पु•ना International School

Shree Swaminarayan Gurukul, Zundal

Class -VIII

Science(sem-2)

Specimen Copy

Year- 2021-22

Index

Chapter – 10
Reaching the age of Adolescence

key words :-

1) **Adolescents** :- Humans become capable of reproduction after puberty sets in. Between the ages of 11 years and 19 years children are called **adolescents.**

2) Puberty: It is the time when sex organs begin to work. It brings about growth in reproductive organs and changes in the body. Puberty starts at the beginning of **adolescence**.

3) **Hormones :- Hormones** are secretions of endocrine glands which pour them directly into the blood stream.

Extra Questions:-

Very short Answer Questions :-

1. Name the hormone that is released by testes at the onset of puberty.
Ans: At the onset of puberty, the testes release the male hormone called **testosterone**.
2. Name the female hormone produced by ovaries that helps in the development of mammary glands.
Ans: At the onset of puberty, the ovaries in females release female hormone called **estrogen.** Estrogen helps in the development of mammary glands (milk-producing glands).

Short Answer Questions:-

1. Fill the blank circles in figure 10.1 and identify the sex of child A and B.

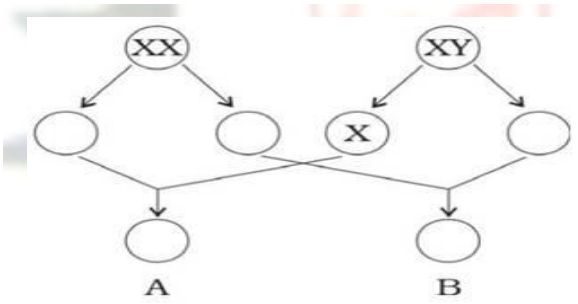
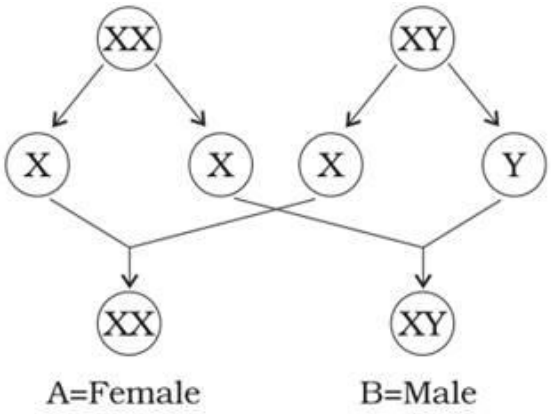


Fig. 10.1

Ans: Child A is female child. Child B is male child.



15. We should avoid taking medicines/drugs unless prescribed by a doctor. Give reasons.

Ans: Several medicines have adverse side effects and have specific dosage levels which, if not followed, may harm the body. Drugs can be addictive too and can ruin our health and happiness. Hence, medicines/drugs should be avoided unless prescribed by a doctor.

Long Answer Questions:-

1. In Fig.10.2 mark the positions of the endocrine glands which release the hormones that:

(a) Controls the release of sex hormones.

(b) Is responsible for the secondary sexual characters in boys.

(c) Prevents diabetes.

(d) Maintains the correct salt balance in the blood.

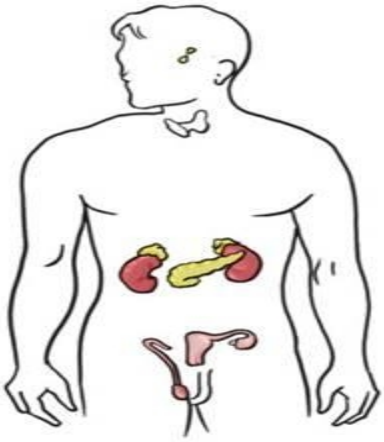
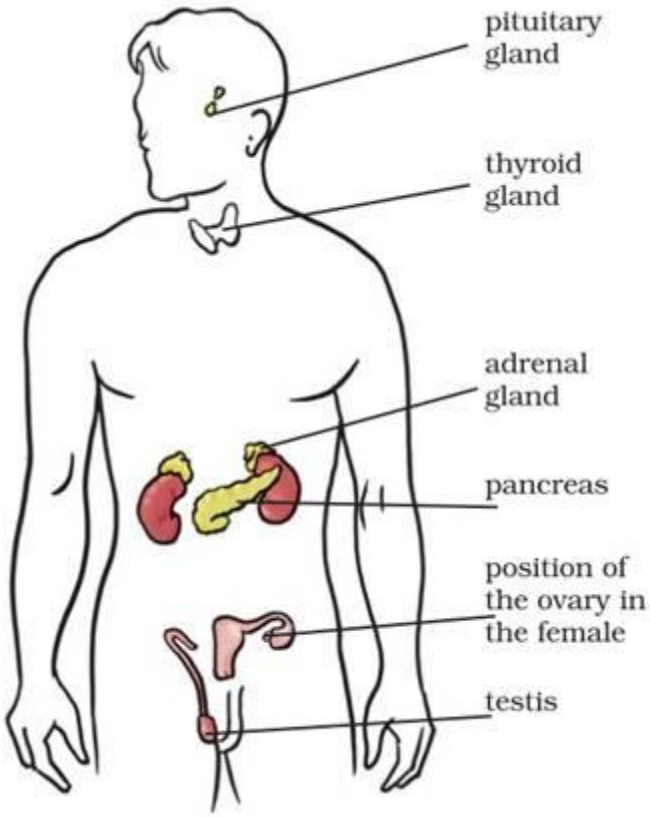


Fig.10.2

Ans: The position of the endocrine glands have been marked in the figure:



2. In human females, each time during menstruation and release of egg, the inner wall of uterus thickens. Is this thickening permanent? Give reasons.

Ans. No, this thickening of the uterine wall is not permanent.

If the egg gets fertilised, it starts developing and gets embedded in the uterine wall resulting in pregnancy. During pregnancy, no more eggs are released and the thickened lining of the uterus is discharged only when the baby is born.

However, if fertilisation does not occur, the released egg and the thickened lining are shed off resulting in menstruation.

EXERCISE :-

1. What is the term used for secretions of endocrine glands responsible for changes taking place in the body?

Ans. The term used for secretion of endocrine glands is hormones, which is responsible for various changes taking place in the body.

2. Define adolescence.

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

3. What is menstruation? Explain.
Ans. Menstruation is the process of the shedding of the uterine lining on a regular monthly basis in woman. During menstruation the uterus wall along with blood vessels break off. This causes blood to come out and a new wall of uterus is formed.Menstruation lasts generally lasts for 4 to 5 days.

4. List changes in the body that take place at puberty.
Ans. The onset of puberty brings about:
Growth of the reproductive organs which begin to function.
Hair growth at various places of the body. Breasts develop in girls and facial hairs appear in boys.
Voice of the boys becomes hoarse as voice box enlarges during adolescence.

5. Prepare a table having two columns depicting names of endocrine glands and hormones secreted by them.
Ans.

Name of Endocrine Gland	Hormones Secreted
Testis	Testosterone
Ovary	Estrogen
Adrenal	Adrenaline
Thyroid Gland	Thyroxin
Pituitary Gland	FSH
Pancreas	Insulin

6. What are sex hormones? Why are they named so? State their function.
Ans. Sex hormones are the hormones that control the development of secondary sexual characteristics and also regulate the proper functioning of the sex organs. 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.

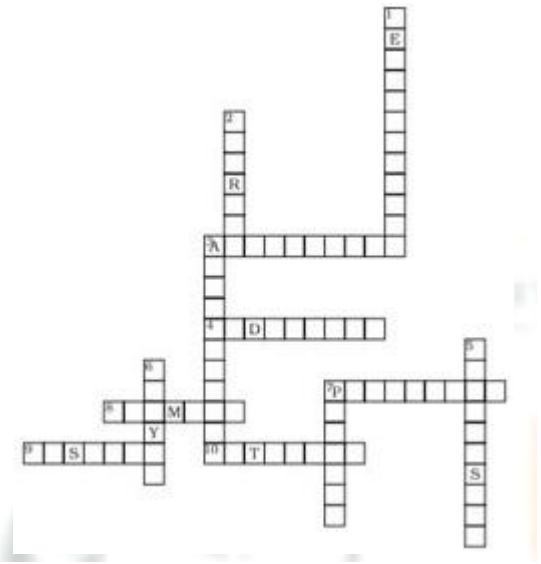
Functions of sex hormones:
Testosterone: This hormone brings about secondary sex characters in boys such as the growth of a beard, the voice becoming hoarse, development of reproductive organs, etc.
Oestrogen: This hormone is responsible for the development of secondary sexual characters in females such as the enlargement of breasts, development of female reproductive organs, etc.

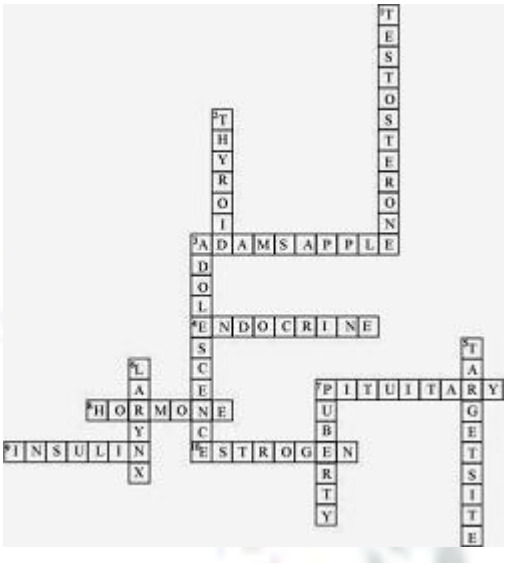
7. Choose the correct option.
(a) Adolescents should be careful about what they eat, because
(i) Proper diet develops their brains.

