पु॰ना International School
Shree Swaminarayan Gurukul, Zundal

CLASS – VII

SCIENCE(Term-2)

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INDEX

Chapter – 10
Respiration in Organisms

Key words :

- Respiration is essential for survival of living organisms. It releases energy from the food.
- The oxygen we inhale is used to breakdown glucose into carbon dioxide and water. Energy is released in the process.
- The breakdown of glucose occurs in the cells of an organism **(cellular respiration).**
- During heavy exercise when the supply of oxygen to our muscle cells is insufficient, food breakdown is by anaerobic respiration (without oxygen)

Types of Respiration :

1. **External respiration** also known as breathing refers to a process of inhaling oxygen from the air into the lungs and expelling carbon dioxide from the lungs to the air. Exchange of gases both in and out of the blood occurs simultaneously.

2. **Internal Respiration:** Process in which food is broken down in body cells through various chemical reactions.

   Internal respiration are further classified into two parts:
   (a) **Aerobic Respiration:** Aerobic respiration takes place in the presence of oxygen. Carbon dioxide and water are the end products of aerobic respiration. Aerobic respiration happens in most of the organisms.

   (b) **Anaerobic Respiration**: Anaerobic respiration takes place in the absence of oxygen. Anaerobic respiration usually happens in most of the microbes. Alcohol and carbon dioxide are formed at the end of anaerobic respiration. In some cases, lactic acid is formed at the end of anaerobic respiration.

- **Respiration in Plants:** Leaves have pores called stomata for gaseous exchange by diffusion. Stems have openings called lenticels for gaseous exchange by diffusion. Roots have stomatal pores for gaseous exchange of oxygen dissolved in soil water.

- **Respiration in Animals:** Respiration in animals are vary according to their character like:
  Earthworm: through their skin
  Insect: through entire body surface
  Fish: respire through their gills
  Frogs: through its thin, moist and smooth skin when in water and by lungs when in land.

- **Respiration in Humans:** Inhaled air passes through nostrils into nasal cavity and then into lungs through windpipe.
- Breathing is a part of the process of respiration during which an organism takes in the oxygen-rich air and gives out air rich in carbon dioxide. The respiratory organs for the exchange of gases vary in different organisms.
- During inhalation, our lungs expand and then come back to the original state as the air moves out during exhalation.
- Increased physical activity enhances the rate of breathing.
- In animals like cow, buffalo, dog and cat the respiratory organs and the process of breathing are similar to those in humans.·

VERY SHORT ANSWER TYPE QUESTION

Ques 1 Name the respiratory organs in frogs.

Ans. Frogs respire through their moist skin as well as through a pair of lungs.

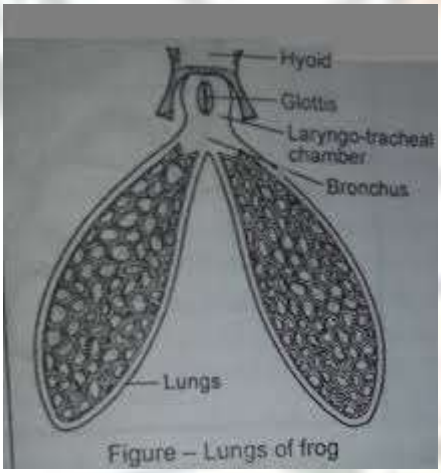


Figure – Lungs of frog

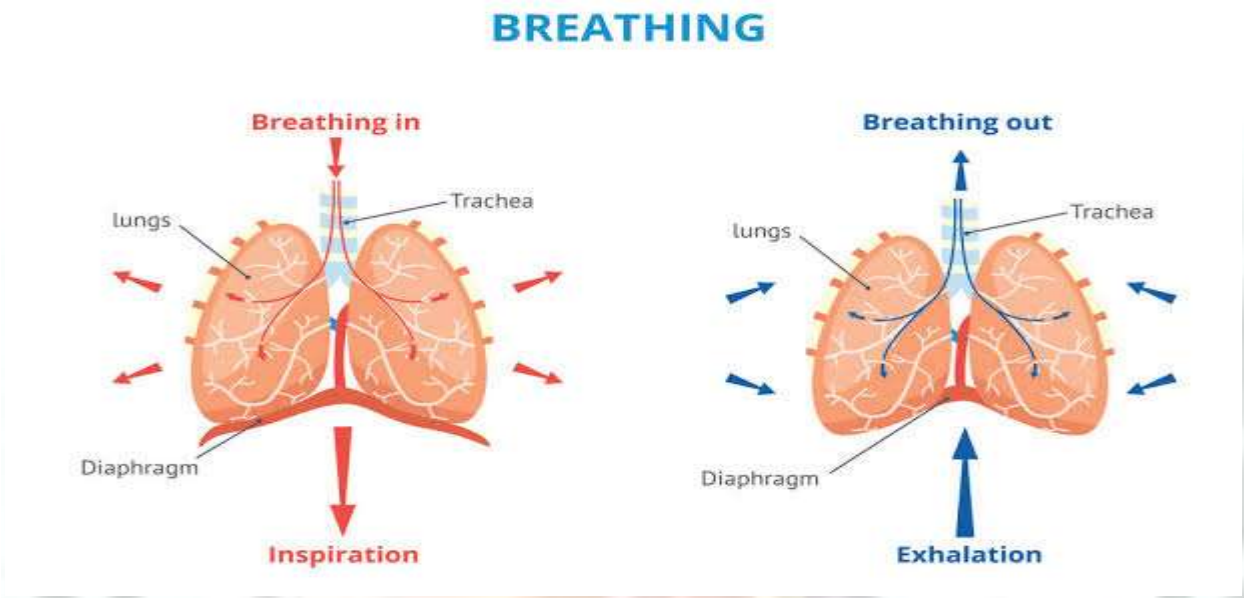
Ques **2. What are the end products of aerobic respiration.**

Ans. During aerobic respiration, carbon dioxide and water are released along with a large amount of energy.

Glucose + O2 ------- CO2 + Water + Energy

Ques 3. What changes are observed in diaphragm during inhalation ?

Ans. During the process of inhalation diaphragm contracts and move downwards.



Ques 4. The process of fermentation is based on which principle?

Ans. Anaerobic respiration.

SHORT ANSWER QUESTIONS

1. Pick the odd-one-out from each of the groups given below on the basis of respiratory organs. Give reason for your answer.

(a) cockroach, grasshopper, snail, ant

(b) lizard, cow, earthworm, snake

(c) crocodile, whale, dolphin, fish

(d) snake, tadpole, crow, goat

Ans: (a) Snail, as it does not breathe by means of trachea. Snails "breathe" through their skin and through an opening called the "pneumostome" visible on the right side of their bodies.

(b) Earthworm, because it breathes through its skin and it does not have lungs.

(c) Fish, as most fish breathe through their gills. Fish do not have lungs.

(d) Tadpole, as it breathes through gills. Tadpoles do not have lungs.

2. Which gas present in air is essential for aerobic respiration? What is the role of oxygen during respiration?

Ans: Oxygen present in air is responsible for aerobic respiration.

Role of oxygen during aerobic respiration: During aerobic respiration, oxygen helps in the oxidation of food and releases energy.

3. On an average, an adult human being at rest breathes 15–18 times per minute. The breathing rate, however, may differ under different conditions. Arrange the following activities given in the box in order of increasing breathing rates and give reason for your answer.

[sleeping, cycling, brisk walk, watching T.V.]

Ans: Activities in the order of increasing breathing rates will be as follows:-

Sleeping > Watching T.V. > Brisk walk > Cycling

The breathing rate would be the least while sleeping and would be the highest while cycling.

Whenever a person uses muscular force and engages in a physical activity, the breathing rate becomes faster. Whenever a human being is engaged in a strenuous work, the body cells require more energy. Hence, the breathing rate increases further to provide more oxygen to the cells .

4. On a very cold morning, Boojho and Paheli were talking with each other as they walked down to their school. They observed that the air coming out of their mouth looked like smoke. They were amused and wondered how it happened. Help them find the answer.

Ans: The warm and moist air exhaled by Boojho and Paheli came in contact with the cold air of the outside atmosphere and condensed into mist. That is why they observed the air coming out of their mouth as smoke.

5. Whenever we feel drowsy or sleepy, we start yawning. Does yawning help us in anyway?

Ans: During drowsiness, our breathing rate slows down. The lungs do not get enough oxygen from the air resulting in yawning. Yawning brings extra oxygen into the lungs and helps us to keep awake.

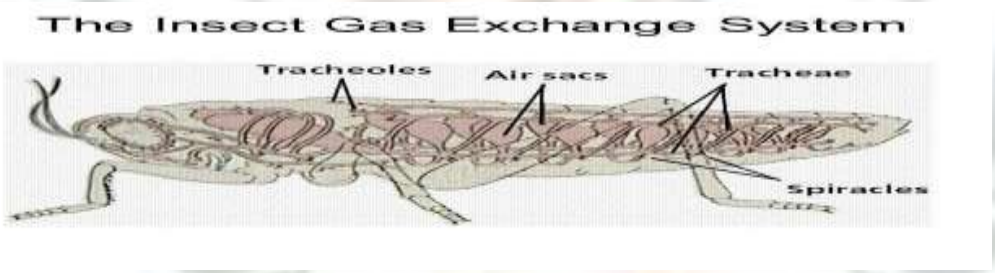
6. Insects and leaves of a plant have pores through which they exchange gases with the atmosphere. Can you write two points of differences between these pores with respect to their position, number and extension into the body?

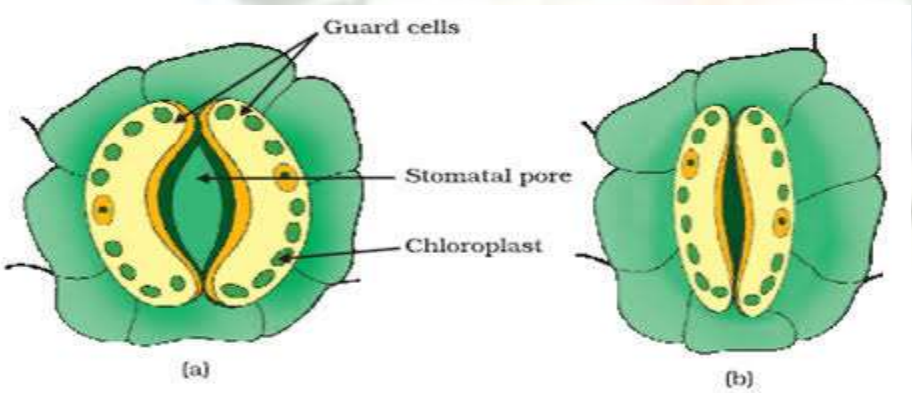
Ans: The differences between the pores of insects and leaves of a plant with respect to their position, number and extension into the body are as follows:-

(i) Spiracles are present on the sides of insects' body while stomata are present on the lower surface of the leaves.

(ii) Spiracles are fewer in number as compared to stomata.

(iii) Spiracles lead to an extensive network of tracheal system which is absent in the leaves.





LONG ANSWER QUESTIONS

1. Paheli participated in a 400m race competition held at her school and won the race. When she came home she had mixed feelings of joy and pain as she had cramps in her leg muscles. After a massage she was relieved of the pain. Answer the following questions related to the situation.

(a) What can be the possible reasons for the pain in her legs?

(b) Why did she feel comfortable after a massage?

Ans: (a) Paheli might not have focused on her breathing during the race. The possible reason for pain in her legs could be the accumulation of lactic acid in her muscles. During heavy exercise or running, the muscle cells respire anaerobically due to insufficient supply of oxygen and produce lactic acid.

(b) The massage improved the circulation of blood leading to increased supply of oxygen to the muscle cells. The increased oxygen supply helped in complete breakdown of lactic acid into CO_2 and water. Hence, she felt comfortable after the massage.

TEXTUAL EXERCISE

Question 1. Why does an athlete breathe faster and deeper than usual after finishing the race?
Answer: During running the athlete uses up lot of energy. So, she/he needs more oxygen and it can be obtained by speeding up oxidation of food.This requires more oxygen to be supplied.This is the reason behind fast and deep breathing of athlete after finishing the race.

Question 2. List the similarities and differences between aerobic and anaerobic respiration.
Answer: Similarities-
(i) Energy is released.
(ii) Carbon dioxide is produced.

Differences-
(i) Anaerobic nutrition takes place in absence of oxygen but aerobic respiration needs oxygen.
(ii) Glucose is completely broken down in aerobic respiration while in anaerobic respiration incomplete oxidation occurs.

Question 3. **Why do we often sneeze when we inhale a lot of dust-laden air?**
Answer: The air around us has various types of unwanted particles, such as smoke, dust, pollen etc. when we inhale; the particles get trapped in the hair present in our nasal cavity. Sometimes these particles enter the nasal cavity and create irritation that leads to sneezing.

Question 4. **Take three test-tubes. Fill 3/4th of each with water. Label them A,B, and C. Keep a snail in the test-tube A, a water plant in test tube B and in C keep snail and plant both. Which**

test-tube would have the highest concentration of CO_2?
Answer: Test-tube A will have the highest concentration of CO_2 because snail will take in oxygen and gives out CO_2. In test-tubes B and C, the CO_2 will be utilized by the water plant for Synthesizing food and hence there will be less concentration of CO_2 in these.

Question 5. Tick the correct answer:
(a) In cockroaches, air enters the body through
(i) lungs
(ii) gills
(iii) spiracles
(iv) skin

(b) During heavy exercise, we get cramps in the legs due to the accumulation of
(i) Carbon dioxide
(ii) lactic acid
(iii) Alcohol
(iv) water

(c) Normal range of breathing rate per minute in an average adult person at rest is:
(i) 9-12
(ii) 15-18
(iii) 21-24
(iv) 30-33

(d) During exhalation, the ribs
(i) move outwards
(ii) move downwards
(iii) move upwards
(iv) do not move at all.

Answer: (a) (iii) Spiracles
(b) (ii) Lactic acid
(c) (ii) 15-18
(d) (ii) move downwards

Question 6. Match the items in Column I with those in Column II

Column I	Column II
(a) Yeast	(i) Earthworm
(b) Diaphragm	(ii) Gills
(c) Skin	(iii) Alcohol
(d) Leaves	(iv) Chest cavity
(e) Fish	(v) Stomata
(f) Frog	(vi) Tracheae

Answer: (a) (iii) (b) (iv) (c) (i) (d) (v) (e) (ii) (f) (vi)

Question 7. Mark 'T' if the statement is true and 'F' if it is false:
(i) During heavy exercise the breathing rate of a person slows down.(T/F)
(ii) Plants carry out photosynthesis only during the day and respiration only at night. (T/F)
(iii) Frogs breathe through their skins as well as their lungs.(T/F)
(iv) The fishes have lungs for respiration.(T/F)
(v) The size of the chest cavity increases during inhalation.(T/F)
Answer: (i) F (ii) F (iii) T (iv) F (v)T.

