आज़ादी का अमृत महोत्सव

Student Study Material
Term -2
Class- VII
SCIENCE

स्वच्छ भारत
एक कदम स्वच्छता की ओर

तत् त्वं पूषन् अपावृणु

केन्द्रीय विद्यालय संगठन
देहरादून

तत् त्वं पूषन् अपावृणु

SCIENCE

STUDENT SUPPORT MATERIAL

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- **2- ANUPAMA CHANDOLA (KV ONGC D,DUN)**
- **3- NISHA CHAUHAN (KV BHEL HARIDWAR)**
- **4- UMESH UPADHYAY (KV BIRPUR D,DUN)**
- **5- RENUKA SHARMA (KV IMA D,DUN)**
- **6- MADHVI SINGH (KV RISHIKESH)**
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- **4- ANUSHIL SINGH CHAUHAN (KV IIP D,DUN)**

A NOTE TO THE STUDENTS

Dear Students,

The current academic session has been historic in a number of ways. The pandemic not only forced shutting down of onsite classes and substituting them with online, virtual mode of teaching, a number of classroom activities, esp. writing under guidance of teachers and its prompt correction too has taken a backseat. On the examination front, the entire setup has undergone a revolutionary change. From typology of questions to their evaluation and to number of examination and duration of examination- nothing has remained untouched by these winds of change. This is the time we gear up ourselves to embrace these changes in examination landscape as we have done in case of online classes and explore possibilities in the challenges thrown before us by the pandemic.

The New Education Policy, too is an agent of massive changes in our knowledge landscape. Let us amalgamate all these changes and feel proud ourselves to be the first to answer the call of CHANGE.

In the light of new education policy new structure of assessment is proposed by Kendriya Vidyalaya Sangathan for classes VI to VIII. Multiple assessment methods are developed to assess the students in two terms (Term-I, April to September and Term-II October to March) throughout the academic session. Each term consists of Subject Enrichment Activities (SEA), Note Book submission (NB), Periodic Tests (PT), Multi-disciplinary Projects (MDP), Learners Diary (LD), and Critical & Creative Thinking (CCT).These assessments will be carried out regularly and continuously during each term. The assessment will be done through online/offline mode as per the pertaining situation of Covid-19 Pandemic SOPs. Students are advised to understand the learning and evaluation process/methods introduced as per NEP-2020, and get your all kinds of queries sorted out with proper guidance of learned subject teachers.

So, it is important to read the text and understand it thoroughly as per the guidance of your subject teachers. So, please make reading the text and practice writing in the centre of all your academic activities. Treat your NCERT books as your holy books and also go through the study material prepared by a team of dedicated teachers who have devoted sufficient time in understanding and then developing the content to suit the needs of all our dear students. Focus has been on relevance and conciseness- the content strictly is a supplement to your NCERT books and in no way it should be treated as a substitute to it.

I am sure the content in study material where you will find all units/ chapters for SECOND TERM at a glance, Chapter wise question bank , sample test items will be useful to you. However, it is imperative you keep your self-updated with regular in-touch and guidance of your teacher for any further changes that may take place after the study material has been prepared. Hope the efforts of your teachers in preparing this material will help you perform very well in your second term examination.

All the best.

INDEX

SYLLABUS TERM 2

9	SOIL	7+1(CC T)	SEPTEMBER	1. Students will be able to know about the soil and soil profile. 2. Students will be able to differentiate between different types of soil on the basis of textures and size of particles. 3. Students will be able to calculate the percolation rate of water in the soil. 4. Students will be able to apply the studied knowledge in daily life.	**ACTIVITY-1:-**To show soil contains air **ACTIVITY-2:-**Experiment to show that soil contains water. **Activity 3:** Calculate the percolation rate of water in the given sample of soil. **Activity 4:** To calculate the amount of water absorbed in the given sample of soil. **Activity 5:** Write an essay explaining reasons and remedies of soil erosion	• NCERT textbook • Resources from teachers • DIKSHA app • YOUTUBE videos • Resources from home.	1.Google form tests, assignments, projects, viva. 2.Assertion reason based questions. 3. CCT based questions. 4. Puzzle
10	RESPIRATION IN ORGANISM	9+1(CCT)	OCTOBER	1.The students will learn and understand about respiration, breathing mechanisms in humans, animals and plants. 2. Students will be able to correlate the breathing rate and the physical exercise. 3. Students will be able to explain the breathing mechanism	**ACTIVITY-1**:- Experiment to show that CO2 is released during aerobic respiration. **ACTIVITY-2:-**Count and find the breathing rate. **ACTIVITY-3-**Observe the effect of breathing on chest size. **ACTIVITY-4:-**Prepare a model to show the mechanism of breathing.	• NCERT textbook • Resources from teachers • DIKSHA app • YOUTUBE videos • Resources from home.	1.Google form tests, assignments, projects, viva. 2.Assertion reason based questions. 3. CCT based questions. 4. Project to prepare a model to show the mechanism of breathing.
11	TRANSPORTATION IN ANIMALS AND PLANTS	10+1(CCT)	NOVEMBER	1. Students will be able to know about the composition and function of blood . 2. Students will be able to differentiate the arteries and veins . 3. Students will be able to draw the diagram of the human heart and excretory system. 4. Students will be able to explain the process of transpiration.. 5. students will be able to apply the studied knowledge in their daily life .	**ACTIVITY-1:-** – Make a model of a stethoscope. **ACTIVITY-2:-**Find heartbeat and pulse rate. **ACTIVITY-3:-** Find out about different blood groups and their importance. **ACTIVITY-4:-**An activity showing transportation of water in a stem. system by using chart or video	• NCERT textbook • Resources from teachers • DIKSHA app • YOUTUBE videos • Resources from home.	1.Google form tests, assignments, projects, viva. 2.Assertion reason based questions. 3. CCT based questions. 4. project to prepare a stethoscope from the martial locally available.
12	REPRODUCTION IN PLANTS	9+1(CCT)	NOVEMBER	1. The students will learn and understand about modes of reproduction. 2. Students will be able differentiate sexual and asexual reproduction. 3. Students will be able to explain the formation of fruit	**ACTIVITY-1**: – Demonstration vegetative reproduction in potato and bryophyllum leaf. **ACTIVITY-2:--** Demonstration of sexual parts of the flower by dissecting the mustard flower. **ACTIVITY-3:--** Propagate	• NCERT textbook • Resources from teachers • DIKSHA app • YOUTUBE videos • Reso	1.Google form tests, assignments, projects, viva. 2.Assertion reason based questions. 3. CCT based questions.

				and seed . 4. Students will be able to describe pollination and seed dispersal. 5.Students will understand the methods of propagation and apply them in their kitchen gardens	plants like potato, onion, mint, rose vegetative at home. **ACTIVITY-4:--** Collect various types of fruits, split them open and examine the seeds	urces from home.	
13	**MOTION AND TIME**	6+1(CCT)	OCTOBER	The students will learn and understand about the type of motion. 2. Students will be able to describe speed, measurement of time. 3. Students will be able to represent data of time and distance on a graph. 4. Students will be able to solve numerical problems on the basis of speed time relation.	**ACTIVITY-1:--** To measure the time period of a simple pendulum. **ACTIVITY-2:--** By using a time measuring device available in your house (clock, wristwatch or mobile) measure time required for different daily life activities. For example, while cooking rice, pulses, filling one bucket of water, the time taken by a fan to completely come to rest after it is switched off **ACTIVITY-3:--** Measurement of speed by walking and running by the students.	• NCERT textbook • Resources from teachers • DIKSHA app • YOUTUBE videos • Resources from home.	1.Google form tests, assignments, projects, viva. 2.Assertion reason based questions. 3. CCT based questions. 4. Numerical on the basis of calculation of speed , frequency and time period.

14	**ELECTRIC CURRENT AND ITS EFFECTS**	8+1(CCT)	DECEMBER	1.The students will learn and understand about symbols of electric components. 2. Students will be able to explain the heating and magnetic effect of electric current. 3. Students will be able to describe electric fuse and its applications. 4. Students will be able to draw the diagram of an electric bell.	**ACTIVITY-1:-** To make an electric circuit using wire, cell and bulb **ACTIVITY-2:-** To make an electromagnet, **ACTIVITY-3:-**Make four electromagnets with 20, 40 and 60 turns. Connect them one by one with a battery of 2 cells. Compare the strengths of the electromagnets.	• NCERT textbook • Resources from teachers • DIKSHA app • YOUTUBE videos • Resources from home.	1.Google form tests, assignments, projects, viva. 2.Assertion reason based questions. 3. CCT based questions.
15	**LIGHT**	10+1(CCT)	SEPTEMBER	1.The students will learn and understand about rectilinear propagation of light 2. Students will be able to describe reflection of light, characteristics of the image formed by plane mirror, lateral inversion. 3. Students will be able to identify the spherical mirrors and lens. 4.Students will be able to understand the image formation by lens and mirrors. 5. Students will be able to explain the process of	**ACTIVITY-1:-**To show images formed by convex and concave lenses and mirrors. **ACTIVITY-2:-**Activity to dispersion of sunlight by prism(Making Newton's disc) **ACTIVITY-3:-**Observe different types of image formation using steel spoon(from inner and outer side of spoon). **ACTIVITY-4:-** Make a rainbow on a bright sunny day using hose pipe.	• NCERT textbook • Resources from teachers • DIKSHA app • YOUTUBE videos • Resources from home.	1.Google form tests, assignments, projects, viva. 2.Assertion reason based questions. 3. CCT based questions. 4. Project to prepare periscope and Newton Disk.

				dispersion of light.			
16	**WATER : A PRECIOUS RESOURCE**	7+1(CCT)	JANUARY	1.The students will learn and understand about availability of water, ground water, distribution of water, water management, role for water saving and forms of water. 2. Students will be able to explain the importance of water for plants and the environment.	**ACTIVITY-1:-**Collect clippings from newspapers and magazines on the news items, articles and pictures related to water shortage. Paste them in your copy and share it with your friends. List some problems faced by the people and discuss them in the class. **ACTIVITY-2:-**Mark the distribution of water in various states of India on a map. **ACTIVITY-3:-**Design a poster with slogan depicting 'Save Water'	• NCERT textbook • Resources from teachers • DIKSHA app • YOUTUBE videos • Resources from home. http://www.rainwaterharvesting.org	1.Google form tests, assignments, projects, viva. 2.Assertion reason based questions. 3. CCT based questions.
17	**FOREST OUR LIFELINE**	10+1(CCT)	DECEMBER	1. Students will be able to define the terms like canopy , crown ,understory etc. 2. Students will be able to know about the importance of forest in our daily life and for the animals also. 3. Students will be able to describe the role of forest in bringing rainfall.	Activity 1: Try to recognize various types of trees , shrubs and herbs. Activity 2: To list various products we get from forest. Activity 3: a)To collect different kinds of seeds or hard fruits like nuts. b)Collect and paste the pictures	• NCERT textbook • Resources from teachers • DIKSHA app • YOUTUBE videos • Resources from	1.Google form tests, assignments, projects, viva. 2.Assertion reason based questions. 3. CCT based questions.

				4. Students will be able to explain the role of decomposers in the forest.	of trees having different types of crowns. c)Make a poster showing negative impacts of deforestation.	home.	
II PERIODIC TEST IN THE SECOND FORTNIGHT OF JANUARY							
18	**WASTE WATER STORY**	7+1(CCT)	JANUARY	1. The students will be able to understand the waste water. 2. The students will be able to know the need and importance of cleaning the water. 3. Students will be able to list the steps involved in the treatment of water. 4. Students will learn better housekeeping practices. 5. Students will be able to co relate sanitation with diseases.	Activity1: Construct the cross word puzzle of your own using the keywords. Activity 2: To study the drainage system of your locality. Activity 3: Discuss with grandparents and other elderly people in your neighborhood about sewage disposal systems of olden times.	• NCERT textbook • Resources from teachers • DIKSHA app • YOUTUBE videos • Resources from home. http://www.un.org/waterforlifedecade/	1.Google form tests, assignments, projects, viva. 2.Assertion reason based questions. 3. CCT based questions.
19	**REVISION**		FEBRUARY				
SESSION ENDING EXAMINATION IN MARCH							

CHAPTER- 9 SOIL

IMPORTANCE OF SOIL:

- Soil is one of the most important natural resources. It is the uppermost layer of earth's crust which is blackish-brown in colour.
- It supports plant growth by holding the roots firmly and supplying water and nutrients to the plants.
- It acts as a natural habitat for many organisms like an earthworm, fungi, bacteria, ants, etc.
- It is also essential for agriculture which provides us with food, clothing and shelter for all.
- It supplies water and nutrients to plants

SOIL POLLUTION:

- Dumping non-biodegradable substances such as plastic bags and polythene causes soil pollution.
- Waste products from industries which contain chemicals can affect the soil adversely.
- Excess use of fertilizers and pesticides pollute the soil and decrease its fertility.

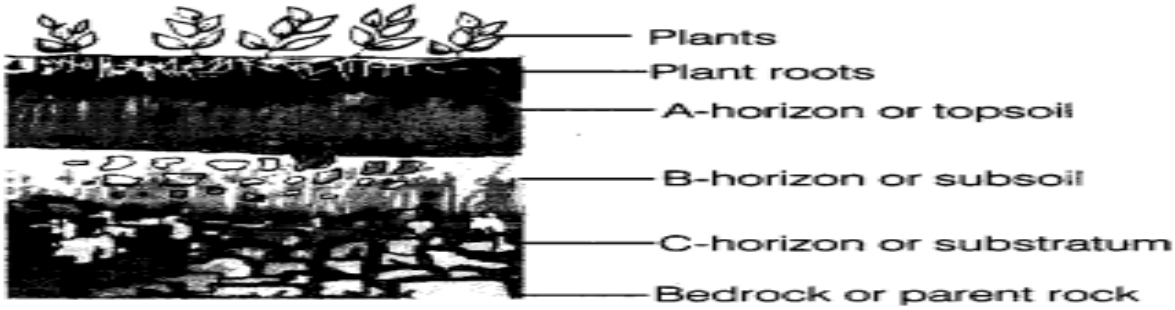
SOIL PROFILE:

- Soil is formed by breaking down of rocks by the action of wind, water or climate by the process called weathering.
- Weathering is a very slow process as it takes thousands of years for a huge rock to turn into fine particles.
- The soil profile is a vertical section through different layers of the soil, which are called horizon.

Different horizons of the soil are:

1. A-Horizon or Topsoil

It is the uppermost layer of soil and is usually dark in colour because of the presence of minerals and humus in it.Humus is the dark brown coloured layer which consists of dead, rotting remains of plants and animals.



Soil profile

2. B-Horizon or Subsoil.

This layer is made up of slightly bigger rock particles than that of the topsoil. It does not have much humus and is lighter in colour than topsoil

3. C-Horizon or Substratum

The layer of soil which lies just below the subsoil is called C-horizon. It consists of small pieces of broken rocks with cracks and crevices, formed by the weathering of bedrock or parent rock.

4. Bedrock or Parent Rock
Below the C-horizon unweathered solid rock is found which is called as bedrock. Rainwater gets collected over it to form the water table.

SOIL TYPES
The rock particles present in soil are of different sizes and chemical compositions. On the basis of sizes, the rock particles present in soil can be divided mainly into four major groups:
(i) Clay: These are formed by the smallest rock particles. These are so small that we cannot see a single clay particle and it feels smooth.
(ii) Silt: These are made up of somewhat bigger rock particle than clay. It is not so smooth as clay. Silts are found deposited at river beds. Floods deposit the silt from rivers in the field.
(iii) Sand: These are made up of larger particles enough than that of silt and can be easily seen. These are coarse to touch due to their larger size.
(iv) Gravel: These are the largest sized rock particles that are present in the soil. These are the tiny stones that are present in topsoil in very small quantity.

PROPERTIES OF SOIL
- It contains air.
- It can hold water or moisture.
- It can absorb or soak water
- It allows water to pass down through it.

PERCOLATION RATE OF WATER IN SOIL
- The process of passing down water slowly through the soil is called percolation of water.
- Percolation rate is the amount of water (in mL) that is percolated through the soil in unit time, i.e. in minutes. The percolation rate differs in different soil types.
- Percolation rate (mL/min) = Amount of water(mL) / Percolation time(min)
- Percolation rate is highest in sandy soil because it is very loose and particle size is large enough.
- Clayey soil is very compact and therefore has the lowest rate of percolation.
- Since clayey soil can retain water in them, it is used to grow paddy because paddy requires standing water in fields.

- **MOISTURE IN SOIL**
    - The soil contains some water in it which is called soil moisture.
    - This moisture is absorbed by the roots of plants. Thus, the moisture content of the
    - soil is very important for the growth of crop

Types of Soil	Crop Grown
Clayey Soil	Wheat, Gram and Paddy
Loamy Soil	Lentil, Tomatoes, Corn and Oats
Sandy-loam Soil	Potatoes, Cotton and Cereal Rye

SOIL AND CROPS

- Clayey and loamy soils are both suitable for growing cereals like wheat and gram. Such soils are good at retaining water.
- For paddy, soils rich in clay and organic matter and having a good capacity to retain water are ideal.
- For lentils (masoor) and other pulses, loamy soils which drain water easily, are required.
- For cotton, sandy-loam or loam, which drain water easily and can hold plenty of air, are more suitable.
- Crops such as wheat are grown in the fine clayey soils because they are rich in humus and are very fertile.

SOIL EROSION

- The removal of land surface by water wind or ice is known as erosion.
- Soil erosion is mainly caused by the large scale cutting of forest trees and plants, called deforestation.
- The effects of soil erosion are, famines, flood desertification and damage or spoilage of environment.

MULTIPLE CHOICE QUESTIONS

1-Which one of the following is a step in the formation of soil?
(a) Earthquakes or volcanic eruptions (b) Weathering of rocks
(c) Addition of humus (d) All are involved in the formation of soil

2-Which physical property of soil is important to us?
(a) Texture (b) Water holding capacity
(c) Both of these (d) None of these

3-Which of the following type of soil will form a colloidal solution when suspended in water?
(a) Clay (b) Silt (c) Sand (d) Gravel

4-Which factor influences soil formation?
(a) Climate (b) Vegetation
(c) Parent rock (d) All of these

5-The proportion of sand, silt and clay in a soil sample determines
(a) structure (b) texture
(c) nutrient potential (d) fertility level

6-The microorganisms present in the soil require moisture (water) and nutrients for growth and survival. Choose from the options below the habitat (place) where the soil has plenty of water and nutrients.
(a) Desert (b) Forest (c) Open field (d) Cricket ground

7- Availability of water and minerals in the soil for maximum absorption by roots is in the:
(a) B-horizon (b) C-horizon (c) A-horizon (d) Surface of soil

8- Soil conservation measures are mainly aimed at protecting which of the following?
(a) Plants (b) Topsoil (c) Sub soil (d) Soil organisms

9- Read the following statements with reference to soil:
(i) Weathering is a very fast process of soil formation.
(ii) Percolation of water is faster in sandy soils.
(iii) Loamy soil contains only sand and clay.
(iv) Top soil contains the maximum amount of humus.
Choose the correct statements from the above.
(a) (ii) and (iv) (b) (i) and (iii) (c) (ii) and (iii) (d) (i) and

(ii)10- In which horizon of soil minerals are found?
(a) A (b) B (c) C (d) None of these

HIGHER ORDER THINKING SKILL QUESTIONS

Question 1. The soil is said to be inseparable part of our life. Why?
Answer: Soil is one of the most important natural resources. It is the uppermost layer of earth's crust which is blackish-brown in colour. Major functions of the soil are:

- It supports plant growth by holding the roots firmly and supplying water and nutrients to the plants.
- It acts as a natural habitat for many organisms like earthworm, fungi, bacteria, ants, etc.
- It is also essential for agriculture which provides us food, clothing and shelter for all.
- It supplies water and nutrients to plants.

Question 2. Read the following statements and give the appropriate terms for each of them.
(a) The process of breakdown of rocks by the action of wind, water, sunlight.
(b) Removal of topsoil during heavy rains or strong winds.
(c) Accumulation of wastes in the soil generated by human activity which alter the features of soil.
(d) The process of movement of water into deeper layers of soil.
Answer: The terms for the above described statements are as follows
(a) Weathering
(b) Soil erosion
(c) Soil pollution
(d) Percolation

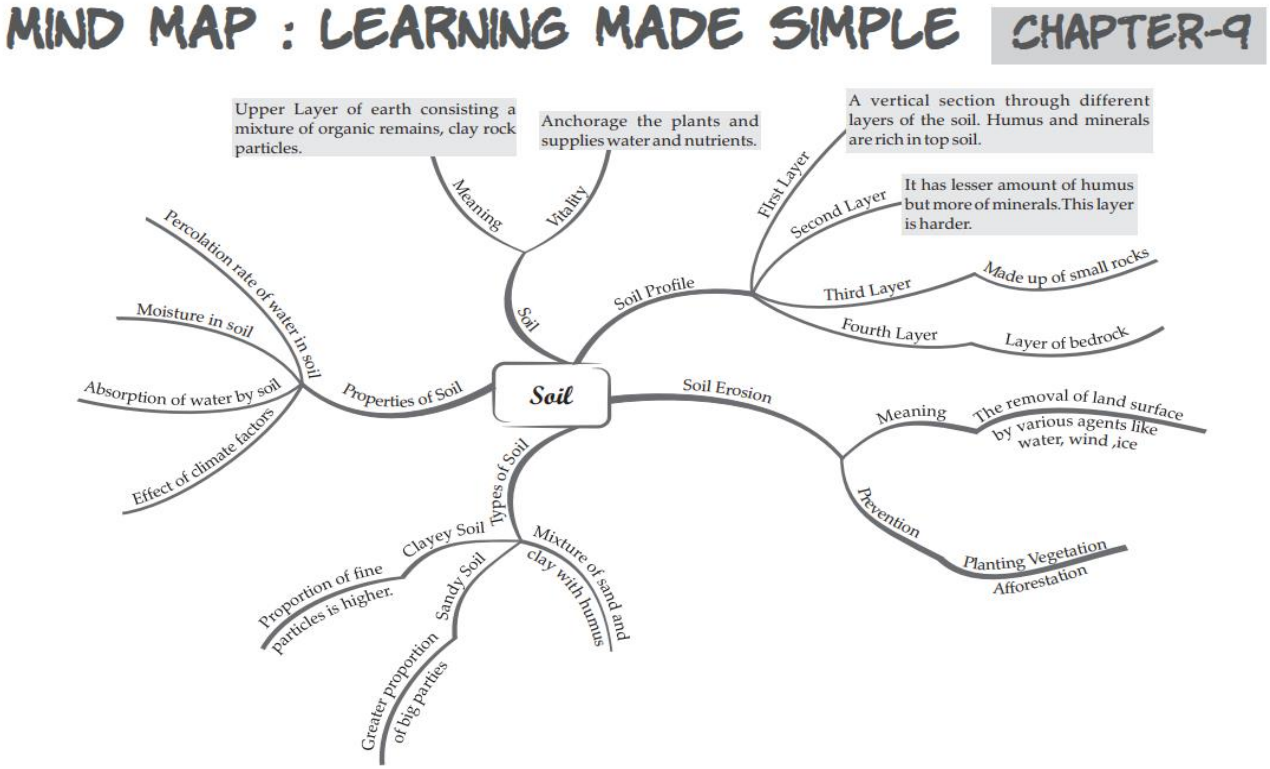
Question 3. Rajasthan is a desert state in India. Once while travelling to Rajasthan by train, Boojho observed several streams and rivulets of rainwater during the journey but to his

surprise, he did not see streams of water in the desert region even during rains. Help Boojho to find a suitable explanation for this.
Answer: Deserts are made up of sand, thus when the rainwater falls on land, it percolates immediately downwards in the spaces between sand particles. So, the streams of water in desert region are not visible even during rainy seasons.

Question 4. A man digging a pit found that he could dig with ease initially but digging became difficult as he went deeper. He could not big beyond a depth 5 feet. Provide a suitable scientific explanation.
Answer: The man digging a pit could dig with ease initially because of the presence of topsoil and subsoil (mainly comprising of humus and nutrients). But as he digs deeper, he finds it difficult to dig beyond a depth of 5 feet as lower layers are made up of small partially weathered rocks with cracks, crevices and with bedrock which make it hard to dig.

Question 5. Continuously water-logged soils are disadvantageous for plant growth. Why?
Answer: Roots although underground possesses living cells that require oxygen for respiration and production of energy. They absorb oxygen that is present in the spaces between soil particles. But in water-logged soils, water occupies spaces between soil particles and pushes the oxygen out into the atmosphere. Thus, roots are deprived of oxygen and this affects the plant growth.

MIND MAP



CHAPTER -10 RESPIRATION

All living organisms need food which gives them the required energy.

The energy present in the food gets released when the organisms respire or breathe

RESPIRATION: The biological process in which food is utilized to produce energy is called respiration. Respiration is necessary for survival of the living beings. A living being cannot survive even for a few seconds, without respiration. During respiration, it is mainly the carbohydrate which is oxidized to produce energy. This can be shown by following equation:

Carbohydrate + Oxygen → Carbon dioxide + Water + Energy

$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + Energy$

SITE OF RESPIRATION: Respiration happens inside the cells. As respiration happens inside the cell, it is also called cellular respiration. A cell organelle, called mitochondria is the site of cellular respiration.

TYPES OF RESPIRATION

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.

Glucose (Presence of oxygen) → Carbon dioxide + Water + Energy

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.

Glucose (absence of oxygen) → Alcohol + Carbon dioxide + Energy

Anaerobic respiration also happens in our muscle cells. When someone runs or walks too fast, one may feel a throbbing pain in calf muscles. This happens because of deposition of lactic acid, produced as a result of anaerobic respiration. Once the person takes rest for some time, the pain goes away

Glucose (absence of oxygen) → Lactic acid + Energy

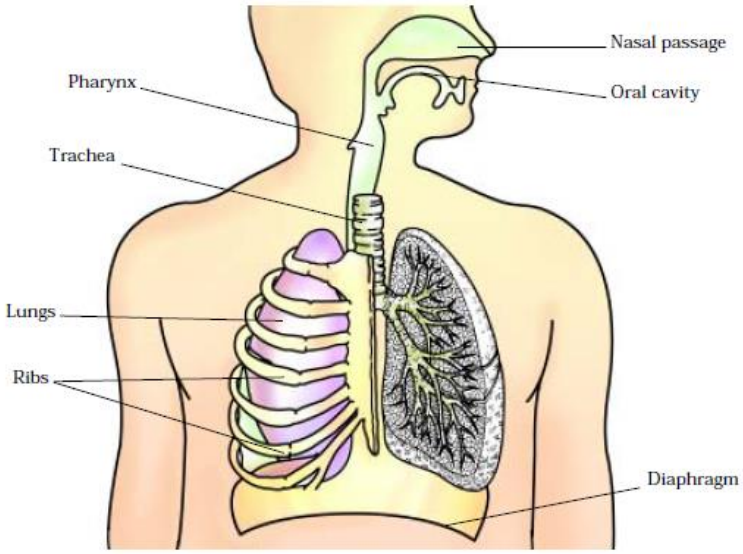
DIFFERENCE BETWEEN AEROBIC AND ANAEROBIC RESPIRATION

Aerobic Respiration	Anaerobic Respiration
1. This kind of respiration takes place in the presence of oxygen.	1. This type of respiration happens in the cells in the absence of oxygen.
2. It leads to release of a high amount of energy in living organisms.	2. It results in a low amount of energy.

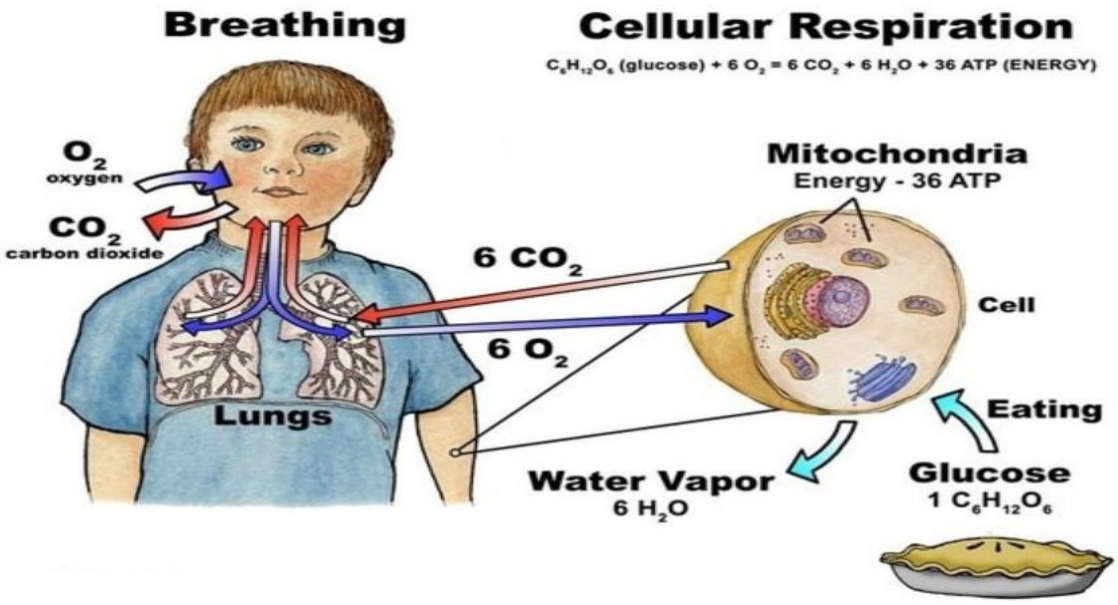
3. Human beings and many other animals undergo aerobic respiration.	3. Yeast and sometimes human beings undergo anaerobic respiration.
4. Carbon dioxide and water are also released in aerobic respiration.	4. Animal muscle cells release lactic acid. Yeast releases ethanol and carbon dioxide.

COMPONENTS OF THE RESPIRATORY SYSTEM IN HUMANS

The respiratory system of the humans has several parts- Nasal chamber, pharynx, larynx, trachea, bronchi, lungs, diaphragm.



