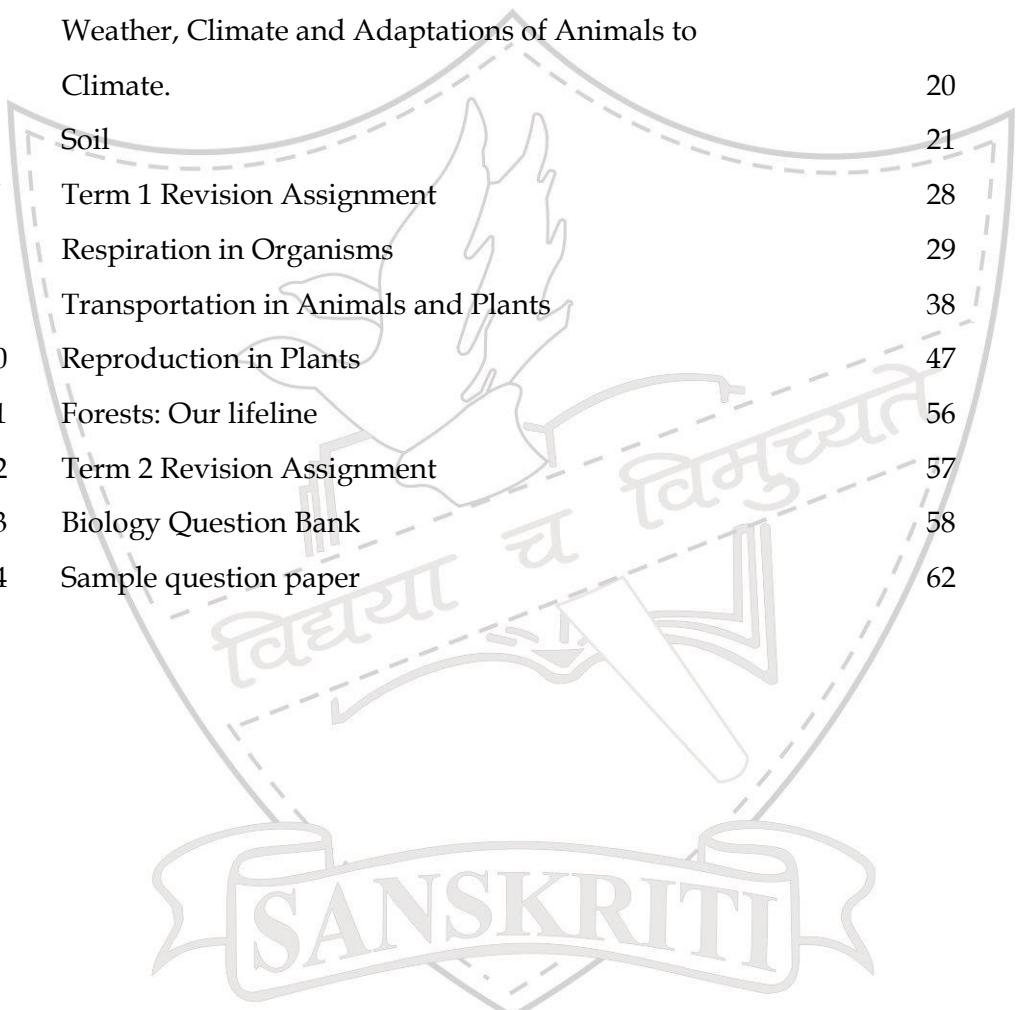


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SYLLABUS – BIOLOGY
CLASS – VII
2020-21

APRIL - MAY:-

- Nutrition in plants
- Nutrition in animals

Nutrition in plants

Concepts- Mode of nutrition in plants, autotrophs and heterotrophs; photosynthesis; synthesis of plant food other than carbohydrates, other modes of nutrition in plants.

Activity:-

- To test a leaf for presence of starch.

Nutrition in animals

Ingestion; digestion in humans , mouth and buccal cavity, oesophagus , stomach , small intestine , absorption in small intestine; digestion in grass eating animals; feeding and digestion in amoeba

JULY-AUGUST

- Nutrition in animals(cont.)
- Soil
- Weather, Climate and Adaptations (Project based)
- Forest Our Lifeline (Project Based)

Nutrition in animals (cont.)**Activity:-**

- To observe the action of salivary amylase on starch

Soil

Concepts – Importance, study of various layers of soil; Soil profile; differences between clayey, loamy and sandy soil; sustainability of different soil types for different crops grown in India

Activity:-

- To study the profile of the soil.
- To investigate the absorption of water in different types of soil.

SEPTEMBER- NOVEMBER

- Respiration in organisms
- Transportation in animals and plants

Respiration in organisms

Concepts: - Definition and significance of respiration; aerobic and anaerobic respiration, inhalation and exhalation, breathing rate, human respiratory system, respiratory structure in cockroach, earthworm and fish. Role of stomata and root hair.

Activities:-

- To determine breathing rate at rest and after exercise
- To show CO₂ is released during respiration
- To observe anaerobic respiration in yeast

DECEMBER

- Transportation in animals and plants

Transportation in animals and plants

Concepts- Composition of blood, role of haemoglobin; difference between artery vein and capillaries, pulse, pulse rate, structure and function of human heart.

Excretory system in human beings, xylem phloem and transpiration in plants.

Activities:-

- Model of human lungs
- Model of human heart – Observation
- Model of a Stethoscope
- Demonstration Of Osmosis by potato osmometer

JANUARY – FEBRUARY

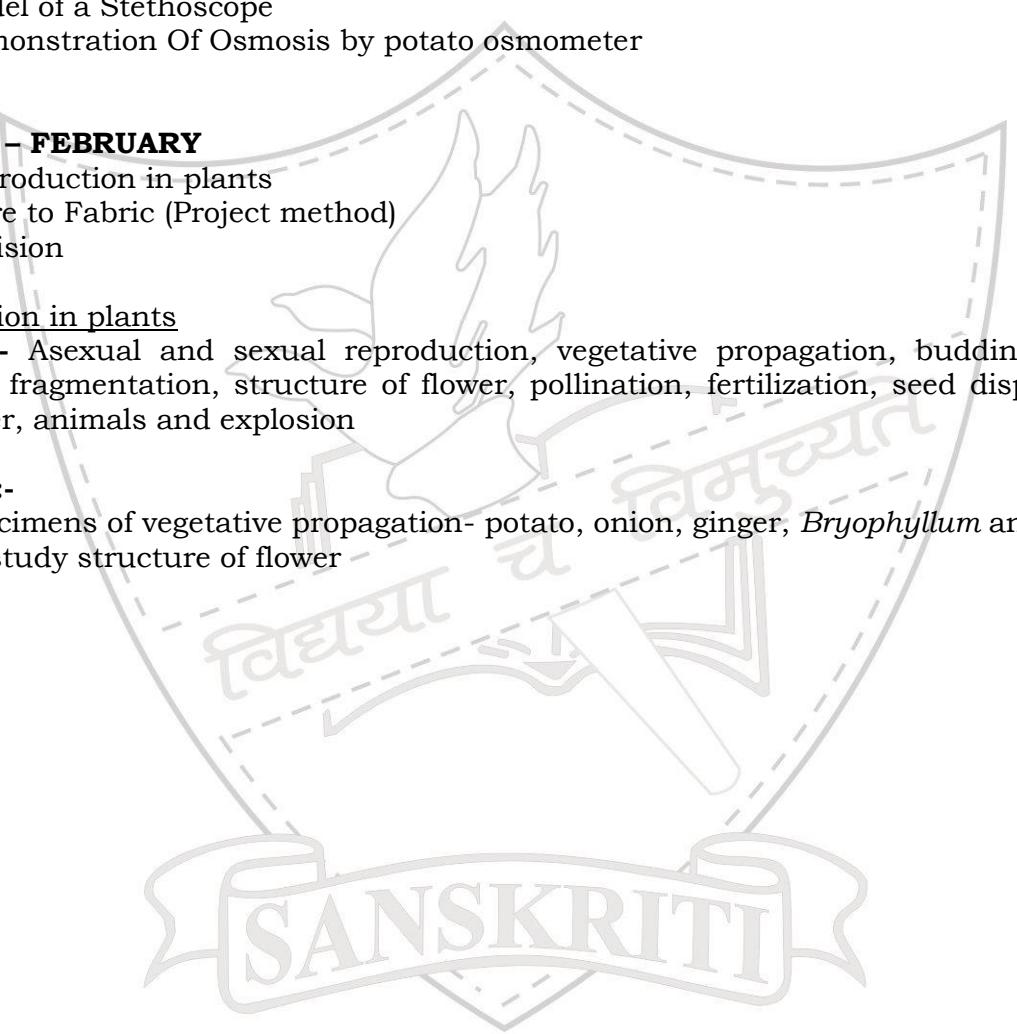
- Reproduction in plants
- Fibre to Fabric (Project method)
- Revision

Reproduction in plants

Concepts:- Asexual and sexual reproduction, vegetative propagation, budding , spore formation, fragmentation, structure of flower, pollination, fertilization, seed dispersal- by wind, water, animals and explosion

Activities:-

- Specimens of vegetative propagation- potato, onion, ginger, *Bryophyllum* and fern
- To study structure of flower



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Chapter- 1
NUTRITION IN PLANTS

EXPLANATORY NOTES FOR BETTER UNDERSTANDING

Nutrition- the process of manufacturing/taking in and utilizing food for various life processes.

TYPES OF NUTRITION

Autotrophic- In this process green plants take in inorganic substances like water, carbon dioxide, sunlight and chlorophyll and convert it to organic substances like glucose. Oxygen is given out in the process.

- 1) Plants need soil and atmosphere to grow.
- 2) They get water and minerals from the soil.
- 3) They get carbon dioxide from atmosphere.
- 4) They get light and temperature from sun.
- 5) They have a green pigment called chlorophyll, which is in abundance in their leaves.
- 6) Plants collect the raw material and food is made in the leaves.

Heterotrophic- In this process non- green plants and animals depend on green plants for their food. Heterotrophic mode of nutrition can be seen in different forms

1. Parasitic mode
2. Saprophytic mode
3. Carnivorous mode
4. Symbiotic mode

Parasitic mode—There are certain plants like Cuscuta that depend on other plants for their nutrition. These parasitic plants do not have chlorophyll. They are pale yellow in colour. They have special structures that help them to extract nutrition from other plants.

In parasitic mode of nutrition the organism which derives nutrients is called a Parasite. The organism which the parasite depends is called a Host.

Parasitic plants have specialised structures called haustoria to obtain food from their host plants.

Did you know????
Rafflesia(world's largest flower) is also a parasitic plant.

Saprotrophic mode

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These organisms grow on dead organic matter and obtain their food from them only, such mode of nutrition is called **saprophytic nutrition** and such plants are called **saprophytes**. These plants release enzymes outside their body, digest the organic matter and absorb them i.e. **extracellular digestion**.

Saprophytes (sapros-rotten, phyt-e-plants) are decomposers. Saprophytes breakdown complex organic matter for their use. In exchange they release vital chemicals into the soil. These are absorbed and used by autotrophs. We can say that saprotrophs help reuse and recycle the organic material. They also clean up the environment.

Carnivorous plants:

In some areas soil is deficient in certain nutrients, especially nitrogen. Hence plants growing in such areas need to obtain the same from other sources

Carnivorous plants are those plants that derive some of its nutrients by trapping and consuming animals, mainly insects. Therefore such plants are called **insectivorous plants**.

Some common examples are the pitcher plant, *Drosera*(sundew), bladderwort, and the Venus fly trap.

Plants requirement for nitrogen is supplied by the digested insects. Unlike parasitic plants like *Cuscuta*, the pitcher plant has chlorophyll. So it is a partial heterotroph.

Symbiotic plants:

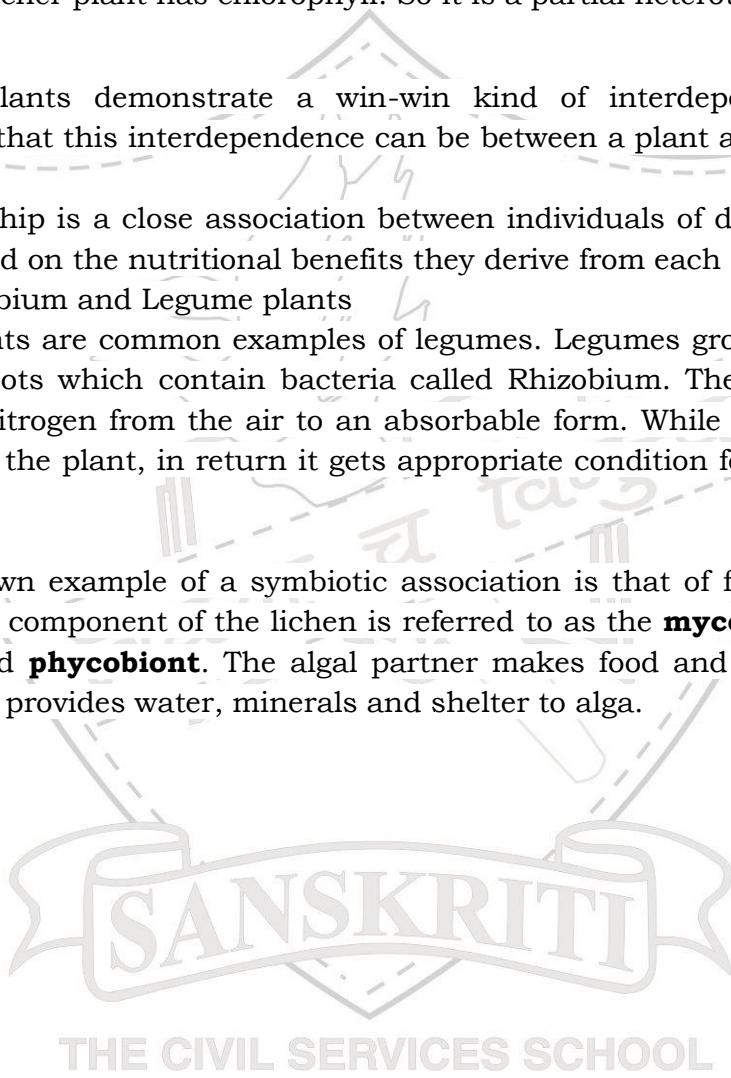
Some symbiotic plants demonstrate a win-win kind of interdependence. The most beautiful aspect is that this interdependence can be between a plant and bacteria or plant and fungus.