Question 8. Given below is a square of letters in which are hidden different words related transpiration in organisms. These words may be present in any direction-upwards, downwards, or along the diagonals. Find the words for your respiratory system.
Clues about these words are given below the square.

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

(i) The air tubes of insects.
(ii) Skeletal structure surrounding chest cavity.
(iii) Muscular floor of chest cavity.
(iv) Tiny pores on the surface of leaf.
(v) Small opening on the sides of the body of an insect.
(vi) The respiratory organ of human beings.
(vii) The opening through which we inhale.
(viii) An anaerobic organism.
(ix) An organism with tracheal system

Answer: (i) The air tubes of insects – Trachea
(ii) Skeletal structures surrounding chest cavity – Ribs
(iii) Muscular floor of chest cavity – Diaphragm
(iv) Tiny pores on the surface of leaf – Stomata
(v) Small openings on the sides of the body of an insect – Spiracles
(vi) The respiratory organs of human beings – Lungs
(vii) The openings through which we inhale – Nostrils
(viii) An anaerobic organism – Yeast

(ix) An organism with tracheal system – Ant

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

Question 9. **The mountaineers carry oxygen with them because----------.**
(a) At an altitude of more than 5 km there is no air.
(b) The amount of air available to a person is less than that available on the ground.
(c) The temperature of air is higher than that on the ground.
(d) The pressure of air is higher than that on the ground.

Answer: (b) The amount of air amiable to a person is less than that available on the ground.

Chapter – 11
Transportation in Animals and Plants

Key words:

Transportation in animals:

- In most of the animals the blood that circulates in the body distributes food and oxygen to different cells of the body. It also carries waste products from different parts of the body for excretion.
- Circulatory system consists of the heart and blood vessels.
- In humans, blood flows through arteries and veins and the heart acts as a pumping organ.
- Blood is the fluid which flows in blood vessels. It transport substance like digested food from the small intestine to the other parts of the body.
- Blood consists of plasma, RBC, WBC and platelets. Blood is red due to the presence of a red pigment, haemoglobin which binds with oxygen and transport oxygen to various parts.
- The human heart beats about 70 to 80 times per minute in an adult person. This is called heart rate.
- Arteries carry blood from the heart to all parts of the body.
- Veins carry blood from all parts of the body back to the heart.
- Removal of waste products from the body is called excretion.
- Excretory system of humans consists of two kidneys, two ureters, a urinary bladder, and urethra.
- Salts and urea are removed along with water as sweat.
- Fish excrete waste substances such as ammonia which directly dissolve in water.
- Birds, insects and lizard excrete uric acid in semi-solid form.

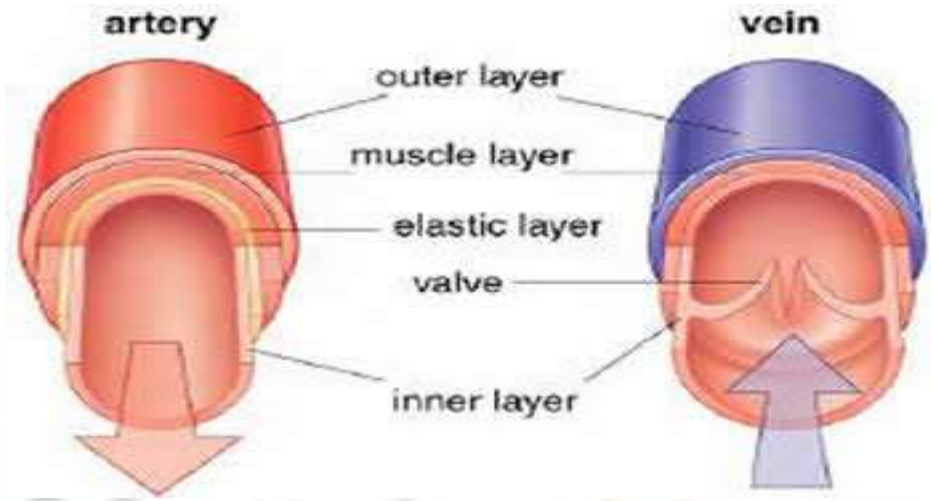
Transportation in plants :

- Water and mineral nutrients are absorbed by roots from the soil.
- Nutrients are transported along with water to the entire plant via the vascular tissue called xylem.
- The vascular tissue for the transport of food to the various parts of the plant is phloem.
- A lot of water is lost by plants in the form of vapour through stomata during transpiration.
- Transpiration generates a force which pulls up water absorbed by the roots from the soil, to reach the stem and leaves.

VERY SHORT ANSWER QUESTIONS

1. Veins have valves which allow blood to flow only in one direction. Arteries do not have valves. Yet the blood flows in one direction only. Can you explain why ?

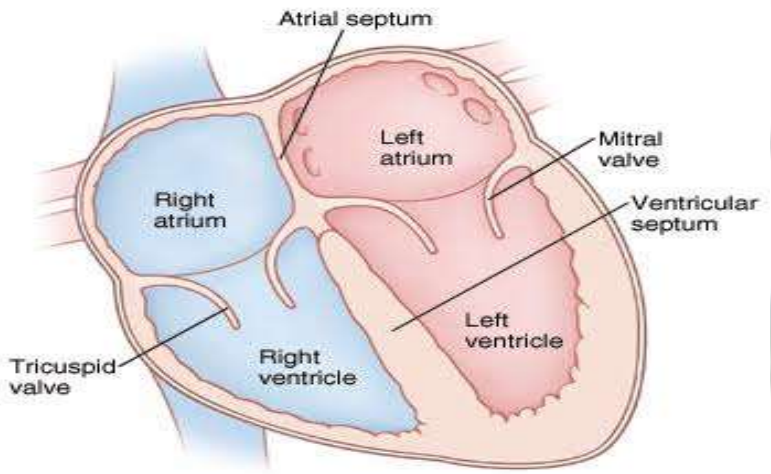
Ans: Arteries do not have valves, yet the blood flows in one direction only because blood flow in arteries is rapid and at a high pressure. Arteries also have narrow passage and thick elastic walls.



2. What is the special feature present in a human heart which does not allow mixing of blood when oxygen-rich and carbon dioxide-rich blood reach the heart ?

Ans: Heart is partitioned into four chambers :-

- Right and left auricles (or atria) and
- Right and left ventricle



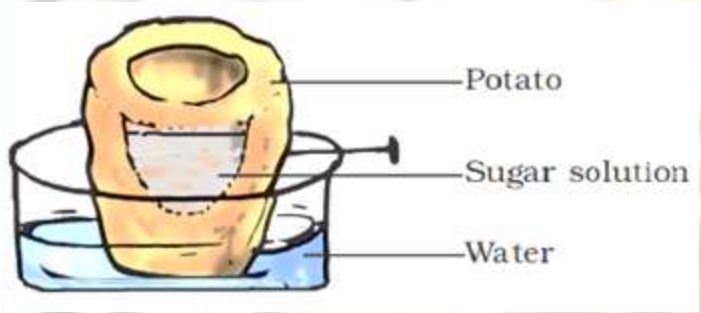
3. Name the organ which is located in the chest cavity with its lower tip slightly tilted towards the left.

Ans: Heart.

SHORT ANSWER QUESTIONS

1. Look at Figure 11.1. Draw another figure of the same set-up as would be observed after a few hours.

Ans:



2. Arrange the following statements in the correct order in which they occur during the formation and removal of urine in human beings.

(a) Ureters carry urine to the urinary bladder.

(b) Wastes dissolved in water is filtered out as urine in the kidneys.

(c) Urine stored in urinary bladder is passed out through the urinary opening at the end of the urethra.

(d) Blood containing useful and harmful substances reaches the kidneys for filtration.

(e) Useful substances are absorbed back into the blood.

Ans: (d) Blood containing useful and harmful substances reaches the kidneys for filtration.

(e) Useful substances are absorbed back into the blood.

(b) Wastes dissolved in water is filtered out as urine in the kidneys.

(a) Ureters carry urine to the urinary bladder.

(c) Urine stored in urinary bladder is passed out through the urinary opening at the end of the urethra.

3. Paheli uprooted a rose plant from the soil. Most of the root tips, with root hairs got left behind in the soil. She planted it in a pot with new soil and watered it regularly. Will the plant grow or die ? Give reason for your answer.

Ans: Possible answers are :

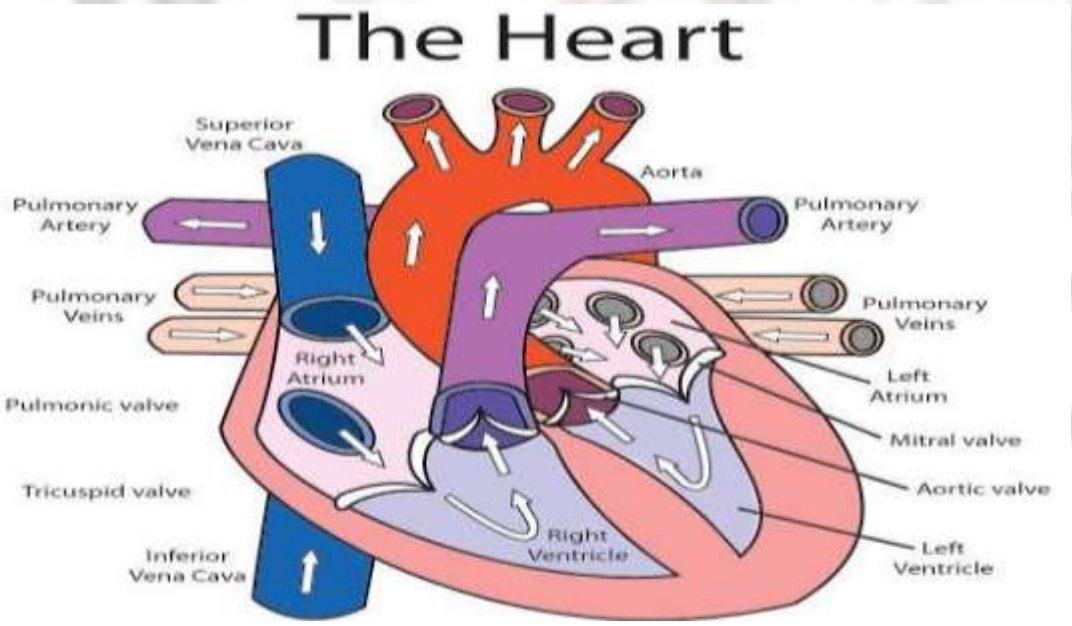
- The roots will not be able to absorb water and nutrients without the root hairs and the plant will die.
- The stem of the rose plant may grow new roots and the plant will live.
- The rose plant may not be able to survive in a different type of soil.

4. (a) Name the only artery that carries carbon dioxide-rich blood.

(b) Why is it called an artery if it does not carry oxygen-rich blood ?

Ans: (a) Pulmonary artery is the only artery that carries carbon dioxide-rich blood.

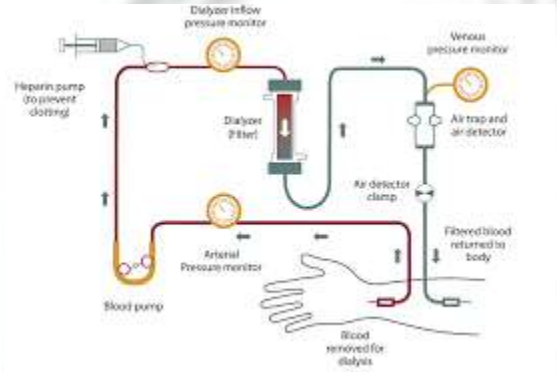
(b) It does not carry oxygen-rich blood but it is called an artery because arteries carry blood away from the heart and Pulmonary artery also carry blood away from the heart.



5. Boojho's uncle was hospitalised and put on dialysis after a severe infection in both of his kidneys.

(a) What is dialysis ?

(b) When does it become necessary to take such a treatment ?



Ans: (a) Dialysis is a method for removing toxic substances from the blood with the help of machine when kidneys are unable to do so. The dialysis machine is also called an artificial kidney.

(b) It become necessary to take such treatment when a person's kidneys stop working. An infection in the kidney, an injury to kidney or restricted flow of blood to the kidney can damage the kidneys due to which it may stop working.

6. Name the process and the organ which helps in removing the following wastes from the body.

(a) Carbondioxide

(b) Undigested food

(c) Urine

(d) Sweat

Ans: Process - Organ

(a) exhalation - lungs

(b) egestion - large intestines and anus

(c) excretion - kidneys

(d) perspiration - sweat glands

7. Observe Figure 11.2 and answer the given questions:

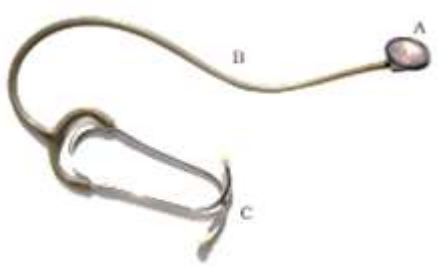


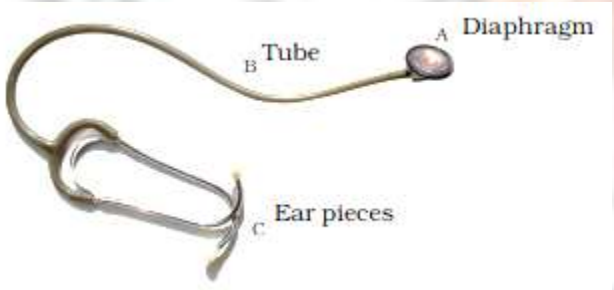
Fig 11.2

(a) Name the instrument.

(b) Label the parts A, B and C.

Ans: (a) The given instrument is stethoscope.

(b)



8. Paheli noticed water being pulled up by a motor-pump to an overhead tank of a five-storeyed building. She wondered how water moves up to great heights in the tall trees standing next to the building. Can you tell why ?

Ans: Constant diffusion of water along with the minerals from the root cells produces a pushing force upwards. At the same time, constant evaporation of water from the leaves produces a pulling force which causes the water to move upwards in xylem vessels.

TEXTUAL EXERCISE

Question 1. Match the structures given in Column I with functions given in Column II.

Column I	Column II
(i)Stomata	(a)Absorption of water
(ii) Xylem	(b) Transpiration
(iii) Root hairs	(c) Transport of food
(iv) Phloem	(d) Transport of water
	(e) Synthesis of carbohydrates.