- We take in the air present in the environment through our nostrils which travels through the nasal cavity.
- Then it moves through the windpipe and reaches the lungs.
- The lungs are located in the chest cavity which is surrounded by the ribs.
- On the floor of the chest cavity lays a muscular sheet called diaphragm.
- During the breathing process, the movement of the ribs and diaphragm takes place. This is so because the lungs expand and contract during breathing.
- As we take in the air it fills up the lungs. This moves the diaphragm downwards and the ribs outwards.
- The lungs when releasing out air from the body which brings back the diaphragm and the ribs to their original positions.

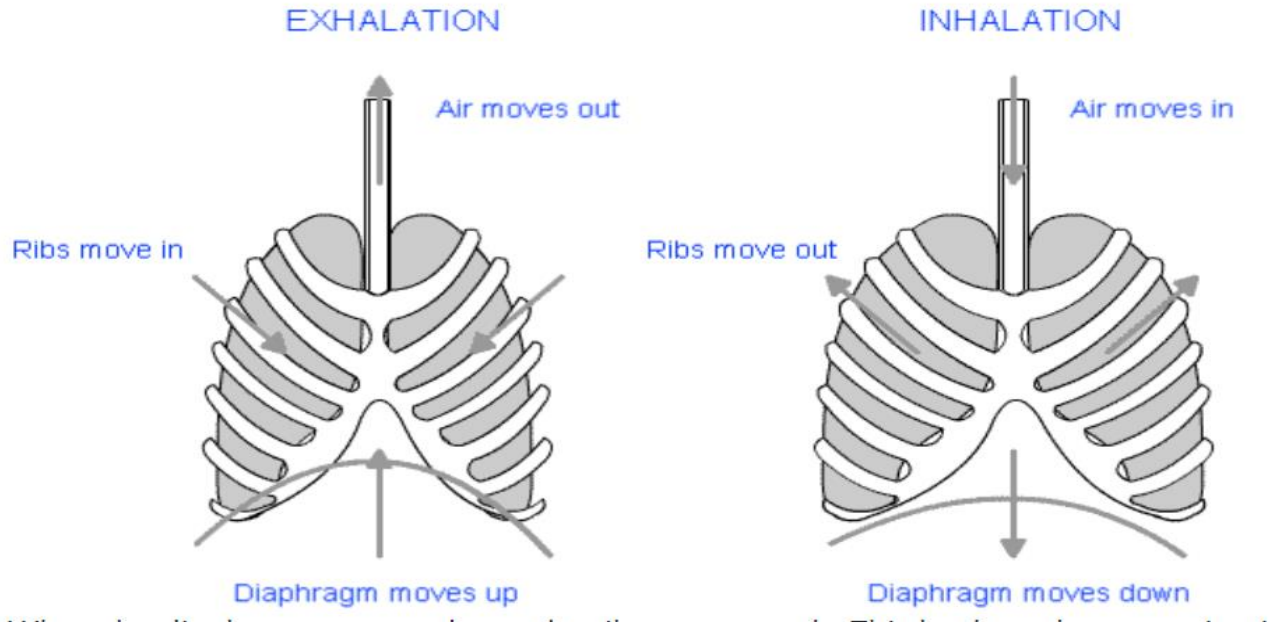


BREATHING: The process of taking in oxygen and giving out carbon dioxide is called breathing. Breathing involves two steps, viz. inhalation and exhalation.

Inhalation is the process of taking the air that contains oxygen inside the body.

Exhalation is a process of releasing out air that contains carbon dioxide out of the body.

PROCESS OF BREATHING: The breathing is controlled by the movement of diaphragm. Diaphragm is a membrane which is between the chest and abdomen. The movement of diaphragm is controlled by a group of muscles; called intercostal muscles
.https://www.excellup.com/Image/breathing_mechanism.mp4



RATE OF BREATHING: When we are doing normal activities, the rate of breathing is normal. The rate of breathing increases when we do strenuous physical works, such as running, swimming, jogging, etc. the rate of breathing decreases when we take rest or when we are sleeping.
Breathing rate:- The no. of times a person breathes in a minute is termed as the breathing rate.

On an average, an adult human being at rest breathe in and out 15-18 times. During heavy exercise, the breathing rate can increase up to 25 times.

Why do we feel hungry after doing a physical activity like walking or running?
When we do a physical activity the food that is present in our body is converted into energy. Since all the food gets consumed in generation of energy we start feeling hungry. Hence in order to gain more energy we need to eat more food.
Why do we sneeze?
As we inhale the air present in the surroundings, sometimes various unwanted elements such as smoke and dust are also included in it. However, they get stuck in the hair in our nostrils but some of them can get through the nasal cavity. They thus cause irritation in the nasal cavity which makes us sneeze. This helps in getting rid of the unwanted particles out of the nasal cavity.

BREATHING IN OTHER ANIMALS

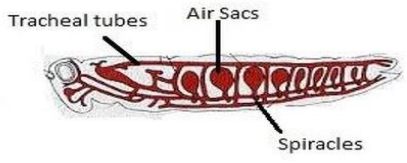
Animals, which belong to amphibia, reptilia, aves and mammalia, use the lungs for breathing. Amphibians breathe through their skin, when they are in water. Smaller animals have different organs for breathing.

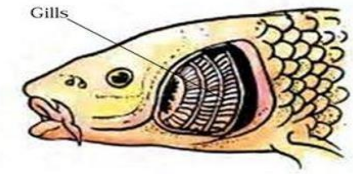
BREATHING IN FISH: Fish have a pair of gills. It breathes air, dissolved in water, through gills.

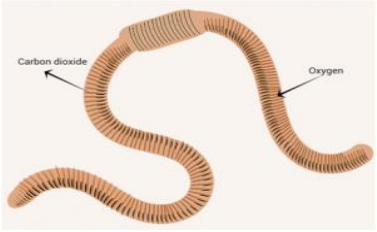
BREATHING IN COCKROACH: Cockroach and other insects breathe through spiracles and trachea. There is a network of hollow tubes running through the body of an insect. These hollow tubes are called trachea. Each trachea opens on the body surface in the form of very small pore. These pores are called spiracles.

BREATHING IN EARTHWORM: Earthworms breathe through their skin. The skin of earthworm always remains moist, which helps in breathing.

Breathing in Unicellular Animals: Unicellular animals breathe through the cell membrane.

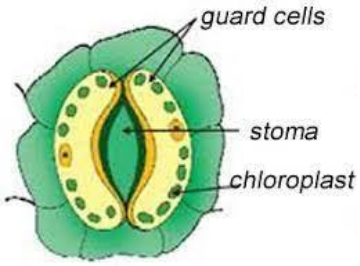






BREATHING IN PLANTS: Plants can be of various sizes. Developing respiratory organs could not be a fruitful solution for plants, because of their unlimited growth. Each plant part breathes through its external layer of cells. Roots breathe through root hairs. Stems breathe through epidermis. Leaves have numerous small pores; called stomata; for breathing.

STOMATA: Tiny pores present on the lower surface of the leaf are called stomata.



FUNCTION OF STOMATA

1. Transpiration
2. Exchange of gases

MULTIPLE CHOICE QUESTIONS

Question 1. Sometimes when we do heavy exercise, anaerobic respiration takes place in our muscle cells. What is produced during this process?
(a) alcohol and lactic acid (b) alcohol and CO_2
(c) lactic acid and CO_2 (d) lactic acid only

Question 2. Yeast is used in wine and beer industries because it respires.
(a) aerobically producing oxygen (b) aerobically producing alcohol
(c) anaerobically producing alcohol (d) anaerobically producing CO_2

Question 3. During the process of exhalation, the ribs move
(a) down and inwards (b) up and inwards
(c) down and outwards (d) up and outward

Question 4. Breathing is a process that
(i) provides O_2 to the body.
(ii) breaks down food to release energy.
(iii) helps the body to get rid of CO_2
(iv) produces water in the cells.
Which of the following gives the correct combination of functions of breathing?
(a) (i) and (ii) (b) (ii) and (iii) (c) (i) and (iii) (d) (ii) and (iv)

Question 5. Which are the gases involved in breathing?
(a) O_2 and NO_2 (b) O_2 and SO_2 (c) O_2 and O_3 (d) O_2 and CO_2

Question 6. Name the organ of the body in which the blood is oxygenated.
(a) Heart (b) Lungs (c) Lever (d) Pancreas

Question 7. After heavy exercise, due to the accumulation of which substance we get muscle cramps?
(a) Malaic acid (b) Fumaric acid (c) Lipoic acid (d) Lactic acid

Question 8. Yeasts are used in
(a) wine and beer industry (b) bakery
(c) in both (d) none of these

Question 9. In the following figure of respiratory system organs labelled by 1 and 2 are respectively:

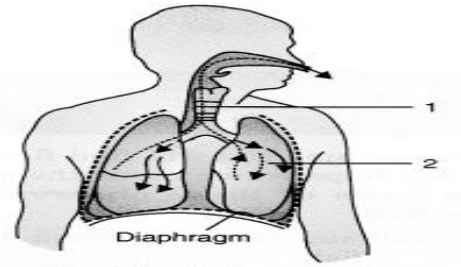


Fig. Respiratory system

(a) Trachea, Lungs (b) Lungs, Trachea
(c) Nasal cavity, Lungs (d) Lungs, Nasal cavity

Question 10. Breathing rate in human beings in normal condition is
(a) 12-15 times in a minute (b) 15-18 times in a minute
(c) 18-22 times in a minute (d) 22-25 times in a minute

HIGHER ORDER THINKING SKILL QUESTIONS

Question 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 [NCERT Exemplar]
Answer:
(a) Snail, as it does not breathe by means of trachea.
(b) Earthworm, because it breathes through its skin and it does not have lungs.
(c) Fish, as most fish breathe through their gills and do not have lungs.
(d) Tadpole, as it breathes through gills and do not have lungs.

Question 2. Smoking is considered harmful due to certain effects. Explain in brief.
Answer: Lungs are very delicate organs and essential for breathing, thus beeping us alive. Smoking tobacco in the form of beedi, cigarette or cigar damages our lungs gradually and causes ill health. While smoking, smoke along with chemicals present in tobacco enters our body. These chemicals present in tobacco damages the lungs in many ways take breathing becomes difficult causes lung cancer, heart diseases, etc. Smoking also affects people around smokers as they also inhale air containing tobacco. This is called passive smoking.
Refer to text on page 141.

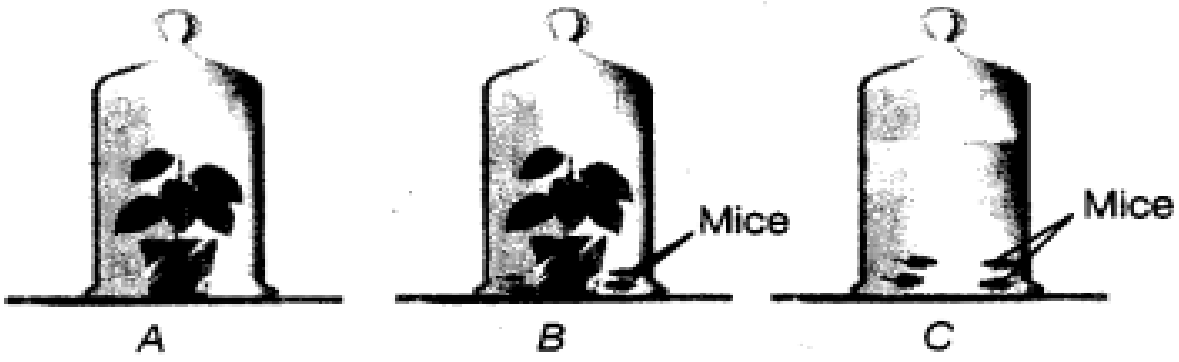
Question 3. Whenever we feel drowsy or sleepy, we start yawning. Does yawning help us in anyway?
Answer: When we feel drowsy, sleepy or tired, we yawn (i.e. open our mouth wide to take a long and deep breathe, of air), because our breathing rate slows down and body do not receives sufficient oxygen.

Question 4. Respiration in fish is different from humans. Explain in brief how fishes can breathe through gills?
Answer: Fishes are the aquatic animals that live in water. These have a special organ for breathing called gills. The oxygen dissolved in water enters through the gills. Gills are actually the projections of skin and have blood vessels for the exchange of respiratory gases. The fishes breathe by taking in water through its mouth and sending it over the gills. The oxygen dissolved in the water is extracted by the gills and the extracted oxygen is absorbed by the blood.

Breathing in fish

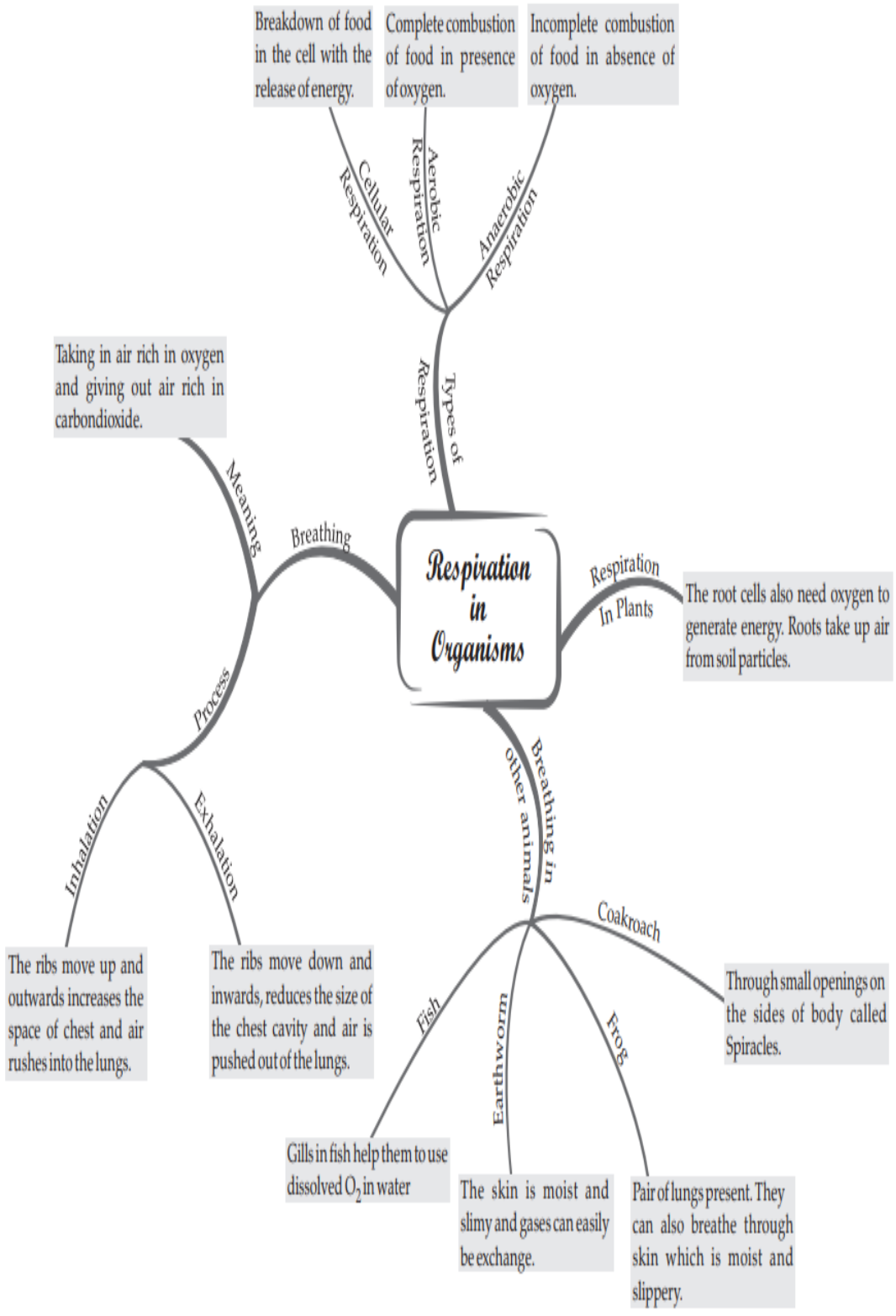
This oxygen is then carried to all the parts of fishes for respiration. The carbon dioxide produced during respiration is brought back by the blood into the gills and expelled into the surrounding water.

Question 5. Observe the given figures carefully. And answer the following questions.
(a) The amount of CO_2 be the highest in which jar. Why?
(b) The amount of CO_2 be the lowest in which one and why?



Answer: (a) The amount of CO_2 will be the highest in jar C. It is because the mice kept under the jar will breathe out CO2 continuously increasing its amount in the jar.
(b) The amount of CO_2 will be the lowest in jar A. It is because in jar A, CO_2 released during respiration is used by the plants, i.e. during the process of photosynthesis.

MIND MAP : LEARNING MADE SIMPLE CHAPTER-10



CHAPTER 11 - Transportation in Animals and Plants

Circulatory System

The organ system of the body that is responsible for the **transport of material** throughout the body is called the **circulatory system**.

- The materials transported are nutrients, oxygen, carbon dioxide, etc
- The medium of transportation is blood.
- The main parts of the circulatory system are heart, and blood vessels

Blood

- Blood is a fluid tissue that transports nutrients and oxygen to the cells and carries away carbon dioxide and other waste products in our body.
- The fluid part of blood is called plasma and has various salts and nutrients dissolved in it.
- Blood cells are suspended in plasma and they are Red Blood Cells (RBCs), White Blood Cells (WBCs) and Platelets.

Components of blood- (RBC , WBC, PLATELETS)

RBC : Contains a red pigment called haemoglobin

WBC : Fight against germs that enter our body.

PLATELETS : Helps in clotting blood.

Blood Vessels

- Blood vessels are tubes that carry blood all over the body.
- Arteries, veins and capillaries are collectively called as blood vessels.

Arteries

- Arteries are blood vessels that carry oxygenated blood to the cells and tissues of our body.
- They carry blood from the heart to the tissues.
- Thick walled.

Veins

- Veins are blood vessels that carry away deoxygenated blood from the cells and tissues of our body.
- They carry blood from tissues to the heart.
- Thin walled.

Capillaries

- Capillaries are the smallest of the body's blood vessels.
- It serves the most important task of the circulatory system: exchange of material between blood and cells.
- The fine network makes it easy for the process of diffusion of materials due to the increase in surface area.

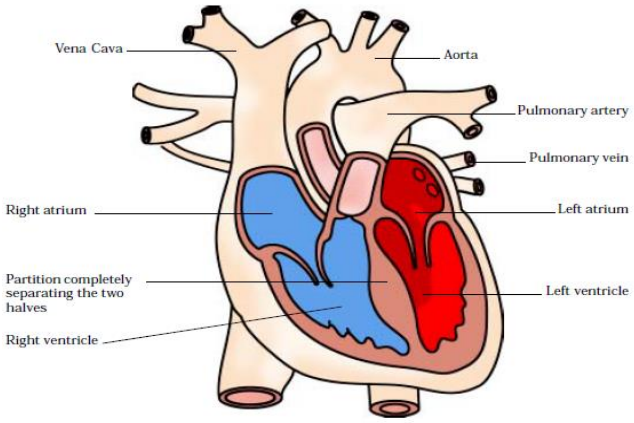
Functions of Blood:

Blood perform several functions:

- It transports digested food from the small intestine to the other parts of the body.
- It carries oxygen from the lungs to the cells and carbon dioxide from the cells to the lungs.
- It protects the body against infection by destroying disease causing germs.
- It clot blood when there is an injury or cut, preventing excess loss of blood.
- It also carries waste products from the cell to the kidney for removal from the body.

Heart

- The heart is a muscular organ in animals that pumps blood through blood vessels to all the parts of the body.
- The heart consists of four chambers that prevent the oxygenated and deoxygenated blood from mixing.
- The upper chambers are called as atria and the lower chambers are called as ventricles.



Oxygenation of Blood

- Oxygenation of blood occurs at the alveoli in the lungs.
- The alveoli have blood vessels wrapped around it and the blood is oxygenated by diffusion.

Pulse

- The heart periodically expands and contracts to pump blood into the arteries, which also expands and contracts as the blood flows through them. This is called pulsation.
- This pulsation of the arteries can be felt at certain places of the body such as the wrist.
- Pulsation is measured as the number of heartbeats per minute, which is nothing but pulse rate

HEART BEAT : Rythmic contraction followed by its relaxation.

Excretory System

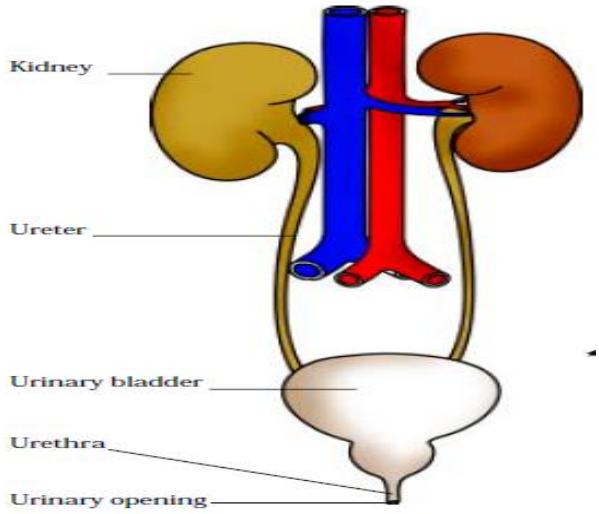
Excretion

The process of removal of waste products from the cells of living organisms is called excretion.

- For human beings, the waste products are in the form of carbon dioxide, urine and faeces.

Kidneys

- Our body's main excretory organs are the kidneys.
- There is a pair of kidneys present on either side of the spine.
- Each kidney is a bean-shaped organ, reddish in colour.
- It contains millions of tiny tubules that act as microscopic filters and filter out the useful and harmful substances from the blood.
- The useful substances are again reabsorbed back into the blood and only harmful substances are excreted.
- These harmful substances are present in a dissolved state in water and called as urine.
- Urine is excreted out of the body.
- Thus, kidneys act as filters of our body.



Ureters

Urine is sent from the kidneys to the urinary bladder through tubes called ureters.

Urinary Bladder

- The urinary bladder is a muscular bag where urine is accumulated and excreted from the body through the urethra.
- It can hold about 300-500 mL urine for a while before the urge to empty occurs.

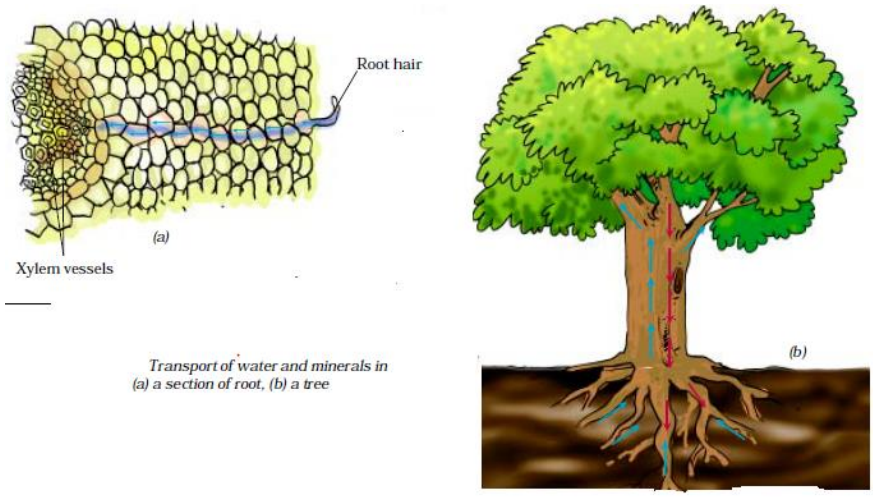
Transportation in Plants

Phloem

- Phloem is the plant tissue that transports the soluble organic material created during photosynthesis from the leaves to the other parts of the plant.

Xylem

- Xylem is the plant tissue that transports the water and other nutrients from the roots to other parts of the plant.



Transport of water and minerals in (a) a section of root, (b) a tree

Transpiration

- Transpiration is the loss of water in the form of water vapour from stomata present on leaves.
- This process also helps the plants to absorb and distribute water through their roots.
- Transpiration exerts a straw-like effect and the water moves up against gravity in tubes made of xylem cells.

MULTIPLE CHOICE QUESTIONS

1-Which of the following is the main circulatory fluid in our body ?
(a) Plasma (b) Lymph (c) Blood (d) None of these

2-Which one of the following contains haemoglobin?
(a) RBC (b) WBC (c) Platelets (d) None of these

3-What is the function of WBCs?
(a) Transport of oxygen (b) Fight against germs
(c) Involved in blood clotting (d) All of these

4-Blood platelets help in
(a) formation of urine (b) excretion of urine
(c) sweating (d) blood clotting

5-The muscular tube through which stored urine is passed out of the body is called:
(a) kidney (b) ureter (c) urethra (d) urinary bladder

6-They are pipe-like, consisting of a group of specialised cells. They transport substances and form a two-way traffic in plants. Which of the following terms qualify for the features mentioned above?
(a) Xylem tissue (b) Vascular tissue (c) Root hairs (d) Phloem tissue

7-The absorption of nutrients and exchange of respiratory gases between blood and tissues takes place in:
(a) veins (b) arteries (c) heart (d) capillaries

8-In a tall tree, which force is responsible for pulling water and minerals from the soil?
(a) Gravitational force (b) Transportation force
(c) Suction force (d) Conduction force

9-Aquatic animals like fish excrete their wastes in gaseous form as
(a) Oxygen (b) Hydrogen (c) Ammonia (d) Nitrogen

10-In which of the following parts of human body are sweat glands absent?
(a) Scalp (b) Armpits (c) Lips (d) Palms

HIGHER ORDER THANKING SKILL QUESTIONS

Question 1. Make a table depicting the function of all chambers of the human heart.
Answer: The human heart is divided into four chambers, i. e. upper two atrium and lower two ventricles. The functions of these chambers can be tabulated as follows :

Chamber	Function
Left atrium	Receives oxygenated blood from lungs through pulmonary veins and pours it into left ventricle.
Right atrium	Receives deoxygenated blood from various body parts through superior and inferior vena cava and pours it into right ventricle.
Left ventricle	Pumps oxygenated blood to various parts of body through aorta.
Right ventricle	Pumps deoxygenated blood into lungs through pulmonary artery.

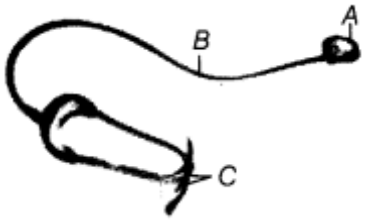
Question 2. Paheli noticed water being pulled up by a motor pump to an overhead tank of a five storeyed building. She wondered how water moves up to great heights in the tall trees standing next to the building. Can you tell why?

Answer: When the water is pulled up by a motor-pump to an overhead tank of a five storeyed building, it moves to a great height due to the suction pull. This pull forms the continuous column of water and water rises up to a great height. Similarly, when transpiration occurs in the plants, water is evaporated and this creates a suction pull in the plants. Due to this suction pressure, water from the soil rises up through the roots of the plants and reaches to a great height in tall plants.

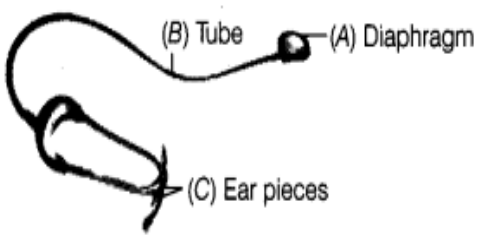
Question 3. What is the relation between the rate of heartbeat and pulse rate? If a pulse rate of an athlete Is 96/min, what will be the number of his heartbeat at the same time?

Answer: The rhythmic contraction and relaxation of the muscles of the heart is called heartbeat. Whereas, the rhythmical throbbing of the arteries as the blood is pushed forward through them is called pulse. It can be felt in the wrist, temples, etc.
Pulse rate is the number of heartbeats per minutes. The number of heartbeat is equal to the number of pulse per minute.
Therefore, if a pulse rate of an athlete is 96/min then the number of his heartbeat at the same time will also be 96/min

Question 3. Observe given figure and answer the given question.



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



Answer:
(a) The name of the given instrument is stethoscope.
(b) Labelled diagram of stethoscope.

