

CHAPTER-18

Pollution of air and water

Text book Exercise Pg. No. 250,251

Q.7 to be done and discussed and done in Textbook.

Q.1 What are the different ways in which water gets contaminated?

Ans Water gets contaminated due to the addition of substances harmful to health. Sewage, agricultural chemicals and industrial wastes are some of the major contaminants of water.

Q.2 At an individual level, how can you help reduce air pollution?

Ans At an individual level we can help in reducing air pollution by the following methods:

- (i) We should use unleaded petrol and CNG as fuels.
- (ii) We can take part in Van Mahotsava actively and effectively every year and motivate people about the importance of plantation.
- (iii) We can educate the people against burning the dried leaves and advise them to put them in compost pit.
- (iv) We can walk small distances ,use bicycle or do car pooling.
- (v) We can use alternative sources of energy.

Q.3 Clear, transparent water is always fit for drinking. Comment.

Ans No, clear and transparent water even without smell, may contain bacteria, viruses etc. which are not visible to eyes. Drinking such water can cause illness of various kinds. Therefore, we must drink purified and potable water after boiling/ disinfecting.

Q.4 You are a member of the municipal body of your town. Make a list of measures that would help your town to ensure the supply of clean water to all its residents.

Ans **The following steps could be taken:**

- (a) First of all, procurement of required amount of water for all residents should be ensured.
- (b) Wastage of water by leakage at various places should be taken into account.
- (c) Water treatment should be ensured.
- (d) Must have sufficient water tanker to meet emergency situations.

Q.5 Explain the differences between pure air and polluted air.

Ans

Pure air

Polluted Air

- | | |
|--|---|
| 1) It contains 78% nitrogen, 21% oxygen, .03% carbon dioxide and small amounts of other gases. | 1) It contains oxides of sulphur, carbon, nitrogen, etc and other particulate matter. |
|--|---|

2) Smog is absent.

2) Smog is present.

3) It is not harmful to human beings.

3) It is harmful to human beings.

Q.6 Explain circumstances leading to acid rain. How does acid rain affect us?

Ans

1) Gases like sulphur dioxide and nitrogen dioxide react with water vapour present in atmosphere to form sulphuric acid and nitric acid.

2) These acids come down with rain water, making the rain acidic. This is known as acid rain.

3) Acid rain corrodes the marble of the monuments. This phenomenon is known as Marble Cancer.

4) It also kills the useful organism in agricultural soil.

Q.8 Describe the 'Green House Effect' in your own words.

Ans

1) The Sun's rays when falls on the earth's surface, make it warm.

2) Some of the Sun's rays are trapped by the atmosphere and these are not allowed to go out of the earth's atmosphere.

3) This trapped heat causes warming of atmosphere called the greenhouse effect.

4) The gases like methane and carbon dioxide form a thick layer and prevent the escaping of heat to cause this effect.

5) The increased amount of greenhouse gases in atmosphere leads to global warming.

Q.9 Prepare a brief speech on global warming. You have to deliver the speech in your class.

Ans

1) Global warming is defined as the gradual increase in earth's average temperature due to increased amount of greenhouse gases in the atmosphere.

2) Today, global warming has appeared as one of the most severe threat to the human beings.

3) On one hand, carbon dioxide is added in the atmosphere due to human activities. On the other hand, the forest area is decreasing day by day. It leads to an increase in the amount of carbon dioxide in atmosphere.

4) The accumulation of this gas as well as other greenhouse gases causes global warming.

5) Global warming can create the melting of ice of icebergs, resulting in rise in the sea level causing the flooding of many coastal areas.

So, we must be aware of this problem and take every possible step to tackle it.

Q.10 Describe the threat to the beauty of the 'Taj Mahal'.

Ans

1) The Taj Mahal is made of white marble, which is getting affected adversely due to the industrial pollutants from Agra, Mathura etc.

2) The sulphur dioxide gas along with nitrogen oxide gas released from these industries

mix with rain water to form sulphuric acid and nitric acid respectively that falls on marble of this monument as acid rain. The acid rain corrodes the marble of the monument.

3) The soot particles released from the factories has contributed to the yellowing of the Taj Mahal.

Q.11 Why does the increased level of nutrients in the water affect the survival of aquatic organisms?

Ans

1) Agriculture relies on the use of chemical fertilizers to improve the crop yield.

2) All these chemicals dissolve in water and run into water bodies from the fields.

3) These seep into the ground and pollute the ground water.

4) Lot of algae in the ponds grow and keep the ponds green. This is caused due to excessive quantities of chemicals like nitrates and phosphorous present in fertilisers.

5) Excessive growth of algae decrease the oxygen level of water bodies and kills the other aquatic animals living inside it.

CHAPTER-17

Stars and the Solar System

Textbook page 234-235

Q.1 to Q.6 and 16 to be discussed and done in class in text book.

Q.7 In which part of the sky can you find Venus if it is visible as an evening star?

A.7 Venus appears in the western sky just after sunset as an evening star.

Q.8 Name the largest planet of the solar system.

A.8 Jupiter is the largest planet of the solar system.

Q.9 What is a constellation? Name any two constellations.

A.9 A group of stars which forms a recognizable pattern or shape is called a constellation. eg.

1. Ursa Major (Great Bear)

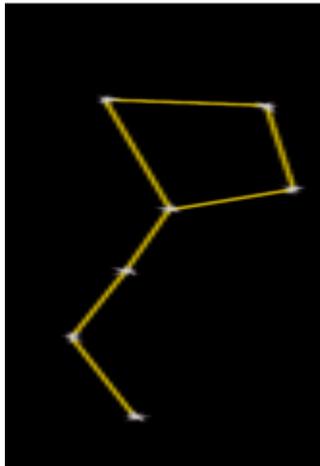
2. Orion the hunter

Q.10 Draw sketches to show the relative positions of prominent stars in:

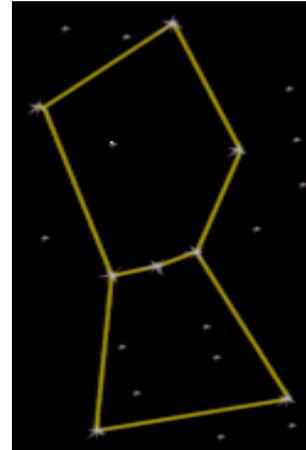
(a) Ursa Major and

(b) Orion.

A.10



(a) Ursa Major



(b) Orion

Q.11 Name two objects other than planets which are members of the solar system.

A Satellites and Asteroids are the two objects other than planets which are members of the solar system.

Q.12 Explain how you can locate the Pole Star with the help of Ursa Major.

A 1) To locate the Pole Star we have to look towards the northern part of the sky and try to identify Ursa Major.

2) We have to look at the two stars at the end of Ursa Major.

3) A straight line passing through these stars is imagined and is extended towards the north direction.

4) This line leads to a star which is called Pole Star.

Q.13 Do all the stars in the sky move? Explain.

A No stars do not move in sky. They appear to move from east to west, because the Earth rotates from west to east about its axis.

Q.14 Why is distance between stars expressed in light years ? What do you understand by the statement that a star is eight light years away from the earth ?

A.14 The distance of stars is so large that it cannot be expressed in terms of kilometers. That is why very large distances are expressed in another unit known as light year. One light year is the distance travelled by light in one year.

If the distance of a star is eight light years, it means that this distance is the distance travelled by light in eight years.

Q.15 The radius of Jupiter is 11 times the radius of Earth. Calculate the ratio of the volumes of Jupiter and the earth. How many earths can Jupiter accommodate?

A.15 If the radius of the Earth is r .

Then, radius of the Jupiter is $11r$.

$$\begin{aligned}\text{So, ratio of the volumes of Jupiter and Earth} &= \frac{4}{3}\pi R^3 : \frac{4}{3}\pi r^3 \\ &= 1331 : 1\end{aligned}$$

So, 1331 Earth can accommodate within the Jupiter.

Extra questions:

Q.1 Define the following:

1. Artificial satellite:

A It is an artificial body placed in orbit round the earth or moon or another planet in order to collect information or for communication.

2. Asteroids:

A Asteroid are celestial bodies made up of rocks or metals revolving around the sun in between the orbits of Mars and Jupiter. The largest asteroid is Ceres which is actually a dwarf planet.

3. Retrograde motion:

A Rotation of a planet from east to west is called retrograde motion. Venus and Uranus shows retrograde motion.

Q.2 What are meteoroids, meteor and meteorites ?

A 1) Meteoroids are solid objects of the size considerably smaller than comets and asteroids moving in the solar system.

2) Meteor is a visible streak of light that occurs when a meteoroid enters earth's atmosphere.

3)The unburnt meteoroid that reaches the earth's surface is called meteorite.

Q.3 Write short note on Comet.

- A.**
- 1) A comet is a celestial body made mostly of ice mixed with smaller amounts of dust and rock having a long tail of gas.
 - 2) They revolve around the sun in large orbits.
 - 3)The tail always points away from sun.
 - 4)The length of the tail decreases while coming towards the sun.
 - 5)This happens because the heat of the sun melts some of the ice turning it into gas.
 - 6) Many comets are known to appear periodically eg Halley's comet which appears after 76 years.

CHAPTER-16

LIGHT

Text Book Exercise page no. 212-213

Q. 3, 6, 7, 8, and 14 to be discussed and done in textbook.
Q5 and 9 to be marked in textbook.

Q.1 Suppose you are in a dark room. Can you see object in the room? Can you see objects outside the room? Explain.

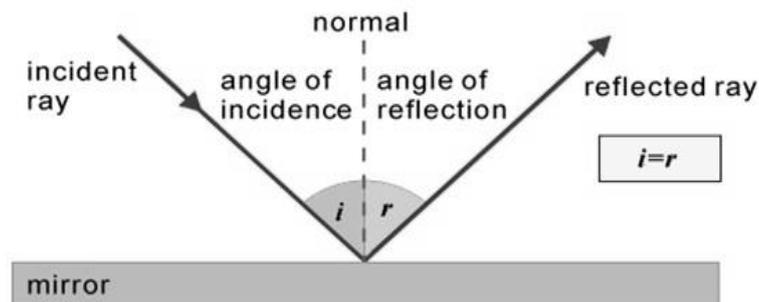
- A.**
- 1) The objects cannot be seen inside the room because there is no light.
 - 2) The objects outside the room can only be seen if there is light outside.
 - 3) We can see objects only when light reaches our eyes after being reflected by the object.

Q.2 Differentiate between regular and diffused reflection. Does diffused reflection mean the failure of the laws of reflection?

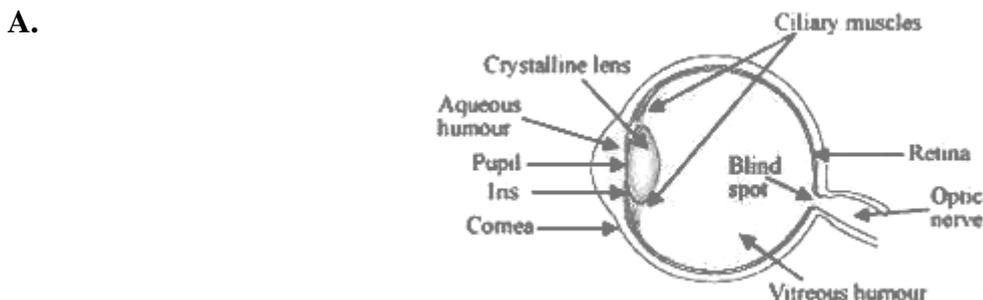
- A.**
- | Regular reflection | Diffused reflection |
|---|---|
| 1. It is reflection from polished surface. | 1. It is reflection from rough surface. |
| 2. Image is seen in the reflecting surface. | 2. Image is diffused. |
| 3. Reflected rays are parallel to each other. | 3. Reflected rays are not parallel to each other. |
- No, diffused reflection does not mean the failure of laws of reflection, they remain unchanged for both types of reflection.

Q.4 State the laws of reflection.

- A.** Laws of reflection are :
- 1) The incident ray, the reflected ray and the normal at the point of incidence lie in the same plane.
 - 2) The angle of incidence is equal to the angle of reflection.



Q.10 Draw a labelled sketch of the human eye.



Q.11 Gurmit wanted to perform Activity 16.8 using a laser torch. Her teacher advised her not to do so. Can you explain the basis of the teacher's advice?