Symbiotic relationship is a close association between individuals of different species. The relationship is based on the nutritional benefits they derive from each other.

For Example-Rhizobium and Legume plants

Gram and pea plants are common examples of legumes. Legumes growing in soil develop nodules in their roots which contain bacteria called Rhizobium. The bacterium has the ability to convert nitrogen from the air to an absorbable form. While the bacteria provide usable nitrogen for the plant, in return it gets appropriate condition for its survival in the root nodule.

The most well known example of a symbiotic association is that of fungi and algae in a **lichen**. The fungus component of the lichen is referred to as the **mycobiont** and the algal component is called **phycobiont**. The algal partner makes food and provides it to fungi and in return fungi provides water, minerals and shelter to alga.



Assignment- 1.1

Trophic Terminology

- Grass ● Predators ● Algae ● Grasshopper
- Producers ● Consumers ● Hawk ● Photosynthetic

Autotrophs



Heterotrophs



Assignment- 1.2**I FILL IN THE BLANKS**

1. The components of food that are necessary for our body are called _____.
2. The components of food include _____, _____, _____, _____ and _____.
3. _____ and _____ are directly or indirectly dependent on plants.
4. _____ are the only organisms that can prepare their own food using _____, _____, _____, and _____.
5. _____ is the mode of taking food by an organism and its utilization by the body.
6. The green pigment in leaves is called _____.
7. _____ which is essential for the survival of all organisms is produced during photosynthesis.
8. During photosynthesis plants synthesize _____, which ultimately gets converted into _____.
9. Slimy, green patches in ponds and other stagnant water bodies are due to the growth of organisms called _____.
10. Carbohydrates are made of _____, _____ and _____.
11. _____ are nitrogenous substances that contain nitrogen.
12. Soil has certain _____ that convert gaseous nitrogen into usable form and release it into the soil.

II Answer the following:

1. Where do plants synthesize their food?
2. Why are algae green in colour? Where do they grow?
3. Why do organisms need to take food?
4. Write the word equation for photosynthesis.
5. Name the pores through which leaves exchange gases.
6. How does the following raw material reach the leaves of a plant for preparing food:
 - a. Water and minerals
 - b. Carbon-dioxide:
7. Explain photosynthesis in brief.

8. If two similar potted plants A & B are taken such that:
Plant A is kept in the dark or a black box for 72 hours (3 days),

Plant B is kept in sunlight.

Iodine test is conducted with the leaves of both plants.

Which plant leaf tests positive for the test and Why?

9. Why is the sun considered as the ultimate source of energy for all things?

10. Label the following diagram of stomata:



Assignment- 1.3**MULTIPLE CHOICE QUESTIONS:**

1. Plants take carbon dioxide from air during photosynthesis from
a. root hair b. Leaves c. Water d. Flowers
2. Presence of starch can be tested by
a. alcohol b. Iodine c. Water d. Hydrochloric acid
3. Which part of plant gets CO₂ from air during photosynthesis
a. root hair b. Sepal c. Stomata d. Leaf vein
4. Green plants are also known as
a. autotrophs b. Multicellular c. Carnivores d. Saprophytes
5. The green pigment in leaves help to
a. make food b. Absorb water c. Absorb sunlight d. Take in CO₂
6. In a cactus plant, the part responsible for photosynthesis is
a. leaf b. Thorn c. Root d. Stem
7. Which of these products is not stored as food in plants
a. protein b. Vitamins c. Oxalic acid d. Oil
8. The simplest carbohydrate made as food during photosynthesis is
a. starch b. Sugar c. Glucose d. Oil
9. Cuscuta plant can be categorized as
a. parasite b. Insectivorous c. Saprophyte d. Host
10. The plant that traps and feeds on insects
a. cuscuta b. China rose c. Rose d. Pitcher plant
11. The leather objects that are kept in hot humid weather for a long time are spoiled due to the growth of
a. algae b. Yeast c. Fungi d. Moss
12. The Rhizobium bacteria lives inside the root nodules of
a. peas b. Beans c. Peanuts d. All of the above

Lab activity

Objective: To test a leaf for presence of starch.

Materials required: Green leaves, Beaker, tripod stand, burner, test tube, alcohol, iodine solution, petridish, water.

Procedure:

Diagram:



Observation:

Conclusion:

Precautions:

Chapter 2 NUTRITION IN ANIMALS

EXPLANATORY NOTES FOR BETTER UNDERSTANDING

NUTRITION IN HUMANS

- The alimentary canal and the associated glands together constitute the digestive system.
- Food is taken into the body through the mouth. This process of taking food into the body is called ingestion.

What happens to the food in different parts of the digestive tract?

The mouth:

Our mouth has the salivary glands which secrete saliva. The saliva breaks down the starch into simple sugars.

Oesophagus –

- It is a long, narrow, muscular tube which directly leads to the stomach.
- It is about 25 cm long and passes downwards through the neck, the thorax and the abdominal cavity.
- Oesophagus gently pushes masticated food down to the stomach in a wave – like action, called peristalsis.

The stomach:

- The inner lining of the stomach secretes mucous, hydrochloric acid and digestive juices.
- The mucous protects the lining of the stomach from the acid present in the gastric juice.
- The hydrochloric acid kills many bacteria that enter along with the food and makes the medium in the stomach acidic.
- The digestive juices break down the proteins into simpler substances

The small intestine:

- The small intestine is highly coiled and is about 7.5 meters long.
- Liver (reddish brown) is the largest gland in the body.
- It secretes bile juice that is stored in a sac called the gall bladder. It digests fats.

- The pancreas, a cream colored gland secretes pancreatic juice that acts on carbohydrates and proteins and changes them into simpler forms.
- The carbohydrates get broken into simple sugars such as glucose, fats into fatty acids and glycerol, and proteins into amino acids
- The digested food can now pass into the blood vessels in the wall of the intestine having thousands of finger-like projections called villi.
- The surface of the villi absorbs the digested food materials. The absorbed substances are transported via the blood vessels to different organs of the body
- Large intestine: The food that remains undigested and unabsorbed then enters into the large intestine.
- It is about 1.5 meter in length.
- Its function is to absorb water and some salts from the undigested food material.
- The undigested food is removed from the body through the anus as faeces.

DIGESTION IN RUMINANTS

Rumination:

A process in which partially digested food returns to the mouth in small lumps and the animal chews it. This type of process is called Rumination and such types of animals are called Ruminants.

How does digestion occur in Ruminants grass-eating animals?

- Ruminants quickly swallow the grass and store it in a separate part of the stomach called rumen. Here the food gets partially digested and is called cud.
- Later the cud returns to the mouth in small lumps and the animal chews it. This process is called rumination.
- The cellulose present in grass is digested here by the action of certain bacteria which are not present in humans.

DIGESTION IN AMOEBA:

Amoeba is a single-celled organism found in pond water. It has a cell membrane, a dense, rounded nucleus and many bubble-like vacuoles. Amoeba constantly changes its shape and position. It pushes out one or more finger like projections, called pseudopodia or false feet for movement and capturing of food. *Amoeba* feeds on microscopic organisms. When it senses food, it pushes out pseudopodia around the food particle and engulfs it. The food becomes trapped in a food vacuole and digested by the digestive juices.

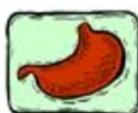
Assignment 2.1**To observe how animals take in food**

Find out about the food habits of the animals given below. Make a table in your notebook as shown here.

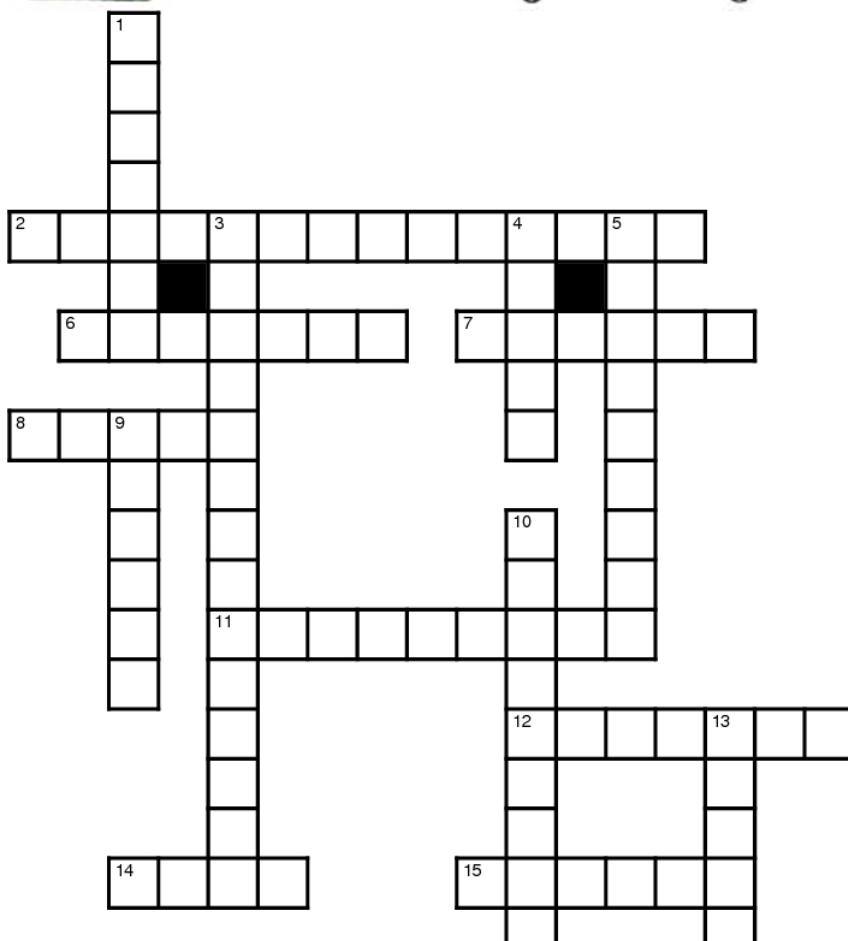
Name of the animal	Its food	How it procures its food
Starfish		
Octopus		
Beetle		
Leech		
Snake		
Earthworm		
Hawk		
Duck		



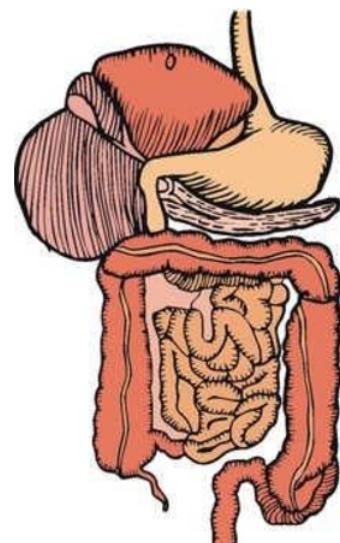
Assignment 2.2



The Human Digestive System



Find the digestive system words below in the grid to the left.

**Across**

2. A long folded tube inside the body attached to the stomach where nutrients in the food are absorbed.
6. A part of your throat that acts like a gateway sending air into the lungs and food down into the stomach.
7. The place where waste is stored before it leaves the body.
8. The part of the food that is not digested.
11. The tube that connects the stomach to the mouth.
12. A verb that means to push food through your pharynx.
14. Crush food with your teeth.
15. Muscle in your mouth that is used for pushing food around.

Down

1. After being swallowed, food goes to this place where it is mixed with acid.
3. The tube after the small intestine where liquid is absorbed.
4. These are used to chew food.
5. The good things in food.
9. A slippery liquid that makes food easy to swallow and helps to break the food down.
10. The process of breaking down food for use as energy and building materials for your body.
13. This produces juices (called bile) that go into the small intestine and help digest the food.

Assignment 2.3

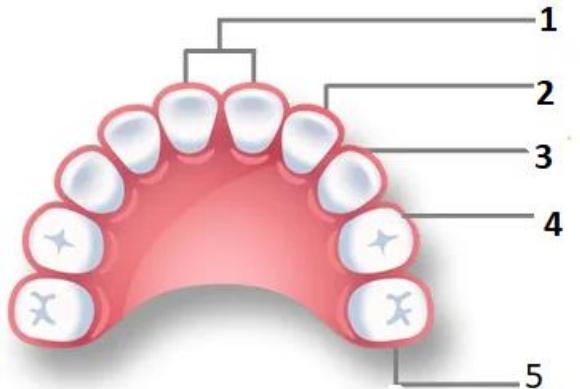
1. Fill in the blanks:

- _____ is the process of elimination of undigested material from the body.
- _____, Liver and _____ are the glands associated with the digestive system.
- Digestion begins in the _____ and ends in the _____ intestine.
- Food pipe or _____ connects mouth to stomach.
- _____ help in movement and _____ in *Amoeba*.