Question 4. Name the process and the organ which help in removing the following wastes from the body.
(a) Carbon dioxide
(b) Undigested food
(c) Urine
(d) Sweat

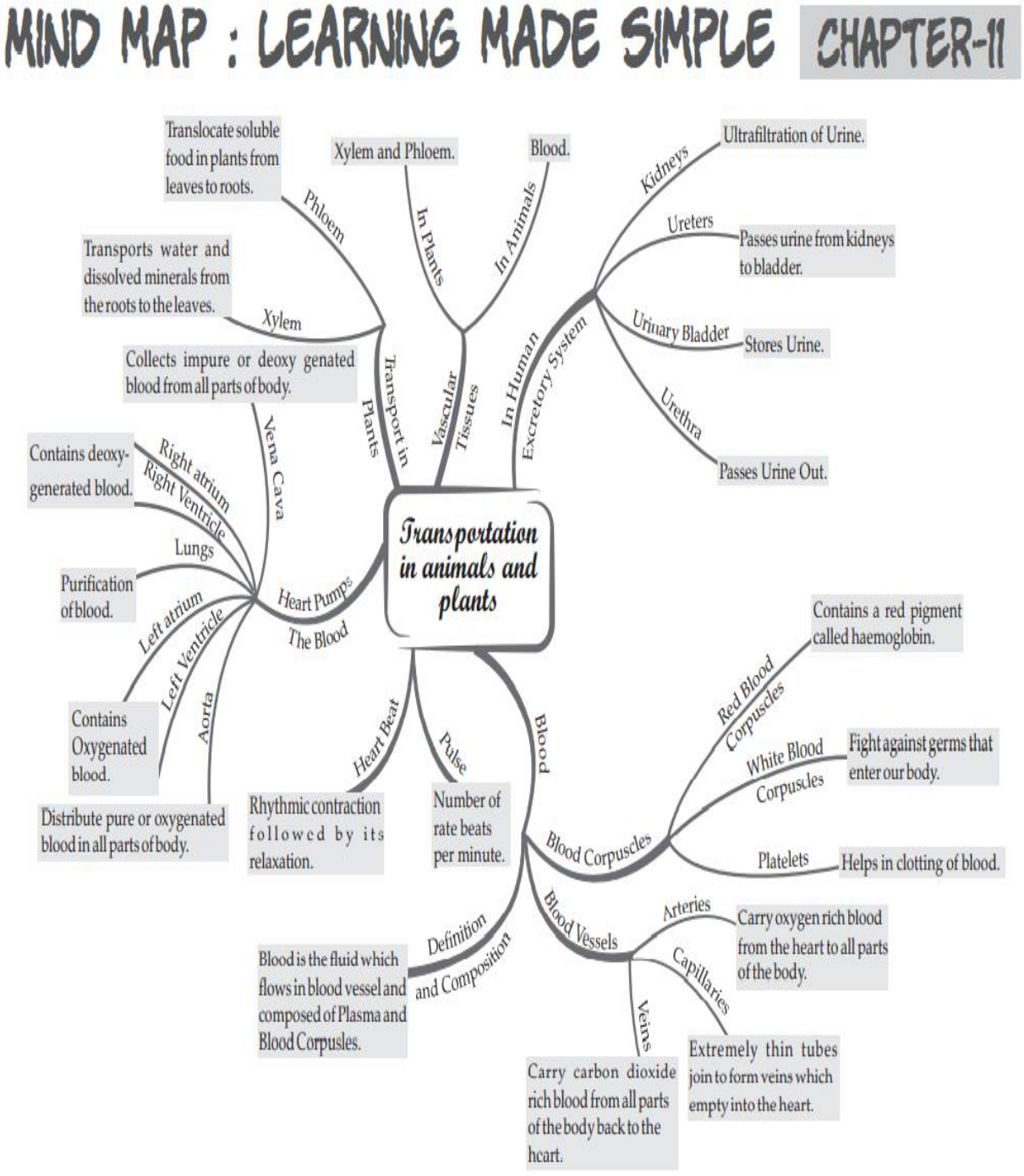
Answer:

	Waste	**Process**	**Organ**
(a)	Carbon dioxide	Exhalation	Lungs
(b)	Undigested food	Egestion	Large intestine and anus
(c)	Urine	Excretion	Kidneys
(d)	Sweat	Perspiration(sweating)	Sweat glands

Question5. 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.

Answer: The correct order of the formation and removal of urine in human beings is
(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.

MIND MAP


MIND MAP : LEARNING MADE SIMPLE
CHAPTER-11
Transportation in animals and plants
Transport in Plants
Phloem
Translocate soluble food in plants from leaves to roots.
Xylem
Transports water and dissolved minerals from the roots to the leaves.
Vascular Tissues
In Plants
Xylem and Phloem.
In Animals
Blood.
In Human Excretory System
Kidneys
Ultrafiltration of Urine.
Ureters
Passes urine from kidneys to bladder.
Urinary Bladder
Stores Urine.
Urethra
Passes Urine Out.
Vena Cava
Collects impure or deoxy genated blood from all parts of body.
Heart Pumps The Blood
Right atrium
Right Ventricle
Contains deoxy-generated blood.
Lungs
Purification of blood.
Left atrium
Left Ventricle
Contains Oxygenated blood.
Aorta
Distribute pure or oxygenated blood in all parts of body.
Heart Beat
Rhythmic contraction followed by its relaxation.
Pulse
Number of rate beats per minute.
Blood
Red Blood Corpuscles
Contains a red pigment called haemoglobin.
White Blood Corpuscles
Fight against germs that enter our body.
Blood Corpuscles
Platelets
Helps in clotting of blood.
Definition and Composition
Blood is the fluid which flows in blood vessel and composed of Plasma and Blood Corpusles.
Blood Vessels
Arteries
Carry oxygen rich blood from the heart to all parts of the body.
Capillaries
Extremely thin tubes join to form veins which empty into the heart.
Veins
Carry carbon dioxide rich blood from all parts of the body back to the heart.

CHAPTER -12 REPRODUCTION IN PLANTS

All Living things produce more of their own kind The process through which a living thing (organism) produces new living things (young ones) like itself is called reproduction.

Types of reproduction in plants

Reproduction in plants occurs in two ways:

1. Asexual: Plants can give rise to new plants without seeds.
2. Sexual reproduction: New plants are obtained from seeds.

Asexual Reproduction in Organisms

- In asexual reproduction, organisms can give rise to new organisms without fusion of gametes.
- Only one parent is involved.

Fission

- It is a type of asexual reproduction that takes place in unicellular organisms like amoeba, paramecium etc.
- A single parent cell divides into two or more daughter cells.
- There are two types:

1. Binary Fission: a single parent cell divides into two daughter cells. (e.g. amoeba, paramecium)
2. Multiple Fission: a single parent cell divides into many daughter cells. (e.g. Plasmodium)

Fragmentation

- Fragmentation is a form of asexual reproduction or cloning, in which an organism is split into fragments.
- Each of these fragments develop into a mature fully grown individual that are clones of the original organism.
- Eg: Spirogyra

Budding

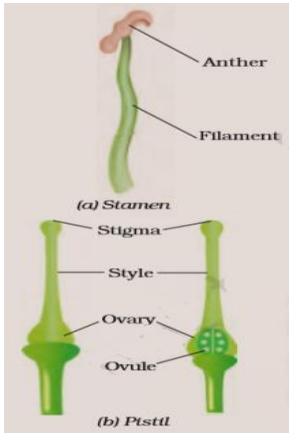
- Budding is a form of asexual reproduction in which a new organism develops from an outgrowth or bud due to cell division at one particular site of the parent organism.
- They eventually break away from the parent. Eg: hydra, yeast

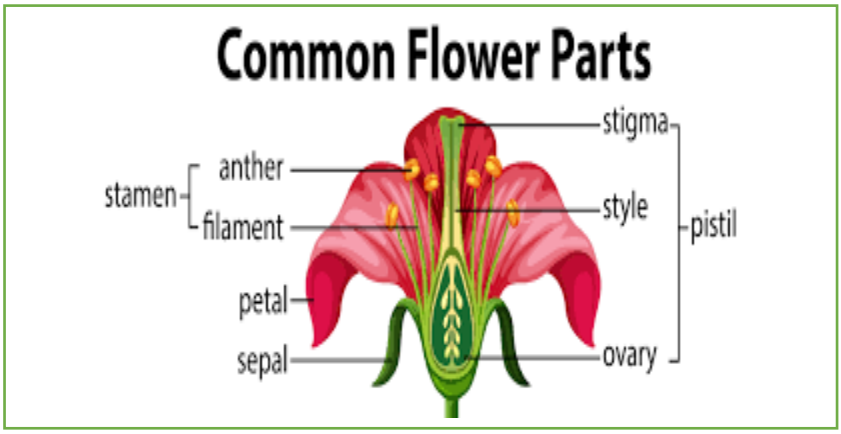
Sexual Reproduction in Plants

- Sexual reproduction in plants occurs through the fusion of gametes, which eventually gives rise to seeds that develop into the new plant.
- Flowers are the parts of the plant involved in sexual reproduction.
- The male gamete i.e. pollen grains are produced by anthers while the female gamete i.e. ovule is produced by pistil.
- The male and female gametes meet due to pollination, fuse by fertilization and give rise to a new plant by fruit and seed formation

Parts of a typical flower: Flower is the reproductive part of flowering plant. A typical flower has four parts- sepals, petals, stamens and a carpel.

- *Sepals:* Sepals are green and they protect the other part of a flower before it blooms.
- *Petals:* Petals are either colored or white and are seen as the flower blooms. They usually attract insects. The sepals and petals do not directly take part in reproduction.
- *Stamen:* Stamen is the male part of the flower, that has a long filament with an elongated sac like structure at its tip called the anther. Anthers produce pollen grains.
- *Pistil:* The pistil or carpel is the female reproductive organ of the flower. The carpel has a stalk-like style with a sticky tape called the stigma and a swollen base, called the ovary. Ovary contains one or more ovules. Ovules contain the egg cells, the female gamete of the plant

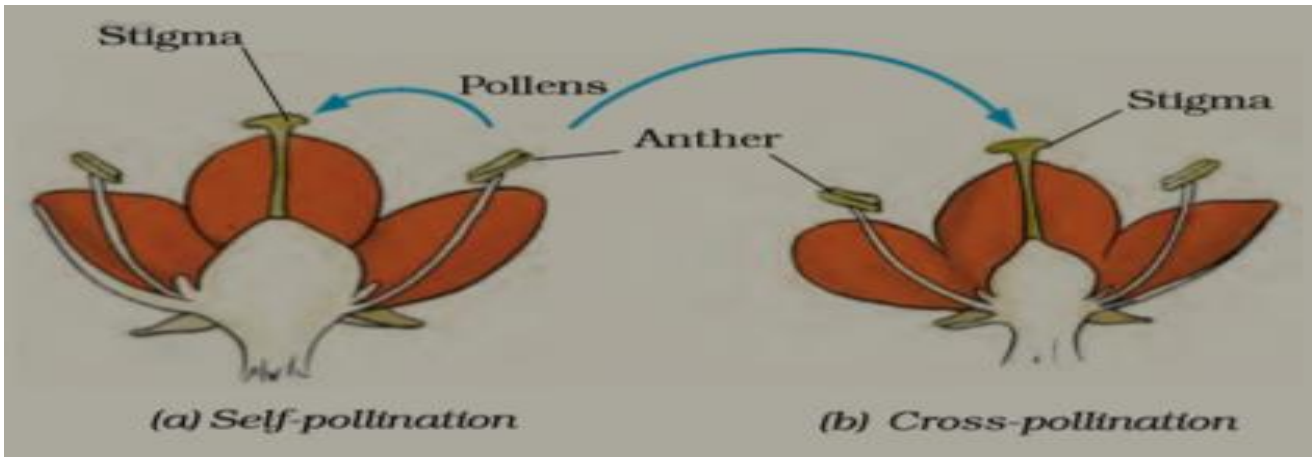




Pollination

- Pollination is the act of transferring pollen grains from the male part of the flower i.e. anthers to the female part of the flower i.e. stigma.

Self-pollination	Cross-pollination
1. It is the process of transfer of pollen grains from anther to the stigma of the same flower.	1. It is the process of transfer of pollen grains from anther to the stigma of the different flower.
2. The process occurs in either within the same flower or a different flower of the same plant.	2. The process occurs between two different flowers of two different plants.
3. They do not require pollinators for the transfer of pollen grains.	3. They require the presence of pollinators for the transfer of pollen grains.
4. Inbreeding between the plants occur.	4. It causes outbreeding of plants.
5. In this process both the stigma and anther matures at the same time.	5. In this process both the stigma and anther matures at a different time.
6. It occurs only in perfect flowers.	5. It can occur in both perfect as well as imperfect flowers.



Zygote

- In sexual reproduction a male and a female gamete fuse to form a zygote.
- So in case of plants, the male gametes present in the pollen grains fuse with the female gamete i.e. egg.
- This fusion is called as fertilization and the cell formed out of the fusion is called as a zygote.

Fertilisation

Fertilization is the phenomenon of of fusion of the male gamete with the female gamete cell.

Embryo

- The zygote further develops to form the embryo.
- In animals, the embryo grows into an adult.
- In Plants, the embryo further gives rise to shoot system and root system.

Fruits and Seed Formation

- In plants, post fertilisation, the ovary develops into a fruit and other parts of the flower fall off.
- The ripened ovary forms the fruit.
- The ovules form the seeds.

Seed Dispersal

- Seeds and fruits of plants are dispersed away by wind, water and animals.
- The seeds show different characteristics depending on their dispersing agent.

Wind

1. Seeds are winged and light to get carried by the wind. eg: maple and drumstick.
2. Hairy seeds, eg: aak (Madar) and hairy fruit of sunflower.

Water

1. These seeds or fruits normally develop the ability of floating in the form of fibrous or spongy outer coat, eg: coconut.

Animals

- Spiny seeds with hooks that are attached to the animal body and are hence carried to distant places. Eg: Xanthium, Urena

Few of the seeds disperse when the fruits burst out with a sudden jerk, which gets scattered away to a distance far from the parent plant. Eg: Balsam and Castor.

MULTIPLE CHOICE QUESTION

1. Flowers with both androecium and gynoecium are called

1. Bisexual flowers 2. Anther 3. Stamens 4. Unisexual flowers

2. The transfer of pollen from the anther to stigma is called

1. Pollination 2. Fertilization 3. Adoption 4.Diffusion

3. The fusion of female reproductive nucleus with the male reproductive nucleus is known as

1. Adoption 2.Excretion 3.Fertilization 4.Regeneration

4. The two nuclei at the end of the pollen tube are called

1.Tube nucleus and a generative nucleus 2.Sperm and ovum

3.Generative nucleus and stigma 4.Tube nucleus and sperm

5. Generative nucleus divides forming

1. Two male nuclei
2.Three male nuclei
3.Two female nuclei
4.Three female nuclei

6. Embryo sac is located inside the

1.Stigma 2.Ovule 3.Micropyle 4.Style

7. One nucleus of the pollen tube and secondary nucleus of the ovum grow into

1. Stigma 2.Endosperm 3.Anther 4.Stamen

8. The stalk of Datura flower at its base is known as

1.Pedicel 2.Corolla 3.Sepals 4.Thalamus

9. The male reproductive parts of a flower, the stamens, are collectively known as

1.Androecium 2.Filament 3.Anther 4.Gynoecium

10. The other name for gynoecium is

1.Pistil 2.Stigma 3.Androecium 4.Style

HIGHER ORDER THINKING SKILL QUESTION

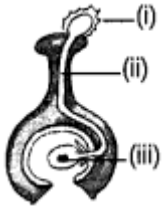
Question 1. When you keep food items like bread and fruits outside for a long time especially during the rainy season, you will observe a cottony growth on them.
(a) What is this growth called?
(b) How does the growth take place?

Answer: (a) When food items like bread and fruits are kept outside for a long time especially during rainy season, a cottony growth of bread mould, a fungus is observed.
(b) This growth of fungus takes place by spores present in air, which when comes in the contact with moisture in bread germinates and grow to produce new cells.

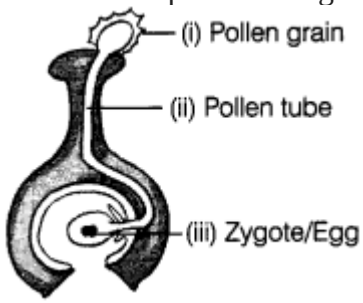
Question 2. Collect some flower of different plants like papaya, rose, mustard, lady's finger, Petunia, cucumber, corn, pea, etc. Group them under following heads.
(a) Which of these plants have unisexual flowers?
(b) Which of these plants have bisexual flower?
(c) What is the other name of unisexual and bisexual flower?

Answer:(a) Unisexual flowers are papaya, cucumber.
(b) Bisexual flowers are rose, mustard, lady's finger, Petunia, pea.
(c) Unisexual flowers are also called as incomplete flower while bisexual flowers are called hermaphrodite or complete flowers.

Question 3. In the figure given below, label the part marked (i), (ii) and (iii).



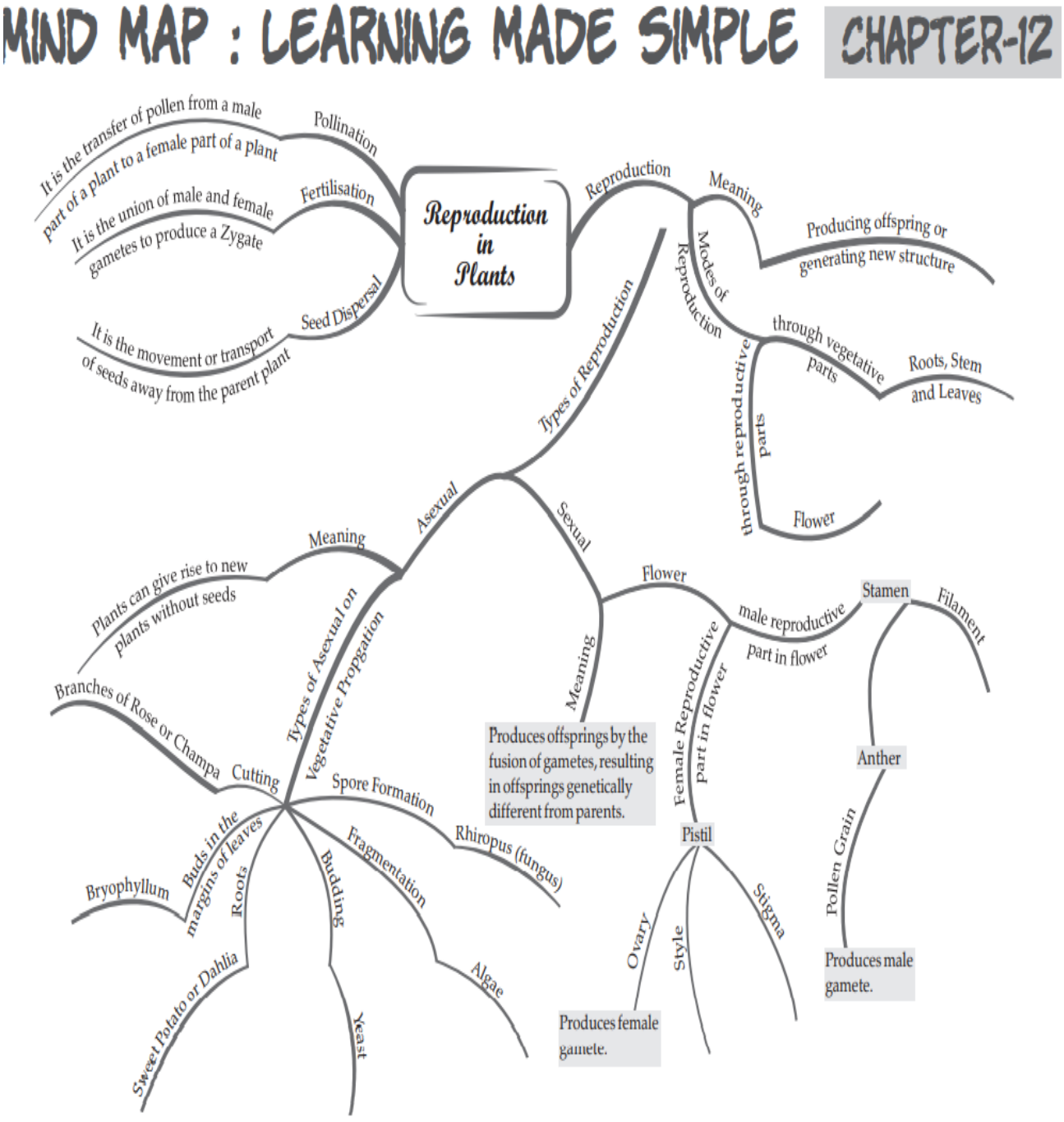
Answer: The parts in the given figure are labelled as follows



Question 4. Coconut is a large and heavy fruit. How is it adapted for dispersal by water?
Answer: The seeds of some plants that have an outer fibrous or spongy covering are dispersed through water. They have the ability to float in the water and drift along with its flow, e.g. seeds of water lily, lotus, chestnut (singhara) and coconut are dispersed through water. The coconut fruits have a fibrous outer coat which enables them to float in water and carried away by flowing water to far off places.

Question 5. What is a bud? Which organism reproduce by budding? Given the diagrammatic representation of budding in a plant.
Answer: Buds are small bulb-like projections of yeast cell.
These are asexual reproducing bodies of yeast.
Diagrammatic representation of budding in yeast Refer to figure on page 178

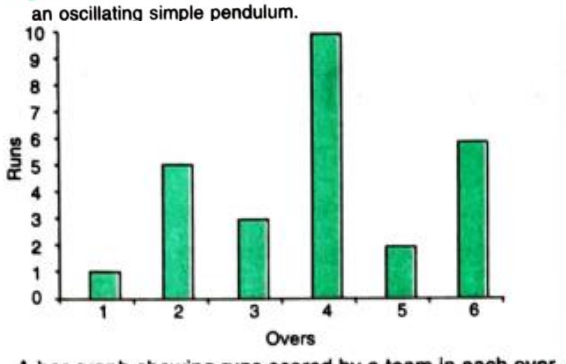
MIND MAP


MIND MAP : LEARNING MADE SIMPLE
CHAPTER-12
Reproduction in Plants
Pollination
It is the transfer of pollen from a male part of a plant to a female part of a plant
Fertilisation
It is the union of male and female gametes to produce a Zygate
Seed Dispersal
It is the movement or transport of seeds away from the parent plant
Reproduction
Meaning
Producing offspring or generating new structure
Modes of Reproduction
through vegetative parts
Roots, Stem and Leaves
through reproductive parts
Flower
Types of Reproduction
Asexual
Meaning
Plants can give rise to new plants without seeds
Types of Asexual Vegetative Propgation
Branches of Rose or Champa
Cutting
Bryophyllum
Buds in the margins of leaves
Roots
Sweet Potato or Dahlia
Budding
Yeast
Fragmentation
Algae
Spore Formation
Rhiropus (fungus)
Sexual
Meaning
Produces offsprings by the fusion of gametes, resulting in offsprings genetically different from parents.
Flower
Female Reproductive part in flower
Pistil
Ovary
Style
Stigma
Produces female gamete.
male reproductive part in flower
Stamen
Filament
Anther
Pollen Grain
Produces male gamete.

CHAPTER - 13 MOTION AND TIME

1. Speed of objects help us to decide which one is moving faster than the other.
2. The speed of an object is the distance travelled divided by the time taken to cover that distance. Its basic unit is meter per second (m/s or ms-l).
3. Periodic events are used for the measurement of time. Periodic motion of pendulum has been used to make clocks and watches.
4. Motion of objects can be presented in pictorial form by their distance-time graphs.
5. The distance-time graph for the motion of an object moving with constant speed is a straight line.
6. An object moving along a straight line is said to be in uniform motion.
7. If the speed of an object along a straight line keeps changing, its motion is said to be in non-uniform motion.
8. The time taken by the pendulum to complete one oscillation is called its time period.
9. Instruments that measures the distance moved by vehicle is known as odometer.
10. Instruments that record speed directly in km/h is called a speedometer.
11. The basic unit of time is known as second.
12. The pendulum has said to have completed one oscillation when its bob moves from one extreme position A to other extreme position B and come back to A
13. A simple pendulum consists of a small metallic ball suspended from a rigid stand by a thread
14. The metallic ball is called the bob of pendulum
15. We can represent the data in pictorial form by three ways:
    - Bar graph
    - Pie chart
    - Line graph

Fig. Different positions of the bob of an oscillating simple pendulum.



A bar graph showing runs scored by a team in each over.

Fig. A simple pendulum.

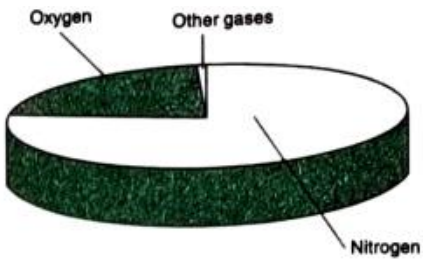


Fig. B. A pie chart showing composition of air.

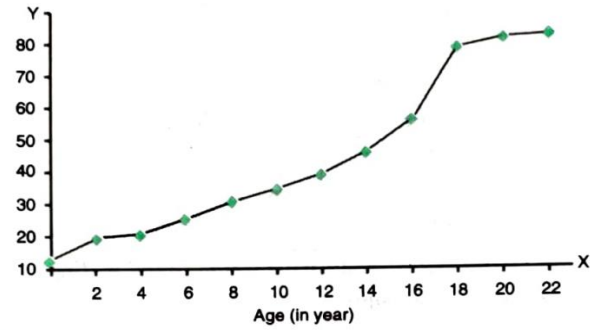


Fig. C. A line graph showing change in weight of a man with age.

17. When the bob of the pendulum is released after taking it slightly to one side, it begins to move to and fro. The to and fro motion of a simple pendulum is an example of oscillatory or periodic motion.

EXTRA QUESTIONS

Fill in the blanks:

1. The distance between two cities is measured in _____
2. A car moving with constant speed is said to be in _____ motion.
3. For a body in uniform motion, the distance-time graph is a_____
4. The time taken to complete one oscillation is called _____

Match the following:

Column A	Column B
1. Odometer	(i) The time taken by a pendulum to complete one oscillation
2. Time period	(ii) A device used by Romans to measure time
3. Sand clock	(iii) 10^6nanosecond
4. Second	(iv) (iv) Representation of the speed of different moving bodies
5. Distance-time graph	(v) SI unit of time
	(vii) Gives the distance travelled by a moving vehicle

Multiple Choice Questions (MCQs): Choose the correct answer for each of the following:

1. One solar day is equal to

(a) 24 hours. (b) 1440 minutes. (c) 86400 seconds. (d) all of them

2. Speed is calculated as

(a)Speed= Distance x time. (b) Speed=Distance / time.

(c) Speed=Time - distance. (d) None of these.

3. A car is moving at a speed of 30 km/h and a truck is moving at a speed of 40 km/h. The distance-time graph will show

(a) one straight line. (b) two parallel straight lines.

(c) two straight line at different angle (d) a zigzag line

4. The standard unit of speed is

(a) km/h. (b) m/s. (c) m/h. (d) km/s.

Short answer type questions

1.The distance covered by a cyclist is given in the following table. Represent it in the form of a line graph and calculate his speed.

Distance (m)	**3**	**5**	**9**	**11**	**14**
Time (s)	**10**	**15**	**20**	**25**	**30**

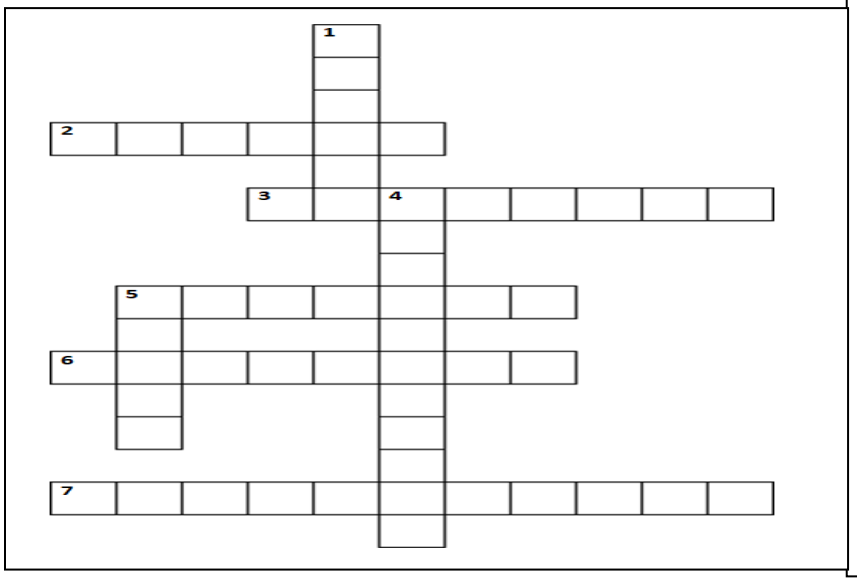
2. What is meant by slow and fast motion?