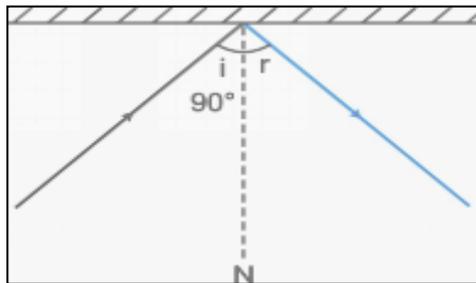
A.11 Intensity of laser beam is very high, as it carries large amount of energy. It is harmful for eyes and can cause permanent damage to retina. One should not look at laser beam directly or indirectly for a longer period.

Q.12 Explain how you can take care of your eyes.

A. We can take care of our eyes in the following ways:

- 1) Have a regular check up.
- 2) If advised, use suitable spectacles.
- 3) Avoid too much or too little light.
- 4) Wash your eyes frequently with cold water.
- 5) Always read at normal distance for vision.

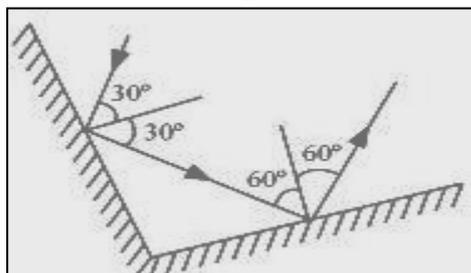
Q.13 What is the angle of incidence of a ray if the reflected ray is at an angle of 90° to the incident ray?



A. Given: $\angle i + \angle r = 90^\circ$ (1)
 We know that, $\angle i = \angle r$ (Laws of reflection)
 Replacing $\angle r$ in equation (1) with $\angle i$
 $\angle i + \angle i = 90^\circ$
 or $2\angle i = 90^\circ$
 or $\angle i = 90^\circ / 2$
 or $\angle i = 45^\circ$

Q.15 Two mirrors meet at right angles. A ray of light is incident on one at an angle of 30° as shown in Fig. 16.19. Draw the reflected ray from the second mirror.

A. The laws of reflection are used to obtain the path of reflected light.

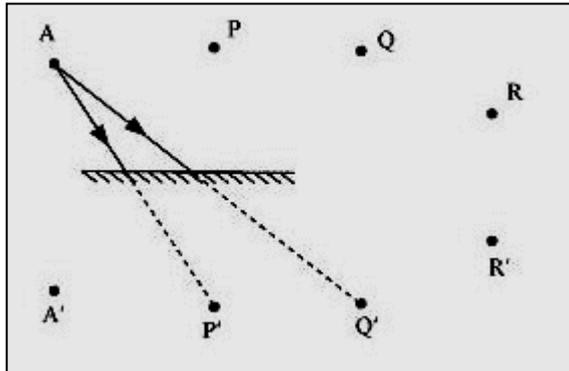


It is observed that the given ray of light will reflect from the second mirror at an angle of 60° .

Q.16 Boojho stands at A just on the side of a plane mirror as shown in given figure. Can he see himself in the mirror? Also can he see the image of objects situated at P, Q and R?

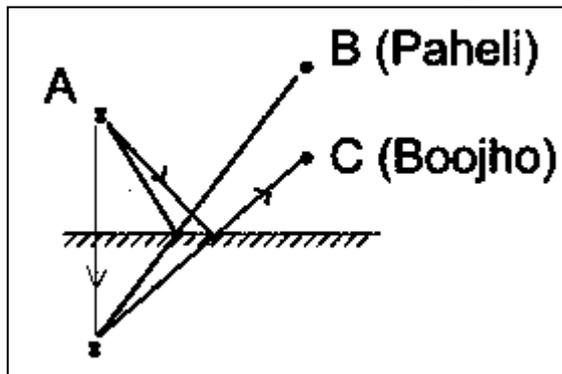
- A. A plane mirror forms a virtual image behind the mirror. The image is as far behind the mirror as the object is in front of it. A cannot see his image because the length of the mirror is too short on his side. However, he can see the image of the objects placed at points P and Q, but cannot see the image of the object placed at point R

A.



- Q.17 (a) Find out the position of the image of an object situated at A in the plane mirror in the given figure. (b) Can Paheli at B see this image? (c) Can Boojho at C see this image? (d) When Paheli moves from B to C, where does the image of A move?

- A. a) Image of the object placed at A is formed behind the mirror. The distance of the image from the mirror is equal to the distance of A from the mirror. Image of A is shown in the figure.



- b) Yes, Paheli at B can see this image.
 c) Yes Boojho at C can see this image.
 d) Image of the object at A will not move. It will remain at same position when Paheli moves from B to C.

Extra Questions:

- Q.1 Define the following terms:

- A. a) **Angle of incidence:** The angle between the incident ray and the normal is known as angle of incidence.
 b) **Dispersion of light:** Splitting up of white light into seven colours when it passes through a glass prism is known as dispersion of light.
 c) **Lateral inversion :** Lateral inversion is the phenomenon of the interchange of left and right sides, between the object and its image.

- Q.2 Write short note on:

- A. 1) **Persistence of vision:** 1) It is the ability of eye to continue to see an image for a very short period of time ($1/16^{\text{th}}$ of a sec) even after the object is removed.
 2) Movie cameras and projectors use the persistence of vision to record and show still images fast to create the impression of smooth movement.

2) **Power of accommodation:** 1) The ability of the eye to alter the focal length of its lens so that it can clearly see all the objects within a certain range.

2) When we want to see nearby objects the ciliary muscles expand and make the lens thick and when we want to see far off objects the ciliary muscles contract making the lens thin, thus we are able to see nearby and far off objects clearly.

3) Working of the eye:

a) The light rays from an object enter the eye through pupil.

b) A real, inverted and highly diminished image is formed on retina.

c) The rods and cones of the retina get activated and convert the image into electric impulses.

d) The signals are taken by the optic nerve to the brain.

e) While the signals are transmitted the inverted image is re-inverted and the brain sees it as a erect image and helps us to sense the actual object.

4) Defects of vision:

The various defects of vision are:-

Short sightedness: This is a defect in which a person can not see far off objects clearly. It is also called myopia. It can be corrected by using concave lens of appropriate focal length.

Long sightedness: In this defect, the person cannot see nearby objects clearly. It is also called hypermetropia. It can be corrected by using convex lens of appropriate focal length.

Cataract- Sometimes lens becomes cloudy and opaque. It can be corrected by replacing foggy lens with a new lens through surgery.

Presbyopia- It is a defect usually seen in old age when a person cannot see nearby and far off objects clearly. It can be corrected by using bifocal lens.

5) Multiple reflection:

Multiple reflection is the phenomenon in which we get multiple images of an object because the image formed by one mirror acts as an object for the second mirror.

The number of images formed by 2 mirrors kept at an angle can be calculated by using the formula

$$n = \left(\frac{360}{\theta}\right) - 1$$

where n = number of images

θ = angle between the 2 mirrors

CHAPTER-15

SOME NATURAL PHENOMENA

Text book Exercise 197

Q.1, Q.2, Q.3 and 10 to be done in Text Book.

Q4. Sometimes, a crackling sound is heard while taking off a sweater during winters. Explain.

A. The crackling sound is heard because when the sweater is rubbed while taking it off, it acquires a small charge due to friction between sweater and body.

Q5. Explain why a charged body loses its charge if we touch it with our hand.

A. Our body is a good conductor of electricity. When we touch a charged body with our hand, the charged body loses charge to the earth through our body. This phenomenon is known as earthing.

Q6. Name the scale on which the destructive energy of earthquake is measured. An earthquake measures 3 on this scale. Would it be recorded by seismograph? Is it likely to cause much damage?

A. The destructive energy of an earthquake is measured on a scale called Richter scale. An earthquake that measures three (3) on this scale would be recorded by a seismograph but it is not likely to cause much damage.

Q7. Suggest three measures to protect ourselves from lightning.

A.

- 1) Hearing thunder, we should rush to a safer place like building.
- 2) If no proper shelter is available, we should go in open, never hide under a tree or electric pole.
- 3) The telephone cord, electric wires and metal pipes should be avoided from touching.

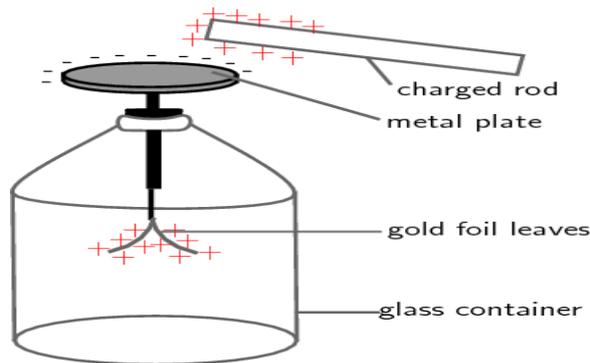
Q8. Explain why a charged balloon is repelled by another charged balloon whereas an uncharged balloon is attracted by another charged balloon?

A.

- 1) A charged balloon is repelled by another charged balloon because both have the same charge and we know that like charges repel each other.
- 2) But a charged balloon attracts an uncharged balloon because uncharged balloon acquires charges on its surface due to induction of charges.
- 3) Since the charges produced are opposite in nature the two balloons will attract each other. Hence an uncharged balloon is attracted by another charged balloon.

Q9. Describe with the help of a diagram an instrument which can be used to detect a charged body.

- A.
- 1) A device that is used to test whether an object is carrying charge or not is known as electroscope.
 - 2) In the diagram, there is a metal rod. Below in the end of the metal rod, there are leaves of aluminium foil.
 - 3) Now if we touch the charged body at the upper end of the metal rod, then charge go to the leaves of aluminium foil by flowing through the metal rod.
 - 4) Thus both leaves have same charge, so the leaves spread because of force of repulsion as we know that same charges repel each other.
- So, by this instrument we can detect a charged body.



Q11. Suppose you are outside your home and an earthquake strikes. What precaution would you take to protect yourself?

A. Following precautions could be taken to protect ourselves in a earthquake out side the home :

- (a) First find a clear spot, away from building, trees and overhead wires.
- (b) If I am in a car or a bus, I will not come out. Instead I will tell driver to drive the car slowly to clear spot and will not come out till the tremors stop.

Q12. The weather department has predicted that a thunderstorm is likely to occur on a certain day. Suppose you have to go out on that day. Would you carry an umbrella? Explain.

A. No, I would not carry an umbrella, because the pointed metallic rod of the umbrella can become a target of lightning. Electric discharge can occur through the metallic rod which can give an electric shock.

Extra Questions:

Q1. Define the following:

- A.
- a) **Earthing:** The process of transfer of charges from a charged object to the earth is called earthing.
 - b) **Lightning:** The process of electric discharge between clouds and the earth or between different clouds causes lightning.

Q2. How can the magnitude of earthquake be measured?

A. The magnitude of an earthquake can be measured on a scale called Richter scale.

Earthquakes are classified on the basis of reading on Richter scale as follows:

0 - 2 - Unnoticed

2 - 4 - felt but not damaging

4 - 6 - Moderate

6 - 8 - Severe

8 - 10 - Very Severe.

Q3. Explain why atoms are electrically neutral?

- A.**
1. Atoms are made up of protons, neutrons and electrons.
 2. Protons are positively charged, electrons are negatively charged and neutrons have no charge.
 3. In a normal stage an atom has equal numbers of protons and electrons and it carries no charge, thus it is electrically neutral.

Q4. Name the instrument used to measure seismic waves. Describe its components.

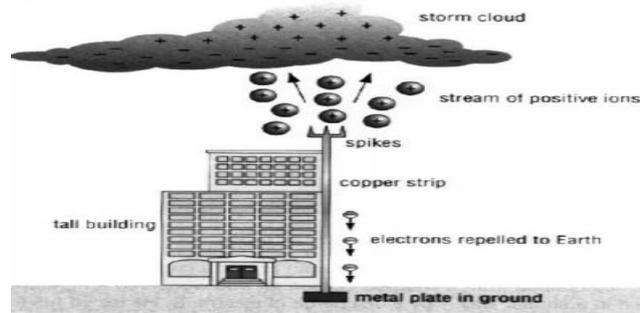
- A.**
1. The instrument used to measure seismic waves is called a seismograph.
 2. It consists of a pendulum bob or a vibrating rod suspended with a string.
 3. A pen is attached to this bob upside down.
 4. A roll of graph paper is placed on a rotating drum that is fixed to the base of seismograph.
 5. The instrument is fixed to the ground.

Q5. Describe the process of electric discharge during a thunderstorm.