2. Complete the table given below:

JUICE	GLAND	LOCATION	ACTION OF JUICE
Saliva			
Bile			
Pancreatic juice			

- Name the largest gland of the human body.
- Give the function(s) of the following:
 - Rectum
 - Caecum in ruminants
 - Pseudopodia
 - Large intestine
 - Gall Bladder
- Give any two functions of our tongue besides talking.
- What would happen if there are no villi in the walls of small intestine?
- Differentiate between ingestion and egestion.
- If a piece of chapatti is chewed for sometime without swallowing it tastes sweet. Why?
- Give reasons, why cows are able to digest cellulose but human beings cannot?
- In the figure of human teeth given below, what do the given numbers indicate?



Assignment 2.4**Multiple choice questions**

Choose the correct option:

1. In which of the following organs of the alimentary canal, digestion of food does not take place?
 - a) Stomach
 - b) Small intestine
 - c) Large intestine
 - d) Mouth

2. The salivary enzymes convert
 - a) Complex sugars into amino acids
 - b) proteins into amino acids
 - c) Starch into simple sugars
 - d) fats into fatty acids and glycerol.

3. Which of the following teeth have similar function?
 - a) Molars and pre molars
 - b) incisors and molars
 - c) Canines and premolars
 - d) incisors and canines.

4. Which of the following gland secretes bile?
 - a) Salivary gland
 - b) liver
 - c) Pancreas
 - d) Intestinal gland

5. Which organ absorbs water and salts?
 - a) Stomach
 - b) Small intestine
 - c) Large intestine
 - d) Rectum.

6. Which animals depend both on plants and animals for their food?
 - a) Herbivores
 - b) Carnivores
 - c) Omnivores
 - d) Saprophytes

7. Intake of food is also known as:
 - a) Egestion
 - b) Ingestion
 - c) Digestion
 - d) Nutrition.

8. The hardest part of a tooth is:
 - a) Dentine
 - b) Enamel
 - c) Pulp
 - d) Gum

9. How many stomachs do ruminants have?
 - a) One
 - b) Four
 - c) Five
 - d) None

10. Which of these statements is true about the tongue:
 - a) It rolls the food into a bolus
 - b) it converts sugar into starch
 - c) It tears up food
 - d) it helps in chewing of food.

Lab activity

Objective: To test the activity of salivary amylase on starch.

Materials required: enzyme salivary amylase, starch solution, test tubes, iodine solution, dropper.

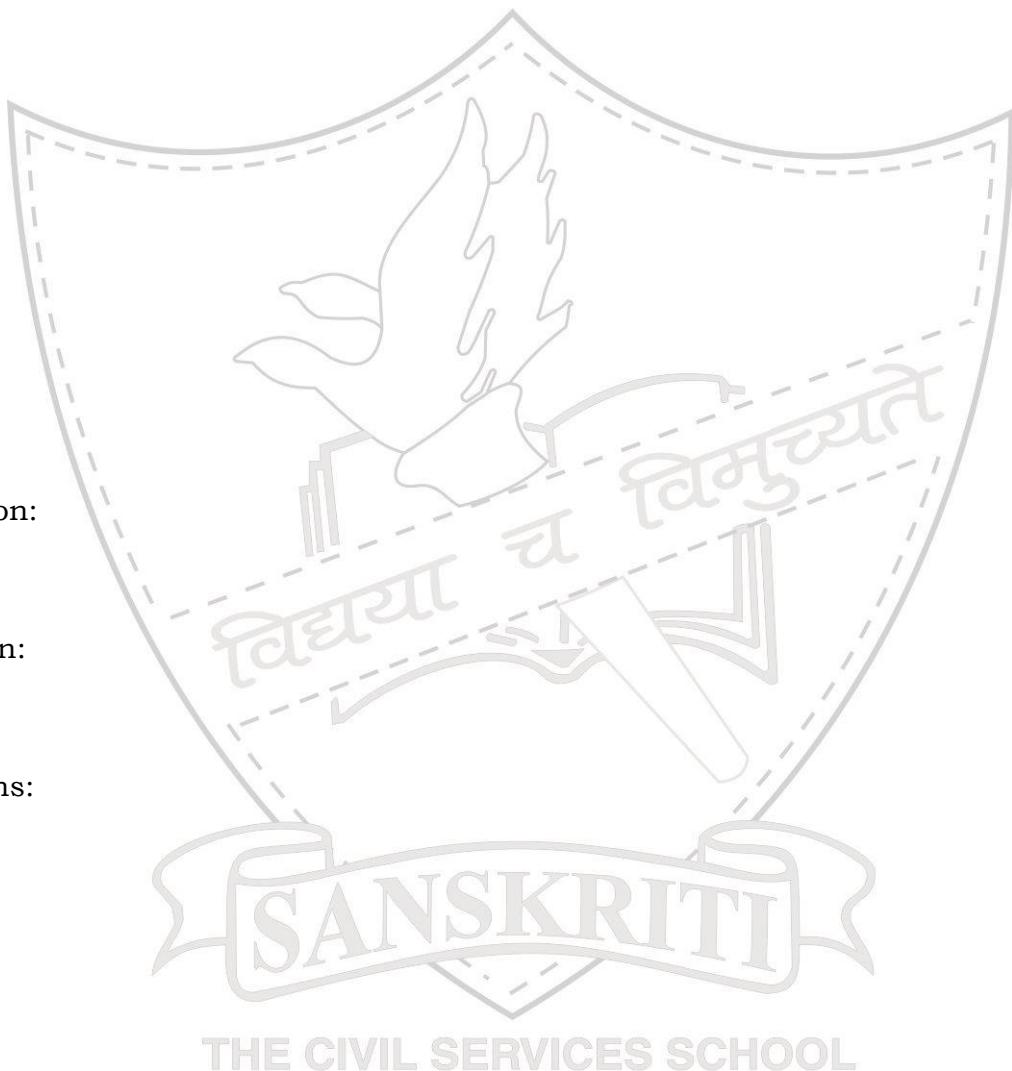
Procedure:

Diagram:

Observation:

Conclusion:

Precautions:



CHAPTER 3

Fibre to Fabric

This chapter will be done with the help of project method.

This chapter will not be evaluated in the exam.



Chapter 7

WEATHER, CLIMATE AND ADAPTATION OF ANIMALS TO CLIMATE

Climate and Adaptation- This Topic will be done as Project.



Chapter 9

SOIL

EXPLANATORY NOTES FOR BETTER UNDERSTANDING

The word soil is derived from a Latin word solum meaning ground. It is a stratified mixture of inorganic and organic materials, both of which are products of decomposition.

Inorganic component of soil i.e. mineral constituents are derived from the soil forming rocks, by fragmentation or weathering. Weathering of rocks takes place by two methods:

- Physical weathering – It is due to the action of rain, wind and temperature.
- Biological weathering of rocks – This is due to growth of lichens and mosses on the rocks. The organic component of the soil is formed either by microbial decomposition of dead remains of plants (litter) or animals, or through metabolic activities of living organism present in the soil. Thus the formation of soil takes place by interaction between the physical and biological components.

Soil can be defined as the uppermost crust of earth, which is mixed with organic material and in which animals and microorganisms live and plants grow.

Components of soil

- Inorganic material derived from parent (material) rocks
- Organic material derived from dead and decayed materials
- Biological system – such as bacteria, fungi, algae, protozoa and other soil animals such as nematodes, earthworms etc.

The air and water occupy the pores between the soil particles, which are loosely packed

Soil Profile:

A soil consists of three horizontal layers. They are true soil at the top, sub – soil and bedrock. Each horizon is different from other by its own physical and chemical composition and organic contents produced during the process of soil formation.

Soil is the medium for plant growth, it provides anchorage to plants.

- Soil provides nutrients, both major and minor, to plants for their growth and development. Thus, it circulates the nutrients into biological system by means of mineral weathering.
- Soil contains microorganisms such as bacteria and fungi, which fix the free atmospheric nitrogen into soil (nitrogen fixation) and at the same time, some of the fungi also fix phosphorus (Mycorrhiza).

Soil Texture :

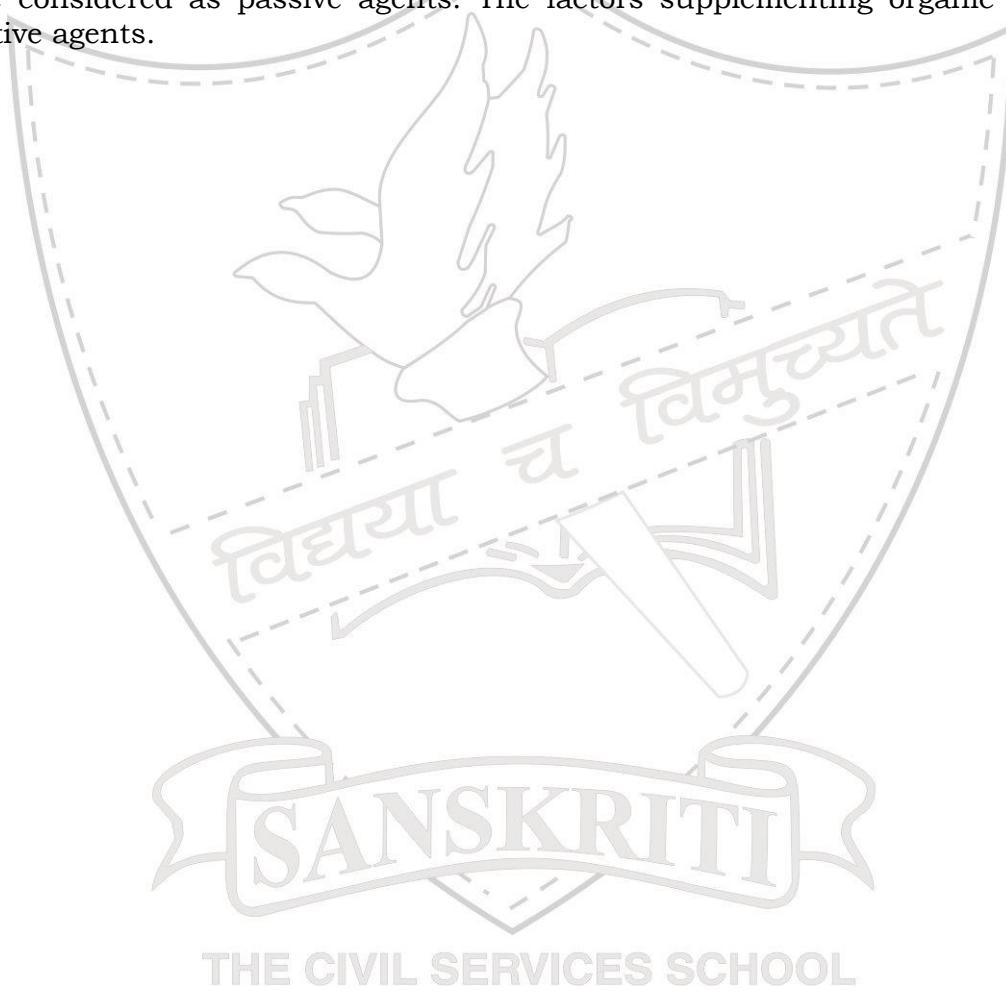
Soil texture refers to the mixture of different soil particles grading from coarse to fine grades of gravel, sand, silt and clay. Soils with a large proportion of sand grains are called Sandy Soils. Clayey soils have a large proportion of clay particles and a little of sand, and soils, with fairly equal proportions of sand, silt and clay are called loams.

Fertile Soil

Fertility of the soil is nothing but ability to nourish the plant life with required nutrients. The fertility of soil decreases when crop is grown in the same land repeatedly. Another cause of reduction of fertility of soil is soil erosion. Soil erosion refers to physical removal of soil particles from their original place and transportation to some other places. Soil fertility can be prolonged both by the human efforts (application of manures, bio-fertilizers, chemical fertilizers to soil of crop fields etc.) and natural processes.

Soil Formation:

Soil is a stratified mixture of organic and inorganic materials and both are decomposed products. The organic matter are derived from plant and animal life as well as moisture and air, while the inorganic matter is supplemented by parent rocks, topography and time which are considered as passive agents. The factors supplementing organic matter are called active agents.



Assignment 9.1

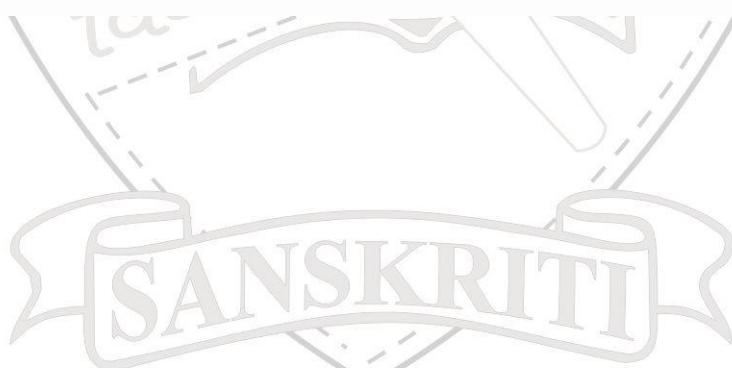
Soil

Let's play a game! Can you find all the words about soil? Circle them as you find them. Have fun!

B	S	D	W	H	U	M	U	S	H
ED	SIL	NU	E	D	C	SO	OR	AN	SAND
ROCK	LIT	UT	A	E	COM	SOIL	ORG	ANIC	LOAM
CLAY	CL	RI	H	CO	P	LI	ANIC	IC	
EX	E	IEN	M	PO	S	SH	Q		
X	F	N	I	PO	T	HD	Z		
WI	S	G	H	SH	H	NT	R		
		E	N	NT	D	S	A		

**Word Bank**

*Sand Silt Clay Loam Soil Compost Nutrients Organic
Decompose Humus Bedrock Weathering Erosion*

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Assignment 9.2

1. Fill in the blanks:
 - a) _____ is the process of breakdown of rocks by the action of wind, water and climate.
 - b) Dead plant and animal remains are decomposed to form _____.
 - c) _____ Soil has the right water holding capacity for the growth of the plants.
 - d) Clayey soil is suitable for growing _____ and _____.
 - e) _____ Soil is used for making pots, toys and statues.
2. Compare and contrast sandy and clayey soils on the basis of given criteria.

