DELHI PRIVATE SCHOOL
SHARJAH

ACADEMIC WINDOW BIOLOGY
GRADE 10 (2023 - 2024)

FORE WORD

Life is incredibly varied yet based on common processes. Through learning Biology, we can discover that life involves interactions at all levels of organization. No living thing exists in isolation from its environment. Intrinsic motivation arises from a desire to learn a topic due to its inherent interests, for self-fulfillment, enjoyment and to achieve a mastery of the subject.

This support material is prepared by the faculty members of the Department of Biology at Delhi Private School Sharjah. This is composed and compiled based on the latest syllabus prescribed by CBSE and will be updated as and when required. This support material focusses on the following key points.

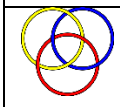
- Learning objectives
- Synopsis lessons/chapter
- Important questions
- Sample Question papers

Needful additions have been made to make the concept clear as per latest syllabus and CBSE pattern. A lot of activity-based questions and high order thinking questions are included for analytical thinking. Students are suggested to go through the support material. Regular reading and practice will help them to score very good marks. The following steps may be followed to use the material for the maximum benefit:

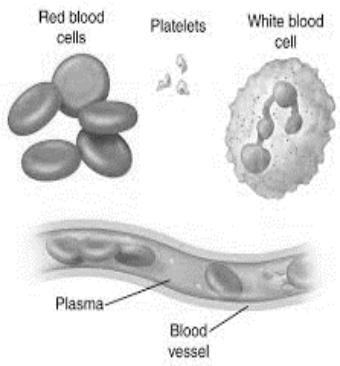
- Read and understand the concepts in the synopsis given chapter wise.
- Practice questions given in each chapter.
- Understand the Question Bank content thoroughly.
- Do the activity based and HOTS questions regularly.
- Use the signposts to differentiate between various levels of questions.
  GOOD LUCK!!!

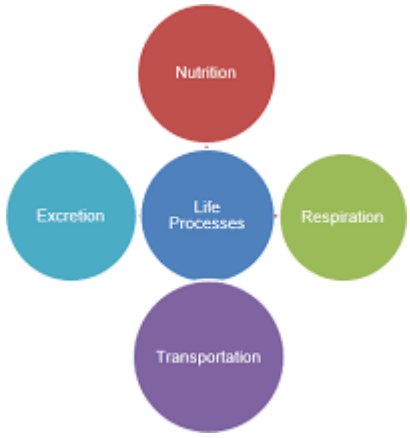
ANJUM HASAN HOD

BIOLOGY DEPARTMENT

QUESTION SIGNPOSTS  	
	FACTUAL / SIMPLE
	ABOVE AVERAGE
	INTERESTING
	HOTS
	MULTI DISCIPLINARY

TERM -I
CHAPTER 6 -LIFE PROCESSES





What are life Processes?

- The processes (like Nutrition, Respiration, Transportation & Excretion) which together perform the maintenance job of living organisms are called **life processes**.

Need for maintenance processes.

- To prevent damage and breakdown in our body.

Where does the energy come from?

- From Outside the body of the individual organism, which we call "food" to the inside by the process called **Nutrition.**
- Outside sources of energy are quite varied since the environment is not under our control.
- These sources need to be broken up or built up in the body and finally converted to a uniform source of energy.
- A series of chemical reactions are necessary in the body. Oxidizing-reducing reactions are the most common chemical means to break down molecules.

- The process of acquiring oxygen from outside the body and using it to break down food sources for cellular needs is called **Respiration.**

- In a single celled organism, no specific organs for taking in food, exchange of gases or removal of wastes may be needed as the entire surface of the organism is in contact with the environment.

- In a multicellular organism various body parts have specialized in the functions they perform.

- Food and oxygen are taken up at one place in the body of the organisms. This creates a need for a **transportation system** for carrying food and oxygen from one place to another in the body.

- Chemical reactions use the carbon source and the oxygen for energy generation creating by products that are not only useless to the cells, but also harmful for the body. These by products are removed from the body and discarded outside by a process called **Excretion.**

- Autotrophic Nutrition- involves the intake of simple inorganic materials from the environment & using an external energy source like the sun to synthesize complex high energy organic material.

- Carbohydrates not utilized immediately are stored in the body as:

  Starch—in plants

  Glycogen—in animals

- The overall balanced equation for photosynthesis (Autotrophic Nutrition)

$$6\,CO_2 + 12\,H_2O \xrightarrow{\text{Chlorophyll / Sunlight}} C_6H_{12}O_6 + 6O_2 + 6H_2O$$

Main events during photosynthesis:

a) Light energy absorbed by chlorophyll, chlorophyll molecules get excited and give out electrons.

b) This light energy is converted to chemical energy: Splitting of water molecules into hydrogen and oxygen (called as photolysis of water)

$H_2O = H_2 + ½ O2 + 2e$

ATP molecules give energy for these processes.

c) Reduction of CO_2 to carbohydrates ($C_6H_{12}O_6$)

- Desert plants take up CO_2 at night because their stomata remain close during the day.

- Heterotrophic Nutrition: involves the intake of complex material prepared by other organisms.

- Depends on the type and availability of food material and how it is obtained.

- Different modes of heterotrophic nutrition are:

a) Saprophytic—e.g. Bread moulds, yeasts, fungi

b) Parasitic—e.g. Cuscuta, orchids, lice, tapeworms.

c) Holozoic—e.g. amoeba, frog, humans

ROLE OF DIGESTIVE GLANDS IN DIGESTION

GLAND	SECRETION	ENZYME	FOOD IT ACTS UPON	FOOD PRODUCT
Salivary glands	Saliva	Salivary Amylase	Starch	Sugar
Gastric glands	Gastric Juice	Pepsin	Proteins	Peptones and polypeptides
Liver	Bile	---------	Fats	Emulsified fats
Pancreas	Pancreatic	Pancreatic Amylase	Starch	Glucose

	Juice	Lipase Trypsin	Emulsified fats Proteins	Fatty acids and Glycerol Amino Acids
Small intestine	Intestinal juice	Sucrase Trypsin	Sucrose Proteins	Glucose Amino Acids

PASSAGE BASED QUESTIONS

1. Read the following and answer any four questions from 1.1 to 1.5.

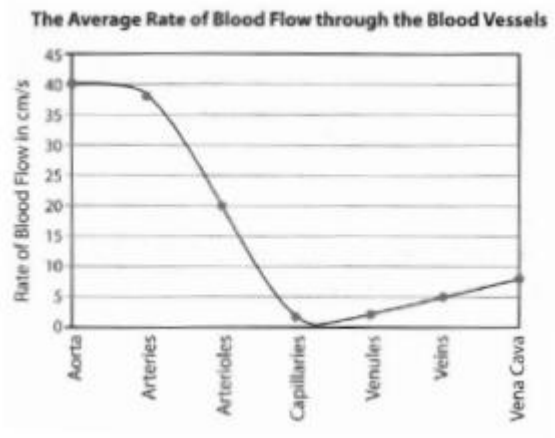
Blood transport food, oxygen, and waste materials in our bodies. It consists of plasma as a Fluid medium. A pumping organ(heart) is required to push the blood around the body. The blood now passes through the chambers of the heart in a specific manner and direction. While Flowing throughout the body, blood exerts pressure against the wall of a vessel.

1.1 Oxygenated blood from lungs enters the left atrium through.

(a) vena cava (b) pulmonary artery

(c) pulmonary vein (d) aorta

1.2 The given graph indicates the average rate of blood flow in the different blood vessels.



The rate of blood flow in the capillaries is very low because capillaries are:

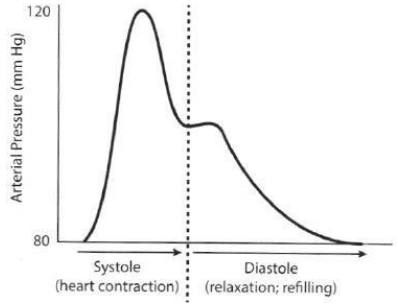
(a) very narrow and have high resistance.

(b) much wide and have low resistance.

(c) very narrow and have low resistance.

(d) much wide and have high resistance.

1.3 Study the graph below that represents changes in pressure within large arteries during a single cardiac cycle of contraction and relaxation.



Choose the correct combination of plots provided in the following table.

	Blood pressure category	**Systolic (mmHg)**	**Diastolic (mmHg)**
(a)	Normal	120	80
(b)	Normal	80	120
(c)	Hypertension	120	80
(d)	Hypertension	70	60

1.4 Which of the following statement(s) is (are) true about human heart?

I. It is a hollow muscular organ.
II. It is a four chambered having three auricles and one ventricle.
III. It has different chambers to prevent oxygen- rich blood from mixing with the blood containing carbon dioxide.
IV. Arteries always carry blood away from the heart.

(a) I and II (b) II and III
(c) I, II and III (d) I, III and IV

1.5 Study the table below and select the row that has the correct information.

	Bodily fluid	**Contents**
(a)	Blood	Plasma + RBCs + WBCs + Platelets
(b)	Plasma	Blood − RBCs
(c)	Lymph	Plasma + RBCs

2. Read the following and answer any four questions from 2.1 to 2.5.

Nitrogenous materials formed due to metabolic activities need to be removed. The biological process involved in the removal of these harmful metabolic wastes from the body is called excretion. Different organisms use varied strategies to do this. Many unicellular organisms remove these wastes by simple diffusion from the body surface into the surrounding water while complex multi-cellular organisms use specialized organs to perform the same function.

2.1 The excretory system of human beings includes.

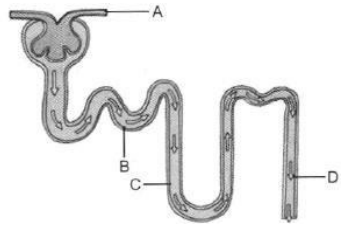
(a) a pair of kidneys, a pair of ureters, a urinary bladder, and a urethra

(b) a pair of kidneys, a pair of urinary bladders, a ureter, and a urethra

(c) a pair of kidneys, a pair of ureters, a pair of urinary bladders and a urethra

(d) a kidney, a ureter, a urinary bladder, and a urethra

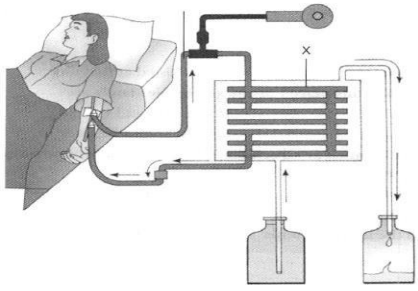
2.2 The given figure represents the structure of a nephron.



Which section of the nephron is responsible for concentrating the solute in the filtrate?

(a) A (b) B
(c) C (d) D

2.3



Study the picture given above and choose the correct combination of plots provided in the following table.

	X	Process used	Function
(a)	Dialyzer	Diffusion	To remove the excess wastes and fluid from the blood
(b)	Blood thinner	Clotting	To remove the clots from the blood
(c)	Dialysate	Osmosis	To add fluid to the blood
(d)	D i a l y s i n g pump	Filtration	To draw blood from the body and send it to dialyzer

2.4 Which of the following statement(s) is (are) true about excretion in human beings?

I. Kidneys are the primary excretory organs.

II. The bladder is muscular, so it is under nervous control.

III. Each kidney has large numbers of filtration units called nephrons.

IV. Urine is stored in the urethra until the urge of passing it out.

(a) I and II only (b) I and III only

(c) I, II and III only (d) I and IV only

2.5 Study the table below and select the row that has the incorrect information.

	Excretory organ	Substances excreted
(a)	Kidneys	Nitrogenous wastes
(b)	Lungs	Urea
(c)	Skin	Sweat
(d)	Oil glands	Sebum

DIRECTION : The following question consists of two statements - Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

(a) Both A and R are true, and R is the correct explanation of A.

(b) Both A and R are true, but R is not the correct explanation of A.

(c) A is true but R is false.

(d) A is false but R is true.

1. **Assertion:** Walls of the intestine have numerous villi.
   Reason: These villi increase the surface area of digestion.

2. **Assertion:** Lungs always contain a residual volume of air.
   Reason: It provides sufficient time for oxygen to be absorbed and for carbon dioxide to be released.

Short Answers (2marks each)

1. Why is nutrition necessary for an organism? (C)

2. Why do desert plants take up CO_2 at night? (U)

3. Bile juice does not contain any digestive enzymes, yet it is essential for digestion. Why? (U)

4. When we are asleep and not performing any activity still our life processes are going on (HOTS)

5. Why do the walls of trachea not collapse, even when there is less air in it? (HOTS)

6. State the function of diaphragm and alveoli. (C)

7. Explain the steps of nutrition in amoeba. (C)

8. Why are alveoli covered with blood capillaries? (U)

Answer in Brief (3 marks each)

1. What are the main events occurring during the process of photosynthesis? (C)

2. Explain the double circulation of heart. (U)

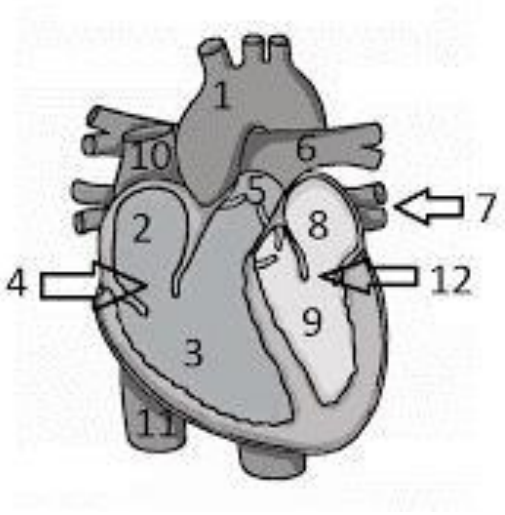
3. What are the methods used by plants to get rid of excretory waste? (C)

4. Name the constituents of blood. White blood corpuscles are called the 'soldiers' of the body. Why? (HOTS)

5. What is the difference between the systolic and diastolic phases of the cardiac cycle? (U)

6. **Long Answer Type Questions:** (5 marks each)

1. The diagram below shows the vertical section of the human heart. Label the chambers and the major blood vessels shown. (U)



1 - 2 –

3 - 5 -

6 – 7 -

8 – 9 -

10– 11 -

2. Explain the various digestive glands present in man. (U)

3. Draw the diagram showing Human Respiratory system. (C)

HOTS QUESTIONS

1. What are the three main characteristics of all respiratory organs? (U)

2. In the process of Photosynthesis, food A is prepared which gets converted into food B. What are A and B? Why is A converted to B? (HOTS)

3 Mucus is not used for churning the food or digesting it. Then why is it secreted in the stomach? (U)

4 Fish taken out of water die although there is more O**2** in the atmosphere. Explain. (HOTS)

5 Why is breathing through the nose healthier? (U)

6 What is dental plaque? What harm can it do? How can the formation of plaque be controlled? (U)

7 All life on earth would come to an end if there were no green plants. Explain why? (MD)

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DPS SHARJAH

PERIODIC TEST (2022-23)

Subject: Biology **Grade: X**	**Max. Marks:13** **Time:**

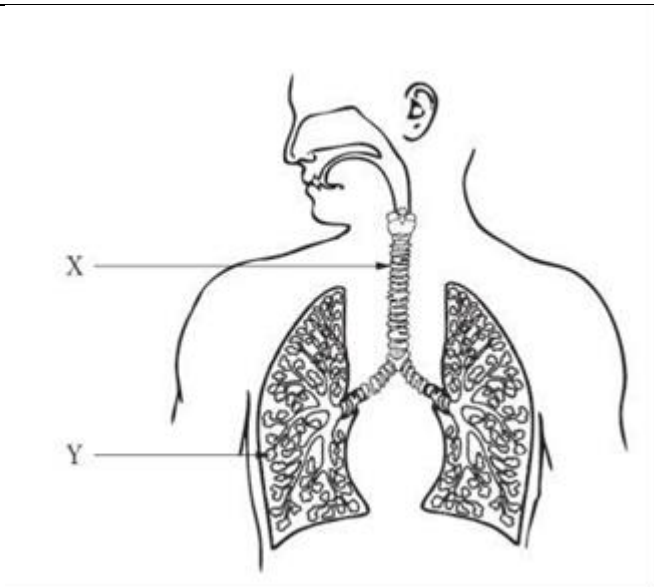
Name:	**Section:**	**Roll No:**

General Instructions:

- ***This question paper consists of ? printed pages.***
- ***All answers to be written in the answer sheet provided.***

	PART-A: OBJECTIVE TYPE OF QUESTIONS				**2 marks**
1.	**Multiple Choice Questions:**				
1.	The internal energy reserve in autotrophs is				
	a.	Glycogen	b.	Protein	
	c.	Starch	d.	Fatty acid	
2.	Name the part of alimentary canal that receives biles from the liver				
	a.	Oesophagus	b.	Stomach	
	c.	Small intestine	d.	Large intestine	

II	**PART B: SUBJECTIVE QUESTIONS**	
1.	Why are the walls of trachea supported by cartilaginous rings?	**(1)**
2.	a) If you compare your rate of breathing by feeling your chest movement with the number of times a fish opens and closes its mouth. Which will be higher and why? b) Leaves of healthy potted plant were coated with Vaseline to block the stomata. Will this plant remain healthy for long? Give one reason.	**(2)**
3.	Explain why. a) Carbon dioxide is transported in dissolved form. b) During the day oxygen release is the major event in plants.	**(2)**
4.	Explain the three pathways of breakdown of glucose in living organisms.	**(3)**
5.		**(3)**



a. Identify Y in the diagram. What is its function?

b. What happens to ribs and diaphragm during inhalation?

c. Write any two effects of smoking in human beings.

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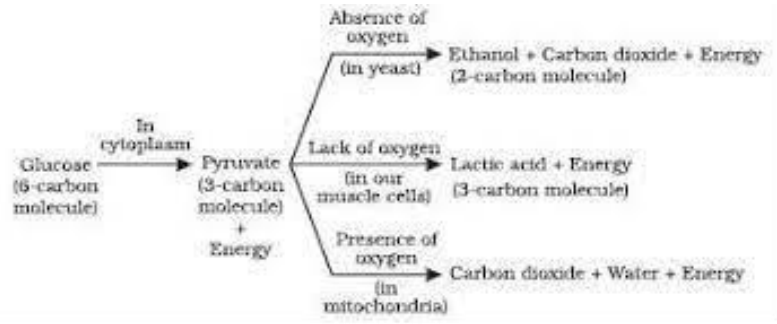
DPS SHARJAH

PERIODIC TEST AK (2022- 2023)

Subject: BIOLOGY **Grade: X**	**Max. Marks: 13** **Time:**	
Name:	**Section:**	**Roll No:**

SECTION A		
1	(c) starch	1
2	c) small intestine	1
3	To prevent air passage from collapsing even when there is not much air in it.	1
4	a) As the amount of dissolved oxygen is relatively low (1/2)compare to the amount of oxygen in the air, the number of times a fish opens and closes its mouth will be higher .(1/2) b) No, the plant would not stay healthy. 1. There will not be major carbon dioxide. 2. oxygen exchange for photosynthesis and/or respiration. 3. There will not be any transpiration resulting in the accumulation of water in the plant. (Any one reason) 1mark	2
5	a) Carbon dioxide is more soluble in water (1mark) b) During day CO_2 generated during respiration is used up for photosynthesis (1/2) hence no CO_2 release . Instead, oxygen release is major event (1/2)	2
6		3
7	i. Y - Alveoli.1/2 Function – exchange of gases ½ ii. When we breathe in, ribs move forward / lift(½)and diaphragm gets flattened/ contract and move downward(½) iii. Any two effects – Lungs cancer / infection /cough ½ each	3

PRACTICALS

EXPERIMENT-1

Aim: - To prepare a temporary mount of a leaf peel to show its stomata

Materials required: - Slides, forceps, watch glass, brush, safranine, glycerin, needle, microscope, water, leaf, dropper, coverslip.

Theory: - The epidermis of the leaf contains numerous minute pores called stomata. Each stomata opening is surrounded by two lunar cells called the guard cells. The inner wall of the guard cells is thicker and less stretchable than the outer wall. This difference in thickness of the walls helps in the opening and closing of the stomata.

Opening of the stomata: - The guard cells take up water by osmosis from the neighboring epidermis cells, as a result the guard cells swell up and bend, so the gap between them widens and the stomata opens.

Closing of the stomata: - Water passes out of the guard cells into the neighboring epidermal cells. As a result, the guard cells straighten and the gap between them gets narrower and the stomata closes.

Stomata are mostly found on the lower surface of the leaves. They help in the exchange of gases and water vapour in the air.

Procedure: -

1. Take a leaf. Peel the leaf from its lower surface with the help of forceps.
2. Take a large number of peels and keep them in a watch glass containing a few drops of safranine stain.
3. Select a thin peel and put it on a clean slide.
4. Remove the excess stain and water with the help of filter paper.
5. Spread the peel properly with the help of needles and brush.
6. Put a drop of glycerin over the peel and place the coverslip over it.
7. Remove excess glycerin with the help of filter paper and observe it under the microscope.

Observation: -

1. A pair of been shaped cells can be seen in between the epidermal cells.
2. These cells have an opening in the center and this opening is surrounded by two guard cells.
3. The opening is called the stoma. The apparatus is called the stomata. This opening helps in exchange of gases and loss of water during transpiration.

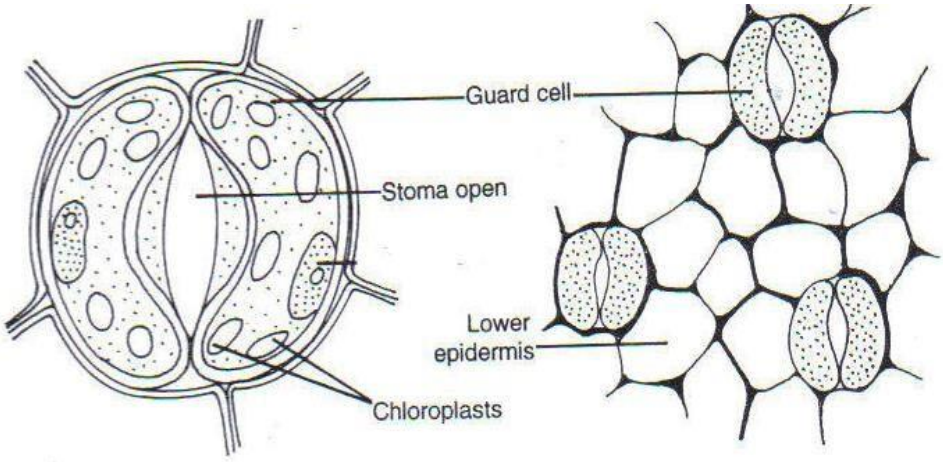
Inference: -

1. Stomata are embedded in epidermal cells.

2. Stomata are present mostly on the lower surface of leaves.

Precautions: -

1. Peel should be taken from fresh leaves.
2. Peels should be transferred with the help of brush only.
3. Peel should not be allowed to dry.
4. Thin peel should be taken so that the stomata can be seen clearly.
5. Coverslip should be kept gently so that no air bubbles are trapped inside.