- A.**
1. During the development of a thunderstorm there is an upward movement of air currents and the water droplets move downwards.
 2. Due to these vigorous movements positive and negative charges separate from each other.
 3. The positive charges accumulate near the upper edges of the cloud and negative charges collect near the lower edges of the cloud.
 4. The positive charges are also induced near the ground.
 5. Although air is a poor conductor of electricity yet when the magnitude of the collected charges becomes very large air is no longer able to resist their flow.
 6. Hence negative charges meet positive charges producing streaks of bright light and loud sound.
 7. This streak of bright light is known as lightning and the process is known as electric discharge.

Q6. Draw a neat and labelled diagram of a lightning conductor and explain how it protects a building from lightning?

- A.**
1. A lightning conductor is a device used to protect a building from the effect of lightning.
 2. It consists of a metal rod with spikes on the top and a copper plate attached to the lower end.
 3. The copper plate is buried deep in the earth.
 4. The rod provides easy route for the transfer of electric charge to the ground.



Q7. Give the various causes that result in an earthquake. Explain how movement of tectonic plates causes an earthquake.

A. An earthquake can be caused due to the following reasons:

1. Disturbance in tectonic plate.
2. Volcanic eruption.
3. Underground nuclear explosion.
4. Collision of meteor and the earth.

Earthquake caused due to movement of tectonic plates:

- (1) The crust and the upper layer of mantle together forms the earth's lithosphere.
- (2) The earth's lithosphere is not a single piece, it is divided into many small fragments called tectonic plates.
- (3) Tectonic plates move continuously.
- (4) When these move, they rub against each other, sometimes getting interlocked. This prevents them from moving.
- (5) For years forces pushing the two plates from beneath create tremendous pressure against the edges of the plate.
- (6) As the pressure continues to build the strain rips the two plates apart.
- (7) This sudden ripping of the two plates sends waves of high energy in all directions within and along the surface of the earth.
- (8) These waves are called seismic waves and are felt as earthquake when they reach the surface.

CHAPTER-14 CHEMICAL EFFECTS OF ELECTRIC CURRENT

Text Book Exercise Page 180-181

Q.1,3,5,6 to be discussed and done in textbook.

Q2. When the free ends of a tester are dipped into a solution, the magnetic needle shows deflection. Can you explain the reason?

A. Yes, the solution does conduct electricity. Compass needle shows deflection due to magnetic effect of electric current.

Q4. The bulb does not glow in the set-up shown in figure. List the possible reasons. Explain your answer.

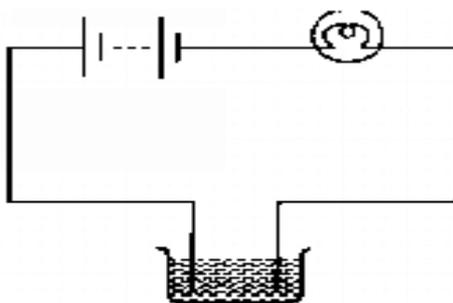


Fig. 14.2

A. The liquid does not conduct electricity because either:

1) The cells may be weak or the current may be so weak that it does not heat the filament of the bulb allowing it to glow.

2) Liquid/electrolyte is not conducting.

3) Bulb may be fused.

Q7. In case of a fire, before the firemen use the water hoses, they shut off the main electrical supply for the area. Explain why they do this.

A. Firemen shut off the main electrical supply for the area because water is a good conductor of electricity and the firemen can get electrocuted.

Q8. A child staying in a coastal region tests the drinking water and also the seawater with his tester. He finds that the compass needle deflects more in the case of seawater. Can you explain the reason?

A. The sea water contains more salts dissolved in it as compared to the tap water. So, the deflection of the compass needle is more.

Q9. Is it safe for the electrician to carry out electrical repairs outdoors during heavy downpour? Explain.

A. No, it is not advisable for electrician to carry out electrical repairs during heavy downpour because water is a good conductor of electricity and the person can get shock.

Q10. 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 a tester. To her surprise she found that the compass needle showed deflection. What could be the reasons?

A. The rainwater showed deflection with the tester because it is not as pure as distilled water. Distilled water does not have any salts dissolved in it, but rain water may have some impurities in it.

Q11. Prepare a list of objects around you that are electroplated.

A. Examples of electroplated objects are as follows:

(i) Chromium plating is done on different parts of cars, buses and motor cycles to give them shiny appearance.

(ii) A fine layer of gold is deposited on the silver ornaments and they are called gold-plated ornaments.

(iii) Iron used in constructing a building is coated with a layer of zinc. (galvanization). This protects iron from corrosion and rusting.

Q12. The process that you saw in Activity 14.7 is used for purification of copper. A thin plate of pure copper and a thick rod of impure copper are used as electrodes. Copper from impure rod is sought to be transferred to the thin copper plate. Which electrode should be attached to the positive terminal of the battery and why?

A. Copper ions are positively charged.

They are attracted towards the plate which is connected to the negative terminal of the battery. As copper ions are transferred to the thin copper plate, this thin pure copper plate must be connected to the negative terminal of the battery.

Consequently, impure copper rod is connected to the positive terminal of the battery.

Extra Questions:

Q.1 Define:

A. **1) Electrodes-**

Electrodes are the terminals through which current is passed into a liquid.

They are of two types: cathode and anode.

2) Electrolysis

Electrolysis is the breaking up of a compound from its solution on passing electric current through the electrolyte.

3) Electrolyte:

The liquid which conducts electricity and undergoes decomposition. eg. Solution of acid, base and salt.

Q2. Give three applications of chemical effect of current.

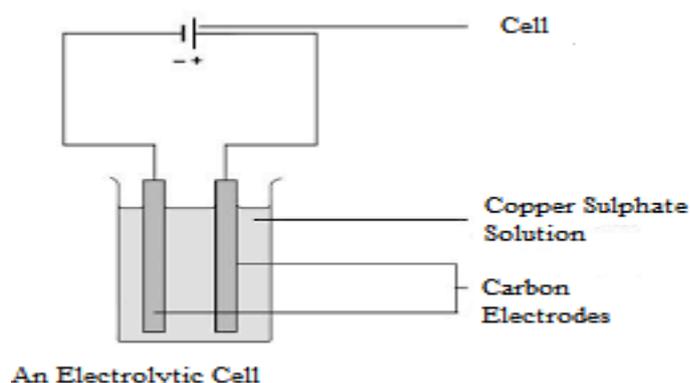
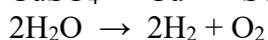
A. Applications of chemical effect of current are:-

- (a) Electroplating.
- (b) Refining of impure metals
- (c) Extraction of metals from their ores.

Q3. Describe with a well labelled diagram the process of electrolysis of copper sulphate.

- A.
- 1) Electrolysis is carried out in an apparatus called voltameter or electrolytic cell.
 - 2) It consists of a glass vessel containing an electrolyte (CuSO_4) and two carbon electrodes connected to a battery.
 - 3) When electric current is passed through aqueous CuSO_4 solution, the CuSO_4 dissociates into Cu^{+2} and SO_4^{2-} ions.
 - 4) Cu^{+2} ions collect at cathode and SO_4^{2-} ions move towards anode.
 - 5) After sometime time, we will observe the formation of bubbles at the positive electrode.
 - 6) This is because of electrolysis of water into hydrogen gas and oxygen gas due to passage of electric current.
 - 7) If we test the gas evolving at anode with a burning splinter, we will find that it burns more brightly showing O_2 is evolved near it.

Chemical Equations:-



Electrolysis of Copper Sulphate

CHAPTER-13

SOUND

Text Book Exercise page no. 168-169

Q-1 to 4 to be discussed and done in textbook.

Q.5 A pendulum oscillates 40 times in 4 seconds. Find its time period and frequency.

A.5 No. of oscillations = 40.
Time Taken = 4 sec.
Frequency = Number of oscillations/ Time taken
= $40/4 = 10\text{Hz}$
Time period = $1/F = 1/10 = 0.1$ second

Q.6 The sound from a mosquito is produced when it vibrates its wings at an average rate of 500 vibrations per seconds. What is the time period of the vibration?

A.6 No. of Vibration in 1 second = 500.
Therefore, Frequency = 500Hz.
Time = $1/F$
= $1/500 = 0.002\text{sec}$

Q.7 Identify the part which vibrates to produce sound in the following instruments.

- (a) Dholak**
- (b) Sitar**
- (c) Flute**

A.7 (a) Dholak - Stretched membrane.
(b) Sitar - Stretched string
(c) Flute - Air column.

Q.8 What is the difference between noise and music ? Can music become noise sometimes?

A.8	Noise	Music
	1. Unpleasant sound is called noise.	1. Pleasant sound is called music.
	2. Noise can produce many health hazards.	2. Music brings about a soothing effect.
	3. It is produced by irregular vibrations.	3. It is produced by regular vibrations.

Yes, music can become a noise sometimes when the musical instruments produce very high volume sounds.

Q.9 List sources of noise pollution in your surroundings.

A.9 The sources of noise pollution are :

- (i) The sound produced by buses and trucks / automobiles.
- (ii) The sound produced at the construction site.
- (iii) The sound produced by playing of T.V., radio and loudspeaker.
- (iv) Bursting of crackers, and sound of big machines in the factories.

Q.10 Explain in what way noise pollution is harmful to humans.

A.10 1) The noise pollution cause many health related problems like lack of sleep, hypertension, anxiety, etc. are some of the problems that may be caused due to noise pollution.
2) Moreover, a person who is exposed to a loud sound continuously may get temporary or permanent deafness.

Q.11 Your parents are going to buy a house. They have been offered one on the roadside and another three lanes away from the roadside. Which house would you suggest your parents should buy ? Explain your answer.

A.11 I would suggest my parents to buy the house which is three lanes away from the roadside because this would protect us from noise pollution which is maximum at roadside building.

Q.12 Sketch larynx and explain its function in your own words.

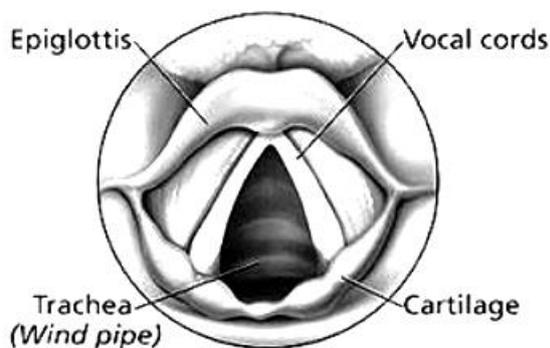
A.12 1)The other name of larynx is voice box.

2)It is present at the upper end of the windpipe.

3)The function of larynx is to produce sound.

4)Two Vocal cords are stretched across larynx in such a way that it leaves a narrow slit between them for the passage of air.

5)When the lungs force air through the slit the vocal cords vibrate producing sound.



Q.13 Lightning and thunder take place in the sky at the same time and at the same distance from us. Lightning is seen earlier and thunder is heard later. Can you explain. Why?

A.13 Speed of light is more than the speed of sound.

Light travels at the speed of 3,00,000 km/s which is very large in comparison to the speed of sound which travels at the rate of 330 m/s in air. That is why lightning is seen earlier and thunder is heard later.

Extra Questions:

Q.1 Define the following terms:

A. 1.Frequency :The number of oscillations per second is called the frequency.

2.Amplitude:The maximum displacement of a vibrating object about its mean position is known as amplitude.

Q.2 Explain audible and inaudible sound in brief.

A. Sounds of frequency less than 20 Hz and more than 20000 Hz cannot be detected by the human ear, such sounds are called inaudible sounds. Humans can hear sounds of frequencies between 20 Hz to 20000 Hz.

Q.3 Which characteristics of sound determines loudness and pitch of a sound?

A. Loudness depends on amplitude of sound whereas pitch depends on frequency of sound. If the amplitude is more the loudness is more. If the frequency is more the pitch is more.

Q.4 Write a short note on uses of ultrasonic sound waves.