S.NO.	FEATURE	SANDY SOIL	CLAYEY SOIL
a.	Composition		
b.	Size of particles		
c.	Air spaces (large/small)		
d.	Porosity (high /low)		
e.	Water absorption tendency		
f.	Water holding ability		

3. Name the layer of soil which is rich in minerals and has compactly packed fine particles.
4. Topsoil also provides shelter to many organisms. Name them.
5. Give one characteristic features of C-Horizon and bedrock respectively.
6. Define Soil. How is soil classified? What is the criterion of this classification?
7. Why is top soil or A-Horizon dark in colour?
8. There are two soil samples A and B. It takes 10 min for 200 ml of water to flow through sample A and 5 min for the same amount of water to flow through sample B. Which of the given two samples will let water pass through more quickly? Justify.
(Hint: Calculate percolation rate of each sample)
9. Which type of soil is ideal for growing pulses? What is its composition? Give any two important features of this type of soil.
10. Draw a neat and well-labelled diagram of soil profile.



Multiple choice questions

Choose the correct option:

1. Loam is a mixture of:
 - a) Sand and clay
 - b) sand and silt
 - c) Clay and gravel
 - d) Clay and silt

2. The percolation rate of soil is:
 - a) The rate at which water enters and moves through the soil
 - b) the rate at which water is absorbed by the soil.
 - c) The rate at which water evaporates from the soil.
 - d) the rate at which soil loses water.

3. Which of these do not cause soil erosion?
 - a) Floods and heavy rains.
 - b) Drought
 - c) Deforestation
 - d) Afforestation.

4. Soils differ in different places due to?
 - a) Parent rock
 - b) temperature
 - c) Climate
 - d) slope of land

5. The rotting dead matter in soil is called:
 - a) Humus
 - b) Salt
 - c) Sugar
 - d) Protein

6. Humus and the smallest particles of rock form the?
 - a) A-horizon
 - b) B-horizon
 - c) C-horizon
 - d) Bedrock

7. Which type of soil is best for growing cotton?:
 - a) Sandy
 - b) Clayey
 - c) Loam
 - d) Sandy- Loam.

8. Which of these do not cause weathering?
 - a) Clouds
 - b) Wind
 - c) Flowing water
 - d) Freezing of rain water

9. Water logging can be expected in soil which is rich in?
 - a) Silt
 - b) Clay
 - c) Humus

10. Paddy grows best in:
 - a) Sandy soil
 - b) Sandy- Loam
 - c) Clayey Soil
 - d) Loamy soil.

LAB ACTIVITY 1

Objective: To study the profile of the soil.

Materials required: Glass jar, soil and water.

Procedure:

Diagram:

Observation:

Conclusion:

Precautions:

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LAB ACTIVITY 2

Objective: To investigate the absorption of water in different types of soil.

Materials required: 3 glass jars, 3 funnels, water, 3 different kinds of soil (loam, sand, clay), filter paper, weighing machine.

Procedure:

Diagram:



Observation:

Conclusion:

Precautions:

REVISION ASSIGNMENT**TERM 1****Answer the following questions:****M.M=30**

Q1 Give one word for the following:

1x5=5

- Process of breakdown of complex compounds into simple soluble molecules.
- In humans, this type of teeth is used for tearing.
- A tube which connects the buccal cavity with the stomach.
- A parasite plant with long yellow and slender stem.
- Green coloured pigment present in plants.

Q2 Define the following terms:

1x5=5

- Pseudopodia
- Assimilation
- Saprotrophs:
- Horizons:
- Photosynthesis

Q3 Give reasons for the following:

3

- While performing the starch test, chewed rice does not give blue black colour with iodine.
- In cities, the bore wells have to be dug very deep to get water whereas in villages it is not so.
- Soil becomes rich in nitrogenous compounds when leguminous plants are grown in it.

Q4 a. Define symbiotic relationship.

3

- Give two examples of symbiotic relationship in nature.

Q5 What is the end product after complete digestion of the following components of food:

3

- Starch
- Proteins
- Fats

Q6. Draw the diagram of stomata and label the following:

3

- Guard cells.
- Stomatal pore.

Q7 a) Water drains out very quickly from sandy soil. Why this would be a disadvantage for farmers trying to grow plants in sandy soil?

3

- A soil sample takes 45 minutes to percolate 900 ml of water. Find the percolation rate of the given soil sample.

Q8 a) Why do insectivorous plants feed on insects when they are green in colour and contain chlorophyll?

5

- Draw the diagram of a pitcher plant and give its two adaptations to trap insects.

CHAPTER 10 **RESPIRATION IN ORGANISMS**

EXPLANATORY NOTES FOR BETTER UNDERSTANDING

The cells of living organisms require a constant supply of oxygen to release energy. The energy released is used to carry out cellular processes.

HUMAN RESPIRATORY SYSTEM:

Breathing

It is the process by which organism takes in oxygen continuously and releases carbon dioxide into the environment.

- Breathing is a part of respiration and it is also referred to as external respiration.
- Breathing merely involves exchange of gases between the organism and the environment.
- Breathing is purely a physical process.
- Breathing is brought about by coordination between lungs, ribs and the diaphragm. Diaphragm is a thin sheet of skeletal muscle that separates the thoracic cavity from the abdominal cavity.
- It is a mechanical process that involves two steps – inhalation and exhalation.

a) Inhalation is the action of taking in air rich in oxygen. During inhalation, the rib cage moves outwards and the diaphragm contracts to move downwards. As the rib cage expands, the space in the chest cavity increases allowing air rich in oxygen enter the lungs.

b) Exhalation is the action of giving out air rich in carbon dioxide to the environment. During exhalation, the ribs move inwards and the diaphragm relaxes to return to its normal position. The contraction of rib cage reduces the size of the chest cavity. Now air rich in carbon dioxide is driven out of the lungs.

CELLULAR RESPIRATION	BREATHING
Cellular Respiration is a bio- chemical process.	Breathing is purely physical process.
It involves oxidation of food to release energy.	Breathing is the action of taking in oxygen and giving out carbon dioxide.
Respiration releases energy.	Breathing does not release any energy.
Respiration takes place in all the cells of the body.	Breathing takes place only in the organs involved in the process.

Breath and breathing rate

- One complete breath accounts for the sum of one inhalation and one exhalation.
- Breathing rate is the number of times a person breathes in one minute. Normal breathing rate in an individual during rest is 15 – 18 breaths per minute. Breathing rate increases drastically during exercise and running.

Respiratory system in human beings

Different organs of respiratory system include nostrils, larynx, trachea, bronchi, a pair of lungs, bronchioles and alveoli.

- a) During inhalation, nostrils take in the air which is moistened by the mucous secreted by the inner lining of the nose.

- The mucous lining present in the respiratory tract keeps the passage moist from the nasal cavity to the lungs.
 - Mucous and the hair in the nose entangle the dirt, pollen and other dust particles and prevent them from entering our nose.
- b) Air passes through the pharynx and enters the trachea made up of rings of cartilage. Trachea is also called as wind pipe.
- c) Trachea bifurcates into two stems called as bronchi (singular: bronchus).
- d) Lungs are situated inside the chest cavity and they rest on a large muscular sheet called the diaphragm.
- Diaphragm forms the floor of the chest cavity. When you breathe in, your diaphragm and rib cage get into action.
 - The diaphragm is protected by the rib cage.
 - The diaphragm plays an important role in inhalation and exhalation. Movement of diaphragm is brought about by special musculature.
- e) Each bronchus enters the lung on either side and gives out repeated branches named as bronchioles inside the lung.
- f) Bronchioles supply individual cells of the lung named as alveoli (singular: alveolus). Each lung is made up of 300 million alveoli.
- A group of alveolar cells are surrounded by blood vessels.
 - Oxygen that enters the lungs is exchanged with carbon dioxide from the tissues at this alveolar region.
 - Carbon dioxide is taken out in the same path through which oxygen entered inside.
- g) Carbon dioxide is released through nostrils by the process of exhalation.
- h) During exercise, breathing rate increases so as to obtain more amount of oxygen which in turn oxidizes more food to release more energy required.

Respiration in earthworms

Earthworms exhibit cutaneous respiration i.e. respiration by skin.

- Earthworms do not possess special organs for respiration.
- They always secrete slimy secretion onto the skin which keeps it moist.
- The skin in these animals is moist and slimy which makes it permeable for oxygen to diffuse in and carbon dioxide to diffuse out of the body.
- As the earthworms cannot breathe in waterlogged conditions, they come out on to the soil during rainy season to obtain oxygen required for respiration.

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Respiration in insects

An insect body is covered with air holes called as spiracles.

- Air enters through these air holes on the body and finally reaches the trachea.
- Trachea are a network of fine air tubes extending throughout the body.
- Trachea help in circulating the oxygen throughout the body.
- The oxygen in the air diffuses into the tissues and is ultimately absorbed by the cells.
- The carbon dioxide released by the cells is carried by the trachea and given out through the spiracles.

Respiration in fishes

Fish are the aquatic vertebrates which respire through structures called as gills. This is called as branchial respiration.

- Gills are present on either side of the head and are supplied by rich blood vessels.
- Fish obtain oxygen dissolved in water.
- During respiration, water enters the body through mouth, passes through gills and comes out of the operculum.
- Exchange of gases takes place in the gills of fish supplied by numerous blood vessels.
- They accept oxygen into the body and expel out carbon dioxide.

Respiration in frogs

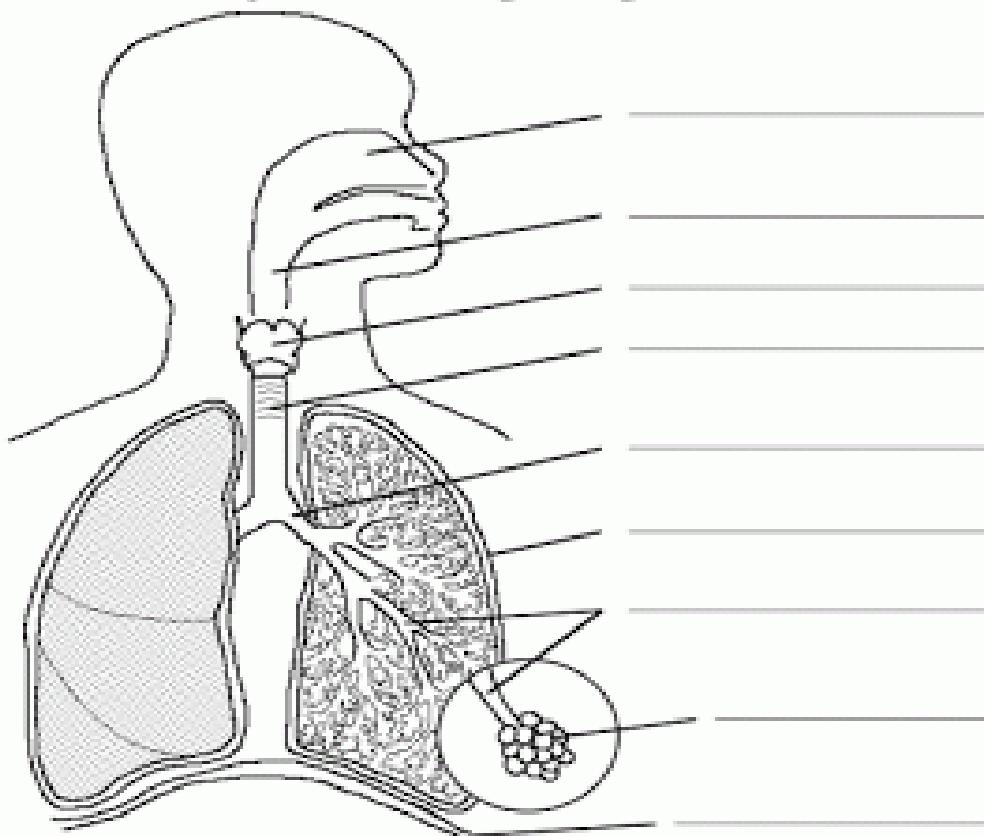
Frog is an amphibian having two lives, one in water and one on land.

- Adult frogs can breathe through their skin. Skin is moist and slimy helping the animal to respire through skin under water as well as on land. This is termed to be cutaneous respiration.
- Adult frogs while on land respire through lungs. Lungs are the respiratory organs which help in exchange of gases. This is termed to be pulmonary respiration.
- Tadpoles, the larval stages of frog live in water. They respire through their gills as they do not possess well developed lungs. This is termed to be branchial respiration.