Stomata (surface view).

EXPERIMENT-2

Aim: - To show that carbon dioxide is produced during respiration.

Materials Required: - Germinating seeds, conical flask, cork with one hole, delivery tube bent at two right angles, test tube, lime water, clamp with stand, a small tube with KOH solution.

Theory: -

Respiration: - It is the process in which organic food material of the cell breaks down into simpler substances to liberate energy and carbon dioxide.

Aerobic Respiration: - It is respiration that takes place in the presence of oxygen. In aerobic respiration complete oxidation of organic food takes place. It can be represented as:

$$C_6H_12O_6 + 6O2 \longrightarrow 6CO_2 + 6H_20 + \text{Energy}\,(38ATP)$$

Anaerobic Respiration: - It is the respiration that takes place in the absence of oxygen. In anaerobic respiration, the food is incompletely oxidized and much less amount of energy is released. However, carbon dioxide is produced. It can be represented as:

$$C_6H_{12}O_6 \longrightarrow 2C_2H_5OH + 2CO_2 + \text{Energy}(2ATP)$$

Procedure:

1. Germinate about 20-30 seeds of gram by placing them in moist cotton wool for 3-4 days.

2. Place the germinating seeds in a conical flask and put a little water to keep them moist.

3. Take some KOH solution in a small test tube and tie it with a thread.

4. Hold the tube with KOH solution in the conical flask, above the germinating seeds and fix a cork with one hole in the mouth of the flask. So, the small test tube remains hanging.

5.Through the hole of the rubber cork, insert one end of the U-shaped glass delivery tube in the conical flask.

6.Place the other end of U-shaped delivery tube into a beaker filled with water.

7.Seal all the connections of the experimental set-up with Vaseline so as to make it air tight.

8.Mark the initial level of water in the U-shaped delivery tube.

9.Keep the apparatus undisturbed for 1-2hours and note the change in level of water in delivery tube immersed in water of the beaker.

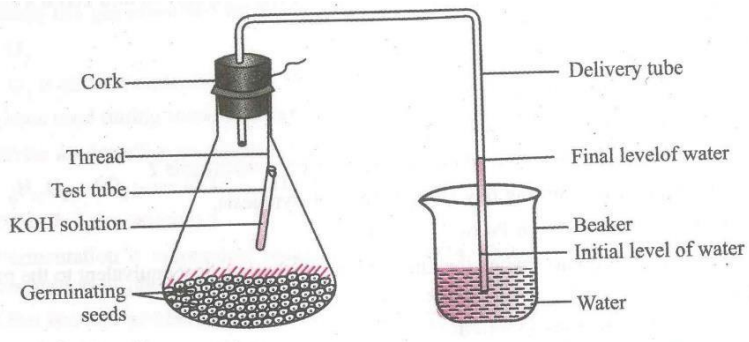


Fig. Experiment to show that CO_2 is given out during respiration

Observation: -After some time, the level of water in U-shaped delivery tube dipped in water of the beaker rises.

Inference (Result): Germinating gram seeds in conical flask release CO2 during respiration. The CO2 released is absorbed by KOH present in hanging test tube in conical flask. This creates a vacuum in conical flask which causes upward movement of water in delivery tube which leads to change in level of water in delivery tube.

Precautions: -

1.Germinating seeds should always be moist.

2.The apparatus should be airtight.

3. Freshly prepared KOH solution should be used.

4. Keep one end of U-shaped delivery tube in conical flask and the other end completely immersed in

water of the beaker.

5.Carefully hang the test tube containing KOH.

Practical based Questions

Experiment - 1

Objective: To prepare a temporary mount of a leaf peel to show stomata

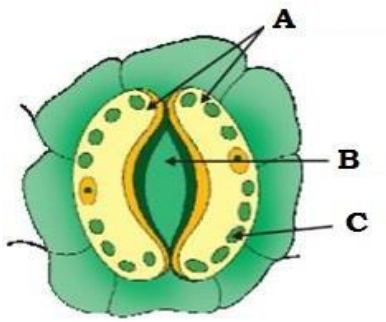
Experiment: "Preparation of Temporary mount of leaf to show Stomata"

Q1. List the steps for the preparation of temporary mount of leaf peel to observe the structure of stomata.

Q2. Which stain is used while preparing "Temporary mount of leaf peel"? List any two precautions while preparing the slide.

Q3. A student is observing the slide of a leaf peel under high power of a compound microscope. Draw a labelled diagram to show the main parts of stomata.

Q4. A student has drawn the following diagram after viewing a slide. Name the structure and label the parts "A", "B" and "C".



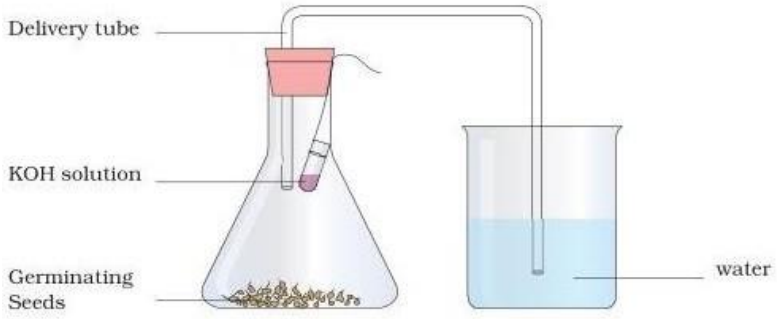
Q5.

(a) To prepare a temporary mount of leaf peel to observe the structure of stomata, the peel should be taken from dorsal side or ventral side of the leaf? Justify your answer.

(b) Why is glycerin used for making the temporary mount of leaf peel?

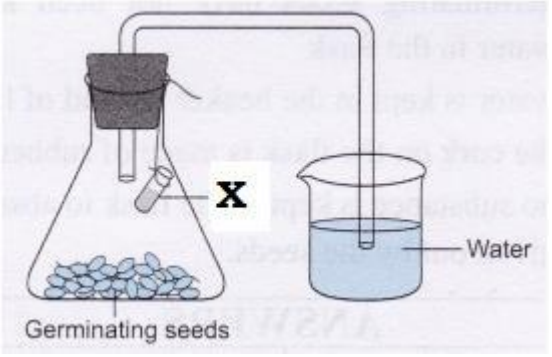
Experiment: "CO2 is released during respiration"

Q1.



In the above experimental set up, if one forgets to keep the vial with KOH in the conical flask, how will the result vary? Give reason for the change in result.

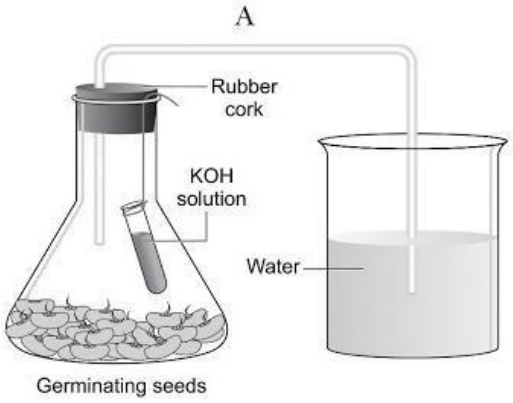
Q2. What is the aim of the experimental setup given below.



Which chemical is being used in test tube 'X'? What is the use of this chemical substance?

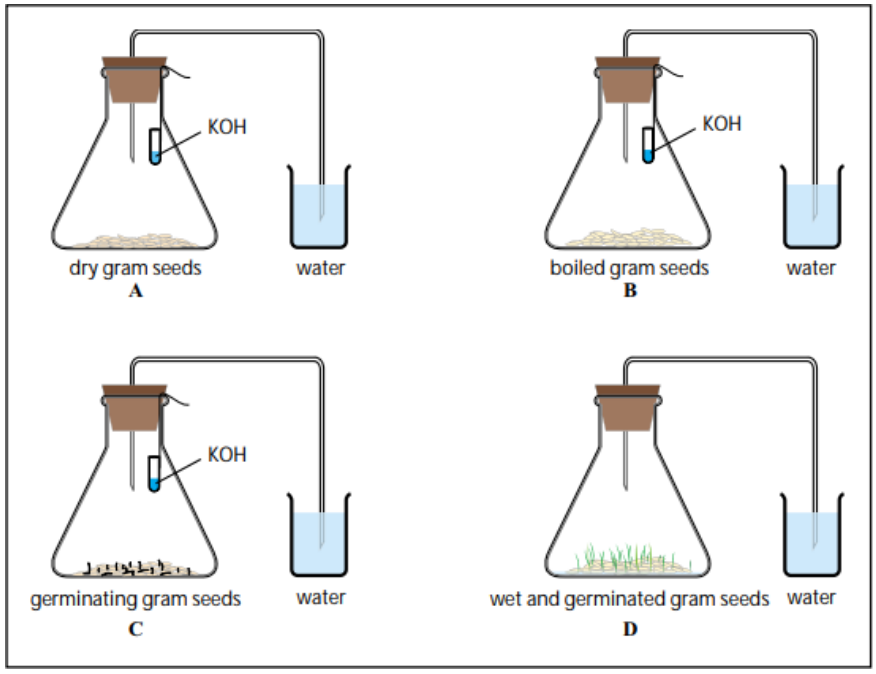
Q3. Amit is performing an experiment to show that "CO_2 is given out during respiration". List any two precautionary measures to be taken while performing this experiment to get correct result.

Q4. How does the use of KOH in the below experiment show that CO_2 is given out during respiration?



Q5. What would happen if instead of moist germinating seeds, boiled seeds were used for the experiment "CO_2 is given out during respiration"? Explain.

Q6. Given below are four different set ups to show that CO2 is released during respiration.

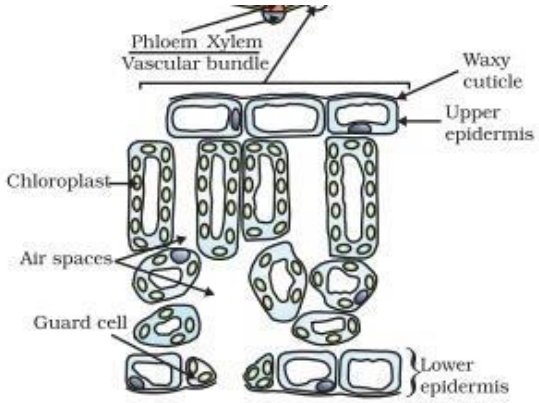


Which set up will give the desired result? Why?

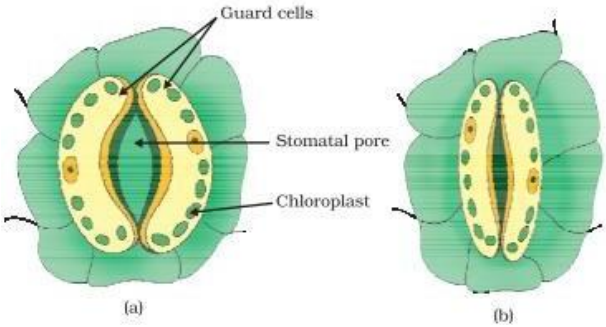
.

DIAGRAMSFORPRACTICE

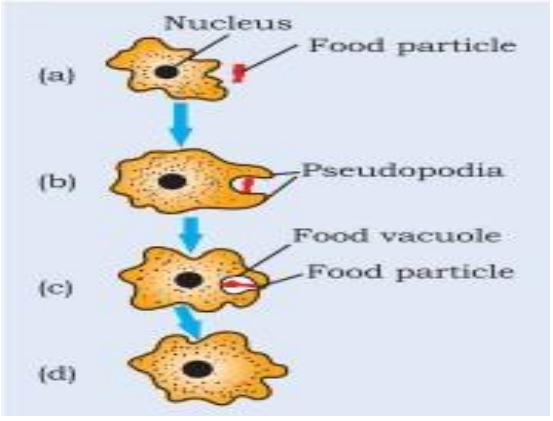
C.S.OF LEAF

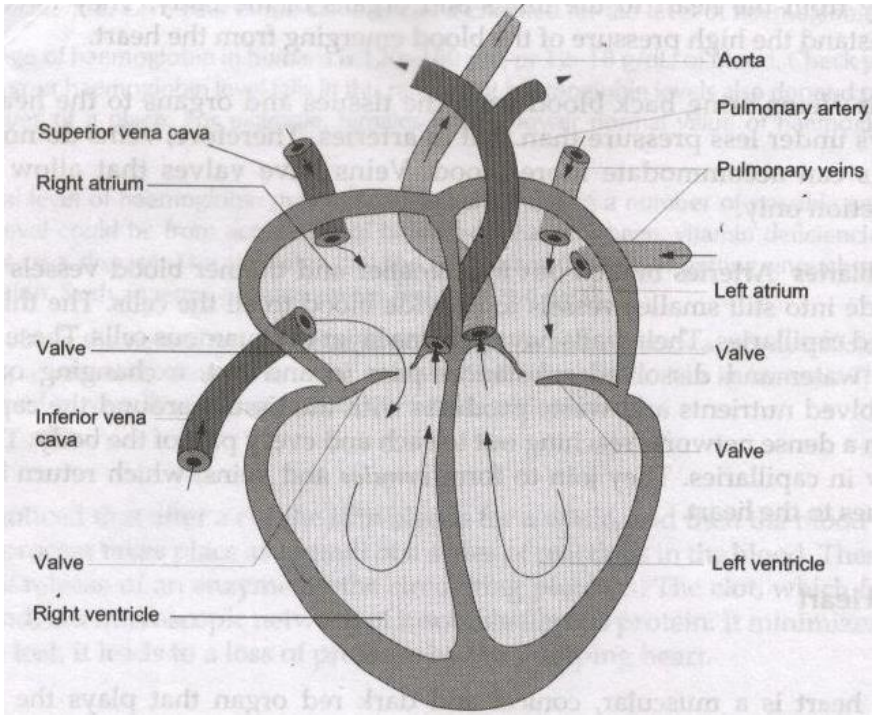


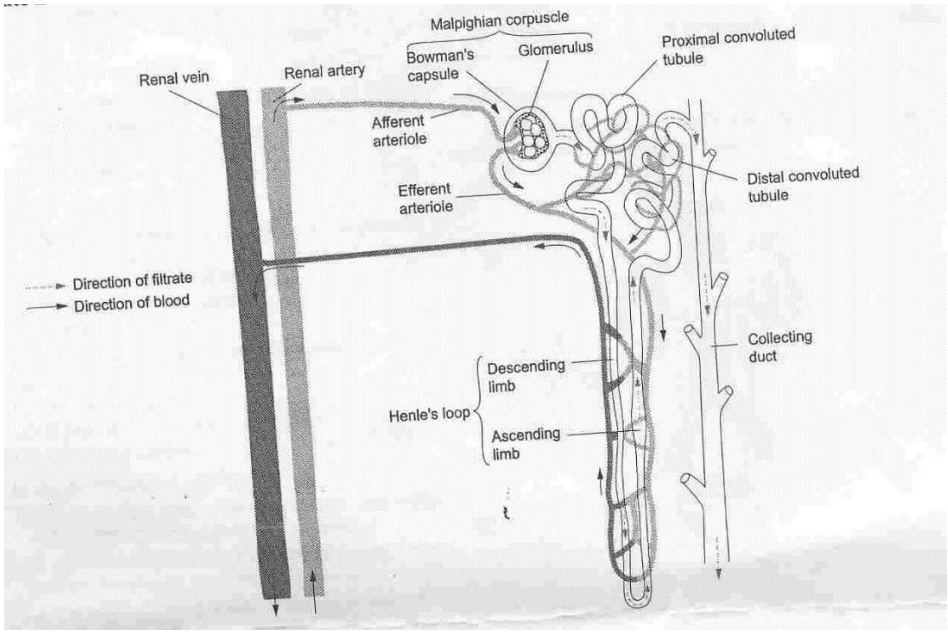
OPEN AND CLOSED STOMATAL PORE

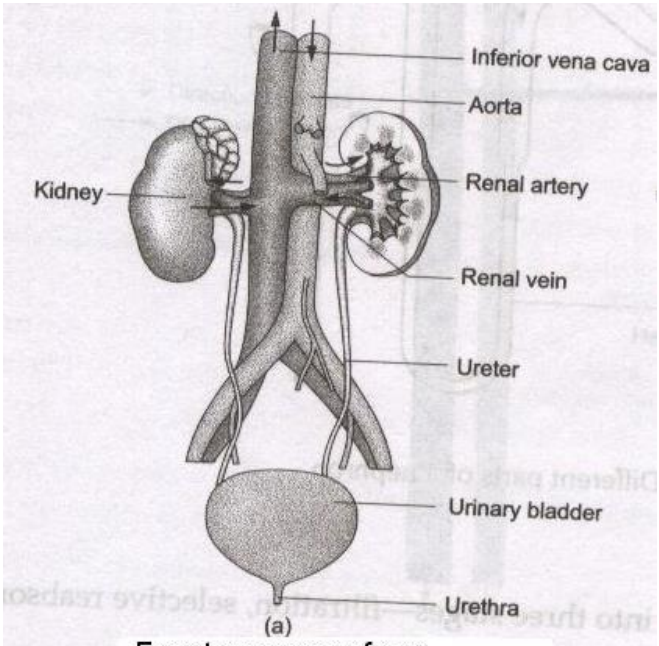


NUTRITION IN AMOEBA

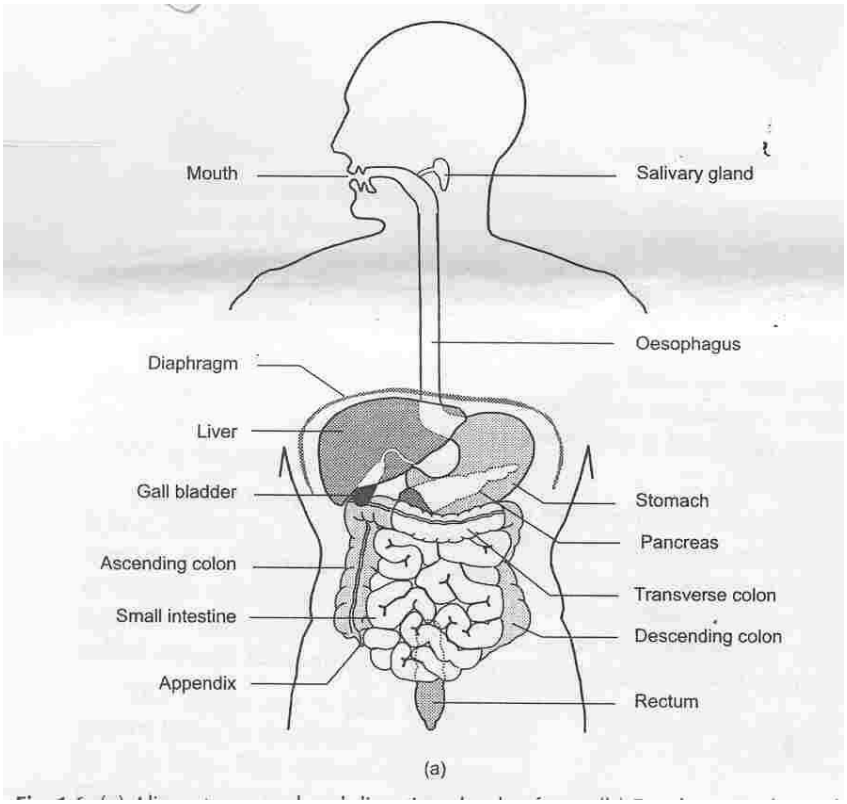



Aorta
Pulmonary artery
Superior vena cava
Pulmonary veins
Right atrium
Left atrium
Valve
Valve
Inferior vena cava
Valve
Valve
Left ventricle
Right ventricle


Malpighian corpuscle
Bowman's capsule
Glomerulus
Proximal convoluted tubule
Renal vein
Renal artery
Afferent arteriole
Efferent arteriole
Distal convoluted tubule
Direction of filtrate
Direction of blood
Collecting duct
Descending limb
Henle's loop
Ascending limb



Excretory organs of man



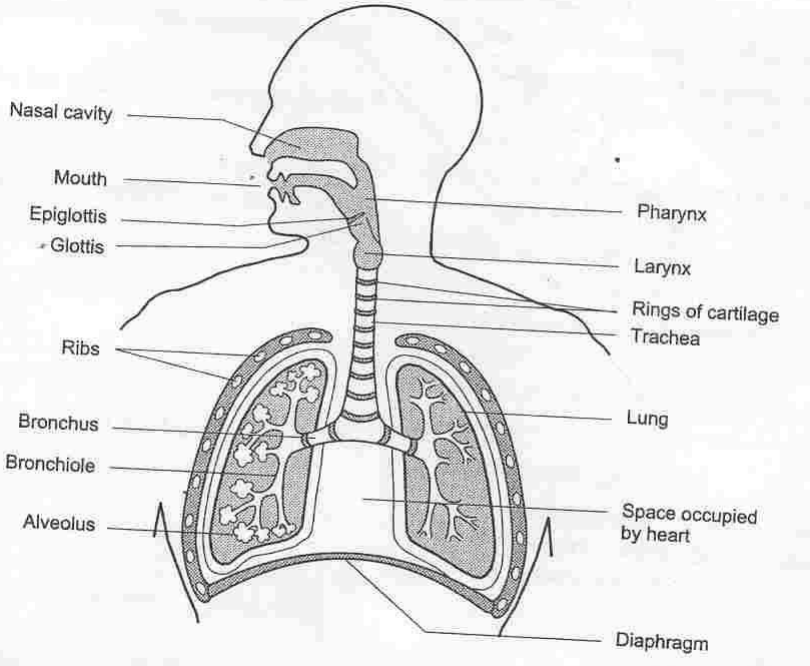
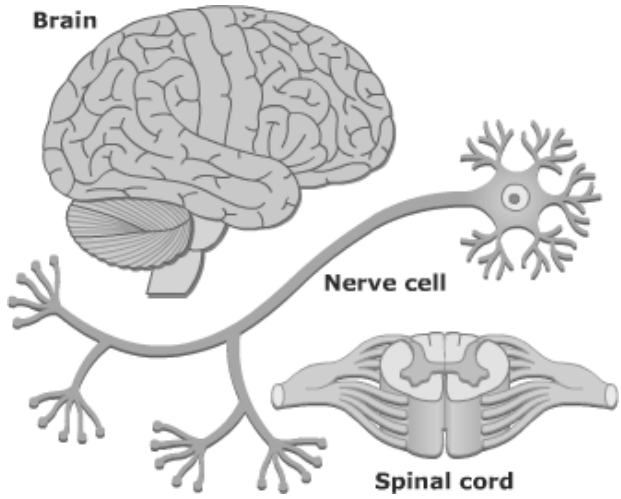


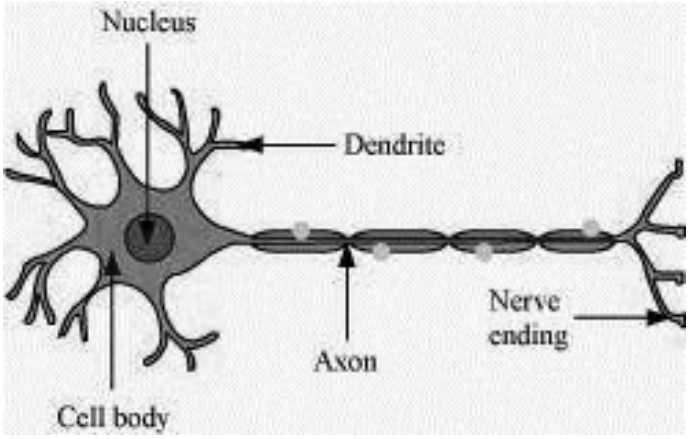
Fig. 2.7 Human respiratory system

CHAPTER 7 - CONTROL & COORDINATION



Important Terms & Concept:

1. **Nervous System:** It is the system of conducting tissues that receives the stimulus and transmits it to other parts of the body forming a network.
2. **Receptor**: It is a cell or group of cells specialized to detect a particular stimulus and to initiate the transmission of impulses via the sensory nerves.
3. **Unit of Nervous System**: Neurons are the structural & functional unit of nervous system.
    - Neuron is the largest cell in the body.
    - Neurons carry messages in the form of electrical signals called nerve impulses.
    - Neuron is an elongated branched cell having three components-Cell body, Dendrites and Axon.