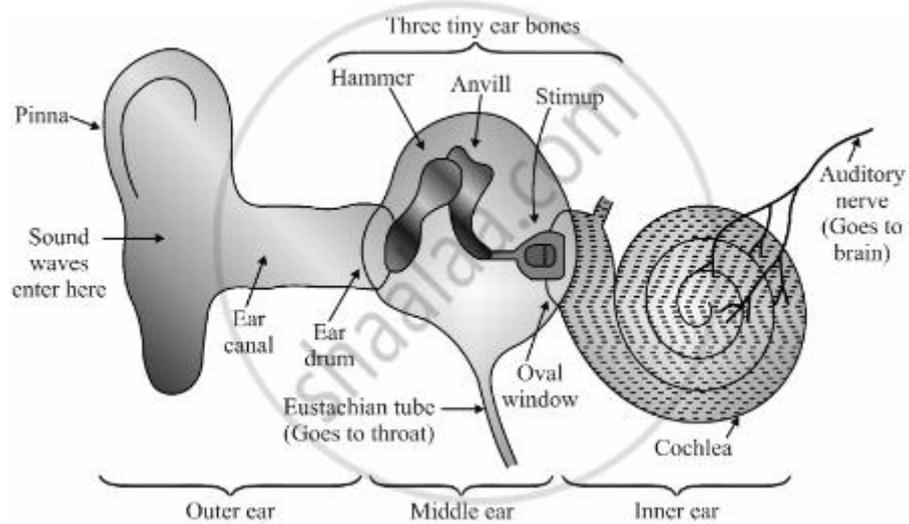
A. 1. SONAR : An acronym for sound navigation and ranging. It is a system that uses transmitted and reflected underwater sound waves. It is used in submarines, for mine detection, depth detection etc.

2. INDUSTRIES: Grease, dirt, rust and paint from metal ceramics, glass and crystals are cleaned in industries with the help of ultrasonic sound waves.
3. AGRICULTURE: Ultrasonic sound waves are used to improve the quality of homogenised milk, control pest etc.
4. MEDICINES: Ultrasonic sound waves are used for imaging the organs of human body, sterilizing surgical instruments, brain surgery, treatment of arthritis etc.

Q.5

A.

Draw a well labelled diagram showing parts of human ear.



CHAPTER-12

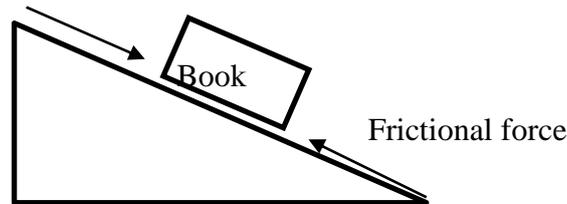
FRICTION

Text book Exercise Pg. No. 155

Q.1, Q.2, and Q.3 discussed and done in class in text book.

Q.4 Suppose your writing desk is tilted a little. A book kept on it starts sliding down. Show the direction of frictional force acting on it.

A The frictional force will act parallel to the inclined surface, opposite to the direction of the sliding of book.



Q.5 You spill a bucket of soapy water on a marble floor accidentally. Would it make easier or more difficult for you to walk on the floor? Why?

A Soapy floor reduces the frictional force applied by the floor to a minimum. That is why, it is difficult to walk on a soapy floor.

The coating of soapy water makes the floor smooth, and the foot cannot make a proper grip on the floor, so we may fall.

Q.6 Explain why sportsmen use shoes with spikes?

Sportsmen use shoes with spikes because spikes produce the desired frictional force and thus help in holding the ground firmly.

Q.7 Iqbal has to push a lighter box and Seema has to push a similar heavier box on the same floor. Who will have to apply a larger force and why?

A Seema will have to apply a larger force, because her box is heavier and a heavier object will have to undergo greater frictional force from the surface of contact.

Q.8 Explain why sliding friction is less than static friction.

A Suppose a box kept on the surface has to be pushed.

When the box starts sliding, the contact points on its surface do not get enough time to lock into the contact point on the floor.

So, sliding friction is slightly less than the static friction and we find it easier to move the box already in motion than to get it started.

Q.9 Give examples to show that friction is both a friend and foe.

A (i) **Friction as a friend:**

(a) To hold a glass, we have irregularities on our palm, which interlock with the irregularities present on glass.

(b) We can tie a knot and sew clothes because of friction.

(c) Teacher writes on black-board with chalk because of friction between black-board surface and the chalk.

(d) If there is no friction, then a moving body would never stop.

(ii) Friction as a foe:

(a) Friction wears out materials, whether they are screws, ball-bearing or soles of shoes.

(b) Friction can also produce heat, which increases wear and tear of machine parts.

(c) It also causes much wastage of energy.

Q.10 Explain why objects moving in fluids must have special shapes.

A When a body moves in a fluid it experiences an opposite force which tries to oppose its motion in the fluid. This opposing force is called drag.

Drag depends on:

1)Speed of the object with respect to the fluid.

2)Nature of the fluid.

3)Shape of the object-Streamlining reduces drag, hence it becomes easier for the object to move in the fluid.

Extra questions:

Q.1 What is friction? On what factors does friction depend?

A Friction is the force that opposes the motion of an object.

Friction depends on:

1) The nature of the surfaces in contact.

2) How hard the two surfaces press each other.

Q.2 What causes friction?

A i) Friction is caused by irregularities on the two surfaces in contact.

ii) Irregularities on the two surfaces lock into one another.

iii)When we attempt to move any surface, we have to apply a force to overcome interlocking.

Q.3 Explain how lubrication helps in reducing friction between two surfaces?

A When lubricants like oil, grease or graphite is applied between the moving parts of a machine, a thin layer is formed there and moving surfaces do not directly rub against each other.

Interlocking of irregularities is avoided to a great extent. Movement becomes smooth.

Q.4 Why are spaceships provided with heat shield?

A While going and returning back to atmosphere a spaceship experiences a lot of air friction which generates enormous amount of heat.

The heat produced due to this friction can burn the spaceship.

CHAPTER-9

Reproduction in animals

Text Book Exercise page 110,111

Q.3,4 and 10 to be done in Textbook.

Q1. Explain the importance of reproduction in animals.

- A.
- 1) The production of a new individual from parents is known as reproduction.
 - 2) Reproduction is very important as it ensures the continuation of similar kinds of individuals, generation after generation.
 - 3) If this process does not exist, the generation of living beings will vanish from the earth.

Q.2 Describe the process of fertilisation in human beings.

- A.
- 1) In human beings, sexual reproduction occurs.
 - 2) In this process, the fusion of male and female gametes takes place.
 - 3) Male individuals produce sperms in testes and females produce ovum in ovary.
 - 4) Sperms are released by the male which moves towards the fallopian tube in the female reproductive system.
 - 5) Female releases one ovum every month in the middle of the menstruation cycle which travels towards the fallopian tube.
 - 6) The fusion of male gamete (sperm) and female gamete (ovum) takes place in the fallopian tube.
 - 7) The fusion of male and female gametes is called fertilization.

Q5. Give two differences between zygote and foetus.

- | ZYGOTE | FOETUS |
|---|---|
| 1) It is formed by the fusion of male and female gametes. | 1) It is formed by the growth and development of the embryo. |
| 2) It is the beginning of the formation of a baby. | 2) It is an unborn baby in the uterus. |
| 3) It is a single cell. | 3) It is multicellular with body features of a developing baby. |

Q6. Define asexual reproduction. Describe two methods of asexual reproduction

- A.
- 1) The type of reproduction in which only single parent is involved is called asexual reproduction.

2) Asexual reproduction takes place in very small primitive organisms like Hydra and microscopic organisms like Amoeba.

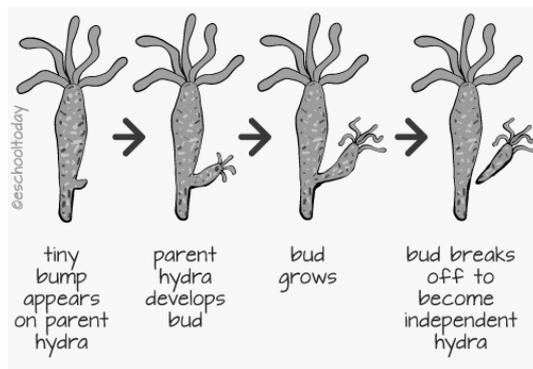
Budding-1) New individual develops as an outgrowth from a single parent.

2) In hydra a small bulge called bud develops into a new individual.

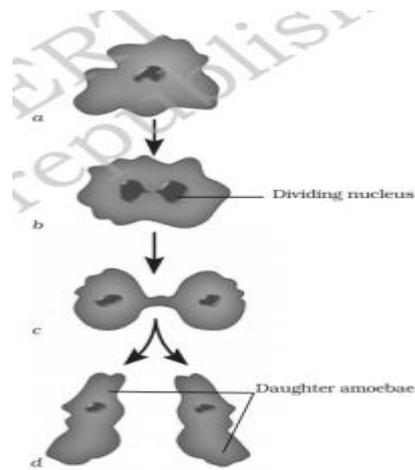
3) Bud detaches itself from the parent and grows into a new individual.

Binary fission- 1) The body of unicellular organisms like amoeba divides into two equal parts and each part develops as a new individual.

2) First the nucleus divides followed by division of cytoplasm.



Budding in Hydra



Binary fission in Amoeba

Q7. In which female reproductive organ does the embryo get embedded?

A. The embryo gets embedded in the uterus for further development.

Q8. What is metamorphosis? Give an example.

A. 1. The drastic change which takes place during the development of an animal is called metamorphosis.

2. Change of an intermediary stage of an animal into a young one resembling an adult.

Example: eggs → Caterpillar → Pupa → Silk moth

Q9. Differentiate between internal fertilisation and external fertilisation.

A. **Internal fertilisation**

1) The fertilisation that takes place inside the female body.

2) Less number of gametes are produced and released.

External fertilisation.

1) The fertilisation that takes place outside the female body.

2) More number of gametes are produced and released.

Extra Questions:

Q1. Define the following:

- A
- 1) **Embryo:** An embryo is a ball of cells formed by the repeated cell divisions of zygote.
 - 2) **Implantation:** The attachment of embryo in uterus is called implantation.

Q2. Differentiate between :

1) Sexual and Asexual reproduction.

A.

Sexual Reproduction

Asexual Reproduction

- | | |
|---|---|
| 1) Usually two parents take part. | 1) A Single parent is involved. |
| 2) Two types of gametes are produced. | 2) Gametes are not produced. |
| 3) New individual is not identical to the parent. | 3) New individual is identical to the parent. |

2) Testis and Ovary

Testis

Ovary

- | | |
|---|---|
| 1) Male reproductive organs in humans. | 1) Female reproductive organs in humans. |
| 2) Present outside the body. | 2) Present inside the body. |
| 3) It secretes male hormone testosterone. | 3) It secretes female hormones estrogen and progesterone. |

3) Sperm and Ovum

Sperm

Ovum

- | | |
|---|--|
| 1) Male gamete | 1) Female gamete |
| 2) Small in size with little cytoplasm. | 2) Large in size with more cytoplasm. |
| 3) Large number of sperms are produced at a time. | 3) Only one egg is produced by one of the ovaries every month. |

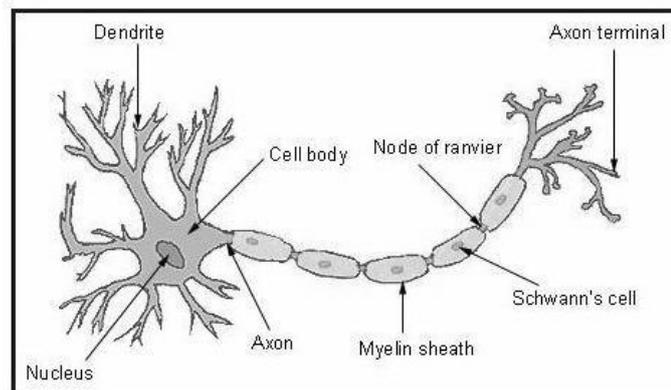
CHAPTER-8

Cell- Structure and Functions

Text book Exercise Pg. No. 98

Q.1, Q.4, Q.7 and Q.10 discussed and done in class in text book.

Q 2. Make a sketch of the human nerve cell. What function do nerve cells perform?



Ans The main function of the nerve cell is to transmit messages to the brain from receptor organs and vice versa. It has a control over the working of different parts of the body.

Q.3 Write short notes on the following:

Ans a) Cytoplasm-

1. Cytoplasm is a jelly like fluid that contains all the cell organelles such as the Mitochondria, Ribosomes, Golgi bodies, etc.
2. It is present between the nucleus and the plasma membrane.
3. It helps in the exchange of materials between cell organelles.
4. It is made up of eighty percent water and is usually clear and colourless.

b) Nucleus of a cell-

(a) The nucleus is a double-membrane bound cell organelle present in eukaryotic cells.

(b) It contains the DNA, the genetic material.