(ii) Proper diet is needed for the rapid growth taking place in their body.
(iii) Adolescents feel hungry all the time.
(iv) Taste buds are well developed in teenagers.
(b) Reproductive age in women starts when their
(i) Menstruation start.
(ii) Breast start developing
(iii) Body weight increases
(iv) Height increases.
(c) The right meal for adolescents consist of
(i) Chips, noodles, coke.
(ii) Chapatti, dal, vegetables.
(iii) Rice, noodles and burger.
(iv) Vegetables cutlets, chips and lemon drink.
Ans. (a) (ii) Proper diet is needed for the rapid growth taking place in their body.
(b) (i) menstruation starts.
(c) (ii) Chapatti, dal, vegetables.
8. Write notes on-
(a) Adam's apple.
(b) Secondary sexual charecters.
(c) Sex determination in unborn baby.
Ans. (a) Adam's apple- At puberty, the voice box or the larynx begins to grow. The growing voice box in boys can be seen a 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- Human beings have 23 pairs of chromosome. One pair of male (XY) and one pair of chromosome in female (XX) are called sex chromosome. Male produce two types of gametes half containing X chromosome and half containing Y chromosome. When the sperm containing Y chromosome fuse with egg the sex of baby is male and when X chromosome containing sperm fertilse the egg the sex of baby is female.

9. Word game: use the clues to work out the words.

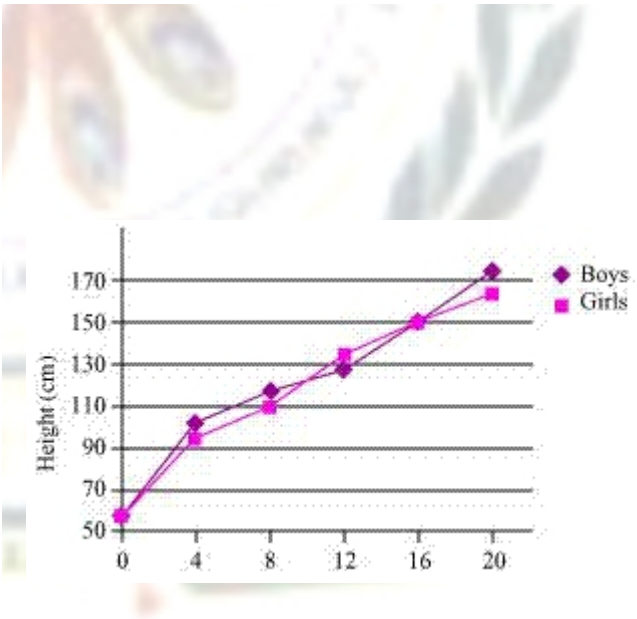
Across	Down
3. Protruding voice box in boys	1. Male hormone
4. Glands without ducts	2. Secretes thyroxin
7. Endocrine gland attached to brain	3. Another term for teenage
8. Secretion of endocrine glands	5. Hormone reaches here through blood stream
9. Pancreatic hormone	7. Term for changes at adolescence
10. Female hormone	





10. The table below shows the data on likely height of boys and girls as they grow in age. Draw graphs showing height and age for both boys and girls on the same graph paper. What conclusions can be drawn from these graphs?

Age (Years)	Height (cm)	
	Boys	Girls
0	53	53
4	96	92
8	114	110
12	129	133
16	150	150
20	173	165



Ans.

The graph depicts the relation between the age and height of both boys and girls. During puberty, there is a sudden increase in height of both boys and girls. On the basis of the above graph, it can be observed that during the age of 48 years, girls have less height as compared to boys. However, as soon as girls reach 12 to13 years, their height shows a sudden increase

and becomes more than boys. In later years, growth in both sexes becomes stable. Growth during puberty is under the control of hormones.

Chapter – 11
Force and Pressure

key words :-

1) Force: A push or a pull, that changes or tends to change the state of rest or of uniform motion of an object or changes its direction or shape.

Types of Forces:

Contact Forces: The forces act on a body when the source of force is in actual contact with the body. The point where the force is applied on an object is called the point of application of force (or point of contact).

(i) **Muscular Force** (ii) **Mechanical Force** (iii) **Frictional Force**

Non-Contact Forces: Forces which do not involve physical contact between two bodies on which they act.

(i) **Magnetic Force**(ii) **Electrostatic Force**(iii) **Gravitational Forces**

2)Pressure: Thrust acting per unit surface area is called pressure. Thrust is the force acting on an object perpendicular to its surface. In SI system, pressure is measured in Newton per square metre which is equal to 1 pascal (Pa).

Extra Questions:-

Very short Answer Questions :-

1. Where do we apply a force while walking?

Ans: While walking, we apply a force on the ground against the force of friction.

2. A ball of dough is rolled into a flat chapatti. Name the force exerted **to** change the shape of the dough.

Ans: The shape of the dough is changed through the action of body muscles. The resulting force is called the **muscular force**.

short Answer Questions :-

1. Fig. 11.7 shows a man with a parachute. Name the force which is responsible for his downward motion. Will he come down with the same speed without the parachute?

Fig. 11.7

Ans: The force of gravity is responsible for the downward motion of the man with the parachute. He comes down slowly with the parachute since the air trapped beneath the open parachute provides an opposing force.

He will not come down with the same speed without the parachute. Without the parachute, the opposing upward force against the force of gravity will be missing and the speed of downward motion of the man will be higher.

2. A man is pushing a cart down a slope. Suddenly the cart starts moving faster and he wants to slow it down. What should he do?

Ans: When the man is pushing the cart down the slope, the force of gravity also acts on the cart. The net force acting on the cart increases and hence, the cart starts moving faster down the slope.

The man should apply an opposing force to decease the net force acting on the cart. Instead of pushing the cart, he should try to pull the cart up the slope so that the cart slows down.

Long Answer Questions :-

1. Two women are of the same weight. One wears sandals with pointed heels while the other wears sandals with flat soles. Which one would feel more comfortable while walking on a sandy beach? Give reasons for your answer.

Ans: The woman wearing "sandals with flat soles" will feel more comfortable while walking on the sandy beach.

Since the two women are of the same weight, they will apply the same amount of force on the sand. The area of contact of "sandals with flat soles" will be larger as compared to the area of contact of "sandals with pointed heels". The pressure exerted by the

pointed heels will be more than that exerted by "sandals having flat soles". As a result, the pointed heels will sink in the sand and offer higher friction to walking.

EXERCISE:-

1. Give two examples each of situations in which you push or pull to change the state of motion of objects.
Ans. Two examples of push force are as follows:
A heavy box at rest is pushed to move it from one room to another. This changes the state of motion of the box.
A player pushes a football using his foot. This changes the state of motion of the ball.
Two examples of pull force are as follows:
Rope is pulled to draw water from a well. This changes the state of motion of the water bucket.
A drawer is pulled to open it. This changes the state of motion of the drawer

2. Give two examples of situations in which applied force causes a change in the shape of an object.
Ans. (i) Making a chapati from a ball of dough.
(ii) Stretching of rubber band.

3. Fill in the blanks in the following statements.
(a) To draw water from a well, we have to _____ at the rope.
(b) A charged body_____ an uncharged body towards it.
(c) To move a loaded trolley, we have to _____ it.
(d) The north pole of a magnet _____ the north pole of another magnet.
Ans. Fill in the blanks
(a) To draw water from a well, we have to pull at the rope.
(b) A charged body attracts an uncharged body towards it.
(c) To move a loaded trolley, we have to pull it.
(d) The north pole of a magnet repels the north pole of another magnet.
4. An archer stretches her bow while taking aim at the target. She then releases the arrow, which begins to move towards the target. Based on this information fill up the gaps in the following statements using the following terms:
Muscular, contact, non-contact, gravity, friction, shape, attraction
(a) To stretch the bow, the archer applies a force that causes a change in its _____.
(b) The force applied by the archer to stretch the bow is an example of _____ force.
(c) The type of force responsible for a change in the state of motion of the arrow is an example of a _____ force.
(d) While the arrow moves towards its target, the forces acting on it are due to ____and that due to _____ of air.
Ans. (a) shape
(b) muscular
(c) contact
(d) gravity, friction.

5. In the following situations 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 piece of lemon between the fingers to extract its juice.
(b) Taking out paste from a toothpaste tube.
(c) A load suspended from a spring while its other end is on a hook fixed to a wall.
(d) An athlete making a high jump to clear the bar at a certain height.
Ans.

S.No	Agent exerting the force	Object on which it acts	Form of effect
(a)	Fingers	Lemon	Change in shape of lemon
(b)	Fingers	Toothpaste tube	Change in shape of tube
(c)	Load	Spring	Change in shape of Spring
(d)	Muscles of Athlete	Athlete	Change of state of motion of Athlete/ High jump

6. A blacksmith hammers a hot piece of iron while making a tool. How does the force due to hammering affect the piece of iron?
Ans. The force of hammering changes the shape of iron in the form of desired tool.
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?
Ans. Electrostatic force.
8. Name the forces acting on a plastic bucket containing water held above ground level in your hand. Discuss why the forces acting on the bucket do not bring a change in its state of motion.
Ans. The forces that act on the bucket are as follows:-
(i) The pressure of water contained in it.
(ii) Force of gravity due to Earth's gravitation.
Pressure of water can not change the state of motion because it is inside the bucket and force of gravity is compensated by force applied vertically upward using rope.
9. A rocket has been fired upwards to launch a satellite in its orbits. Name the two forces acting on the rocket immediately after leaving the launching pad.
Ans. The two forces acting on rocket are:
Force due to gravity acts vertically downward.
Frictional force of atmosphere.