Assignment 10.1

Respiratory System



alveoli	larynx (voice box)	bronchial tube
diaphragm	pharynx (throat)	bronchiode
pleura	trachea (windpipe)	nasal passage

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Assignment 10.2

Number the terms in the first column according to their correct sequence and also match them with their corresponding functions in the other column.

respiration	the exchange of oxygen and carbon dioxide
alveoli	microscopic air sacs, gas exchange occurs here
nose	the normal route for respiration
pharynx	used for respiration and digestion
nasal cavities	the inside of the nose
nostrils	the openings of the nasal cavities to the outside

Assignment 10.3**I Fill in the blanks:**

1. Oxygen we inhale is used to breakdown _____ into _____ and water and release _____ in the process.
2. The breakdown of glucose occurs in the cells of an organism and is called _____ respiration.
3. If the food is broken down with the use of oxygen it is called _____ respiration.
4. If the food is broken down without the use of oxygen it is called _____ respiration.
5. During heavy exercise, supply of oxygen to our _____ cells is insufficient and food breakdown is by _____ respiration.
6. During _____ our lungs expand and then come back to the original state as the air moves out during _____.
7. Increased _____ enhances the rate of breathing.
8. In animals like cow, buffalo, dog and cat the respiratory organs and the process of breathing are similar to those in _____.
9. In cockroaches, air enters the body through small openings on the side of the body called _____.
10. Heavy exercise always gives us cramps in the leg due to accumulation of _____.
11. Normal range of breathing in an adult person at rest is _____.
12. During exhalation ribs move _____ and _____, while diaphragm moves _____ to its former position.
13. Frogs breathe through their _____ and _____.
14. In anaerobic respiration, as in _____, glucose breaks down into _____ and CO_2 , and releases _____.
15. Earthworms breathe with their _____.
16. Leaves breathe through tiny pores called _____.

17. _____ are present in fish for breathing.
18. Insects have a network of air tubes called _____ for gas exchange.
19. The skeletal structures that surround the chest cavity are the _____.
20. The muscular floor of the chest cavity is called _____.
21. The openings through which we inhale are called _____.
22. Yeasts are used to make beer and _____ because when they breathe anaerobically they yield _____.
23. Our breathing involves the movement of the _____ and the _____.
24. Plants carry out both _____ and _____ during the day and only _____ during the night.

II Answer the following questions:

1. Why do you get muscle cramps after heavy exercise?
2. How can we get relief from cramps? Why does it give relief?
3. What do you mean by breathing? Can we survive without breathing ?
4. What is understood by 'breathing rate'? What is the normal breathing rate of an adult?
5. Why do we eat more and breathe faster after an exercise?
6. When is our breathing rate the slowest?
7. Describe the process of inhalation.
8. Give the formulas of aerobic and anaerobic respiration.
9. Why do we sneeze?

III. Give Reasons:

1. A child blows out air on the surface of a clean cold mirror and notices droplets of water after sometime. Why does this happen?
2. What will happen to a cockroach if it is made to drown in water?
3. Why should we breathe through the nose and not through the mouth?

Assignment 10.4**MULTIPLE CHOICE QUESTIONS**

1. What is the “pipe” between the mouth and stomach called?
 - a. Epiglottis
 - b. Trachea
 - c. Esophagus
 - d. Appendix

2. What are the increasingly smaller airways branching off into the lungs called?
 - a. Air sacs
 - b. Bronchial tubes
 - c. Capillaries
 - d. Lungs

3. What are the bubble-shaped sacs in the lungs where gas exchange takes place called?
 - a. Capillaries
 - b. Bronchial tubes
 - c. Alveoli
 - d. Lungs

4. When you inhale, the air pressure in the chest cavity...
 - a. stays the same, allowing both pressures to be equal
 - b. increases, allowing lungs to expand
 - c. decreases, allowing outside air to flow into the lungs
 - d. there is no air pressure in your chest cavity

5. Where does the transfer of oxygen into the bloodstream take place?
 - a. In the heart
 - b. In the trachea
 - c. In the alveoli
 - d. In the nasal passages

6. Emphysema is a disease of the lungs that can best be prevented by:
 - a. healthy diet
 - b. exercise
 - c. never smoking
 - d. taking vitamins

LAB ACTIVITY

Objective: To show that exhaled air contains carbon dioxide.

Materials required: Freshly prepared Lime water, straw, test tube.

Procedure:

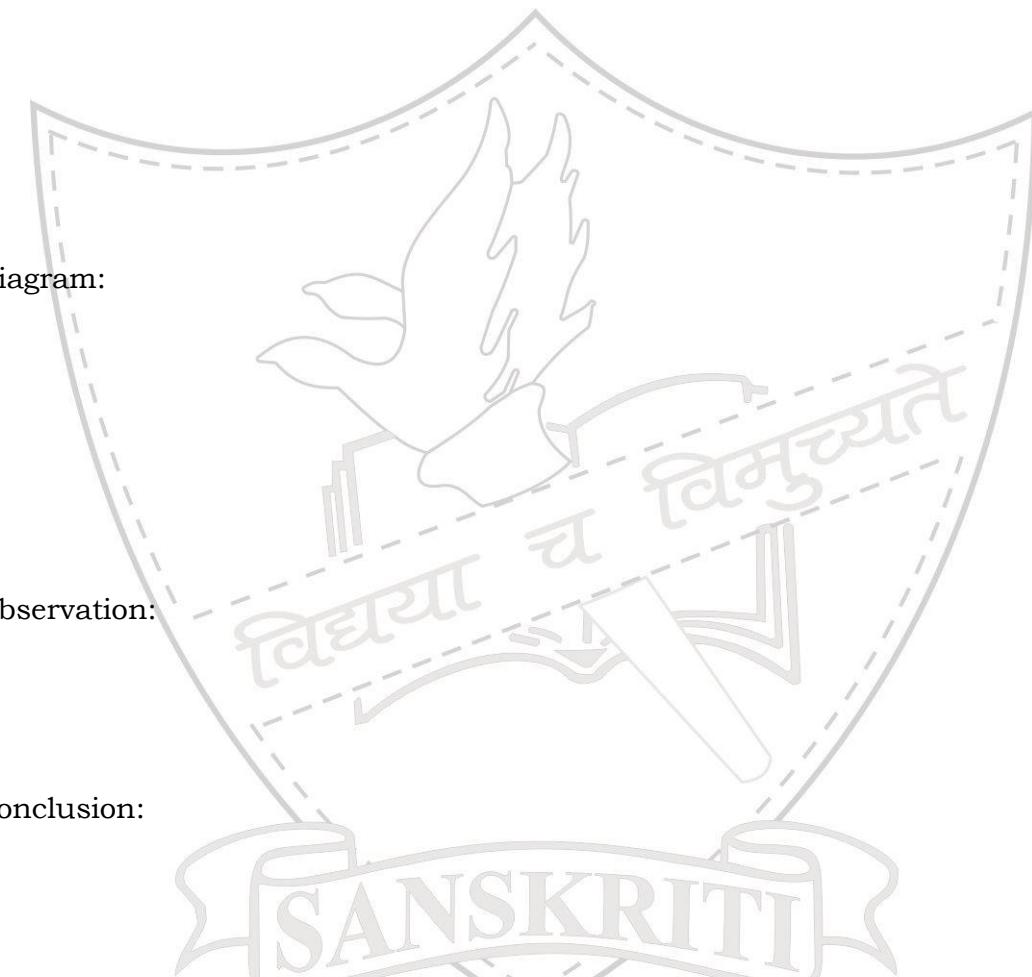
Diagram:

Observation:

Conclusion:

Precautions:

Equation of reaction:



CHAPTER 11

TRANSPORTATION IN ANIMALS AND PLANTS

EXPLANATORY NOTES FOR BETTER UNDERSTANDING

HUMAN CIRCULATORY SYSTEM

What is the job of the Circulatory System?

The **Circulatory System** is responsible for transporting materials throughout the entire body. It transports nutrients, water, and oxygen to your billions of body cells and carries away wastes such as carbon dioxide that body cells produce. It is an amazing highway that travels through your entire body connecting all your body cells.

Parts of the Circulatory System

The circulatory System is divided into three major parts:

1. The Heart
2. The Blood
3. The Blood Vessels

The Heart

The **Heart** is an amazing organ. The heart beats about 3 BILLION times during an average lifetime. It is a muscle about the size of your fist. The heart is located in the centre of your chest slightly to the left. Its job is to pump your blood and keep the blood moving throughout your body.

The Blood

It consists of fluid part the plasma and solid part consists of three types of cells.

Plasma

- Fluid part of blood which is straw colored
- 90-92% of plasma is water
- Carries carbon dioxide, hormones, waste, digested food, antibodies, some mineral ions, and enzymes.

Blood Cells

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Red Blood Cells are responsible for carrying oxygen. Red Blood Cells pick up oxygen in the lungs and transport it to all the body cells. There are about 4.5-5 million red blood cells in one cubic milliliter of blood. The RBC's contain an iron containing pigment called hemoglobin. Hemoglobin carries oxygen. They are biconcave disc shaped and live for 120 days.

White Blood Cells help the body fight off germs. White Blood Cells attack and destroy germs when they enter the body. When you have an infection your body will produce more White Blood Cells to help fight an infection. They are amoeboid in shape or may be oval in outline. Their number is 6,000-10,000 per cubic mm of

blood. They survive from few hours to few days. They are called soldiers of the body as they fight disease and provide immunity to the body.

Platelets are blood cells that help stop bleeding. When we cut ourselves we have broken a blood vessel and the blood leaks out. They help in clotting of blood. There are 250,000 platelets per cubic mm of blood. Their life span is about 25-29 days.

The Blood Vessels

There are three types of blood vessels in human body

1. Arteries
2. Capillaries
3. Veins

Arteries

- Carry blood away from the heart (always oxygenated other than the pulmonary artery which goes to the lungs)
- Have thick muscular walls
- Have small passageways for blood (internal **lumen**)
- Contain blood under high pressure
- No valves present and are located deep in the skin

Veins

- Carry blood to the heart (always de-oxygenated other than pulmonary vein which goes from the lungs to the heart)
- Have thin walls
- Have larger internal **lumen**
- Contain blood under low pressure
- Have valves to prevent blood flowing backwards and are close to skin

Capillaries

- Found in the muscles and lungs
- Microscopic – one cell thick
- Very low blood pressure
- Where **gas exchange** takes place. Oxygen passes through the capillary wall and into the tissues, carbon dioxide passes from the tissues into the blood

STRUCTURE and FUNCTION OF HUMAN HEART

The heart is a muscular organ about the size of a closed fist that functions as the body's circulatory pump. It takes in deoxygenated blood through the veins and delivers it to the lungs for oxygenation before pumping it into the various arteries (which provide oxygen and nutrients to body tissues by transporting the blood throughout the body). A double-walled sac called the pericardium encases the heart, which serves to protect the heart and anchor it inside the chest. The muscles that make up the human heart are called cardiac muscles.

Chambers of the Heart

- The heart contains 4 chambers: the **right atrium**, **left atrium**, **right ventricle**, and **left ventricle**.

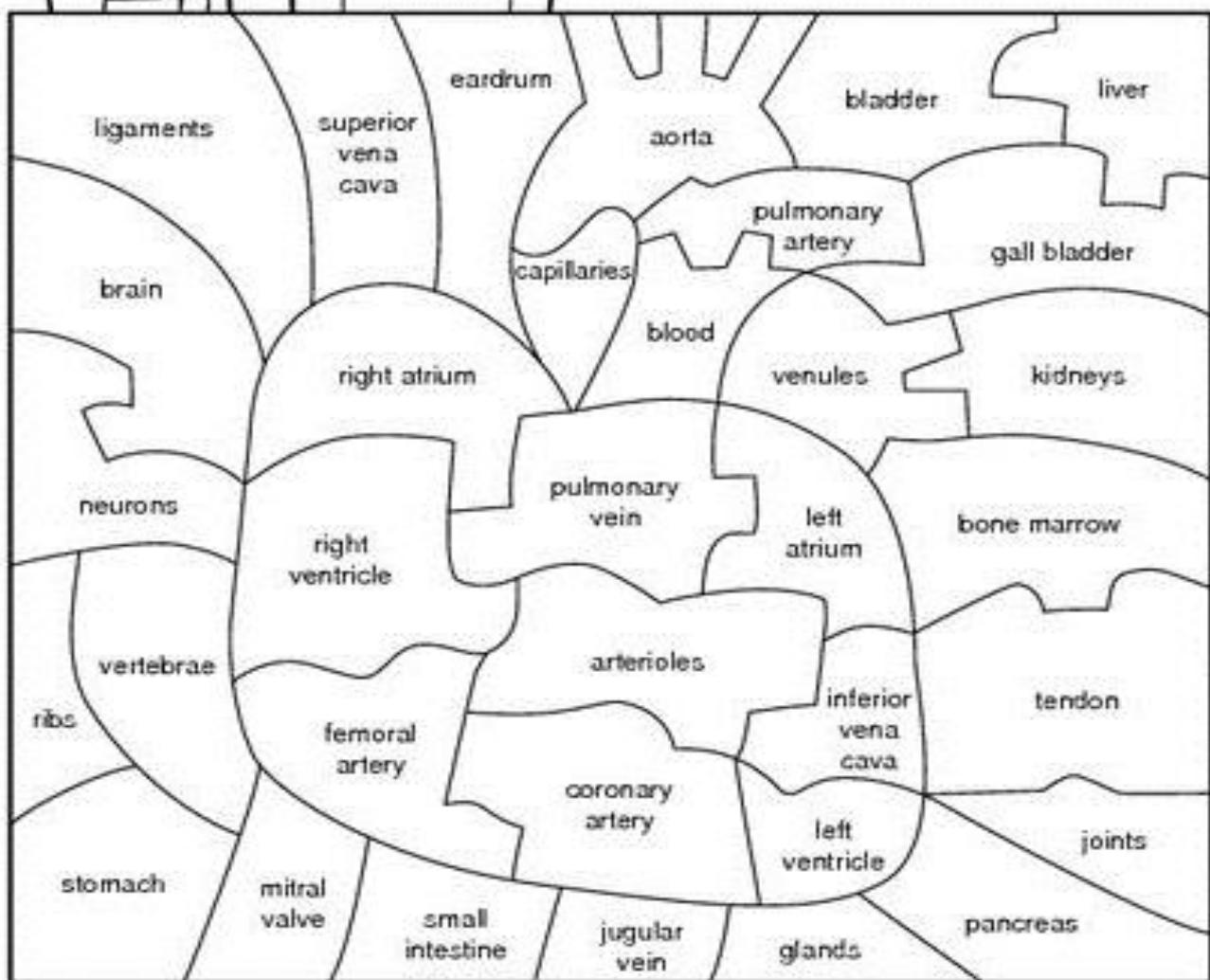
- The atria are chambers on top, are smaller than the ventricles and have thinner, less muscular walls than the ventricles.
- The atria act as receiving chambers for blood, so they are connected to the veins that carry blood to the heart.
- The ventricles are the larger, stronger pumping chambers that send blood out of the heart. The ventricles are connected to the arteries that carry blood away from the heart.
- A wall of muscle called the septum separates the two sides of the heart.
- Each atria open into the respective ventricle through an aperture or hole which is guarded by a valve. (Tricuspid and Bicuspid Valves)
- The heart pumps oxygenated blood into the main artery called Aorta that leaves the left ventricle.
- Aorta carries oxygen rich blood to all organs of the body.
- The main vein called Vena Cava brings CO₂ rich blood back to the right atrium.
- From right atrium blood goes to right ventricle
- The contraction of the right ventricle pushes the blood into the pulmonary artery that carries CO₂ rich blood to the lungs for oxygenation.
- The oxygenated blood from the lungs is brought back to the left atrium by the pulmonary vein.
- The oxygenated blood from the left atrium is sent to the left ventricle and then to all parts of the body through the Aorta.
- At the base of Aorta and Pulmonary artery semi- lunar valves are present that prevent the backflow of blood.
- Thus there is double circulation of blood in humans
- Between heart and body organs- systemic circulation
- Between heart and lungs- pulmonary circulation

Assignment 11.1

Name _____ Date _____

**Puzzling Parts**

Help Maya complete the circulatory system puzzle below. Color the puzzle piece red if the term is part of the circulatory system. Color the puzzle piece blue if the term is not part of the circulatory system.