It is the command centre of the cell and is spherical in shape. It has the following components:

1. Nuclear membrane:

It is a double-layered membrane.

It separates the contents of the nucleus from the cytoplasm and acts as a wall.

It has pores that allow the transfer of certain substances in and out of the cell.

2.Nucleolus:

It is a small dense spherical body. It is not bounded by any membrane.

3.Chromosomes:

These are thread-like structures that carry genes.

All the necessary information required for the transfer of characteristics from the parents to the offspring are stored in the genes.

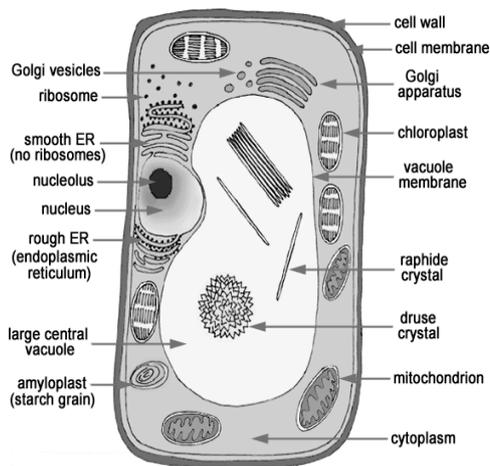
Inheritance of characteristics is possible only because of chromosomes.

4.Nuclear sap:

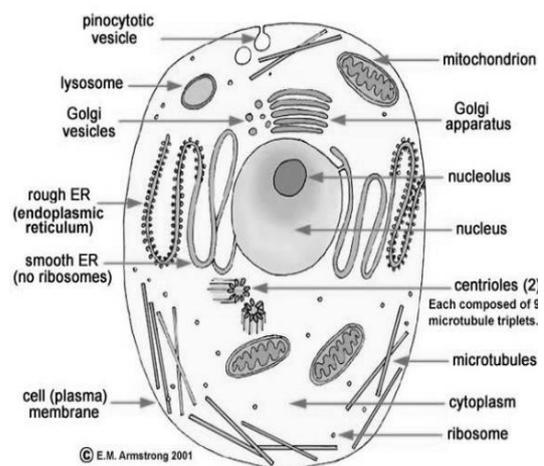
It is a jelly like substance that fills the nucleus.

Q.5 Make sketches of animal and plant cells. State any three differences between them.

Ans



Plant Cell



Animal Cell

1)They have a cell wall.

1)They do not have a cell wall.

2)Lysosomes are absent, if present very small in size.

2)Lysosomes are present.

3)Plastids are present.

3)Plastids are absent.

4)A large vacuole is present

4) Vacuole is absent, if present small in size.

Q.6 State the difference between Prokaryotes and Eukaryotes.

Ans

Prokaryotes

Eukaryotes

1) The size of the cell is generally small.

1) The size of the cell is generally large.

2) Nucleus is absent.

2) Nucleus is present.

3) It contains a single chromosome.

3) It contains many chromosomes.

4) Nucleolus is absent.

4) Nucleolus is present.

5) Membrane bound organelles are absent.

5) Membrane bound organelles are present.

Q.8 'Cells are the basic structural units of living organisms.' Explain.

Ans

1. Various components of plants and animals are constituted by cells.

(a) It is the smallest unit of life and is capable of all living functions.

They are the building blocks of life. That is the reason why cells are referred to as 'the basic structural and functional blocks of life'.

(b) Cells exist in various shapes and sizes and perform the functions of life like respiration, reproduction, nutrition, etc.

Q.9 Explain why chloroplasts are found only in plant cells.

Ans

1. Only plant cells contain chloroplasts.

(a) They contain chlorophyll, a green pigment.

(b) This pigment is essential for photosynthesis.

(c) It manufactures food for the plants with the help of the sunlight that it traps.

EXTRA QUESTIONS

Q.1 Mention the functions of the following:

Ans

1) Mitochondria- Cells power house, provides energy to the cell.

2) Endoplasmic reticulum- Responsible for synthesis, storage and transport of materials.

3) Golgi Body- Responsible for secretion of materials.

4) Ribosomes- Synthesizes proteins for the cell.

5) Lysosomes- Cell's suicide bag, helps in digesting excess or worn-out organelles, engulfs bacteria.

6) Vacuole- Stores excess water, useful materials, pigments and waste products.

7) Cell membrane-

1) Allows movement of substances both inwards and outwards.

2) Provides shape to the cell.

3) Protects the cell.

8) Cell wall- 1) Provides protection.

2) Shape and support to the cell.

Q.2 How are cells organised in an organism?

Ans

Cells → Tissues → Organs → Organ system → Organisms

CHAPTER-7

Conservation of Plants and Animals

Text book Exercise Pg. No. 87, 88

Q.1, Q.9 and Q.11 discussed and done in class in text book.

Q.2 Differentiate between the following:

- Ans a)**
- | Wildlife sanctuary | Biosphere reserve |
|--|--|
| 1) It occupies a comparatively smaller area of land. | 1) It is spread over a large area of land. |
| 2) It is mainly for the protection of wild animals of the area in their natural habitat. | 2) It is for the conservation of biodiversity of the area as well as economic development of the area. |
- b)**
- | Zoo | Wildlife sanctuary |
|--|--|
| 1) In a zoo, the wild animals live in artificial settings such as cage and enclosures. | 1) In it, wild animals live in their natural habitat. |
| 2) It contains wild animals from different parts of the country and world. | 2) It contains animals and birds found locally. |
| 3) Zoo is open for public for a fixed time every day. | 3) It is not open for public. Public can only visit it with permit, accompanied by forest guard. |
- c)**
- | Endangered Species | Extinct Species |
|---|---|
| 1) These are those species which are facing danger of extinction. For eg. Tiger | 1) These are those species which have vanished from earth. For eg Dinosaurs |
- d)**
- | Flora | Fauna |
|--|---|
| Flora are the plants found in a particular region. For eg. Sal | Fauna are the animals found in a particular region. For eg Chinkara |

Q.3 Discuss the effects of deforestation on the following:

Ans (a) Wild animals- Destruction of habitat.

Animals may become extinct or endangered.

(b) Environment- Climate changes disturb the environment.

Global warming is caused due to excess carbon dioxide.

(c) Villages- It will lead to soil erosion which will then lead to desertification.

Water table will decrease.

(d) Cities- Pollution.

Global warming which will cause frequent climatic changes.

Health problems.

(e) Earth- Global warming causes melting of icecaps.

It will disturb the earth's ecological balance.

(f) The next generation- Pollution causing various health problems.

Depletion of natural resources.

Q.4 What will happen if:

Ans (a) If we go on cutting trees, then following situation will arrive:

(i) The climate change will affect the environment, due to global warming and there will be no rain.

(ii) The soil will become infertile due to soil erosion.

(iii) Frequent droughts and floods.

(b) If the habitat of an animal is disturbed

(i)The animal may not be in position of getting its natural habitat as well as food. It may become endangered or extinct.

(ii)It will disturb the earth's ecological balance.

(c) The top layer of soil is exposed.

(i)Removal of the top layer of soil by floods and heavy winds will expose the lower hard and rocky layers. This soil has less humus and less fertility.

(ii)It will lead to desertification and frequent droughts and floods.

Q.5 Answer in brief:

(a) Why should we conserve biodiversity?

Ans We should conserve biodiversity:

- 1) For the continuation of species
- 2) For maintaining the ecological balance.
- 3) For the availability of natural resources in future.

(b) Protected forests are also not completely safe for wild animals. Why?

Ans It is because despite all these the poachers keep killing or capturing the animals in these forests. That is why protected forests are also not completely safe for animals.

(c) Some tribal depend on the jungle. How?

Ans Jungle provides them food and protection. That is why; they are fully dependent upon the forests.

(d) What are the causes and consequences of deforestation?

Ans **Causes of deforestation-**

- (i) Procuring land for cultivation.
- (ii) Building houses and factories.
- (iii) Natural Calamities like flood, drought and forest fire.

Consequence of deforestation-

- (i) Global warming.
- (ii) Soil erosion
- (iii) Melting of ice on poles.

(e) What is a Red Data Book?

Ans Red Data Book a book which keeps record of all endangered animals and plants.

(f) What do you understand by the term migration?

Ans Migration is the phenomenon of movements of a species from its own habitat to some other habitat for a particular time period every year for a specific purpose like escaping from harsh climate, breeding, etc.

Q.6 In order to meet the ever-increasing demand in factories and for shelter, trees are being continually cut. Is it justified to cut trees for such projects? Discuss and prepare a brief report.

Ans Of course, to meet the ever-increasing demand in factories and for shelter, trees are being continually cut, which is not justified at all.

(a) If one tree is cut, at least five trees should be grown so that the reforestation process will remain continuous.

(b) But, if trees are cut blindly and no trees are planted then the earth will face global warming, no rainfall, climate change, soil erosion and deforestation.

So, cutting trees for any reason at all is not justified.

Q.7 **How can you contribute to the maintenance of the green wealth of your locality? Make a list of actions to be taken by you.**

Ans For the maintenance of the green wealth of my locality. I will prefer reforestation in the locality.

I shall start a campaign, along with my friends, to make the people of the locality aware of the importance of trees. Once the people become conscious of the importance of plants they will be requested to do the following-

(a) Each family should plant at least one tree in the monsoon month.

(b) During summer, they should ensure watering of the plants every day.

(c) On the occasion of a birthday, marriage ceremony and other happy occasions, they should give gifts to their friends and relatives.

(d) Saving paper.

Q.8 **Explain how deforestation leads to reduced rainfall.**

Ans (a) Deforestation leads to accumulation of carbondioxide in the atmosphere which results in global warming as carbondioxide traps the heat of the sun rays.

(b) The increase in temperature of earth will disturb the water cycle and reduce rainfall causing drought in the region.

Q.9 **Why should paper be saved? Prepare a list of ways by which you can save paper.**

Ans Manufacturing of paper needs trees. By cutting trees, deforestation is caused.

(a) If paper is saved or recycled, so many trees can be saved. To make one tone of paper 17 full grown trees are to be cut.

(b) Therefore, to stop deforestation, we should save paper. It can be saved by recycling.

Paper can be recycled for 5-7 times and can be used. If everyone who uses paper could save at least one sheet of paper in a day, we can save many trees in a year.

Extra Questions:-

Q.1 Define the following:

- 1) **Conservation-** Wise and judicious use of our natural resources is called conservation.
- 2) **Biodiversity-** The variety of plants, animals and microorganisms found in a particular area or habitat are included in the biodiversity of the region.
- 3) **Ecosystem-** An ecosystem is a system which includes all living organisms (plants, animals and microorganisms) of an area and the physical environment (soil, air and water) in which they live.
- 4) **Species-** A species is a group of population which are capable of interbreeding. Members of a species have common characteristics.
- 5) **Endemic species-** Endemic species are those species of plants and animals which are found exclusively in a particular area. Eg endemic flora of Panchmarhi is sal and wild mango and fauna are giant squirrel and bison.
- 6) **Biosphere-** Biosphere is that part of the earth where living organisms exist. It includes land that is the surface of the earth, atmosphere of the earth as well as water bodies.

Q.2 Differentiate between wildlife sanctuary and national park.

Ans

Wildlife sanctuary

National park

- | | |
|---|--|
| 1) It protects and preserves wild animals in their natural habitat. | 1) It protects and preserves wild animals in their natural environment as well as scenic beauty, historical objects and habitats of scientific interest in the area. |
|---|--|

CHAPTER-4

Materials: Metals and Non-Metals

Text book Exercise Pg. No. 53, 54 and 55

Q.1, Q.2, Q.3, Q.4, Q.5 and Q.8 discussed in class and done in text book.

Q.6 Give reasons for the following:

a) Aluminium foils are used to wrap food items.

1. Aluminium foils are used to wrap food items because aluminium metal is malleable and it can be beaten into foil.
2. It is cheap and keeps the food warm.

b) Immersion rods for heating liquids are made up of metallic substances.

Immersion rods for heating liquids are made up of metallic substances because metals are good conductors of heat and electricity.

c) Copper cannot displace zinc from its salt solution.

1. In an aqueous solution, a high reactive metal can displace a less reactive metal from its salt.
2. Since zinc is more reactive than copper, copper cannot displace zinc from its salt solution.

Copper + Zinc Sulphate \longrightarrow No reaction

d) Sodium and potassium are stored in kerosene.

Sodium and potassium are stored in kerosene because they are highly reactive elements and can easily catch fire with the contact of air and water

Q.7 Can you store lemon pickle in an aluminium utensil? Explain.