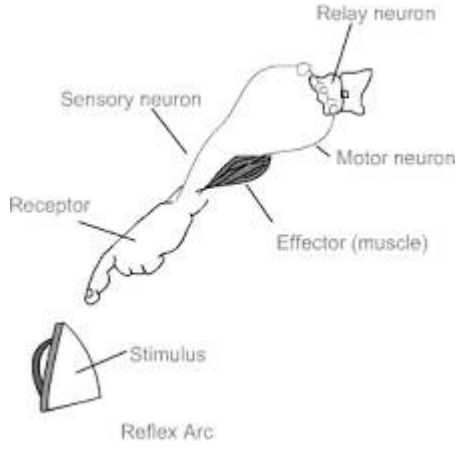
4. **Synapse**: It is the junction between two adjacent neurons or nerve cells, i.e., between the axon ending of one and the dendrites of the next.
5. **Nerve Impulse**: It is the information in the form of chemical and electrical signals passing through neurons. These impulses are carried by dendrites towards the cell body.
6. **Neuromuscular Junction**: It is the point where a muscle cell fiber comes in contact with a motor neuron carrying nerve impulses from the central nervous system. The impulses travel from the neuron to the muscle fiber by means of a neurotransmitter in the same way as the transmission of impulses across a synapse between two neurons.
7. **Voluntary** Actions: These are the actions which need thinking and are performed knowingly, i.e., are controlled by conscious thought.

   E.g.: Speaking to a friend, writing a letter, etc.
8. **Involuntary Actions**: These are not under the control of the will of an individual and are automatic response to a stimulus which is not under the voluntary control of the brain.

   E.g.: Touching a hot plate unknowingly.
9. **Reflex Action**: It is defined as an unconscious, automatic, and involuntary response of effectors, i.e., muscles and glands, to a stimulus, which is monitored through the spinal cord.

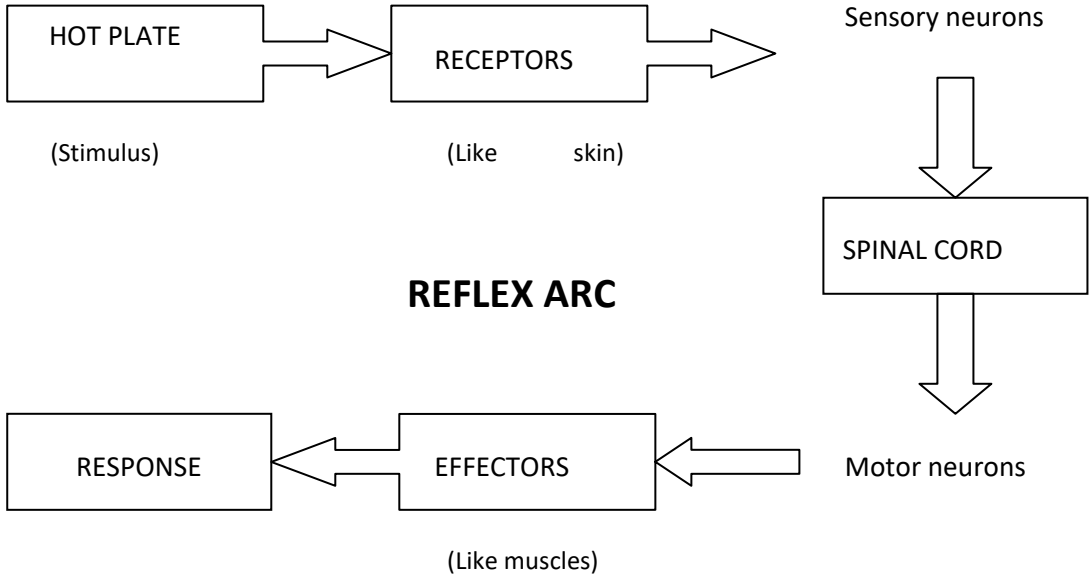
Advantages of Reflex Action:

- It enables the body to give quick responses to harmful stimuli and thus protects our body.
- It minimizes the overloading of the brain.



10. **Reflex Arc**: It is the pathway taken by the nerve impulses and responses in a reflex action, i.e., from the receptor organs like skin to the spinal cord and from the spinal cord to the effector organs like muscles.

The Reflex arc pathway shown in the flow chart as follows:



11. **Central Nervous System**: The CNS consists of the brain and the spinal cord.

    The brain and the spinal cord are protected by the cranium and the vertebral column respectively.

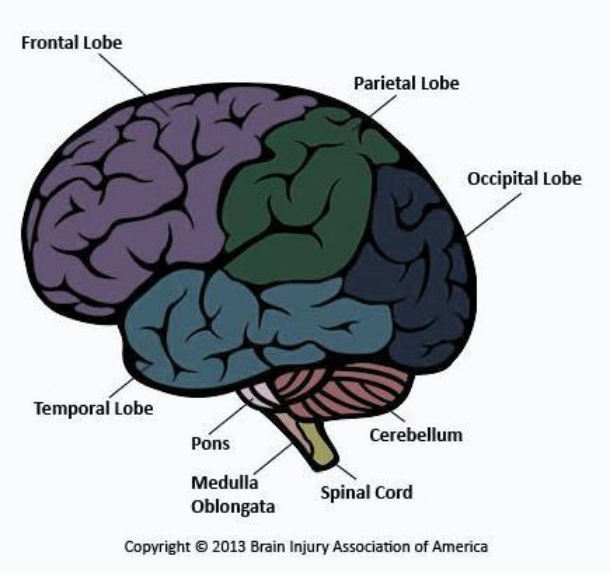
The brain is broadly divided into three regions.

Fore-brain-main thinking part of the brain.

12. **Mid Brain** connects the forebrain and hindbrain. It controls the reflex movements of the head, neck, and trunk in response to visual and auditory stimuli.

13. **Hind Brain** consists of three centers called cerebellum, pons, and medulla oblongata.

    - **Cerebellum** lies at the roof of the hindbrain. This region controls the coordination of body movements and posture.
    - **Pons** lies just above the medulla and takes part in regulating respiration.
    - **Medulla oblongata** lies on the floor of the hindbrain and continues into the spiral cord. It is also the regulating center for swallowing, coughing, sneezing, and vomiting.



14. <u>Functions of Brain</u>.

- The brain receives information carrying impulse from all sensory organs of the body.
- The brain responds to the impulse brought in by sensory organs by sending its own instructions to the muscles and glands causing them to function accordingly.
- The brain correlates the various stimuli from different sense organs and produces the most appropriate and intelligent response.

- The brain coordinates the bodily activities so that the mechanisms and chemical reactions of the body work efficiently.
- The brain stores 'information' so that behavior can be modified according to the experience. This function makes the brain the organ of *thought and intelligence*.

15. **Spinal Cord.** It is a cylindrical structure and a part of the central nervous system. It is made up of nerves which supply information.
    - It begins in continuation with medulla oblongata and extended downwards.
    - It is enclosed in a bony cage called vertebral column.
    - A total of thirty-one pairs of spinal nerves arises from the spinal cord.

16. Functions of Spinal Cord.

- The spinal cord is the main center of reflex action.
- It is concerned with the conduction of nerve impulse to and from the brain.

17. **Peripheral Nervous System** constitutes the cranial and spinal nerves along with their branches.
    - **Cranial nerves** arise from the brain and spread throughout the head.
    - There are twelve pairs of cranial nerves.
    - **Spinal Nerves** arise from the spinal cord along most of its length and spread throughout the body.
    - There are 31 pairs of spinal nerves- eight in the neck region, twelve in chest region, five in abdominal region, five in hip region. Coccyx is the last bone of the vertebral column.

18. Action of Nervous Tissues

- The nervous tissue collects information, sends it to brain, processes, it makes decision based on it and conveys decision to muscles for action.
- When a nerve impulse reaches the muscles, the muscle fibers move by changing the shape of the muscle cells with the help of special proteins

19. **Coordination in Plants.** Plants respond to light, touch, gravitational force and other stimulus. The growth in plants is controlled by certain chemical substances.

known as plant hormones or *phytohormones* and movement of plants in the direction of stimulus is known as *tropism.*

20. **Stimulus.** It is the change in the external or internal environment of an organism that provokes a physiological and behavioral response in the organism.

21. Plants Response to External Stimulus.

- Plants use electrochemical means to convey information from cell to cell.
- Sensitive plants move very quickly in response to touch that are independent of the direction of stimuli.
- The folding and drooping of the leaves of sensitive plant of 'touch-me-not' when lightly touched is as example.
- Plants cells change shape by changing the amount of water in them resulting in swelling or shrinking, thereby changing shapes.

22. **Plant Movements.** The movements of the individual plant parts or organs of a plant like shoot, root etc. are due to some external stimuli like light, force of gravity, chemical substances, water, etc.

23. **Directional or Tropic Movements.** It is the directional growth or movement of a plant organ in response to an external stimulus.

- Growth towards the stimulus is *positive tropism* and growth away from the stimulus is *negative tropism*.
- Tropic movements are classified as follows, depending on the type of stimulus causing it:
  - **Phototropism** is the movement of a part of the plant in response to light.
  - **Geotropism** is the upward and downward growth of shoots and roots in response to the pull of gravity.
  - **Hydrotropism** is the movement of a part of the plant in response to water.
  - **Chemotropism** is the movement of the part of the plant in response to chemical stimulus. If the plant shows movement or growth towards the chemical, it is called *positive Chemotropism* and if the plant part shows movement or growth away from the chemical, it is called *positive Chemotropism*.

24. **Plant Hormones or Phytohormones.** It can be defined as a chemical substance which is produced naturally in plants and is capable of translocation and regulating one or more physiological processes when present in low concentration.

Plant hormones help to coordinate growth, development, and responses to the environment.

They are synthesized at places away from where they act and simply diffuse to the area of action.

Plant Hormones – (phytohormones) are chemical substances other than nutrients produced naturally in plants which regulate growth and other physiological processes with or without translocation to other sites

Functions of some plant hormones:

Auxin

- Growth of cells
- Plant movements like – geotropism and phototropism

Gibberellin

- Promote growth in stems and leaves.
- Increase in size and number of fruits.

Cytokinin

- Essential for cell division
- Increase resistance to diseases and temperature extremes.

Ethylene

- Helps in ripening fruits.

Abscisic Acid (ABA)

- A stress hormone.
- Inhibits growth.
- Induces dormancy of buds and seeds

Hormones are chemical messengers produced by ductless glands, which are translocated by the circulatory system to other parts for inducing a specific physiological response.

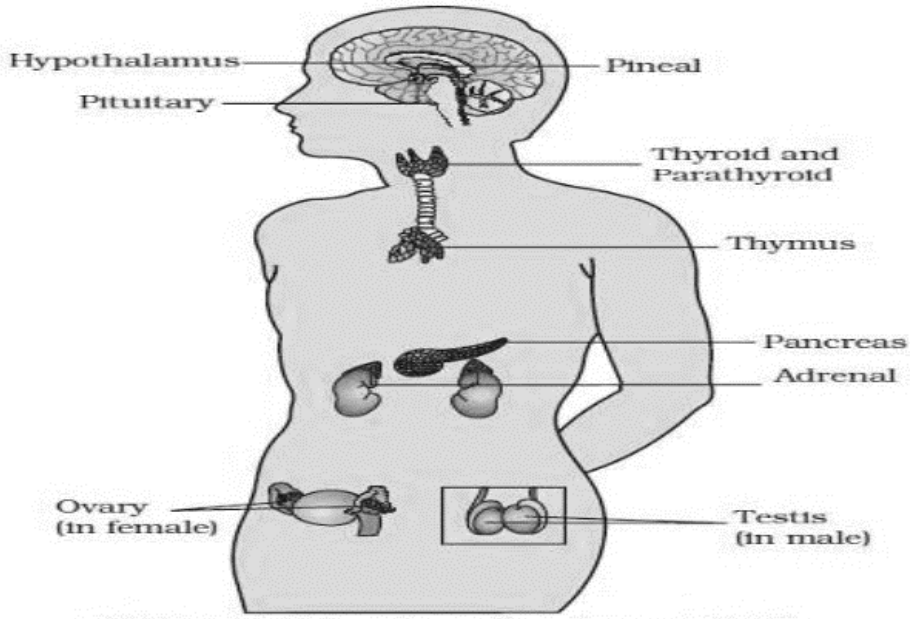


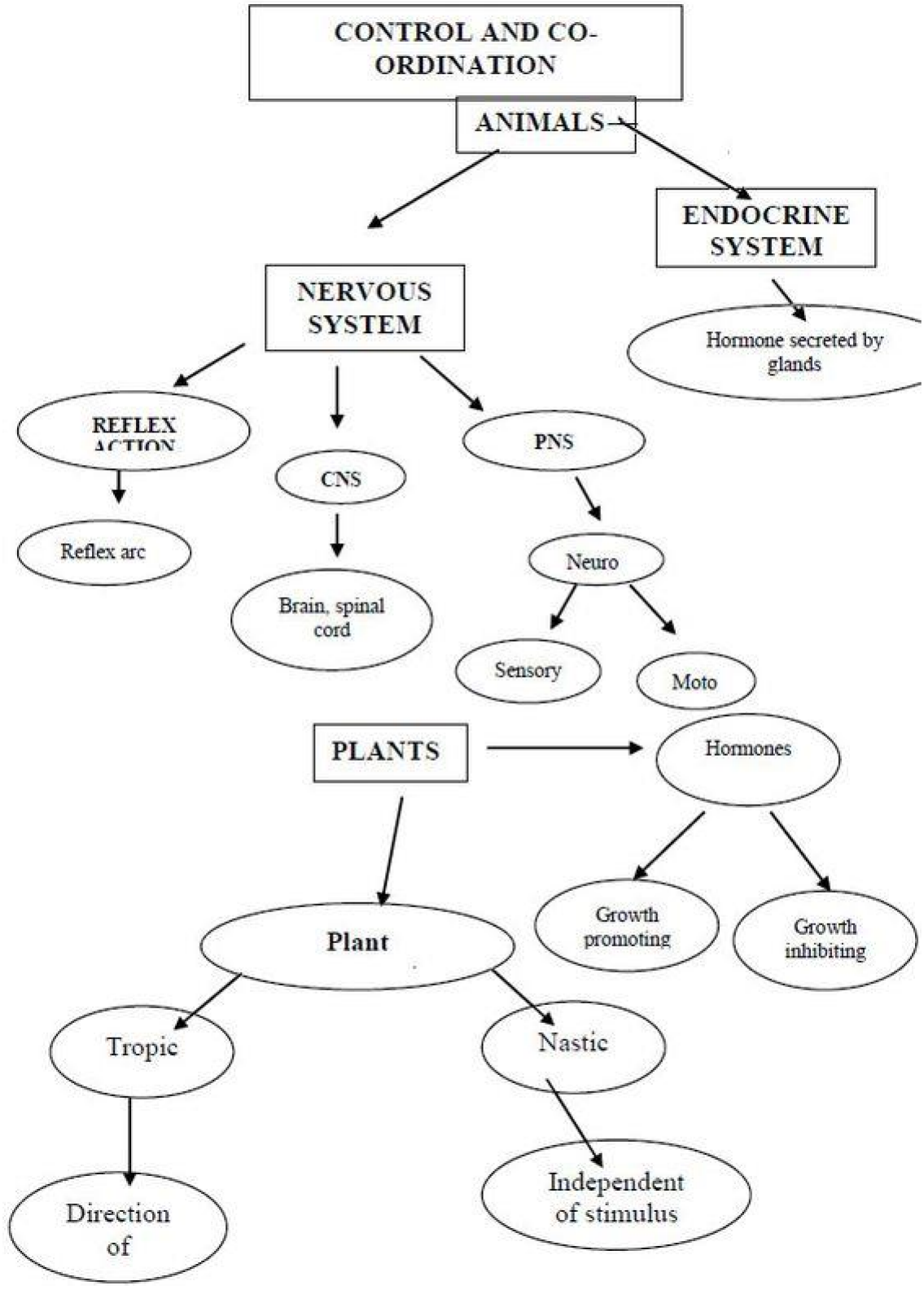
Figure 22.1 Location of endocrine glands

FUNCTIONS OF ENDOCRINE GLANDS

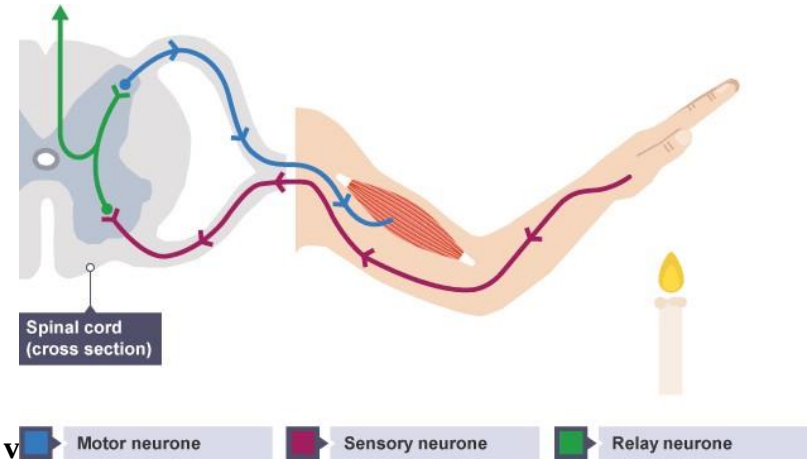
Glands	**Hormones**	**Functions**
Hypothalamus	Releasing Hormone (RH) Inhibiting Hormone (IH)	Stimulate the secretion of pituitary hormones. Inhibits secretion of pituitary hormones.
Pituitary	Growth Hormone (GH)	Regulates growth and development. Over-secretion leads to gigantism (very tall) Under-secretion leads to dwarfism (very short)
Pineal	Melatonin	Maintains the normal rhythm of sleep-wake cycle, body temperature, sexual cycle etc.
Parathyroid	Parathyroid Hormone/Parathormone	Increases the calcium levels in blood

Thymus	Thymosin	Development of immune system
Thyroid	Thyroxin	Carbohydrate, protein and fat metabolism
Pancreas	Insulin Glucagon	Lowers blood sugar level. Increases blood glucose
Testes	Testosterone	Regulation of male accessory sex organs and secondary sexual characters like moustache, beard and voice
Ovary	Estrogen& Progesterone	Regulation of female accessory sex organs and secondary sexual characters like mammary gland, hair pattern and voice. Maintenance of pregnancy

MIND MAP


CONTROL AND CO-ORDINATION
ANIMALS
ENDOCRINE SYSTEM
NERVOUS SYSTEM
Hormone secreted by glands
REFLEX ACTION
CNS
PNS
Reflex arc
Brain, spinal cord
Neuro
Sensory
Moto
PLANTS
Hormones
Growth promoting
Growth inhibiting
Plant
Tropic
Nastic
Direction of
Independent of stimulus

PASSAGE BASED QUESTIONS



v

1. The receptor in the skin detects a stimulus (the change in temperature).
2. Sensory neuron sends electrical impulses to a relay neuron, which is located in the spinal cord of the CNS. Relay neurons connect sensory neurons to motor neurons.
3. Motor neuron sends electrical impulses to an effector.
4. Effector produces a response (muscle contracts to move hand away)

Q Study the above picture and answer the following qs 1 to 5

i) The above diagram represents the:
   a) Endocrine system
   b) Reflex arc
   c) Central nervous system
   d) None of the above

ii) Sensory neuron sends an impulse to the relay neuron which is located in the:
   a) Brain
   b) Peripheral nervous system
   c) Endocrine system
   d) Spinal cord

iii) Receptors are in the skin and effectors are:
   a) Muscles
   b) Motor neuron
   c) Sensory neuron
   d) All of the above

iv) Sensory neuron relays impulses to the:
   a) muscles

b) Motor neuron
c) Brain
d) Spinal cord

v) Motor neuron carries electrical impulse to the:
   a) Brain
   b) Spinal cord
   c) Effector (muscle)
   d) None of the above

Q2. The physiological functions of our human body are regulated and coordinated by both neural and endocrine systems. The endocrine system influences the metabolic activities by means of **hormones** (hormone means *to excite)* which are chemical messengers released into the blood and circulated as chemical signals and acts specifically on certain organs or tissues called target organs or target tissues. Hormones may speed up or slow down or alter the activity of the target organs. The hormones secreted do not remain permanently in the blood but are converted by the liver into inactive compounds and excreted by the kidneys.

i) Control and coordination of human systems depends on:
   a) Reproductive and muscular systems
   b) Nervous and endocrine systems
   c) Skeletal and neural systems
   d) Excretory and digestive systems

ii) Hormones belong to:
   a) Endocrine system
   b) Nervous system
   c) Muscular system
   d) Skeletal system

iii) Hormones are secreted by:
   a) Exocrine glands
   b) Endocrine glands
   c) Brain
   d) Liver

iv) Hormones can only speed up the activity of the target organs:
   a) True
   b) False

v) The gland which is known as the master gland is:
   a) Liver
   b) Pituitary
   c) Adrenal
   d) Ovaries

DIRECTION: The following questions consist of two statements - Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

a. Both A and R are true, and R is the correct explanation of A.
b. Both A and R are true, but R is not the correct explanation for A.
c. A is true but R is false.
d. A is false but R is true.
e. Both Assertion and Reason are false.

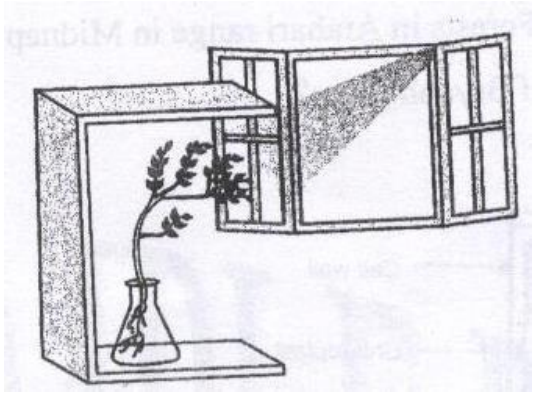
2. **Assertion:** Reflex actions are automatic and rapid responses to stimuli.
   Reason: These actions are controlled by the brain.