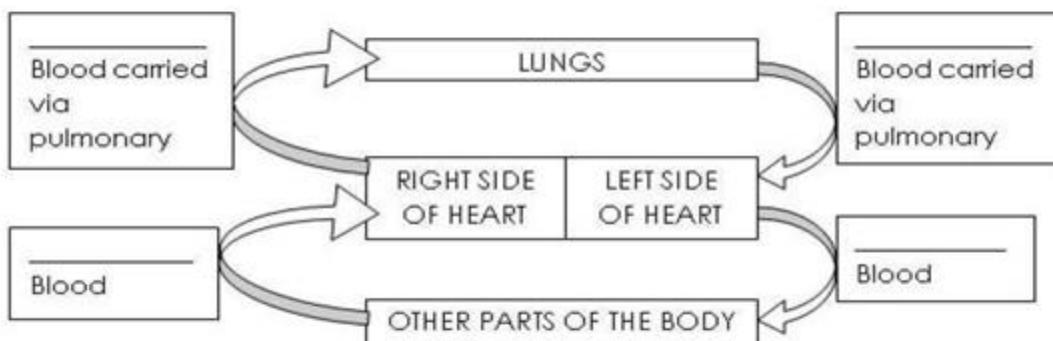


Assignment 11.2

1. Fill in the blanks:

- _____ carry blood from all parts of the body back to heart.
- The process that causes ascent of water in plants is called _____.
- A normal heart beats about _____ times per minute which can be measured with the help of an instrument called _____.
- The _____ present in _____ blood cells transports oxygen to all parts of the body.
- The main organs of excretion in the human body are _____ and an adult human being passes about _____ L of urine per day.

2. Complete the flow diagram given below:



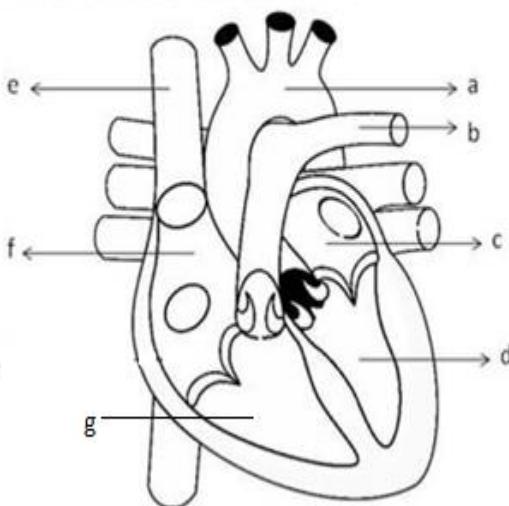
Word Bank: Oxygen-rich, carbon-dioxide rich, artery, vein.

3. Give **one** function of each of the following:

- Urinary Bladder
- Blood platelets
- Haemoglobin
- Capillaries
- Stomata

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4. Name the artery that carries oxygen rich blood from left ventricle to all parts of the body.
5. Define Pulse.
6. Give the composition of urine formed in humans.
7. Differentiate between the following pairs:
 - a) Xylem and Phloem
 - b) Arteries and Veins
 - c) Egestion and Excretion
8. List any three functions of blood.
9. What is the significance of sweat formation in humans?
10. Root hair help the plants to absorb water and minerals. How?
11. What prevents mixing of oxygen rich blood and carbon dioxide rich blood in human heart?
12. Sponges and Hydra neither require a circulatory system nor a circulatory fluid like blood. Why?
13. In a state of bacterial infection like cholera, which cells are expected to attack the germs?
14. Draw neat and well-labelled diagrams of the following:
 - a) Circulation of blood in humans
 - b) Human Excretory System
15. Label the diagrams given below:



HUMAN HEART



STETHOSCOPE

Assignment 11.3**Multiple choice questions**

Q1: Name the pigment which gives red color to the blood in mammals.

- (a) Globulin
- (b) Haemoglobin
- (c) Plasma
- (d) Platelets

Q2: The fluid part of the blood is called _____

- (a) RBCs
- (b) Plasma
- (c) Haemoglobin
- (d) WBCs

Q3: Which component of blood in mammals build up defense against harmful germs enter in the body?

- (a) RBCs
- (b) Plasma
- (c) Platelets
- (d) WBCs

Q4: Upper chambers of a human heart are called?

- (a) atria
- (b) ventricles
- (c) pulmunary vein
- (d) vena cava

Q5: The filtering of blood through an artificial kidney is called _____

- (a) circulation
- (b) transportation
- (c) dialysis
- (d) diffusion

Q6: Name the scientist who discovered blood circulation?

- (a) Isaac Newton
- (b) Christiaan Barnard
- (c) William Harvey
- (d) William Thomson

Q7: The major excretory product in humans is _____

- (a) uric acid
- (b) ammonia
- (c) feaces
- (d) urea

Q8: Vascular tissues that transport water and nutrients in plants are called _____.

- (a) Veins
- (b) Phloem
- (c) Xylem
- (d) Root Hairs

Q9: Phloem helps in the transport of _____ in plants.

- (a) food
- (b) water
- (c) minerals
- (d) carbon dioxide

Q10: What is the heart rate of a normal adult human?

- (a) 90-120 times per minute
- (b) 70-80 times per minute
- (c) 40-50 times per minute
- (d) 10-20 times per minute



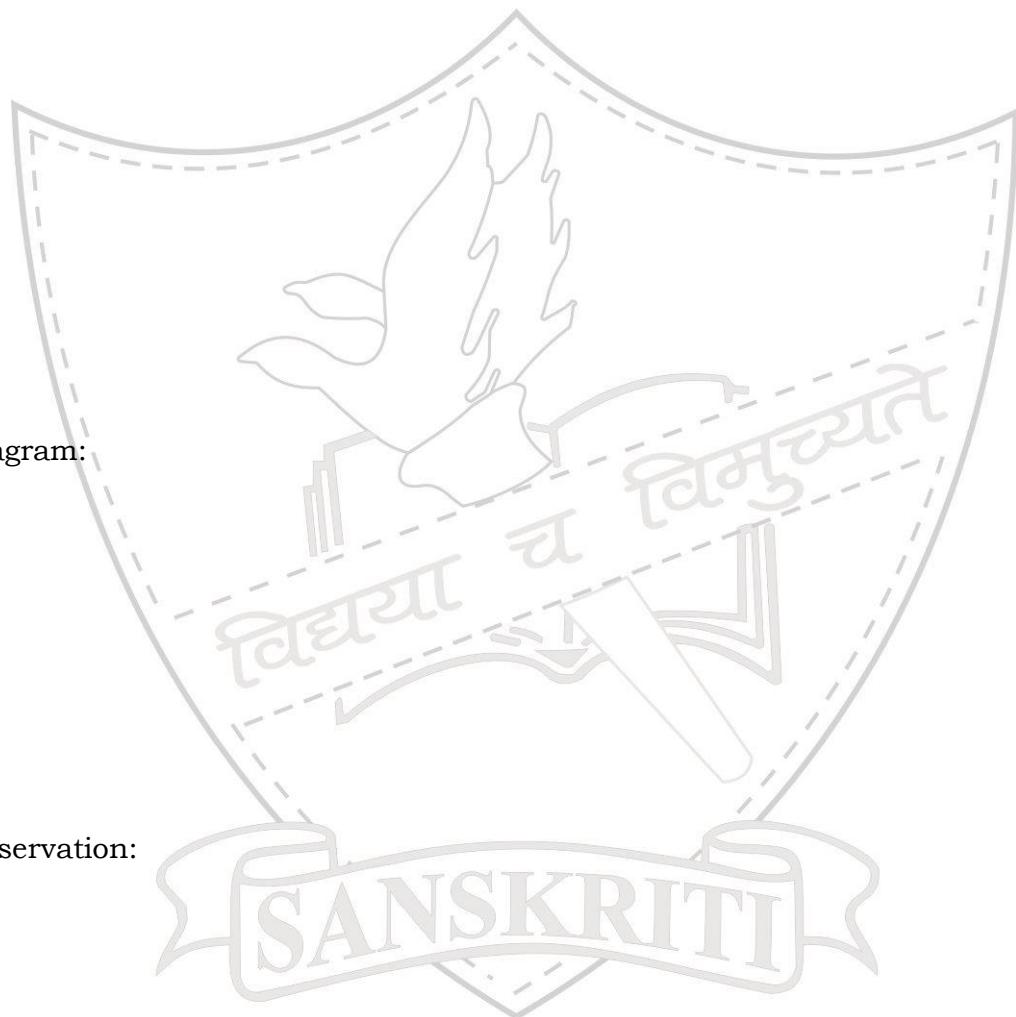
LAB ACTIVITY

Objective: To show transportation of water through the cells of potato.

Material required: 2 potatoes, peeler, knife, salt solution, coloured water, pins, and petridish.

Procedure:

Diagram:



Observation:

Conclusion:

Precautions:

Chapter 12

Reproduction in Plants

EXPLANATORY NOTES FOR BETTER UNDERSTANDING

Reproduction

Reproduction is the process by which living organisms produce more of their kind. Plants reproduce either sexually or asexually.

I. Asexual mode of reproduction

It is the process which involves single parent giving rise to offspring. It is the growth of a new plant from a part of the plant other than the seed.

Modes of asexual reproduction in plants

Plants reproducing by asexual mode do not produce gametes. A single parent multiplies to give rise to new individuals. Different modes of asexual reproduction in plants are elucidated.

1. Vegetative propagation is the production of new plants from the vegetative parts of the plant. Roots, stems and leaves are called the vegetative parts of a plant.
Vegetative propagation takes place by different methods like Leaf propagation, Root propagation, Underground stem propagation etc.
 - a) Leaf propagation: *Bryophyllum* propagates vegetatively by the formation of leaf buds on the margins of a leaf. When the buds come in contact with moist soil, each bud is capable of growing into a new plant.
 - b) Root propagation: Sweet potato and Dahlia are cut into many pieces and are covered with mud. Each piece of the root tuber is capable of growing into young plant.
 - c) Stem propagation: In money plant, stem is cut and one side of it is buried in the soil. This stem from the parent plant grows into a new plant.
 - d) Underground stem tuber propagation: Potato is a stem tuber growing underground. It bears special structures called as eyes on it. When a potato is cut and buried under the soil. Each eye having a bud developed into a new plant.
 - e) Underground stem propagation: Ginger is an underground stem called as rhizome. It has lot of scaly leaves at nodes. These when buried under the soil gave rise to new plants.

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2. Budding involves the growth of a small bulb-like projection called as bud. This bud grows and detaches itself from the parent cell to grow independently into a new organism.
 - a. Yeast reproduces by budding.
 - b. Yeast is a unicellular organism belonging to the category of Fungi.
 - c. Little amount of cytoplasm forms a protuberance.
 - d. Nucleus divides into two. One nucleus migrates into the bud.
 - e. Bud gets detached from the parent to develop into new individual.
 - f. During budding, yeast respires and releases carbon dioxide.

- g. The carbon dioxide released helps the dough to puff up and become spongy. Hence, it is used to bake a cake and to make dough.
- 3.** Fragmentation involves breaking down of filaments into fragments that grow into young ones. Example Spirogyra
- Algae are green, thread-like plants that grow in stagnant water, ponds and lakes.
 - They float on the surface of the water causing algal bloom.
 - Algae reproduce by the method of fragmentation.
 - As it is a multicellular organism, each cell strips off as a fragment and falls on the substratum
 - It gets its strength to develop into new individual.
- 4.** Spore formation is the method of developing new individuals by forming reproductive structures called spores.
- A spore is a small spherical or oval structure which protects the future individual in a thick protective covering.
 - Spore germinates on a substratum under favourable conditions.
 - Some organisms like ferns, some groups of fungi reproduce by spore formation.
- Ferns reproduce by releasing spores that germinate into young ones.
 - Fungus reproduces by means of spores. Fungus like bread mould produces spores which germinate on moist organic surfaces. The cottony white mass on bread formed by fungus after spore germination is called a mould. Spores can survive in extreme conditions because of the protective hard coat.
 - Moss also reproduces by spores.