Answer: (i) (b) (ii) (d) (iii) (a) (iv) (c)

Question 2.Fill in the blanks.

(i) The blood from the heart is transported to all parts of the body by the----------.
(ii) Hemoglobin is present in ---------- cells.
(iii) Arteries and Veins are joined by a network of ----------.
(iv)The rhythmic expansion and contraction of the heart is called ----------.
(v) The main excretory product in human beings is ----------.
(vi) Sweat contains water and ----------.
(vii) Kidneys eliminates the waste materials in the liquid form called ----------.
(viii) Water reaches great heights in the trees because of suction pull caused by ------.

Answer: (i) The blood from the heart is transported to all parts of the body by the **arteries**.
(ii) Hemoglobin is present in **red blood** cells.
(iii) Arteries and Veins are joined by a network of **capillaries**.
(iv) The rhythmic expansion and contraction of the heart is called **heart beat**.
(v) The main excretory product in human beings is **urea**.
(vi) Sweat contains water and **salts**.
(vii) Kidney eliminates the waste materials in the liquid form called **urine**.
(viii) Water reaches great heights in the trees because of suction pull caused by **transpiration**.

Question 3. Choose the correct options:

(a) In plants, water is transported through
(i) Xylem
(ii) Phloem
(ii) Stomata
(iv) Root hair

(b) Water absorption through roots can be increased by keeping the plants
(i) in the shade
(ii) in dim light.
(iii) under the fan
(iv) covered with a polythene bag.

Answer: (a) (i) Xylem (b) (iii) under the fan.

Question 4. Why is transport of materials necessary in a plant or in an animal? Explain.
Answer: In plants and animals the transport of materials is necessary. It can be explained as below:
(i) Animals need to transport food and water from intestine and oxygen from lungs to all other body parts.
(ii) Animals need to transport the wastes from where they are produced to parts from where they can be removed.
(iii) Plants need to transport the food from leaves, water and minerals to all other parts of the plant.

Question 5. What will happen if there are not platelets in the blood?
Answer: Blood cannot clot without the platelets help in the clotting of blood at the time of injury with bleeding.If there is no platelets, then there would be no clotting of blood and ultimately the person may die due to excess of flow of blood.

Question 6. What are stomata? Give two functions of stomata.
Answer: Small pores in leaves of plant are called stomata.

Functions of stomata-

(i) Exchange of carbon dioxide and oxygen.
(ii) Transpiration to remove excess of water.

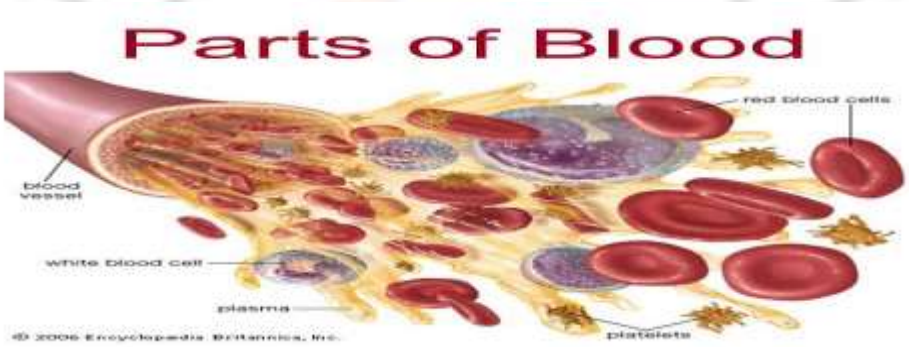
Question 7. Does transpiration serve any useful function in the plants? Explain.

Answer: (i) The excess water absorbed by the root system of the plants lost in the form of water vapour to their surroundings by the process of transpiration.
(ii) It also in transport of absorbed water to the leaves of plants from the roots for photosynthesis and helping the plants keeping erect.
(iii) It also produces cooling effect for the plants.

Question 8. What are the components of blood?

Answer: The main component of blood cells are:

Red blood cells (RBC), white blood cells (WBC), platelets and plasma.

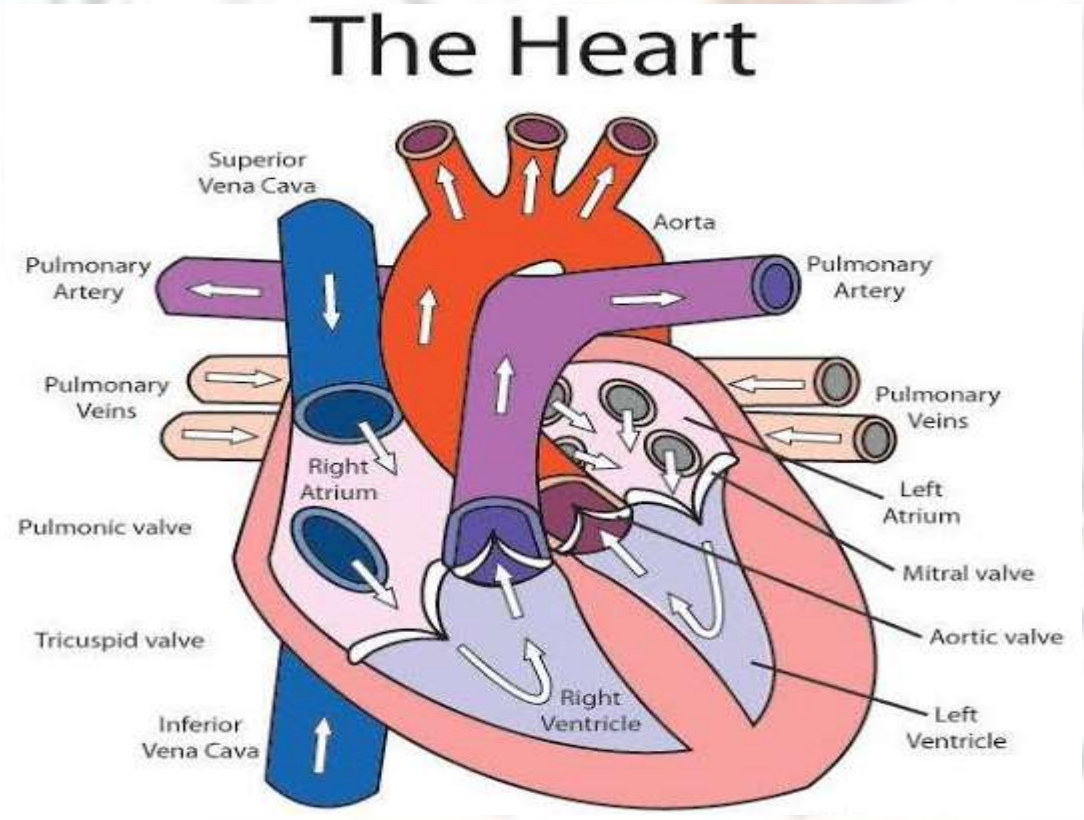


Question 9. Why blood needed by all the parts of a body?

Answer: Blood is needy by all the parts of a body because:
(i) It carries oxygen to all the parts of the body and also carries carbon dioxide back to the lungs.
(ii) It carries digested food to various parts of the body for absorption.
(iii) It contains platelets which help in the clotting of blood.
(iv) It helps in maintaining constant body temperature.
(v) It transports hormones and help in fighting the body with germs and bacteria.

Question 10. What makes the blood look red?
Answer: The presence of red pigment called haemoglobin.

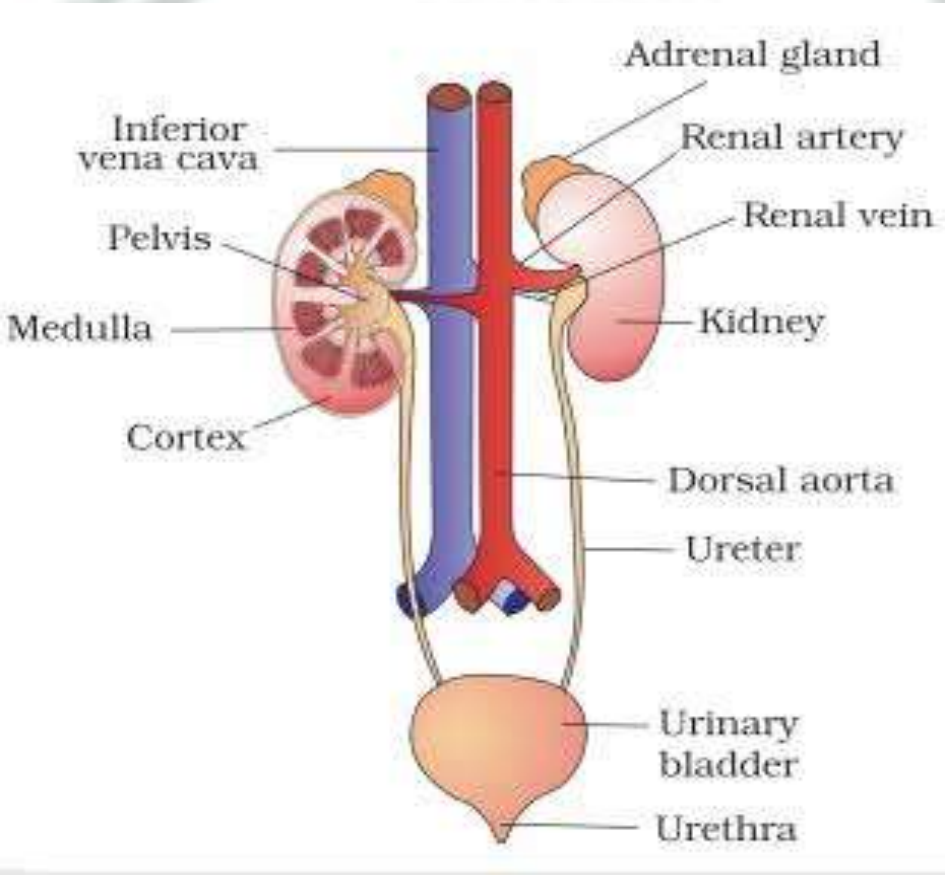
Question 11. Describe the functions of the heart.
Answer: Functions of the heart:
(i) It helps in the circulation of oxygen rich blood throughout the body by the pumping.
(ii)It receives oxygenated blood from the lungs.
(iii) It also pumps back the blood carrying carbon dioxide to the lungs.
(iv) It shows rhythmic contraction and relaxation for movement of blood.



Question 12. Why is it necessary to excrete waste products?
Answer: The waste products produced in various metabolic process in our body are harmful for the body. So it is necessary to excrete it.

Question 13. Draw a diagram of the human excretory system and label the various parts.

Answer:



Chapter – 12
Reproduction in Plants

Key words:

- All organisms multiply or reproduce offspring of their own kind.
- In plants there are two modes of reproduction, namely (a) Asexual and (b) Sexual.
- There are several methods of asexual reproduction such as fragmentation, budding, spore formation and vegetative propagation.
- Sexual reproduction involves the fusion of male and female gametes.
- In vegetative propagation new plants are produced from different vegetative parts such as leaves, stems and roots.
- Flower is the reproductive part of a plant.
- A flower may be unisexual with either the male or the female reproductive parts.
- A bisexual flower has both the male and the female reproductive parts.
- The male gametes are found inside the pollen grains and female gametes are found in the ovule.
- Pollination is the process of transfer of pollen grains from the anther of one flower to the stigma of the same or another flower.
- Pollination is of two types, self-pollination and cross-pollination. In self-pollination, pollen grains are transferred from the anther to the stigma of the same flower. In cross-pollination, pollen grains are transferred from the anther of one flower to the stigma of another flower of the same kind.
- Pollination takes place in plants with the help of wind, water and insects.
- The fusion of male and female gametes is called fertilization.
- Fertilized egg is called zygote. Zygote develops into an embryo.
- Fruit is the mature ovary whereas ovule develops into a seed, which contains the developing embryo.
- Seed dispersal is aided by wind, water and animals.
- Seed dispersal helps the plants to
  (i) prevent overcrowding,
  (ii) avoid competition for sunlight, water and minerals
  (iii) invade new habitats.

VERY SHORT ANSWER QUESTIONS

1. Fungus, moss and fern reproduce by a common method of asexual reproduction. Name the method.

Ans: They can reproduce asexually by means of spore formation.

2. Pick the odd one out from the following on the basis of mode of reproduction and give reason for it.

Sugarcane, Potato, Rice, Rose

Ans: Rice, because it does not reproduce by vegetative propagation whereas the other three plants reproduce by vegetative propagation.

3. Boojho had the following parts of a rose plant - a leaf, roots, a branch, a flower, a bud and pollen grains. Which of them can be used to grow a new rose plant ?

Ans: A Branch can be used to grew a new rose plant.

4. Which type of pollination does the Figure 12.1 indicate ?

Fig. 12.1

Ans: This figure shows self-pollination.

5. One morning as Paheli strolled in her garden she noticed many small plants which were not there a week ago. She wondered where they had come from as nobody had planted them there. Explain the reason for the growth of these plants.

Ans: The seeds from the tree may have fallen below and germinated into small plants.

SHORT ANSWER QUESTIONS

1. In the diagram given in Figure 12.2 label the parts marked (a), (b) and (c).

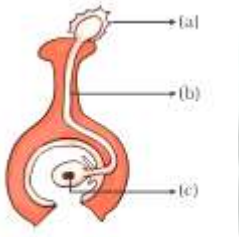
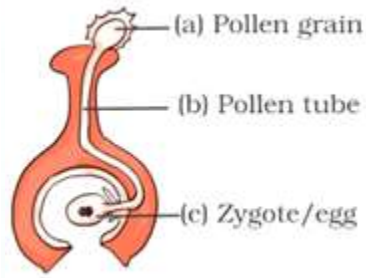


Fig. 12.2

Ans:



2. When you keep food items like bread and fruits outside for a long time especially during the rainy season, you will observe a cottony growth on them.

(a) What is this growth called?
(b) How does the growth take place?

Ans:(a) It is bread mould, a fungus.
(b) They develop from spores.

3. Group the seeds given in Figure 12.3 (i) to (iii) according to their means of dispersion.

(a) Seed dispersed by wind
(b) Seed dispersed by water
(c) Seed dispersed by animal

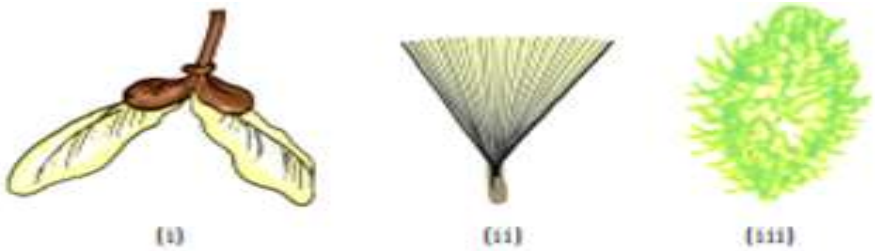


Fig. 12.3

Ans:(i) dispersed by wind
(ii) dispersed by wind.
(iii) dispersed by animal.