3. A bus takes 2 h to cover a distance of 80 km. Calculate its speed in km/h and m/s.

4. Define oscillation and time period of a pendulum.

CCT BASED QUESTION -

Crossword puzzle-



Across-

2. An act of change in position (6)
3. Measures distance (8)
5. A device to measure time (7)
6. A bob attached to a thread (8)
7. Records speed (11)

Down-

1. A unit of time (6)
4. Movement of pendulum bob (11)
5. Distance travelled in unit time (5)

ANSWERS:

Fill in the blanks

1. Kilometer 2. Uniform 3. Straight-line 4. time period

Match the following

1. vii 2. i 3. ii 4. vi 5. iv

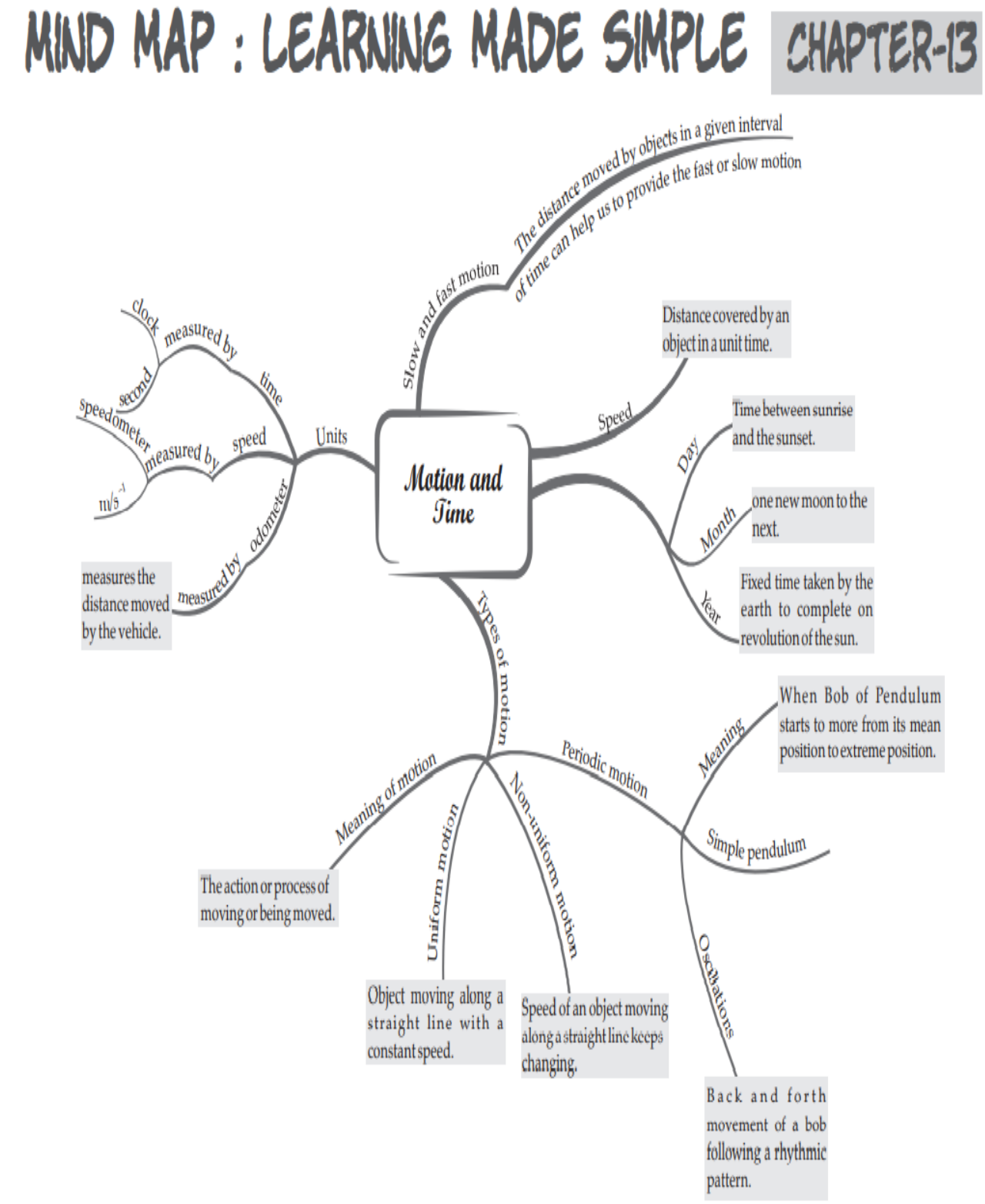
Multiple choice questions

1. (d) 2. (b) 3. (c) 4. (b)

Crossword puzzle-

Across- 2. Motion 3. Odometer 5. Sundial 6. Pendulum 7. Speedometer **Down-** 1. Second 4. Oscillation 5. Speed

MIND MAP

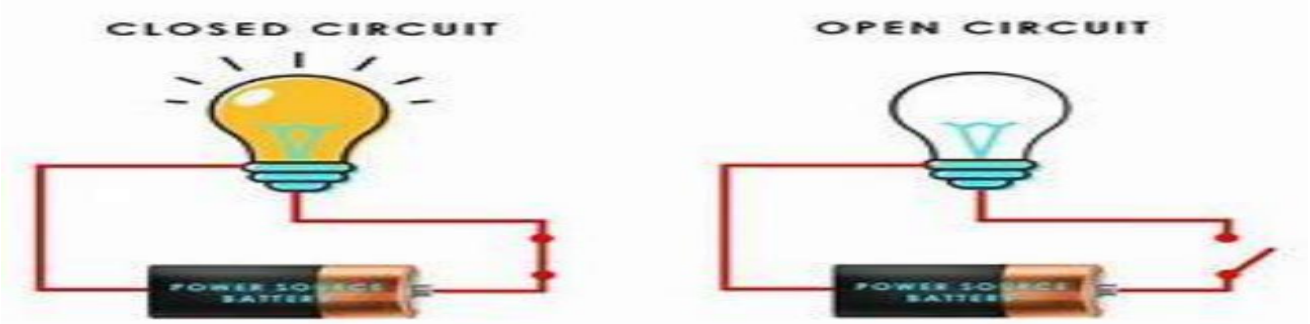

MIND MAP : LEARNING MADE SIMPLE
CHAPTER-13
Motion and Time
Slow and fast motion
The distance moved by objects in a given interval of time can help us to provide the fast or slow motion
Speed
Distance covered by an object in a unit time.
Day
Time between sunrise and the sunset.
Month
one new moon to the next.
Year
Fixed time taken by the earth to complete on revolution of the sun.
Units
time
measured by
clock
second
speed
measured by
speedometer
m/s⁻¹
odometer
measured by
measures the distance moved by the vehicle.
Types of motion
Meaning of motion
The action or process of moving or being moved.
Uniform motion
Object moving along a straight line with a constant speed.
Non-uniform motion
Speed of an object moving along a straight line keeps changing.
Periodic motion
Meaning
When Bob of Pendulum starts to more from its mean position to extreme position.
Simple pendulum
Oscillations
Back and forth movement of a bob following a rhythmic pattern.

ELECTRIC CURRENT AND ITS EFFECTS

Electricity is form of energy which can be converted into light, sound or heat energy,etc.

1. It is convenient to represent electric components by symbols: using these, an electric circuit can be represented by a circuit diagram.
2. The electric current flows from its source through the conducting material only. A material set to be good conductor of electricity if it allows electric current to flow or pass easily through it for example the metals like iron, copper, aluminium in their solid states or salt solutions, acid solution, alkali solution, water etc. are good conductors of electricity. The materials through which electricity cannot pass or flow easily are known as bad conductors of electricity. For example plastic, wood,rubber,wax, paper etc. The bad conductor of electricity are also called insulator
3. • Electric circuit •

An electric circuit is a path through which current flows. An electric circuit may be a complete electric circuit (closed circuit) or incomplete electric circuit(open circuit) • In a closed electric circuit , the electric current starts from the positive terminal of the source and ends at the negative terminal of the source without any break.The current flows only ifthe circuit is complete or closed,all the elements of the electric circuit start functioning.



4. Effects of electric current:When an electric current is passed through an electric circuit,it may produce the following effect:--

1. Heating effect 2.lighting effect 3. Magnetic effect

• Heating effect of electric current: When electric current flows through a conductor,some heat is produced(due to resistance of the conductor).This effect of current is known as heating effect of electric current.

Heat produced in a conductor by an electric current depends on:

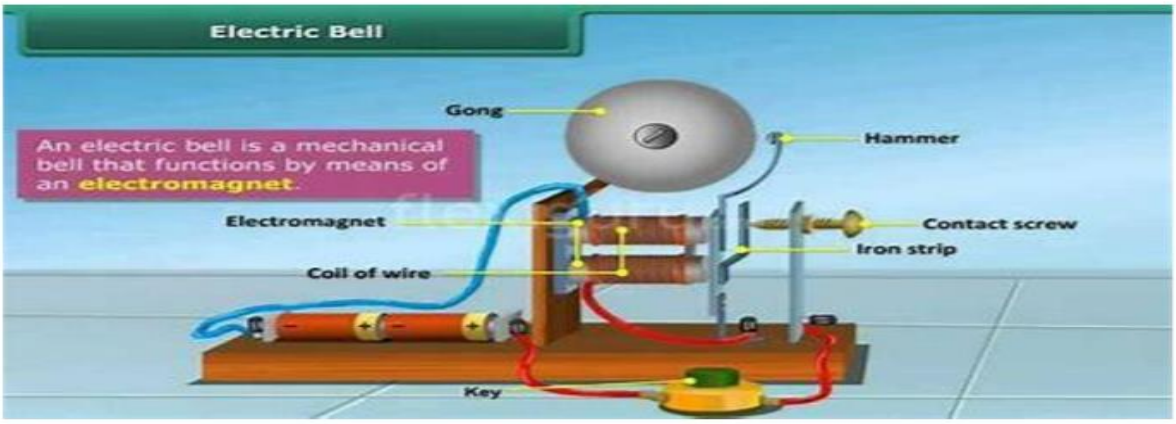
1.Length of the conductor
2.Thickness of the conductor
3.Nature of the material of the conductor

5. Wires made from some special materials melt quickly and break when large electric current is passed through them. These materials are used for making electric fuses which prevent fires and damage to electrical appliances.
6. Coil of wire is called an element.
7. A fuse is a safety device which prevents damage to electrical circuits and possible fires.
8. MCBs (Miniature Circuit Breakers): These are the switches which automatically turn off when the current in circuit exceeds the safe limit.

9. When an electric current flows through a wire, it behaves like a magnet. This is the magnetic effect of electric current
10. Hans Christian Oersted discovered the magnetic effects of electric current.
11. A current carrying coil of an insulated wire wrapped around a piece of iron is called an electromagnet.
12. Electromagnets are used in many devices.
13. When two or more cells are joined together, it is called a battery.
14. Electric components are electric cells, electric bulb, switch in 'on' position, switch in 'off position, battery, wire.
15. Electric Bell

Principle:It works on the principle of Electromagnetism.

- Construction and working: It consists of a soft iron armature mounted on a springy metal strip placed in front of a U-shaped electromagnet.
- The electromagnet is wound on an insulated copper wire of a large number of turns.one end of the insulated copper wire is connected to the T1 of the cell and the other end of the metal strips.
- The metal strip makes contact with one adjustable contact screw at contact point.
- A hammer made up of steel is attached to the armature.
- It also consists of a gone which is made of brass.
- When the bell operates, the hammer repeatedly strikes against the gong and produces the sound.



EXTRA QUESTIONS

State whether the following statements are True (T) or False (F):

1. The strength of the magnetic field of a current carrying coil depends on the number of turns in the coil.
2. Fuse wire has high melting point.
3. Fuse wire melts when the circuit is overloaded.
4. Electromagnets are used to make permanent magnets.
5. Copper wire is coated with insulating material to protect the user from an electric

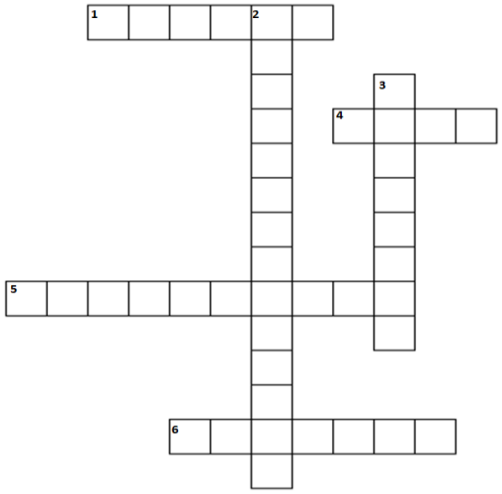
Fill in the blanks:

1. _____ is used in making the filament of the bulb.
2. _____ are the materials which allow electric current to pass through them and have _resistance
3. In the symbol of a cell, the longer line represents the _____ terminal while the shorter line represents the _____terminal.
4. An electromagnet can attract _____

Multiple Choice Questions (MCQs)

1.Which of the following material offers minimum resistance to the flow of electric current?
(a) Copper (b) Tungsten (c) Nichrome (d) Silver
2. A fuse wire is made of
(a) copper and tin. (b) lead and tin. (c) copper and lead. (d) aluminium and copper.
3. Which of the following does not allow the electric current to pass through them?
(a) Cell (b) Impure water (c) Rubber (d) Brass
4. Materials which offer maximum resistance and do not allow current to flow through them are called-
(a) conductors. (b) insulators. (c) bad conductors. (d) fuse.
5. Electromagnets are used in
(a) electric bell. (b) electric fan. (c) electric motor. (d) all of them.

Crossword puzzle-



Across-

1. A shiny metal used in ornaments is also a very good conductor of electricity (6)
4. Melts and breaks circuit (4)
5. Hindrance to the flow of electric current (10)
6. Cells connected in series (7)

Down-

2. Used to separate magnetic materials from junk (14)
3. Filament of a bulb (8)

ANSWERS

State whether true/false

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

Fill in the blanks

1. Tungsten 2. Conductors 3. Positive and negative 4. Magnetic material

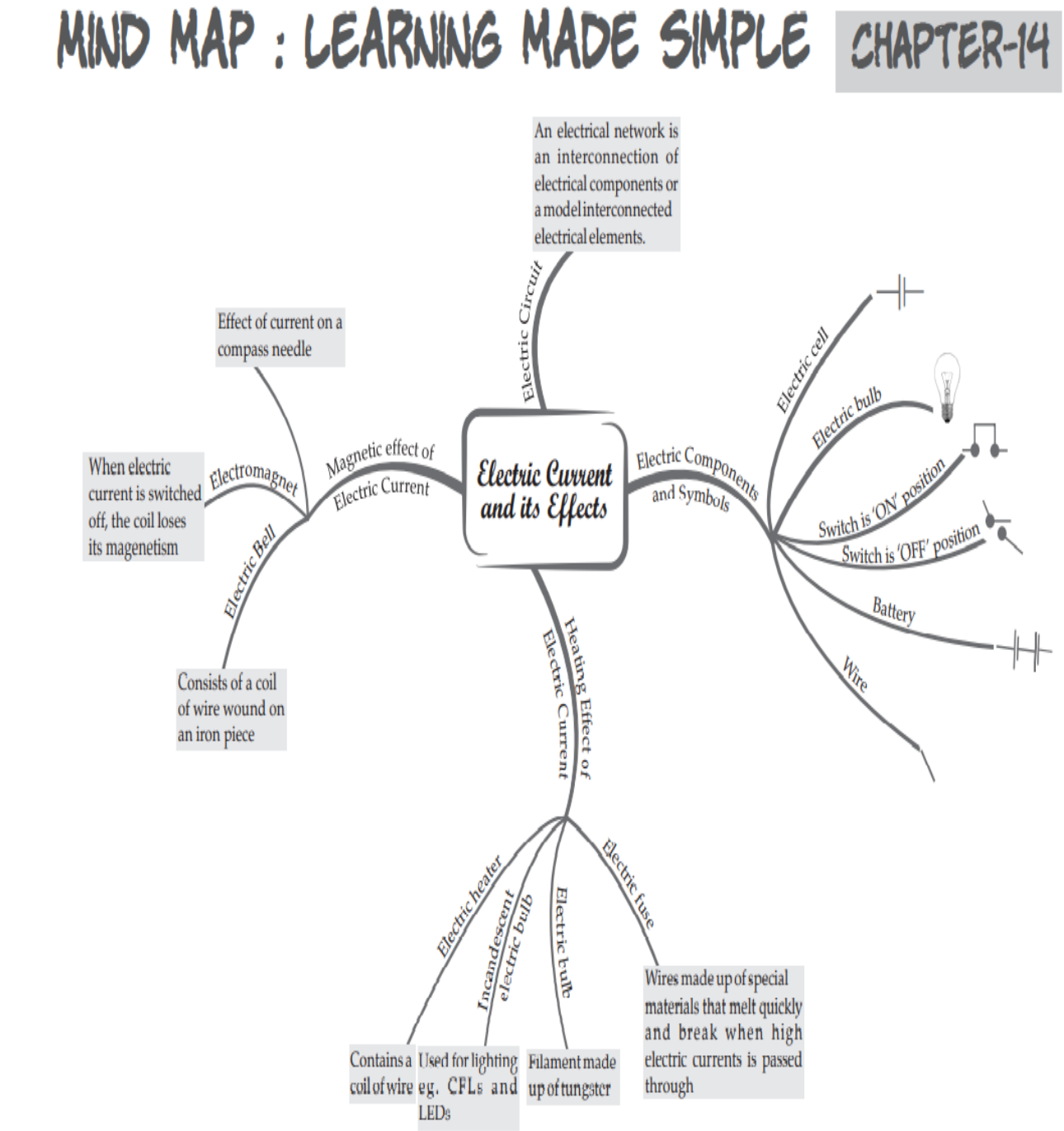
Multiple choice questions

1. (d) 2. (b) 3. (c) 4. (b) 5. (d)

Crossword puzzle-

Across- 1. Silver 4. Fuse 5. Resistance 6. Battery
Down- 2. Electromagnet 3. Tungsten

MIND MAP


MIND MAP : LEARNING MADE SIMPLE
CHAPTER-14
Electric Current and its Effects
Electric Circuit
An electrical network is an interconnection of electrical components or a model interconnected electrical elements.
Magnetic effect of Electric Current
Effect of current on a compass needle
Electromagnet
When electric current is switched off, the coil loses its magenetism
Electric Bell
Consists of a coil of wire wound on an iron piece
Electric Components and Symbols
Electric cell
Electric bulb
Switch is 'ON' position
Switch is 'OFF' position
Battery
Wire
Heating Effect of Electric Current
Electric heater
Contains a coil of wire
Incandescent electric bulb
Used for lighting eg. CFLs and LEDs
Electric bulb
Filament made up of tungster
Electric fuse
Wires made up of special materials that melt quickly and break when high electric currents is passed through

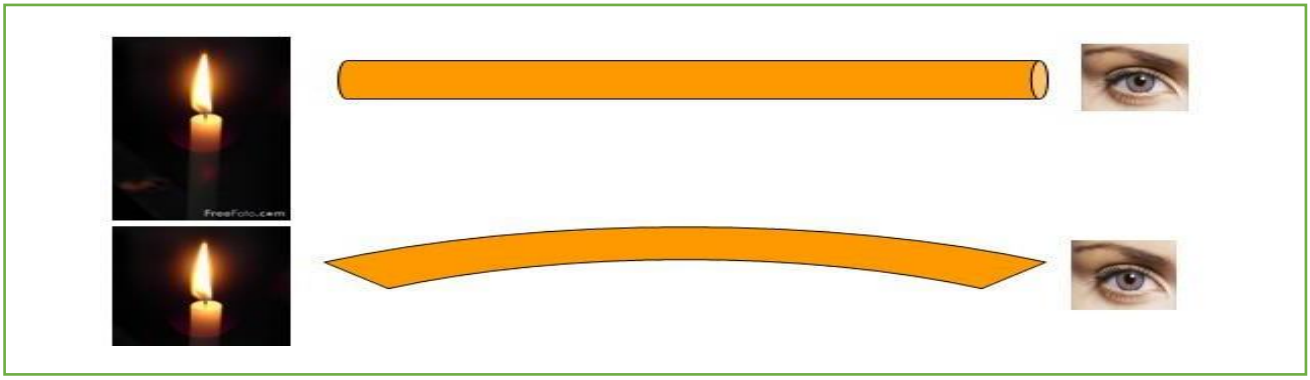
LIGHT

Light is a form of energy which enables us to see objects from where it comes reflected. We can detect light with our eyes.

Light Travelling along a Straight Line

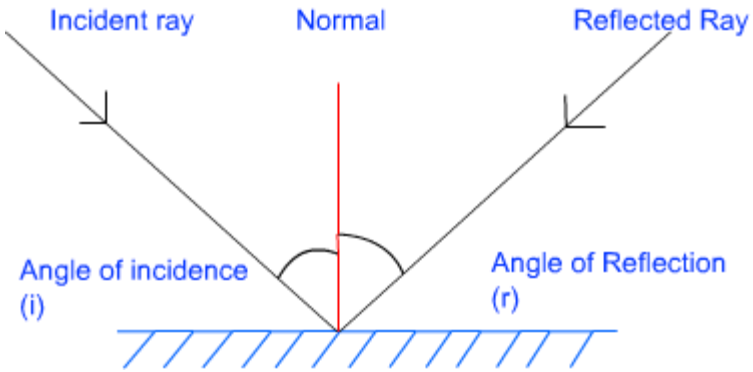
By seeing the phenomena around us like a beam of sunlight enters a room through a narrow opening or a hole and beams of light coming out from the headlamps of cars, scooters, engines, torch, etc.

From the above examples, we can conclude that light travels along a straight line.



Reflection of Light

Reflection: When light falls on a shiny surface, it bounces back. This phenomenon is called reflection. We are able to see images in mirrors or in water, because of reflection.



Laws of Reflection

There are two laws of reflection.

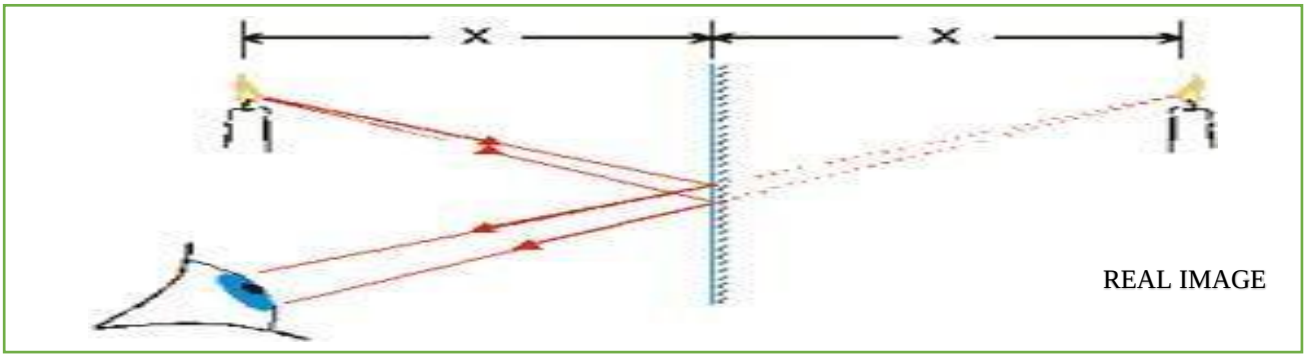
The incident ray, the reflected ray and the normal at the point of incidence lie in the same plane.

Angle of incidence and angle of reflection are equal.

There are two types of images:

Real Image: When the image can be obtained on a screen, it is called real image. Real image is formed in front of mirror. Images formed on the retina are real images. Images formed on the film of a camera are real images.

Virtual Image: When the image cannot be obtained on a screen, it is called virtual image. Virtual image is formed behind the mirror.



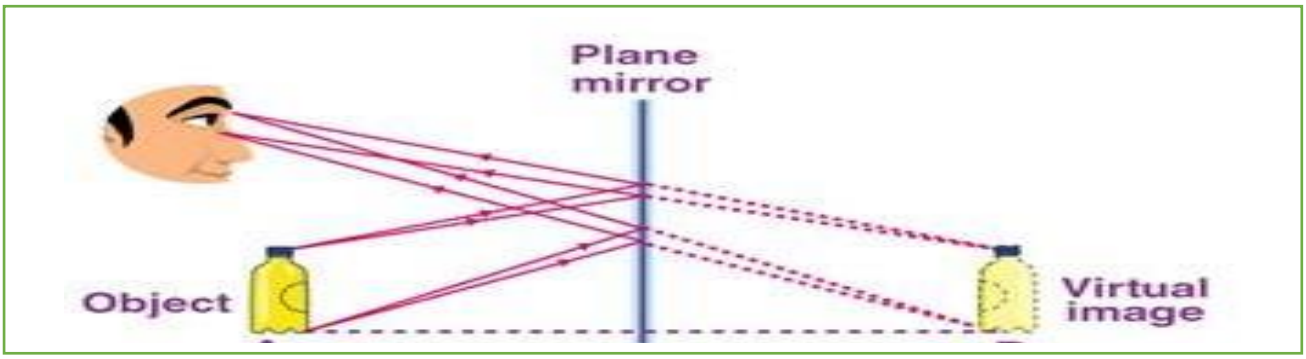


Image formation in Plane Mirror: Image is of the same size as object. The distance of image and object from the plane mirror is same. Image is erect and virtual.

Lateral Inversion in Plane Mirror: A plane mirror makes laterally inverted image. This is the reason, your right hand looks like the left hand of your image. The word 'AMBULANCE' is written in laterally inverted form on the front of the ambulance. This is deliberately done so that the driver in a vehicle ahead can easily spot the ambulance and can give way.

Spherical Mirrors

All the mirrors are not straight like plane mirror as some of the mirrors are curved mirror. There is a common example of a curved mirror, i.e. spherical mirror. A mirror whose reflecting surface is the part of ahollow sphere of glass is known as a spherical mirror.

Image Formed by Spherical Mirror

It is a fact that spherical mirrors form images of the objects placed in front of them. So, these images are formed, when light rays coming from the object fall on the mirror, get reflected and converge or diverge. We can use a spoon in order to understand the image formation by a spherical mirror.

The inside surface of a hollow sphere of glass is bent in or concave but the outside surface is bulging out orconvex. So, the spherical mirrors are of two types:

- Concave mirror
- Convex mirror

Concave Mirror (Converging Mirror)

The mirror whose reflecting surface is concave (and polished surface is convex) is called a concave mirror. Since a concave mirror converges a beam of parallel light rays. Therefore, it is also known as a converging mirror

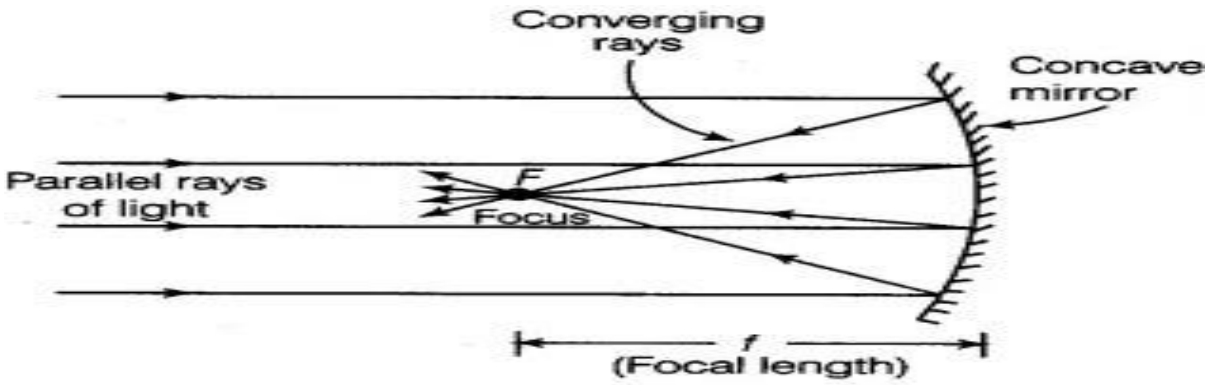


Image Formed by a Concave Mirror When the Object is Far Off

A concave mirror forms a real image of the sun. The image formed by a concave mirror is much smaller than the object (highly diminished) and real because it can be obtained on a sheet of paper (which is a kind of screen). So, when an object is placed at a far off distance in front a concave mirror, then image formed by a concave mirror is

- real
- inverted
- much smaller than the object.

Image Formed by a Concave Mirror When the Object is Placed Close to Concave Mirror: When an object is placed close to a concave mirror, the image formed by the concave mirror is

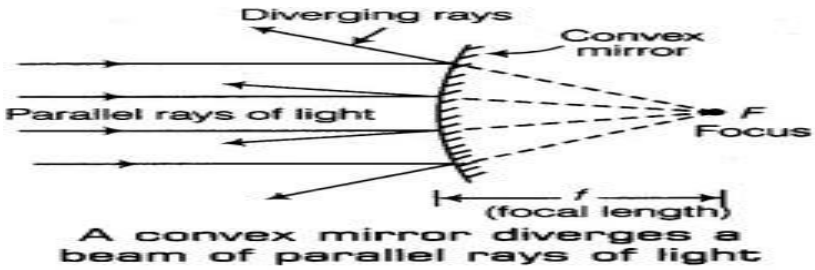
- virtual
- erect
- larger than the object (enlarged or magnified).

Uses of Concave Mirrors

- To see the large image of teeth of a patient, concave mirrors are used by the dentist.
- In torches, headlights of vehicles and searchlights to get a strong, straight beam of light, etc., concave mirrors are used as reflectors.
- To see a large image of the face, then concave mirrors are used as shaving mirrors.

Convex Mirror (Diverging Mirror)

The mirror whose reflecting surface is bulging or convex (polished surface is concave) is called the convex mirror. After reflection from the convex mirror, the parallel rays of light are spreading out. When the parallel rays of light spread out, we can say that the rays of light are diverging.



A convex mirror diverges a beam of parallel rays of light

Since a convex mirror diverges a beam of parallel light rays, therefore, it is also known as a diverging mirror.

Image Formed By a Convex Mirror

Whatever be the distance of the object from a convex mirror, the image formed by aconvex mirror is always:

- virtual
- erect and
- smaller than the object (or diminished).

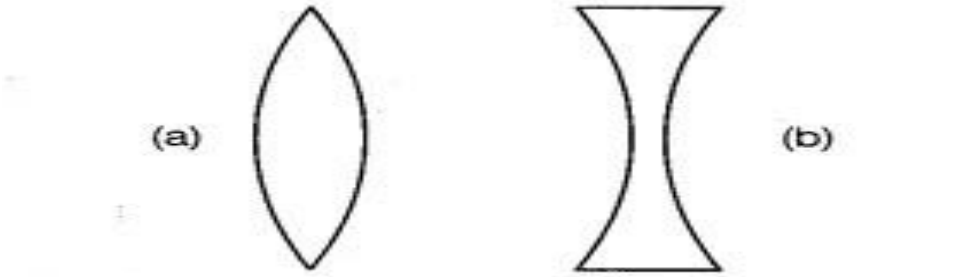
Uses of Convex Mirrors

- To see the traffic at the rear side or backside on the road, convex mirrors are used as rear viewmirrors or side view mirrors in vehicles such as cars, scooters, buses, etc.
- Big convex mirrors are used as shop security mirrors. By installing a convex mirror in the shop, the shop owner can keep an eye on the customers.

Image Formed by Lenses

A lens is a piece of transparent glass bound by the two spherical surfaces. Lenses are transparent so that light can pass through lenses. Lenses are of two types:

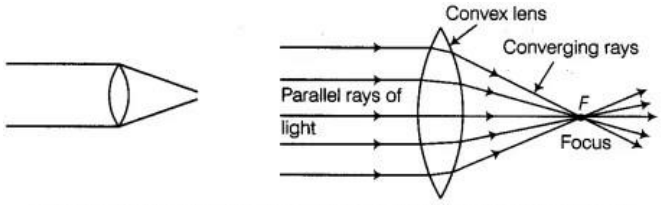
- Convex lens
- Concave lens



(a) A convex lens (b) A concave lens

Convex Lens (Converging Lens)

The convex lens is the lens which is thicker in the middle than at the edges. A beam of parallel rays of light falls on a convex lens from the left side. After passing through the convex lens, the beam of parallel rays of light converges at a point as shown in the figure given below. Hence, a convex lens is a converging lens.