10. When we press the bulb of a dropper with its nozzle kept in water, air in the dropper is seen to escape in the form of bubbles. Once we release the pressure on the bulb, water gets filled in the dropper. The rise of water in the dropper is due to
(a) Pressure of water.
(b) Gravity of the earth.
(c) Shape of rubber bulb.
(d) Atmospheric pressure.
Ans. (d) Atmospheric pressure.

Chapter – 12
Friction

key words :-

1. Friction:- Friction is a force that opposes the relative motion between two surfaces of objects in contact. The force of friction always acts in a direction opposite to that of the applied force.

Types of Friction:

(i) **Static Friction**: When a body is at rest, the force of friction is called the static friction and is always equal and opposite to the applied force. The force of friction which acts when the body is just at the verge of sliding on the surface is called limiting friction.

(ii) **Sliding friction**: The friction force which opposes the actual relative sliding motion between two contact surfaces. Sliding friction is smaller than static friction.

(iii) **Rolling Friction**: The frictional force that exists between two surfaces when a body rolls over the other. Rolling friction is smaller than sliding friction.

Extra Questions:-

Very short Answer Questions :-

1. Will force of friction come into play when a rain drop rolls down a glass window pane?Ans: Yes, the force of friction will come into play when a rain drop rolls down a glass window pane.

2. While playing tug of war (Fig.12.4), Preeti felt that the rope was slipping through her hands. Suggest a way out for her to prevent this.

Fig. 12.4

Ans: Preeti can rub soil between her hands to increase the friction between the rope and her hands. Increased friction will prevent slipping of rope through her hands.

Short Answer Questions :-

1. Is there a force of friction between the wheels of a moving train and iron rails? If yes, name the type of friction. If an air cushion can be introduced between the wheel and the rail, what effect will it have on the friction?

Ans: Yes, the force of friction between the wheels of a moving train and iron rails is rolling friction. If an air cushion is introduced between the wheels and the rails, the friction between the two surfaces will decrease.

Long Answer Questions :-

1. Two friends are trying to push a heavy load as shown in Fig.12.5. Suggest a way which will make this task easier for them.

Fig. 12.5

Ans: It would be easier for the friends to roll the load than to slide it. They can put rollers below the heavy load. Rolling friction is smaller than sliding friction. Putting rollers below the heavy load will make the task easier for them.

EXERCISE :-

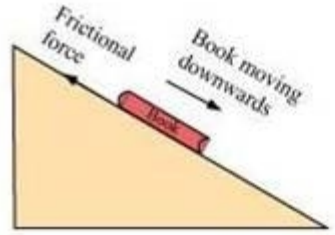
1. Fill in the blanks.
(a) Friction opposes the _____ between the surfaces in contact with each other.
(b) Friction depends on the _____ of surfaces.
(c) Friction produces _____.
(d) Sprinkling of powder on the carom board_____ friction.
(e) Sliding friction is _____ than the static friction.
Ans. Fill in the blanks.
(a) Friction opposes the relative motion between the surfaces in contact with each other.
(b) Friction depends on the nature of surfaces.
(c) Friction produces heat.
(d) Sprinkling of powder on the carom board reduces friction.
(e) Sliding friction is less than the static friction.

2. Four children were asked to arrange forces due to rolling, static and sliding frictions in a decreasing order. Their arrangements are given below.
Choose the correct arrangement.

(a) Rolling, static, sliding
(b) Rolling, sliding, static
(c) Static, sliding, rolling
(d) Sliding, static, rolling
Ans. (c) static, sliding, rolling

3. Alida runs her toy car on dry marble floor, wet marble floor, newspaper and towel spread on the floor. The force of friction acting on the car on different surfaces in increasing order will be
(a) Wet marble floor, dry marble floor, newspaper and towel
(b) Newspaper, towel, dry marble floor, wet marble floor
(c) Towel, newspaper, dry marble floor, wet marble floor
(d) Wet marble floor, dry marble floor, towel, newspaper
Ans. (a) Wet marble floor, dry marble floor, newspaper and towel.

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.
Ans. The frictional force will act parallel to the inclined surface, opposite to the direction of the sliding of book i.e.., upward.



Concept insight: Friction opposes the motion.

5. You spill a bucket of soapy water on a marble floor accidently. Would it make it easier or more difficult for you to walk on the floor? Why?
Ans. it is difficult to walk on a soapy floor because soapy floor reduces the frictional force and hence we can slip on such floors.

6. Explain why sportsmen use shoes with spikes.
Ans. It is done to provide the shoes better grip on the ground.

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?
Ans. Seema will have to apply a larger force, because the force of friction is increased if two surfaces are pressed harder. So heavier box will apply more force on the floor and hence seema will experience more frictional force.

8. Explain why sliding friction is less than static friction.
Ans. Suppose a box kept on the surface has to be pushed. If the box is slide then, 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, the 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.

9. Give examples to show that friction is both a friend and foe.
Ans.
Friction as a friend:
To hold a glass, we have ridges on our palm, which increase the friction between palm and glass.
We do write anything with pen or pencil because there is friction between the surfaces of paper and point of pen or pencil.
Teacher writes on black –board with chalk because of friction between black-board surface and the chalk.
If there is no friction, then a moving body would never stop.
Friction as a foe:
Friction wears out materials, whether they are screws, ball-bearing or soles of shoes.
Friction can also produce heat, which increases wear and tear of machine parts. It also causes much wastage of energy because this heat is not utilized.
10. Explain why objects moving in fluids must have special shapes.
Ans.When a body moves through a fluid, it experiences an opposing force which tries to oppose its motion through the fluid. This opposing force is known as the drag force. This frictional force depends on the shape of the body. By giving objects a special shape, the force of friction acting on it can be minimised. Hence, it becomes easier for the body to move through the fluid.

Chapter – 13
Sound

key words :-

1) Sound: Vibrations that travel through the air or another medium and can be heard when they reach a person's or animal's ear.

2) Musical Sound: The sound which produce a pleasing effect on the ear.

3) Noise: The sounds which produce a jarring or unpleasant effect.

Types of Sound:

(i) **Audible Sound:** Vibrations whose frequency lies between 20 Hz to 20,000 Hz (20 kHz) are heard by human ear.

(ii) **Inaudible Sound:** The sounds having frequencies above 20,000 Hz and below 20 Hz cannot be heard by the normal human ear.

4) Amplitude: The maximum extent of vibration of the vibrating body from its mean position is known as its amplitude.

5) Frequency: The number of vibrations made by the vibrating body in one second is known as its frequency.

The SI unit of frequency is the hertz (Hz).

Extra Questions:-

Very short Answer Questions :-

1. Does any part of our body vibrate when we speak? Name the part.
Ans: Yes**, the part of our body that vibrates when we speak is the** larynx **(also known as vocal cords)**
2. Name two musical instruments which produce sound by vibrating strings?
Ans: Sitar **and** Ektara **are two musical instruments which produce sound by vibrating strings.**

short Answer Questions :-

1. List three sources of noise pollution in your locality.
Ans: Vehicle noise, bursting of crackers, loudspeakers.
2. A simple pendulum makes 10 oscillations in 20 seconds. What is the time period and frequency of its oscillation?
Ans: Frequency is number of oscillations per second.
Frequency = (10/20) oscillations per second = 0.5 oscillations/sec

Time period is reciprocal of frequency. T = 1/f = 2 s

Long Answer Questions :-

1. Suggest three measures to limit noise pollution in your locality.

Ans: Measures to limit noise pollution could be as follows:-
i) Use of horns in the locality should be minimised. Persons of the locality can be sensitised to reduce noise.
ii) Double glazed glass can be used in windows to keep out noise.
iii) Trees should be planted along the roads and around the buildings.
iv) Silencers should be installed in transport vehicles and industrial machines.

EXERCISE:-

1. Choose the correct answer :
Sound can travel through
(a) Gases only
(b) Solid only
(c) Liquid only
(d) Solids, liquids and gases
Ans: (d) Solids, liquids and gases

2. Voice of which of the following is likely to have minimum frequency?
(a) Baby girl
(b) Baby boy
(c) A man
(d) A woman
Ans: (a) Baby girl.

3. In the following statements, tick 'T' against those which are true, and "F" against those which are false.
(a) Sound cannot travel in vacuum.
(b) The number of oscillations per second of a vibrating object is called its time period.
(c) If the amplitude of vibration is large, sound is feeble.
(d) For human ears, the audible range is 20 Hz. To 20,000 Hz.
(e) The lower the frequency of vibration, the higher is the pitch.
(f) Unwanted or unpleasant sound is termed as music.
(g) Noise pollution may cause partial hearing impairment.
Ans: (a) T (b) F (c) F (d) T (e) F (f) F (g) T

4. Fill in the blanks with suitable words :

(a) Time taken by an object to complete one oscillation is called _____ .
(b) Loudness is determined by the _____ .
(c) The unit of frequency is _____ .
(d) Unwanted sound is called _____ .
(e) Shrillness of a sound is determined by the _____ of vibration.