4. Coconut is a large and heavy fruit. How is it adapted for dispersal by water?

Ans: Coconut is a large and heavy fruit. Even that it is adapted for dispersal by water because coconut fruit develops a spongy fiber to help it to float in water. Coconut tree grows near sea shore. So, it floats in water and is carried away from one place to another by water currents.

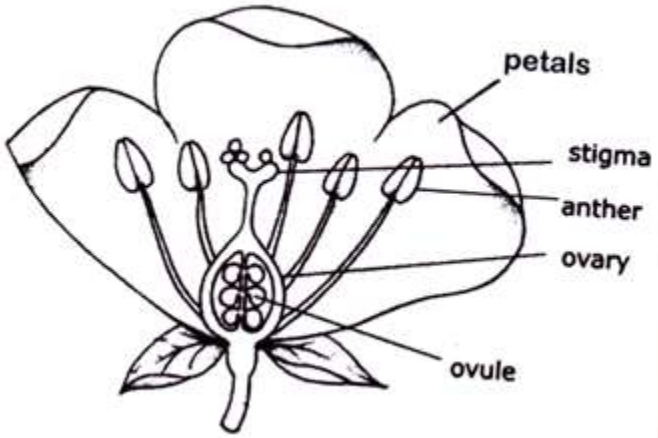
LONG ANSWER QUESTIONS

1. In the figure (12.4) of a flower , label the parts whose functions are given below and give their names.

Fig 12.4

(a) The part which contains pollen grains.
(b) The part where the female gamete is formed.
(c) The female reproductive part where pollen grains germinate.
(d) The colourful part of flower which attracts insects.

Ans:



2. Fill in the blanks with correct terms.

The male and female gametes fuse to form a (a) _____ during the process of (b) ___. This grows into an (c) ____ which is enclosed within a seed. After fertilization, the ovules develop into (d) _____ and the ovary develops into a (e)_____.

Ans:(a) zygote
(b) fertilization
(c) embryo
(d) seed
(e) fruit

3. In the diagram of a bisexual flower given as Figure 12.5, draw the missing part and label the parts marked (a), (b) and (c). Also label the missing part that you draw.

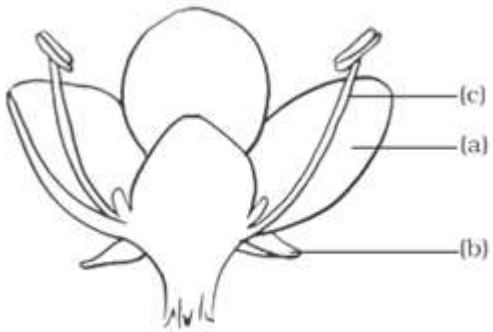
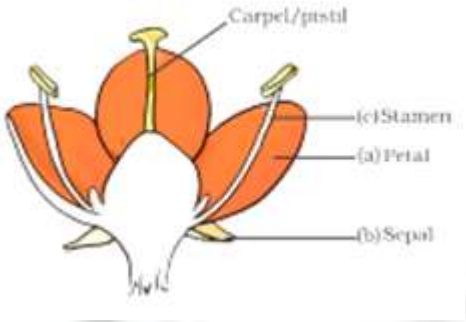


Fig. 12.5

Ans:



4. Write how the following seeds are dispersed.

(a) Seeds with wings.
(b) Small and light seeds.
(c) Seeds with spines/hooks.

Ans:(a) Seeds with wings are dispersed by wind. There winglike structures help them in flying with the wind. Two popular examples of winged fruits are*clematis* and*thistle*.

(b) Small and light seeds are dispersed by wind. Seeds of dandelion, maple, cotton, etc are dispersed by wind.

(c) Seeds with spines/hooks are dispersed by animal. These seeds stick to the fur of animals or clothes of human beings and are carried to distant places.

TEXTUAL EXERCISE

Question 1. Fill in the blanks:

(a) Production of new individuals from the vegetative part of parent is called -------.
(b) A flower may have either male or female reproductive parts. Such flower is called ---------.
(c) The transfer of pollen grains from the anther to stigma of the same or of another flower of the same kind is known as ----------.
(d) The fusion of male and female gametes is termed as ----------.
(e) Seed dispersal takes place by means of ---------- and ----------.

Answer: Fill in the blanks:

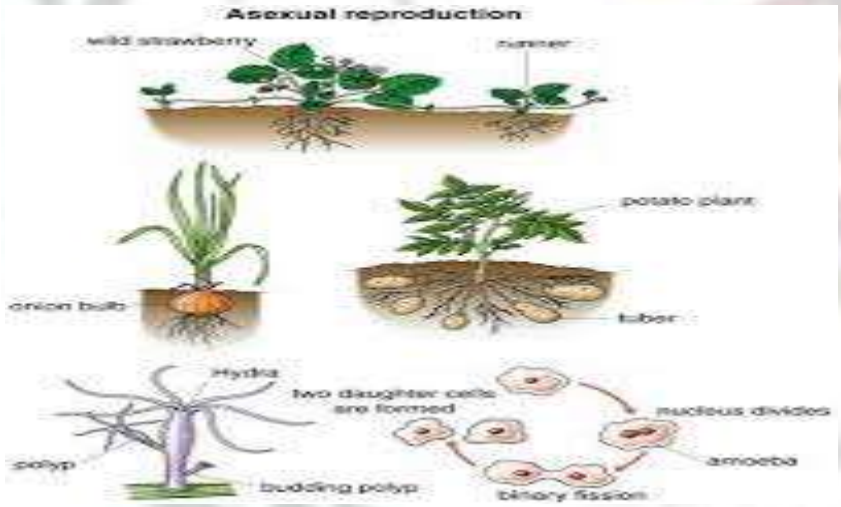
(a) Production of new individuals from the vegetative part of parent is called **vegetative propagation**.
(b) A flower may have either male or female reproductive parts. Such flower is called **unisexual**

flowers.
(c) The transfer of pollen grains from the anther to stigma of the same or of another flower of the same kind is known as **pollination**.
(d) The fusion of male and female gametes is termed as **fertilisation**.
(e) Seed dispersal takes place by means of **wind, water** and **animals**.

Question 2. Describe the different methods of asexual reproduction. Give examples.

Answer: Various methods of asexual reproduction are:

a. Vegetative propagation- In this method new plants are developed from root, stem or leaf of plant.
b. Budding – Here, small bulb-like projection coming out from, yeast cell is called bud, gradually grows and gets detached from parent body to form new organism. Ex- hydra, yeast.
c. Fragmentation- In favorable condition, plant body breaks into two or more fragments which grow into independent plant.
d. Spore formation – The fungi on bread pieces grow from spores which are present in air. Spores germinate when come in contact of moisture.



Question 3. Explain what you understand by sexual reproduction.

Answer: The mode of reproduction in which male and female gamete fuse together to form a zygote. Zygote divides further to form new organism. Male and female gamete may be of same kind or different kind. Sexual reproduction is common in multicellular organism and unicellular organism in unfavorable condition.

Question 4.State the main difference between asexual and sexual reproduction.

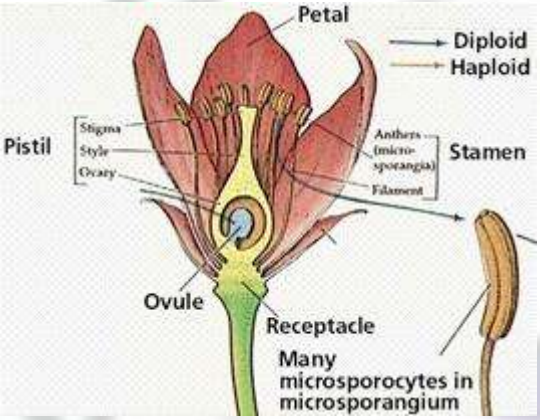
Answer:

Sexual Reproduction	Asexual Reproduction
New plants are obtained from seeds.	Plants can give rise to new plants without seeds.

Two parents are required to produce an individual.	The new individual comes from a single parent.
Takes place with the help of specialized sex cells.	No sex cells are required.
New individual has the characters of both the parents.	Characters of the new individual are same as that of the parent.

Question 5. Sketch the reproductive parts of flower.

Answer:



Question 6. Explain the difference between self-pollination and cross-pollination.

Answer:

Self - Pollination	Cross – Pollination
Pollen of a flower reaches to the stigma of same flower	The transfer of pollen grains from the anthers of a flower to the stigma of another flower on a different plant of the same species
No pollinating agent is required	Pollinating agent like wind, air or insects are required
Occurs only in bisexual flowers	Occurs in unisexual flower
It does not lead to genetic variation in the progeny	It leads to genetic variation in the progeny

Question 7. How does the process of fertilisation take place in flowers?

Answer: The male and female gametes fuse together to form zygote. The process of fusion of male and female gamete is called fertilization. The zygote undergo to mitotic division to form embryo.

Question 8. Describe the various ways by which seeds are dispersed.

Answer: Dispersal of seed takes place by various means such as wind, water, insects, animals and birds. The seeds dispersed by wind are light and smaller in size. So, that it may be carried by wind easily. The water dispersed seeds are generally floating in nature. Spiny seeds with hooks are generally carried by animal's body. The birds disperse the seed to faraway places by eating fruit, they excrete with digesting the seeds.

Question 9. Match items in Column I with those in Column II:

Column I	Column II
(a) Bud	(i) Maple
(b) Eyes	(ii) Spirogyra
(c) Fragmentation	(iii) Yeast
(d) Wings	(iv) Bread mould
(e) Spores	(v) Potato
	(vi) Rose

Answer: (a) (iii) (b) (v) (c) (ii) (d) (i) (e) (iv)

Question 10. Tick ( ) the correct answer:

(a) The reproductive part of a plant is the
(i) Leaf
(ii) Stem
(iii) Root
(iv) Flower

(b) The process of fusion of the male and female gametes is called
(i) Fertilisation
(ii) Pollination
(iii) Reproduction
(iv) Seed formation

(c) Mature ovary forms the
(i) Seed
(ii) Stamen
(iii) Pistil
(iv) Fruit

(d) A spore producing plant is
(i) Rose
(ii) Bread mould
(iii) Potato
(iv) Ginger

(e) Bryophyllum can reproduce by its
(i) Stem
(ii) Leaves

(iii) Roots
(iv) Flower

Answer: (a) (iv) flower.
(b) (i) fertilisation.
(c) (iv) fruit.
(d) (iii) bread mould.
(e) (ii) leaves.

Chapter – 13
Motion and Time

Key words:

- **Motion:** The action or process of moving or being moved.
- The distance moved by an object in a unit time is called its speed.
- Speed of objects help us to decide which one is moving faster than the other.
- The speed of an object is the distance travelled divided by the time taken to cover that distance. Its basic unit is mere per second (m/s).
- Periodic events are used for the measurement of time. Periodic motion of a pendulum has been used to make clocks and watches.
- Motion of objects can be presented in pictorial form by their distance-time graphs.
- The distance-time graph for the motion of an object moving with a constant speed is a straight line.

- **Types of Motion:**
  (i) **Uniform motion:** An object moving along a straight line with a constant speed is said to be in uniform motion. The average speed is the same as the actual speed.
  (ii) **Non-Uniform motion:** If the speed of an object moving along a straight line keeps changing, its motion is said to be non-uniform.

- **Speed:** It is the distance covered by an object in a unit time. Basic unit of speed is m/s.

  Speed=Total distance coveredTotal time takenSpeed=Total distance coveredTotal time taken

- **Distance-Time Graph:** Motion of objects can be presented in pictorial form by their distance-time graphs. The distance-time graph for the motion of an object moving with a constant speed is a straight line.

VERY SHORT ANSWER QUESTIONS

1. A simple pendulum is oscillating between two points A and B as shown in Figure 13.5. Is the motion of the bob uniform or non-uniform?

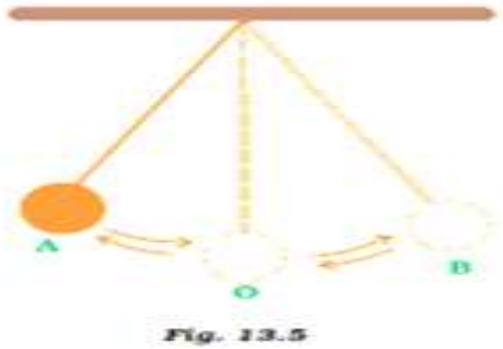


Fig. 13.5

Ans: The motion of the bob isNon-uniform motion as the object is changing its motion.

2. Paheli and Boojho have to cover different distances to reach their school but they take the same time to reach the school. What can you say about their speed ?

Ans: Paheli and Boojho travelled at different speed due to which they reached at the same time even on travelling through different paths.

3. If Boojho covers a certain distance in one hour and Paheli covers the same distance in two hours, who travels in a higher speed ?

Ans: Boojho travels in a higher speed because he covered the distance in 1 hour but Paheli covered the same distance in 2 hours. Paheli take double time than Boojho to travel the same distance.

SHORT QUESTION ANSWERS

1. The average age of children of Class VII is 12 years and 3 months. Express this age in seconds.

Ans: average age= 12 years 3 months

$= 12 \times 365 + 3 \times 30$
$= 4380 + 90$
$= 4470$ days
$= 4470 \times 24 \times 60 \times 60$ s
$= 386208000$ s

2. A spaceship travels 36,000 km in one hour. Express its speed in km/s.

Ans: 1 hr = 60 min.

1 min. = 60s.

1 hr = 3600 s.

Distance = 36000 km.

Speed = 36000/3600 km/s

= 10 km/s

3. Starting from A, Paheli moves along a rectangular path ABCD as shown in Figure 13.7. She takes 2 minutes to travel each side. Plot a distance-time graph and explain whether the motion is uniform or non-uniform.