3. **Assertion:** Olfactory receptors detect taste.
   Reason: Olfactory receptors are present in cerebellum.

Short Answer Type Questions: **(2 Marks)**

1. Name the systems, which take part in control and coordination in animals. (C)

2. Name the two types of movements shown by the plant in the set-up below. (U)



3. What is chemotropism? Give one example of chemotropism. (C)

4. What is feedback mechanism? (U)

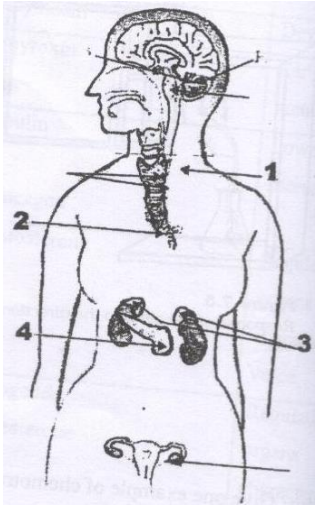
5. Name the largest and second largest parts of human brain. (C)

6. Name two hormones secreted by Pancreas. Write one function of each(C)

7. Write the name and functions of any two parts of hind brain. (C)

Short Answer Type Questions **(3 Marks)**

1. Differentiate between: -(U)
    a. Cerebrum and Cerebellum
    b. Geotropism and Phototropism
    c. Endocrine and Exocrine glands
2. Enumerate the functions of: -(C)
    a) Auxins
    b) Gibberellins
    c) Cytokinin
3. Mention 3 involuntary actions controlled by the medulla. (U)
4. Describe the way adrenaline responds when secreted into blood. (U)
5. Give a well-labelled diagram of a neuron. (C)
6. a) Name the glands in the figure numbered 1 to 4. (C)



b) Which of the four glands given above gets degenerated or lost in adults? (U)

7. What is the difference between sensory and motor neurons? Which parts of the brain are responsible for auditory reception and sensation of smell? (U)

8. What is hydrotropism? Describe an experiment with diagram to demonstrate hydrotropism. (U)

9. Name the plant hormone responsible for the following(C)

    a. Elongation of cells

    b. Growth of stem

    c. Promotion of cell divisions

Long Answer Type Questions: **(5) Marks**

1. With the help of a labeled diagram explain the structure of the brain. (C)

2. What is a reflex action? Describe the mechanism of a reflex action with a suitable diagram. (U)

3. What are tropic movements? Explain with suitable examples. (U)

4. Why is the pituitary gland known as the master gland of our body? Describe the various hormones produced by it. (C)

5. Draw an outline of the human body and show the position of the various endocrine glands in it. (U)

6. In a family of normal sized members, there are two exceptions, one member is dwarf and one is tall like “Khali”. What could be the cause of it? (HOTS)

7. Explain the cause of shoots of the plant bending towards light. (HOTS)

8. a.) Distinguish between voluntary and involuntary actions of our body (HOTS)

b) Chose involuntary actions amongst the following.

reading, beating of heart, salivation in the mount on view tasty food, talking

9. Name the hormone responsible for regulation of

i) Metabolism of carbohydrates, fats and proteins

ii) Development of Immune System

iii) Increases blood Glucose. (HOTS)

10. Plant parts show two types of movements, one dependent on growth and the other independent of growth. Give one example of each type of movements in plant parts. (HOTS)

1. Aman becomes unconscious due to head injury. A pin is pricked on his foot, he withdraws his foot. Why? Explain (HOTS)

2. Ramaswamy is very short in height in fact far less than an average Indians height. All his classmates tease him, but Raju is his good friend, they both play together. Raju keeps.

encouraging him whenever he feels sad about his height and explains to him the reason behind it. (MD)

a) What is the reason for Ramaswamy's short height?

DIAGRAMS FOR PRACTICE

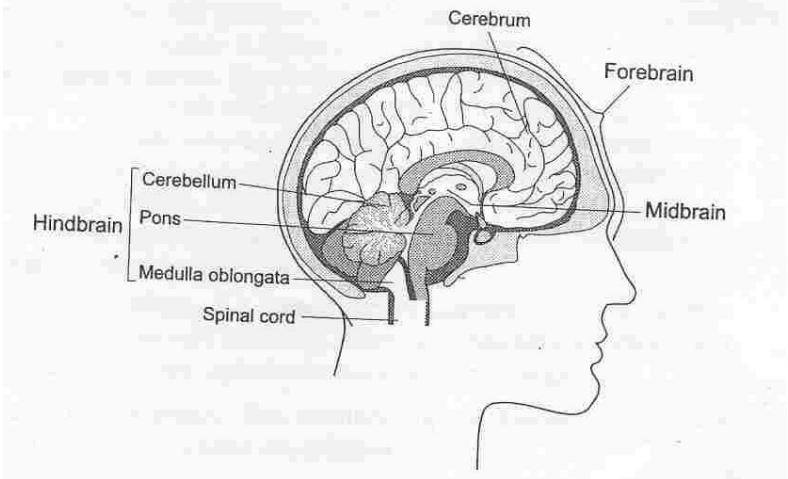
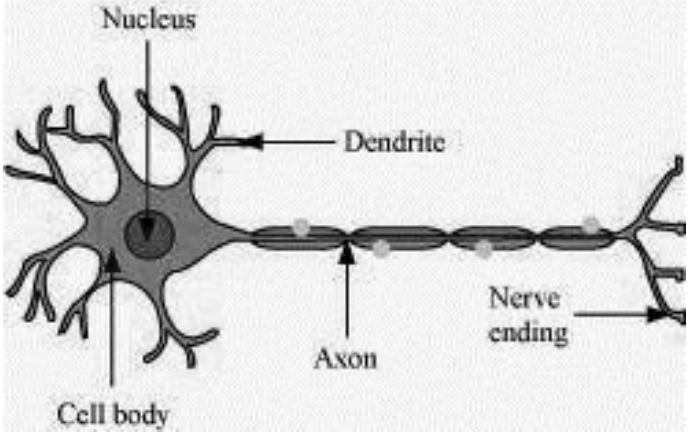


Fig. 5.9 Section through the human brain



15 - OUR ENVIRONMENT

- **Environment**: The physical and biological world that an organism lives in and with which it interacts can be called its *environment.*
- **Biodegradable substances:** microorganisms like certain bacteria decompose these. Eg: Sewage, agricultural residue, paper, wood, domestic waste product, urine cloth & cattle dung.
- **Non-Biodegradable Substances:** microorganisms do not decompose and also do not break up by any agent present in the environment. These substances may be in solid, liquid or gaseous form and may be inert and accumulate in the environment or may be concentrated in the food chain and harm the organisms': plastic, DDT, glass, polythene bags.
- **Ecology:** It is about how living things interact with each other and with their environment. It is the study of the relationship between organisms and environment.
- **Ecosystems:** All the organisms interacting in an area, together with the non-living constituents form an ecosystem. Eg: Pond, Grassland.
- Both living (**biotic**) and non-living **(abiotic**) components constitute the environment of man on earth.
- The various components of an ecosystem are independent.
- **Biosphere:** All ecosystems together make up the biosphere.
- **The Producers** make the energy from sunlight available to the rest of the ecosystem.
- There is a loss of energy as we go from one tropic level to the next; this limits the number of tropic levels in a food chain.
- **Food Chain**: It shows the movement of food energy from one organism to the next. It shows the relationship of producer and consumer i.e., 'who eats whom'. Thus it is a series of organisms taking part at various biotic levels to form a food chain.
- **Food Web: Each organism is generally eaten by two or more other kinds of organisms, which in turn, are eaten by several other organisms. So instead of a straight-line food chain, the relationship can be shown as a series of branching lines. Thus, the network of interconnected food chains is called food web.**
- **Tropic level**: These are the various steps or levels in the food chain. The autotrophs or the producers are at the first level. The herbivores or the consumer come at the second, small carnivores or the secondary consumers at the third and larger carnivores or the tertiary consumers form the fourth trophic level. Trophic means 'to feed.
- **Flow of Energy:** The flow of energy through different steps in the food chain is

unidirectional.

- Human activities have an impact on the environment.
- The use of chemicals like **CFCs** has endangered the ozone layer. Since the ozone layer protects against the ultraviolet radiation from the Sun, this could damage the environment.
- The waste we generate may be biodegradable or non-biodegradable.
- The disposal of the waste we generate is causing serious environmental problems.

1. Read the following and answer any four questions from 1.1 to 1.5.

The food chain generally consists of only 3 or 4 steps. Each step of the food chain forms a trophic level. The loss of energy at each level is so great that very little usable energy remains. The food web consists of many food chains in which each organism is generally eaten by 2 or more other kinds of organism which further eaten by several organisms.

1.1. Which of the following gets the minimum energy through the food chain in an ecosystem?

a. Carnivores

b. Large carnivores

c. Producers

d. Herbivores

1.2. The flow of energy in an ecosystem always

a. unidirectional

b. bidirectional

c. Cyclic

d. Multidirectional

1.3. In the food chain, the initial organism is usually:

a. photosynthetic

b. Herbivore

c. Saprophytic

d. Parasitic

1.4. In the food chain compromising of snake, grass, insect, frog and the secondary

consumer is:

a. Insect

b. Snake

c. Frog

d. Grass

15. What will happen if deer is missing in the food chain given

Grass – deer—Tiger.

a. Population of tiger increase
b. Population of grass decrease
c. Tiger will start eating grass.

The population of tiger decreases and the population of grass increases.

DIRECTION: The following question consists of two statements - Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

a) Both A and R are true, and R is the correct explanation of A.
b) Both A and R are true, but R is not the correct explanation of A.
c) A is true but R is false.
d) A is false but R is true.
e) Both Assertion and Reason are false.

1. **Assertion:** The concentration of harmful chemicals is more in human beings.

Reason: Man is at the apex of the food chain

2. **Assertion:** Ozone is both beneficial and damaging.

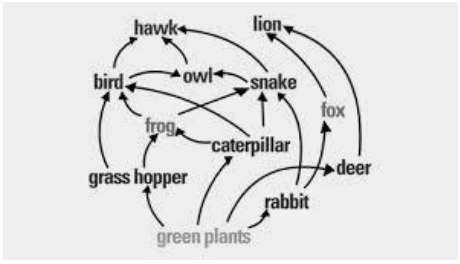
Reason: Stop the release of chlorofluorocarbons to protect the ozone.

Very Short Answer Type Questions: (1m each)

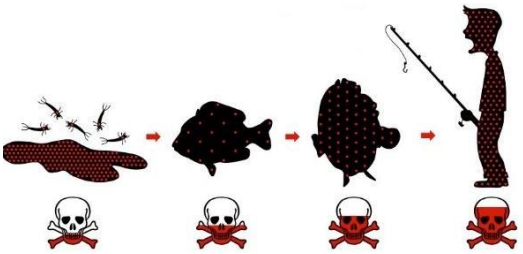
1.  Name any two biodegradable pollutants

2.  Name any two non-biodegradable pollutants.

3. Describe what is shown in the picture.



3. What do you infer from the picture given below.



4. The number of malarial patients in a village increased tremendously, when a large number of frogs were exported from the village. What could be the cause of it?

1. Why do food chains consist of three or four steps only?

Short Answer Type Questions: (2m each)

1. Mention the components of environment

2.  Is your kitchen garden a natural ecosystem or not? Justify your answer.

3. What will happen if all the waste that we generate is biodegradable?

4. Expand

a-GMO

b- UNEP

5. Describe any four methods of disposal of waste.

6. Ashwin is a non-vegetarian and eats a lot of meat fish and chicken. The pesticides used in fields are coming back to his body in much greater amounts. How is this possible? Justify your answer giving an example.

7. Aquariums require regular cleaning whereas lakes normally do not. Why? (hint: Microorganisms)

8. Calculate the amount of energy available to tiger in the following food chain if plants have 3000J of energy available from the sun.

Plant → Deer → Tiger

Long Answer Type Questions: (3 m each)

1. Energy flow in food chains is always unidirectional.'' Justify this statement.

2. What will be the impact on ecosystem if bacteria and fungi are removed from the Environment?

3. What control measures would you suggest for overcoming the problem of ozone depletion?

4. Can you make some useful products from biodegradable wastes? If so, give any three examples with their uses.

5. How is the ozone layer getting depleted? Explain.

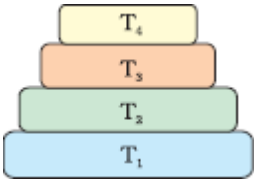
6. Differentiate between biodegradable and non-biodegradable wastes.

Very Long Answer Type Questions: (5 m each)

1. What are trophic levels? Give an example of a food chain and state the different trophic levels in it.

2. What general observations can be drawn from a study on the flow of energy in an ecosystem?

3. Observe the diagram and answer the following questions.



a) What are the four different levels termed as? _____

b) Where will be the maximum energy available? _____

c) What happens to the energy as the levels move up? _____

d) If one level is removed in between, what happens to the

i) Next upper level

ii) Below the removed level

e) If the lowest level has 200J of energy, how much will be the topmost level?

TERM -II

CHAPTER-8 HOW DO ORGANISMS REPRODUCE

REPRODUCTION: It is the process of producing new individuals of the same species by existing organisms of a species, i.e., parents.

Asexual Reproduction it is a type of reproduction in which only one individual is involved.

1. **Binary fission** it is the division of one cell into two similar or identical cells.
   - In this method, the nucleus first divides into two, followed by the division of the cytoplasm.
   - The cell finally splits into two daughter cells.
   - In plants, binary fission can be seen in bacteria, yeast and euglena.
   - Among animals, amoeba and paramecium reproduce through binary fission.

2. **Multiple fission** in multiple fissions, many individuals are formed from a single individual.
   - The nucleus of the cell divides repeatedly, producing many nuclei.
   - Each nucleus is surrounded by a small amount of cytoplasm and many daughter cells are produced within the cyst.
   - The cyst breaks up under favorable conditions and small offspring are liberated.

   E.g.: In plants – algae

   In animals – plasmodium

3. **Regeneration** it is the ability of the fully differentiated organism to give rise to new individual organism from its body parts.Eg. – Hydra and Planaria.
4. **Budding** in budding, a small part of the body of the parent grows out as a bud which then detaches and becomes a new organism.Eg: hydra reproduces by budding using the regenerative cells
5. **Vegetative Propagation** in vegetative propagation new plants are obtained from the parts of old plants like stems, roots and leaves without the help of any reproductive organ. The different types of vegetative propagation are:

1. **Cutting-** In this type of propagation any part of the plant root, stem or leaf is cut and buried partly in the moist soil. E.g.: rose plant, chrysanthemum, grapes are propagated by means of cutting.
2. **Layering -**The adventitious roots are produced in the branch of the stem before the plant is detached from the parent plant. The branch of the stem is called layer. This process is utilized in the propagation of plants and the phenomenon is called layering. The process is used in the propagation of plants like lemon, guava, hibiscus, bougainvillea, jasmine, raspberry , strawberry and many ornamental plants .
3. **Grafting** in this method of reproduction, two plants of closely related varieties are joined together so that they live as one plant.
    - The portion of a plant that is grafted on the other plant is called scion and the plant in which grafting is performed is called the stock.
    - This method is applied to improve varieties of fruits like mango, apple, peas, citrus and guava.

Advantages of Vegetative Propagation

- Vegetative propagation is a cheaper, easier and more rapid method of propagation in plants than growing plants from their seeds.
- The traits or characters of the parent plant are preserved by vegetative propagation.
- Better quality of the plants can be maintained by this method.
- It results in propagation of those plants which do not produce viable seeds or produce seeds with prolonged period of dormancy.
- The plants generated from vegetative means require less time to grow and have the advantage of being more uniform and genetically similar to the parent stock.

Disadvantages of Vegetative Propagation

- Vegetative propagation induces over – crowding.
- There is no genetic variation so there is less adaptability to the environment.
- The disease of the parent plant gets transferred to the offspring.
- The plants lose vigor.
- New characters can neither be introduced nor undesirable characters be eliminated.

Tissue Culture is the production of new plants from isolated plant cells or small pieces of plant tissue in a synthetic medium of culture solution.

- This technique is also known as micro propagation in vitro because it takes place outside the body of the parent plant in a test tube using an artificial environment.
- Micro propagation techniques are being used to produce ornamental plants like orchids, dahlia and carnation.

Spore Formation while a slice of bread is kept in moist dark place for a few days, spore of Rhizopus present in air settle on the bread to form new fungus plants of Rhizopus.

Sexual Reproduction it is a type of reproduction in which the two sexes, namely male and female are involved.

- The male sexual unit is known as male gamete or sperm, while female sexual unit is termed as female gamete or ova.
- Thus, the two major processes, i.e., formation of gametes and fusion of gametes constitute sexual reproduction.

Significance of Sexual Mode of Reproduction

- Sexual reproduction promotes diversity of characters in the offspring.
- It results in new combinations of genes brought together in the gamete and this reshuffling increases genetic variation.
- It plays a prominent role in the origin of new species.

The sexual mode of reproduction incorporates the process of combining DNA from two different individuals during reproduction.

Gamete the cells involved in sexual reproduction are called gametes. The male gamete in animals is called sperm or spermatozoan and the female gamete in animals are called ovum or eggs.

Zygote the cell which is formed by the fusion of a male gamete and a female gamete is called zygote; it is a fertilized ovum or fertilized egg.

Embryo it is the stage of development between the zygote or fertilized egg and the newly formed offspring.

Fertilization It is defined as the fusion of a male gamete (sperm) with a female gamete (ovum) to form a zygote during sexual reproduction.

Fertilization In Plants

Pollination is followed by fertilization in plants.

- After the pollen grain lands on the suitable stigma, it has to reach the female germ cells in the ovary.
- The pollen tube grows out of the pollen grain through the style to reach the ovary.
- After fertilization, the zygote divides several times to form an embryo within the ovule.
- The ovule then develops a tough coat and gets converted into a seed.
- The seed contains the future embryo which develops into seedling.
- The ovary develops and ripens to form a fruit.

Double fertilization

Fertilization is the process of fusion of male and female gametes. In plants the transfer of pollen grains from stigma to ovary. For this to happen, a tube grows out of the pollen grain. The pollen travels through this tube through the style to reach ovary. The pollen tube enters the ovary through an opening called micropyle. Here it releases 2 male gametes in the embryo sac in which one male gamete fuses with one female gamete. This is known as syngamy. The other male gamete fuses with two other polar nuclei. This is known as triple fusion. Syngamy along with triple fusion is defined as double fusion.

Sexual Reproduction In Human Beings:

Important Terms:

- **Fertilization**: In the fallopian tube, only one sperm fertilizes the ovum to form a zygote. This is called fertilization.
- **Implantation**: The embedding of embryo in the thick inner lining of the uterus is called implantation.
- **Placenta:** A special tissue develops between the uterine wall and the embryo (foetus), called placenta, where the exchange of nutrients, oxygen and waste products takes place.
- **Gestation:** The time period from the development of foetus inside the uterus till birth is called gestation.
- **Parturition**: The act of giving birth of the fully developed foetus at the end of gestation period is termed parturition.
- **Menstruation**: The breakdown and removal of the inner thick and soft lining of the uterus along with its blood vessels in the form of vaginal bleeding is called menstrual flow or menstruation.

- **Reproductive health**: All those aspects of general health which help a person to lead a normal, safe and satisfying life.
- **Sexually Transmitted Diseases (STD)**

Through Bacteria

i) **Gonorrhea-**Caused by bacterium ***Neisseria gonorrhoe*a** infects the ureter in men and the cervix in women. Causes burning sensation during urination.

ii) **Syphilis**-Caused by bacterium ***Treponema palladium*** causes lesions in the mucous membrane of urinogenital tract and ulcers on genitalia.

Through Protozoa: Trichomoniasis (not in the text, just for information)

Through Virus:

i) **AIDS (Acquired Immune Deficiency Syndrome)-**Caused by a virus, **HIV (Human Immunodeficiency Virus)-**suppresses the body's immune system thereby making it susceptible to diseases.

ii) **Warts.**

Methods to avoid Pregnancy:

i) **Mechanical Barrier Methods-** Use of physical devices such as condoms, diaphragm, and cervical caps.

ii) Chemical Methods-specific drugs used by females which are of two types- oral pills and vaginal pills.

ii) **Surgical Methods:**

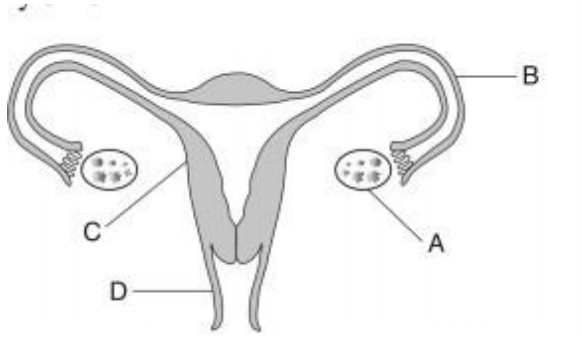
***Vasectomy**-a small portion of Vas deferens in male is surgically removed

***Tubectomy-**a small portion of fallopian tube in females is surgically removed or tied.

PASSAGE BASED QUESTIONS

Read the following questions and answer any four questions from 1.1 to 1.5.1.1

1.1 The diagram represents the human female reproductive system.



The placenta forms from the combination of fetal tissue and tissue from structure

(1) A (2) B (3) C (4) D

1.2 Structure A usually produces.

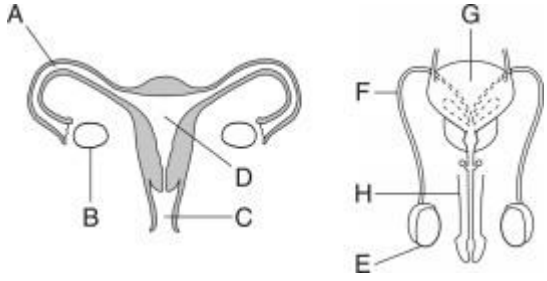
(1) sperm and eggs

(2) testosterone and eggs

(3) estrogen, progesterone, and eggs

(4) estrogen, progesterone, and testosterone

1.3 The diagram represents the reproductive systems of the human female and male.



In which structure do gametes usually unite to produce a zygote?

(1) A (2) G (3) C (4) F

1.4 The fetus normally develops within structure

(1) A (2) B (3) C (4) D

1.5 Which reproductive structure is correctly paired with its function?

(1) uterus-usual site of fertilization

(2) testis- usual location for egg development

(3) ovary- delivers nutrients to the embryo.

(4) sperm-transports genetic material

Read the following and answer any four questions 1.1 to 1.5.

Sexually Transmitted Diseases (STDs) or Sexually Transmitted Infections (STIs) are caused by bacteria, viruses or parasites that are transmitted through skin-to-skin genital contact. Bacterial infections include gonorrhea and syphilis whereas viral infections include warts, genital herpes and HIV-AIDS. STIs are an important public health problem in India. ICMR estimates the occurrence of about 30-35 million new

infections in the country every year, almost half of them among adolescents and young people.