A convex lens converges a beam of parallel rays of light

Image Formed by a Convex Lens

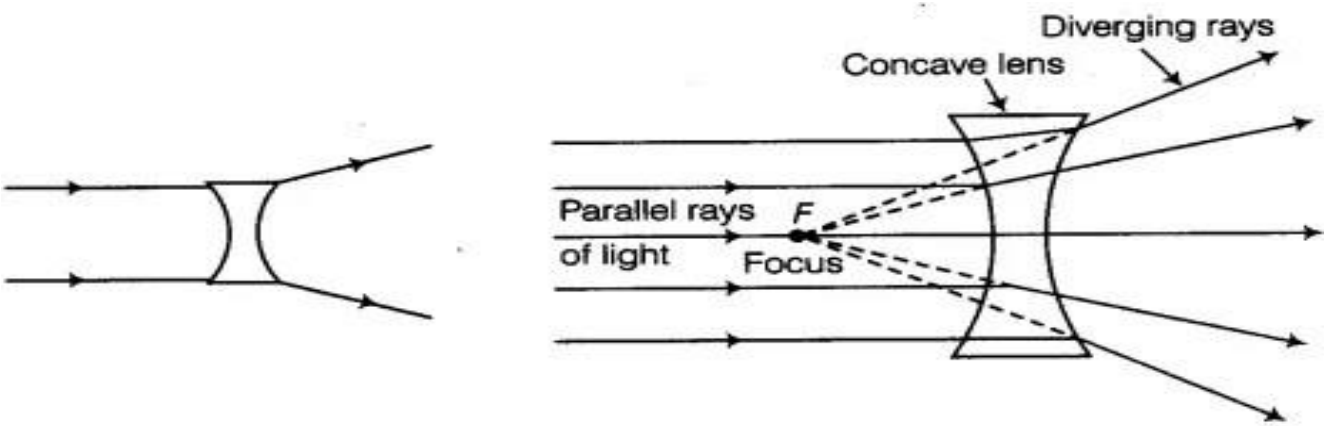
The image formed by the convex lens is real, inverted and much smaller than the object (or highly diminished).

Uses of Convex Lenses

- Convex lenses are used as a magnifying glass.
- In the manufacturing of spectacles, camera, microscope, telescope and binoculars, convex lenses are used.

Concave Lens (Diverging Lens)

A concave lens is a lens which is thinner in the middle than at the edge. A parallel beam of light falls on a concave lens as shown in the figure. After passing through the concave lens, the rays of light are diverging(or spreading out)



A concave lens diverges a beam of parallel rays of light

Image Formed by a Concave Lens

In the case of a convex lens, the image formed is:

- Virtual
- Erect
- Diminished (smaller than the object)

Uses of Concave Lenses

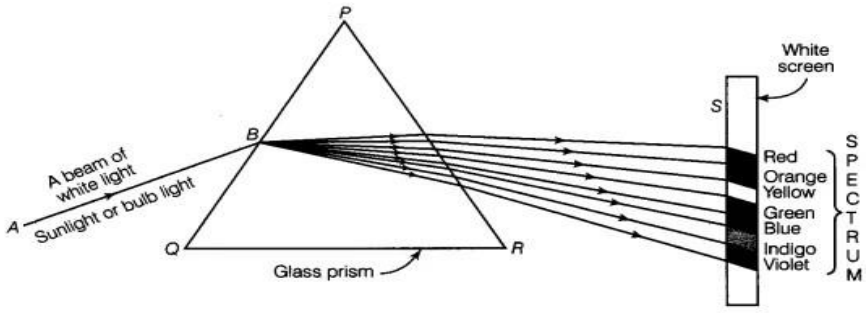
- In order to see the image of the person standing outside, concave lenses are used in the peepholes inthe door of hotel rooms.
- Concave lenses are used in making spectacles.

RAINBOW :

An arc of seven colours seen in the sky is known as the rainbow.The rainbow is produced by the dispersion of sunlight by tiny raindrops suspended in the atmosphere.

Dispersion of Light

In the year 1665, Newton discovered by his experiments with glass prisms that white light (like sunlight) consists of a mixture of lights of seven colours. Newton found that if a beam of white light is passed through a glass prism, then the white light splits to form a band of seven colours on a white screen. The band of seven colours formed on a white screen, when a beam of white light is passed through a glass prism, is known as a spectrum of white light. The seven colours of the spectrum are Red, Orange, Yellow, Green, Blue, Indigo and Violet.



A glass prism splits white light into seven colours

So, dispersion of light is the phenomenon of splitting up of white light into seven colours on passing through a transparent medium like a glass prism. The formation of a spectrum of seven colours indicates that white light is a mixture of seven colours. White light can be sunlight. So, now we can say that sunlight consists of seven colours.

MULTIPLE CHOICE QUESTIONS

Question 1. The path of the light is

(a) always a straight line (b) a curved line

(c) a zig-zag line (d) depends on the medium

Question 2. Which one shows lateral inversion?

(a) Plane mirror (b) Convex mirror (c) Concave mirror (d) All of these

Question 3. Image formed by a plane mirror is

(a) virtual and erect (b) real and erect (c) virtual and inverted (d) real and inverted

Question 4. Boojho and Paheli were given one mirror each by their teacher. Boojho found his image to be erect and of the same size whereas Paheli found her image erect and smaller in size. This means that the mirrors of Boojho and Paheli are, respectively

(a) plane mirror and concave mirror (b) concave mirror and convex mirror

(c) plane mirror and convex mirror (d) convex mirror and plane mirror

Question 5. Which of the following can be used to form a real image?
(a) Concave mirror only (b) Plane mirror only
(c) Convex mirror only (d) Both concave and convex mirrors

Question 7. You are provided with a concave mirror, a convex mirror, a concave lens and a convex lens. To obtain an enlarged image of an object you can use either
(a) concave mirror or convex mirror (b) concave mirror or convex lens
(c) concave mirror or concave lens (d) concave lens or convex lens

Question 8. An erect and enlarged image can be formed by
(a) only a convex mirror (b) only a concave mirror

(c) only a plane mirror (d) both convex and concave mirror

Question 9. You are provided with a convex mirror, a concave mirror, a convex lens and a concave lens. You can get an inverted image from
(a) both concave lens and convex lens (b) both concave mirror and convex mirror
(c) both convex mirror and convex lens (d) both convex mirror and concave lens

Question 10. An image formed by a lens is erect. Such an image could be formed by a
(a) convex lens provided the image is smaller than object.
(b) concave lens provided the image is smaller than object.
(c) concave lens provided the image is larger than object.
(d) concave lens provided the image is of the same size.

Question 10. If an object is placed at a distance of 0.5 m in front of a plane mirror, the distance between the object and the image formed by the mirror will be
(a) 2 m (b) 1 m (c) 0.5 m (d) 0.25 m

HIGHER ORDER THINKING SKILL QUESTIONS

Question 1. 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?
Answer: In case of convex lens, when we move the object far away from the lens, the size of image decreases and ultimately, when object is at infinity, it will form a point image at focus.

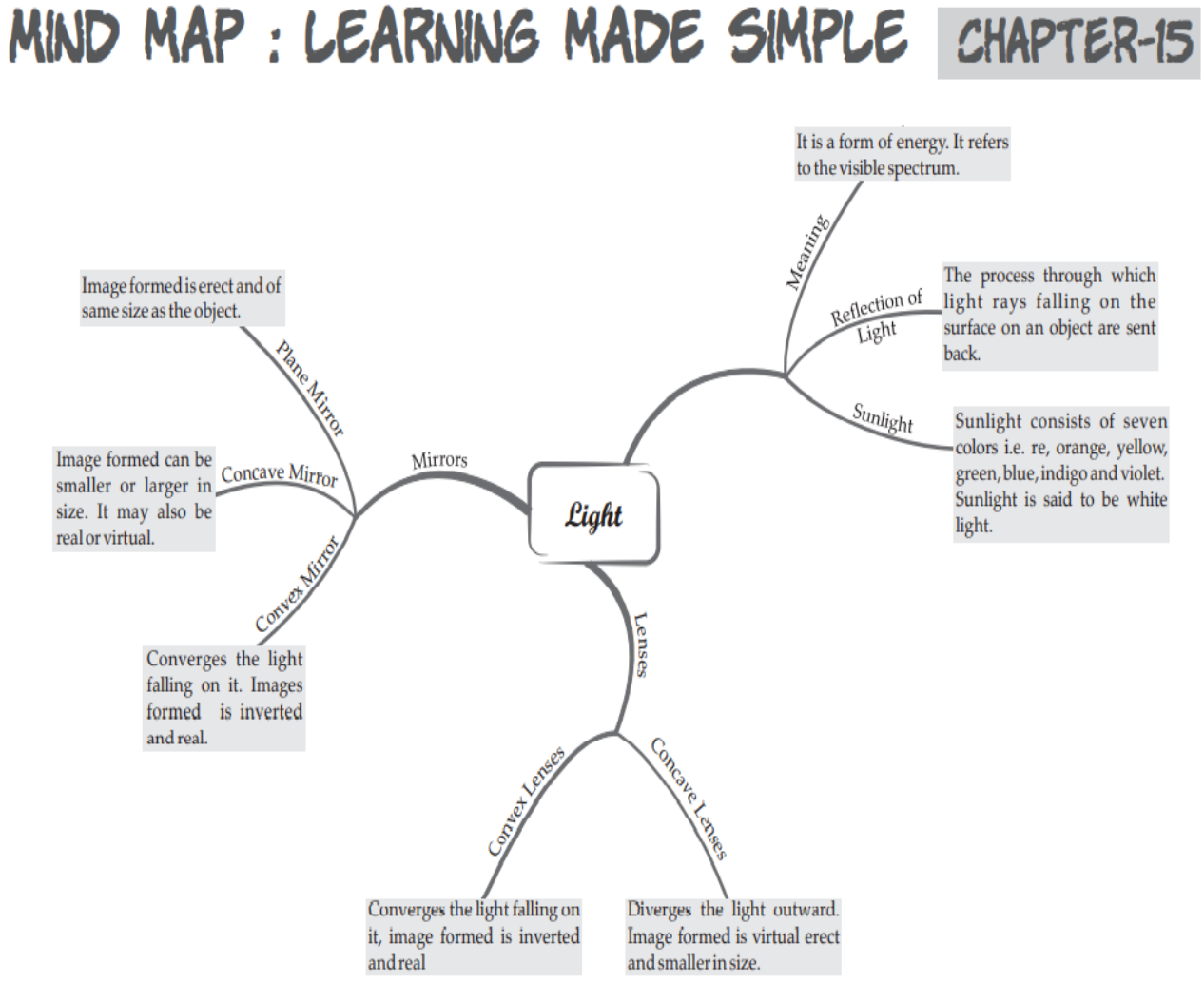
Question 2. Two different types of lenses are placed on a sheet of newspaper. How will you identify them without touching?
Answer: On identifying the letters of newspaper, we can differentiate the two types of lenses. If image is large or magnified, then the lens is a convex lens and if the image is smaller or diminished in size for all the positions of object, then the lens is concave.

Question 3. 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.
Answer: As we know that the side mirror of a scooter must be of convex mirror so that we can view a wide range of traffic spread over a large area. But if plane mirror is used, we are not able to see large area of traffic which may be difficult for driving vehicle and can cause accident.

Question 4. We need a shiny surface for reflection. Explain why.
Answer: Since, the extent of reflection depends upon the shine and smoothness of the surface. So, greater the shining and smoothness of the surface, greater will be the reflection. So, this is a reason why we require a shiny surface for reflection.

Question 5. Differentiate between a plane mirror, concave mirror and a convex mirror without touching them.
Answer: These mirrors can be differentiated by bringing our face close to each mirror turn by turn. Since, a plane mirror will produce an image of the same size as our face while a concave mirror will produce a magnified image and our face will look much bigger and on other sides, a convex mirror will produce a diminished image and our face will look much smaller like a small child.

MIND MAP



CHAPTER-16

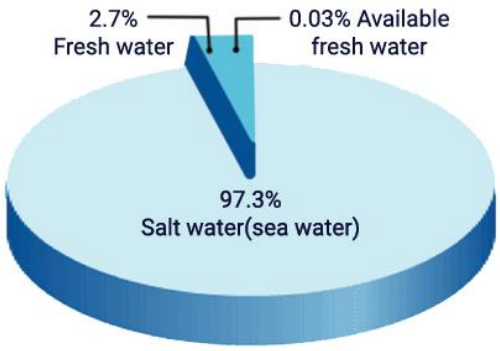
WATER-A PRECIOUS RESOURCE

Water is one of the most common and useful substances around us. Water is essential for the existence of allforms of life.

After knowing the importance of water, awareness is being created by different organisations of the world.22nd March is celebrated as World Water Day to attract the attention of everybody towards the importanceof conserving water. The year 2003 was recognised as 'International year of freshwater'.

Water Available for Use

If we take a picture of earth from outer space, it appears blue because of presence of water in the form of sea and ocean. About 71% of surface of the earth is covered with water. Of the total water present on earth, 97.4% is in the seas and oceans but it is not fit for human consumption. Fresh water in a usable form is present in just a small fraction of all water present on the earth.



Most of us assume that there is plenty of water all over the earth. But infact this all water is not suitable for human consumption, not even fit for plants and other forms of life.

Different Forms of Water

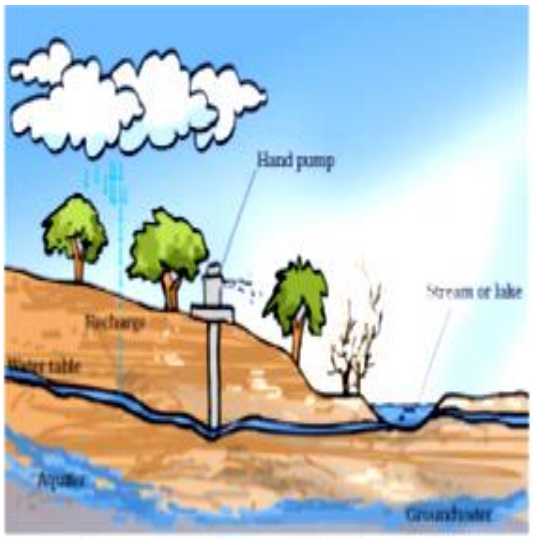
Water exists in three forms. These three forms of water are as follows:

- Snow or ice (solid) exists on the earth in the form of ice caps at the poles of the earth, glaciers andsnow covered mountains. These are the main sources of water on earth.
- Water (liquid) is present in oceans, lakes, rivers and even underground water in the earth's upper layers.
- Clouds (gas) are found in the form of water vapour present in the atmosphere. On condensation, itturns into droplets and precipitates on earth's surface in the form of rain.

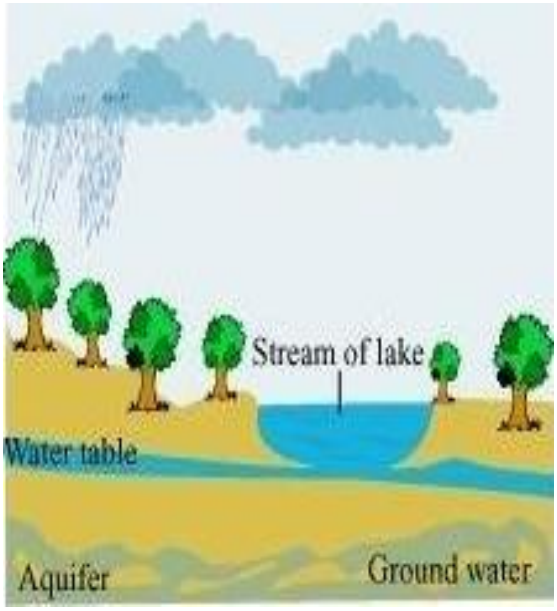
The continuous recycling of these forms of water takes place and the amount of water on the earth is maintained of constant. Most of the urban areas have a system of water supply whereas underdeveloped/undeveloped areas depend on resources like rivers, lakes, ponds, handpumps, etc.

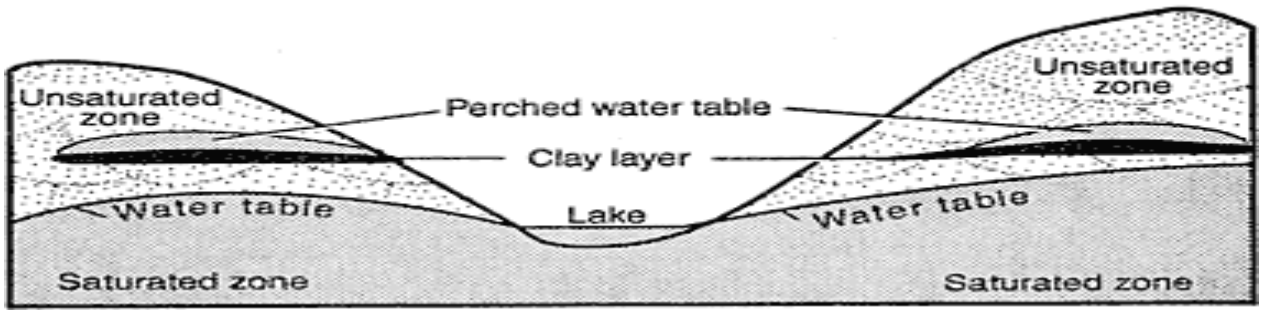
Groundwater as an Important Source of Water

The wells, tubewells and handpumps are the main sources of water for many people. The water in these sources is the groundwater. It is the upper level of underground water which occupies all the spaces in the soil and rocks and form a water table as shown in the figure below:



Ground Water and Water table





The upper limit of groundwater is called water table. It represents the depth of water filled area at a given place. The water table rises and falls depending upon the amount of rainwater that seeps into the groundwater and how much groundwater is drawn out for irrigation and industry. The seeping down of rainwater into the groundwater is called infiltration. The groundwater thus gets recharged by this process.

At some places, the groundwater is stored between layers of hard rock below the water table. This is aquifer which contains the groundwater usable by tubewells and handpumps. These sources however, have limited sources of water and may get exhausted if used excessively.

Depletion of Water Table

Water drawn from underground water gets replenished by seepage of rainwater. The water table does not get affected as long as we draw the same amount of water as is replenished by natural resources like rain.

However, there is a number of factors which cause depletion of water table at a very fast rate which is really a matter of concern for every one of us. Increase in population, industrial and agricultural activities are somecommon factors affecting water table. Scanty rainfall, deforestation and decrease in the effective area for seepage of water may also deplete the water table.

Increasing Population

Rise in population also increases use of water. This results in depletion of groundwater level to alarmingly low levels (in many cities).

Increased Industrialisation

Water is used by all industries. Almost everything that we use needs water somewhere in its production process. The number of industries is increasing continuously. Most of the water used in the industries is drawn from groundwater. This results in depletion of water.

Agricultural Activities

In our country, farmers depend on rain, canal water or groundwater for irrigation. Canals are found only at a few places. Since rain is often irregular, canals also suffer frequently from lack of water. Therefore, farmers have to use groundwater for irrigation. This results in depletion of groundwater.

Deforestation

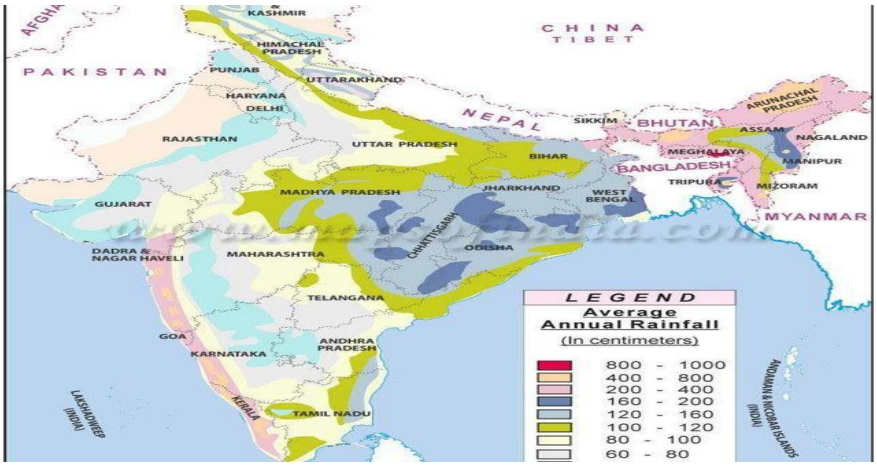
Large scale deforestation has occurred to accommodate the growing population to grow food for them and toprovide space for industries. Overgrazing by our animals has also destroyed large amount of vegetation. Thegreen coverage of vegetation slows down the flow of water on land and increases the absorption of water by the soil. Cutting down of trees and vegetation, therefore interferes with the natural processes by which seepage takes place and the groundwater is recharged and causes depletion of water

Distribution of Water

The distribution of water over the globe is quite uneven due to the number of factors. Some places have a good amount of rain. On the other hand, these are deserts which have scanty rainfall. Some regions have excessive rains which cause floods while some others have very little rainfall which causes drought. India is a vast country and the rainfall is not the same everywhere. Therefore, some regions in our country may havefloods while others may suffer from droughts at the same time.

Water Resources in India

India receives a lot of precipitation (rain and snow) in comparison to the rest of the world. The average annual precipitation in India is 1170 mm as compared to the world's average of 700 mm. The rain map of India showing average rainfall in the different parts of our country.



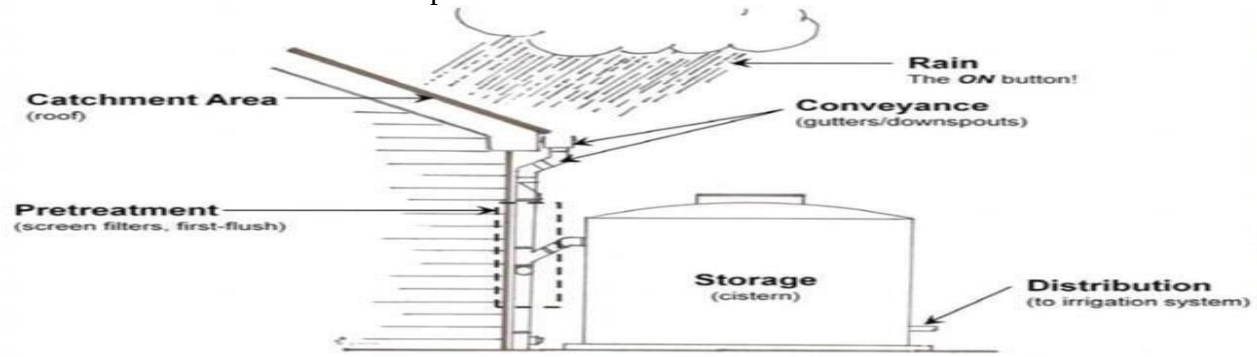
Water Management

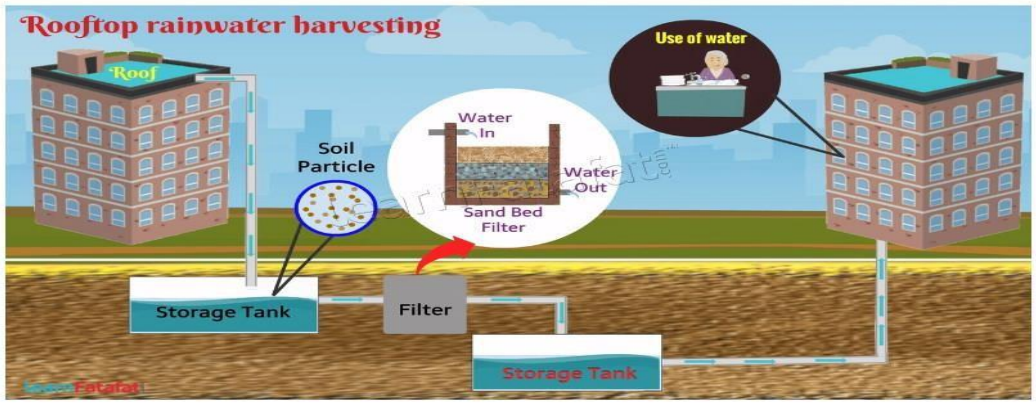
It is the activity of planning, developing, distribution and managing the optimum use of water resources. It is a subset of water cycle management. Water supply pipes leaking and a lot of water gushing out of the pipes are the wastage of water. It is the responsibility of the civic authorities to prevent such wastage of precious water. Mismanagement or wastage may also take place at the level of individuals also. All of us knowingly or unknowingly waste water, we should also take care for it. Some of the steps which can be taken for the proper management of water are given below:

1. Rainwater harvesting
2. Bawris
3. Drip irrigation

1. Rainwater Harvesting

Most of the rainwater just flows away. This can be skillfully used to recharge the groundwater. The modern buildings of schools, offices, homes can install a rainwater harvesting system, so as to store rainwater in their own premises for future use.



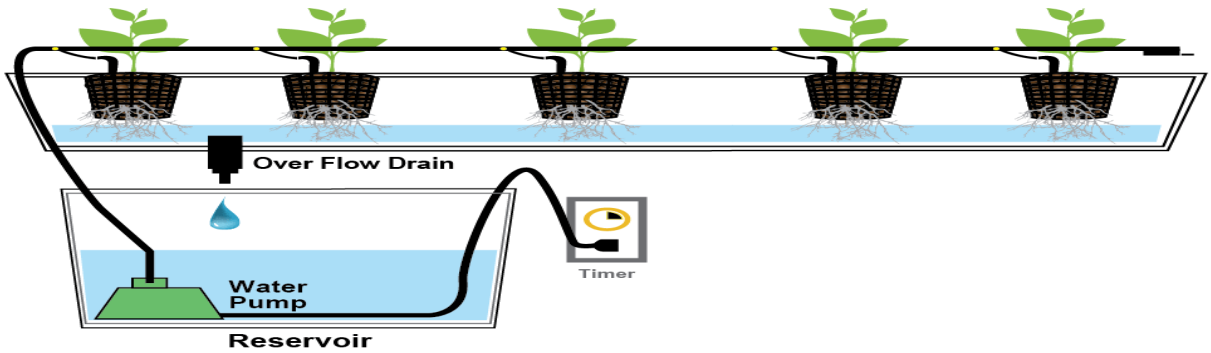


1. Bawris

The bawris is age old method of collecting water. These structures are still found in old buildings, palaces and forts. With time, the bawris fell into disuse and garbage started piling in these reservoirs. However, because of the acute shortage of water, the bawris are being revived. Today the situation is that inspite of scanty rains those places are managing their water needs well.

2.Drip Irrigation

It is a method of watering plants by use of narrow tubings which deliver water directly to the base of a plant.This minimizes wastage of water. The mechanism of drip irrigation is shown in the figure given below:



Role for Saving Water

You can be a leader to show people about water management skills. If any pipeline and tap water is leaking there, immediately report to authorities like 'JAL BOARD' (in Delhi) to prevent water loss. Educate people about water wise habits which can be developed gradually and will last life long once developed.

Water-wise Habits

- Turn off the tap while brushing, shaving and washing hand. Open when need. This will check the excess flow of water into drains.
- Use mug and water in the bucket for bathing instead of using showers.
- Mop the floor instead of washing.
- Irrigate potted plants with used water for washing rice and dal in the kitchen while cooking.

Check no tap or pipe is leaking

Effect of Water Scarcity on Plants

We grow many plants in pots in our homes. These are called potted plants. The potted plants are watered regularly. If the potted plants are not watered even for a few days, the plants will 'wilt' (become limp) and ultimately 'dry up'. If potted plants are not given water for a considerable time, they will die. Thus, sufficient water is essential for maintaining the life of plants. Plants need water to obtain nutrients from thesoil and to make food by the process of photosynthesis.

The various effects of water scarcity on plants are

- Water scarcity will affect nutrient uptake from soil by the plants.
- The rate of photosynthesis will decline, so oxygen evolved will be less.
- Rate of transpiration will also decline, so water vapours released in the atmosphere by transpiration will be less, it will disturb the water cycle.

So, in brief, we can say the shortage of water will lead to a shortage of food, shortage of oxygen and shortage of rain also.

MULTIPLE CHOICE QUESTIONS

Question 1. On which day the world water day is celebrated?
(a) 23rd March (b) 22nd March (c) 21st March (d) None of these

Question 2. Which year was observed as International Year of Fresh Water?
(a) 2003 (b) 2004 (c) 2006 (d) 2002

Question 3. Which of the following does not show water shortage?
(a) Taps running dry
(b) Long queue for getting water
(c) Marches and protests for demand of water
(d) A family gets three buckets of water per person per day

Question 4. Seas and oceans are full of water on earth. However, a very small percentage of water present on earth is available for us. This percentage is roughly
(a) 0.006% (b) 0.06% (c) 0.6% (d) 6%

Question 5. Which of the following is a way to use water economically?
(a) construction of bawris (b) Rainwater harvesting

(c) Drip irrigation (d) Infiltration

Question 6: Which of the following does not show water shortage?

[A]. Taps running dry [B]. Long queues for getting water

[C]. Marches and protects for demand of water [D]. A family gets three buckets of water per person per day

Question 7. The amount of water recommended by the United Nations for drinking, washing, cooking and maintaining proper hygiene per person per day is a minimum of
(a) 5 litres (b) 15 litres (c) 30 litres (d) 50 litres

Question 8. "Every Drop Counts" is a slogan related to
(a) counting of drops of any liquid (b) counting of water drops
(c) importance of water (d) importance of counting

Question 9. Water cycle does not involve which of the following?
(a) Evaporation (b) Condensation (c) Formation of clouds (d) Rainwater harvesting

Question 10. Which of the following inhibits the seepage of rainwater into ground?
(a) A pukka floor (b) playground(c) Grass lawn (d) Forest land

HIGHER ORDER THINKING SKILL QUESTIONS

Question 1. Sachin lives in an area where on and off water scarcity is there. He gave a thought to the problem and planned to get a solution. He decided to harvest rainwater in his village. He made efforts to convince the people of his area, built some drainage system and water tanks where rainwater could be collected.
(a) Name few structures he might have built.
(b) Name the process of water cycle, Sachin will use for harvesting water.
(c) Write the methods, Sachin will tell the people to use water wisely. (Value Based Question]
Answer:
(a) Sachin has build up cemented drainage channels in the elevated area and tanks where these channels will collect water.
(b) Sachin is planning to harvest rainwater.
(c) Sachin will educate people to use water judicially in the following way
(i) Use mug for brushing, shaving and bathing.
(ii) Water plants with drip irrigation.
(iii) Use and reuse water in home activities.

Question 2. Some definitions are given which can be corrected by changing one word. Correct them.
(a) Aquifer is groundwater stored between layers of hard rock above the water table.
(b) The process of evaporation of water in the ground is called infiltration.
(c) The evaporation of water from oceans and its arrival back into oceans is called vapour cycle.

Answer:
(a) Aquifer is groundwater stored between layers of hard rock below the water table.
(b) The process of seeping of water in the ground is called infiltration.
(c) The evaporation of water from oceans and its arrival back into oceans is called water cycle.