1. No, it is not possible to store lemon pickle in an aluminium utensil because lemon pickle contains an acid.
2. This acid of pickle can react with aluminium (metal) to form a poisonous salt and hydrogen gas.
3. This may spoil the pickle and make it unfit for consumptions.

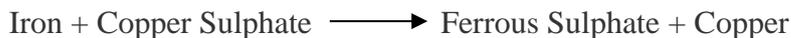
Q.9 What happen when:

a) Iron nails are placed in copper sulphate solution?

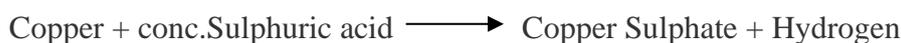
b) Dilute sulphuric acid is poured on a copper plate?

Write word equations of the reaction involved.

- a) 1. Iron being more reactive than copper displaces copper from copper sulphate.
2. In this reaction, the blue colour of copper sulphate fades and turns green.
3. There is deposition of copper on the iron nail.



- b) 1. When dilute sulphuric acid is poured on a copper plate, there will be no reaction.
2. But when, concentrated sulphuric acid is poured on a copper plate it reacts to give copper sulphate and hydrogen gas.



Q.7 Saloni took a piece of burning charcoal and collected the gas evolved in a test tube.

a) How will she find out the nature of gas?

b) Mention the equation of the reaction taking place in this process.

a) In a test tube containing gas, add a few drops of water. Now cover the test tube and shake well. After shaking, test the solution with blue litmus and red litmus. It will change from blue to red. Thus, the gas is acidic in nature.

b) Charcoal reacts with oxygen to form carbon dioxide gas.



Carbon dioxide reacts with water to form carbonic acid, which turns blue litmus paper red.

Q.11 Once Reeta along with her mother went to the jeweller's shop. Her mother gave old gold jewellery to the goldsmith to polish. Next day when they brought the jewellery back, they found that there was a slight loss in his weight. Can you suggest a reason for the loss in weight?

A In order to polish the gold ornament, it is to be dipped into a liquid called aqua regia (a mixture of hydrochloric acid and nitric acid). On getting dissolved in the environment of aqua regia, the outer layer of gold dissolves and an inner shiny layer appears. The dissolving of the layer causes a reduction in the weight of the jewellery.

Extra questions:

Q.1 Define the following:

a) **Malleability-** The property of metals by which they can be beaten into thin sheets is called malleability.

b) Ductility- The property of metals by which it can be drawn into wires is called ductility.

c) Corrosion-The chemical reaction between a material, usually a metal and its environment is called corrosion. Corrosion of iron is called rusting.

d) Alloy- An alloy is a metallic substance made by mixing two or more metals or a metal and a non- metal to obtain desirable qualities such as hardness, strength, etc. e.g. stainless steel, brass, bronze.

Q.2 Mention five uses of non-metals.

- 1) Oxygen is used for respiration.
- 2) Chlorine is used to purify water.
- 3) Iodine in the form of tincture iodine is used as an antiseptic and is applied on wounds.
- 4) Nitrogen in fertilizers is used for plant growth.
- 5) Phosphorus is used in crackers.

CHAPTER-5

Coal and Petroleum

Text Book Exercise Page 62 and 63

Q.2, 4, 5 and 9 to be discussed and done in the textbook.

Q.1 What are the advantages of using CNG and LPG as fuels?

- A. The advantages of using CNG and LPG are:
- 1) They burn easily.
 - 2) They have high calorific value.
 - 3) They burn with a smokeless flame and do not cause pollution.
 - 4) They are easy to transport.

Q.3 Describe how coal is formed from dead vegetation. What is this process called?

- A.
- 1) About 300 million years ago, the earth had dense forests in low lying wetland areas.
 - 2) Due to earthquakes, floods and volcanic eruptions, these forests got buried under the soil.
 - 3) As more soil deposited over them, they were compressed. The temperature also raised as they sank deeper and deeper.
 - 4) Due to high temperature and lack of oxygen dead plants inside the earth got slowly converted to coal. This process of coal formation is called carbonization

Q.6 Explain why fossil fuels are exhaustible natural resources.

- A. Fossil fuels are limited in nature, and are liable to be exhausted by different human activities. So, fossil fuels are called as exhaustible natural resources.

Q.7 Describe characteristics and uses of coke.

- A.
- 1) Characteristics of coke are:
 - Tough
 - Porous
 - Black in colour
 - 2) Uses of coke:
 - In manufacturing steel.
 - In the extraction of metals

Q.8 Explain the process of formation of petroleum.

- A.
- 1) Petroleum was formed from dead organisms that got buried in the sea millions of years ago.
 - 2) These dead bodies got covered with layers of sand and clay.
 - 3) Lack of air, high temperature, and high pressure transformed these dead organisms into petroleum and natural gas.

Extra Questions:

Q.1 Define:

- A.
- a) **Natural resources:** The materials obtained from nature are called natural resources.
 - b) **Fossil fuels:** Fossil fuels are the materials of biological origin occurring within the

earth's crust which can be used as sources of energy.

- c) **Fractional distillation:** The process of separating the constituents of a liquid mixture by heating it and then condensing separately the components according to their different boiling points is known as fractional distillation.

Q.2 What is natural gas? State its uses.

- A. 1) Natural gas is a fossil fuel often found in association with petroleum. It mainly contains methane.
- 2) It is used as domestic and industrial fuel. It is also used in manufacturing many chemicals and fertilizers.

Q3. Explain how excessive use of fossil fuels is a matter of environmental concern.

- A. 1) Burning of fossil fuels is a major cause of air pollution which can lead to acid rain.
- 2) It also increases the amount of greenhouse gases on earth leading to global warming.
- 3) It also releases unburnt carbon particles which can cause many health problems.

Q4. What is destructive distillation? What are the major components of destructive distillation of coal?

- A. The process by which substances like wood, coal, etc. are decomposed by heat in the absence of air and distilled to produce useful products is known as destructive distillation.

The various components of destructive distillation of coal are:

Coke

Coal tar

Coal gas

CHAPTER-6

Combustion and Flame

Text book Exercise Pg. No. 75

Q.2 and Q.7 discussed and done in text book

Q.1 List conditions under which combustion can take place.

Ans Conditions under which combustion can take place are:

- i) Presence of combustible substance.
- ii) Presence of supporters of combustion.
- iii) Attainment of ignition temperature of the combustible substance.

Q.3 Explain how the use of CNG in automobiles has reduced pollution in our cities.

Ans The use of CNG in automobiles has reduced pollution in our cities because CNG does not produce any poisonous gas on burning. That is why it is considered as a cleaner fuel.

Q.4 Compare LPG and wood as fuels.

Ans

LPG

Wood

- | | |
|---|---|
| 1) It is expensive but readily available in cities and easy to transport. | 1) It is cheap fuel but not readily available in cities and difficult to transport. |
| 2) It has a high calorific value. | 2) It has a low calorific value. |
| 3) It causes less air pollution and prevents deforestation. | 3) It causes air pollution and deforestation. |
| 4) It has a low ignition temperature. | 4) It has a high ignition temperature. |

Q.5 Give reasons.

Ans a) Water is not used to control fires involving electrical equipment.

Water is not used to control fire produced by electrical equipment because water is a conductor of electricity and may result in electric shock.

b) LPG is a better domestic fuel than wood.

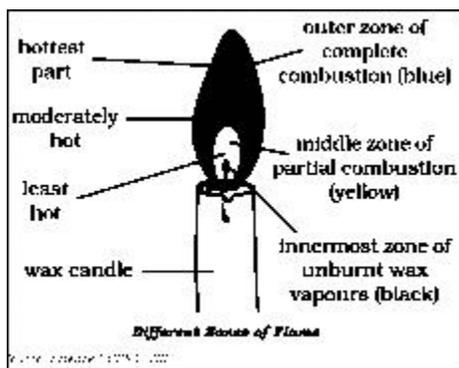
LPG is easily available . It is cheaper and burns in air at a moderate rate. It produces a large amount of heat and does not leave behind any undesirable substance.

- c) **Paper by itself catches fire easily whereas a piece of paper wrapped around an aluminium pipe does not.**

Paper catches fire easily, but when it is wrapped around an aluminium pipe, the ignition temperature does not meet as heat is transferred to aluminium which lowers the temperature of paper.

Q.6 Make a labelled diagram of candle flame.

Ans



Q.8 Explain how CO₂ is able to control fires.

Ans

- 1) Carbon dioxide being heavier than oxygen covers the fire like a blanket. Since the contact between fuel and oxygen is cut off, the fire is controlled.
- 2) When released from cylinders, CO₂ expands enormously in volume and cools down and brings down the temperature of the fuel.
- 3) The added advantage of carbon dioxide is that in most cases it does not harm the electrical appliances.

Q.9 It is difficult to burn a heap of green leaves but dry leaves catch fire easily. Explain

Ans

- 1) Green leaves contain a lot of water. So, when we try to burn green leaves, water contained in the leaves cools the combustible materials, so that its temperature is brought below its ignition temperature. This prevents the burning of green leaves.
- 2) In case of dry leaves, water is absent in them so the burning process starts as the temperature is raised above the ignition temperature and the leaves catch fire easily.

Q.10 Which zone of a flame does a goldsmith use for melting gold and silver and Why?

Ans

The goldsmith uses the outermost zone of a flame with a metallic blow pipe for melting gold and silver.

The flame in the outermost zone has the highest temperature sufficient to melt the gold and silver.

Q.11 In an experiment 4.5 kg of fuel was completely burnt. The heat produced was measured to be 180,000 kJ. Calculate the calorific value of the fuel.

Ans Calorific value of a fuel = Total heat produced/total fuel burnt.

Here, mass of fuel = 4.5 kg.

Heat produced = 180,000 kJ

Therefore, the calorific value of fuel = $180,000/4.5\text{kg} = 40,000 \text{ kJ/kg}$.

Q.12 Can the process of rusting be called combustion? Discuss.

Ans 1) Combustion is a chemical process in which a substance reacts with oxygen and gives out energy during the process, in the form of either heat or light or both.

2) Rusting of iron is an exothermic process as heat is released during rusting. Hence it is a kind of slow combustion.

Q.13 Abida and Ramesh were doing an experiment in which water was to be heated in a beaker. Abida kept the beaker near the wick in the yellow part of the candle flame. Ramesh kept the beaker in the outermost part of the flame. Whose water will get heated in a shorter time?

Ans The water of Ramesh's beaker will get heated in a shorter time because the outermost part of the flame is the hottest.

Additional Extra Questions:

Q.1 Define the following:

- Ans**
- i) **Combustion:** The process of burning of a substance in presence of oxygen is called combustion.
 - ii) **Ignition Temperature:** The temperature at or above which a substance starts burning.
 - iii) **Inflammable substance:** The substance that has low ignition temperature and catches fire easily.
 - iv) **Flame:** The visible gaseous part of the fire.
 - v) **Calorific value:** The amount of heat energy released by a unit quantity of fuel on complete combustion in oxygen is called the calorific value of fuel. It is expressed in kilojoules per kilogram (kJ/ kg) or kilocalorie per kilogram. (kcal/ kg)

Q.2 **Mention the principles to extinguish fire.**

Ans Fire can be extinguished by:

- 1) Removing the combustible substance from the site of fire.
- 2) Cutting the supply of oxygen.
- 3) Bringing down the temperature of the combustible substance.

Q.3 **Distinguish between luminous and non-luminous zones of the candle flame.**

Ans

Luminous

Non Luminous

- | | |
|---|---|
| 1) It is yellow in colour. | 1) It is blue in colour. |
| 2) It is formed as a result of incomplete combustion of fuel in insufficient oxygen availability. | 2) It is formed as a result of complete combustion of hydrocarbons in excess of oxygen. |
| 3) Its temperature is lower than the non luminous zone. | 3) Its temperature is highest from all the three zones. |
| 4) It leaves black carbon particles and other residues. | 4) It does not leave any residues. |

CHAPTER-3

SYNTHETIC FIBRES AND PLASTIC

Text book Exercise Pg. No. 41,42

Q.2, Q.3, Q.8 and Q.13 to be done in the textbook.

Q.1 Explain why some fibres are called synthetic.

Ans Some fibres are called synthetic fibres because they are obtained neither from plants nor animals. They are obtained from chemical processing of petrochemicals.

Q.4 Give examples which indicate that nylon fibres are very strong.