Birth control methods such as oral contraceptives or IUDs do not prevent STD transmission, however, barrier method is highly effective in reducing STD transmission.

i) Which of the following is not a sexually transmitted disease?

(a) gonorrhoea (b) hepatitis
(c) syphilis (d) AIDS

ii) The sexually transmitted disease which is caused by bacteria is:

a) diarrhoea (b) AIDS
b) gonorrhoea (d) genital herpes

iii) Which of the following methods of contraception protects a person from acquiring a STD?

(c) oral pills (b) copper T
(c) surgery (d) condom

iv)Study the table below and select the row that has the incorrect Information.

	Disease	**Cause**
(a)	LGV	Bacteria
(b)	GenitaI Herpes	Virus
(c)	Syphilis	Virus
(d)	Gonorrhoea	Bacteria

v) STIs are most common in which age group?

(d) people 60 and older
(e) people aged 40 to 50
(f) adolescents and young people upto age 25.
(g) none of these

DIRECTION : The following question consists of two statements - Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

a) Both A and R are true and R is the correct explanation of A.
b) Both A and R are true but R is not the correct explanation of A.
c) A is true but R is false.
d) A is false but R is true.
e) Both Assertion and Reason are false.

1. **Assertion:** Sexual reproduction increases genetic diversities and plays a role in origin of new species.

Reason: Sexual reproduction involves formation of gametes and fusion of gametes.

2. **Assertion:** Pollen grains from the carpel stick to the stigma of stamen.

Reason: The fertilized egg cells grow inside the ovules and become seeds.

Short Answers (2 marks each)

1. Give the importance of DNA copying in reproduction.

2. Name the female gonad in human beings and mention its functions.

3. Why are the testes in human male located outside the abdominal cavity?

4. What are Sexually Transmitted Diseases? Give two examples.

5. Why is regeneration considered a method of reproduction?

6. Protozoanreproducesbybinaryfissionaswellasbymultiplefission.Inyour opinion, which process is better and why?

7. What happens to the ovule and ovary after fertilization?

8. How do contraceptive pills prevent conception?

9. Write about the dual purpose served by urethra.

10. Why is the number of sperm produced always more than the number of eggs produced?

11. What is sex ratio?

12. A pregnant woman visits a doctor to determine the sex of her child. The doctor refused to perform the test. Why is she being denied?

Answer in Brief (3 mark each)

1. What is meant by contraception? What are the different methods of contraception?

2. What is a seed? What are the parts of a seed? Explain with the help of a labelled diagram.

3. Write the full form of DNA. Name the part of the cell where it is located. Explain its role in the process of reproduction of the cell.

4. What is tissue culture? What types of plants are being produced increasingly by this method? Give two examples of such plants.

5. Give the difference between human sperm and human ovum

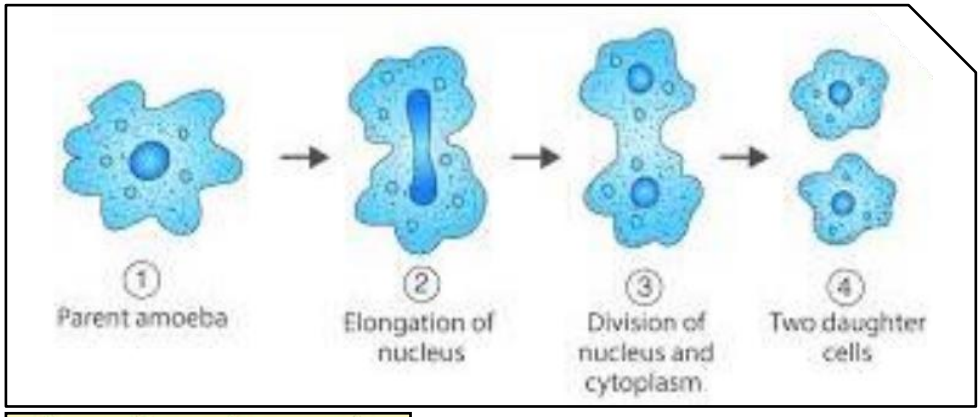
Answer in Detail (5 mark each)

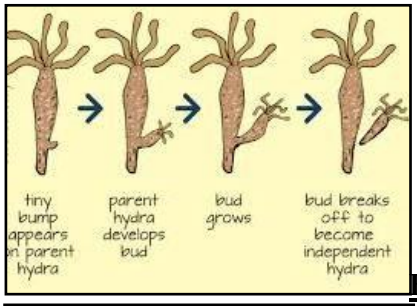
1. Draw a labeled diagram of the human female reproductive system.

2. Draw a longitudinal section of a flower.

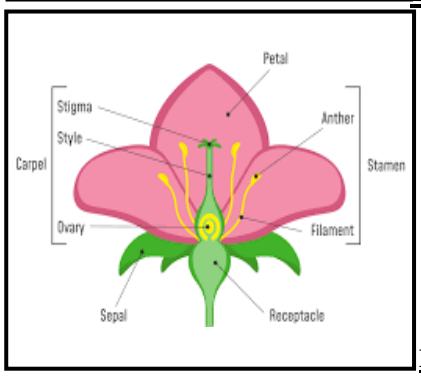
3. Explain the following methods of contraception giving one example of each:

DIAGRAMS FOR PRACTICE

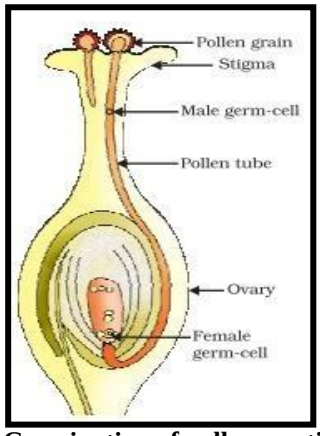




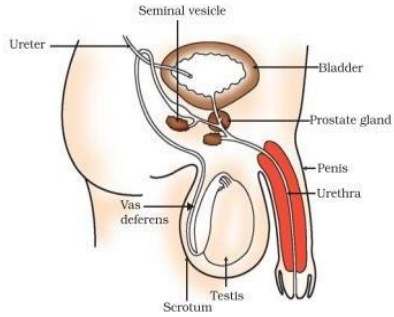
Budding in hydra



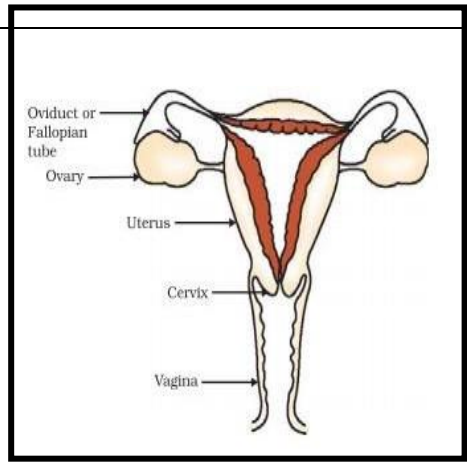
L.S.OF FLOWER



Germination of pollen on stigma (Fertilisation)



Human male Reproductive system



Human female Reproductive system

PRACTICALS

Experiment 3

AIM: To study the process of Binary Fission and budding with the help of prepared slides

MATERIALS REQUIRED: Compound microscope, prepared slides of Binary fission in Amoeba and Budding in Hydra and Yeast.

THEORY:

BINARY FISSION: It is the process of asexual reproduction found in unicellular organisms such as amoeba and paramecium. In the process, the parent cell divides to give rise to two daughter cells. Each daughter cell has a nucleus and eventually grows into an adult organism.

BUDDING IN YEAST: In budding yeast, a small protuberance appears on the upper part of an adult yeast cell. This gradually grows and detaches from the parent body and grows.

OBERSERVATIONS:

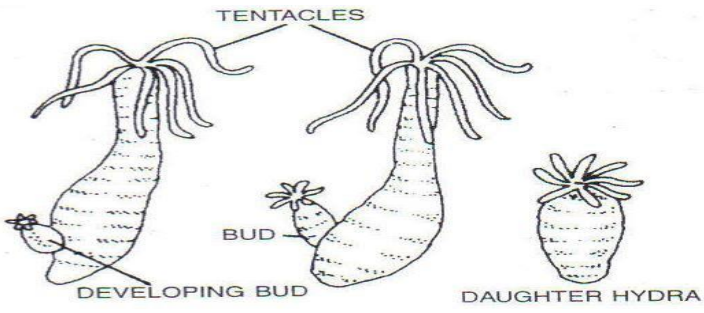
We observe the different stages of binary fission and budding in Amoeba and Hydra.

INFERENCE:

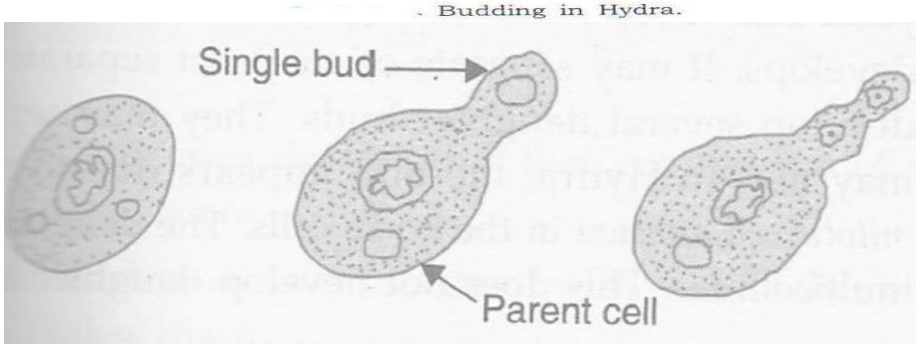
Binary fission and Budding are asexual methods of reproduction.

PRECAUTIONS:

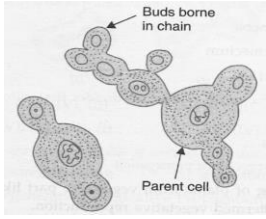
1) The slide should be first observed under the low power of the microscope.
2) Locate the various stages by moving the slide very slowly sideways.
3) After locating the stages, observe the slide under high power.
4) Always lower the lengths of microscope very slowly and gradually look into the eye-piece.
5) Observe the budding hydra slide under a dissecting microscope.



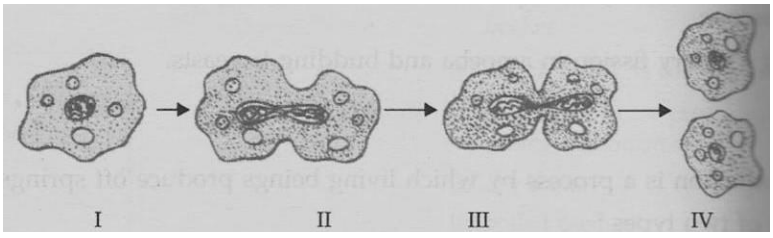
Budding in Hydra.



Budding of Yeast Cells



Chain of Buds on Parent Cell



Different Stages of Binary Fission in Amoeba

Experiment 4

OBJECTIVE: To identify the different parts of an embryo of a dicot seed (pea, gram or red kidney bean)

MATERIAL REQUIRED:

1- Germinated seeds of (pea, gram or red kidney bean)
2- Dissecting needle
3- Forceps
4- Petri dish
5-

PROCEDURE:

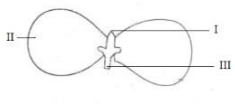
1- Take a germinated seed of gram in a petri dish.
2- Cut open this seed along the depression from broader side.
3- Remove the seed coat carefully, without breaking the germinated embryo.
4- Carefully open up the swollen yellow-coloured cotyledons and observe the short embryonal axis.
5- Draw a neat and labelled diagram of the dissection in your practical file and record your observations.

OBSERVATIONS:

1- In a dicot seed the whole interior of seed is occupied by embryo.
2- Embryo has a short embryonal axis to which two large broad yellow coloured cotyledons are attached at the middle by narrow short stalk.
3- One end of the embryonal axis bears rudimentary leaves and the plumule and the opposite end bears the radicle.
4- The portion of axis between the radicle and cotyledonary node is called hypocotyl and the portion between the cotyledonary node and plumule is called epicotyl.

PRECAUTIONS:

1- Use only partially germinated seeds.
2- Remove the seed coat with utmost care.
3- Open cotyledons with great care, so that the embryo axis remains attached to the cotyledons.



I. Plumule

II. Cotyledon

III. Radicle

Practical based questions- X

EXPERIMENT- 1

Aim: To study (a) binary fission in Amoeba and (b) budding in yeast with the help of prepared slides.

1. What is the mode of reproduction in amoeba?
2. Malarial parasite reproduces by which method?
3. How is mode of reproduction in yeast similar to the one in hydra?
4. Out of binary and multiple fission, which is better and why?
5. A yeast cell in which budding occurs, it can have:
6. How is spore formation different from seeds?
7. What is the method of multiplication in species without seeds known as?
8. If yeast is put in cold sugar solution, it does not reproduce; why?
9. Amoeba reproduces by binary fission. Why the cells produced are known as daughter cells?

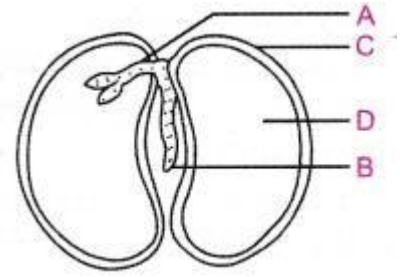
EXPERIMENT- 4

Aim: To identify the different parts of an embryo of a dicot seed (pea, gram or red kidney bean)

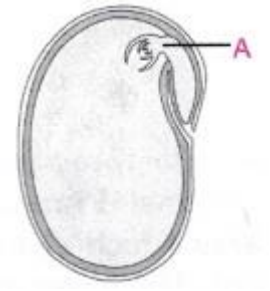
PRACTICAL BASED QUESTIONS

GERMINATION OF SEED

1. Label parts A,B,C and D from the diagram given below.



2. What is A in the following diagram? Write its function.



3. After a seed is germinated, it will develop and grow into a young plant. Arrange the following to show the correct order of events taking place during seed germination.
   A. root appears
   B. seed coat ruptures
   C. seedling
   D. shoot appears
4. What is the function of the following?
   (a) Plumule (b) Radicle?
5. The gram seed has a small pore through which it absorbs water. What is the pore called? Write its importance.

6. A) Which plants have endospermic seeds?
   B) Which plants have non-endospermic seed?

7. Name the part of the plant that first emerges from the seed. Write its function?

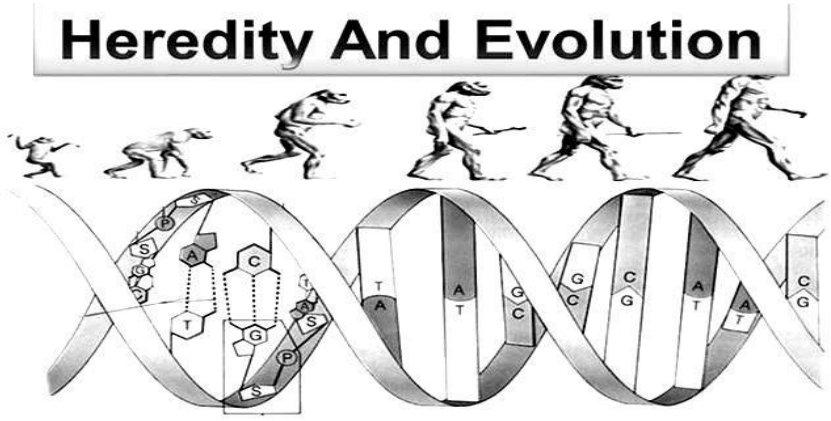
8. A seed was soaked for 8-10 hours. If the seed can be separated into two parts, what kind of seed is it? Write any two differences between a dicot seed and monocot seed.

9. You have to perform the experiment, "To identify the different parts of an embryo of a gramseed." Describe the procedure that you would follow.

10. You soak seeds of bean and observe them after 2-3 days. What will be your observations?

11. Write any two precautions for the experiment identifying different parts of an embryo of a seed.

CHAPTER 9



SYNOPSIS

IMPORTANT TERMS:

1. **Heredity**: The transmission of characters (or traits) from the parents to their offspring.

   Gametes constitute the link between one generation and the next, and pass on the paternal (father's) and maternal (mother's) characters or traits to the offspring. This relation that continues to exist between successive generations is referred to as heredity.

2. **Variation**: The difference in the characters (or traits) among the individuals of a species.

   The offsprings are never a true copy of the parents.

   In fact, no two individuals are exactly alike and the members of any one species differ from one another in some characteristics (or traits).

   Some amount of variation is produced even during asexual reproduction, but it is very small.

   The number of variations produced during sexual reproduction is very large.

   The significance of a variation shows up only if it continues to be inherited by the offspring for several generations.

   The great advantage of variation to a species is that it increases the chance of its survival in a changing environment.

3. **Chromosome**: thread like structure in the nucleus of a cell formed of DNA, which carries the genes.

4. **Genes**: A gene is a unit of DNA on a chromosome, which governs the synthesis of one protein that controls a specific characteristic (or trait) of an organism.

   Genes are actually units of heredity, which transfers characteristics from parents to their offspring during reproduction.

5. **Dominant gene**: The gene which decides the appearance of a trait even in the presence of an alternative gene.

6. **Recessive gene**: The gene which decides the appearance of a trait only in the presence of another identical gene.

7. **Genotype**: Genotype shows the genetic constitution of an organism. It is the description of genes present in an organism.

8. **Phenotype**: The visible trait or characteristic in an organism

9. **F1 generation**: When two parents cross (or breed) to produce progeny (or off springs), then their progeny is called first filial generation or F1 generation.

10. **F2 generation:** When the first-generation progeny cross among themselves to produce the second progeny, then this progeny is called second filial generation or F2 generation.

11. **Alleles:** Contrasting or alternative form of genes. Eg. TT, Tt

12. **Speciation: The process by which new species develop from existing species or formation of new species**

13. **Species:** A species is a population of organisms consisting of similar individuals which can interbreed.

14. **Gene flow:** It is the exchange of genetic material by interbreeding between populations of the same species or between individuals within a population. Gene flow increases the variation in the genetic composition of a population.

15. **Genetic drift:** it is the random change in the frequency of alleles in a population over successive generations.

16. **Natural selection:** It is the process of evolution of a species whereby characteristics which help an individual organism to survive and reproduce are passed on to their off-springs, and those characteristics which do not help are not passed on.

17. **Fossils:** They are all preserved traces or remains of living organism of geological past. E.g., Archaeopteryx—shows the link between birds and reptiles.

18. **Phylogeny:** It is the evolutionary history of an organism or a group of organisms.

19. **Molecular Phylogeny:** It is the idea that organisms those are more distantly related will accumulate a greater number of differences in their DNA. Such studies traces the evolutionary relationships.

20. **Homozygous:** When two alleles of a gene are similar E.g. TT, tt.

21. **Heterozygous:** when two alleles in a pair are different. E.g. Tt.

22. **Classification:** It is the arrangement of organisms into series of groups based on physiological, biochemical, anatomical or other relationships

- **Why did Mendel choose pea plants for studying inheritance?**

  Pea plants had many contrasting characteristics, which were easy to tell apart.

  Pea plants were self-pollinating, which enabled them to produce the next generation of plants easily.

  He chose pea plants to study inheritance because many generations of plants can be produced in a comparatively short span and their study is much simpler than that of animals.

- **Evolutionary relationships**

  - The more common characteristics two species have the more closely are related.
  - The closer
  - A girl and her first cousin are closely related but less related than her brother. The cousins have a common ancestor, their grandparents in the second generation.

  Thus, evolutionary relationships are traced in the classification of organisms.

- **Homologous organs:** are those which have the same basic structural design and development origin but have different functions and appearance.

  E.g. the forelimb of a frog, a lizard and a man seem to be from the same basic design of bones but they perform different functions.

- **Analogous organs:** are those organs which have different basic structural design and development origins but similar appearances and perform similar functions.

  E.g. the wings of birds and bats look similar but have different design in their structure. Wings of bats are skin folds stretched in between fingers but wings of birds are covered by feathers all along the arm

- **Sex chromosomes**: are chromosomes associated with sex determination.

  There are two types of sex chromosomes.

  X-chromosome- Females carry 2 similar X-chromosomes, XX Y-

  chromosomes-Males have one X and one Y chromosome, XY

- **Autosomes**: the chromosomes associated with the functioning and characters of an individual other than sex determination.

  Human beings have 22pairs of autosomes and 1 pair of sex chromosomes in each cell.

- **Sex Determination**:
  - Genetics involved in the determination of the sex of a person, is as follows:
  - A male has one X-chromosome and Y-chromosome i.e. half of the male gamete or sperms will have X-chromosome and the other half will have Y-chromosome.
  - A female has two X-chromosome i.e. all the female gametes or ova will have only X-chromosome.
  - Sex of a child depends on what happens at fertilization:
  - If a sperm carrying X-chromosome fertilizes an ovum, which carries X-chromosome, then the child born will be a girl.
  - If a sperm carrying Y-chromosome fertilizes an ovum, which carries X-chromosomes, then the child born will be a boy.
  - Thus, the sperm determines the sex of a child.
  - Sex determination is also controlled by the environmental factors in some reptiles e.g., turtle, high incubation temperature leads to the development of female offspring, while in case of lizard, high incubation temperature results in male off spring.

INHERITANCE OF BLOOD GROUP

Blood groups are inherited from our biological parents in the same way as eye colour and other genetic traits.

Within the ABO Blood Group system, the A and B genes are co-dominant, i.e. these will be expressed whenever the gene is present. The O gene is silent and only expressed when neither A nor B is present.

Both A and B alleles are dominant over O. As a result, individuals who have an AO genotype will have an A phenotype. People who are type O have OO genotypes. In other words, they inherited a recessive O allele from both parents. The A and B alleles are co dominant. Therefore, if an A is inherited from one parent and a B from the other, the phenotype will be AB. Agglutination tests will show that these individuals have the characteristics of both type A and type B blood.

The following charts outline the possible ABO group combinations of parents and the possible blood types of their biological children.

ABO Blood Groups

Parents	Possible Children
O & O	O
O & A	O or A
O & B	O or B
O & AB	A or B
A & A	O or A
A & B	O, A, B or AB
A & AB	A, B or AB
B & B	O or B
B & AB	A, B or AB
AB & AB	A, B or AB

Q1- A woman having blood group B marries a man having blood group A and they have four off springs. One child has blood group O, one has blood group B, one has group A, and one has blood group AB.

1.What are the genotypes of the parents?

2. With the help of a punnet square show the above cross.

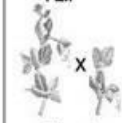
LAWS OF INHERITANCE

1. **Law of dominance:** This law states that in a heterozygous condition, the allele whose characters are expressed over the other allele is called the dominant allele and the characters of this dominant allele are called dominant characters.
2. **Law of segregation**: This law states that when two traits come together in one hybrid pair, the two characters do not mix with each other and are independent of each other. Each gamete receives one of the two alleles during meiosis of the chromosome.
3. **Law of independent assortment:** This means that at the time of gamete formation, the two genes segregate independently of each other as well as of other traits. Law of independent assortment emphasizes that there are separate genes for separate traits and characters, and they influence and sort themselves independently of the other genes. This law also says that at the time of gamete and zygote formation, the genes are independently passed on from the parents to the offspring.