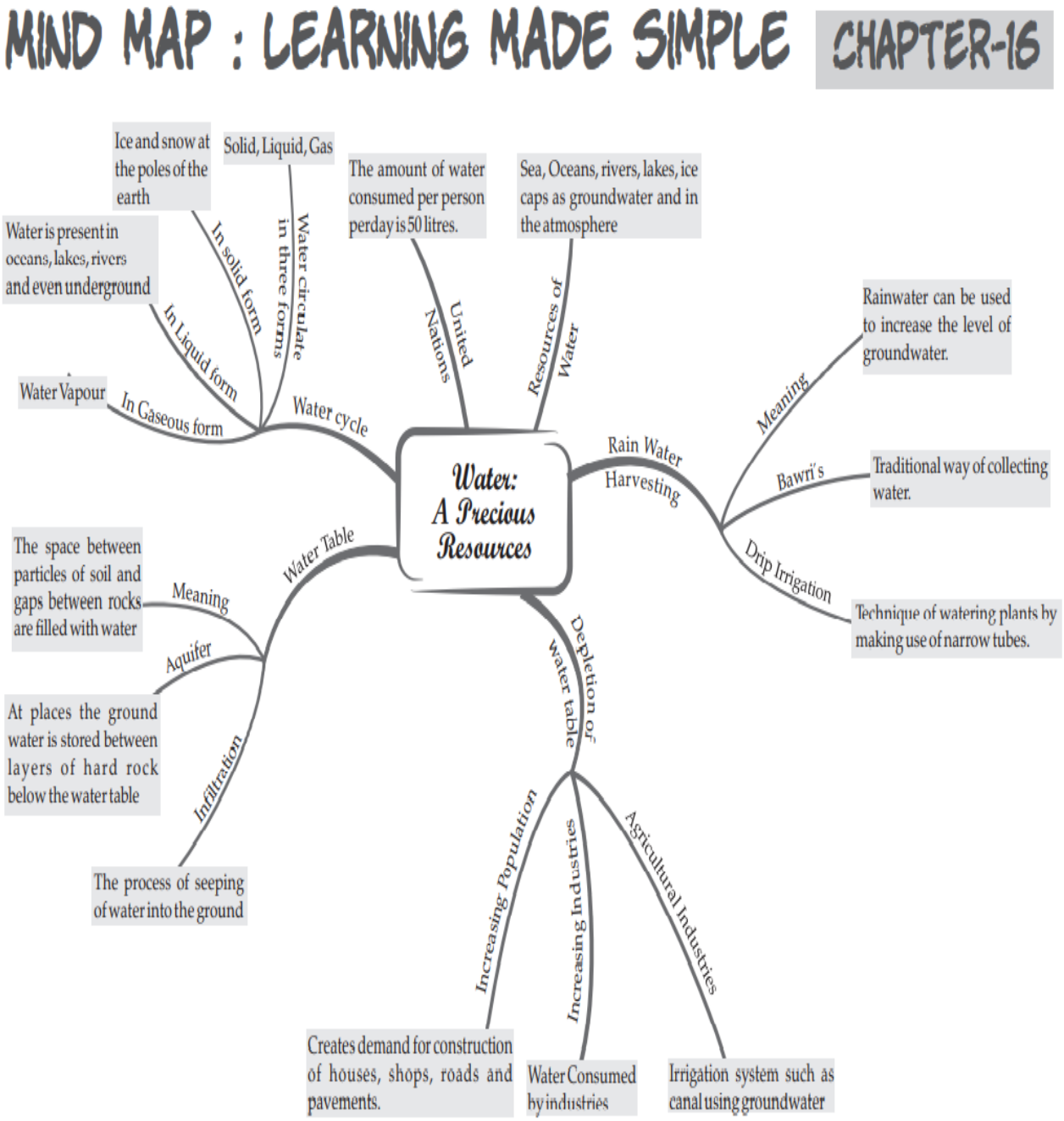
Question 3. Shishir returned from school and found his mother busy in the kitchen. He noticed that she is making his favourite dosa. Shishir rushed to his mother as he was feeling hungry and found that the tap in the kitchen was leaking. He told his mother to replace it as leaking taps lead to the wastage of water. His mother smiled and ensured him to do the same.
(a) What is water management?
(b) Why should we save water?
(c) What values are shown by Shishir? [Value Based Question]
Answer:
(a) Minimum wastage of water is called water management.
(b) We should save water to prevent water crisis.
(c) Shishir is sincere, responsible and has capability of applying knowledge practically.

Question 4. Certain pattern of the rainfall in our country leads to scarcity of water. Explain that pattern. Which part of the country gets rainfall twice a year?
Answer: We face shortage of water mainly because water is not evenly distributed by the nature on the earth. Some places such as North East India get so much rains, so that it gets flooded almost every year. On the other hand, Thar desert in Rajasthan may get rains rarely in the monsoon season. This uneven pattern of rains causes water scarcity in India at some places.

Question 5. A number of problems can be faced due to shortage of water. List some of them.
Answer: The number of problems that can be faced due to shortage of water are as follows

- Less amount of pure drinking water will be available.
- Lack of equal distribution of water.
- Drought.

MIND MAP

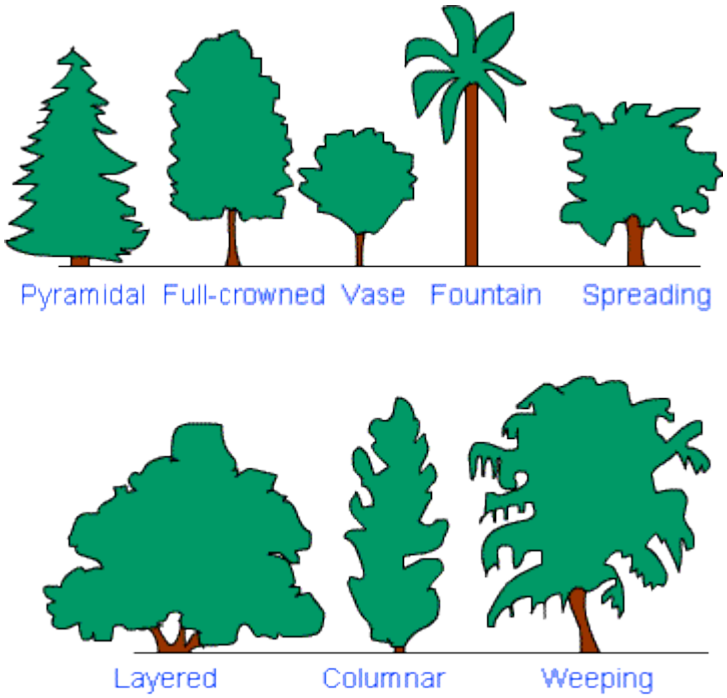

MIND MAP : LEARNING MADE SIMPLE
CHAPTER-16
Water: A Precious Resources
Water cycle
Water circulate in three forms
Solid, Liquid, Gas
In solid form
Ice and snow at the poles of the earth
In Liquid form
Water is present in oceans, lakes, rivers and even underground
In Gaseous form
Water Vapour
United Nations
The amount of water consumed per person perday is 50 litres.
Resources of Water
Sea, Oceans, rivers, lakes, ice caps as groundwater and in the atmosphere
Rain Water Harvesting
Meaning
Rainwater can be used to increase the level of groundwater.
Bawri's
Traditional way of collecting water.
Drip Irrigation
Technique of watering plants by making use of narrow tubes.
Water Table
Meaning
The space between particles of soil and gaps between rocks are filled with water
Aquifer
At places the ground water is stored between layers of hard rock below the water table
Infiltration
The process of seeping of water into the ground
Depletion of water table
Increasing Population
Creates demand for construction of houses, shops, roads and pavements.
Increasing Industries
Water Consumed by industries
Agricultural Industries
Irrigation system such as canal using groundwater

FORESTS: OUR LIFELINE

Forest: An area with high density of trees is called a forest. A forest is a system which is composed of plants, animals and microorganisms.

Forest as Habitat: Forest is the habitat for a variety of living beings. Many plants, animals and microbes live in the forest.

A typical tree forest is composed of two distinct layers, viz. overstory (or **canopy**) and understory. A tree can be divided into two parts: trunk and branches. The branches of a tree make its crown. Crowns of several trees (in the forest) make the canopy. In dense forests, the canopy looks like the roof of the forest. There are many animals and creatures which live only on the canopy, e.g. monkeys.



Crowns of trees come in various shapes. Some common examples are shown in the given figure.

The lower layer of the forest is called **understory.** It is composed of herbs and shrubs. The understory is a different world in itself. The understory may not get proper sunlight in dense forests.

The understory is a treasure of creatures and animals. There are many animals and creatures which live only in the understory of a forest.

Important Forest Produce:

Many important forest produce are useful for us. Some examples are given below:

- Firewood and dry leaves are used as kitchen fuel in villages which are close to a forest.
- Timber is an important raw material, for construction activities and for making furniture and artifacts.
- Wood pulp is used in manufacturing paper.
- Honey, kendu leaves, catechu, lac, raisin, etc. are important forest produce.
- Many medicinal plants and herbs are found in forests.

Forest as a System:

Every part of the forest contributes in making a self-sustaining system. The green plants prepare food through photosynthesis. The herbivores directly take food from the green plants. The carnivores take food from the herbivores. This makes a food chain, which can be shown by following example:

Grass → Deer → Lion

When an animal or a plant dies, its dead remains rot in due course of time and turn into soil-like thing. The process is called decomposition and microorganisms carry out this process. Decomposition is the process by which all the raw materials are returned to the nature. The soil-like thing made after decomposition is called humus. It makes the soil highly fertile. The top soil of forest is fertile because of presence of humus.

Role of Forest in Preserving the Environment: Forest plays an important role in preserving the environment. Green plants take solar energy and convert it into chemical energy while making food. Thus, solar energy is transferred to other living beings through the green plants. Green plants utilize carbon dioxide during photosynthesis and release oxygen. That is how the green plants maintain the balance of carbon dioxide and oxygen in the environment.

Role of Forest in Water Cycle: The roots of the trees make the soil porous. Rainwater seeps through these pores and recharge groundwater. Forests prevent wastage of rainwater in the form of runoff. Forests also prevent flash floods by slowing down the movement of water.

Role of Forest in Soil Conservation: The roots of the trees hold the top soil in place. This prevents soil erosion by wind or by running water.

Deforestation and its Effect: Large scale cutting of trees to clear land for human use is called deforestation. Due to growing human population, vast tracts of forest have been removed. This has created many problems. Some of them are given below:

- Reduced forest cover has led to soil erosion and loss of soil fertility at many places.
- Reduced forest cover has disturbed the natural process of recharging of groundwater. This has resulted in shortage of drinking water at many places.
- Reduced forest cover means there is loss of habitat for many animals. Existence of most of the animals is in danger because of this.
- Reduced forest cover means there is higher percentage of carbon dioxide in the atmosphere. This is leading to global warming. The average temperature of the earth is on the rise.

MUTIPLE CHOICE QUESTIONS:

1-Which one of the following is an animal product?
(a) Gum (b) Catechu (c) Honey (d) Rubber

2- Roof of the forest made by the branches of the tall trees is called
(a) canopy (b) crown (c) understoreys (d) none of these

3- Understoreys are formed due to
(a) different types of crowns (b) different sizes of crown
(c) different heights of trees (d) all of these

4- Decomposers convert the dead plant and animal tissues into
(a) clay (b) humus (c) inorganic debris (d) soil

5- Which one of the following is a role of forests?
(a) Provide food, shelter, water and medicines (b) Prevent soil erosion
(c) Prevent flood (d) All the above

6-Which of the following serve as green lungs?

(a) Green pigment of the plants (b) Forests (c) Kitchen Gardens (d) Greenhouses gases

7- Consider the following statements and choose the correct one:

(a) A forest is a large area of land covered mainly with trees and other plants.

(b)Due to different climates and soils, there are various types of trees and other plants found in various forests.

(c) The forest floor provides favourable conditions for seeds to germinate into seedlings and saplings.

(d) All the above.

8- Micro-organism act upon the dead plants to produce:

(a) Sand (b) Mushroom (c) Humus (d)Wood

9- Which of the following is not a forest product?

(a) Gum (b) Plywood (c) Sealing wax (d)Kerosene

10- Which of the following has the strongest stem?

(a) A tree (b) A creeper (c) A climber (d) A bush

HOTS (HIGH ORDER THINKING SKILL) QUESTIONS:

1- While going inside a forest, it becomes darker. Why?
Ans- In a forest, big trees, shrubs and other plants are found. They trap solar radiation for photosynthesis. So, the sunlight does not reach at the forest floor, thus making it dark.

2- 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 seedling was being benefited from the animal dung as the decaying animal dung provided nutrients to the growing seedlings.

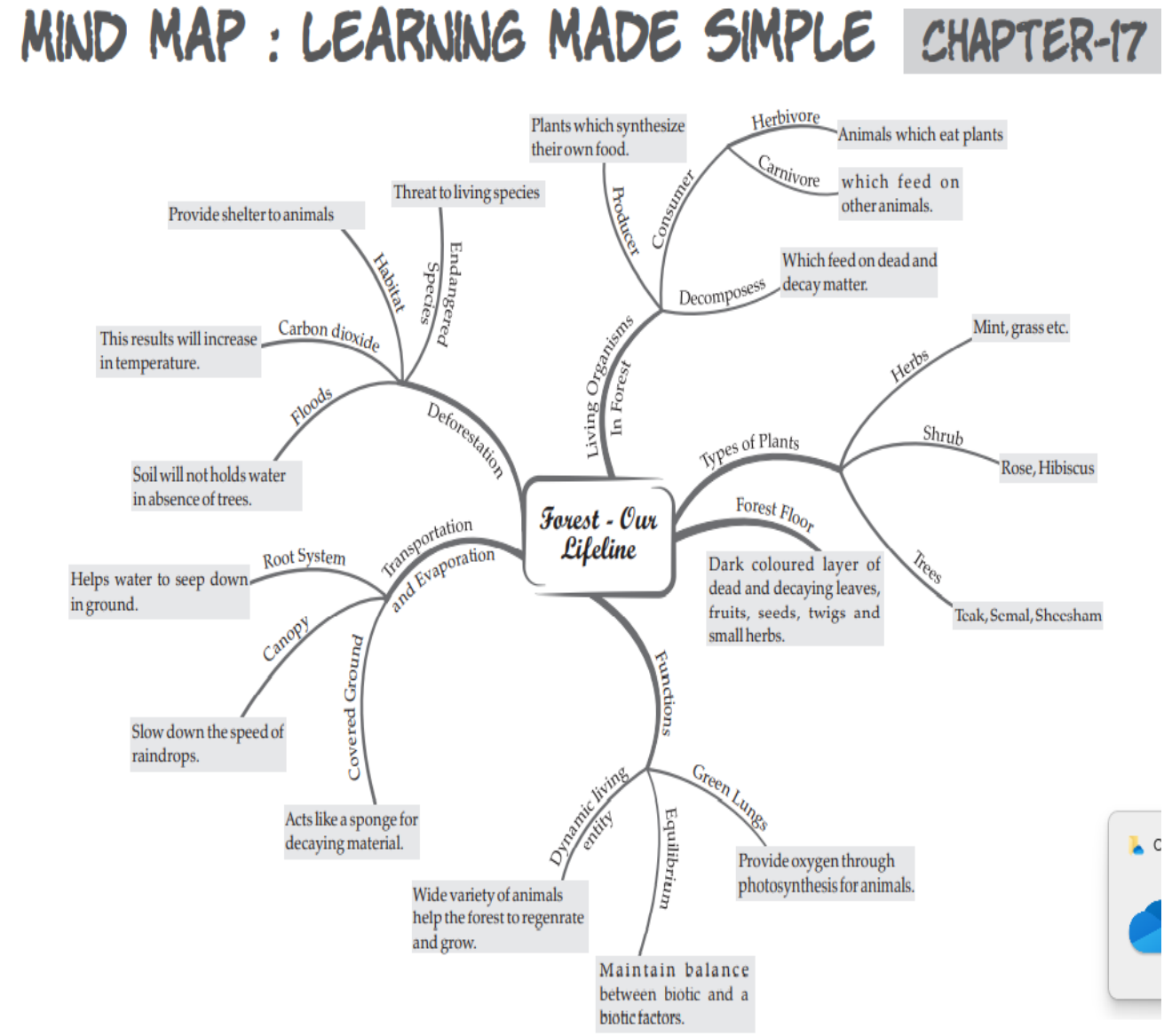
3- Deforestation may lead to floods. Why?
Ans- Deforestation leads to floods as lesser number of trees will be available due to deforestation. In the absence of trees, the soil will not hold water leading to floods.

4- All the needs of animals living in a forest are fulfilled. Justify this statement in a few sentences.
Ans- Forest provides home (shelter), food and water to the animals living there. Thus, all the needs of animals living in a forest are fulfilled.

5- Plants help in maintaining O_2-CO_2 cycle. Explain it in the light of photosynthesis and respiration.

Ans- Photosynthesis is the process during which CO_2 is used by the plants and O_2 is released as a product. This O_2 is used by the animals for their respiration and CO_2 is released during it which is again used for photosynthesis by plants. In this way, O_2-CO_2 cycle is balanced by plants.

MIND MAP

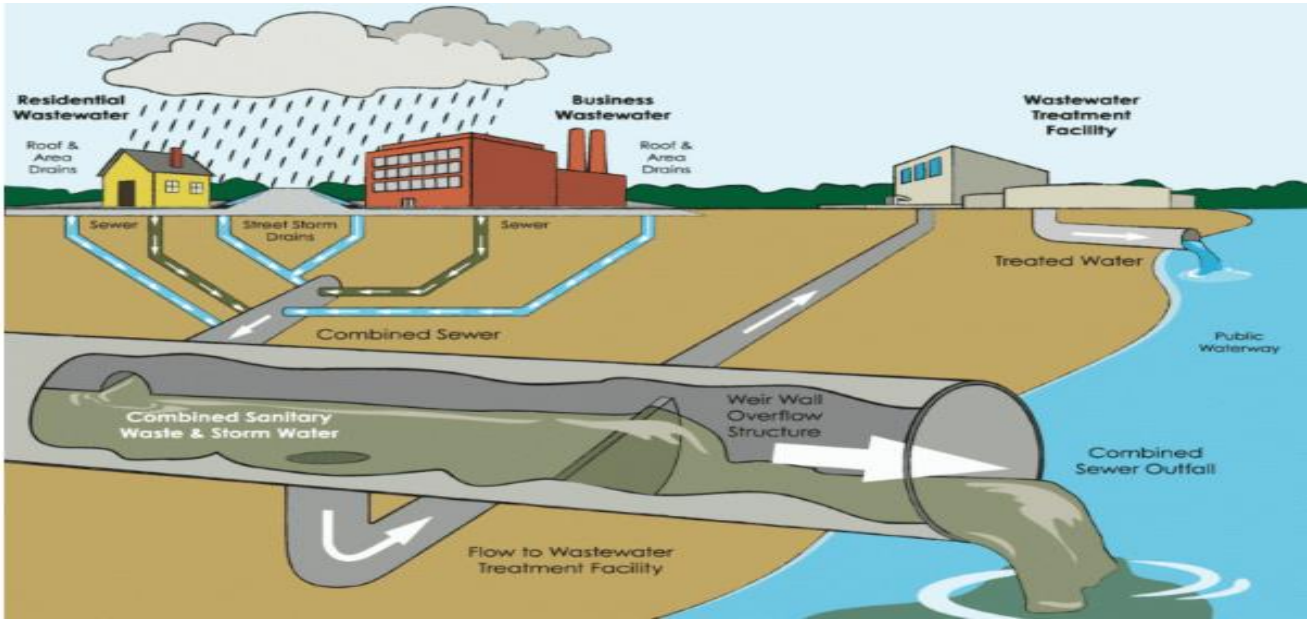

MIND MAP : LEARNING MADE SIMPLE
CHAPTER-17
Forest - Our Lifeline
Living Organisms In Forest
Producer
Plants which synthesize their own food.
Consumer
Herbivore
Animals which eat plants
Carnivore
which feed on other animals.
Decomposess
Which feed on dead and decay matter.
Deforestation
Habitat
Provide shelter to animals
Species Endangered
Threat to living species
Carbon dioxide
This results will increase in temperature.
Floods
Soil will not holds water in absence of trees.
Types of Plants
Herbs
Mint, grass etc.
Shrub
Rose, Hibiscus
Trees
Teak, Semal, Sheesham
Forest Floor
Dark coloured layer of dead and decaying leaves, fruits, seeds, twigs and small herbs.
Transportation and Evaporation
Root System
Helps water to seep down in ground.
Canopy
Slow down the speed of raindrops.
Covered Ground
Acts like a sponge for decaying material.
Functions
Dynamic living entity
Wide variety of animals help the forest to regenrate and grow.
Equilibrium
Maintain balance between biotic and a biotic factors.
Green Lungs
Provide oxygen through photosynthesis for animals.

CHAPTER 18 WASTE WATER STORY

WASTEWATER

Wastewater refers to all effluent from a household, hospitals, commercial organizations and institutions, industries and so on. It is also inclusive of agricultural, horticultural, storm water and urban runoff, and aquaculture effluent.

Effluent is used to refer to the liquid waste or sewage that is discharged into water bodies either from treatment plants or direct sources.



CONTAMINANTS

A contaminant is something that contaminates a substance such as water or food. Sewage is a liquid waste. Most of it is water, which has dissolved and suspended impurities. These impurities are called contaminants.

ORGANIC IMPURITIES

Organic impurities in sewage include human faeces, animal waste, urine, oil, vegetable and fruit waste, faeces, pesticides and herbicides.

INORGANIC IMPURITIES

Inorganic impurities include phosphates, nitrates and metals. Inorganic impurities generally do not contain any carbon, but there are certain inorganic impurities, which contain carbon like carbon dioxide.

BACTERIA

Bacteria are a type of microorganism, which are tiny forms of life that can only be seen with a microscope.

Harmful bacteria that cause bacterial infections and disease are called pathogenic bacteria.

The diseases caused by bacteria are typhoid, cholera, pneumonia etc.

SEWAGE

Sewage is the wastewater released by hospitals, homes or industrial establishments that is carried away in sewers or drains for dumping or conversion into a form that is not toxic.

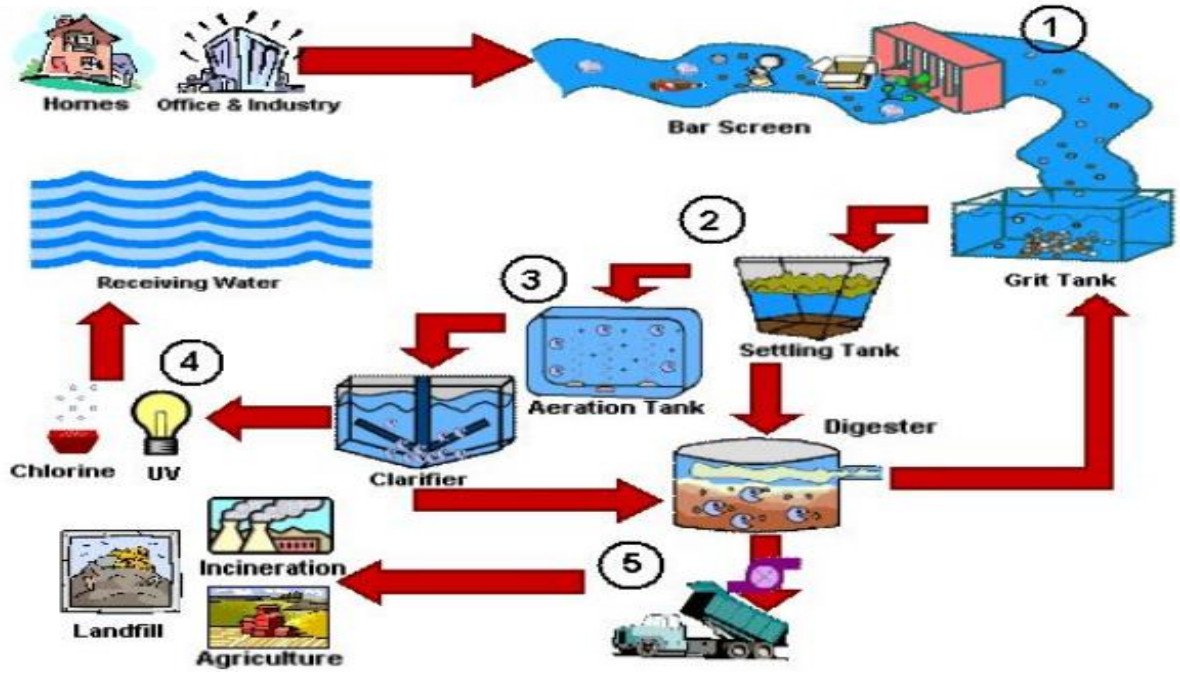
Sewage is a liquid waste containing a complex mixture of suspended solids, organic and inorganic impurities, nutrients, saprophytic and disease-causing bacteria, and some other microbes.

A network of of big and small pipes called sewers, forming the sewerage. It is like a transport a system that carries sewage from the point of being produced to the point of disposal.

WASTEWATER MANAGEMENT

Wastewater treatment is a process used to remove contaminants and make the water usable. The steps in waste water treatment are-

- Wastewater Collection
- Screening
- Primary Treatment
- Secondary Treatment
- Final Treatment



SCREENING

Screening is one of the first stages in the process of treating wastewater.

In this process, the larger objects are removed from wastewater and then moved into the grit and sand removal tank.

PRIMARY TREATMENT

Wastewater after screening is taken for primary treatment where all the organic waste is removed.

Primary treatment is done by pouring the wastewater into big tanks for the solid matter to settle at the surface of the tanks.

SLUDGE

The settled solids, after primary treatment, are called the sludge. It is decomposed by anaerobic bacteria and the gas emitted is known as biogas, which can be used as a fuel or can be used to generate electricity.

SECONDARY TREATMENT

Water after primary treatment is passed through a tank called ‘aeration lane’’ where the air is tapped into the water to increase the growth of aerobic bacteria.

Aerobic bacteria break down small particles of sludge that escaped after primary treatment.

ACTIVATED SLUDGE

After the secondary treatment, the broken-down sludge settles down at the base of the huge tank known as ‘activated sludge’. It contains air in it.

FINAL TREATMENT

The activated sludge is passed through a bed of sand drying machine where the sludge is dried up and water is filtered out.

The water is directed to flow over a wall wherein it gets filtered through sand bed to eliminate additional particles if any.

This water that is filtered is then released into the river.

SEWAGE SYSTEMS

Sewage from each house is collected through the drainage and the network of pipes called sewers take them to the wastewater treatment plants from which its released into water bodies.

BETTER HOUSEKEEPING PRACTICES

Cooking oil and fats should not be thrown down the drain as the fats clog and block the pipes.

Used tea leaves, solid food remains, soft toys, cotton, sanitary towels, etc. should not be thrown in drains as do not allow free flow of oxygen. This hampers the degradation process.

SANITATION

Sanitation generally refers to the provision of facilities and services for the safe disposal of human urine and faeces.

Poor sanitation causes a large number of diseases and health hazards.

VERMI-PROCESSING TOILET

In this process, the waste sewage slurry collected from sewage disposal systems are treated with earthworms, wrigglers and tiger worms.

They decompose the faecal matter, kitchen waste (organic) and other households organic waste.

It is a very simple, hygienic and low water consuming process with no odour or flies problem.

SEPTIC TANKS

The septic tank is a buried, water-tight container usually made of concrete, polythene, in which sewage is collected and allowed to decompose through bacterial activity before draining by means of a soak-away.

MULTIPLE CHOICE QUESTIONS

1-Which one of the following is a quality of wastewater?
(a) Foul smell (b) Bad taste (c) Dirty look (d) All of these

2-Period 2005-2015 is being celebrated as the international decade for action on
(a) water for life (b) education for all (c) global war (d) terrorism

3-In sewerage manholes are located at every
(a) 20-25 m (b) 50-60 m (c) 90-100 m (d) 100-110 m

4-Which one of the following is a step in wastewater treatment?
(a) Aeration (b) Filtration (c) Chlorination (d) All of these

5-Sludge in separate tanks is decomposed to get biogas by
(a) yeasts (b) aerobic bacteria (c) anaerobic bacteria (d) none of these

6-Which one of the following is used in vermi-processing toilet?
(a) Earthworm (b) Cockroach (c) Both of these (d) None of these

7-Sewage is mainly a
(a) liquid waste (b) Solid waste (c) gaseous waste (d) Mixture of solid and gas

8-Which of the following is not a source of waste water?

(a) Sewers (b) Homes (c) Industries (d) Hospitals

9- Open drain system is a breeding place for which of the following:
(a) Files (b) Mosquitoes (c) Organisms which cause diseases (d) All of these

10- Which of the following is/are products of wastewater treatment?
(a) Biogas (b) Sludge (c) Both Biogas and sludge (d) Aerator

HIGHER THINKING ORDER SKILL QUESTIONS

Question 1. Water in a river is cleaned naturally. Do you agree? Think and explain.
Answer: Yes, river water is cleaned naturally by a process that is similar to wastewater treatment plant.
As muddy water when flows through grass or weeds on its way to a stream, mud and solid particles get filtered out. At the bottom of a lake or stream, microorganism brings chemical changes in the water. The natural filtration process removes pollution from the roundwater throughout the process making it clean and fit for drinking.