Ans Nylon fibres are used to make parachutes and ropes for rock climbing. It has high tensile strength.

Q.5 Explain why plastic containers are favoured for storing food.

Ans Plastic is non-reactive. It does not react with air and water. It is not corroded easily. It is lightweight, cheap and durable.

Q.6 Explain the difference between thermoplastic and thermosetting plastic.

Ans

Thermoplastic	Thermosetting plastic
(i) These are the plastics which get deformed easily on heating and can be easily bent.	(ii) These are the plastics which when moulded once cannot be softened by heating. They do not bend, and break if forced to bend.
(ii) These are used for making toys, combs and various types of containers. E.g. Polythene, PVC, etc.	(ii) They are used for making electrical switches and handles of various utensils. E.g. Bakelite, melamine, etc.
(iii) It is a linear or branched polymer.	(iii) It is a cross-linked polymer.

Q.7 Explain why the following are made of thermosetting plastic.

Ans a) **Saucepan handles-** They are made up of Bakelite as it is a bad conductor of heat and will not melt on heating.

b) **Electric plugs/switches/plugs broods-** These are made of Bakelite which is a bad conductor of heat and electricity.

Q.9 Rana wants to buy shirts for summer. Should he buy cotton shirts or shirts made from synthetic material? Advise Rana, giving your reason.

Ans Rana should buy a cotton shirt for the summer and not a synthetic shirt because cotton is a good absorber of water. So it can soak the sweat coming out of the body and expose it to the environment. Thus, it helps in evaporating the sweat and in keeping the body cool.

Q.10 Give examples to show that plastics are non-corrosive in nature.

Ans Plastics are non-corrosive in nature even if they come in contact with strong chemicals, this is because of their non-reactive nature with most of the materials.

For example, the cleaning chemicals that we use at home are stored in plastic bottles, instead of metal containers.

Q.11 Explain why the handle and bristle of a tooth brush should not be made of the same material.

Ans The handle and bristle of a toothbrush should not be made of the same material as the handle of the toothbrush should be hard and strong while the bristle should be soft and flexible.

Q.12 Why should we avoid plastics as far as possible?

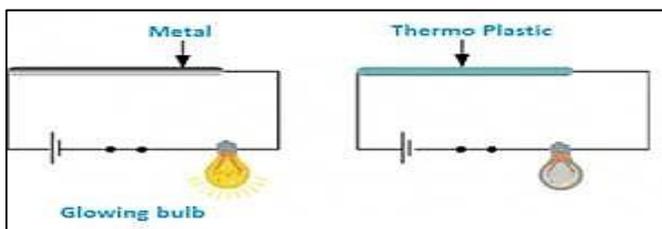
- Ans**
1. We should avoid plastics as far as possible because plastics are non-biodegradable in nature.
 2. Once introduced into the environment, it takes several years to decompose thereby polluting the environment.
 3. We cannot burn them as well because if burnt, it releases poisonous gases.
 4. The plastic bags thrown in the garbage dump are swallowed by animals like cows, which choke their respiratory system or form a lining in the stomach and can even prove fatal.

Q.14 Why do you think manufacturing synthetic fibre is helpful in the conservation of the forest?

- Ans**
1. The manufacturing of synthetic fibres is helpful in the conservation of forests because if we use natural fibres, the raw materials for them have to be derived from the plants, which means cutting off lots of trees. This leads to deforestation.
 2. Raw materials of synthetic fibres are mainly petrochemicals. Hence this proves to be helpful in the conservation of forests.

Q.15 Show and describe an activity to prove that thermoplastic is a poor conductor of electricity.

- Ans**
1. In order to show that thermoplastic is a poor conductor of electricity, we will design a circuit.
 2. For that, we need a bulb, some wires, a battery, a piece of metal and a plastic pipe (as shown in the figure below).
 3. After we switch on the current, we will observe that the bulb glows in the former case.
 4. In the second case, the bulb does not glow. Hence a plastic pipe (which is a thermoplastic) is shown to be a poor conductor of electricity.

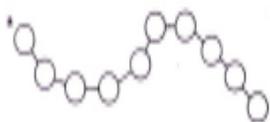


Extra questions:

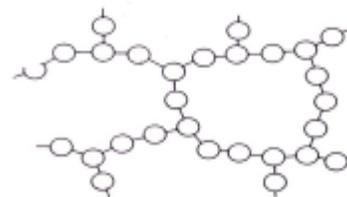
Q.1 What is polymerization? Give an example of a natural polymer.

Ans 1) The process of combining monomer units into a large polymer is called polymerization.
2) Monomers are either linked in a linear fashion or in a cross linked fashion in the polymer structure.

Linear polymer -



Cross-linked polymer



3) A natural polymer is cellulose which is made up of a large number of glucose molecules.

Q.2 What is Teflon? Where is it used?

Ans Teflon is a special plastic on which oil and water do not stick because it has a slippery surface. It is used as coating on non-stick cookware. It has high melting point unlike many other plastic and does not stick to the material. This makes cooking effective and cleaning of the pan easy.

CHAPTER-1

Crop Production and Management

Text book Exercise Pg. No. 13, 14 and 15.

Q.1,2,3,10 and 11 to be discussed and done in Text book.

Q.4 Write a paragraph in your own words on each of the following :

- A**
- a) Preparation of soil:** -1) It is the first step before growing a crop. One of the most important tasks in agriculture is to turn the soil and loosen it.
2) The softening of soil allows the deep penetration of roots into soil.
3) The soil preparation includes ploughing and levelling.
4) Ploughing which is loosening of soil, is done with the help of plough, hoe or cultivator.
5) Levelling is done by wooden or iron leveller which breaks the big pieces of soil called crumbs.
- b) Sowing:** – 1) The process of putting seeds in soil to grow crop is called sowing.
2) Sowing is done with the help of seed drill or broadcasting.
3) The healthy seed is selected for proper growth.
4) The distance between the seeds and the depth at which the seed is sown is also kept into consideration while sowing seeds.
- c) Weeding:** -1) The unwanted plants that grow along with the main crop and compete with crop plants for sun light, food and other substances are called weeds.
2) Removal of these unwanted plants is called weeding. Weeding is done by different ways which include manual removal by trowel or harrow and by using weedicides.
- d) Threshing:** - 1) After harvesting crop, the grain seeds are separated from their stalks. This process is called threshing.
2) This is carried out by using a machine thresher or by beating the stalks on a hard surface.

Q.5 Explain how fertilisers are different from manure.

- | A | Fertilizer | Manure |
|----------|--------------------------------------|---|
| | 1) It is a chemical substance. | 1) It is a natural substance obtained by decomposition of plants and animals. |
| | 2) It does not contain any humus. | 2) It contains a lot of humus. |
| | 3) It is rich in specific nutrients. | 3) It is not rich in specific nutrients. |
| | 4) It is required in small quantity. | 4) It is required in large quantity. |

5) It causes water pollution.

5) It does not cause water pollution.

Q.6 What is irrigation? Describe two methods of irrigation which conserve water.

A Irrigation means supplying water to the crops in the fields at specific intervals.

The two commonly used methods of irrigation which conserve water are:

i) Sprinkler System: 1) In this system there are perpendicular pipes, having rotating nozzles on top, joined to the main pipeline at regular intervals.

2) When water is allowed to flow through the main pipe under pressure with the help of pump, it escapes from the rotating nozzles and gets sprinkled on the crop.

3) This system is useful on uneven land and sandy soil where sufficient water is not available.

ii) Drip System: 1) In this system, the waterfalls drop by drop just at the position of the roots.

2) It is the best technique for watering fruit plants, gardens and trees.

Q.7 If wheat is sown in the Kharif season. What would happen? Discuss.

A Kharif crops need lot of rainfall, whereas wheat needs winter season and does not need heavy rainfall. So, if wheat is sown in Kharif season, the crop will get damaged due to heavy rainfall and water logging in the field.

Q.8 Explain how soil gets affected by the continuous plantation of crop in a field.

A Continuous growing of crops on the same field makes the soil poorer in certain nutrients. To avoid this, manure and fertilizer can be added to the soil or crop-rotation can be done which will replenish the soil with nutrients.

Q.9 What are weeds? How can we control them?

A 1) The undesirable plants in the field are called weeds. These have to be removed; otherwise our own crop plants may not get sufficient water, nutrients, space and light. So, they are removed either by manual method or by using weedicides.

2) The manual removal includes physical removal of weeds by uprooting or cutting them close to the ground from time to time. This is done with the help of a khurpi or harrow.

3) By using weedicides also, we can remove weeds. These weedicides only kill weeds and do not harm the crops.

EXTRA QUESTIONS

Q.1 Define the following:

a) **Agriculture-** The branch of science that deals with growing crops and

raising livestock for human use is called agriculture.

b) Fallowing- The practice of leaving the land uncultivated for one or more seasons is called fallowing.

c) Animal husbandry- Rearing of animals on a large scale with proper food, shelter and care is called animal husbandry.

Q.2 What is crop rotation? Why is it done?

A The practice of growing different crops in different season in rotation so that the soil is not depleted of its nutrients is called crop rotation.

Significance:

1)This is done to improve the fertility of the soil.

2)If the same crop is grown in field year after year, the fertility of the soil goes on decreasing.

3)The soil becomes poor in nutrients.

4)The fertility of the soil can be improved by growing different crops alternately.

5)Leguminous crops are used in crop rotation.

6)Roots nodules (which contain Rhizobium bacteria) present in these plants help to fix atmospheric nitrogen and convert it into usable nitrogen.

Q.3 What is transplantation? Mention its advantages.

A 1)Some seeds cannot be sown directly into field. Instead they are first sown in nursery. For e.g. tomato, onion, brinjal etc.

2)The method of transferring the seedlings from a nursery to a field is called transplantation.

Advantages:

1) It helps the farmer to select only healthy seedlings.

2) Seedlings can be planted at proper distance.

3) It increases crop production.

Q.4 What do you mean by agricultural practices? Write down the steps involved in it?

A Cultivation of crops involves several activities undertaken by the farmers over a period of time. These activities or tasks are referred to as agricultural practices.

The basic agricultural practices are:

i) Preparation of soil

ii) Sowing

iii) Adding manure and fertilizer

- iv) Irrigation
- v) Protection from weeds
- vi) Harvesting
- vii) Storage

CH-2 Microorganisms: Friend and Foe

Textbook exercise Pg. No. 29,30

Q.1, 2 and 3 to be discussed and done in Textbook.

Q.4 Can microorganisms be seen with the naked eyes? If not, how can they be seen?

Ans No, we cannot see microorganisms with unaided eyes. They can only be seen with the help of a microscope.

Q.5 What are the major groups of microorganisms?

Ans The major groups of microorganisms are:-

- a) Bacteria
- b) Fungi
- c) Protozoa
- d) Algae
- e) Virus

Q.6 Name the microorganism which can fix atmospheric nitrogen in the soil.

Ans The microorganisms which can fix atmospheric nitrogen are Rhizobium, Blue green algae, etc.

Q.7 Write 10 lines on the usefulness of microorganisms in our lives.

Ans The usefulness of microorganisms are as follows:

- a) Lactobacillus- a bacterium useful in making curd etc.
- b) Bacteria are useful in formation of bread and cheese.
- c) They are used in cleaning of environment.
- d) Yeasts are used in production of alcohol.
- e) Acetobactor is used in making acetic acid.
- f) They are used in making antibiotics.
- g) They are used in making vaccines.
- h) Microorganisms are used to make manure.
- i) Bacteria are main nitrogen fixing agent.
- j) Many microorganisms are direct sources of food e.g. mushroom, seaweeds and chlorella.

Q.8 Write a short paragraph on the harms caused by microorganisms.

Ans

- a) They cause many communicable diseases like cholera, common cold, tuberculosis, etc
- b) Malaria is caused by a microorganism called plasmodium.
- c) Several plant diseases are caused by bacteria and fungi.
- d) Food poisoning is caused by microorganism.
- e) They are responsible for spoiling of food, clothes and leather.

Q.9 What are antibiotics? What precautions must be taken while taking

antibiotics?

Ans The medicines that kill or stop the growth of the disease-causing microorganism are called antibiotics. Streptomycin, tetracycline, erythromycin etc. are common antibiotics. They are manufactured by growing specific micro-organisms and are used to cure a variety of diseases. Following precautions must be taken while using antibiotics-

- 1) These medicines should be taken only on the advice of a qualified doctor.
- 2) One must finish the course prescribed by the doctor.
- 3) If anybody takes antibiotics when not needed, his or her body may develop resistance against antibiotics.