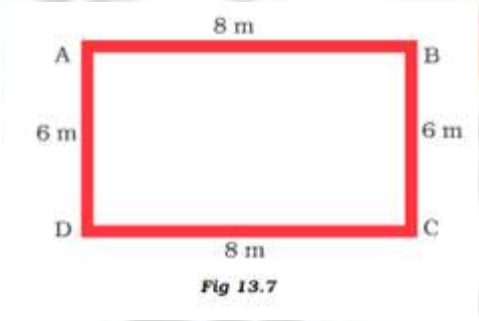
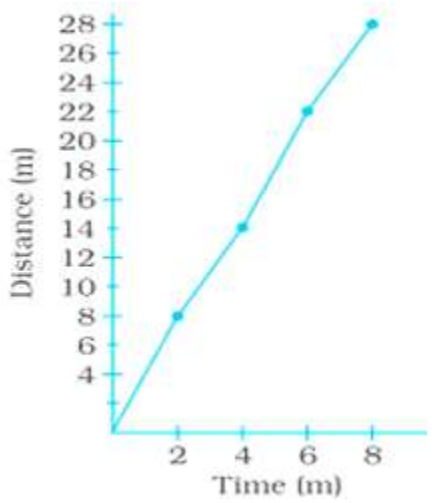


Fig 13.7

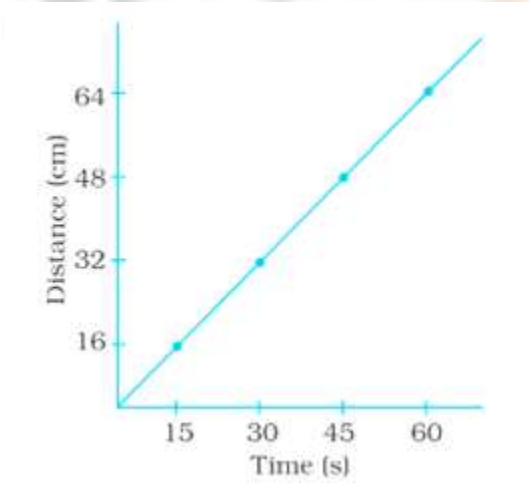
Ans: Since the distance covered per unit time for the entire distance covered is not the same, So the motion is non-uniform.



4. Plot a distance-time graph of the tip of the second hand of a clock by selecting 4 points on x-axis and y-axis respectively. The circumference of the circle traced by the second hand is 64 cm.

Ans:

Time (s)	x	15	30	45	60
Distance (cm)	y	16	32	48	64



LONG ANSWER QUESTIONS

1. Given below as Figure 13.8 is the distance-time graph of the motion an object.

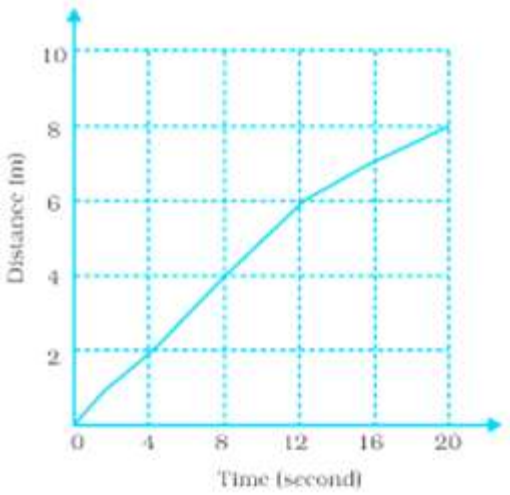


Fig. 13.8

(i) What will be the position of the object at 20s?
(ii) What will be the distance travelled by the object in 12s?
(iii) What is the average speed of the object?

Ans: (i) The position of the object is 8 m from the starting point at 20s.
(ii) The distance travelled by the object in 12s is 6 m.
(iii) The average speed of the object is 0.4 m/s.

2. Distance between Bholu's and Golu's house is 9 km. Bholu has to attend Golu's birthday party at 7 o'clock. He started from his home at 6 o'clock on his bicycle and covered a distance of 6 km in 40 minutes. At that point, he met Chintu and he spoke to him for 5 minutes and reached Golu's birthday party at 7 o'clock. With what speed did he cover the second part of the journey? Calculate his average speed for the entire journey.

Ans: He started at 6'O clock and travelled for 40 minutes i.e. at 6:40, he travelled 6 km out of 9 km. There he waited for 5 minutes and again started i.e. he resumed his journey at 6:45, therefore he travelled remaining 3 km in 15 minutes.

Time = 15 minutes = 0.25 hr.

Distance = 3 km.

Speed = 3/0.25 km/hr. = 12 km/hr.

Average speed = 9/1 km/hr. = 9 km/hr.

3. Boojho goes to the football ground to play football. The distance time graph of his journey from his home to the ground is given as Figure 13.9.

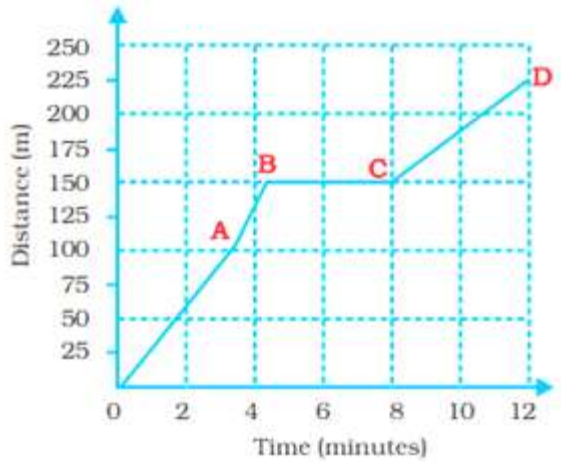


Fig. 13.9

(a) What does the graph between point B and C indicate about the motion of Boojho?
(b) Is the motion between 0 to 4 minutes' uniform or nonuniform?
(c) What is his speed between 8 and 12 minutes of his journey?

Ans: (a) Boojho is at rest, i.e. his speed is zero
(b) Non-uniform

(c)225−15012−8225−15012−8 = 754754= 18.75 m/minute

TEXTUAL EXERCISE

Question 1. Classify the following as motion along a straight line, circular or oscillatory motion.
(i) Motion of your hands while running.
(ii) Motion of a horse pulling a cart on a straight road.
(iii) Motion of a child in merry-go –round.
(iv) Motion of a child on a see-saw.
(v) Motion of the hammer of an electric bell.
(vi) Motion of a train on a straight bridge.

Answer: Classification of motion
(i) Oscillatory motion
(ii) Straight line
(iii) Circular motion
(iv) Oscillatory motion
(v) Oscillatory motion
(vi) Straight line.

Question 2. Which of the following are not correct?

(i) The basic unit of time is second.
(ii) Every object moves with a constant speed.
(iii) Distance between two cities is measured in kilometers.
(iv) The time period of a given pendulum is not constant.
(v) The speed of a train is expressed in m/h.

Answer: (ii), (iv) & (v).

Question 3. A simple pendulum takes 32 s to complete 20 oscillations. What is the time-period of the pendulum.

Answer: Number of oscillations = 20
Total time taken = 32 s
We know that time period of a given pendulum is the time taken by it to complete one oscillation.
Thus, Time
period =Total time taken Number of oscillations=Total time taken Number of oscillations =32 s20 = 1.6 s=32 s20 = 1.6 s

Question 4. The distance between two stations is 240 km. A train takes 4 hours to cover this distance. Calculate the speed of the train.

Answer: The distance b/w two stations = 240 Km
Time taken to cover this distance = 4 Hr
Now Speed =DistanceTime =240 km4 hr=60 km/h=DistanceTime =240 km4 hr=60 km/h
Therefore, speed of the train will be 60\km/h

Question 5. The odometer of a car reads 57,321.0 km when the clock shows the time 8.30 AM. The odometer reading was changed to 57,336.0 km. calculate the speed of the car in km/min during this time. Express the speed in km/h also.

Answer: Initial reading of odometer = 57321.0 Km
Final reading of odometer = 57336.0 Km
Total Distance covered = Final reading of odometer - Initial reading of odometer
= 57336.0 - 57321.0 = 15.0 Km
Initial Time = 8:30 AM
Final Time = 8:50 AM
Total time taken = Final time - Initial time = 8:50 - 8:30 = 20 min
We Know that, Speed
= distance coveredTime takendistance coveredTime taken = 1520=0.75 Km/min1520=0.75 Km/min

Speed in Km/h = 0.75×60=45 Km/h0.75×60=45 Km/h

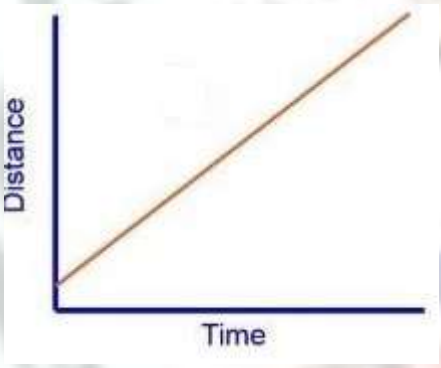
Question 6. Salma takes 15 minutes from her house to reach her school on bicycle. If the bicycle has a speed of 2 m/s, calculate the distance between her house and the school.

Answer: Speed of bicycle = 2 m/s
Total time taken = 15 min = 15×60=900 s15×60=900 s
We know that,
The distnace covered = Speed×Time takenSpeed×Time taken =
2×900=1800 m2×900=1800 m = 1.8 Km
Distance b/w house and school is 1800 m or 1.8 Km

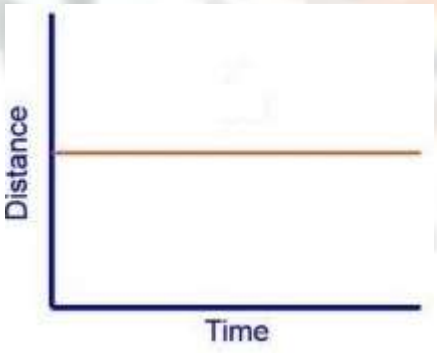
Question 7. Show the shape of the distance-time graph for the motion in the following cases:
(i) A car moving with a constant speed.
(ii) A car parked on a side road.

Answer:

(i)



(ii)



Question 8. Which of the following relations is correct?
(i) Speed = Distance x Time.
(ii) Speed = DistanceTimeDistanceTime
(iii) Speed = TimeDistanceTimeDistance
(iv) Speed = 1Distance×Time1Distance×Time
Answer: (ii) Speed = DistanceTimeDistanceTime

Question 9. The basic unit of speed is:
(i) Km/min
(ii) m/min
(iii) km/h

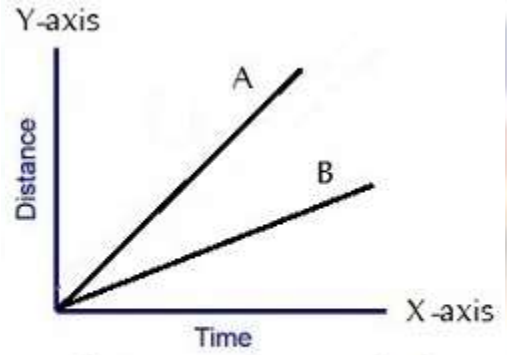
(iv) m/s
Answer: (iv) m/s.

Question 10. A car moves with a speed of 40 km/h for 15 minutes and then with a speed of 60 km/h for the next 15 minutes. The total distance covered by the car is :
(i) 100 km
(ii) 25 km
(iii) 15 km
(iv) 10 km
Answer: (ii) 25 km

Question 11. Suppose the two photograph, shown in Fig. 13.1 and Fig.13.2, had been taken at an interval of 10 seconds. If a distance of 100 meters is shown by 1 cm in these photograph, calculate the speed of the blue car.

Answer: Speed = 100 m/10s = 10 m/s

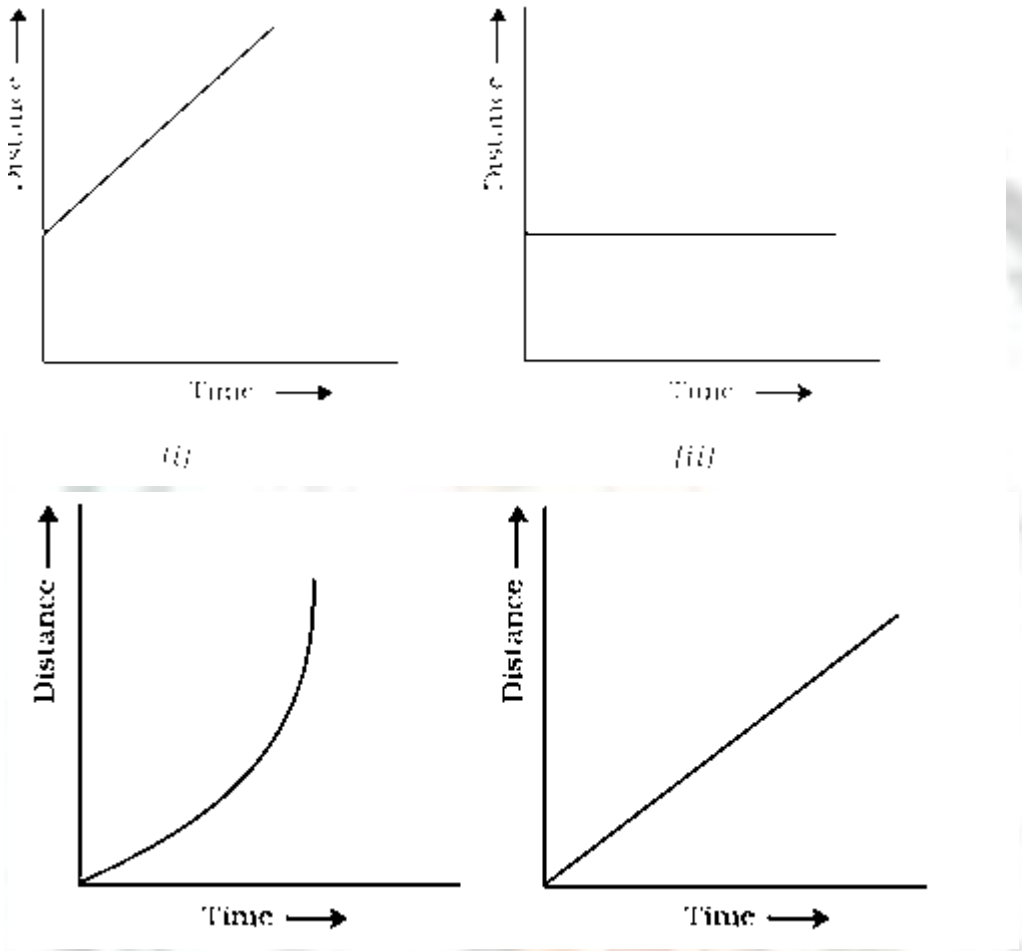
Question 12. Fig. 13.5 shows the distance-time graph for the motion of two vehicles A and B. which is one of them moving faster?



Distance - time graph for the motion of two cars

Answer: Vehicle A is traveling longer distance in lesser time as compared to Vehicle B. So, vehicle A is moving faster.