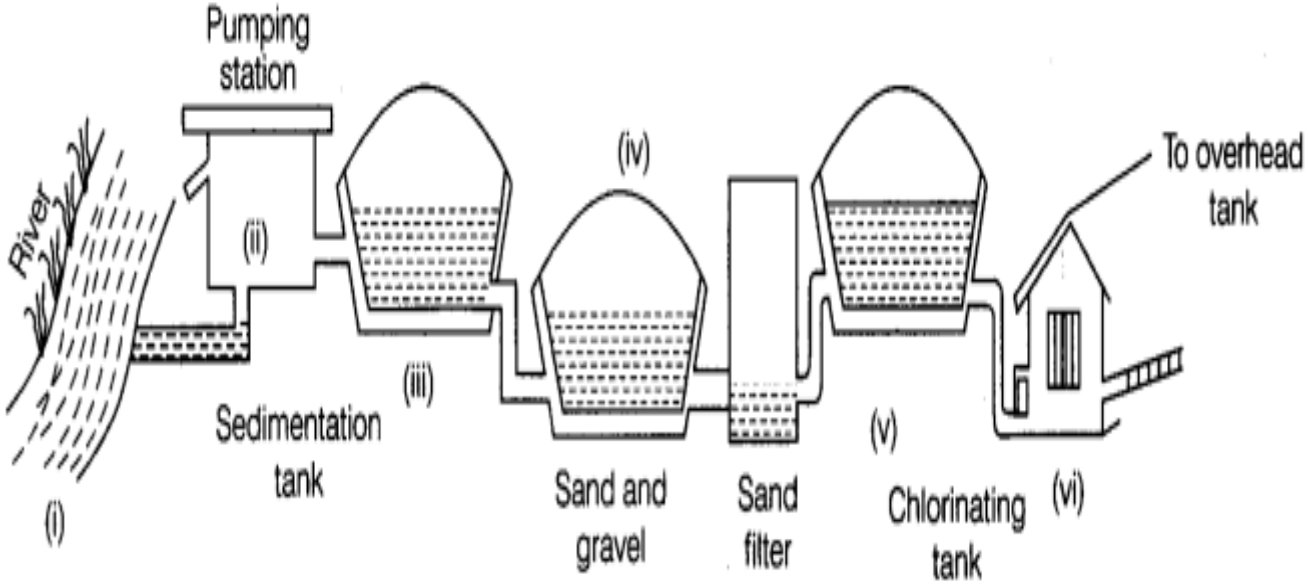
Question 2. The terms sewage, sewers and sewerage are interlinked with each other. Can you explain, how?
Answer: The terms like sewage, sewers and sewerage are interlinked with each other because sewage is a mixture of wastewater coming out of homes and other places. Sewers are pipes which carry sewage and sewerage is a network of sewage carrying pipes.

Question 3. Given below is a jumbled sequence of the processes involved in a wastewater treatment plant. Arrange them in their correct sequence.
(a) Sludge is scraped out and skimmer removes floating grease.
(b) Water is made to settle in a large tank with a slope in the middle.
(c) Large objects like plastic bags are removed by passing wastewater through bar screens.
(d) Sand, grit and pebbles are made to settle by decreasing the speed of incoming wastewater.
(e) Wastewater enters a grit and sand removal tank.
Answer: The correct sequence of wastewater treatment in treatment plant is
(c) Large objects like plastic bags are removed by passing wastewater through bar screens.
(e) Wastewater enters a grit and sand removal tank.
(d) Sand, grit and pebbles are made to settle by decreasing the speed of incoming wastewater.
(b) Water is made to settle in a large tank with a slope in the middle.
(a) Sludge is scraped out and skimmer removes the floating grease.

Question 4.Three statements are provided here which define the terms, i.e. sludge, sewage and wastewater.
Pick out the correct definition for each of these terms.
(a) The settled solids that are removed in wastewater treatment with a scraper.
(b) Water from kitchen used for washing dishes.
(c) Wastewater released from homes, industries, hospitals and other public buildings.

Answer:
(a) The settled solids that are removed in wastewater treatment with a scraper is sludge.
(b) Water from kitchen which is used for washing dishes is wastewater.
(c) Wastewater released from homes, industries, hospitals and other public buildings is sewage.

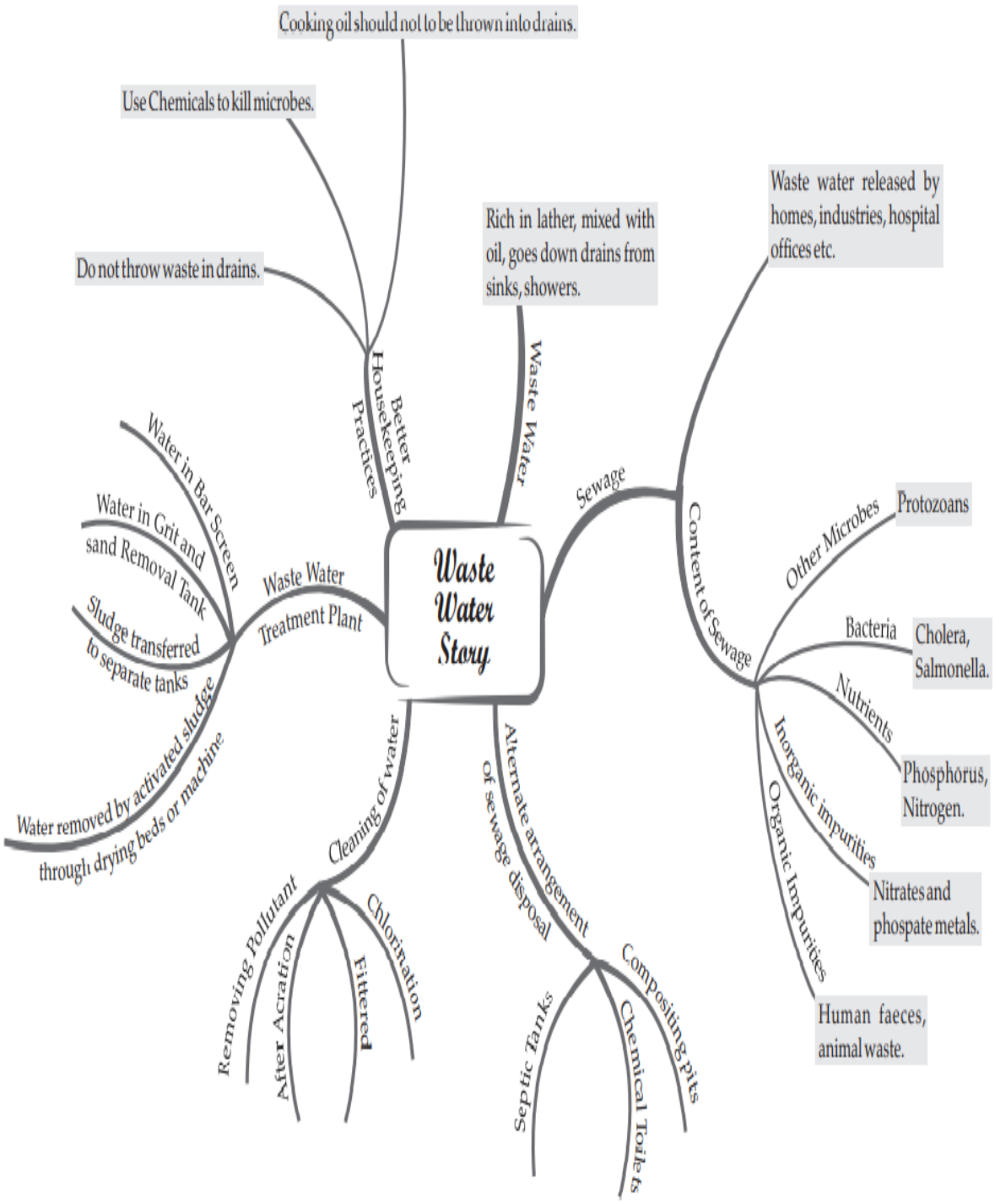
Question 5. Observe the given figure and answer the following:
(a) What does this figure show?
(b) State the functions of each part of the figure?



Answer:(a) This figure shows the supply of drinking water, its processing and its source as well.
Functions of each part of the figure.
(b)

- River It is the source of water.
- Pumping station Pump the water to collect it in reservoir.
- Sedimentation tank Impurities are settled in the bottom of tank.
- Sand and gravel and sand filter Remove the dirt from the water.
- Chlorinating tank Chlorine is mixed in water to disinfect the eater and to kill the germs.
- To overhead tank Purified water is stored in this tank for supply to the households for drinking.

MIND MAP : LEARNING MADE SIMPLE CHAPTER-18



SAMPLE PAPER

TERM II SAMPLE PAPER -1 2021-22
SUBJECT – SCIENCE
TIME – 2 HOURS CLASS VII MM-40

General instructions –

(i) The question paper comprises three sections A, B and C. You are to attempt all the three sections.
(ii) All questions are compulsory.
(iii) Questions 1 to 10 in section A are multiple choice questions.
(iv) Questions 11 to 19 in section B are two marks questions. These are to be answered in 30 words each.
(v) Questions 20 and 22 in section C are four marks questions.

SECTION A

Multiple Choice Questions – 1x10 = 10

1. Which factor influences soil formation ?
(a) Climate (b) Vegetation (c) Parent rock (d) All of these
2 During heavy exercise, we get cramps in the legs due to the accumulation of -
(a) Carbon dioxide (b) Lactic acid (c) Alcohol (d) Water
3 Which of the following always carries oxygenated blood -
(a) Arteries except pulmonary artery
(b) Veins except pulmonary vein
(c) Blood capillaries
(d) None of these
4 Mature ovary forms the -
(a) Seed (b) Stamen (c) Pistil (d) Fruit
5 A simple pendulum takes 42 sec to complete 20 oscillations. What is its time period?
(a) 2.1s (b) 4.2s (c) 21s (d) 8.40s
6 The coil of wire contained in an electric heater is known as -
(a) Component (b) Element (c) Circuit (d) Spring
7 Image formed by a plane mirror is -
(a) Virtual and erect (b) Real and erect (c) Virtual and inverted (d) Real and inverted
8 Which year was observed as international year of fresh water ?
(a) 2003 (b) 2004 (c) 2006 (d) 2002
9. Roof of the forest made by the branches of the tall trees is called -
(a) Canopy (b) Crown
(c) Under storeys
(d) None of these
10. Sludge in separate tanks is decomposed to get biogas by -
(a) Yeast (b) Aerobic bacteria (c) Anaerobic bacteria (d) None of these

SECTION B 2x9=18

11. Write differences between clayey soil and sandy soil.
12. Why do we feel hungry after a heavy exercise and activity?
13. Draw a neat and labelled diagram of human excretory system.
14. Salma takes 15 minutes from her house to reach her school on a bicycle. If the bicycle has a speed of 2m/s, calculate the distance between her house an the school.

15. Define – Fertilisation , Pollination
16. (a) On which effect of electric current does electric iron works?
    (b) Name the device used in our houses which protects damages to electrical circuits when current exceeds the safe limit accidentally.
17. How many colours are found in rainbow? Name them.
18 Explain the role of forest in maintaining the balance between oxygen and carbon-dioxide in the atmosphere.
19 What are the main reasons for increasing scarcity of fresh water? (any four)

OR

(a) Write the full form of WWTP?
(b) Name the three steps involved in the treatment of polluted water.

SECTION C 4x3=12

20. (a) Draw a neat and labelled diagram of human respiratory system.
    (b) Write one difference between aerobic and anaerobic

21. (a) What is rainwater harvesting ?
    (b) What role can you play to overcome water problem?
22 (a) Draw neat diagrams of concave and convex lenses.
(b) Write one difference between concave and convex lens.
(c) Why should we not look at the sun through convex lens?
(d) Which type of lens forms always a virtual image?

OR

(a) Write differences between real and virtual image.
(b) State two uses of concave mirror.
(c) What type of image is formed by a concave mirror?
(d) What type of mirror is used in scooters?

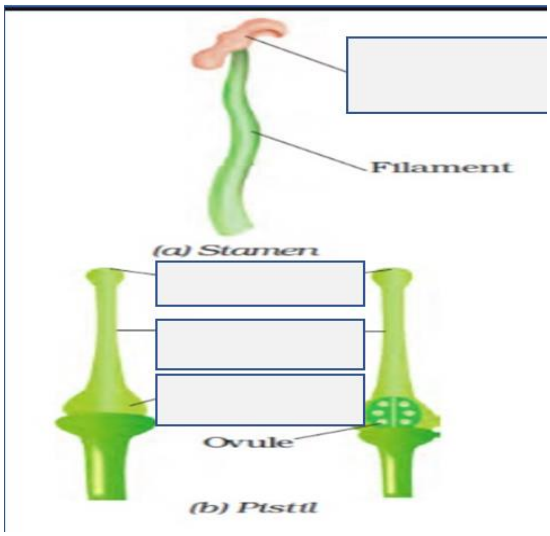
TERM II SAMPLE PAPER-2 2021-22
SUBJECT – SCIENCE
TIME – 2 HOURS CLASS VII MM-40

SECTION A
SECTION A OBSERVTION AND REPORTING

Q1. Which is the water bearing layer of earth?
Q2. Draw the symbols to represent cell and battery?
Q3. What joins the arteries and veins in the circulatory system?
Q4. Define speed.
Q5. What is the term used for fusion of male and female gamete?
Q6. Which device is used in our houses to protect electric appliances?
Q7. What type of mirrors are used as rear mirrors in bikes and cars?
Q.8.Which type of plants form lowest layers in forest?
Q.9.Which phenomena will be observed when a light hits a mirror?
Q10. Why should oil and fat must not be released in the sewer?

SECTION B IDENTIFICATION

Q11. Identify and label the plant reproductive parts:-(2)



12. Identify the mirror in the picture and write its 2 uses.

Q 13 Observe the picture and write why the picture 1 is marked as wrong and picture 2 as right?

PICTURE 1

PICTURE 2

Q14. Identify the reason and explain in brief the following: (4)

a) Growing shortage of water
b) Sanitation diseases are related

SECTION C
DISCOVERY OF FACTS

Q15. Draw the diagram of human excretory system and label its various parts. (2)

Q16. a) When the current is switched on through a wire, a compass needle kept nearby gets deflected from its north-south position. Explain. (2)

c) Draw the circuit diagram to represent this electric circuit.

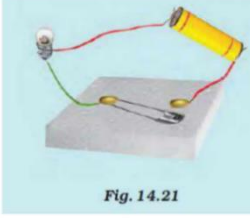


Fig. 14.21

Q 17. Explain how soil pollution can be prevented. (Any two points) (2)

Q18. (a) What is the difference between sexual and asexual reproduction?
(b) Write down any three methods of asexual reproduction?

SECTION D
APPLICATION

Q19. Show the shape of the distance-time graph for the motion in the following cases: (2)
(i) A car moving with a constant speed.
(ii) A car parked on a side road.

Q20. Flood is a natural calamity. List some methods to prevent outbreak of flood. (2)

Q21. What is your role as an active citizen in relation to sanitization in our surroundings? (2)

Q22. (a) When does the water table get depleted?
(b) List any four reasons for depletion of water table

TERM II SAMPLE PAPER - 3 2021-22
SUBJECT – SCIENCE
TIME – 2 HOURS CLASS VII MM-40

General instructions –

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(iii) Questions 1 to 10 in section A are multiple choice questions.
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(v) Questions 20 and 22 in section C are four marks questions.

S.NO	SECTION A (1X10)	marks
1	Time period of a simple pendulum depends upon its… a) weight and bomb b) Length c) Both a and b d) none of these	1
2	Which one records distance travelled by a vehicle? a) Speedometer b) Monometer c) Motometer d) Audometer	1
3	The amount of heat produced in a wire depends on… a) Material b) Length c) Thickness d) all of these	1
4	Which mark is necessary on electric appliances? a) EGG MARK b) ISI c) FICCI d) KSK	1
5	Which is not a water born disease? a) Cholera b) Typhoid c) Tuberculosis d) Dysentery	1
6	Which of the following is not a scavenger? a) Crow b) Lion c) Jackal d) Valture	1
7	Which of the following is not a forest product? a) Gum b) Plywood c) Sealing wax d) Kerosene	1
8	What is the function of WBCs? a) Transport of oxygen b) Fight against germs c) Involved in blood clotting d) All of these	1

9	Breathing is a process that 1) provides O_2 to the body 2) break down food to release energy 3) help the body to get rid of CO_2 4) produces water in the cell Which if the following gives the correct combination of functions of breathing? a) 1 and 2 b) 2 and 3 c) 1 and 3 d) 2 and 4	1
10	Bryophyllum can reproduce by its a) Stem b) Leaves c) Roots d) Flower	1
	SECTION B	
11	Why are forests called green lungs?	2
12	What is uniform and non-uniform motion?	2
13	What are the electrical fuse? What is its importance?	2
14	What do you meant by depletion of water table?	2
15	Write two differences between Real image and Virtual image.	2
16	How many colours are found in rainbow? Write it in correct sequence.	2
17	What do you know about understoreys?	2
18	Explain what do you understand by sexual reproduction?	2
19	Name the four chambers of the heart.	2
	SECTION C (4x3)	
20	Draw a neat and labelled diagram of closed and opened circuit.	4
21	Explain the relationship between sanitation and disease.	4
22	What is pollination? Explain in brief self pollination and cross pollination.	4

MARKING SCHEME
TERM II SAMPLE PAPER - 1
MARKING SCHEME
SUBJECT – SCIENCE
CLASS - VII

Qno.	Answers	Marks
	MCQs SECTION A	
1	(d) All of these	1
2	(b) Lactic acid	1
3	(a) Arteries except pulmonary artery	1
4	(d) Fruit	1
5	(a) 2.1s	1
6	(b) Element	1
7	(a) Virtual and erect	1
8	(a) 2003	1
9	(a) Canopy	1
10	© Anaerobic bacteria	1
	SECTION B	
11	Clayey soil – 1 Proportion of fine particles is large. 2 Has good water holding capacity. Sandy soil - 1 Proportion of big particles is large. 2 Has poor water holding capacity	1+1=2
12	Exercise needs extra energy for which food breaks down very rapidly by faster breathing. This makes us feel hungry.	2
13	NCERT text book, page no 127 Diagram , Labelling (any 2 parts)	1 +1=2
14	Speed of a bicycle = 2m/s Total time taken = 15 min = 900 s Distance = speed x time 2 x 900 = 1800 m	 1/2 ½ 1 =2
15	Fertilisation – Fusion of male and female gamete Pollination - The transfer of pollen grain from anther to stigma	1+1=2
16	(a) Heating effect of electric current (b) Fuse or MCB	1+1=2
17	7 colours , VIBGYOR – violet,indigo,blue,green,yellow,orange,red	1+1=2
18	By the process of photosynthesis and respiration,use and consumption of oxygen and carbon dioxide goes on.Thus they maintain the balance of oxygen and carbon dioxide in the atmosphere.	1+1=2

19	Reasons – Population growth, Pollution, Industrial development, mismanagement of water (or any other) OR (a) Wastewater Treatment Plant (b) 1 Aeration 2 Filtration 3 Chlorination	1/2x4=2 0R 1 1
	SECTION C	
20	(a) NCERT text book, page no. 112, fig.10.4- Diagram + labelling (b) Any one difference	1+2 1=4
21	(a) Correct definition (b) 1 Surroundings should be clean. 2 Sewage system in the home should be properly managed. 3 Some leakage or other problem in the sewage system should be reported to the municipality. (or any other)	1+ 3=4
22	(a) Correct diagram (b) Any one difference (c) When the light passes through a convex lens, it concentrates at a point, so it can damage our eyes permanently. (d) Concave lens. OR (a) Real image – 1 Can be obtained on a screen. 2 It is always inverted. Virtual image- 1 Cannot be obtained on a screen. 2 It is always erect. (b) Used in head lights of the cars, buses, shaving mirrors,used by dentists and doctors. (c) Real and inverted image is formed but if the object is placed very near to the mirror, then the image formed is virtual and erect. (d) Convex mirror	1 1 1 1=4 ½+ ½ ½+1/2 1 1=4

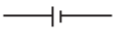
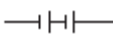
TERM II SAMPLE PAPER - 2
MARKING SCHEME
SUBJECT – SCIENCE
CLASS - VII

SECTION A OBSERVTION AND REPORTING

1. The water-bearing layer of the earth is

Aquifer.

2.symbols to represent cell and battery

Connecting wires	
Switch in 'on' position	
Bulb	
Cell	
Switch in 'off' position	
Battery	

3.CAPILLARIES

4.Distance travelled per unit time.

5.FERTILIZATION

6.MCB

7.CONVEX

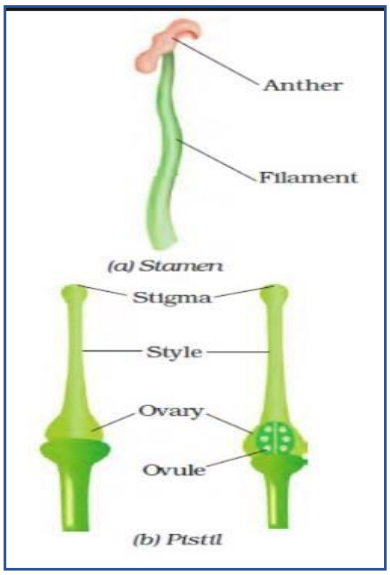
8. HERBS

9. REFLECTION

10.Because of the release of oils and fats in **drains it hardens the soil in sewage pipes** and blocks them.

SECTION B IDENTIFICATION

Q11. Identify and label the plant reproductive parts:-(2)



12. Identify the mirror in the picture and write its 2 uses.

Uses Of Concave Mirror

- Shaving mirrors.
- Head mirrors.
- Ophthalmoscope.
- Astronomical telescopes.
- Headlights.
- Solar furnaces.

Q 13 Observe the picture and write why the picture 1 is marked as wrong and picture 2 as right?

Pictures 1 is marked worng because garbage is thrown into sink directly.

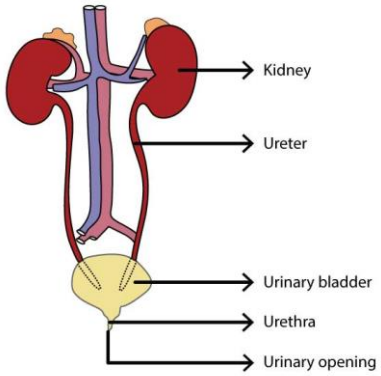
Picture 2 is marked right because garbage is thrown into dustbin properly.

14. Identify the reason and explain in brief the following: (4)

1.Growing shortage of water
Increase in demand, decrease in supply,Depleting natural resources .
2.Sanitation and diseases are related
Good sanitation and waste management help to keep people separate from potential sources of pathogens. They reduce the risk of contaminating water supplies with pathogens and discourage the transmission of disease.

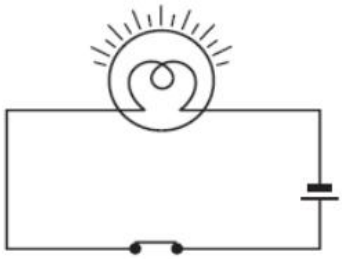
SECTION C DISCOVERY OF FACTS

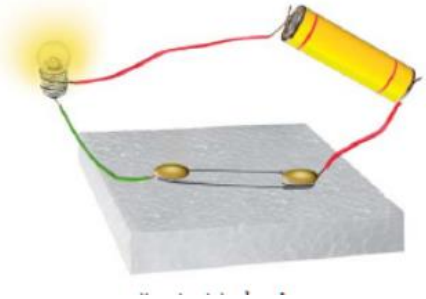
Q15. Draw the diagram of human excretory system and label its various parts. (3)



16. a.When a current is switched on through a wire, the wire starts behaving as a magnet. Hence, when a compass needle is placed near the given current carrying wire, **it gets influenced bythe magnetic effect of electric current** and gets deflected from its North-South position.

b. Draw the circuit diagram to represent this electric circuit.





17. soil pollution can be prevented. (Any three points) (3)

Prevention of soil pollution can be done by (i) **use of manures instead of synthetic fertilisers**. (ii) use of natural pesticides. (iii) avoid dumping of polythene and plastics in soil. (iv) industrial waste should be treated before release in soil.

18. (a)difference between sexual and asexual reproduction? (4)

Asexual Reproduction	Sexual Reproduction
Uniparental	Biparental
Somatic cells are involved.	Germ cells are involved.
It involves the production of asexual spores	It involves the formation and fusion of gametes.
Offsprings are genetically similar to parents.	Offsprings are genetically dissimilar to parents.
The rate of reproduction is faster.	The rate of reproduction is slower.

B .Methods of asexual reproduction?

There are a number of types of asexual reproduction including **fission, fragmentation, budding, vegetative reproduction, spore formation**

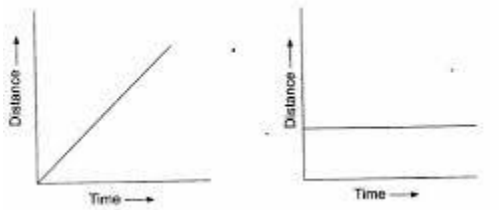
SECTION D

APPLICATION

Q19. 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.



Q20. Flood is a natural calamity. List some methods to prevent outbreak of flood.

Some of the common techniques used for flood control are planting trees , preventing soil erosion and over mining , the installation of rock beams, rock rip-raps, sand bags, maintenanceof normal slopes with vegetation or application of soil cements on steeper slopes and construction or expansion of drainage. (2)

Q21. What is your role as an active citizen in relation to sanitization in our surroundings?

A citizen has many responsibilities regarding sanitation. Among other things, an active citizen should do the following with regard to maintaining proper sanitation: 1) **Ensure that his surroundings (both inside and outside home) are clean**. 2) Ensure that the sewerage system in his house is properly managed.

Q 22. (a)When does water table get depleted? (2)

Water drawn from under the ground gets replenished by seepage of rainwater. The water table does not get affected as long as we drawn as much water as is replenished by natural process. However, water table may go down if the water is not replenished sufficiently this may happens due to many reasons increase in population industrial and agricultural activities are some common factors which cause depletion in water table.

(b) List any four reasons for depletion of water table.

Various causes of the depletion of water table are:-

1 Increase in population

2 Industrialization

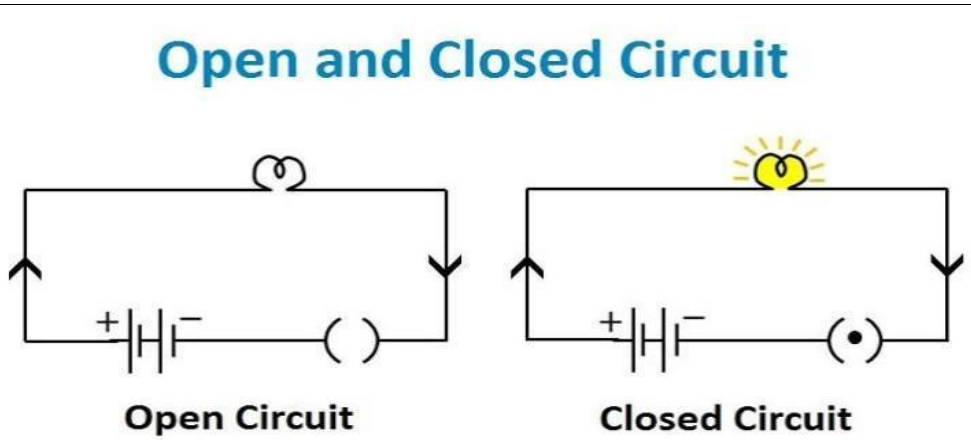
3 Agricultural activities

4 Scanty rainfalls

5 Deforestation

TERM II SAMPLE PAPER - 3
MARKING SCHEME
SUBJECT – SCIENCE
CLASS - VII

S.NO	ANSWER	MARKS
1	c) Both a and b	1
2	a) speedometer	1
3	d) all of these	1
4	b) ISI	1
5	c) Tuberculosis	1
6	b) lion	1
7	d) Kerosene	1
8	b) Fight against germs	1
9	c) 1 and 3	1
10	b) leaves	1
11	Plants absorb carbon dioxide from atmosphere for photosynthesis and release oxygen. Thus they help to maintain the balance in the oxygen and carbon dioxide levels in atmosphere. That is why forests are called green lungs	2
12	Uniform motion can be defined as the motion in which a body travels equal distance in equal intervals of time. Non-uniform motion can be defined as the body that covers unequal distances in equal intervals of time or equal distances in unequal intervals of time	2
13	A fuse is a safety device which prevents damage to electrical circuit and possible fires In all buildings cruise are inserted in all electrical circuits there is a maximum limit of the current which can safely flow through the circuit if by accident the current exceeds this self-limit the wires may become over heated and may cause fire if a proper fuse is there in the circuit it will blow off and break the circuit as safety measure.	2
14	We are consuming more groundwater for industrial agricultural and as human waste and on the other hand we are allowing lesser water to seep into the ground due to this reason depletion of water table occurs	2
15	Real image Formed when reflected or refracted rays actually meet at a point Can be taken on a screen It is always inverted Virtual image Formed when reflected or refracted rays seems to come from a point Cannot be taken on a screen It is always erect	2

16	There are seven different colours in a rainbow though it may not be easy to distinguish all of them they are as VIBGYOR and the colours are red, orange, yellow, green,blue, indigo and Violet	2
17	The trees have crowns of different types and sizes they create different horizontal layers in the forest they are known as understoreys. Giant and tall trees constitute the top layer, followed by shrubs and tall grasses and herbs from the lowest layer	2
18	In sexual reproduction the male and the female gametes fuse to form a zygote for sexual reproduction one or two parents are required to produce two different gametes and ultimately after zygote formation new individual forms.	2
19	The two upper chambers of the hearts are called the Atria and the two lower chambers are called the ventricles	2
20		
21	sanitation is the hygienic means of promoting health through prevention of hazards of wastes as well as the treatment and proper disposal of savage waste water poor sanitation is a major cause of diseases worldwide and improving sanitation is known to have a significant beneficial impact on household and across communities so poor sanitation and contaminated water is the cause of a large number of diseases	4
22	The transfer of pollen grains from the anthers to the stigma of a flower is called pollination If the pollen lands on the stigma of the same flower it is called self pollination when the pollen of a flower lands on the stigma of another flower of the same plant or the other plant of the same species is called cross pollination	4

CREATIVE AND CRITICAL THINKING QUESTIONS

TERM II
SUBJECT – SCIENCE
CLASS VII
CCT- TEST

TIME: 30 minutes **MM: 15**

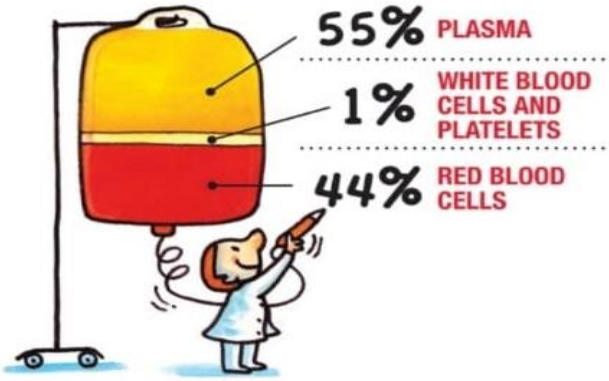
I BLOOD AND ITS COMPONENTS –

What Is Blood and What Does It Do?