Ans: (a) Time taken by an object to complete one oscillation is called time period.
(b) Loudness is determined by the amplitude.
(c) The unit of frequency is hertz.
(d) Unwanted sound is called noise.
(e) Shrillness of a sound is determined by the pitch of vibration.

5. A pendulum oscillates 40 times in 4 seconds. Find its time period and frequency.
Ans: No. of oscillations = 40.
Time Taken = 4 sec.
Frequency = No. of Oscillation / Time Taken
=40/4=10 Hz

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 ?
Ans: No. of Vibration in 1 second = 500.
Therefore, Frequency= 500Hz.
Time-period = 1/Frequency
=1/500=0.002 Second

7. Identify the part which vibrates to produce sound in the following intruments.
(a) Dholak
(b) Sitar
(c) Flute
Ans: (a) Dholak - Stretched membrane.
(b) Sitar - Stretched string
(c) Flute - Air column.

8. What is the difference between noise and music ? Can music become noise sometimes ?
Ans: The unpleasant sound is called noise. Whereas pleasant sound is called music. Noise can produce so many health hazards, whereas music brings about soothing effect.
Yes, music can become a noise sometimes when the musical instruments produce very high volume sounds.

9. List sources of noise pollution in your surroundings.
Ans: The sources of noise pollution are :
(i) The sound produced by buses and trucks.
(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.

10. Explain in what way noise pollution is harmful to humans.
Ans: The noise pollution cause many health related problems. Lacks of sleep, hypertension, anxiety, etc. are some of the problems that may caused due to noise pollution. Moreover, a person who is exposed to a loud sound continuously may get temporary or permanent deafness.

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.
Ans: 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.

12. Sketch larynx and explain its function in your own words.
Ans: The other name of larynx is voice box. It is present at the upper end of the windpipe. The function of larynx is to produce sound.

13. Lightning and thunder take place in the sky at the same time and at the same distance from us. Lightening is seen earlier and thunder is heard later. Can you explain why ?
Ans: Because speed of light is more than the speed of sound. The 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 lightening is seen earlier and thunder is heard later.

Chapter – 14
Chemical Effects of Electric Current

key words :-

1) Electrolysis: The process of decomposition of a chemical compound in a solution when an electric current passes through it is called electrolysis.

2) Electroplating: The process of depositing a layer of any desired metal on another material by means of electricity is called electroplating.

3)electrolyte : A liquid That conducts electricity due to the presence of ions is called an electrolyte.

Extra Questions:-

Very short Answer Questions :-

1. Why is a layer of zinc coated over iron?

Ans: A layer of zinc is coated over iron to protect iron from rusting and corrosion. This process is known as galvanization.

2. Will the solution of sugar in distilled water conduct electricity?

Ans: No, the solution of sugar in distilled water will not conduct any electricity.

3. Name the effect of current responsible for the glow of bulb in an electric circuit.

Ans: Heating effect of electric current is responsible for the glow of bulb in an electric circuit.

short Answer Questions :-

1. Why is tin electroplated on iron to make cans used for storing food?

Ans: Tin is less reactive than iron. Tin coating on iron prevents food from coming in contact with iron can and thus prevents it from getting spoiled.

2. Observe Fig. 14.5.

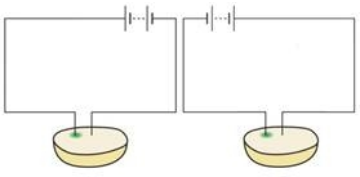


Fig. 14.5

Which of these two circuits A or B shows the correct observation?

Ans: Diagram A shows the correct observation.

Explanation: Circuit A shows the correct observation because in this circuit, wire connected to the positive terminal of the battery has a greenish blue spot.

3. Observe the following circuits carefully. In which circuit will the bulb glow. Write 'Yes' or 'No' in the blank space provided along each of the circuit given in Fig. 14.6.


Piece of coal .....


Iron nail .....


Eraser .....


Steel spoon .....

Fig. 14.6

Ans: (a) No

(b) Yes. Iron is a metal and hence a good conductor of electricity.

(c) No. The material of an eraser is not a conductor of electricity.

(d) Yes. Steel is an alloy of metals and hence a good conductor of electricity.

Long Answer Questions :-

1. An electric current is passed through a conducting solution. List any three possible observations.

Ans: One of the following can be observed when an electric current is passed through a conducting solution:-

Formation of bubbles of a gas near the electrodes.
Deposit of a metal on an electrode.
Change in colour of the solution.
The solution may become warm. (Any three)

2. In the circuit given as Fig. 14.7, Boojho observed that copper is deposited on the electrode connected to the negative terminal of the battery. Paheli tried to repeat the same experiment. But she could find only one copper plate. Therefore, she took a carbon rod as negative electrode. Will copper be still deposited on the carbon rod? Explain your answer.

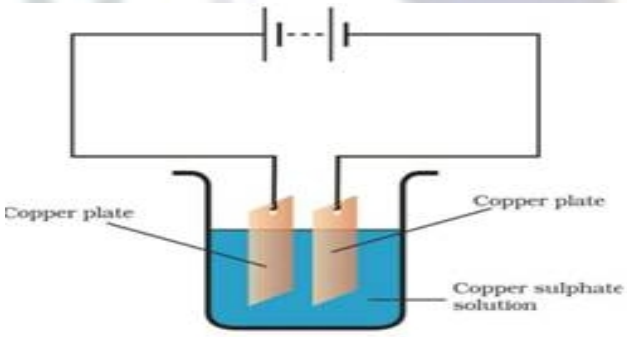


Fig. 14.7

Ans: Yes, a coating of copper will be formed on the carbon rod (electrode connected to the negative terminal of the battery).

When the circuit is complete and the current is flowing, copper sulphate solution will disassociate into copper ions and sulphate ions. Copper ions (positive ions) will get attracted towards the negative electrode and get deposited over the carbon rod. Copper ions from the copper plate connected to the positive terminal will get dissolved into the copper sulphate solution and will replenish the copper ions in the solution.

If required, another copper plate can be used as an anode after the copper plate connected to the positive terminal of the battery wears out. In this way, loss of copper from the copper solution can be restored and the process of electroplating can be continued for the desired time.

This process of depositing a layer of a desired metal (like copper) over another material (like carbon rod), by using the chemical effect of electric current, is known is electroplating.

EXERCISE:-

1. Fill the blanks.

(a) Most liquids that conduct electricity are solutions of _____, _____ and _____.

(b) The passage of an electric current through a solution causes _____ effects.

(c) If you pass current through copper sulphate solution, copper gets deposited on the plate connected to the _____ terminal of the battery.

(d) The process of depositing a layer of any desired metal on another material by means of electricity is called_____.

Ans. Fill the blanks.

(a) Most liquids that conduct electricity are solutions of acids, bases and salts.

(b) The passage of an electric current through a solution causes chemical effects.

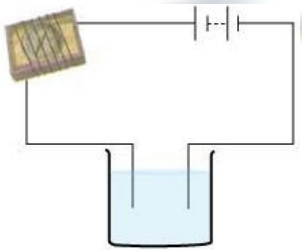
(c) If you pass current through copper sulphate solution, copper gets deposited on the plate connected to the negative terminal of the battery.

(d) The process of depositing a layer of any desired metal on another material by means of electricity is called electroplating.

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

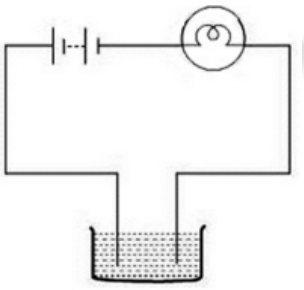
Ans. Yes, it is because the solution conducts electricity and solution plays the role of cell.

3. Name three liquids, which when tested in the manner shown in Fig.14.9 may cause the magnetic needle to deflect.



Ans. Tap water/Sodium chloride solution, copper sulphate solution and hydrochloric acid.

4. The bulb does not glow in the setup shown in fig. 14.1. List the possible reasons. Explain your answer.



Ans. The possible reasons are:

The solution may be conducting electricity but the current produced by it not sufficient to glow the bulb.
Bulb may be fused.
Cells may be used up.

5. A tester is used to check the conduction of electricity through two liquids. Labeled A and B. it is found that the bulb of the tester glows brightly for liquid A while it glows very dimly for liquid B. you would conclude that

(i) Liquid A is a better conductor than liquid B

(ii) Liquid B is a better conductor than liquid A

(iii) Both liquids are equally conducting

(iv) Conducting properties of liquid cannot be compared in this manner.

Ans. (i) Liquid A is better conductor than liquid B.

6. Does pure water conduct electricity? If not, what can we do to make it conducting?

Ans. No. Pure water does not conduct electricity. But pure water can conduct electricity, if salt dissolved in it.

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

Ans. The water used in water houses is not pure water and it conducts electricity. Firemen shuts off the main electrical supply of the area because if the supply of electricity continues there may be high risk of electrocution in the whole area due to water.

8. 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?

Ans. Seawater contains higher amount of salt in comparison to drinking water, hence sea water is a better conductor of heat. This is the reason that the compass needle deflects more in case of seawater.

9. Is it safe for the electrician to carry out electrical repairs outdoors during heavy rain pour? Explain.

Ans. It is not safe for the electrician to carry out electrical repairs outside during heavy rain. Because rain water dissolves many impurities from the atmosphere, which make it impure and very conductive of electricity. So electrician may get electric shock if he works outdoor during heavy downpour.

10. 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 reason?

Ans. Rain water is, of course, as good as distilled water but, when it passes through atmosphere, it dissolves a lot of dust, dirt and impurities and become conducting. So, when Paheli used a tester, its compass showed deflection.

