. UV rays are harmful to us- How?
8. What are pollutants?
9. Give some names of natural sources of air pollution.
10. What do you mean by Marble cancer?
11. What is the aim of "Say no to crackers"?
12. What do you mean by pollution?
13. Name some pollutants produced by vehicles?
14. What is Chlorination?
15. What is Potable water?

Think
We should plant trees and nurture the ones already present in the neighbourhood. Why?
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G. LONG ANSWER TYPE QUESTIONS (3 MARKS)

1. Write three harmful effects of water pollution.
2. What is Ozone? How is it helpful for our environment?
   [Hint: Ozone is a layer of gases around the earth. It is tri atom of oxygen atom. It protects the earth from the ultraviolet rays of the sun. This protects the earth from the ultraviolet rays of the sun. The ultraviolet rays cause many disease and damage to our earth. Thus ozone layer is helpful for our environment.]
3. What are the different ways through which water gets contaminated?
4. Use of excess fertilizers and pesticides affect water bodies. Explain.

5. What steps do you suggest for minimizing the air pollution around you?

H. ESSAY TYPE QUESTIONS (5 MARKS)

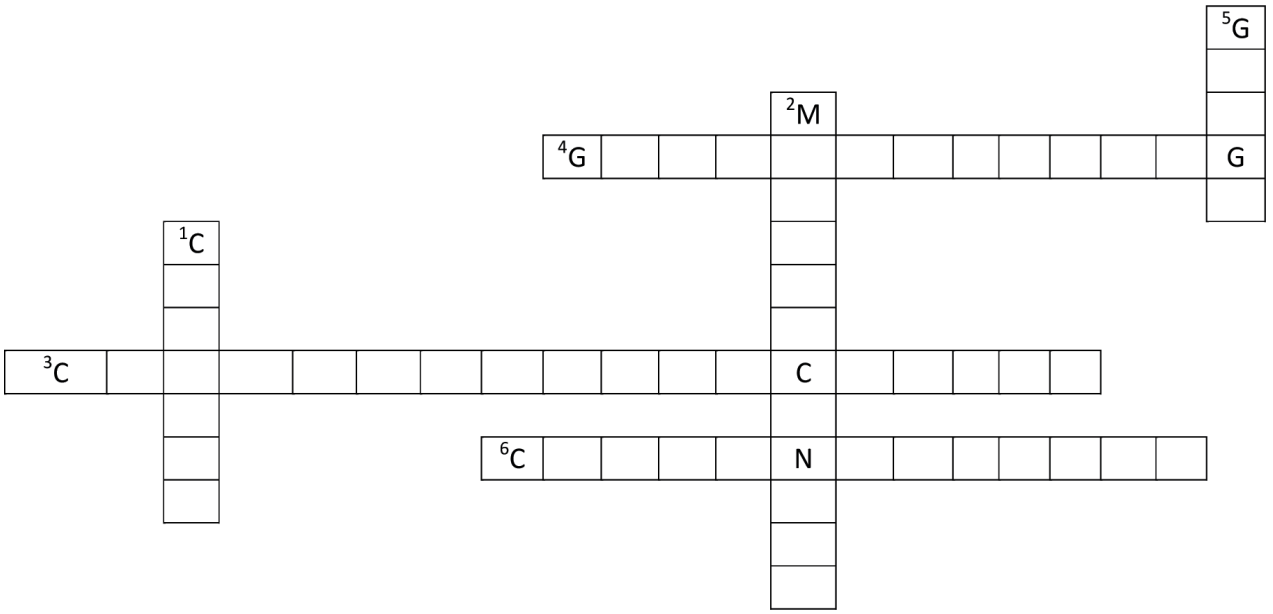
1. Describe global warming in your own words. Write some effects of global warming.
   [Hint: The increasing population and some human activities cause an increase in the amount of CO2 in the atmosphere, which results an increases in the average temperature of earth's. This is called global warming.
   The followings are the effects of global warming-
   (i) It affects the vegetation.
   (ii) The Gangotri glacier in the Himalayas has started melting.
   (iii) It causes flood on earth.
2. What is Acid rain? Write some harmful effects of it?
3. List out some human activities which cause air pollution and water pollution.
4. Describe the threats to the beauty of the Tajmahal?
5. What is Green house effect? How does it cause global warming?

I. HOTS QUESTIONS

1. Runoff water from a garden is not considered as a source of pollution -Give reason
   [Hint: Runoff water from a garden is not considered as a source of pollution because this water does not have a specific location for the discharge of its pollutants.]
2. A poisonous gas P is produced by incomplete combustion of fuels such as coal. This gas interferes with Q of blood and reduces its capacity to carry gas R. Instead it combines itself with Q forming S. What are P, Q, R, S?
3. A gas X present in the stratosphere prevents Y radiation of the sun from reaching to the earth .This gas is getting depleted by CFC's -Identify X and Y.