Blood is needed to keep us alive. It brings oxygen and nutrients to all the parts of the body so they can keep working. Blood carries carbon dioxide and other waste materials to the lungs, kidneys, and digestive system to be removed from the body. Blood also fights infections, and carries hormones around the body.

Blood is made up of blood cells and plasma. **Plasma** is a yellowish fluid that has nutrients, proteins, hormones, waste products and different blood cells

Red blood cells(RBCs): Red blood cells. RBCs contain hemoglobin, a protein that carries oxygen. Blood gets its bright red colour when hemoglobin picks up oxygen from lungs. As the blood travels through the body, the hemoglobin releases oxygen to the different body parts.



White blood cells(WBCs): WBCs helps the body defend itself against infection. Different types of WBCs fight germs, such as bacteria and viruses. Some types of WBCs make antibodies, which are special proteins that recognize foreign materials and help the body get rid of them.

Platelets: Platelets are tiny oval-shaped cells that help in the clotting process. When a blood vessel breaks, platelets gather in the area and help seal off the leak. Platelets work with proteins called clotting factors to control bleeding inside our bodies and on our skin.

1 Which of the following is the main circulatory fluid in our body?

(a) Plasma (b) Lymph (c) Blood (d) None of these

2 What does RBCs stand for?

(a) Plasma (b) White blood cells (c) Platelets (d) Red blood cells

3 Bhujho and Paheli were arguing about the part of blood which helps us to strengthen our immune system. Help them by giving the right answer –

(a) Plasma (b) White blood cells (c) Platelets (d) Red blood cells

4 Blood platelets help in –

(a) Formation of urine

(b) Excretion of urine

(c) Sweating

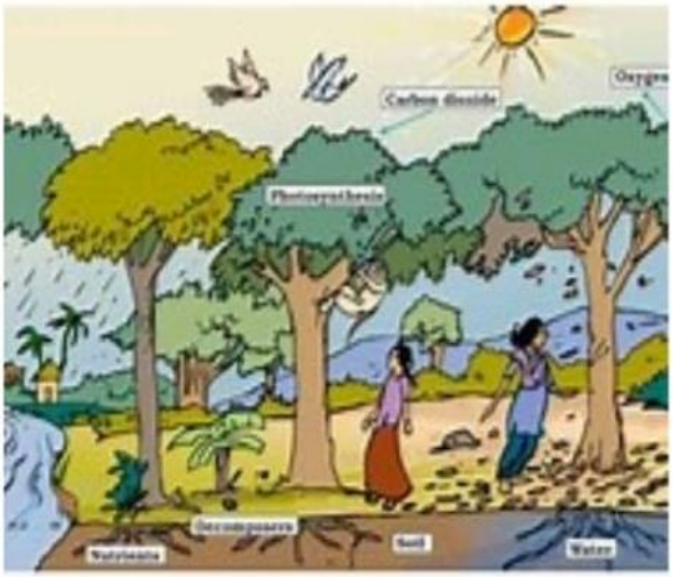
(d) Blood clotting

5 The blood from the heart is transported to all parts of the body by the –

(a) Arteries (b) Veins (c) Pulmonary artery (d) Pulmonary vein

II FOREST: OUR LIFE LINE

"By harbouring greater 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 . Decomposers help in maintaining the supply of nutrients to the growing plants in the forest. Therefore the forest is a " dynamic living entity".



1 What are decomposers?

(a) Dead plant parts (b) Animal excreta (c) Bacteria (d) All of these

2 Which of the following is not a forest product ?

(a) Gum (b) Plywood (c) Sealing wax (d) Kerosene

3 Which among the following states has the maximum forest area in India ?

(a) Kerala (b) Assam (c) Tamil Nadu (d) Madhya Pradesh

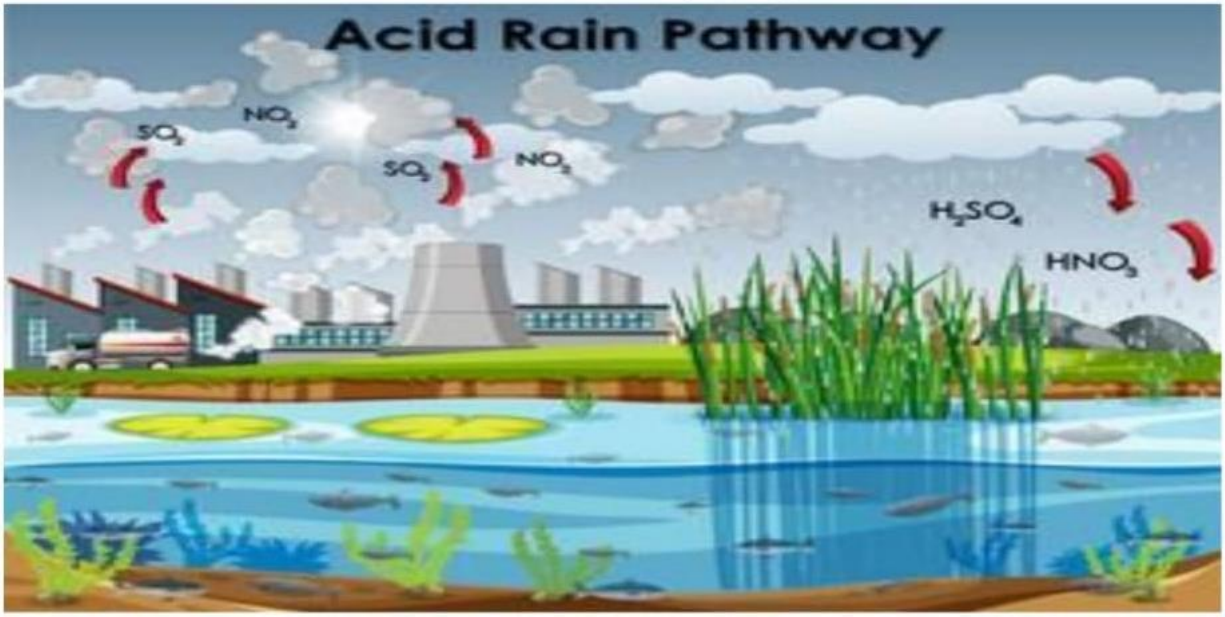
4 Decomposers convert the dead plant and animal tissues into –

(a) Clay (b) Humus (c) Inorganic debris (d) Soil

5 Network of food chain is called –

(a) Food series (b) Food web (c) Food hub (d) None of these

III ACID RAIN PATHWAY -



Nitrogen oxides (NO) and Sulphur dioxide (SO_2) are produced in the atmosphere during the combustion of coal (in industry) and petroleum (in automobiles). These are highly reactive in air and rapidly oxidise to acids i.e., Sulphuric acid (H_2SO_4) or Nitric acid (HNO_3). These acids dissolve in water and form rain acid that washed out to the ground. The pH of acid rain is less than 5.6. It could be as low as four or below. Acid rain adversely affects terrestrial and aquatic vegetation. It decreases the soil fertility. Aquatic plants and animals cannot tolerate acidic water. Acid rain damages material (like marble) and our heritage monuments like Taj Mahal, by the corrosive action of acid deposition.

1. The oxides which cause acid rain are ……..&……..
2. Below which of the following pH is rain considered as acid rain

a) 7 b)7.3 c)5.6 d) 6

3. The main cause of acid rain is

a) soil pollution b) air pollution c)water pollution d)all of the above

4. What is the nature of acid rain

a) with standing b) protecting c) corrosive d) balancing

5. In which of the following ways acid rain affects the plants

a) by nourishing the nutrients from the soil b) by increasing the nutrients in the soil
c) by removing nutrients from the soil d)by balancing the nutrients in the soil

ANSWERS

I 1 (c) 2 (d) 3 (b) 4 (d) 5 (a)
II 1 (c) 2 (d) 3 (d) 4 (b) 5 (b)
III 1 Nitrogen dioxide, Sulphur dioxide 2 (c) 3 (b) 4 (c) 5 (c)

CCT BASED QUESTIONS
CLASS 7
MM:15

Q1. Read the paragraph and answer the questions that follows-(5)

Rusting: Rust is an iron oxide, a usually red powdery substance formed by the reaction of iron and oxygen in the presence of water or air moisture. It is also called oxidation reaction as it takes place in the presence of oxygen. Presence of salty water enhances the process of rusting. To protect from being rusted, the iron metal can be treated in different ways. For example: oiling, painting or galvanization. Making alloys is another way to protect the metal from corrosion. Most of the metals reacts with air when exposed to it and form a coating on them. Oxidation of metals is not always undesirable, for example aluminum. The coating of oxide on the surface of aluminum sheet is extremely hard and abrasion resistant preventing any further reaction with oxygen and it can be dyed to make it colored, making it an ideal material for mobile phones.

a) Metal surface reacts with oxygen and the moisture present in the air and get coated with
a) oxide b) carbonate c) hydroxide d) all of these

b) When a vessel is exposed to moist air, it forms green coating on the surface. The vessel must be made of
a) zinc b) copper c) magnesium d) iron

c) In some case oxidation is considered as desirable. Justify by giving suitable example.
a) It is more than 7 meters in height.
b) It weighs around 6000kg.
c) It was built more than 1600 years ago.
d) It has not rusted after such a long time

d)The colour of rust is
a) Red b) blue c) Green d) black

e) Galvanizing involves coating of which metal on iron?
a) zinc b) copper c) magnesium d) iron

Q2. Read the paragraph and answer the questions that follows-

WHAT HUMAN ACTIVITIES CONTRIBUTE TO CLIMATE CHANGE?

The burning of coal, oil and natural gas, as well as deforestation and various agricultural and industrial practices, are altering the composition of the atmosphere and contributing to climate change. These human activities have led to increased concentrations of particles and greenhouse gases in the atmosphere. The relative importance of the main contributors to temperature change is shown in Figure 1. Increased concentrations of carbon dioxide and methane have a heating effect. Increased concentrations of particles have a cooling effect in two ways, labelled 'Particles' and 'Particle effects on clouds'.

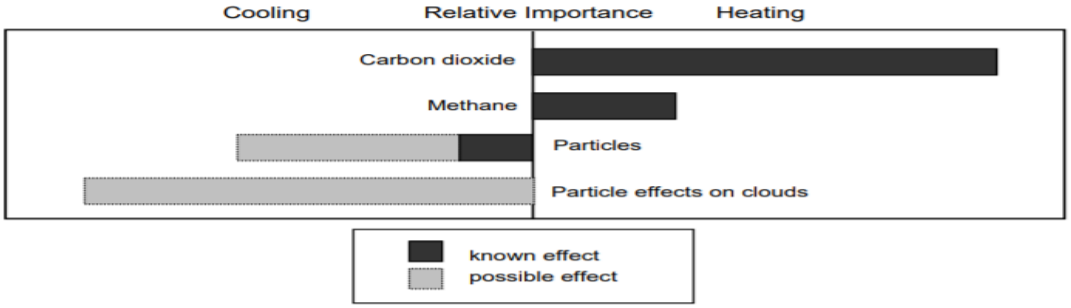


Figure 1: Relative importance of the main contributors to change in temperature of the atmosphere.

Bars extending to the right of the centre line indicate a heating effect. Bars extending to the left of the centre line indicate a cooling effect. The relative effect of 'Particles' and 'Particle effects on clouds' are quite uncertain: in each case the possible effect is somewhere in the range shown by the light grey bar.

1. What are the activities altering the composition of atmosphere?

a) The burning of coal **b) Industrial practices**

c) Deforestation **d) All of these**

2. Human activities have led to increased-

a) Concentration of particle **b) Concentration of green house**

c) both A & B **d) None**

3. Which among the following is not a greenhouse gas?

a) Carbon dioxide **b) Sulphur dioxide** **c) Methane** **d) Oxygen**

4- Bars extending to the right of the centre line indicate a –

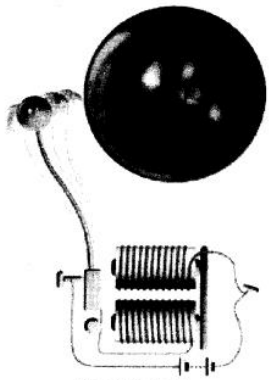
a) heating effect **b) cooling effect** **c) both** **d) none of these**

5- Bars extending to the left of the centre line indicate a-

a) heating effect **b) cooling effect** **c) both** **d) none of these**

Q3. Read the paragraph and answer the questions that follows-(5)

In order to ring the bell first of all we press the push button switch in order to ring the bell. So, when we press the switch, then the electric circuit of the bell is completed and a current pass through the coil of the electromagnet and it gets magnetized. The electromagnet attracts the iron armature towards itself. So, as the armature moves towards the poles of the electromagnet, the clapper attached to it strikes the gong and produces a ringing sound. It implies that the bell rings. When the armature moves towards the magnet, its contact with the contact screw is broken. Due to this, the electric circuit breaks and no current flows in the electromagnet coil. The electromagnet loses its magnetism for a moment and the armature is no longer attracted by it. The flat spring brings back the iron armature to its original position and the clapper also moves away from the gong.



Electric bell

As soon as the armature comes back and touches the contact screw the circuit is completed and current starts flowing in the electromagnet coil again. The electromagnet attracts the iron armature once again and the clapper strikes the gong again producing a ringing sound.

So, this process of 'make and break' of the electric circuit continues as long as we are pressing the switch. Due to this, the armature vibrates forwards and backwards rapidly each time making the clapper strike the gong. Thus, the clapper strikes the gong rapidly producing almost continuous sound.

1. **An electric bell is a type of _____.**

a) Electro magnet b) Non-Magnetic device c)Simple electric device d)Electro magnetic

2. **Electricity can produce_____**

a) Energy b)Magnetic Effect c) Both A and B d) Only B

3. **Make and break circuit refers to ?**

a) Continuous completion and breaking of electric circuit b)Continuous breaking of circuit

c) Continuous current in the circuit d)Both b and C

4. **The two poles of magnets are**

a) East and west b)South and west c)North and south d)West and south west

Sate true or false

5. An electromagnet is a type of temporary magnet whose strength can be increased or decreased.

ANSWER KEY

ITEM -1 1- a 2- b 3- d 4-a 5-a

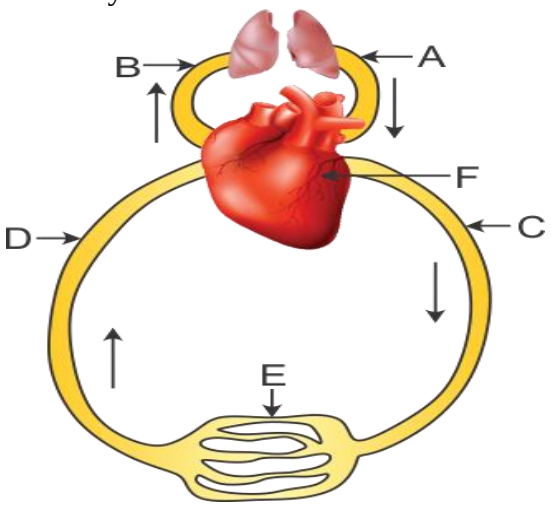
ITEM -2 1-d 2-c 3- d 4-a 5-b

ITEM -3 1-a 2-c 3-a 4-c 5- TRUE

CCT PAPER (2021-22)

I -CIRCULATORY SYSTEM

The fluid part of the blood is called plasma. One type of cells are the red blood cells (RBC) which contain a red pigment called hemoglobin. Hemoglobin binds with oxygen and transports it to all the parts of the bdy and ultimately to all the cells. It will be difficult to provide oxygen efficiently to all the cells of the body without hemoglobin. The presence of hemoglobin makes blood appear red. The blood also has white blood cells (WBC) which fight against germs that may enter our body Also, the blood picks up the waste materials including carbon dioxide from the cells. This blood has to go back to the heart for transport to the lungs for removal of carbon dioxide. So, two types of blood vessels, arteries and veins are present in the body.



Arteries carry oxygen-rich blood from the heart to all parts of the body. Since the blood flow is rapid and at a high pressure, the arteries have thick elastic walls. Paheli explained that the pulmonary artery carries blood from the heart, so it is called an artery and not a vein. It carries carbon dioxide-rich blood to the lungs. Pulmonary vein carries oxygen-rich blood from the lungs to the heart. Veins are the vessels which carry carbon dioxide-rich blood from all parts of the body back to the heart. The veins have thin walls. There are valves present in veins which allow blood to flow only towards the heart The arteries divide into smaller vessels. On reaching the tissues, they divide further into extremely thin tubes called capillaries. The capillaries join up to form veins which empty into the heart.

1.Siddhant got an injury on his knee while playing football in the ground. Blood oozed out from the injured site, but after a few minutes, he observed a brown colored clot on the same site. Which component of the blood might have formed this clot? 1

A)Plasma B)Platelets C)Red blood cells D) White blood cells

2) A patient was facing trouble in breathing. On diagnosis, the doctor examined that the hemoglobin content in the patient's body is less than the normal range. What role does hemoglobin play in breathing? 1 mark

a)Hemoglobin helps in the transportation of oxygen to all body cells.

b)Hemoglobin prevents clot formation inside the respiratory tract.

c)Hemoglobin helps the lungs to take in more air from the surroundings.

d)Hemoglobin fights against germs that enter into the respiratory tract.

3)The table list some characteristic features of a blood vessel. 1 marks

- Carry carbon-dioxide rich blood
- Presence of thin walls
- Presence of valves
- Carries blood towards the heart

Which of the following will have all these characteristics features?

(a) Only pulmonary vein

(b) Only pulmonary artery

(c) All veins except the pulmonary vein

(d) All arteries except the pulmonary artery

4) In the schematic diagram of circulatory system given above label any of the four parts. (2)

II - MOTION

The distance moved by objects in a given interval of time can help us to decide which one is faster or slower. For example, imagine that you have gone to see off your friend at the bus stand. Suppose you start pedalling your bicycle at the same time as the bus begins to move. The distance covered by you after 5 minutes would be much smaller than that covered by the bus. Would you say that the bus is moving faster than the bicycle?

The most convenient way to find out which of the two or more objects is moving faster is to compare the distances moved by them in a unit time. Thus, if we know the distance covered by two buses in one hour, we can tell which one is slower. We call the distance covered by an object in a unit time as the speed of the object. When we say that a car is moving with a speed of 50 kilometers per hour it implies that it will cover a distance of 50 kilometers in one hour. However, a car seldom moves with a constant speed for one hour. In fact, it starts moving slowly and then picks up speed. So, when we say that the car has a speed of 50 kilometers per hour, we usually consider only the total distance covered by it in one hour.

In everyday life we seldom find objects moving with a constant speed over long distances or for long durations of time. If the speed of an object moving along a straight line keeps changing, its motion is said to be non-uniform. On the other hand, an object moving along a straight line with a constant speed is said to be in uniform motion

1) A student observes the positions of two vehicles at different instants of time as shown. (1mark)

Which of these statements explains the motion of the vehicles?

(a) Car A is in motion as it changed its position with respect to the surroundings

(b) Car B is in motion as it changed its position with respect to the surroundings

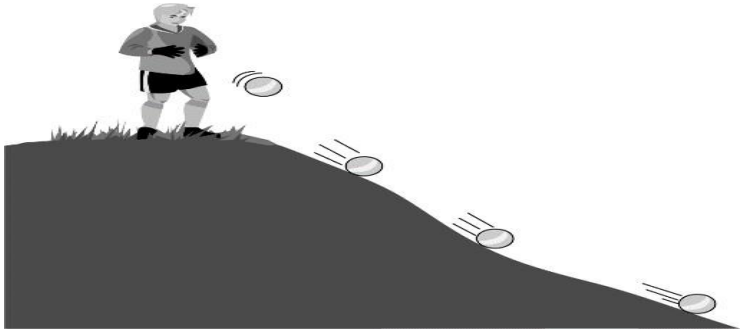
(c) **(**Car A is in motion as it did not change its position with respect to the surroundings

(d) Car B is in motion as it did not change its position with respect to the surroundings

Before

After

2) A student drops a ball from a slope. He notices the ball rolling down as shown in the image.



Which of these statements is true about the motion?

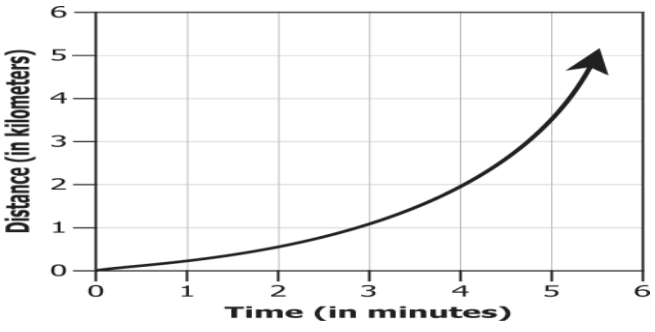
(a) The student is in motion as he is standing

(b) The student is in motion as he drops the ball

(c) The ball is in motion as it rolls down the slope

(d) The ball is in motion as its shape changes over time

3) The graph represents time taken by a car to cover a certain distance



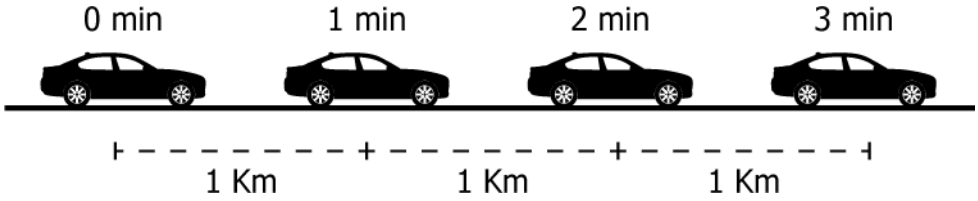
4) Which of these statements is true for the speed of the vehicle? (1mark)

a.It has a uniform speed as time and distance both are increasing

b.It has a uniform speed as speed of the vehicle keeps on changing

c. It has a non-uniform speed as time and distance both are decreasing

d.It has a non-uniform speed as speed of the vehicle keeps on changing



4) The time and position of a moving car covering a distance of 3 km is shown in the image. (1mark)

What can be concluded from the position of the car?

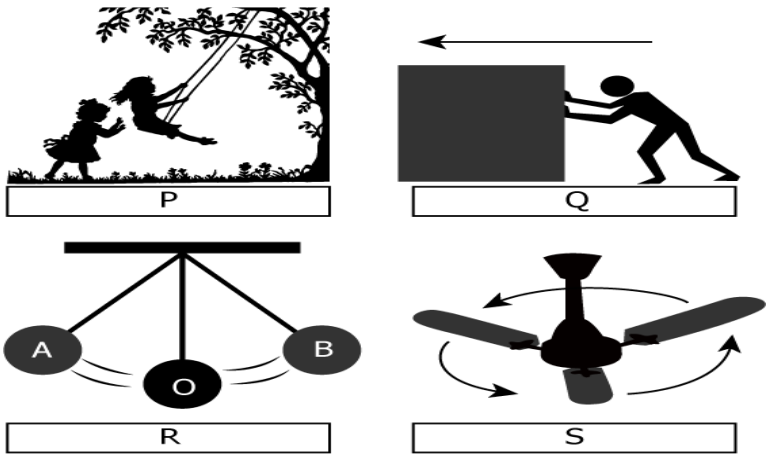
A-It was moving at a uniform speed of 60 km/hr

B-It was moving at a non-uniform speed of 60 km/hr

C-It was moving at uniform speed as it covered 3 km in 3 min

D-It was moving at non-uniform speed as it covers 3 km in 3 min

5). A few activities are provided in the given image



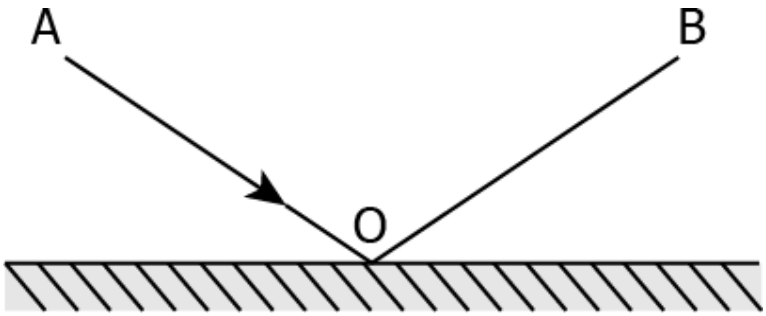
Which of these motions are oscillatory in nature? (1mark)

(a) P and Q b)R and S c)P and S d)Q and R

III- LIGHT AND REFLECTION

A mirror changes the direction of light that falls on it. This change of direction by a mirror is called reflection of light. Can you recall the activity in which you got the light of a torch reflected from a mirror.One way to change the direction of light is to let it fall on a shiny surface. For example, a shining stainless steel plate or a shining steel spoon can change the direction of light. The surface of water can also act like a mirror and change the path of light

. An image formed by a plane mirror is erect and 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 the mirror the 'right' appears 'left' and the 'left' appears 'right'. Note that only sides are interchanged; the image does not appear upside down



A student observes the path followed by a ray of light as shown in the image. She argues that the path represents the reflection of light. (1mark)

1-Which of these statements support the argument by the student?

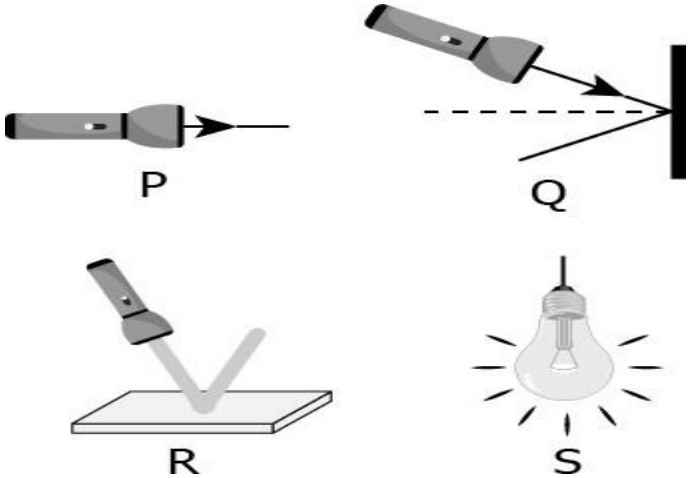
(b) Absorption of light by the polished surface

(c) Maintaining a straight path by the ray of light

(d) Equal amount of light in the initial and final point

(e) Change in direction of light by a polished surface

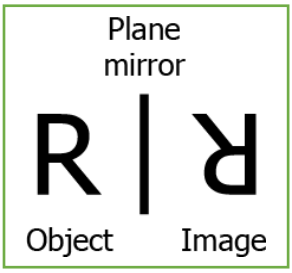
2) The image represents the path of light followed as it travels from different sources.

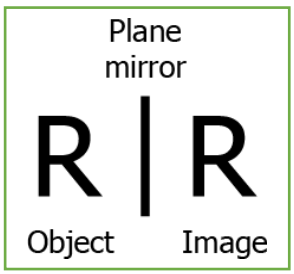


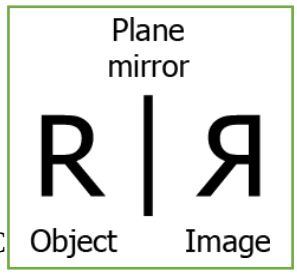
Which of these images represents the reflection of light? (1mark)

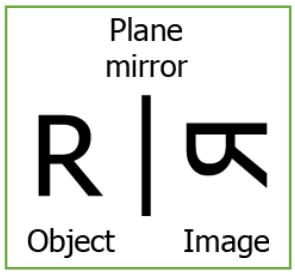
(a) P and Q (b)R and S (c) P and S (d)Q and R

3) Which of these represents the correct image formed by a plane mirror? (1mark)

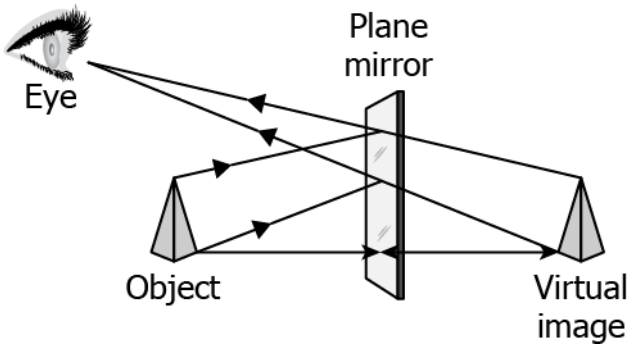
A 

B 

C 

D 

4) The figure represents the image formed by a plane mirror. (1mark)



Which of these statements explains the characteristics of the image formed by the plane mirror?

(a) Erect and diminished

(b) Inverted and magnified

(c) Erect and of the same size as the object

(d) Inverted and of the same size as the object

5)The image shows how the word "AMBULANCE" is written in vehicles. (1mark)

What is the reason behind writing the word in the manner?

(a) To make the vehicle gain extra speed while travelling

(b) To make the vehicle look different from rest on the road

(c) The vehicles ahead can read it easily in the rear-view mirror

(d)People standing in front of the vehicle can read it from distance

MARKING SCHEME
CCT PAPER

I -CIRCULATORY SYSTEM

1-b -platelets (1mark)

2-a)Haemoglobin helps in the transportation of oxygen to all body cells. (1mark)

3-c-All veins except the pulmonary vein (1mark)

4-heart,lungs,pulmonary vein ,pulmonary artery,artery,vein (any four) (1/2*4mark)

II- MOTION

1-(b)Car B is in motion as it changed its position with respect to the surroundings (1mark)

2-(c)The ball is in motion as it rolls down the slope (1mark)

3-d)It has a non-uniform speed as speed of the vehicle keeps on changing (1mark)

4-C-It was moving at uniform speed as it covered 3 km in 3 min (1mark)

5-(b)P and R (1mark)

III- LIGHT AND REFLECTION

1-d-Change in direction of light by a polished surface (1mark)

2-d-Q and R (1mark)

3-c (1mark)

4-c-Erect and of the same size as the object (1mark)

5-The vehicles ahead can read it easily in the rear-view mirror (1mark)