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

Ans. The objects which are electroplated are:

Taps of water connection.
Parts of bicycle.
Body of cars, motor cycle and tractors.
Handles of the doors.

12. 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?

Ans. The thick rod of impure copper should be attached to the positive terminal of battery. Copper ion is positively charged. It is 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.

Chapter – 15

Some Natural Phenomena

key words :-

1) Earthing: The process of transfer of charge from a charged object to the earth is called earthing.

2) Fault zones: The regions where one tectonic plate slides against another are referred to as **fault zone**

3)Seismic zones: These are the regions where an earthquake is likely to occur. Hence, these zones are referred to as **seismic zones.**

4)Seismograph: The instrument that measures the severity of an earthquake is a **seismograph**.

5) Seismic waves: The energy released at the focus of an earthquake, propagates outwardly in form of waves known as **seismic waves.**

Extra Questions:-

Very short Answer Questions :-

1. Is it possible to predict the occurrence of an earthquake ?

Ans: No, it is not possible to predict the occurrence of an earthquake. As it is a sudden shaking or trembling of the earth lasting for a very short duration of time.

2. If a charged plastic straw is brought near another uncharged plastic straw, what will happen ?

Ans: If a charged plastic straw is brought near another uncharged plastic straw, then charged plastic straw will attract uncharged plastic straw.

3. The aluminium strips in an electroscope as shown in fig. 15.1 are replaced by plastic strips and a charged body is brought in contact with the metal clip. What will happen ?

Fig. 15.1

Ans: No divergence of strips will take place as plastic strips are poor conductor of electricity. Hence, no charge can travel through them. So they do not repel each other.

short Answer Questions :-

1. Identify the lightning conductor and the copper plate in Fig. 15.2.

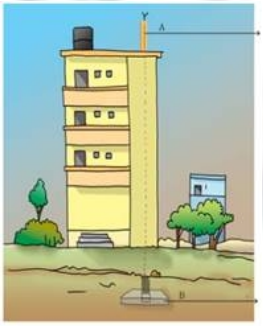


Fig. 15.2

Ans: A is the lightning conductor and B is the copper plate.

2. If the materials used for constructing a building were good conductors, do you think lightning will strike the building. Will the lightning conductor be still required to be installed in the building ?

Ans: No, there is no need to install lightning conductor in the building if the materials used for constructing a building were good conductors.

Explanation: Since, building will pass the electricity due to lighting to earth directly.

3. You might have observed on a dry day that when you touch the screen of a television or computer monitor (with picture tube), you get a slight shock. Why does it happen ?

Ans: Electric charge gets accumulated on the screen. On touching the screen of a television or computer monitor (with picture tube), the charge discharges through our body. Thus, we get a slight shock.

4. Explain how does lightning conductor protects a building from getting struck by lightning.

Ans: Lightning conductor does not allow the charge to accumulate on a building as it conducts the charge to the earth, protecting building from being struck by lightning.

Long Answer Questions :-

1. Explain how lightning takes place ?

Ans: A cloud consists of millions and millions of small water droplets. These droplets collide with other droplets. Due to these collisions, electrons are knocked out of water droplets, but water droplets keep rising up. Thus a charge separation occurs. The knocked out electrons form the lower layer of the cloud. The positively charged water droplets rise to a certain height and form the upper layer of cloud. Hence, there is accumulation of positive charges on the ground. When the magnitude of the accumulated charges become large, the air cannot resist their flow. As a result negative and positive charges meet producing a streak of bright light and sound, called lightning.

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

Ans: Three precautions that we will take to protect ourself if earthquake strikes when we are inside the house are as follows :

(i) Take shelter under a table and stay there till the shaking stops.

(ii) Stay away from tall and heavy objects that may fall on you.

(iii) If you are in bed, do not get up. Protect your head with a pillow.

EXERCISE:-

Select the correct option in questions 1 and 2.

1. Which of the following cannot be charged easily by friction ?

(a) A plastic scale

(b) A copper rod

(c) An inflated balloon

(d) A woolen cloth

Ans: (b) A copper rod.

2. When a glass rod is rubbed with a piece of silk cloth the rod

(a) and the cloths both acquire positive charge.

(b) becomes positively charged while the cloth has a negative charge.

(c) and the cloth both acquire negative charge.

(d) becomes negatively charged while the cloth has positive charge.

Ans: (b) becomes positively charged while the cloth has a negative charge.

3. Write T against true and F against false in the following statements.

(a) Like charges attract each other.

(b) A charged glass rod attracts a charged plastic straw.

(c) Lightening conductor cannot protect a building from lightening.

(d) Earthquakes can be predicted in advance.

Ans: (a) (F) (b) (T) (c) (F) (d) (F)

4. Sometime, a crackling sound is heard while taking off a sweater during winters. Explain.

Ans: The crackling sound is heard because when the sweater is rubbed while taking it off, it acquires a small charge.

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

Ans: 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.

6. 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 ?

Ans: The destructive energy of an earthquake is measured on a scale called Richter scale. An earthquake measure 3 on this scale would be recorded by a seismograph and it is not likely to cause much damage.

7. Suggest three measures to protect ourselves from lightening.

Ans: (a) Hearing thunder, we should rush to a safer place like building.

(b) If no proper shelter is available we should go in open, never hide under a tree or electric pole.

(c) The telephone cord, electric wires and metal pipes should be avoided from touching.

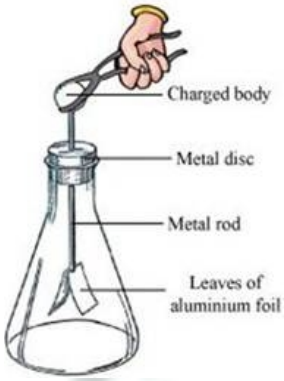
8. Explain why a charged balloon is repelled by another charged balloon whereas an uncharged balloon is attracted by another charged balloon ?

Ans: A charged balloon is repelled by another charged balloon because both have the same charge and we know that likes charged repel each other. But charged balloons attract an uncharged balloon and loose its own charge to the other balloon.

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

Ans: A device that is used to test whether an object is carrying charge or not is known as electroscope. In the diagram, there is a metal rod. Below in the end of the metal rod, there are leaves of alluminium foil. Now if we touch the charged body at the upper end of the metal rod, then charge go to the leaves of alluminium foil by flowing through the metal rod. Thus both leaves have same charge, so the leaves spread because of force of repulsion. We know that same charge repel each other.

So, by this instrument we can detect a charged body.



10. List three states in India where earthquake are more likely to strike.

Ans: The states that fall in seismic zones are Jammu and Kashmir, Himachal Pradesh and Gujarat.

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

Ans: 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 told driver to drive the car slowly to clear spot and will not come out till the tremors stop.

12. 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.

Ans: No, I would not carry an umbrella, because the pointed rod of the umbrella can become a target of lightening.

Chapter – 16
Light

key words :-

1)Light: The natural agent that stimulates sight and makes things visible. Light is reflected from all surfaces. It is a form of energy.

2)Reflection of Light: Bouncing back of light after striking a shiny or polished surface, in the same medium, is called reflection.

3)Types of Reflection:

(i) Regular Reflection: When a beam of parallel light rays is incident on a smooth and plane surface, the reflected rays will also be parallel. This type of reflection is called Regular Reflection. The reflection from a plane mirror is an example of regular reflection.

(ii) Diffused or Irregular Reflection: When light is incident upon a rough or uneven surface, it is reflected in many directions due to presence of irregularities on that surface.

4) Parts of Human Eye:
(i) Cornea: Transparent bulge on the front surface of the eyeball which protects the eye and helps in refraction of light.
(ii) Iris: Coloured diaphragm behind the cornea which controls the amount of light entering the eye.
(iii) Pupil: Dark hole in the middle of iris through which light enters the eye.
(iv) Eye lens: Transparent, crystalline structure behind pupil and iris.
(v) Ciliary muscles: Hole the eye lens in position and control the focal length of the eye lens.
(vi) Retina: Surface of the rear part of the eyeball where the light entering the eye is focused.
(vii) Rods and Cones: Rod cells respond to the brightness of light while cone cells respond to colours.
(viii) Blind spot: It is the least sensitive point where no rods and cones are present.
(ix) The space between the cornea and the eye lens is filled with **aqueous humour.**
(x) The space between the eye lens and the retina is filled with **vitreous humour.**

Extra Questions:-

Very short Answer Questions :-

1. How many times is a ray of light reflected by two plane mirrors placed parallel and facing each other ?

Ans: Infinite number of times.

2. The angle between incident ray and reflected ray is 60°. What is the value of angle of incidence ?

Ans: According to the law of reflection, angle of incidence is always equal to the angle of reflection.

Let equal of incident ray = reflected ray = x.

The angle of between incident ray and reflected ray is 60o i.e. 2x = 60o

Or x = 30o. i.e. angle of incident ray = 30o

short Answer Questions :-

1. What happens to light when it gets dispersed ? Give an example.

Ans: Light is split into its constituent colours. Rainbow is a natural phenomenon showing dispersion of light.

2. Draw Fig.16.6 showing the position of the plane mirror. Also, label the angle of incidence and angle of reflection on it.