J. SOLVE THE PUZZLE

DOWN	ACROSS
1. A water borne disease	3. Full form of CFC
2. Other name of corrosion of marble	4. Continuous increase in temperature of the earth.
5. The most famous Holy river of India.	6. Gas which causes global warming



Workbook

ANSWERS

A. 1| Ozone 2| Increase 3| Nitrogen 4|Smog 5|Aerosols 6| Troposphere 7|Water 8| Natural 9| 21% 10| CO

B. 1| TRUE 2|FALSE 3|FALSE 4|TRUE 5|FALSE 6|FALSE 7|TRUE 8|FALSE 9|TRUE 10|TRUE

C. a| iii b| i c| ii d| v e| iv

D. 1| d 2| b 3| d 4| b 5| d 6| b 7| b 8| b 9| b 10| a

E. 1|Compressed natural gas 2| CNG and LPG 3| air pollution 4|Infrared radiation 5| 78% 6|SO2 and NO2 7|It is responsible for marbel cancer 8| 1985 9|Smoke and Dust 10|Chlorofluorocarbon 11|UV rays 12|CFC 13|25% 14|Marble cancer 15|Chlorine 16|Viruses 17|Untreated sewage, dead bodies, garbage 18| Ganga Action Plan 19|Air pollution 20|Solar energy 21|Ultraviolet radiation 22|CO2, SO2 23|Liquified Petroleum Gas 24|0.04% 25|First week of July, 1950 27|Cholera 28| Lead

J. DOWN: 1|Cholera 2| Marble cancer 5|Ganga
ACROSS: 3| Chlorofluorocarbon 4 |Global warming 6|Carbon dioxide

MODEL QUESTION PAPER
CLASS: VIII
SUB: SCIENCE

TIME: 3 HOURS FULL MARKS: 100

ANSWER ALL THE QUESTIONS

GROUP - A (20 MARKS)

1. The Earth is a planet of the solar system. It revolves around the Sun. The Sun is the nearest star from us. Earth has only one natural satellite named Moon. The moon revolves around the Earth. (2×5=10)

a) The nearest star from us is …… (Moon /Sun)
b) Earth revolves around the ……..(Venus/Sun)
c) Earth has only ……natural satellite.(One/Three)
d) Moon revolves around the ……..(Earth / Mercury)
e) The Earth is a……(Star/ Planet)

2. Write True or False for the following sentences (1x4 = 4)

a) All living organisms require food.
b) We cannot survive without air.
c) We can see an object in the dark.
d) Physical exercise is good for health

3. Match Column -A with Column- B (1x3= 3)

Column - A	Column - B
I. Sun	(a) Mixture of the various gases
II. One month	(b) Emits heat and light
III. Air	(c) 30 days

4. Match Column -A with Column- B (1×3=3)

Column - A	**Column - B**
I. 	(a) Flag
II. 	(b) Spectacle
III. 	(c) Apple

GROUP -B (40 MARKS)

5. Answer the following questions **(1x10=10)**

a) Common cold is a ……borne disease. (Water / Air)
b) All microorganisms are harmful. (True/False)
c) The only liquid metal is ……(Sodium/Mercury)
d) Iron is used in constructing bridges and houses. (True/False)
e) Snakes are killed in large numbers because-
i. They are very poisonous.
ii. They kill rats.
iii. Their skin is expensive.
iv. They damage the crop.
f) Deficiency of which vitamin causes night blindness-
(i) Vitamin D (ii) Vitamin B12 (iii) Vitamin A (iv) Vitamin C
g) Sound can travel in vacuum. (True/False)
h) Earthquake occur all the time all over the world.(true/false)
i) Force can change the …….of an object. (shape/ density)
j) Friction produces ……..(heat/light)

6. Answer the following questions **(2x8=16)**

a) What changes occur in human body during Puberty?
b) What is force of friction?
c) Why mitochondria are called the power house of the cell?
d) Why aluminium is used in making cooking utensils?
e) Why stars are invisible during the day time?
f) What is combustion?
g) What are flora and fauna?
h) Why it is not advised to wear synthetic clothes while working in the kitchen?

7. Answer the following questions **(3x3=9)**

a) Does pure water conduct electricity? If not, what can we do to make it conducting?
b) What are the functions are of pituitary gland?
c) What are fossils fuels? Explain how are they formed?

8. Answer any one from the following questions **(5x1= 5)**

a) Plastics are good as well as bad to us - Explain.

OR

What are the different methods that we can take to control noise pollution?

GROUP - C (40 MARKS)

9. Answer to the following questions **(1x9=9)**

a) Name the full form of ISRO?

b) Sea water is a better conductor than the normal water.(True/False)

c) Which microbes is used to make curd from milk-

(i) Bacteria (ii) Virus (iii) Fungi (iv) Protozoa

d) The cutting of trees is called…….(Deforestation / Reforestation)

e) Chromosomes carry genes.(True/ False)

f) The fuel used for aviation is …….(Petrol/ Kerosene)

g) What is the full form of LPG?

h) What is called 'black gold'?

i) …….is stored in kerosene. (Sodium/ Calcium)

10. Answer the following questions **(2x6=12)**

a) What is Global warming?

b) A vibrating body completes 1000 oscillations in 5 seconds. Find the frequency of the sound?

c) Name the different types of forces.

d) Make a labelled diagram of candle flame?

e) Write the causes of AIDS?

f) How Rhizobium helps in nitrogen fixation?

11. Answer the following questions **(3x3=9)**

a) Mention three precautions that you will take to protect yourself if earthquake strikes when you are inside the house.

b) Differentiate between exhaustible and inexhaustible resources.

c) States the laws of reflection.

12. Answer the following questions **(5x2=10)**

a) Write down some methods through which we can reduce the frictions.

OR

Draw a diagram of human ear. Clearly points its different parts and explain how we hear sound.

b) Write three ways by which bacteria are useful to us and three ways by which they are harmful.

OR

Draw a labelled diagram of human female reproductive system.