II. Sexual mode of reproduction

This type of reproduction involves two organisms of opposite sex, the male and the female. Reproductive organs in plants produce gametes – ovules (eggs) and pollen grains.

- Egg is the female gamete produced by ovary.
- Pollen grains are male gametes produced by stamens.
- A zygote is the future individual formed by the fusion of an egg and a pollen grain. Zygote develops into a seed.
- Seeds enclose embryo, the future individual until favourable conditions prevail for the development of embryo into a plantlet.

Reproductive structures of a plant

Flowers are the reproductive structures which help the plant to undergo the process of sexual reproduction. These are the most attractive parts of the plant. A flower may have a stalk-like structure called the pedicel which helps in its attachment to the plant.

Structure of a flower

A complete flower is made up of four whorls on it. These are sepals, petals, stamens and the pistil. These four whorls are attached to flattened tip of the flower called as receptacle.

- Sepals collectively form calyx. These protect the inner parts of the flower in its bud condition.
- Petals collectively form corolla. These are the coloured structures which attract insects and birds for pollination.
- Stamens are the male reproductive parts. Stamen is made up of two structures namely, a filament and an anther. Filament is a tubular structure. Anther is a knob-like structure containing pollen grains. Pollen grains act as the male gametes or the male reproductive cells.
- Pistil is the centrally located female reproductive part of a flower. It is made up of stigma, style and the ovary. The stigma is a flattened structure which receives the pollen. It is sticky in nature. The style is long tubular structure which conveys pollen to the ovary. The ovary contains numerous ovules. Each ovule contains a female gamete or egg cell.

Types of flowers

Flowers based on the reproductive whorls they carry, can be classified into unisexual flowers and bisexual flowers.

- A unisexual flower is the flower which consists of either stamens or pistil. A flower with a whorl of stamens is called as male flower. A flower with just a pistil is called as a female flower.
- A bisexual flower is the flower which consists both the whorls of stamens and pistil. i.e. male and female reproductive structures.

Pollination

Pollination is the transfer of pollen from the stamen to the stigma.

- Different factors which help in the transfer of pollen are called as agents of pollination. Agents of pollination include air, water, birds, insects, animals etc.
- Pollination can be of two types namely, self-pollination and cross-pollination.
- Self pollination is the transfer of pollen from the stamen to the stigma of the same flower. Cross-pollination is the transfer of pollen from the stamen of one flower to the stigma of another flower on a different plant of the same kind.

SELF POLLINATION	CROSS-POLLINATION
It occurs within the same flower	It occurs between different flowers
It does not require any agents for pollination.	It requires agents like air, water etc for pollination.

Fertilization

- Stigma of the flower secretes sugary substances.
- As the pollen grains from the stamen fall on the stigma, they recognise the sugary substance and germinate to produce a structure called as pollen tube.
- Pollen tube grows in size through style to reach the egg in the ovary.
- As it reaches the ovule, the tip of the tube opens and releases male gametes to fertilise the egg cell.
- The fusion of a male gamete and a female gamete to produce a zygote – single cell.
- Zygote which develops into an embryo.
- Fertilized ovary becomes a fruit.
- The ovule develops into a seed.

Formation of seed

There occur some changes in the flower after the process of fertilization.

- Sepals, petals, stigma and the style fall off leaving the fertilized ovary.
- Zygote utilises the reserved food in the ovule to divide and transform into an embryo.
- Walls of the ovule develop hard layers of the seed.
- A seed contains a young plant and stored food in the form of cotyledons.

Formation of fruit

Ovary grows in size due to formation of seeds. This well-grown fertilized ovary becomes the fruit. A fruit can have any number of seeds in it. Fruits can be fleshy or dry in nature.

Assignment 12.1

Watch the video shown in class and then complete the following write up:

When an organism reproduces it makes another organism of the same _____.

Some organisms reproduce _____. Cows make more cows and pigs make more pigs.

Sexual reproduction combines genes from a mother and a father, making a genetically _____ organism.

Other organisms reproduce asexually. In asexual reproduction, all the genes come from a _____ parent. Asexually produced offspring are genetically _____ to the parent.

There are many **methods¹** of asexual reproduction. In some one-celled organisms, _____ is a method of asexual reproduction. Bacteria cells reproduce through cell division. The cell makes a copy of its _____ then sends the copy into a new bacteria cell. Some bacteria cells can reproduce fast, making a new cell every 20 minutes.

Another method of asexual reproduction is budding. Unicellular yeast cells grow new cells off of the _____ of another. When the cell is developed it falls off and a new _____ cell is produced.

Some organisms produce offspring by splitting into pieces. A sea anemone can split down the middle resulting in the production of another individual _____ to the original. Some worms if split will continue to live as _____ identical worms.

Both sexual and asexual reproduction produce _____. However, asexual reproduction makes genetically _____ offspring and sexual reproduction makes _____ offspring.

Try taking a _____ of a plant. You will be making another that has the same DNA as the parent plant. You just helped the plant to reproduce asexually!

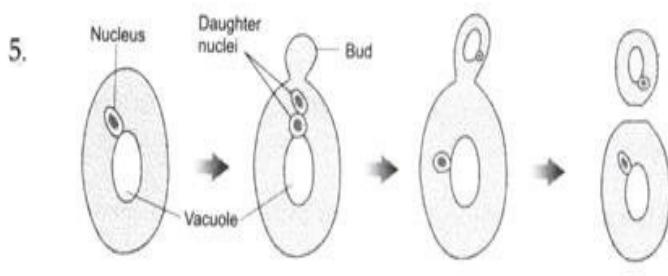
Assignment 12.2

1. Fill in the blanks:
 - a) _____ is the reproductive part of a plant.
 - b) Fungi, ferns and mosses reproduce by _____.
 - c) A type of asexual reproduction in plants in which roots, stems and leaves are used is called _____.
 - d) Reproduction or propagation by stem is common in _____.

2. Circle the **odd one out** and give reasons for the choice of your answer:
 - a) Leaf, root, stem, flower.
 - b) Budding, spore formation, fruit formation, fragmentation.
 - c) Anther, stigma, ovary, style.
 - d) Rose, papaya, *Petunia*, mustard

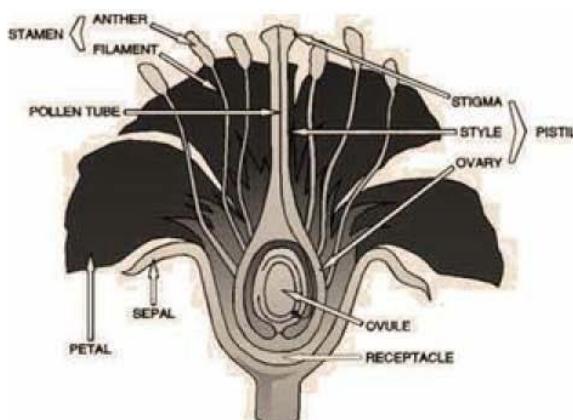
3. Differentiate between the following and give **examples** wherever possible:
 - a) Asexual and sexual reproduction.
 - b) Stamen and Pistil
 - c) Self-pollination and cross-pollination.
 - d) Unisexual and bisexual flowers.

4. Write the correct sequence of the following events that take place during sexual reproduction in plants:
Fertilisation, pollination, development of embryo, germination of pollen tube, seed formation, falling off of all parts of flower except ovary.



- a) Name the type of asexual reproduction shown in the above diagram.
- b) Give an example of organism showing the above method of reproduction.

6. Describe the process of fragmentation with the help of a diagram.
7. Define fertilisation. List the sequence of events that take place in a flower after fertilisation.
8. Give any two uses of seed dispersal. How are the seeds of following plants dispersed?
 - a) Grass
 - b) *Urena*
 - c) Coconut
 - d) *Xanthium*
 - e) Drumstick
9. In the diagram of the flower given below:



- a) Where is female gamete or egg formed?
- b) Which part of the flower contains pollen grains?
- c) Name the parts of the flower that form the fruit and seeds respectively.
10. Draw neat and well-labelled diagrams of the following:
 - a) Maple seed
 - b) Stamen
 - c) Pistil
 - d) Leaf of *Bryophyllum* showing leaf buds.

Assignment 12.3**Multiple choice questions**

1. The production of new individuals from their parents is known as _____
a. Reproduction b. Production c. Vegetative propagation d. Sprouting
2. The process by which plants give rise to new plants without seeds is called
a. Sexual Reproduction b. Asexual Reproduction c. Vegetative Propagation
d. Budding
3. Reproduction through the vegetative parts of a plant is known as
a. Sexual Reproduction b. Asexual Reproduction
c. Vegetative Propagation d. Pollination
4. Male reproductive part of a plant is
a. Pores b. Pistil c. Stamen d. Fusion
5. Reproduction through spore formation takes place in
a. Fem b. Algae c. Fungi d. Yeast
6. Reproduction in yeast takes place by
a. Zygote b. Spore formation c. Fragmentation d. Budding.
7. The flowers which contain either only the pistil or only the stamens are called
a. Unisexual flowers b. Bisexual flowers c. Asexual flowers d. None of the above
8. The transfer of pollen from the anther to the stigma of a flower is called
a. Budding b. Spore formation c. Fragmentation d. Pollination
9. The cell which results after fusion of the gametes is called
a. Spore b. Embryo c. Zygote d. Pistil
10. The female reproductive part of a plant is []
a. Pistil b. Stamen c. Bud d. Spore

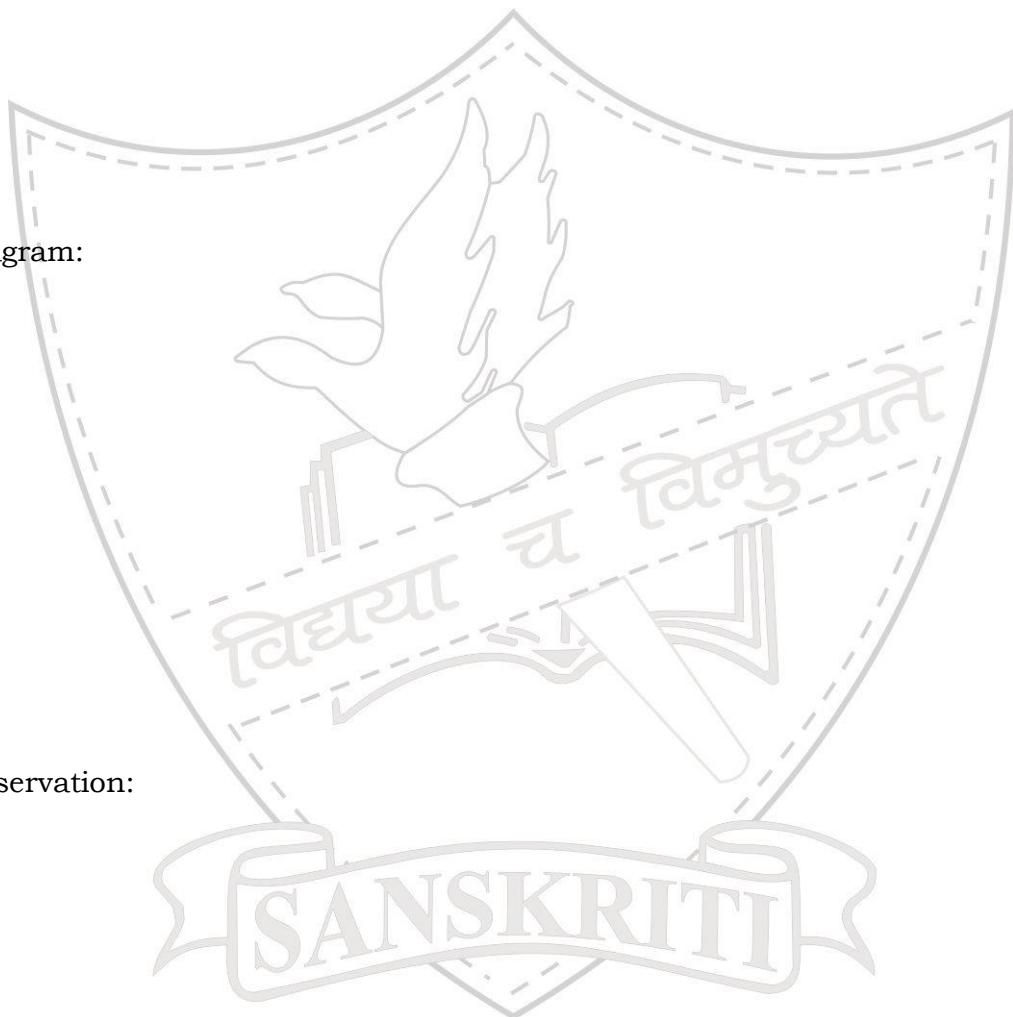
LAB ACTIVITY

Objective: To study the parts of a flower.

Materials required: China rose flower, forceps, and hand lens, dissecting blade, microscope and needle.

Procedure:

Diagram:



Observation:

Precautions: THE CIVIL SERVICES SCHOOL

Chapter 17

Forests: Our Lifeline

- This chapter would not be evaluated in the exam and would be done by project method.