Question 13. Which of the following distance time-graph a truck moving with speed which is not constant.


Distance
Time
(i)
Distance
Time
(ii)
Distance
Time
Distance
Time

Answer: (iii)

Chapter – 14
Electric Current and its Effects

Key words:

- **Electric Current:** Flow of electrons through a conductor.
- It is convenient to represent electric components by symbols. Using these, an electric circuit can be represented by a circuit diagram.
- When an electric current flows through a wire, the wire gets heated. It is the heating effect of current. This effect has many applications.
- Wires made from some special materials melt quickly and break when large electric currents are passed through them. These materials are used for making electric fuses which prevent fires and damage to electric appliances.
- When an electric current flows through a wire, it behaves like a magnet.

- **Electric Circuit:** A complete pathway of the flow of electric current.
- **Component of Electric Circuit:** Component of electric circuit are following :

1. **Cell:** Provides energy for the current to flow.
2. **Bulb:** Lights ups when an electric current flows through it.
3. **Switch:** Keeps the circuit off or on.
4. **Connecting wires:** Help to conduct the electric current and complete the circuit.

- **Effects of Electric Current**:

1. **Heating Effect**: The wire gets hot when an electric current passes through it. This is the heating effect of the electric current. Electric heater contains a coil of wire called element which becomes red hot when current passes through it. The amount of heat produced in a wire depends on its material, length and thickness.

   Fuse: It is a safety device which prevents damage to electric circuit. It is made by inserting a short wire into porcelain or insulating material.

   MCB: Stands for Miniature Circuit Breakers. These are switches which automatically turn off when current in a circuit exceeds the safe limit.

2. **Magnetic Effect**: When electric current passes through a wire, it behaves like a magnet. This is the magnetic effect of the electric current. This was first observed by Hans Christian Oersted.

   A current carrying coil of an insulated wire wrapped around a piece of iron is called an

electromagnet.

- **Electromagnet:** An electromagnet is a coil of wire wound on a soft iron core, used to separate magnetic material from the junk. Doctors use tiny electromagnets to take out small pieces of magnetic material that have accidentally fallen in the eye. Many toys also have electromagnets inside them.

VERY SHORT ANSWER QUESTIONS

1. Which property of a conducting wire is utilised in making electric fuse ?
Ans: The property of a conducting wire which is utilised in making electric fuse is low melting point.

2. Name the device used these days in place of electric fuses in electrical circuits.
Ans: Miniature Circuit Breaker (MCB).

3. Fill in the blanks:

(i) Our body is a _____ of electricity.
(ii) An electric cell produces electricity from the _____ in it.
(iii) In an electric circuit a fuse is a _____ to prevent possible fire.
(iv) A combination of two or more cells is called a _____.

Ans: (i) conductor (ii) chemicals stored (iii) safety device (iv) battery

4. Unscramble the following words:

(i) TBTAYER (ii) SFEU
(iii) HTRCO (iv) HICWTS

Ans: (i) BATTERY
(ii) FUSE
(iii) TORCH
(iv) SWITCH

5. Paheli does not have a night lamp in her room. She covered the bulb of her room with a towel in the night to get dim light. Has she taken the right step? Give one reason to justify your answer.
Ans: No, she had not taken the right step. The towel may burn due to the heat produced by the bulb. Besides, it will also result in wastage of electric energy.

6. Why are compact fluorescent lamps (CFLs) preferred over electric bulbs ?Ans: CFLs produce very less heat in compare to electric bulbs. So CFLs do not waste electricity in the form of heat energy.

7. Why is an electric fuse required in all electrical appliances ?
Ans: The fuse is a safety device used in an electrical circuit to prevent a large amount of current flowing through a circuit. When large current passes through the circuit, the fuse wire gets heated up and melts away. As a result, the circuit is broken and further damage to the electrical appliances is prevented.

SHORT ANSWER QUESTIONS

1. Can we use the same fuse in a geyser and a television set ? Explain.

Ans: No, we cannot use the same fuse in a geyser and a television set because a geyser and a television set require different amount of current. Therefore the fuse used in these will be of different ratings.

2. Name two electric devices for each where (i) heating effect of current is used and (ii) magnetic effect of current is used.

Ans: Devices where heating effect of current is used – Geyser, room heater.
Devices where magnetic effect of current is used – Electric bell, Cranes to lift magnetic material.

3. Why do we cover plug pin holes which are within the reach of children with cello tape or a plastic cover when not in use ?

Ans: We cover plug pin holes which are within the reach of children with cello tape or a plastic cover when not in use because child may put his/her fingers into the socket and he/she may get an electric shock which could be fatal.

4. Boojho made an electromagnet by winding 50 turns of wire over an iron screw. Paheli also made an electromagnet by winding 100 turns over a similar iron screw. Which electromagnet will attract more pins ? Give reason.

Ans: Paheli's electromagnet will attract more pins because Paheli made an electromagnet which has more number of turns of wire on it and thus a stronger electromagnet than Boojho's electromagnet which has less number of turns of wire on it

LONG ANSWER QUESTIONS

1. Your teacher has shown you the following activity.

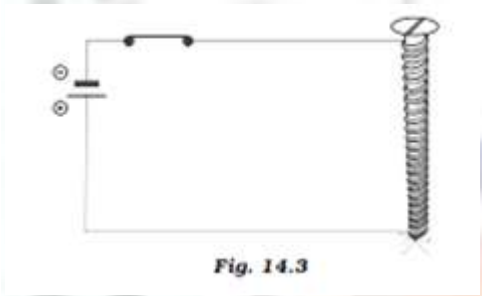


Fig. 14.3

Activity: Teacher has wound a long insulated piece of wire around an iron nail in the form of a coil. Free ends of the wire are connected to a cell through a switch as shown in the Figure 14.3. The current is switched on and some pins are placed near the ends of the nail. Write down any three questions that come to your mind about this activity.

Ans: Some of the questions can be :-

(i) Why does the nail attract the pins ?
(ii) What will happen if we connect more cells in the circuit ?
(iii) What will happen if we use some other material like a straw in place of the nail ?
(iv) What will happen if we wrap the wire on the nail more tightly ?

2. Paheli took a wire of length 10 cm. Boojho took a wire of 5 cm of the same material and thickness. Both of them connected the wires as shown in the circuit given in Figure 14.4. The current flowing in both the circuits is the same.

(i) Will the heat produced in both the cases be equal ? Explain.
(ii) Will the heat produced be the same if the wires taken by them are of equal lengths but of different thickness? Explain.

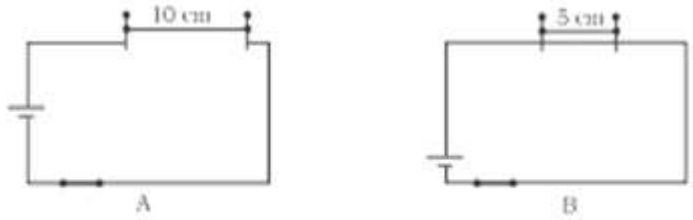


Fig. 14.4

Ans:(i) No, the amount of heat produced in both the cases will not be equal. Amount of heat produced in a wire depends upon the length of the wire.
(ii) No, the amount of heat produced in the wire is not same because amount of heat produced in the wire also depends upon the thickness of the wire.

3. How does the magnetic effect of electric current help in the working of an electric bell ? Explain with the help of a diagram.

Ans: An electric bell is the direct application of electromagnets. It consists of the following parts which are fitted on a flat wooden or plastic board. The main components are :-

• Electromagnet

• Armature

• Gong

• Switch

• Contact screw

• Strip spring

• Hammer

WORKING OF A AN ELECTRIC BELL

Step 1: When the switch is pressed, the circuit is complete and a current flows through the electromagnet.

Step 2: The electromagnet attracts the armature towards itself. The hammer attached to it strikes the gong and produces a ringing sound. At the same time the circuit gets broken, the current stops flowing and the electromagnet loses its magnetism.

Step 3: The spring pulls the armature back such that contact is established again and the circuit gets completed. This keeps repeating, with the hammer striking the gong repeatedly, thereby producing a ringing sound as long as the switch gets pressed.

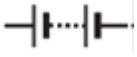
3. Draw the symbols of the following circuit components.

(i) electric cell
(ii) switch in off position
(iii) electric bulb
(iv) battery

Ans:

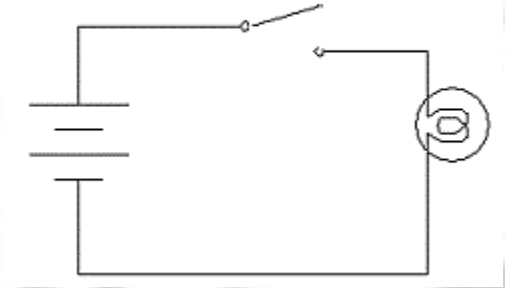
TEXTUAL EXERCISE

Question 1. Draw in your notebook the symbols to represent the following components of electrical circuits. Connecting wires, switch in the OFF position, bulb, cell, switch in ON position and battery.

Answer: Connecting wires
Switch in the OFF position 
Bulb 
Cell 
Switch in ON position
Battery 

Question 2. Draw the circuit diagram to represent the circuit shown in Fig. 14.3.

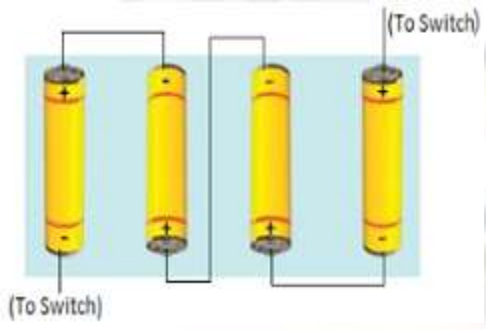
Answer:



Question 3. Fig. 14.4. Shows four cells fixed on a board. Draw lines to indicate how you will connect their terminals with wires to make a battery of four cells.

Fig. 14.22

Answer:



Question 4. The bulb in the circuit shown in Fig. 14.5 does not glow. Can you indicate the problem? Make necessary changes in the circuit to make the bulb glow.

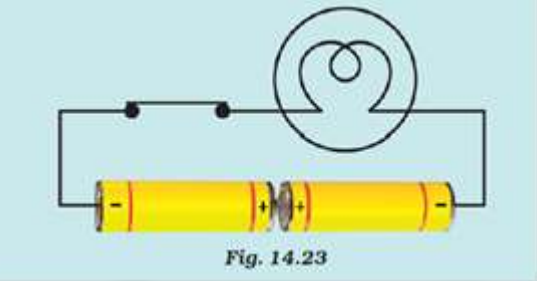
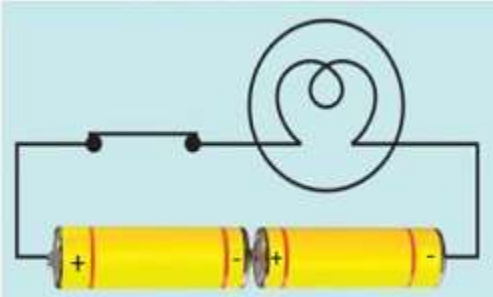


Fig. 14.23

Answer: In the given circuit, the positive terminals of both the batteries are joined together so there is no flow of current and hence the bulb didn't glow.
Suggested changes: The current flows from positive terminals therefore the positive terminals of cell will be connected to negative terminal of the cell and vice versa.



Question 5. Name any two effects of electric current.

Answer: (i) Heating effect

(ii) Magnetic effect

Question 6. When the current is switched on through a wire, a compass needle kept nearby gets deflected from its north-south position. Explain.

Answer: When the current flows through a circuit produce magnetic field around it which deflect the needle of the compass kept nearby as it is also a piece of magnet.

Question 7. Will the compass needle show the deflection when the switch in the circuit shown by Fig. 14.24 is closed?**.**

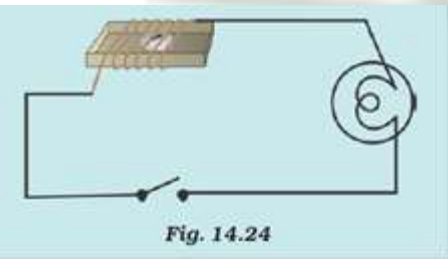


Fig. 14.24

Answer: No, the circuit is not having any source of electricity. Therefore, there will be no flow of electric current through and thus there will be no magnetic effect and neither the deflection of the needle.

Question 8. Fill in the blanks

(a) Longer line in the symbol for a cell represents its ---------- terminal.

(b) The combination of two or more cells is called a----------.

(c) When a current is switched ON in a room heater, it ----------.

(d) The safety device based on the heating effect of electric current is called a ----------.

Answer: Fill in the blanks

(a) Longer line in the symbol for a cell represents its **positive** terminal.

(b) The combination of two or more cells is called a **battery**.

(c) When a current is switched ON in a room heater, it **produces heat**.

(d) The safety device based on the heating effect of electric current is called a **fuse**.

Question 9. Mark 'T" if the statement is true and 'F' if it is false:

(a) To make a battery of two cells, the negative terminal of one cell is connected to the negative terminal of other cell. (T/F)

(b) When the current through the fuse exceeds a certain limit, the fuse wire melts and breaks. (T/F)

(c) An electromagnet does not attract a piece of iron. (T/F)

(d) An electric bell has an electromagnet. (T/F)

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

Question 10. Do you think an electromagnet can be used for separating plastic bags from a garbage heap? Explain.

Answer: No, electromagnets attract only the magnetic material like iron. So, it

cannot be used for separating plastic from garbage.

Question 11. An electrician is carrying out some repairs in your house. He wants to replace a fuse by a piece of wire. Would you agree? Give reasons for your response.

Answer: Replacing the fuse with metal piece should be dangerous as fuse wire have very low melting point. In case of metal piece the melting point will be high and circuit will be not prevented in case of overloading or overheating.

Question 12. Zubeda made an electric circuit using a cell holder shown in Fig. 14.4, a switch and a bulb. When she put she switch in the ON position, the bulb did not glow. Help Zubeda in identifying the possible defects in the circuit.

Answer: Possible defect:
(i) Bulb may have fused.
(ii) Rubber band of cell holder may not be tight and connections are loose.
(ii) Terminals of the cells may not be in the correct positions.

Question 13. In the circuit shown in Fig. 14.25

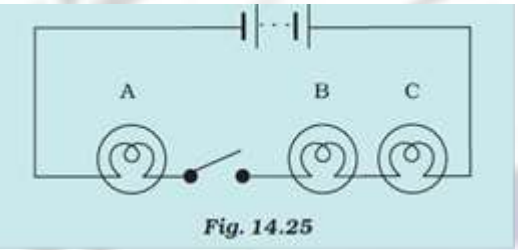


Fig. 14.25

(i) Would any of bulb will glow when the switch is in the 'OF' position?