EXTRA QUESTIONS:

Q.1 How are viruses different from other microorganisms?

Ans

- 1) Viruses are also microscopic, but they are not cells and do not contain cell organelles.
- 2) They are made up of genetic material surrounded by a protein coat.
- 3) They cannot multiply on their own. For this they need to enter a living host cell.
- 4) Outside the host cell, the virus does not show any characteristics of living things. They do not feed, respire, excrete, grow or multiply.

Q.2 How does the bacterium lactobacillus help in curd formation?

Ans

- 1) Milk contains a sugar called lactose.
- 2) Curd contains certain bacteria of which the bacterium Lactobacillus helps in curd formation.
- 3) It converts the lactose present in milk into lactic acid.

Q.3 In bread making why does the dough rise when yeast is added to it?

Ans

- 1) In bread making the dough rises in volume when yeast is added to it, due to the production of carbon dioxide by the respiration of yeast cells.
- 2) Bubbles of gas fill the dough and increases the volume.

Q.4 Mention the advantages of food preservation.

Ans

- 1) Reduces food wastage due to spoilage.
- 2) Increases the shelf life of food item.
- 3) Ensures food availability during off season and in distant places.
- 4) Maintains nutritional value and flavour of food.

Q.5 What is food poisoning?

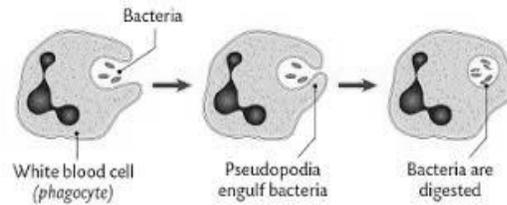
Ans

- 1) Microorganisms that grow on our food sometimes produce toxic substances which are harmful for our health.
- 2) The toxic substances produced by microbes make the food poisonous causing serious illness called food poisoning.
- 3) Diarrhoea, vomiting, headache, fever and abdominal pain are common symptoms of food poisoning.

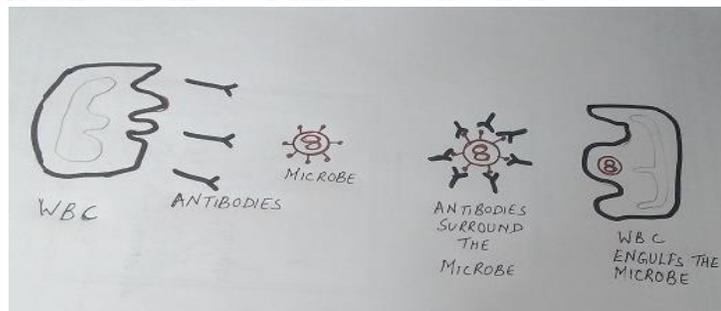
Q.6 How does our body react when a pathogen enters our body?

Ans When a disease causing microbe enters our body, our body reacts in two ways:

1) Some WBC's reach the invading microbe and eat it.



2) Some WBC' s produce chemicals called antibodies to fight the invader. Antibodies surround the invader microbe and then eat it.



Q.7 Define the following :

1) **Microorganisms-** The organisms which are too small to be seen with unaided eyes and can be seen only with the help of microscope are called microorganisms.

2) **Pathogens-** The disease causing microbes are called pathogens.

3) **Immunity-** It is the ability of the body to fight against diseases.

4) **Vaccination-** It is the immunity acquired artificially by injecting a vaccine into healthy body.

5) **Antibody-** Antibody is a substance in blood that provides immunity.

CHAPTER-10

Reaching the age of adolescence

Text Book Exercise Page 124

Q.1 and 7 to be done in Textbook.

Q2. Define: Adolescence.

- A.**
- 1) Adolescence is the period of life, when the body undergoes changes, leading to reproductive maturity.
 - 2) It begins around the age of 11 and lasts till 18 or 19 years of age.
 - 3) The period of adolescence may vary from person to person.

Q3. What is menstruation? Explain.

- A.**
- 1) Menstruation is the process of the shedding of the uterine lining on a regular monthly basis in woman.
 - 2) During menstruation the uterine wall along with blood vessels break off.
 - 3) The causes blood to come out and a new uterine wall is formed.
 - 4) It lasts for 4-5 days.

Q4. List the changes which take place at puberty.

- A.**
- The onset of puberty brings about:
- 1) Increase in height
 - 2) Growth of the reproductive organs which begin to function.
 - 3) Hair growth at various places of the body. Facial hairs appear in boys.
 - 4) Voice of boys becomes hoarse as voice box enlarges during adolescence.
 - 5) Increased activity of sweat and sebaceous glands.
 - 6) Reaching mental, intellectual and emotional maturity.

Q5. Prepare a table having three columns depicting names of endocrine glands hormones secreted by them and their respective function.

A.

Name of Endocrine Gland	Hormones Secreted	Function
Testis	Testosterone	Responsible for development of sex organ in males
Ovary	Estrogen	Responsible for development of sex organ in female
Adrenal	Adrenalin	Control the salt balance in the body
Thyroid Gland	Thyroxine	Controls the metabolic rate in the body
Pituitary Gland	Growth	Responsible for normal growth of the body

Pancreas	Insulin	Controls the glucose level in the blood
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Q6. What are sex hormones? Why are they named so? State their function.

- A.**
- 1) Sex hormones are the hormones that control the development of secondary sexual characteristics and also regulate the proper functioning of the sex organs.
 - 2) They are named so because they are produced in both males and females by the respective sex organs under the influence of the pituitary gland.
 - 3) Functions of the sex hormones:
 - (i) **Testosterone:** This hormone brings about secondary sexual characters in boys such as the growth of a beard, the voice becoming hoarse, development of reproductive organs, etc.
 - (ii) **Oestrogen and Progesterone:** This hormone is responsible for the development of secondary sexual characters in females and development of female reproductive organs, etc.

Q8. Write notes on-

(a) **Adam's apple-** At puberty, the voice box or the larynx begins to grow. The growing voice box in boys can be seen as protruding part of the throat called Adam's apple.

(b) **Secondary sexual characters-** Those changes that take place at puberty in boys and girls are called secondary sexual characters. In includes increase in size of breast in girls and pubic hairs around genital organ in girls. In boys, facial hair and cracking of voice are secondary sexual features.

(c) **Sex determination in the unborn baby**

- 1) Human body cells have 23 pairs of chromosomes.
- 2) The 23 rd pair differs in males and females.
- 3) The gametes however, contains only one set of chromosomes.
- 4) It means that there are 23 single chromosomes in each gamete.
- 5) Female produces only one type of gamete, containing X chromosome.
- 6) Male produces two types of gametes half containing X chromosome and half containing Y chromosome.
- 7) When the sperm containing Y chromosome fuses with egg, the sex of baby is male and when X chromosome containing sperm fertilises the egg, the sex of baby is female.

$$22+X \text{ (egg)} + 22+Y \text{ (sperm)} = 44+XY \text{ (boy)}$$

$$22+X \text{ (egg)} + 22+X \text{ (sperm)} = 44+XX \text{ (girl)}$$

Extra Questions

Q1. Define:

- a. Puberty:** The period during which adolescent boys and girls reach sexual maturity and become capable of reproduction is called puberty.
- b. Hormones:** Hormones are secretions of endocrine glands which coordinate the activities of living organisms and their growth.
- c. Glands:** A gland is an organ which secretes enzymes or hormones in the body.
- d. Exocrine glands:** A gland which secretes its products into duct is called exocrine gland eg. salivary gland
- e. Endocrine glands:** A gland which does not have a duct and secretes its products directly into blood stream is known as endocrine gland eg. pituitary gland.

CHAPTER-11

FORCE AND PRESSURE

Text book Exercise Pg. No.142,143

Q.3, Q.4 and Q.6 to be discussed and done in T.B.

Q.1 Give two examples each of situations in which you push or pull to change the state of motion of objects.

A Following are the pull force examples:

- a) In order to open a drawer, we have to pull it. This action changes the state of motion of the drawer.
- b) To draw water from the well, the rope is pulled. This action changes the state of motion of the bucket.

Following are the examples of push force:

- a) A football is pushed by the foot of a player. This action changes the state of motion of the ball.
- b) In order to change the place of the heavy box from one room to another, we have to push it. This action changes the motion of the box.

Q.2 Give two examples of situations in which the applied force causes a change in the shape of an object.

A The forces which change the shape of an object are as follows:

- i) By pressing the clay between the hands, it deforms.
- ii) The shape of the plastic bottle changes by squeezing it.

Q.5 In the following situation, identify the agent exerting the force and the object on which it acts. State the effect of the force in each case.

- a) **Squeezing a lemon between fingers to extract its juice.**
 - b) **Taking out paste from toothpaste tube.**
 - c) **A load suspended from a spring while its other end is on the hook fixed on the wall.**
 - d) **An athlete making a high jump to clear the bar at a certain height.**
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A	Agent exerting force	Object on which force acts	Effect of force
	a) Fingers/ Muscle	Lemon	Lime juice is extracted
	b) Finger/ Muscle	Toothpaste tube	Toothpaste comes out
	c) A load	Spring	Spring expands
	d) An athlete	Legs	Athlete is able to jump high

Q.7 An inflated balloon was pressed against a wall after it has been rubbed with a piece of synthetic cloth. It was found that the balloon sticks to the wall. What force might be responsible for the attraction between the balloon and the wall?

- A
- 1) When an inflated balloon is rubbed with a piece of synthetic cloth, it becomes charged.
 - 2) A charged body attracts an uncharged body.
 - 3) When this charged balloon is pressed against the wall, it sticks to the wall.
 - 4) Thus, the electrostatic force acts between the charged balloon and the wall.

Q.8 Name the forces acting on a plastic bucket containing water held above ground level in your hand. Discuss why the force acting on the bucket do not bring a change in its state of motion.

- A
- 1) For holding the bucket of water above the ground, we use muscular force.
 - 2) This muscular force acts against the force of gravity that pulls the bucket towards the ground.
 - 3) The two forces are equal in magnitude but opposite in direction.
 - 4) Therefore, the net force on the bucket is zero.
 - 5) Hence, there is no change in the state of motion.

Q.9 A rocket has been fired upwards to launch a satellite in its orbit. Name the two forces acting on the rocket immediately after leaving the launching pad.

- A
- The force of gravity is the one which acts on the rocket to pull it towards the ground and the other one is the force of friction due to earth's atmosphere, which opposes its motion.

Q.10 The bulb of a dropper, when pressed with its nozzle, is kept in water. Then the air in the dropper is seen to escape in the form of bubbles. The water gets filled in the dropper when we release the pressure on the bulb. The rise of water in the dropper is due to: a) Atmospheric pressure

- b) Gravity of the earth
- c) Shape of the rubber bulb
- d) Atmospheric pressure

A a) Due to the atmospheric pressure, there is a rise of water in the dropper.
When all the air escapes from the nozzle, the atmospheric pressure, which is acting on the water, forces the water to fill the nozzle of the dropper.

EXTRA QUESTIONS

Q.1 Can force act without an interaction? Give an example to explain.

A 1. No, for force to act the two objects must interact with each other.
2. For example, if we sit on a bicycle and wait for it to move on its own, it will not move till we apply force on its pedals with our feet.

Q.2 Calculate the pressure if a force of 23 N is applied over an area of 46m².

A $F = 23\text{N}$
 $A = 46\text{ m}^2$
 $P = F/A$
 $= 23/46$
 $= 0.5\text{ Pa}$

Q.3 Calculate the force applied on an area of 136cm² to exert a pressure of 17 Pa?

A $P = F/A$
 $A = 136\text{cm}^2$
 $= 136/10000$
 $= 0.0136\text{m}^2$
 $F = 17 \times 0.0136$
 $= 0.2312\text{ N}$

Q.4 Give reason:

a) **Women are advised not to wear high heeled shoes.**

A 1. High heels concentrate a large amount of force into a small area.
2. The great pressure transmitted through such a heel can make them feel uncomfortable while walking on soft ground.

b) **We do not feel air pressure although there is a tall column of air above us.**

1. The pressure exerted by our body is equal to the pressure exerted by atmosphere on our

body.

2. This nullifies the effect of atmospheric pressure.

c) Astronauts wear special pressurised suits in space.

1. The pressurised suit prevents the blood vessels from bursting.

2. The imbalance between the pressure of the blood and other fluids in the body and the lack of pressure outside would otherwise make blood vessels burst.