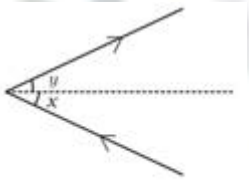
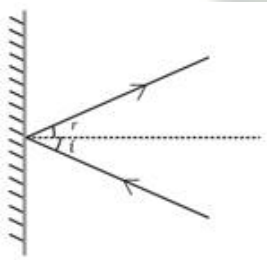


Fig.16.6

Ans:



3. Look at Fig.16.7. Can the image of the child in it be obtained on a screen ?

Fig.16.7

Ans: No, the image of the child cannot be obtained on a screen.

Long Answer Questions :-

1. There is a mistake in each of the following ray diagrams given as Fig. 16.9 a, b, and c. Make the necessary correction (s).

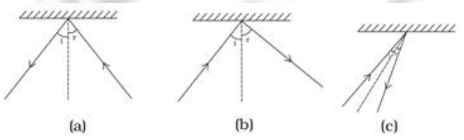
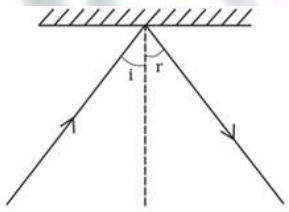


Fig. 16.9

Ans: According to the laws of reflection; angle of incidence is always equal to the angle of reflection. And the normal line is at 90o to the plane. In all of these cases the figures should be as follows:



2. Explain the process which enables us to perceive motion in a cartoon film.

Ans: The cartoon film we see is actually the projection of static pictures on the screen in a specific order. Usually the static pictures are shown in a sequence at the rate of 24 pictures per second one after the other giving us the perception of movement.

3. How is the phenomenon of reflection used in making a kaleidoscope ? What are the applications of a kaleidoscope ?

Ans: In a kaleidoscope, three plane mirrors inclined at an angle of 60° to each other are joined together, and fixed in a tube. This operates on the principle of multiple reflections and used to find colourful patterns.

Applications of a kaleidoscope are as follows :-

Designers and artists use kaleidoscope to get ideas for new patterns to design wallpapers, Jewellery and fabrics.

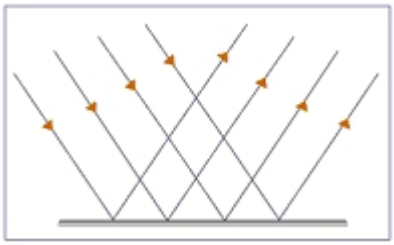
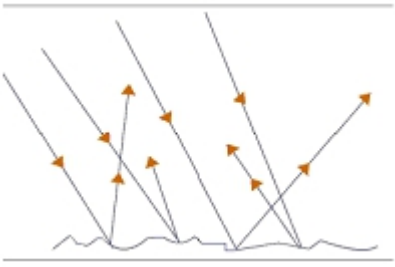
EXERCISE:-

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

Ans. We can see an object from which reflected rays enter our eyes. The light may be emitted by the object or may have been reflected by the object. Thus we cannot see an objectwhich is placed in a dark room if it does not emit light of its own. Whereas an object outside the dark room can be seen if there is either light outside the dark room or the object emit its own light.

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

Ans.

Regular Reflection	Diffused Reflection
i. It occures when parallel beam of incident rays remain parallel after reflection.	i. It occures when parallel beam of incident rays doesn't remain parallel after reflection.
ii. Occures from smooth surfaces like mirror, silver spoon etc.	ii. Occures from rough surfaces like wood, table, door, book etc,
iii. 	iii. 

No, diffused reflection is not the failure of the laws of reflection.

3. Mention against each of the following whether regular or diffused reflection will take place when a beam of light strikes. Justify your answer in each case.

(a) Polished wooden table

(b) Chalk powder

(c) Cardboard surface

(d) Marble floor with water spread over it.

(e) Mirror

(f) Piece of paper.

Ans. (a) Regular reflection will take place because polished wooden table will have a smooth surface.

(b) Diffused reflection will take place because it is rough (not smooth) surface.

(c) Diffused reflection will take place because it is rough surface.

(d) Regular reflection as it will act like a plane mirror.

(e) Regular reflection will take place because plane mirror is a polished surface.

(f) Diffused reflection because suface of paper is rough.

4. State the law of reflection.

Ans. The laws of reflection are

(a) The angle of incident is always equal to angle of reflection.

(b) The incidence ray, the reflected ray and the normal are lie in the same plane.

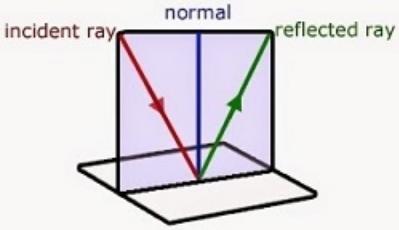
5. Describe an activity to show that the incident ray, the reflected ray and the normal at the point of incidence lie in the same plane.

Ans. Place a plane mirror on the table. Take a paper sheet and make a small hole in its centre. Make sure that the light in the room is not bright. Hold the sheet normal to the table. Take another sheet and place it on the table in contact with the vertical mirror. Draw a normal line on the second sheet from the mirror. Now, light a torch on the mirror through the small

hole such that the ray of light falls on the normal at the bottom of the mirror. When the ray from this hole is incident on the mirror, it gets reflected in a certain direction. You can easily

observe the incident ray, reflected ray and the normal to the mirror at the point of incidence on the sheet placed on the table. This shows that the incident ray, the reflected ray, and the

normal to the surface at the point of incidence all lie in the same plane.



6. Fill in the blanks in the following.

(a) A person 1 m in front of a plane mirror seems to be _____m away from this image.

(b) If you touch your _____ ear with right hand in front of a plane mirror it will be seen in the mirror that your right ear is touched with _____.

(c) The size of the pupil becomes _____ when you see in dim light.

(d) Night birds have _____ cones than rods in their eyes.

Ans. Fill in the blanks.

(a) A person 1 m in front of a plane mirror seems to be 2m away from this image.

(b) If you touch your left ear with right hand in front of a plane mirror it will be seen in the mirror that your right ear is touched with left hand.

(c) The size of the pupil becomes large when you see in dim light.

(d) Night birds have less cones than rods in their eyes.

7. Angle of incidence is equal to the angle of reflection.

(a) Always

(b) Sometimes

(c) Under special conditions

(d) Never

Ans. (a) always.

8. Image formed by a plane mirror is

(a) Virtual, behind the mirror and enlarged

(b) Virtual, behind the mirror and of the same size as the object

(c) Real at the surface of the mirror and enlarged

(d) Real, behind the mirror and of the same size as the object

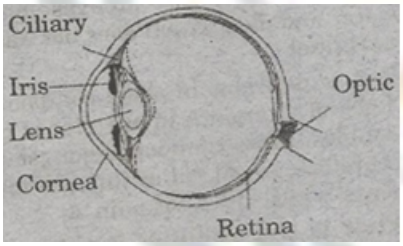
Ans. (b) Virtual, behind the mirror and of the same size as the object.

9. Describe the construction of a kaleidoscope.

Ans. Kaleidoscope is an optical instrument used to see a number of beautiful patterns. It is made up of a circular cardboard tube or tube of a thick chart paper in which rectangular mirror strips are joined together to form a prism. At one end of tube, touching these mirrors, a circular glass plate is fixed. Several small pieces of coloured glass are placed upon it. This end is closed by ground glass plate and beautiful patterns are seen through the other end of the kaleidoscope.

10. Draw a labelled sketch of the human eye.

Ans.



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?

Ans. Laser rays can cause permanent damage in the eyes. Thus, Gurmit will lose her eye sight if laser torch is directed over her eyes.

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

Ans. The following care should be taken to keep our eyes healthy:

(a) We should not look at the sun or a powerful light source diretly.

(b) Too dim or more bright light is bad for the eyes.

(c) If advised, suitable spectacles should be used.

(d) We should always read from a normal distance for distinct vision.

(e) We should never rub our eyes if any small particle or dust goes into the eyes.

(f) Food containing Vitamin A should be used.

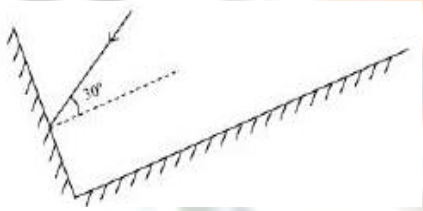
13. What is the angel of incidence of a ray if the reflected rays is at an angle of 90o to the incident ray?

Ans. The angle of incidence is 45o

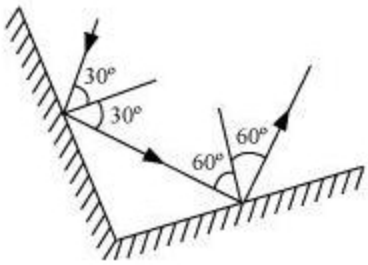
14. How many images of a candle will be formed if it is placed between two parallel plane mirrors separated by 40 cm?

Ans. Infinite number of images will be formed.

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



Ans.



16. Boojho stands at A just on the side of a plane mirror shown in fig. 16.20. can he see himself in the mirror? Also can he see the image of objects situated at P,Q and R?

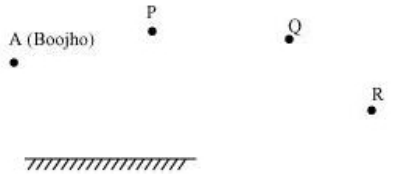
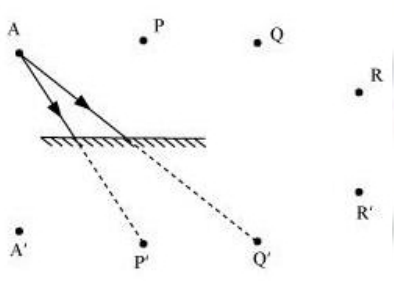


Fig. 16.20

Ans. Boojho will not be able see himself in the mirror. But he can see image of objects situated at P and Q.