(ii) What will be the order in which bulb A, B, C will glow when switch is moved to the 'ON' position?

Answer: (i) No, none of the bulb will glow when the switch is in the 'OFF' position.
(ii) All the bulbs will glow at once because connections are ok.

Chapter – 15
Light

Key words:

- **Light:** It is the natural agent that stimulates sight and makes things visible.
- Light travels along straight line.
- Any polished or a shining surface acts as a mirror.
- An image which can be obtained on a screen is called a **real image**. It is formed by light rays that actually pass through the screen.
- An image which cannot be obtained on a screen is called a **virtual image**. It is formed by light rays that seem to pass through the screen.
- The image formed by a plane mirror is erect. It is virtual and is of the same size as the object.
- The image is at the same distance behind the mirror as the object is in front of it.
- In an image formed by a mirror, the left side of the object is seen on the right side in the image, and right side of the object appears to be on the left side in the image.
- A **concave mirror** can form a real and inverted image. When the object is placed very close to the mirror, the image formed is virtual, erect and magnified.
- A **Convex mirror** is the mirror that curves out; the reflecting surface is convex. Image formed is virtual, upright and diminished. Image formed by a convex mirror is erect, virtual and smaller in size than the object.
- A **Concave lens** is the lens that is thinner at the center than at the edges. It is a diverging lens. Image formed is virtual, erect and diminished.
- A **convex lens** can form real and inverted image. When the object is placed very close to the lens, the image formed is virtual, erect and magnified. When used to see objects magnified, the convex lens is called a magnifying glass.
- White light is composed of seven colors.

- **Properties of Light**:

1. **Rectilinear Propagation of Light:** It is the property of light by which it travels in a straight line in any direction. The direction of path in which light make a ray.

2. **Reflection of Light:** It is the bouncing back of light after striking the surface of an object. Shiny smooth surfaces reflect almost all the light.

3. **Dispersion:** It is the phenomenon of splitting of white light into its seven colors. White light is mixture of: Violet, Indigo, Blue, Green, Yellow, Orange and Red (VIBGYOR) colors.

VERY SHORT ANSWER QUESTIONS

1. The image formed by a lens is always virtual, erect and smaller in size for an object kept at different positions in front of it. Identify the nature of the lens.

Ans. The image formed by a concave lens is always virtual, erect and smaller in size than the object.

2. Fill in the blanks:

(a) The inner surface of a steel spoon acts as a _____ mirror.

(b) The outer surface of a flat steel plate acts as a _____ mirror.

(c) The outer shining surface of a round bottom steel bowl acts as a _____ mirror.

(d) The inner surface of the reflector of a torch acts as a _____ mirror.

Ans. (a) concave

(b) plane

(c) convex

(d) concave

3. State whether the following statements are True or False.

(a) A concave lens can be used to produce an enlarged and erect image.

(b) A convex lens always produces a real image.

(c) The sides of an object and its image formed by a concave mirror are always interchanged.

(d) An object can be seen only if it emits light.

Ans. (a) False – Concave lens always produce an erect, virtual and smaller image of an object.

(b) False – A convex lens forms a real and inverted image but it may produce a virtual, erect and magnified image if the object is placed very close to the lens.

(c) True

(d) False – It is not always true because objects can be seen if they reflect the light falling on its surface.

SHORT ANSWER QUESTIONS

1. What type of mirror is used as a side mirror in a scooter? Why is this type of mirror chosen?

Ans. Convex mirror is used as side mirror in a scooter because it can form dimnished and upright images of objects spread over a large area. So it enables drivers to see the traffic of a large area behind them.

2. Observe the figures given as Figure 15.1 carefully.

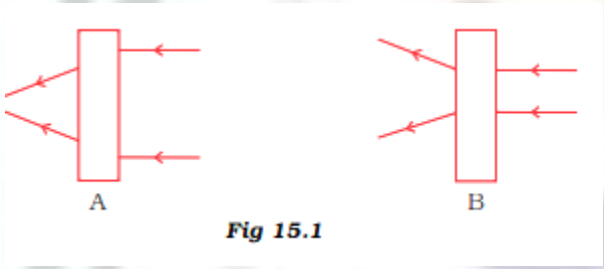


Fig 15.1

The given figures show the path of light through lenses of two different types, represented by rectangular boxes A and B. What is the nature of lenses A and B?

Ans. A – Convex lens - it converges the light ray falling on it;

B – Concave lens- it diverges the light ray falling on it.

3. Boojho made light from a laser torch to fall on a prism. Will he be able to observe a band of seven colours? Explain with a reason.

Ans. No, laser torch gives out light of only one colour.

Prisms bend different colors at different amounts. So when we shine a torch light in, all of the different colors bend differently and get separated. (This is how we get a rainbow - by spreading the colors apart.) Laser light , on the other hand, is made up of only one color. Some of them are only red and some of them are only green, but they're only that color. So when we shine a laser through a prism, there's nothing to be separated, and the light stays together.

4. State the correct sequence (1-7) of colours in the spectrum formed by the prisms A and B, shown in Figure 15.2.

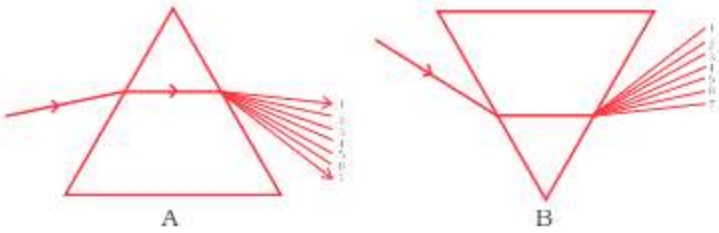


Fig 15.2

Ans. 1 → Red ← 7

2 → Orange ← 6

3 → Yellow ← 5

4 → Green ← 4

5 → Blue ← 3

6 → Indigo ← 2

7 → Violet ← 1

5. The side mirror of a scooter got broken. The mechanic replaced it with a plane mirror. Mention any inconvenience that the driver of the scooter will face while using it?

Ans. The driver will not be able to see traffic spread over a large area behind him as plane mirror will form image of same size that of an object but convex mirror can form dimnished image so that it can cover large area.

6. The concave reflecting surface of a torch got rusted. What effect would this have on the beam of light from the torch?

Ans. Reflection of light can't occur from rusted surface of torch so beam of light will get diffused and diminished. If the rusting is too much no light beam can pass from such surface.

7. An erect and enlarged image of an object is formed on a screen. Explain how this could be possible.

Ans. The image formed on the screen could be enlarged and erect if the object is placed upside down between F and 2F of the lens.

8. Two different type of lenses are placed on a sheet of newspaper. How will you identify them without touching?

Ans. If the letters appear bigger/magnified, then the lens is a convex lens. If the letters appear smaller, then the lens will be concave lens.

9. A shopkeeper wanted to fix a mirror which will give a maximum view of his shop. What type of mirror should he use? Give reason.

Ans. He will fix a convex mirror because it can form dimnished images of object and cover large area.

10. The distance between an object and a convex lens is changing. It is noticed that the size of the image formed on a screen is decreasing. Is the object moving in a direction towards the lens or away from it?

Ans. The object is moving away from the lens. Because it produces magnified image if the object is placed very close to the lens. But in this case the size of the image is decreasing and hence the object is moving far away.

LONG ANSWER QUESTIONS

1. Suppose we wish to obtain the real image of a distant tree. Explain two possible ways in which we can do it.

Ans. Hint : (i) By using a concave mirror and a screen - if the tree is beyond the focus of the concave mirror then the image formed is real, Inverted and in front of the mirror.

(ii) By using a convex lens and a screen- If the tree is beyond its focus then the convex lens creates a real and inverted image of the tree formed on the other side of the incident ray

2. It was observed that when the distance between an object and a lens decreases, the size of the image increases. What is the nature of this lens? If you keep on decreasing the distance between the object and the lens, will you still able to obtain the image on the screen? Explain.

Ans. If the size of image increases with the decrease in distance between the object and the mirror then the lens is a convex lens.

No, by decreasing the distance between the object and the lens we will not be able to obtain the image on the screen because if the object is placed too close to a convex lens then the image formed is virtual which cannot be obtained on screen.

3. You are given three mirrors of different types. How will you identify each one of them?

Ans. First, by looking at the reflecting surface , we can identify the type of mirror - Plane mirror or spherical mirror (concave and convex mirror)

Secondly, Using the mirrors to get the image of an object will help out to distinguish between the mirrors.

a) Image formed by plane mirror is virtual ,erect and is of same size as that of the object.

b)Image formed by concave mirror is real, inverted and magnified.

c) Image formed by convex mirror is virtual ,erect and dimnished .

TEXTUAL EXERCISE

Question 1. Fill in the blanks:

(a)An image that cannot be obtained on a screen is called ----------.

(b)Image formed by a convex ---------- is always virtual and smaller in size.

(c)An image formed by a ---------- mirror is always of the same size as that of the object.

(d)An image which can be obtained on a screen is called a --------- image.

(e)An image formed by a concave ---------- cannot be obtained on a screen.

Answer: Fill in the blanks:

(a) An image that cannot be obtained on a screen is called **virtual image**.

(b) Image formed by a convex **mirror** is always virtual and smaller in size.

(c) An image formed by a **plane** mirror is always of the same size as that of the object.

(d) An image which can be obtained on a screen is called a **real** image.

(e) An image formed by a concave **lens** cannot be obtained on a screen.

Question 2. Mark "T" if the statement is true and "F' if it is false.

(a) We can obtain an enlarged and erect image by a convex mirror. (T/F)

(b) A concave lens always forms a virtual image. (T/F)

(c) We can obtain a real, enlarged and inverted image by a concave mirror. (T/F)

(d) A real image cannot be obtained on screen. (T/F)

(e) A concave mirror always forms a real image. (T/F)

Answer: (a) F

(b) T

(c) T

(d) F

(e) F

Question 3. Match the items given in Column I with one or more item of Column II.

(a) A plane mirror	(i) used as magnifying glass.
(b) A convex mirror	(ii) can form image of objects spread over large area.
(c) A convex lens	(iii) used by dentist to see enlarged image of teeth.
(d) A concave mirror	(iv) the image is always inverted and magnified.
(e) A concave lens	(v) the image is erect and of the same size than object.
	(vi) the image is erect and smaller in size than the object.

Answer: (a) (v)

(b) (ii)

(c) (i)

(d) (iii)

(e) (vi)

Question 4. State the characteristic of the image formed by a plane mirror.

Answer: Characteristics of the image formed by a plane mirror:
(i) The image formed is virtual
(ii) The image is laterally inverted.
(iii) It is of the same size as the object.
(iv) The image is situated at the same distance from the mirror as the object.
(v) The image is erected.

Question 5. Find out the letters of English alphabet or any other language known to you in which the image formed in plane mirror appears exactly like the letter itself. Discuss your findings.

Answer: A, H, I, M, O, T, U, V, W, X, Y are the letters of English alphabet in which the image formed in a plane mirror appears exactly like the letter itself.

Question 6. What is a virtual image? Give one situation where a virtual image is formed.

Answer: The image that cannot be formed or obtained on the screen is called virtual image.
When we stand in front of our dressing table mirror, we use to see our virtual image. The virtual image is formed in case of plane and convex mirror.

Question 7. State the differences between convex and a concave lens.

Answer: Difference between convex lens and concave lens:

Convex lens	Concave lens
1. Thick at middle, thin at edge. 2. Can form real image. 3. Converges light falling on it	1. Thin at middle, thick at edge. 2. Cannot form real image. 3. Diverges light falling on it

Question 8. Give one use of a concave and a convex mirror.

Answer: Concave mirror – used by dentist to see enlarged image of teeth.
Convex mirror – used in vehicles as rear view mirror.

Question 9. Which type of mirror can form a real image?

Answer: Concave mirror.

Question 10. Which type of lens forms always a virtual image?

Answer: Concave lens.

Choose the correct option in questions 11-13.

Question 11. A virtual image larger than the object can be produced by a

(i) Concave lens

(ii) Concave mirror

(iii) Convex mirror

(iv) Plane mirror

Answer: (iii) concave mirror.

Question 12. David is observing his image in a plane mirror. The distance between the mirror and his image is 4 m. if he moves 1 m towards the mirror, then the distance between David and his image will be:

(i) 3 m

(ii) 5 m

(iii) 6 m

(iv) 8 m

Answer: (iii) 6 cm.

Question 13. The rear view mirror of a car is a plane mirror. A driver is reversing his car at a speed of 2 m/s. The driver sees in his rear view mirror the image of a truck parked behind the car. The speed at which the image of the truck appears to approach the driver will be

(i) 1 m/s

(ii) 2 m/s

(iii) 4 m/s

(iv) 8 m/s.

Answer: (iii) 4 m/s.

Chapter – 17
Forests: our lifeline

Key words:

- **Forest:** Large area of land thickly covered with trees, bushes, etc.
- We get various products from the forests around us.
- Forest is a system comprising various plants, animals and micro-organisms.
- In a forest, trees from the uppermost layer, followed by shrubs, the herbs to the lowest layer of vegetation.
- Different layers of vegetation provide food and shelter for animals, birds and insects.
- The various components of the forest are interdependent on one another.
- The forest keeps on growing and changing, and can regenerate.
- In the forest, there is interaction between soil, water, air and living organisms.
- Forests protect the soil from erosion.
- Soil helps forests to grow and regenerate.
- Forests are the lifeline for the forest-dwelling communities.
- Forests influence climate, water cycle and air quality.

- **Deforestation:** Cutting down of trees is known as deforestation.

- **Importance of Forests**:

1. Provide timber.
2. Purify air.
3. Provide shelter.
4. Prevent soil erosion.
5. Control floods.
6. Noise absorbers.

- **Independence of Plants and Animals in Forest:**

1. Plants and animals depends on each other to remain alive.
2. All organisms interact with each other and their physical environment to derive energy and survive.

- **Effects of deforestation:**

1. Amount of carbon dioxide in air will increase, resulting in the increase of earth's temperature. (Global Warming)
2. Animals will not get food and shelter.
3. Soil will not hold water, which will cause floods.
4. Endanger lives and environment.

- **Conservation of Forests**:

1. Do not allow overgrazing.
2. Promote afforestation.
3. Protect wildlife.
4. Control forest fires.

- **Food Chain**: Interdependence between producers and consumers studied in form of various linkage that appears as a chain. or Interdependence of organisms which shows who eats whom.