MENDELIAN EXPERIMENTS: LIST OF TRAITS

Dominant traits are written in bold and underlined.

1- Height of plant—**Tall**/Short (T)
2- Color of Seeds- **Yellow**/Green (Y)
3- Shape of Seeds- **Round**/Wrinkled (R)
4- Color of flower- **Purple**/ White (P)
5- Shape of the Pod- **Inflated**/Constricted (I)
6- Color of Pod- **Green**/ Yellow (G)
7- Position of Flowers- **Axial**/Terminal(A)

	Seed Shape	Seed Color	Seed Coat Color	Pod Shape	Pod Color	Flower Position	Plant Height
P	Round  Wrinkled	Yellow  Green	Gray  White	Smooth  Constricted	Green  Yellow	Axial  Terminal	Tall  Short
F_1	 Round	 Yellow	 Gray	 Smooth	 Green	 Axial	 Tall

PASSAGE BASED QUESTIONS

1. An F1 Pea plant with round and yellow seeds was crossed with a certain plant X and resulted in production of four different types of plants in equal number I e round and yellow seed , round and green seed, wrinkled and yellow seed ,and wrinkled and green seed.

i Which alternative represents plant X?

a. RrYy
b. rryy
c. RRYY
d. rrYy

ii Which type of cross is represented in the above example?

a. Monohybrid cross
b. Dihybrid cross
c. Self-cross
d. Both a and b

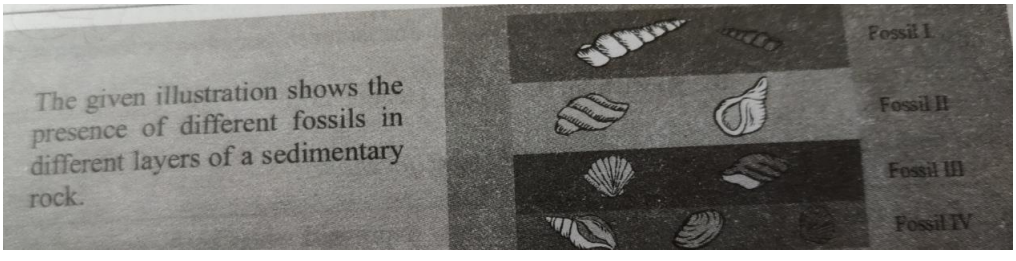
iii In humans if gene B gives brown eyes and gene b gives blue eyes, what will be the colour of eyes of the persons having combinations.
(i) Bb and (ii) BB?
(a) (i) Blue and (ii) Brown
(b) (i) Brown and (ii) Blue
(c) (i) Brown and (ii) Brown
iv (i) Blue and (ii) Blue

iv. Robin is a boy who has curly hair, dark brown eyes and attached earlobes. He is also a very good table tennis player.

Which trait in Robin cannot be passed on to his children?

a. Curly hair
b. Dark brown eyes
c. Attached earlobes.
d. Ability to play table tennis.

Use the following information to answer the next question



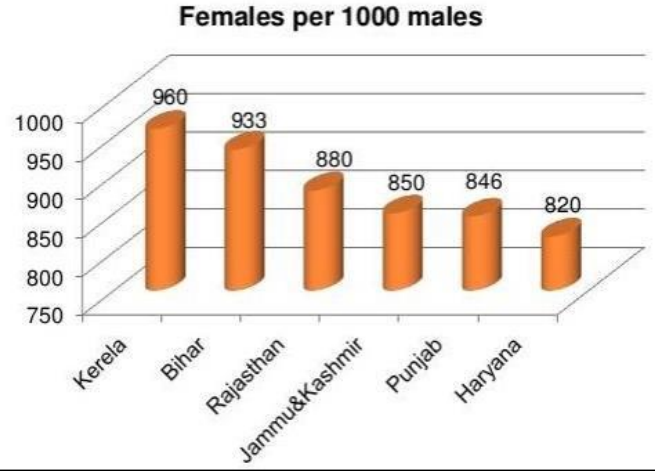
According to the given illustration, which is the most recent fossil?

i. Fossil I
ii. Fossil II
iii. Fossil III
iv. Fossil IV

2. **Read the following and answer any four questions from 2.1 to 2.5**.

India's urban population is choosing to have smaller families. Studies reveal that in families with two children, one-third have both boys while just one-sixth have both girls. In the past, families may have chosen to keep having children until a boy is born but with medical advancements, they are now simply choosing to conceive and deliver boys. The government has attempted to clamp down on this sex determination. The below graph shows the number of females per 1000 males in some states and it is observed that some states have fewer females per 1000 males as females are killed before they are born.

SEX RATIO – AGE GROUP (0-6 YRS)



2.1 his practice of killing unborn female child called _____

a. Female foeticide

b. Infanticide

c. Both a and b

d. None of the above

2.2 Sex of a human child is determined by Page 4 of 11

a. Size of the egg at the time of fertilization

b. Size of the sperm at the time of fertilization

c. Sex chromosome of father

d. Sex chromosome of mother

2.3 The chromosomes responsible for the determination of sex are called

a. Autosomes

b. Allosomes

c. Multiple alleles

d. None of the above

2.4 Which of the following is a consequence which will be faced in the

future if this practice is not banned?

a. It leads skewed sex ratio, it gives rise to decrease in female population.

b. Adverse effect on the mother's health physically and emotionally after repeated abortions.

c. Leads to women kidnapping, trafficking.

d. All of the above

2.5 From the above graph which state shows the least rate of this

practice?

a. Punjab

b. Kerala

c. Haryana

d. Rajasthan

DIRECTION: The following question consist of two statements - Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

a) Both A and R are true and R is the correct explanation of A.
b) Both A and R are true but R is not the correct explanation of A.
c) A is true but R is false.
d) A is false but R is true.
e) Both Assertion and Reason are false.

1. **Assertion:** Dominant allele is an allele whose phenotype expresses even in the presence of another allele of that gene.
   Reason: It is represented by a capital letter, e.g. T.
2. **Assertion:** The sex of the children will be determined by chromosome received from the father.
   Reason: A human male has one X and one Y chromosome.

Very Short Answer Questions (VSA)- (1m each)

1.- 

i. Sudden inheritable change is called?

ii. Who is known as the father of genetics?

2.-  i. Which of the processes, sexual reproduction or asexual reproduction, brings about maximum variation in the off springs?

ii. What is the advantage of variations? What does it lead to?

3.  Through which process the chromosome number of a species is restored? What is the resultant cell called?

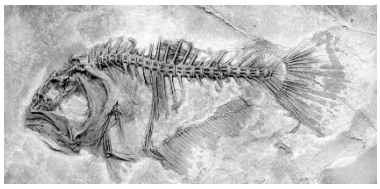
Short Answer Questions (SA) (2m each)

1.  Name the scientist who gave the theory of origin of life on Earth. What is this theory?

 Out of the wing of a bird, wing of an insect and wing of a bat which two are:

a. Homologous organs?

b. Analogous organs?

2. How is the age of a fossil determined? 

Long Answer Questions (LA) (3m each)

1. -Define 'Speciation'. Explain how speciation occurs.

2. What are genes? Where are, they located in our body? Why are they important for us?

3. Why did Mendel choose pea plant for conducting his experiments on inheritance?

4. Explain how sex is determined in human beings.

5. What is meant by dominant and recessive genes? Give one example of each?

6. a) What will you get in the F_1 and F_2 generation in the following cross? (Mention both phenotypic & genotypic ratios)

Pure tall pea plant X Pure dwarf pea plant.

b) Is it an example of monohybrid cross or a dihybrid cross?

Very Long Answer Questions (VLA) (5m each)

1. -What are the different ways in which individuals with a trait may increase in a population?

2. -i. Pure bred pea plants A are crossed with pure bred pea plants B. It is found that the plants which look like A do not appear in the F_1 generation but re-emerge in F_2 generation. Which of the following plants A & B are:

a) Tall b) Dwarf

Give reasons for your answer.

ii. Pure bred tall pea plants are first crossed with pure dwarf pea plants. The pea plants obtained in F_1 generation are then crossed to produce F_2 generation pea plants.

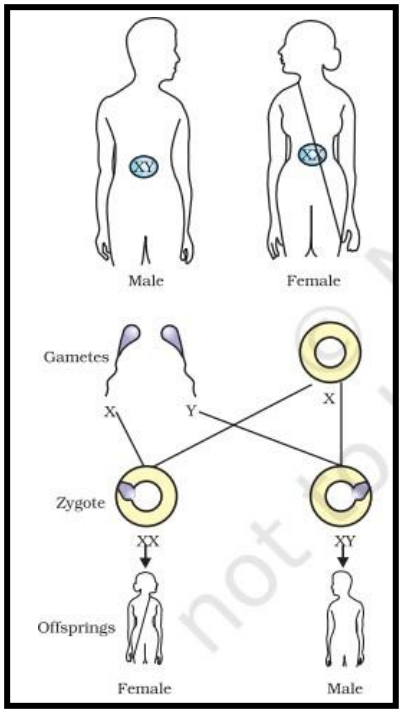
a) What do the plants of F_1 generation look like?

b) What is the ratio of tall plants to dwarf plants in F_2 generation?

c) Which type of plants was missing in F_1 generation but reappeared in F_2 generation?

2. -Pea plants with round and green seeds are crossed with wrinkled and yellow seeds bearing pea plants. On the basis of Mendelian experiment what do you conclude from the experiment?

DIAGRAM FOR PRACTICE



Sex determination in human beings.

CHAPTER16- MANAGEMENT OF NATURAL RESOURCES

Our resources like forests, wildlife, water, coal and petroleum need to be used in a sustainable manner. They are the resources which are found in nature & are called as **Natural Resources.**

- **Ganga Action Plan:** It is a multi-core project implemented in 1985, which has been undertaken to clean the excess of pollution from the river Ganga.
- We can reduce pressure on the environment by sincerely applying the maxim of '**Reduce, Reuse and Recycle'** in our lives.
- Management of forests resources has to take into account the interests of various stakeholders.
- The harnessing of water resources by building dams has social, economic and environmental implications. Alternative to large dams exist. These are local- specific and may be developed so as to give local people control over their local resources.
- The fossil fuels, coal and petroleum, will ultimately be exhausted. Because of this and because their combustion pollutes our environment, we need to use these resources judiciously.
- **Sustainable Development:** is maintained for a long time without undue damage to the environment
- **Social Forestry:**Progaramme such as rising, planting, and protecting trees for various purposes, should be undertaken on a large scale.
- **AgroForestry:** is an absolute commercial forestry developed to fulfill the need of various forest-based industries.
- **Urban forestry:** should be encouraged in small gardens and house compounds and it should be well maintained by planting trees and flower plants.
- **Chipko Movement:** The 'Chipko movement' was a movement of the local people to resist the deforestation attempt on the hill slopes.
- The **Chipko Movement** quickly spread across across communities and media, and forced the government, to adopt Forest-Friendly Policy.
- People like Sunderlal Bahuguna and Chandiprasad Bhatt have been responsible for carrying this movement forward over the years.

- **Amrita Devi Bishnoi National Award**: In 1731, Amrita Devi Bishnoi sacrificed her life along with 363persons for the protection of 'Khejri' trees in Khejri village near Jodhpur in Rajasthan. In her memory, Government of India has recently instituted this award for 'wildlife conservation'.
- **Rainwater Harvesting**: is a method of catching rainwater when it falls and storing it to use during the non-rainy season.

PASSAGE BASED QUESTIONS

1. Read the following and answer any four questions from 1.a to 1.e

Rainwater harvesting is a viable option to supplement city water for non-potable human uses, such as irrigation. The overall efficiency of a rainwater harvesting system to supplement city water increases as area increases. The system would be highly effective in high commercial regions where there are warehouses and large buildings. These areas also contain less lawn area, so that the water can be used for uses beyond irrigation. In order to display the potential of the rainwater harvesting project for a heavy commercial area, Ontario, CA was chosen as a sample site. Ontario is an area with many commercial facilities, when all of the roof area is considered with the average annual rainfall at 16 inches, a total of 2,200 acre-feet per year of water can be collected, this can meet the demands of 10,000 people.

The simplicity of the model and the low overall cost to install the system makes rainwater harvesting easily translatable for use in developing regions. The water quality data shows that the water is clean for non-consumption purposes; although, a simple filtration system may have the ability to take the water into the potable range. The water collected from the harvesting system is cleaner than many water sources found in developing regions. In developing regions with a growing industry sector, water sources are often contaminated by outflow of waste from the facilities as many countries do not have stringent outflow laws. In areas with high populations, waterways used for drinking water are overdrawn and are used for purposes such as the cleaning of clothes and bathing. Rainwater harvesting can prevent the need to travel far distances to obtain water and can help the overall health and growth of communities.

(a) The method of rainwater harvesting which can be adopted by individual house owners is.

(i) Construction of recharge trenches

(ii) On channel storage of water

(iii) Creation of new water bodies

(iv) Roof-top rainwater harvesting

(b) Which one of the following is not an ideal solution for tackling water shortages?

(i) Controlling population growth

(ii) Conserving water in irrigation

(iii) Controlling water pollution

(iv) Drilling large number of deep bore wells

(c) Which of the following is not a method for water conservation?

(i) Rainwater harvesting

(ii) Groundwater extraction

(iii) Improving irrigation efficiency

(iv) Avoiding water wastage

(d) The_____system is based on the principle of harvesting rainwater on farmland and subsequent use of this water-saturated land for crop production.

i)Khadin

ii)Bavadi

iii)Taanka

iv) Surangam

e) Which one of the following is the benefit of rainwater harvesting?

i) Flood mitigation

ii) Provide a lot of water to playv

iii) Create good aesthetic view

iv) Decrease the ground water level

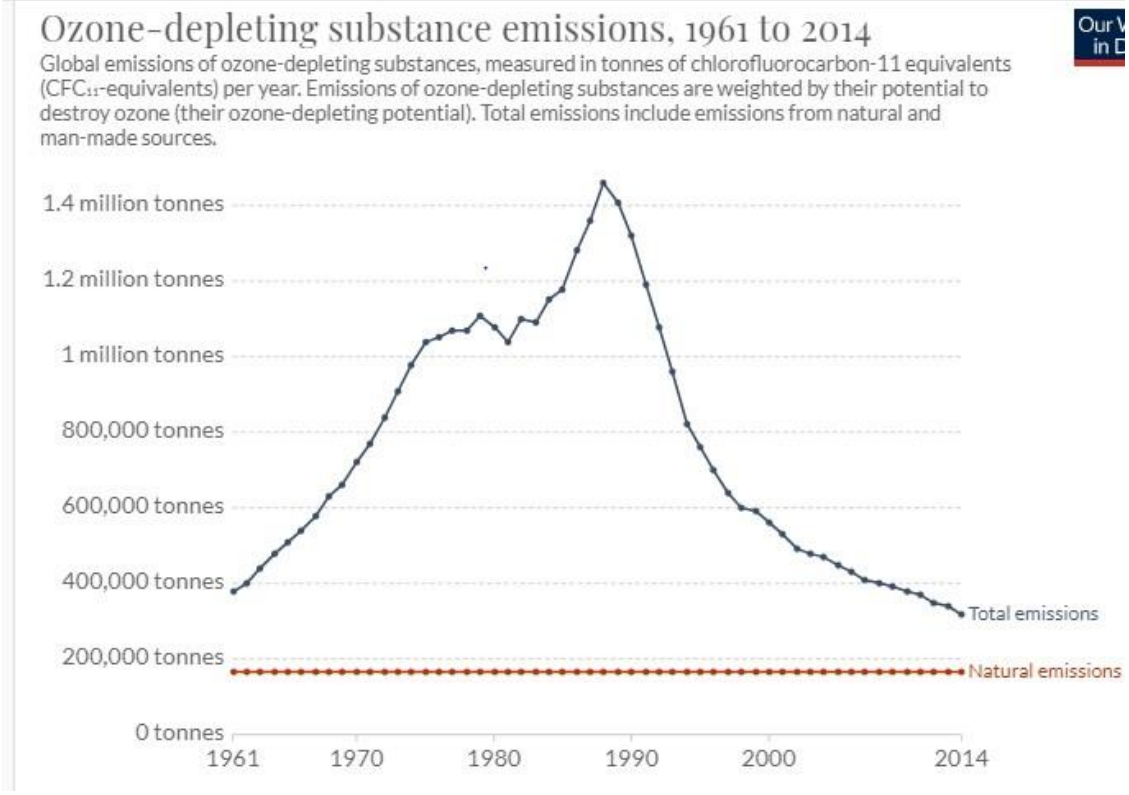
2.

Read the passage carefully and answer the questions that follow:

It's becoming very dangerous to sit in the sun. If you have a fashionable suntan, it doesn't necessarily mean that you have lots of outdoor activities – but it does mean that you're in greater danger of getting skin cancer and cataracts.

The ozone layer, which protects us from the sun's dangerous ultraviolet rays, is progressively deteriorating. In February 1992, a scientific report said that people in Canada, Northern Europe and Russia were in serious danger.

In 1985, the news of the destruction of the ozone layer in the South Pole alarmed people in the Southern Hemisphere. In Australia, there are now three times more cases of skin cancer than in the past. In New Zealand, teachers tell school children to wear hats and not to sit in the sun. What causes the destruction of the ozone layer? Mostly chlorofluorocarbons (CFCs), Aerosol sprays, refrigerators, air conditioners, as well as industrial chemicals, send chlorofluorocarbons into the atmosphere.



Read the passage and observe the graph.

Q1. CFCs are caused by:

a. Manuring
b. Aerosols and sprays
c. Medicines

d. All of the above

ii) Australia:

a. Has other problems to deal with
b. Has most number of skin cancer cases
c. Tells students to wear hats
d. None of the above

iii) the scientific report published in 1992 said people in_____were in serious danger:

a. India and Pakistan
b. Canada north Europe and Russia
c. Canada, America and spain
d. Bangladesh and sudan

iv) In the graph the peak in ozone depleting substances is shown in the year:

a. 1961
b. 2014
c. 1990
d. 2000

v) Ozone protects us from:

a. weather

b. heat energy

c. rain

d. ultraviolet radiations

DIRECTION : The following question consist of two statements - Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

a) Both A and R are true and R is the correct explanation of A.
b) Both A and R are true but R is not the correct explanation of A.
c) A is true but R is false.
d) A is false but R is true.
e) Both Assertion and Reason are false.

1. **Assertion:** Reuse is better than recycle.

Reason: Recycle prevents environmental pollution.

2. **Assertion:** Dams are the barriers constructed across the rivers to hold the water.

Reason: These dams ensure the storage of adequate water for different uses.

Very Answer Short Type Questions: (1 m each)

1. What is meant by sustainable development?
2. Name the bacteria whose presence in water indicates its contamination with disease- causing microorganism.
3. What does rainwater-harvesting mean?
4. What is the main purpose of rainwater harvesting?
5. Mention the harmful effects of ozone depletion
6. Why should fossil fuels like coal and petroleum be used judiciously?
7. What is a biodiversity hotspot?

B. Short Answer Type Questions: (2 m each)

1. Name two factors, which can be used to find whether river water has been contaminated.
2. Describe how the water of river Ganga has been highly polluted?
3. Describe some of the problems associated with the construction of dams across rivers.
4. "Forestscannotbeconservedonlybylegislation;localhumaninterventionis alsorequired." Justifyyouranswerwithtwoexamples.

5. Explain three main functions of the forests.

6. What are *Tendu* leaves? What is its used for?

7. What is the other name for petroleum? Is it renewable or non-renewable resource?

C. Short Answer Type Questions: (3 m each)

1. Write a short note on 'Chipko Andolan' (hug trees movement)

2. Explain why despite good rain, we not able to meet the demand for water of all the people in our country.

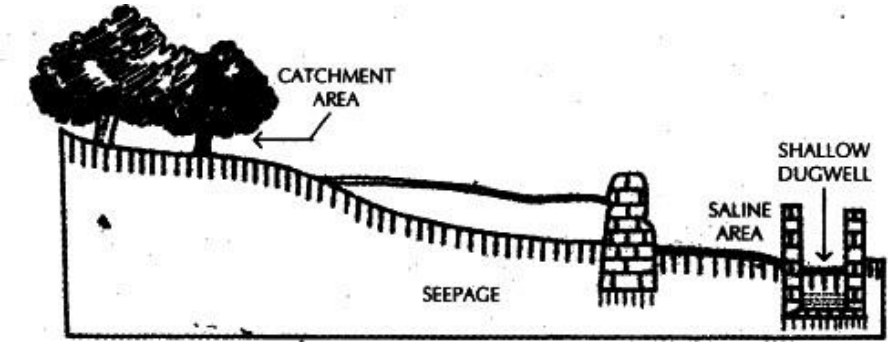
3. What are the various advantages of water stored in the ground?

D. Long Answer Type Questions: (5 m each)

1. Name the product of combustion of fossil fuels like coal and petroleum products. How do they affect our environment and us?

2. What is meant by rainwater harvesting? Name some of the common methods used for rainwater harvesting by the rural people.

3. Observe the given diagram and answer the following questions.



a) What is this process known as?

b) What are the advantages of other check dams?

4. Why is dependence of man on nature greater than that of any other organism?

SAMPLE PAPERS

(Subject to change as per CBSE instructions)

CBSE Class 10th blueprint Science – 2021

Unit	Title	Weightage
1	Chemical Substances-Nature and Behavior	26
2	World of Living	23
3	Natural Phenomena	12
4	Effects of Current	14
5	Natural Resources	05
	Total Marks	80
	Internal Assessment	20
	Grand Total	100

Assessment Areas (Theory) 2021
(Class X)
Science (086)

Competencies	
Demonstrate Knowledge and Understanding	46%
Application of Knowledge/Concepts	22%
Analyze, Evaluate and Create	32%

Note:

- Typology of Questions: VSA including objective type questions, Assertion – Reasoning type questions.

SA; LA; Source-based/ Case-based/ Passage-based/ Integrated assessment questions.

- An internal choice of approximately 33% would be provided

Internal Assessment (20 Marks)

- Periodic Assessment – 05 marks + 05 marks
- Subject Enrichment (Practical Work) – 05 marks
- Portfolio – 05 marks

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DELHI PRIVATE SCHOOL L.L.C.

Affiliated to C.B.S.E., DELHI

(Approved & Recognized By Ministry of Education - United Arab Emirates)

PRE-BOARD 1 SAMPLE PAPER (2022-23)

Subject: Biology **Grade: X**	**Max. Marks:30** **Time:**	
Name:	**Section :**	**Roll No:**

General Instructions:

The Question Paper contains five sections.