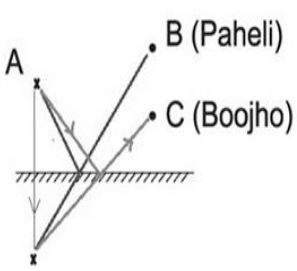
17. (a) Find out the position of the image of an object situated at A in the mirror.

(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?

Ans. (a) A image will be formed at the same distance behind the mirror.



(b) Yes.

(c) Yes.

(d) The image remains at the same place. The image moves only if the object or the mirror is moved.

Chapter – 17

Stars and the Solar System

key words :-

1)Celestial Bodies: All natural bodies visible in the sky, outside the Earth's atmosphere, constitute the celestial bodies, e.g. stars, planets, their moons, comets, asteroids, meteors, etc. The **Moon** is the celestial body closest to us.

2)Solar system: The Sun and the celestial bodies that revolve around it form the solar system. It comprises large number of bodies like planets(8 known till date), their moons, comets, asteroids, meteoroids, meteors and meteorites. These objects are held together in the solar system due to Sun's gravitational pull.

3)Sun: It is the source of almost all energy on Earth. It continuously emits huge amounts of heat and light.

4) **Planets:** Planets reflect sunlight that is incident on them. They have no light of their own, so they don't twinkle like the stars. Planets have definite paths called orbits in which they revolve around the sun. The time taken by a planet to complete one full revolution around the sun is called its period of revolution. The time taken by a planet to rotate a full 360 degrees on its axis is called its period of rotation. Time taken by a planet to complete one revolution increases as the distance from the sun increases.

Extra Questions:-

Very short Answer Questions :-

1. John saw full moon on a particular day. After how many days will he be able to see the full moon again ?

Ans: John will be able to see the next full moon in slightly longer than 29 days.

2. In the picture of rotating earth given as Fig. 17.3 mark the position of pole star.

Fig. 17.3

Ans: The pole star is situated in the direction of the earth's rotation axis.

3. Do stars emit light only during night ?

Ans: The stars are present in the sky even during the day-time. But they are not visible during daytime because of the bright sunlight.

short Answer Questions :-

1. A star is ten light years away from the earth. Suppose it brightens up suddenly today. After how much time shall we see this change ?

Ans: We will see the change after 10 years.

2. Meteors are not visible during the daytime. Explain the reason.

Ans: Meteors are very small, star-like objects that are revolving around the sun. They become visible only when, by some chance, they enter the earth's atmosphere. When a meteor enters the earth's atmosphere, it is travelling very fast . . . about 2 miles a second. At such high speeds, it gets heated due to friction with the molecules in the earth's atmosphere. The heat produced is so high that the meteor begins to burn. It glows and evaporate quickly. But its brightness is extremely small compared to that of the sun due to which it is not visible during day time.

3. Why does the moon change its shape daily ?

Ans: The moon changes its shape daily because we see only that part of the moon from which the light of the sun is reflected towards us.

Long Answer Questions :-

1. Look at Fig. 17.7 carefully and answer the following question :

(a) In which part of the sky would you see the full moon in the evening ?

(b) In which part of the sky would you see the crescent moon in the evening ?

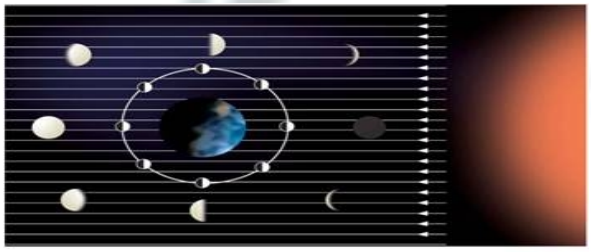


Fig. 17.7

Ans: (a) We see the full moon in the evening in the eastern part of the sky.

(b) We see crescent moon in the evening in the western part of the sky.

2. Write the names of all planets in Fig. 17.8.

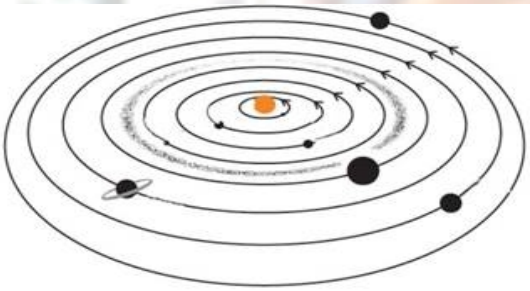
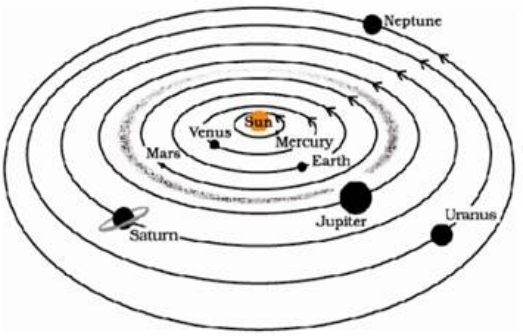


Fig. 17.8

Ans:



3. Suppose the distance between earth and sun becomes half of its present distance. What is likely to happen to life ?

Ans: The sun continuously emits huge amounts of heat and light and acts as the sources of almost all energy on the Earth. If the sun gets closer to earth the survival won't be possible due to excessive heat from sun. Life would no longer exist on earth.

EXERCISE:-

Choose the correct answer in questions 1-3

1. Which of the following is not a member of the solar system ?

(a) An asteroid

(b) A satellite

(c) A constellation

(d) A comet

Ans: (c) A constellation

2. Which of the following is not a planet of the sun ?

(a) Sirius

(b) Mercury

(c) Saturn

(d) Earth

Ans: (a) Sirius

3. Phases of moon occur because :

(a) We can see only that part of the moon which reflects light towards us.

(b) Our distance from the moon keeps changing.

(c) The shadow of the Earth covers only a part of the moon's surface.

(d) The thickness of the moon's atmosphere is not constant.

Ans: (a) We can see only that part of the moon which reflects light towards us.

4. Fill in the blanks.

(a) The planet which is farthest from the Sun is _____ .

(b) The planet which appears reddish in colour is _____ .

(c) A group of stars, that appear to form a pattern in the sky is known a _____ .

(d) A celestial body that revolves around a planet is known as _____ .

(e) Shooting stars are actually not _____ .

(f) Asteroids are found between the orbits of _____ and _____ .

Ans: (a) The planet which is farthest from the Sun is Neptune.

(b) The planet which appears reddish in colour is Mars.

(c) A group of stars, which appear to form a pattern in the sky is known a constellation.

(d) A celestial body that revolves around a planet is known as satellite.

(e) Shooting stars are actually not stars.

(f) Asteroids are found between the orbits of Mars and Jupiter.

5. Mark the following statements as true (T) or false (F).

(a) Pole star is a member of the solar system. ( )

(b) Mercury is the smallest planet of the solar system. ( )

(c) Uranus is the farthest planet in the solar system. ( )

(d) INSAT is the artificial satellite. ( )

(e) There are nine planets in the solar system. ( )

(f) Constellation Orion can be seen only with a telescope. ( )

Ans: (a) (F) (b) (T) (c) (F) (d) (T) (e) (F) (f) (F)

6. Match items in column A with one or more items in column B.

A	B
(i) Inner planets	(a) Saturn
(ii) Outer planets	(b) Great Bear
(iii) Constellation	(c) Moon
(iv) Satellite of the Earth	(d) Mars

Ans:

A	B
(i) Inner planets	(d) Mars
(ii) Outer planets	(a) Saturn
(iii) Constellation	(b) Great Bear
(iv) Satellite of the Earth	(c) Moon

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

Ans: Venus appears in the western sky just after sunset as a evening star.

8. Name the largest planet of the solar system.

Ans: Jupiter is the largest planet of the solar system.

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

Ans: A group of stars which forms a recognizable pattern or shape is called a *constellation*.

Name of two constellations are -

1. Ursa Major (Great Bear)

2. Orion the hunter

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

(a) Ursa Major and

(b) Orion.

Ans:

(a) Ursa Major appears like a big dipper.

Ursa Major

(b) Orion appears like a hunter.

Orion

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

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

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

Ans: To locate the Pole Star we have to look towards the northern part of the sky and try to identify Ursa Major. We have to look at the two stars at the end of Ursa Major. A straight line passing through these stars is imagined and is extended towards the north direction. This line leads to a star which is not too bright. This is the Pole Star.

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

Ans: No, no star moves in sky. They appear to move from east to west, because the Earth rotates from west to east about its axis.

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 ?

Ans: 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 one year.

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 ?

Ans: If the radius of the Earth is r.

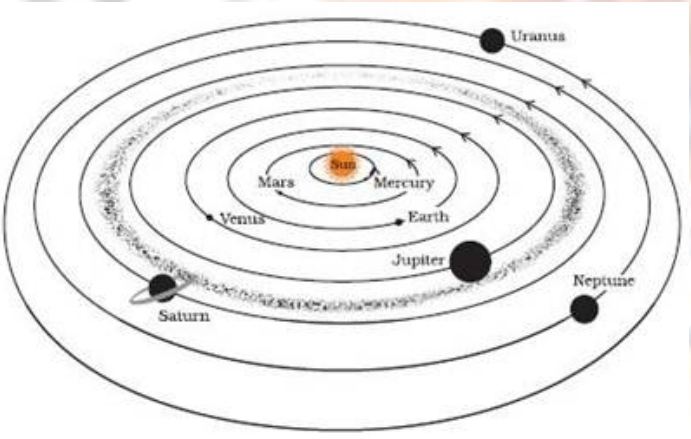
Then, radius of the Jupiter is 11 r.