VERY SHORT ANSWER QUESTIONS

1. Paheli while moving in a forest observed that there was no noise pollution, though lots of heavy vehicles were passing from the nearby highway. Explain why?

Ans. There is no noise pollution inside the forest because the trees absorb the noise.

2. State whether the following statements are true or false. If false, give the correct statement.

(a) Forests influence climate, water cycle and air quality.
(b) In a forest, trees form the uppermost layer, followed by herbs. The shrubs form the lowest layer of vegetation.
(c) The forest keeps on growing and changing and can regenerate.
(d) Forests protect the soil from erosion.

Ans. (a) True

(b) False – In a forest, trees form the uppermost layer, followed by shrubs. The herbs form the lowest layer of vegetation.

(c) True

(d) True

3. Paheli wrote a food chain in the following way:

frog → eagle → insects → grass → snake
The chain is not in the correct order. Help her to write the food chain correctly.

Ans. grass → insects → frog → snake → eagle

SHORT ANSWER QUESTIONS

1. Give names of any four birds which you expect to see in a forest.

Ans. Jungle crow, myna, dove, kingfisher, koel, blue jay, hornbill, forest owlet , great indian bustard , bulbul etc. (any four)

2. Two friends shared their experiences of their vacation trip to two different forests. Do you think they would have seen the same type of plants and animals during their respective trips? Give reason.

Ans. No, they would not have seen the same type of plants and animals. This is so because climatic conditions in the two forests would vary leading to variations and biodiversity in the types of plants and animals.

3. "A bunch of seedlings were seen sprouting on a heap of animal dropping in a forest." How do you think is the seedling benefited from the animal dung?

Ans. The decaying animal dung provides essential nutrients required for the proper growth of the seedlings.

4. Match Column I with Column II

Column I	**Column II**
(a) Decomposers	(i) dead plant and animal tissues
(b) Canopy	(ii) habitats for wild life
(c) Porcupine	(iii) micro-organisms
(d) Humus	(iv) wild animal
(e) Forest	(v) branches of tall trees.

Ans. (a) (iii);

(b) (v);

(c) (iv);

(d) (i);

(e) (ii)

5. Deforestation may lead to floods. Why?

Ans. If trees are not present, rain hits the ground directly and may flood the area around it. Heavy rain may also damages the soil. Roots of trees bind the soil together, but in their absence the soil is washed away or eroded.

6. Name any four useful products other than wood, which we get from forests.

Ans. Gum, oils, spices, fodder for animals, medicinal plants, oxygen is the main by product etc. (any four).

LONG ANSWER QUESTIONS

1. Figure 17.1 shows a part of a forest.

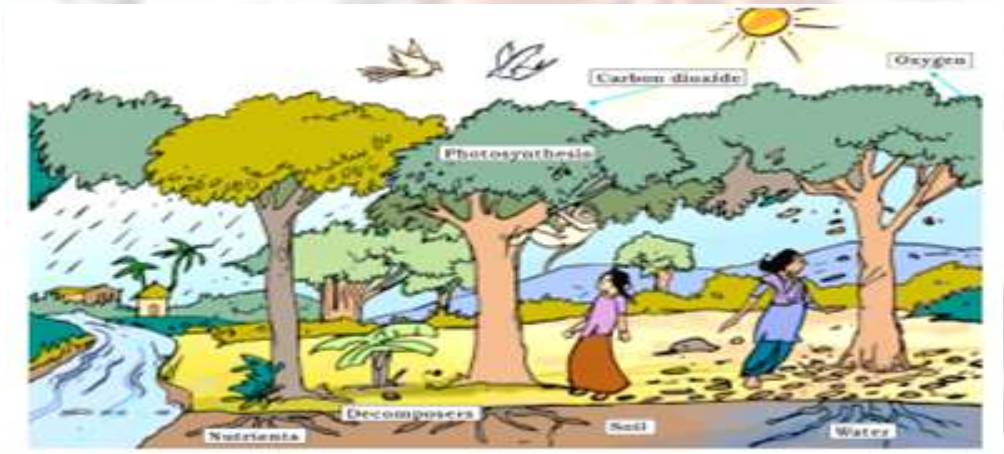


Fig. 17.1

Write any three activities going on in the forest on the basis of this figure

Ans. (i) Oxygen is given out by green leaves with the help of photosynthesis.

(ii) Carbon dioxide is consumed by the plants to prepare their food by the process of photosynthesis.

(iii) Decomposers play an important role in providing nutrients to plants by decomposing dead and decaying matter .

(iv) Roots are holding water and soil particles to replenish ground water and to prevent soil erosion . (Any three)

2. People say that nothing goes waste in a forest. Can you explain, how?

Ans. (i) In a forest, dry leaves and dead animals are converted into humus by the action of decomposers which provides the essential nutrients to the growing plants.

(ii) The dead remains of animals also serve as food for scavengers like vultures, crows, jackals and insects.

(iii) The dry leaves, broken branches and animal dropping serve as fuel for the people living nearby the forest.

3. Give any four factors which are responsible for the destruction of forests.

Ans. (i) Industrial development.

(ii) Increasing demand of wood.

(iii) Construction of roads.

(iv) Construction of buildings

(v) Overgrazing (Any four)

4. Draw a figure showing two animals, two birds and a few trees as a part of a forest.

Ans.

5. All the needs of animals living in a forest are fulfilled. Justify this statement in a few sentences.

Ans. Animals need food, cover, water, and living space to survive .The place that provides these needs is called habitat. Forest serves as a shelter, source for food and water to the animals living there. Food is any material eaten by an organism that gives it energy. Cover provides shelter from adverse weather, protection from predators, is a place to have young ones and a place to rest.Lack of cover can result in death due to exposure or predation. Water is another vital component of habitat. Life is impossible without it.

6. "Forests are our lifeline." Write five sentences on this topic.

Ans. Forests are indeed our lifeline due to following reasons:

(i) Forests serve as an oxygen producer to keep us alive.

(ii) During the process of photosynthesis carbon dioxide gets consumed by the plants for preparing food.

(iii) Wood, gum, medicinal plants and many more things are provided by the forests.

(iv) The roots of plants in forest holds the soil firmly and hence saves the soil from erosion.

(v) They also help in maintaining the ground water level.

TEXTUAL EXERCISE

Question 1. Explain how animals dwelling in the forest help it grow and regenerate.

Answer: Animals dwelling in the forest help in various way for growth and regenerate. Some of them are:
(i) Herbivores animals clear the land by eating grass for the new growth of vegetation.
(ii) Animals also help in the seed dispersal and pollination.
(iii) Dead and decaying bodies of animals convert to humus after decomposition which increase the fertility of the soil of the forest.
(iv) Dung of animals provide nutrient to various types of seedling to grow.

Question 2. Explain how forests prevent floods.

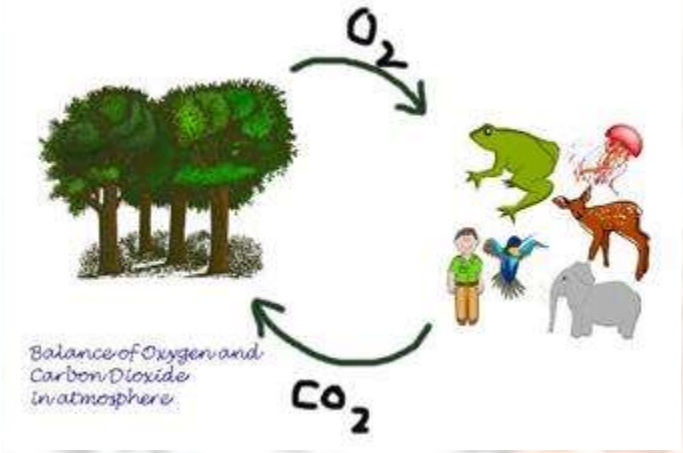
Answer: Forest acts as a natural absorber of rainwater and allows it to seep. It helps in controlling the flow of water and slows it down which helps in preventing flood. Also, the trees present in the forest prevents the rain from directly hitting the ground and bind the soil together which helps in absorption of the rain water and thus prevent flood.

Question 3. What are decomposers? Name any two of them. What do they do in the forest?

Answer: The micro-organisms which convert the dead plants and animals to humus are known as decomposers. Bacteria. Mushrooms etc. are common decomposer. They decompose dead organisms and provide nutrient to trees.

Question 4. Explain the role of forest in maintaining the balance between oxygen and carbon dioxide in the atmosphere.

Answer: Plants release oxygen as a by product during the process of photosynthesis. This oxygen is inhaled by animals for respiration. This respiration process releases carbon dioxide which is used again by plants during photosynthesis. In this way, use and consumption of oxygen and carbon dioxide goes on. They thus maintain the balance of oxygen and carbon dioxide in the atmosphere.



Question 5. Explain why there is no waste in a forest.

Answer: There is no waste in a forest because whatever produced here are utilized by the other organisms or plants for sustainability. Even the waste materials and dead remains which are produced are biodegradable and converted into humus which returns back to the soil as nutrient.

Question 6. List five products we get from forests?

Answer: Products that we get from forests includes:

(i) Wood

(ii) Medicine

(iii) Spice

(iv) Fodder

(v) Honey

Question 7. Fill in the blanks:

(a)The insects, butterflies, honeybees and birds helps flowering plants in --------.

(b)A forest is a purifier of ---------- and ----------.

(c)Herbs form the ---------- layer in the forest.

(d)The decaying leaves and animals dropping in a forest enrich the ----------.

Answer: Fill in the blanks:

(a)The insects, butterflies, honeybees and birds helps flowering plants in **pollination**.

(b)A forest is a purifier of **air** and **water**.

(c)Herbs form the **ground** layer in the forest.

(d)The decaying leaves and animals dropping in a forest enrich the **Soil**.

Question 8. Why should we worry about the conditions and issues related to forests far from us?

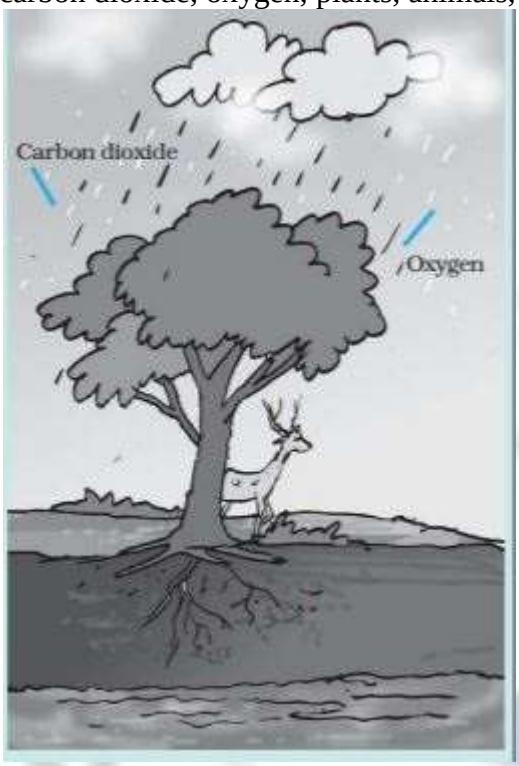
Answer: We should worry about the conditions and issues related to forests far from us because more or less we are dependent on it because:
(i) The amount of carbon dioxide in air will increase if forest will disappear and thus less oxygen in atmosphere o breathe in.
(ii) There will be more soil erosion and thus increase in floods as soil will not able to hold water.
(iii) Increase in the percentage of carbon dioxide will also leads to global warming.
(iv) Deforestation will endanger our life and environment and also there will be no shelter for animals.
(v) There is also imbalance in nature and thus causing climate changes and less rainfall.

Question 9. Explain why there is a need of variety of animals and plants in a forest.

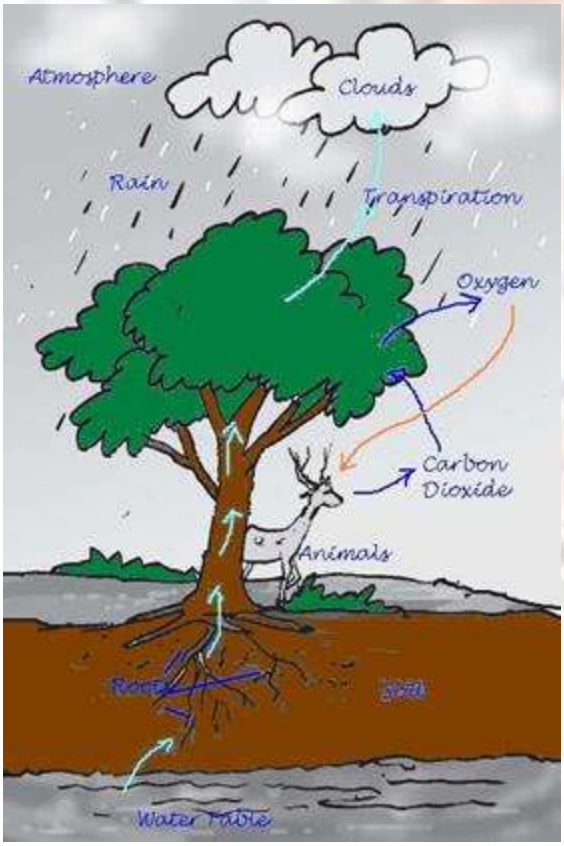
Answer: By harbouring grater variety of plants, the forest provides greater opportunities for food and habitat for the herbivores,Larger number of herbivores means increased availability of food for a variety of carnivores. The wide variety of animals helps the forest to regenerate and grow.
Varieties of animals are necessary for their survival and maintenance of food chain. For example grass is eaten by insects, which in turn, are eaten by the frog. The frog is consumed by snakes which are eaten by eagles. Thus it forms a food chain.
Every part of the forest is dependent on the other parts. If we remove one component, say trees, all other components would be affected.

Question 10. In Fig17.15, the artist has forgotten to put the labels and directions on the arrows. Mark the directions on the arrows and label the diagram using the following labels: clouds, rain, atmosphere,

carbon dioxide, oxygen, plants, animals, soil, roots, water table.



Answer:



Question 11. Which of the following is not a forest product?

(i) Gum

(ii) Plywood

(iii) Sealing wax

(iv) Kerosene

Answer: (iv) Kerosene.

Question 12. Which of the following statements is not correct?

(i) Forests protect the soil from erosion.

(ii) Plants and animals in a forest are not dependent on one another.

(iii) Forests influence the climate ans water cycle.

(iv) Soil helps forests to grow and regenerate.

Answer: (ii) Plants and animals in a forest are not dependent on one another.

Question 13. Micro-organisms act upon the dead plants to produce.

(i) Sand

(ii) Mushrooms

(iii) Humus

(iv) Wood

Answer: (iii) Humus