REVISION ASSIGNMENT
TERM 2

Q1	Fill in the blanks:	0.5x4=2
a)	Insects have _____ for breathing.	
b)	The amount of nitrogen in inhaled and exhaled air is_____.	
c)	Fusion of male and female gamete produces_____.	
d)	Moss reproduces by_____.	
Q2	Name the following:	0.5x4=2
a)	A device to amplify the sound of the heart.	
b)	Red pigment in blood.	
c)	Vascular tissue which transports food in plants.	
d)	Process of removal of metabolic waste from the body.	
Q3	Explain how the roots of the plants also show respiration. Support your answer with a suitable diagram.	2
Q4	Give one difference between the following:	2
a)	Inhalation and exhalation	
b)	Anaerobic and aerobic respiration.	
Q5	Name the three cellular components of blood and state their functions.	3
Q6	Draw the diagram of a human respiratory system and label the following in the diagram:	3
a)	Trachea	
b)	Lungs	
c)	Alveoli	
d)	Diaphragm	
Q7.	Differentiate between the following:	3
a)	Excretion and egestion.	
b)	Arteries and veins.	
c)	Self pollination and cross pollination.	
Q8	Draw a diagram to show circulation of blood through the human body and label the following:	3
a)	An artery that carries deoxygenated blood.	
b)	A vein that carries oxygenated blood.	
c)	Extremely thin tubes through which exchange of substances takes place.	
d)	Organ which helps in pumping blood.	
Q9	a) What are the changes seen in a flower after fertilization? b) Draw a labelled diagram to show zygote formation in plants.	3
Q10.	Draw a well labelled diagram to show reproduction in yeast.	3



Question Bank
First Term
Biology

1. Fill in the blanks:

- Chlorophyll is a _____ coloured pigment.
- Algae and lichens live in a _____ association.
- _____ are the type of teeth used for grinding and chewing food.
- The process of formation of soil is called _____.

Choose the correct answer:

- Plants manufacture food in the form of:
 - Starch
 - Fructose
 - Glucose
 - Sucrose
- Soil in which insectivorous plants grow is deficient in:
 - Nitrogen
 - Sulphur
 - Phosphorous
 - All of the above
- The largest gland in the human body is:
 - Pituitary gland
 - Liver
 - Pancreas
 - Adrenal gland
- In human alimentary canal undigested food is stored in:
 - Rectum
 - Anus
 - Small intestine
 - Caecum

Define photosynthesis. Support your answer with a suitable word equation.

2. Give reasons for the following:

- Cows can digest cellulose but humans cannot.
- Gardeners prefer soil with plenty of humus content.

3.

- Give one difference between clayey soil and sandy soil.
- Name one crop that grows best in loamy soil.

4. Explain the saprotrophic mode of nutrition in fungi.

5.

a. Observe the given diagram and label the parts A, B, C and D.



b. In a given soil sample, it took 10 minutes for 200ml of water to percolate. Calculate the rate of percolation in your soil sample.

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QUESTION BANK
SECOND TERM
BIOLOGY

Q1. Fill in the blanks:

- _____ helps in the transport of glucose in plants.
- _____ is a component of blood which helps in formation of a clot.
- Circulation in _____ takes place with the help of water.
- _____ and _____ are eliminated during sweating.
- Insects have _____ for breathing.
- Anaerobic respiration of _____ is used in wine and beer making industry.
- The amount of nitrogen in inhaled and exhaled air is_____.
- Earthworms take in oxygen from their surroundings through_____.

Q2. Name of following:

- Underground stem with buds
- Type of reproduction in algae
- Male organs of a flower
- Fusion of male and female gamete.

Q3. Differentiate between the following

- Self and cross pollination
- Asexual and sexual production
- Wind and animal dispersed seed.
- Arteries and Veins.
- Inhalation and exhalation
- Anaerobic and aerobic respiration.

Q4. Explain the transport of water and minerals in plants

Q5. Explain the circulation of blood in the human body. Support your answer with a well labelled diagram.

Q6. Give reasons

- Insects prove very beneficial to flowering plants.
- Seeds must go far from the parent plants.

Q7. Explain how the roots of the plants also show respiration. Support your answer with a suitable diagram.

Q8. Draw the diagram of a human respiratory system and label the following in the diagram:

- | | |
|------------|--------------|
| a) Trachea | c) Lungs |
| b) Alveoli | d) Diaphragm |

Q9. Draw the following

- Pistil
- Stamen
- Human excretory system

SAMPLE QUESTION PAPER

Academic Session: 2018 - 2019
Annual Examination
Subject - Science
M/6

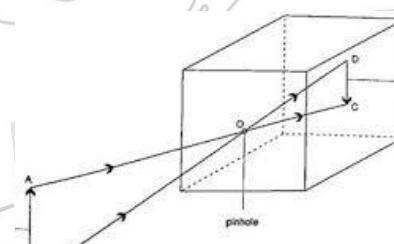
Time: 3h**MM – 80****General Instructions-**

- Attempt Physics and Chemistry on the same answer sheet and Biology on a separate answer sheet.
- Answer the questions in the same sequence as given in the question paper. Write the question numbers as given in the paper.
- Read the questions carefully. Marks will be deducted for not following instructions given in the questions.
- There are 35questions in all.
- This paper has **6**printed sides.

Q.1**PHYSICS**

MM 27

1



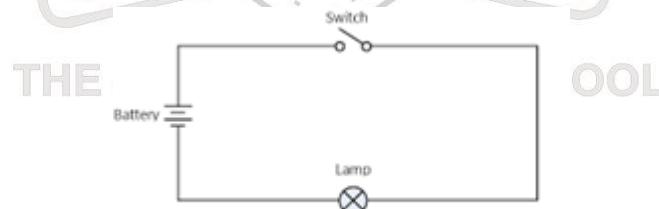
Name the property of light illustrated in the above figure?

Q.2

Why is a Miniature Circuit Breaker better than an electric fuse? 1

Q.3

Why does the Newton's disc appear to lose its colours, when rotated at a high speed? 1

Q.4

Will the lamp glow brighter in the above circuit, if two more cells were added to the battery? Justify your answer?

Q.5

Draw neat figures to show- 1

- A converging lens.
- A diverging lens.

Q.6	a. What is the difference between an open circuit and a closed circuit? b. Draw a circuit diagram using 5 cells and other necessary components to make the bulb glow?	2
Q.7	Henry was playing with a stainless steel spoon and observed that his face appeared different when he saw his image on the hollow side of the spoon and the bulging surface of the spoon. Mention the nature of the image formed on— a. The bulging surface of the spoon. b. The hollow surface of the spoon , when the spoon is taken away from the face.	2
Q.8	If a magnetic compass is placed near a current carrying wire-	2
	a. State your observation? b. What is this effect of current called? c. Name the scientist who discovered the same? d. If the wire does not carry current, in what direction will the magnetic needle orient itself?	
Q.9	What type of lens or mirror is used in the following-	2
	a. Kaleidoscope. b. Magnifying glass. c. Rear view mirror of a car. d. Spectacles.	
Q.10	A factory on the outskirts of Delhi caught fire, due to an electrical failure. Mention the two causes for the fire and explain the same in detail?	2
Q.11	Explain the working of the electric bell, by writing the answer sequentially in points?	3
Q.12	Tarini decided to explore the properties of the image formed by a plane mirror, using a chess board and pencils of different sizes. Write an activity to understand all the properties of the image formed by a plane mirror, using the above materials in the correct format? No diagram is to be drawn.	4
Q.13		5



Observe the picture and answer the questions-

- Describe the nature of the image of the candle flame formed, in two or three words?
- Name the mirror used to obtain this kind of image and represent this mirror by drawing its figure?
- What kind of mirrors will not form an image on the screen?
- Give two important differences between a real and a virtual image?

CHEMISTRY

MM 27

Q.1	Name the acid present in unripe mangoes and the base found in a window cleaning liquid?	1
Q.2	Mention any two physical properties of a substance?	1
Q.3	What is meant by galvanization?	1
Q.4	Carbon dioxide is passed separately through - a. Water b. Dry red litmus paper State your observations in each case?	1
Q.5	What are the colour changes observed when the indicator extracted from China rose is added to- a. Hydrochloric acid. b. Sodium hydroxide.	1
Q.6	Give scientific reasons to explain the following- a. Sometimes rainwater can cause damage to marble structures and life forms. b. Farmers often add organic matter to soil while preparing their fields for the next crop.	2
Q.7	Identify the types of change in the following examples- a. Separating husk from grains. b. Converting animal dung into manure. c. Sublimation of iodine. d. Heating an iron nail.	2
Q.8	Balbir accidentally dropped an iron blade into a beaker containing copper sulphate solution and found a gradual change in the colour of the solution. a. What is the changed colour of the solution? b. Give one reason to justify why is this change called a chemical change? c. Write a word equation to describe the reaction?	2
Q.9	Write the atomicity of hydrogen in the following molecules- HNO_3 , $\text{Ca}(\text{OH})_2$, H_3PO_4 , NH_4Cl	2

Q.10 Sherry was given a piece of magnesium ribbon and some sulphur powder. 3

- Which one should she choose to prepare a base?
- Write the word equations to explain the formation of a base?
- What are alkalies?

Q.11

3



Q.12 Write the chemical formula of the following compounds after choosing the appropriate group of radicals- Show the working. 3



- Magnesium Sulphate
- Ammonium hydroxide
- Ferric chloride

Q.13 a. Lalit was given the following materials-Phenolphthalein, dropper, two test tubes containing an acid and a base . 5 (3+2)

Write an activity in the correct format, using the given materials to help Lalit. Identify correctly which of them are an acid and a base? (Write only the procedure, theory, observation and conclusion)
b. Mention two differences between acids and bases?

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BIOLOGY

MM 26

0.5x4=2**Q.1** Fill in the blanks:

- Presence of starch is tested with the help of _____.
- Anaerobic respiration of _____ is used in wine and beer making industry.
- _____ is an example of a parasitic plant.
- Number of times a person breathes in a minute is termed as _____.

Q.2 Define the following terms:

2

- Saprotrophic nutrition.
- Photosynthesis.

Q.3 a) What is the role of stomata in plants?

2

- Name the part where exchange of gases takes place in earthworms and fishes.

Q.4 a) Give one importance of seed dispersal.

2

- Write any one character of seeds dispersed by the following:
 - Air
 - Water
 - Animals

Q.5 Give reasons for the following statements:

3

- Plant breeders use vegetative propagation to grow certain plants like sugarcane.
- Decreasing populations of honeybees is a threat to the survival of certain plant species.
- Farmers who cultivate pulse crops do not apply nitrogenous fertilizers during cultivation.

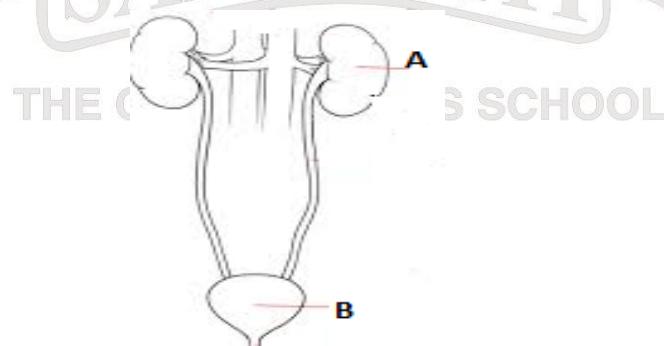
Q.6 a) Explain the mechanism of inhalation in human beings.

3

- What would happen if we overwater the plants?

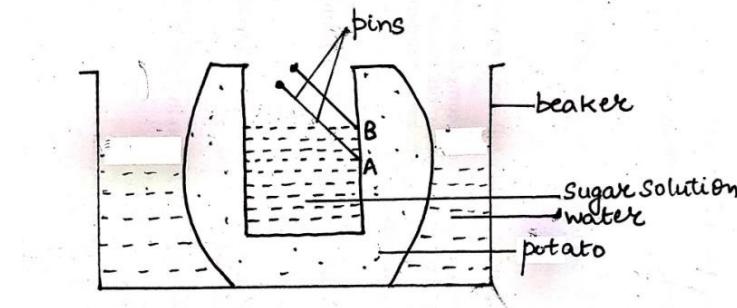
Q.7 a) Observe the diagram and give one function each of the parts labeled A and B.

3

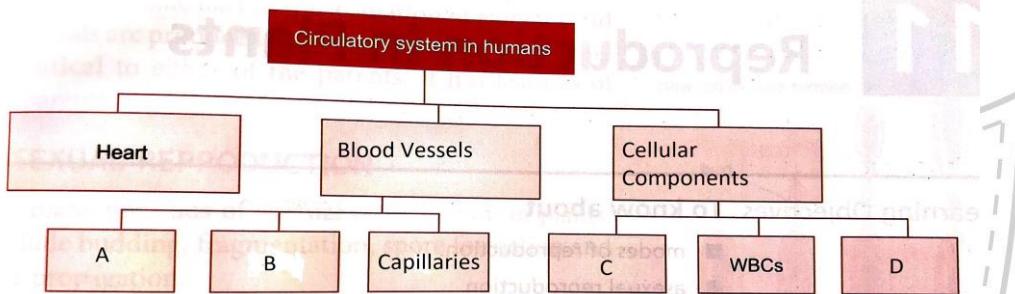


- Give one difference between xylem and phloem.

- Observe the given experimental set up and explain why did water inside the potato rise from level A to level B.

**Q.8**

4



- Label the boxes A, B, C and D.
 - Give one difference between A and B.
 - Write one function each of C and D.
-
- Define fertilization.
 - Draw a neat diagram of a bisexual flower and label the parts whose functions are given below:
 - The part which contains pollen grains.
 - The part where female gamete is formed.
 - The female reproductive part which receives the pollen grain.
 - The part which attracts insects.
 - Identify the type of asexual reproduction in the following:
 - Moss
 - Spirogyra*

Q.9

5

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