- ***All answers to be written in the answer sheet provided.***

SECTION -A

Select and write one most appropriate option out of the four options given for each of the questions

8	The given figure represents the structure of a nephron. Which section of the nephron is responsible for filtering out the waste?			1
	a.	A		B
	c.	C		D
9.	Organism which uses simple food material obtained from inorganic sources in the form of carbon dioxide and water are: 1			1
	a.	amoeba	b.	fungi
	c.	Virus	d.	Autotrophs
10.	Which of the following statements is true about movements in sensitive			1

	plant? 1. These are fast movements. 2. These occur either toward or aways from the stimulus 3. It depends on direction. 4. In such movements, the plant cells change shape by altering their water content				
	a.	1 and 2 only	b.	1 and 4 only	
	c.	3 and 4 only	d.	2 and 4 only	
11.	The sexually transmitted disease which is caused by bacteria is:				1
	a.	diarrhea		AIDS	
	c.	gonorrhea		Warts	
12.	Name the method by which Plasmodium. reproduces				1
	a.	Regeneration	b.	Multiple fission	
	c.	Binary fission	d.	Budding	
	Q. no 18 to 19 are Assertion - Reasoning based questions. These consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below: (a) Both A and R are true, and R is the correct explanation of A (b) Both A and R are true, and R is not the correct explanation of A (c) A is true but R is false (d) A is False but R is true				
18	**Assertion:** Walls of the intestine have numerous villi. **Reason:** These villi increase the surface area of digestion.				**1**
19	**Assertion:** clones are offspring of an organism produced by asexual reproduction **Reason:** clones have exact copies of DNA as their parent				**1**
	SECTION B Very short answer questions				
22	Why is a chemical communication better than electrical impulses as a means of communication between cells in a multicellular organism				2
23	Write in a tabular form the location and functions of hormone secreted by each of the following glands present in human body a. Pituitary b) Adrenal gland				2
24	Draw a diagram of human respiratory system and label pharynx, trachea, lungs, diaphragm, and alveolar sac on it				2
26	What is the feedback mechanism of hormone regulation? take the example of insulin to explain this phenomenon				2
	SECTION -C short answer questions				
29.	A cheetah, on seeing prey, moves towards him at a very high speed. What causes the movement of muscles? how does the chemistry of cellular components of muscles change during this event				3

	OR How does the information acquire at the end of the dendritic tip of a nerve cell reaches the muscle or gland?	
33.	List in tabular form three differences between blood and lymph	3
	SECTION -D long answer questions	
35	a. List the sequences of events in the uterus of a female from fertilization of egg till childbirth. b. State the changes that are observed in the uterus if fertilization of egg does not occur. **OR** c. Define vegetative reproduction. d. List two methods e. Why is this method practiced for growing some types of plants? f. Why variations are observed in the offspring formed by sexual reproduction	5
	SECTION E Q.no. 38 is case - based/data -based questions with 2 to 3 short sub - parts. Internal choice is provided in one of these sub-parts.	
38	Study the table related to sex ration of females /1000 males in different states and answer the following questions. (i) Which test is responsible for knowing the gender of the child? a. Prenatal sex determination test b. Blood test c. Urine test d. All of the above (ii) Which state of India has the lowest sex ratio in 2013 _15 a. Punjab b. Odisha c. Haryana d. Delhi iii) What is the major cause of less female than males in India a. Male foeticide b. Female foeticide c. Natural d. None of these (iv) Government of India has prohibited the prenatal sex determination by law. State its benefits in long run **OR** What is sex ratio why it needs to be maintained in for a healthy society?	4

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PRE-BOARD 1 SAMPLE PAPER AK (2022-23)

Subject: Biology **Grade: X**	**Max. Marks:30**

Name:	**Section:**	**Roll No:**

General Instructions:

The Question Paper contains five sections.

- ***All answers to be written in the answer sheet provided.***

SECTION -A

Select and write one most appropriate option out of the four options given for each of the questions 1x5

8	The given figure represents the structure of a nephron. Which section of the nephron is responsible for filtering blood from the waste?			
	a.	A		B
	c.	C		D
9	Organism which uses simple food material obtained from inorganic sources in the form of carbo dioxide and water are:			
	a.	Amoeba	b.	fungi
	c.	virus	d.	Autotrophs
10	Which of the following statements is true about movements in sensitive plants? 1. These are fast movements. 2. These occur either toward or aways form the stimulus. 3. It depends on growth. 4. In such movement, the plant cells change shape by altering their water content			

	a.	1 and 2 only	b.	1 and 4 only
	c.	3 and 4 only	d.	2 and 4 only
11.	The sexually transmitted disease which is caused by bacteria is:			
	a.	diarrhea		AIDS
	c.	gonorrhea		Warts
12.	Name the method by which Plasmodium reproduces			
	a.	Regeneration	b.	Multiple fission
	c.	Binary fission	d.	Budding

Q. no 18 to 19 are Assertion - Reasoning based questions. These consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

(a) Both A and R are true, and R is the correct explanation of A

(b) Both A and R are true, and R is not the correct explanation of A

(c) A is true but R is false

(d) A is False but R is true

18	**Assertion:** Walls of the intestine have numerous villi. **Reason:** These villi increase the surface area of digestion. (a) Both A and R are true, and R is the correct explanation of A
19	Assertion: clones are offspring of an organism produced by asexual reproduction Reason: clones have exact copies of DNA as their parent b. Both A and R are true, and R is not the correct explanation of A
	SECTION B Very short answer questions
22	Why is chemical communication better than electrical impulses as a means of communication between cells in a multicellular organism? • Electrical impulse has limited access to only those cells that are connected by nervous tissue/neuron. whereas chemical signals can reach each cell of the body • Cells need time to reset to create repeated /new electrical impulses whereas no such time is required for chemical communication
23	Write in a tabular form the location and functions of hormones secreted by each of the following glands present in human body. a. Pituitary b) Pancreas

Endocrine gland	Hormone	Functions
Pituitary	Growth hormone	Regulates growth and development of the body

	Adrenal gland	Adrenalin	It is an emergency hormone Send impulses to organs Dilate air passages to provide oxygen to muscles It contracts blood vessels to redirect blood toward heart and lung s

24 Draw a diagram of human respiratory system and label pharynx, trachea, lungs, diaphragm, and alveolar sac on it

Figure 6.9 human respiratory system (page number 104)

26 What is the feedback mechanism of hormonic regulation? take the example of insulin to explain this phenomenon?

Normal functioning of endocrine glands and regulation of level of hormones in the body is feedback mechanism. The timing and amount of hormone releases are regulated by feedback mechanism. 1m

If the sugar level in blood rise, they are detected by the cells of the pancreas which respond by producing more insulin. As the blood sugar level falls, insulin secretion is reduced 1m

SECTION -C short answer questions

29. A cheetah on seeing a prey, moves towards him at a very high speed. What causes the movement of muscles? how does the chemistry of cellular components of muscles change during this event

cheetah on seeing a prey generates the nerve impulse which reaches the muscles, and the muscle fibre moves. The muscle cell will then move by changing their shape so that muscle shorten .1m Muscle cell have special proteins that change both shape and their arrangement in the cell in response to nervous electrical impulses .1m

When this happens new arrangement of these protein give the muscle cells shorter form. 1m

OR

This information, acquired at the end of the dendritic tip of a nerve cell sets off a chemical reaction that creates an electrical impulse. This impulse travels from the dendrite to the cell body, and then along the axon to its end. At the end of the axon, the electrical impulse sets off the release of some chemicals. These chemicals cross the gap, or synapse, and start a similar electrical impulse in a dendrite of the next neuron. This is a general scheme of how nervous impulses travel in the body. A similar synapse finally allows delivery of such impulses from neurons to other cells, such as muscles cells or gland.

33. List in tabular form three differences between blood and lymph

Blood	Lymph

	It is fluid connective tissue consists of plasma, RBC, WBC and platelets	Extra cellular fluid consists of plasma, protein and an white blood cells
	It is red in color due to the presence of hemoglobin	It lacks RBC and is therefore color less
	It has more proteins	It has less proteins
	It transports oxygen, carbon dioxide, food and nitrogenous waste	It carries absorbed fats from small intestine and drains extra fluid back into blood vessels

SECTION -D long answer questions

35

a. List the sequences of events in the uterus of a female from fertilization of egg till childbirth.

b. State the changes that observed in uterus if fertilization of egg does not occur.

- Uterus prepare itself with the development of a thick lining which is richly supplied with blood to nourish the growing embryo
- The embryo gets nutrition from mother blood with the help of special tissue called placenta
- Disc-like structure in the uterine wall contain villi on the embryos side of the tissue and blood space and capillaries from mother sides.
- It transports glucose and oxygen from mother to the embryo ad waste substances from embryo to the other
- The child gets developed inside the mother's body in nine months and id born as a result of rhythmic contraction of muscle s in the uterus

b) The thick and spongy lining of the uterus break and comes out through vagina as blood and mucous. Menstruation occurs

OR

c. Define vegetative reproduction

Method to grow a new plant from the vegetative parts of the plant

d. List two methods

Rhizome of ginger and bulb of onion, tuber of potato

e. Why is this method practiced for growing some types of plants?

Few plants like banana, orange, rose and jasmine have lost the capacity to produce seeds, Thus, this is the only method of reproduction and continuation of such species.

f. Why are variations observed in the offspring formed by sexual reproduction?

1.Two parents are involved who are different from each other. One setoff chromosome comes from the male gamete and other comes from the female gamete and the fusion of these two created variations and produces a distinct individual

2.The male and female gametes are formed by meiotic division which allows crossing over and recombination which further genetic variation in the genes of offspring

SECTION E

Q.no. 38 is case - based/data -based questions with 2 to 3 short sub - parts. Internal

	choice is provided in one of these sub-parts.
38	(a) B (b) C (c)B (d) maintain male female sex ratio for a healthy society **OR** For a healthy society, the female-male sex ratio must be maintained so that there are enough males for females and vice versa, this provides future breeding potential for a population

DELHI PRIVATE SCHOOL, SHARJAH

CLASS - X

Science (086)

PRE-BOARD -I (2022-23)

Maximum Marks:80

Time: 3 hours

General Instructions:

i. This question paper consists of 39 questions in 5 sections.

ii. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.

iii. Section A consists of 20 objective type questions carrying 1 mark each.

iv. Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should in the range of 30 to 50 words.

v. Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should in the range of 50 to 80 words

vi. Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions

should be in the range of 80 to 120 words.

vii. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

	SECTION - A **Select and write one most appropriate option out of the four options given for each of the questions 1 – 20**	
8	Which part of nephron allows the selective reabsorption of useful substances like glucose, amino acids, salts and water into the blood capillaries? 1. Tubule 2. Glomerulus 3. Bowman's capsule 4. Ureter	1
9	A student sets up an experiment to study the role of enzymes in digestion of food. In which test tube, the digestion of protein will occur? (a) Test tubes A as pepsin will breakdown protein into simple molecules (b) Test tube B as HCl will breakdown protein into simple molecules. (c) Test tube A as pepsin will breakdown into simple molecules. (d) Test tube B as HCl will activate pepsin for breakdown of protein into simple molecules	1
10	The diagram shows an asexual mode of reproduction in bread mould. What is the blob like structure involved in reproduction? (a) Hyphae (b) Sporangia (c) Cyst (d) Callus	1
11	Identify which of the following statements about thyroxin is incorrect? 1. Thyroid gland requires iodine to synthesize thyroxin. 2. Thyroxin is also called thyroid hormone. 3. It regulates protein, carbohydrates, and fat metabolism in the body. (d) Iron is essential for the synthesis of thyroxin.	1
12	**Which of the following diseases is transmitted sexually?** 1. Kala azar 2. Jaundice 3. Elephantiasis 4. Syphilis	1
	Q. no 17 to 20 are Assertion - Reasoning based questions. **These consist of two statements – Assertion (A) and Reason (R).** **Answer these questions selecting the appropriate option given below:** **(a) Both A and R are true, and R is the correct explanation of A** **(b) Both A and R are true, and R is not the correct explanation of A** **(c) A is true but R is false** **(d) A is False but R is true**	
18	Assertion: Pollen grains from the carpel stick to the stigma of stamen. Reason**:** The fertilized egg cells grow inside the ovules and becomes seeds.	1
19	Assertion: In human beings, the respiratory pigment is haemoglobin Reason**:** It is a type of protein which has high affinity for carbon dioxide.	1
	SECTION – B **Q. no. 21 to 26 are very short answer questions.**	

22	Electrical impulses are an excellent means for coordination with its own limitations**.** Explain this statement	2
23	**Why is it necessary to separate oxygenated & deoxygenated blood in mammals & birds?**	2
24	Why leakage of blood from vessels reduces the efficiency of pumping system? How is leakage prevented?	2
26	(a) Name the hormone which is secreted when growing plants detect light. Mention its site of secretion in a plant. (b) Explain why plants appear to bend towards light?	2
	SECTION - C **Q.no. 27 to 33 are short answer questions.**	
29	Write any three methods used by plants to get rid of excretory products. OR Which mechanism act as a driving force in the movement of water in the xylem during daytime? Explain how it is caused and its importance.	3
33	Name the hormones secreted by the following endocrine glands and specify one function of each (i)Adrenal (ii) Pituitary (iii) Pancreas	3
	SECTION - D **Q.no. 34 to 36 are Long answer questions.**	
35	(a) The chromosomal number of the sexually producing parents and their offspring is the same". Justify this statement (b) Explain any three advantages of vegetative propagation **OR** (a) Draw the diagram showing germination of pollen on stigma and label the following parts (i) Ovary (ii) male germ cell (iii) female germ cell (iv) pollen tube. (b) Why are testes located outside the abdominal cavity? List two functions of testes in male reproductive system.	5
	SECTION - E **Q.no. 37 to 39 are case - based/data -based questions with 2 to 3 short sub - parts.** **Internal choice is provided in one of these sub-parts.**	
37	**OR (for part b)**	
38	(a) A couple wants to space the birth of their second child. Suggest one preventive method which could be adopted by (i) Husband (ii) By the wife for the same. (b) Mention two viral diseases that are transmitted sexually. (c) Identify the part labelled as **C** in the female reproductive system. Explain in brief how embryo gets nutrition inside the mother' body? **OR (for part c)** **(**d) What happens to the egg if it's not fertilized? Explain**.**	4

PRE-BOARD 1 EXAMINATION SET 2 AK (2022-23)

Subject: Biology **Grade: X**	**Max. Marks:30** **Time: 3 Hours**

Name:	**Section:**	**Roll No:**

General Instructions:

The Question Paper contains five sections.

- ***All answers to be written in the answer sheet provided.***

	SECTION -A Select and write one most appropriate option out of the four options given for each of the questions	**Marks**
8	(a)Tubule	1
9.	(d). Test tube B as HCL will activate pepsin for breakdown of proteins into simple molecules	1
10.	(b) Sporangia	1
11.	(d) Iron is essential for the synthesis of thyroxin.	1
12.	**(d) syphilis** **1**	
18.	(d) Assertion is false Reason is true.	1
19	(a) Assertion is true but Reason is false	**1**
	SECTION B Very short answer questions	
22	Electrical impulses reach only those cells that are connected by nervous tissue, not each cell in the animal body (1mark) Once an electrical impulse is generated in a cell and transmitted, the cell will take time to reset its mechanisms before it can generate and transmit a new impulse. (1mark)	**2**
23	The separation of the right side and the left side of the heart is useful to keep oxygenated and deoxygenated blood from mixing (1/2 mark). Such separation allows a highly efficient supply of oxygen to the body (1/2 mark). This is useful in animals that have high energy needs, such as birds and mammals, which constantly use energy to maintain their body temperature (1 mark)	**2**
24	Leakage would lead to a loss of pressure which would reduce the efficiency of the pumping system (1mark) To avoid this, the blood has platelet cells which circulate around the body (1/2mark) and plug these leaks by helping to clot the blood at these points of injury (½ mark)	**2**
26	(a) Auxin (½ MARK) synthesized at the shoot tip (½ mark) (b) When light is coming from one side of the plant, auxin diffuses towards the shady side of the shoot (½ mark). This concentration of auxin stimulates the cells to grow longer on the side of the shoot which is away from light(1/2mark). Thus, the plant	**2**

	appears to bend towards light.	
	SECTION -C short answer questions	
29.	• Plants get rid of excess water by transpiration. • For other wastes, plants use the fact that many of their tissues consist of dead cells, and that they can even lose some parts such as leaves. • Many plant waste products are stored in cellular vacuoles. Waste products may be stored in leaves that fall off. • Other waste products are stored as resins and gums, especially in old xylem. • Plants also excrete some waste substances into the soil around them (any three 1mark each) OR Transpiration pull (1 mark) Plant has an adequate supply of water, the water which is lost through the stomata is replaced by water from the xylem vessels in the leaf (½ MARK). Evaporation of water molecules from the cells of a leaf creates a suction which pulls water from the xylem cells of roots (1/2 mark). Transpiration helps in the absorption and upward movement of water and minerals dissolved in it from roots to the leaves (1/2 mark). It also helps in temperature regulation (1/2mark).	**3**
33.	i)Adrenaline (½ mark) Enable the body to deal with stress/emergency situation (½) ii) Growth hormone (½ mark) Regulates growth and development of the body (1/2) iii) Insulin (1/2mark) Regulates the blood sugar level (1/2 mark)	**3**
	SECTION -D long answer questions	
35	(a) Multi-cellular organisms have special lineages of cells in specialized organs in which only half the number of chromosomes and half the amount of DNA as compared to the non-reproductive body cells. This is achieved by a process of cell division called meiosis (1mark). When these female and male germ-cells from two individuals combine during sexual reproduction to form a new individual, it results in reestablishment of the number of chromosomes and the DNA content in the new generation (1 mark). (b) Plants raised by vegetative propagation can bear flowers and fruits earlier than those produced from seeds. (1mark) Such methods also make possible the propagation of plants such as banana, orange, rose and jasmine that have lost the capacity to produce seeds. (1mark) All plants produced are genetically similar enough to the parent plant to have all its characteristics. (1mark) OR (a) Diagram -1mark Labelling ½ mark each – 2marks	**5**

	(b) Testes are located outside the abdominal cavity in scrotum because sperm formation requires a lower temperature than the normal body temperature (1mark) Secretion of the hormone testosterone (½ mark) and formation of sperms (1/2 mark)	
	SECTION E Q.no. 38 is case - based/data -based questions with 2 to 3 short sub - parts. Internal choice is provided in one of these sub-parts.	
38	(a) (i) Husband – male condom (ii) Use of oral pills or copper- T by the wife(1mark) (b) HIV – AIDS and warts (1 mark) (c) C – Uterus (1/2mark) The embryo gets nutrition from the mother's blood with the help of a special tissue called placenta. (1/2 mark) which is a disc which is embedded in the uterine wall. It contains villi on the embryo's side of the tissue (1/2 mark) On the mother's side are blood spaces, which surround the villi which provides a large surface area for glucose and oxygen to pass from the mother to the embryo (1/2 mark). OR (d) If the egg is not fertilised, it lives for about one day (1/2 mark). The thick and spongy lining of uterus (½ mark) slowly breaks and comes out through the vagina as blood and mucous (½ mark) This cycle takes place roughly every month and is known as menstruation(½ mark)	**4**

DELHI PRIVATE SCHOOL, SHARJAH

CLASS - X

Science (086)

PRE-BOARD II (2022-23)

BIOLOGY SET – 1I

Maximum Marks:80

Time: 3 hours

General Instructions:

i. This question paper consists of 39 questions in 5 sections.

ii. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.

iii. Section A consists of 20 objective type questions carrying 1 mark each.

iv. Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should in

the range of 30 to 50 words.

v. Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should in the range of 50 to 80 words

vi. Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.

vii. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

SECTION - A **Select and write one most appropriate option out of the four options given for each of the questions 1 – 20**		
8	Which of the following statement is correct about the human circulatory system? a. Blood transports only oxygen and not carbondioxide. b. Human heart has five chambers. c. Valves ensure that the blood does not flow backwards. d. Both oxygen-rich and oxygen-deficient blood gets mixed in the heart.	1
9	Which of the following is accomplished in a plant by utilizing energy stored in ATP? a. Transport of food b.Transport of oxygen c. Transport of water and minerals d. Transport of water, minerals and food.	1
10	A recessive homozygote is crossed with a heterozygote of the same gene.What will be the phenotype of the F1 generation? a. All dominant b. 75% dominant, 25% recessive c. 50% dominant, 50% recessive d. 25% dominant, 50% heterozygous, 25% recessive	1
11	Identify the type of movements shown in Fig A and Fig B a.Chemotropism , Geotropism b.Geotropism, Phototropism c.Phototropism, geotropism d.Geotropism, Hydrotropism	1
12	The correct sequence of organs in the male reproductive system for the transport of sperms is : a. testis → vas deferens → urethra b. testis → ureter → urethra c. testis → urethra → ureter d. testis → vas deferens → ureter	1
Q. no 17 to 20 are Assertion - Reasoning based questions. **These consist of two statements – Assertion (A) and Reason (R).** **Answer these questions selecting the appropriate option given below:** **(a) Both A and R are true, and R is the correct explanation of A**		

(b) Both A and R are true, and R is not the correct explanation of A **(c) A is true but R is false** **(d) A is False but R is true**		
17		1
18	**Assertion (A):** The sex of a child in human beings will be determined by the type of chromosome he/she inherits from the father. **Reason (R):** A child who inherits 'X'chromosome from his father would be a girl, while a child who inherits a 'Y'chromosome from the father would be a boy.	1
19	**Assertion (a):** Walls of the intestine has numerous villi. **Reason (R): These villi increase the surface are of digestion.**	1
20		1
	SECTION – B **Q. no. 21 to 26 are very short answer questions.**	
21	**OR**	
22	State how concentration of auxin stimulates the cells to grow longer on the side of the shoot which is away from light?	2
23	**How are the lungs designed in human beings to maximize the area for exchange of gases?**	2
24	Which digestive secretion does not contain any enzyme but is very important? Explain.	2
25	**OR**	
26	Give reason 1. The existence of decomposers is essential in a biosphere. 2. Flow of energy in a food chain is unidirectional	2
	SECTION - C **Q.no. 27 to 33 are short answer questions.**	
29	(a) Draw a diagram of human excretory system and label kidneys, ureters on it. (b) What are the two parameters that decide the amount of water that is reabsorbed in the kidney? **OR** 1. "Blood circulation in fishes is different from the blood circulation in human beings". Justify the statement. 2. Write one structural difference between the composition of artery and veins.	3
33	Our food grains, such as wheat and rice, the vegetables and fruits end even meat are found to contain varying amount of pesticide residues. State the reason to explain how and why it happens?	3
	SECTION - D **Q.no. 34 to 36 are Long answer questions.**	
35	(a) The sexual act always has the potential to lead to pregnancy. Explain three methods that have been developed to prevent pregnancy. (b) Why is DNA copying an essential part of the process of reproduction? **OR**	5

	(a) Write the function of following parts in human female reproductive system: (i) Ovary (ii) Oviduct (b) Describe in brief the structure and function of placenta.	
SECTION - E **Q.no. 37 to 39 are case - based/data -based questions with 2 to 3 short sub - parts.** **Internal choice is provided in one of these sub-parts.**		
37	**OR (for part b)**	
38	Rohan performed a cross to study the inheritance of genes. A cross was made between pure breeding Purple (dominant) pea plants with a pure breeding white pea plant. 1. What do the plants of F1 generation look like? 2. What is the ratio of Purple to white in F2 generation? **3.** State the type of plants not found in F1 generation but appeared in F2 generation mentioning the reason for the same. Show the inheritance of flower colour in the offspring with the help of suitable cross. **OR** 4. A cross between two pea plants produces offspring in which approximately 50% of the flowers are white and 50% are purple. What are the genotypes of the parents? Show Punnett square to support your answer.	4

DELHI PRIVATE SCHOOL, SHARJAH

CLASS - X

Science (086)

PRE-BOARD II (2022-23)

BIOLOGY SET – 1I

ANSWER KEY

Maximum Marks: 80 **Time:3hours**

General Instructions:

i. This question paper consists of 39 questions in 5 sections.

ii. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.

iii. Section A consists of 20 objective type questions carrying 1 mark each.