So, ratio of the volumes of Jupiter and Earth $= 4/3\pi(11r)3:4/3\pi r3$

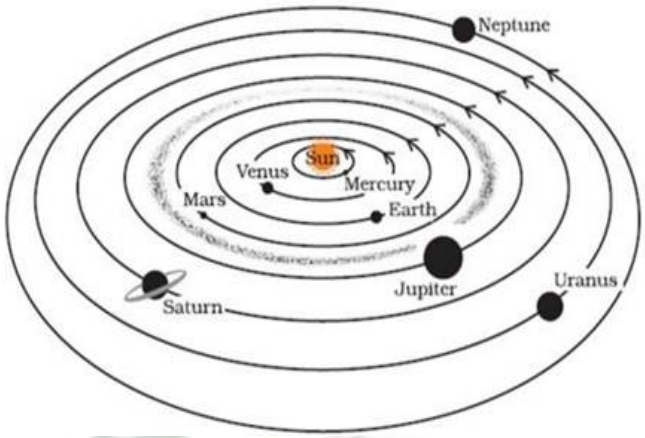
$=4/3\pi\times1331\times r3:4/3\pi r3= 1331 : 1$

So, 1331 Earth can accommodate within the Jupiter.

16. Boojho made the following sketch (fig. 17.29) of the solar system. Is the sketch correct ? If not, correct it.



Ans: The positions of Mars and Venus have to be interchanged. Similarly positions of Neptune and Uranus also have to be interchanged.


Neptune
Sun
Venus
Mercury
Mars
Earth
Jupiter
Uranus
Saturn

Chapter – 18
Pollution of Air and Water

key words :-

1)Pollution: An undesirable change in the physical, chemical or biological characteristics of air, water and land that may be harmful to human life and other animals, living conditions, industrial processes and cultural assets.

2)Pollutants: The agents that pollute our environment are called pollutants. Pollutants are the substances which contaminate air, water and land. For eg. smoke ,dust,fog and gases like sulphur dioxide and nitrogen dioxide.

3)Air pollution: Air pollution is the contamination of air by impurities which may have a harmful impact on the living organisms and the non-living components.

4)Sources of Air Pollution:

Natural Sources: Smoke and dust arising from forest fires or volcanic eruptions. Methane gas arising from decaying organic matter.

Man-made Sources: Exhaust gases from factories, power plants and automobiles.

Extra Questions:-

Very short Answer Questions :-

1. Name the chemicals which are used in refrigerators and air conditioners and damage ozone layer when released in air.

Ans: CFCs (Chloro Fluoro Carbons).

2. Name any two sources which cause air pollution due to suspended particulate matter.

Ans: Two sources which cause air pollution due to suspended particulate matter are as follows:

(i) Combustion of fuel

(ii) Industrial activities

3. Name two gases which are mainly responsible for acid rain ?

Ans: Two gases which are mainly responsible for acid rain are as follows :

(i) sulphur dioxide

(ii) nitrogen dioxide

short Answer Questions :-

1. A lot of dry leaves are collected in a school garden and are burnt every day. Do you think that it is right to do so ? If not, what should be done to dispose off the dry leaves ?

Ans: No, this is not method to dispose off the dried leaves. This is due to the fact that burning of leaves release many harmful gases into the atmosphere causing air pollution. Best way to dispose off the dried leaves is to bury them into the soil and let it turn to manure or directly throw the leaves in the farmer's field.

2. The level of air pollution is higher at a busy traffic intersection. Why ?

Ans: A large number of automobiles stop for a short period at red light throughout the day and release a huge quantity off hazardous gases like nitrogen and Sulphur dioxide, carbon dioxide which consequently lead to air pollution.

3. What do CFCs stand for ? Name some devices where CFCs are used. Why CFCs are considered as pollutants ?

Ans: CFC stands for Chlorofluorocarbons which is used in refrigerators, air conditioners and aerosol sprays. It is considered as a pollutant because it damages the ozone layer of the atmosphere, which protect us from the harmful ultraviolet rays.

Long Answer Questions :-

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

Ans: Automobile burn diesel and petrol and produces tiny particles which remain suspended in air for longer time intervals. Industries release pollutants like sulphur dioxide and nitrogen dioxide that reacts with the water vapour present in the atmosphere and give off sulphuric acid and nitric acid. These acids drop down with rain and making it acidic, This is known as acid rain and it corrodes the marble of the monument. Therefore, it is advised that industries should switch over to cleaner fuels such as CNG and LPG in the Taj Mahal Zone in Agra.

2. It is said, “CO_2 contributes to global warming.” Explain.

Ans: The rays from Sun warms the surface of earth. A part of the radiation falling on earth gets absorbed by the earth and a part is reflected back into the space. A part of the reflected radiation is trapped by the atmosphere which further warms the earth. This is known as the greenhouse effect. CO_2 is one of the gases responsible for this effect. CO_2 traps heat and does not allow it to escape into space. Consequently, the average temperature of the earth’s atmosphere is gradually increasing. This is known as global warming.

3. We should plant trees and nurture the ones already present in the neighbourhood. Why ?

Ans: We should plant more trees because more trees will consume more carbon-dioxide and produce oxygen and hence will reduce the chance of global warming. This in turn will improve the water cycle leading to adequate rainfall.

It also increases the water holding capacity of soil leading to the improvement in the movement of water from soil into the ground. Thereby reducing the chances of flood.

EXERCISE:-

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

Ans. Water gets contaminated by the addition of:

- Agricultural chemicals: Farmers use excessive amounts of pesticides and fertilizers to increase crop production. These chemicals get carried away to the water bodies due to rains and floods which lead to water pollution.
- Industrial wastes: Industries release harmful chemical wastes into water sources, thereby polluting them.
- Sewage wastes: Waste materials from kitchens, toilets, and laundry sources are also responsible for contaminating water.

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 following methods:

- We can plant trees and nurture the ones already present in the neighborhood.
- We can take part in Van Mahotsava actively and effectively every year and motivate people about the importance of plantation.
- We can educate the people against burning the dried leaves and plant and advise them to put them in compost pit.

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

Ans. Clear and transparent water is not always fit for drinking. Water might appear clean, but it may contain some disease causing microorganisms and other dissolved impurities. Hence, it is advised to purify water before drinking. Purification can be done by water purifying systems or by boiling the water.

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. To ensure the supply of clean water to all residents the following steps must be taken:

Leakages in pipelines of water should be repaired.
The main water source must be built in clean surroundings and should be maintained properly.
Open defection in water resources by slum dwellers should be strictly prohibited.
Chemical methods such as chlorination must be used for purifying water.

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

Ans.

Pure Air	Polluted Air
i. Pure air contains around 78% nitrogen, 21% oxygen, and 0.03% carbon dioxide also small amounts of argon, methane, ozone, and water vapours.	i. Polluted air includes gases like sulfur dioxide, nitrogen dioxide, carbon dioxide, etc. and other particulate matter.
ii. In pure air smog is not present.	ii.In polluted air smog can be present.
iii. Pure air is not harmful for human being.	iii. Polluted air is harmful for human beings as cause diseases like asthma.

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

Ans. When harmful gases like sulphur dioxide and nitrogen dioxide, react with moisture present in air, they form nitric acid and sulphuric acid. These acids when drop down on earth along with rain, is called acid rain.

Effects of acid rain:

Acid rains damage crops, decrease fertility of soil and affect aquatic life.
Acid rains corrode buildings and structures.

7. Which of the following is not a green gas?

(a) Carbon dioxide

(b) Sulphur dioxide

(c) Methane

(d) Nitrogen

Ans. (d) Nitrogen.

8. Describe the ‘Greenhouse Effect’ in your own words.

Ans. The greenhouse effect is the rise in the temperature of the Earth's surface due to increased concentration of greenhouse gases like carbon dioxide, methane, and water vapour in the atmosphere. These gases trap solar radiation released back by the Earth. This helps in keeping our planet warm and thus, helps in human survival. However, an increase in the amount of greenhouse gases can lead to an increase in the Earth's temperature leading to global warming.

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

Ans. Today, global warming has appeared as one of the most sever threat to the human beings. One hand, carbon dioxide is added in the atmosphere due to human activities. On the other hand, the forest area are decreasing day by day. It leads to an increase in the amount of carbon dioxide in atmosphere. The accumulation of this gas causing greenhouse effect and global warming.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.

10. Describe the threat to the beauty of the ‘Taj Mahal’.

Ans. The Taj Mahal is made of white marble, which is getting affected adversely due to the industrial pollutants from Agra, Mathura etc. the sulphur dioxide gas along with nitrogen oxide gas released from these industries mix with rain water to form Sulphuric acid that fall on marble of this monument. The acid rain corrodes the marbles and makes it yellowish.

This is a matter of great concern that world famous monument like Taj Mahal may get damaged due to the pollutants emitted by factories around it.

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

Ans. Agriculture relies on the use of chemical fertilizers to improve the crop yield. All these chemicals dissolve in water and run into water bodies from the fields. These seep into the ground and pollute the ground water. 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 fertilsers. Excessive growth of algae decrease the oxygen level of water bodies and kills the other aquatic animals living inside it.