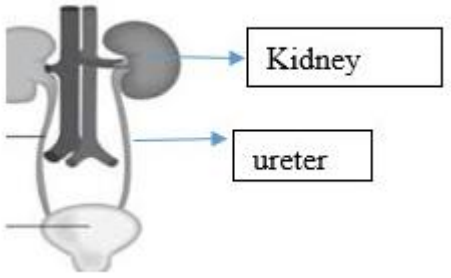
iv. Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should in the range of 30 to 50 words.

v. Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should in the range of 50 to 80 words

vi. Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.

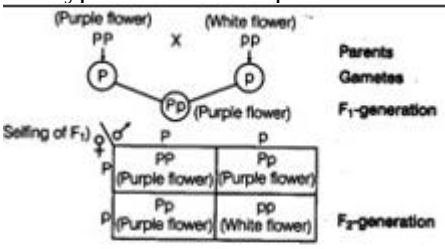
vii. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

SECTION - A **Select and write one most appropriate option out of the four options given for each of the questions 1 – 20**		
8	c. Valves ensure that the blood does not flow backwards.	1
9	a. Transport of food.	1
10	c. 50% dominant, 50% recessive	1
11	b.Geotropism, Phototropism	1
12	a. testis → vas deferens → urethra	1
Q. no 17 to 20 are Assertion - Reasoning based questions. **These consist of two statements – Assertion (A) and Reason (R).** **Answer these questions selecting the appropriate option given below:** **(a) Both A and R are true, and R is the correct explanation of A** **(b) Both A and R are true, and R is not the correct explanation of A** **(c) A is true but R is false** **(d) A is False but R is true**		
18	**(a) Both A and R are true, and R is the correct explanation of A**	1
19	**(c) A is true but R is false**	1

	SECTION – B **Q. no. 21 to 26 are very short answer questions.**	
22	When light is coming from one side of the plant, auxin diffuses towards the shady side of the shoot (1mark) This concentration of auxin stimulates the cells to grow longer on the side of the shoot which is away from light (1mark) Thus, the plant appears to bend towards light	2
23	**In lungs, balloon like structures called alveoli are present that provide maximum surface area for the exchange of gases (1). The alveoli have very thin walls (½) and contain an extensive network of blood vessels (½) to facilitate the exchange of gases.**	2
24	Bile juice (1mark) Fats are present in the form of large globules in intestine which makes it difficult for enzymes to act on them. Bile salts present in bile juice break down fats into smaller globules, (i.e., emulsifies fats) which increases the efficiency of enzyme action (½ mark). In addition, bile juice also makes the acidic food coming from the stomach alkaline, so that pancreatic enzymes can act on them **(**½ mark)	2
25	**OR**	
26	1. Decomposers breakdown complex organic substance sin to simple inorganic substances that can be absorbed by the plants (1). 2. In a food chain the energy moves progressively through the various trophic levels, it is no longer available to the previous level and the energy captured by the autotrophs does not go back to the solar input (1).	2
	SECTION - C **Q.no. 27 to 33 are short answer questions.**	
29	1. diagram – 1 Labelling – kidney ½ ureter ½  (b) The amount of water re-absorbed depends on how much excess water there is in the body ½ and on how much of dissolved waste there is to be excreted ½. **OR** 1. . Fishes have only two chambers to their hearts (½) and the blood is pumped to the gills, is oxygenated there (½) and passes directly to the rest of the body (½) . Thus, blood goes only once through the heart in the fish during one cycle of passage through the body (½) (b) Veins have thin, less elastic and less muscular walls. They have valves to	3

	prevent back flow of blood. Arteries have thick, elastic and muscular walls with no valves. (1)	
33	A large number of pesticides and chemical are used to protect our crops from pest and diseases. Some of these chemicals are washed down into the soil while some enter in the water bodies (½) From the soil they are absorbed by plants along with water and minerals and from water bodies they are taken up by aquatic plants and animals (½)As these chemicals cannot decompose they accumulate progressively at each trophic level (½) As the food chain proceeds the concentration of pesticides also increases (½) This increase in the concentration of harmful chemical with each step of the food chain is called biomagnification. (1)	3

SECTION - D **Q.no. 34 to 36 are Long answer questions.**		
35	(a)Mechanical method- physical devices such as condoms on the penis or similar coverings worn in the vagina so that sperm does not reach egg. Chemical method- Oral pills changing the hormonal balance of the body so that eggs are not released, and fertilisation cannot occur. Surgical method- Vasectomy in males. If the vas deferens in the male is blocked, sperm transfer will be prevented. If the fallopian tube in the female is blocked(tubectomy) the egg will not be able to reach the uterus. IUCD – loop or the copper-T are placed in the uterus to prevent pregnancy. (Three methods 1 mark each) (b) Chromosomes in the nucleus of a cell contain information for inheritance of features from parents to next generation in the form of DNA (Deoxyribo Nucleic Acid) molecules (½)The DNA in the cell nucleus is the information source for making proteins (½)If the information is changed, different proteins will be made ½ Different proteins will eventually lead to altered body designs (½) Therefore, a basic event in reproduction is the creation of a DNA copy. **OR** (a) (i) Ovary – formation of female gamete/egg ½ & secretion of female sex hormones ½ (ii) Oviduct- The egg is carried from the ovary to the womb ½ / site of fertilization ½ (b) The embryo gets nutrition from the mother's blood with the help of a special tissue called placenta (1 mark)This is a disc which is embedded in the uterine wall (½)It contains villi on the embryo's side of the tissue. On the mother's side are blood spaces, which surround the villi(½) This provides a large surface area for glucose and oxygen to pass from the mother to the embryo(½). The developing embryo will also generate waste substances which can be removed by transferring them into the mother's blood through the placenta (½)	5
SECTION - E **Q.no. 37 to 39 are case - based/data -based questions with 2 to 3 short sub - parts.**		

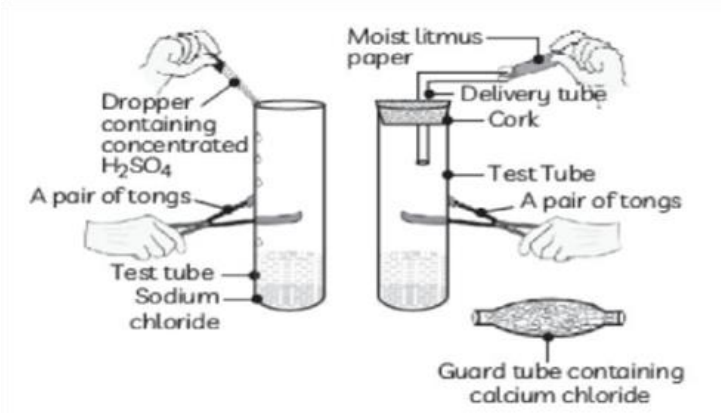
Internal choice is provided in one of these sub-parts.		
38	1. All purple (1 mark) 2. 3 purple: 1 white (1mark) **3.** The type of flower not present in F 1 is white (½) because it is recessive trait (½  Punnet square cross – 1 mark **OR** d. Genotypes of parents – Pp (½) pp (½) |	P	p
p	Pp	pp
p	Pp	pp | **Punnett square – (1 mark)**	4

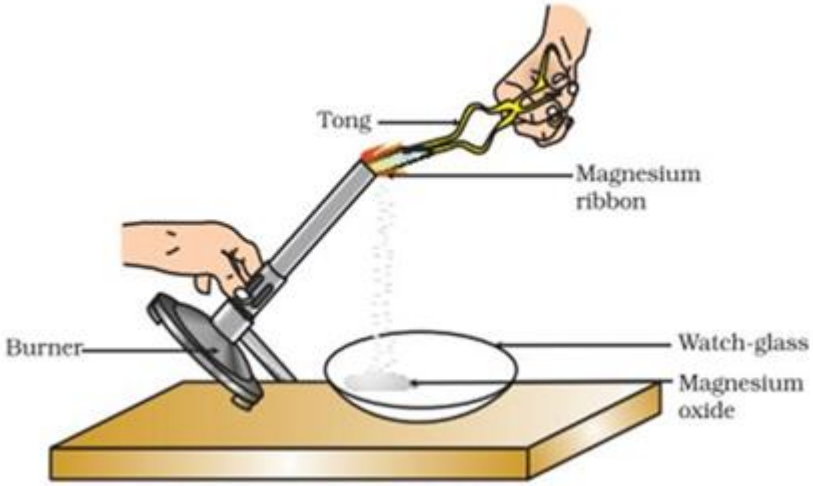
Science (086)
Class X
Sample Question Paper 2022-23

Max. Marks: 80 **Time Allowed: 3 hours**

General Instructions:

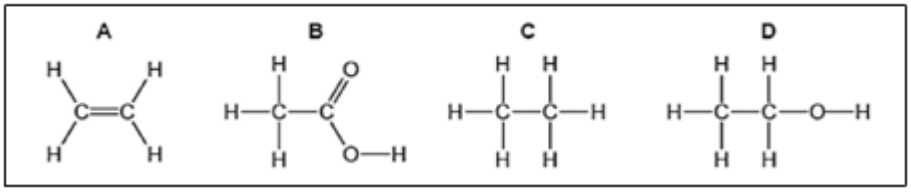
i. *This question paper consists of 39 questions in 5 sections.*
ii. *All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.*
iii. ***Section A** consists of 20 objective type questions carrying 1 mark each.*
iv. ***Section B** consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should in the range of 30 to 50 words.*
v. ***Section C** consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should in the range of 50 to 80 words*
vi. ***Section D** consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.*
vii. ***Section E** consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.*

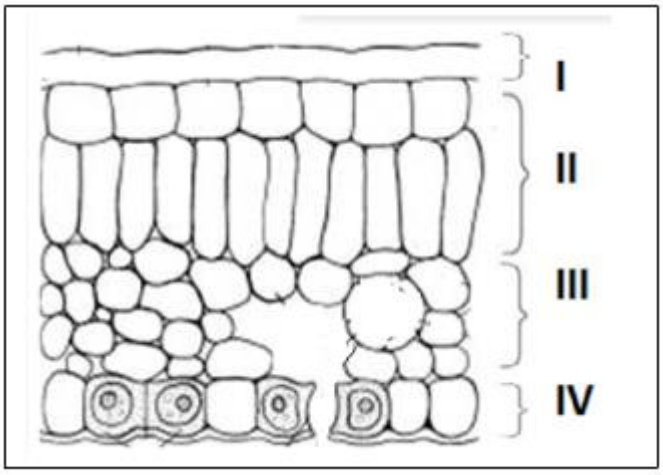
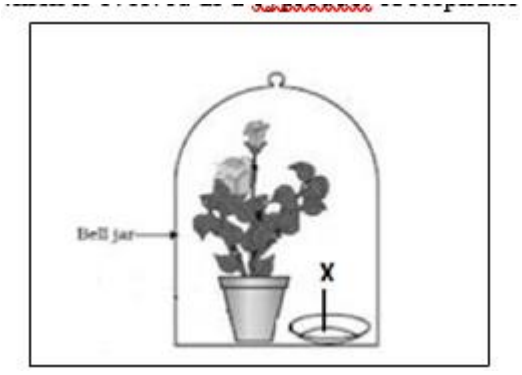
SECTION - A Select and write one most appropriate option out of the four options given for each of the questions 1 – 20		
Q. No	**Questions**	**Marks**
1	The change in colour of the moist litmus paper in the given set up is due to  I. presence of acid ii. presence of base iii. presence of H (aq) in the solution iv. presence of Litmus which acts as an indicator 1. i and ii 2. Only ii 3. Only iii 4. Only iv.	1

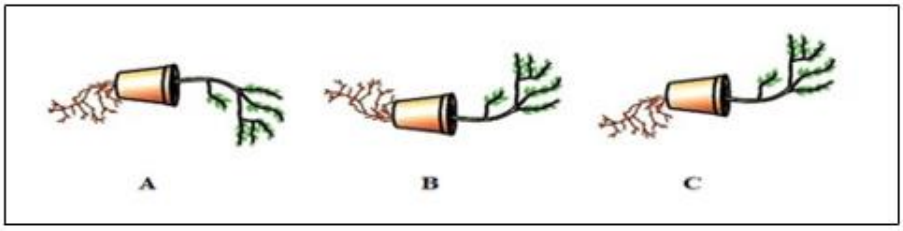
2	In the redox reaction $MnO_2 + 4HCl \rightarrow MnCl_2 + 2H_2O + Cl_2$ 1. MnO_2 is reduced to $MnCl_2$& HCl is oxidized to H_2O 2. MnO_2 is reduced to $MnCl_2$& HCl is oxidized to Cl_2	1
	1. MnO_2 is oxidized to $MnCl_2$ & HCl is reduced to Cl_2 2. MnO_2 is oxidized to $MnCl_2$ & HCl is reduced to H_2O	
3	 Which of the following is the correct observation of the reaction shown in the above set up? 1. Brown powder of Magnesium oxide is formed. 2. Colourless gas which turns lime water milky is evolved. 3. Magnesium ribbon burns with brilliant white light. 4. Reddish brown gas with a smell of burning Sulphur has evolved.	1
4	With the reference to four gases CO_2,CO, Cl_2 and O_2, which one of the options in the table is correct?	1

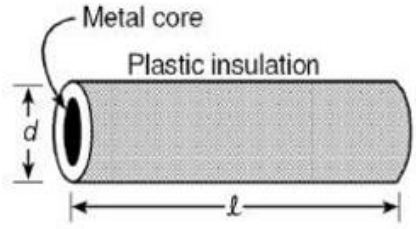
Option	Acidic oxide	Used in treatment of water	Product of respiration	Product of incomplete combustion
(a)	CO	Cl_2	O_2	CO
(b)	CO_2	Cl_2	CO_2	CO
(c)	CO_2	O_2	O_2	CO_2
(d)	CO	O_2	CO_2	CO_2

5	On placing a copper coin in a test tube containing green ferrous sulphate solution, it will be observed that the ferrous sulphate solution 1. turns blue, and a grey substance is deposited on the copper coin. 2. turns colourless and a grey substance is deposited on the copper coin. 3. turns colourless and a reddish–brown substance is deposited on the copper coin. 4. remains green with no change in the copper coin.	1

6	Anita added a drop each of diluted acetic acid and diluted hydrochloric acid on pH paper and compared the colors. Which of the following is the correct conclusion? 1. pH of acetic acid is more than that of hydrochloric acid. 2. pH of acetic acid is less than that of hydrochloric acid. 3. Acetic acid dissociates completely in aqueous solution. 4. Acetic acid is a strong acid	1
7	The formulae of four organic compounds are shown below. Choose the correct option The formulae of four organic compounds are shown below. Choose the correct opt  	1
	1. A and B are unsaturated hydrocarbons 2. C and D are saturated hydrocarbons 3. Addition of hydrogen in presence of catalyst changes A to C 4. Addition of potassium permanganate changes B to D	

8	In the given transverse section of the leaf identify the layer of cells where maximum photosynthesis occurs.  a. I, II b. II, III c. III, IV d. I, IV	1
9	Observe the experimental setup shown below. Name the chemical indicated as 'X' that can absorb the gas which is evolved as a byproduct of respiration.  1. NaOH 2. KOH 3. Ca $(OH)_2$ 4. K_2CO_3	1

10	If a tall pea plant is crossed with a pure dwarf pea plant, then, what percentage of F1 and F2 generation respectively will be tall? 1. 25%, 25% 2. 50%, 50% 3. 75%,100% 4. 100%, 75%	1
11	Observe the three figures given below. Which of the following depicts tropic movements appropriately?	1
	 a. B and C b. Aand C c. C only d. B only	

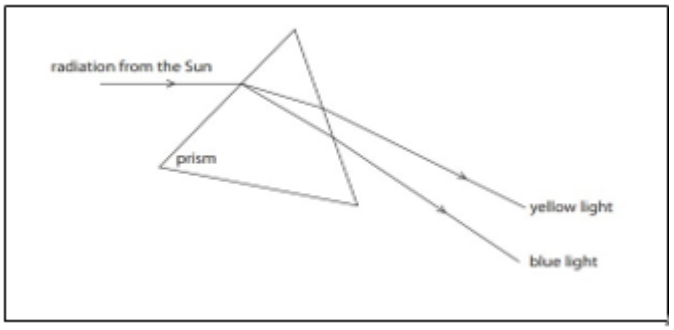
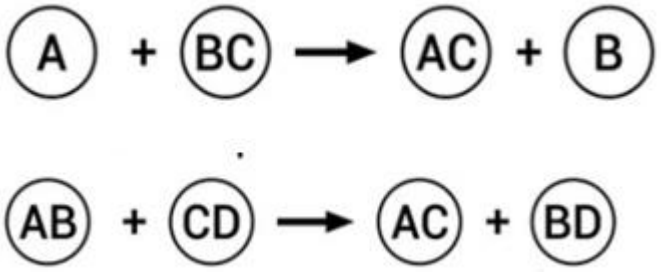
15	 Plastic insulation surrounds a wire having diameter ***d*** and length ***l*** as shown above. A decrease in the resistance of the wire would be produced by an increase in the 1. length l of the wire 2. diameter d of the wire 3. temperature of the wire 4. thickness of the plastic insulation	1
16	Which of the following pattern correctly describes the magnetic field around a long straight wire carrying current? 1. straight lines perpendicular to the wire. 2. straight lines parallel to the wire. 3. radial lines originating from the wire. 4. concentric circles centred around the wire.	1

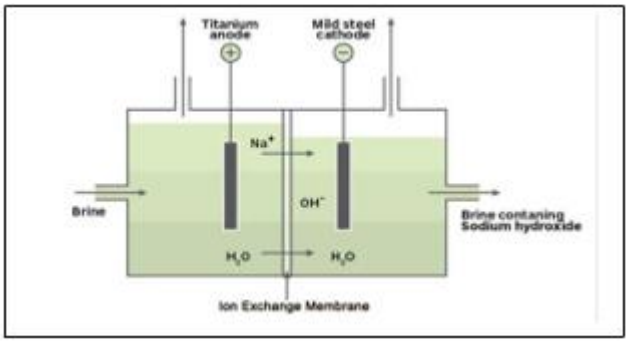
Q. no 17 to 20 are Assertion - Reasoning based questions.
These consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

1. **Both A and R are true, and R is the correct explanation of A**
2. **Both A and R are true, and R is not the correct explanation of A**
3. **A is true but R is false**
4. **A is False but R is true**

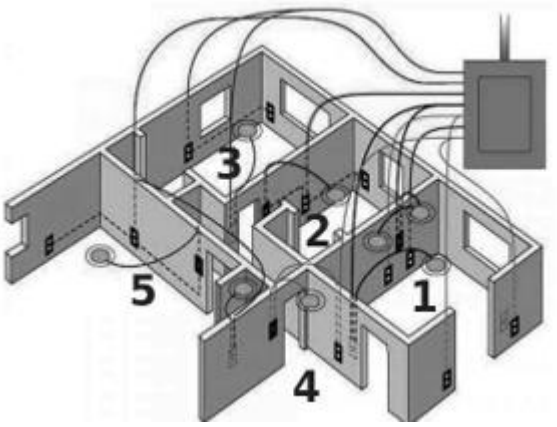
17	Assertion: Silver bromide decomposition is used in black and white photography. Reason: Light provides energy for this exothermic reaction.	1
18	Assertion: Height in pea plants is controlled by efficiency of enzymes and is thus genetically controlled. Reason: Cellular DNA is the information source for making proteins in the cell.	1
19	Assertion: Amphibians can tolerate mixing of oxygenated and deoxygenated blood. Reason: Amphibians are animals with two chambered heart	1
20	Assertion: On freely suspending a current – carrying solenoid, it comes to rest in Geographical N-S direction. Reason: One end of current carrying straight solenoid behaves as a North pole and the other end as a South pole, just like a bar magnet.	1

<table>
<tr><td colspan="3">SECTION – B
Q. no. 21 to 26 are very short answer questions.</td></tr>
<tr><td>21</td><td>A clear solution of slaked lime is made by dissolving $Ca(OH)_2$in an excess of water. This solution is left exposed to air. The solution slowly goes milky as a faint white precipitate forms. Explain why a faint white precipitate forms, support your response with the help of a chemical equation.
OR
Keerti added dilute Hydrochloric acid to four metals and recorded her observations as shown in the table given below:
<table><tr><th>Metal</th><th>Gas Evolved</th></tr><tr><td>Copper</td><td>Yes</td></tr><tr><td>Iron</td><td>Yes</td></tr><tr><td>Magnesium</td><td>No</td></tr><tr><td>Zinc</td><td>Yes</td></tr></table>Select the correct observation(s) and give chemical equation(s) of the reaction involved.</td><td>2</td></tr>
<tr><td>22</td><td>How is the mode of action in beating of the heart different from reflex actions? Give four examples.</td><td>2</td></tr>
<tr><td>23</td><td>Patients whose gallbladder are removed are recommended to eat less oily food. Why?</td><td>2</td></tr>
<tr><td>24</td><td>Name the substances other than water, that are reabsorbed during urine formation. What are the two parameters that decide the amount of water that is reabsorbed in the kidney?</td><td>2</td></tr>
</table>

25	 State the phenomena observed in the above diagram. Explain with reference to the diagram, which of the two lights mentioned above will have the higher wavelength? **OR** How will you use two identical prisms so that a narrow beam of white lightincident on one prism emerges out of the second prism as white light? Draw the diagram.	2
26	A lot of waste is generated in neighborhood. However, almost all of it is biodegradable. What impact will it have on the environment or human health?	2
	SECTION - C Q.no. 27 to 33 are short answer questions.	
27	i)  ii) Identify the types of reaction mentioned above in (i) and (ii). Give one example for each type in the form of a balanced chemical equation.	3

28	 1. Identify the gasses evolved at the anode and cathode in the above experimental set up. 2. Name the process that occurs. Why is it called so? 3. Illustrate the reaction of the process with the help of a chemical equation.	3
29	The leaves of a plant were covered with aluminium foil, how would it affect the physiology of the plant? **OR** How is lymph an important fluid involved in transportation? If lymphatic vessels get blocked, how would it affect the human body? Elaborate.	3
30	Rohit wants to have an erect image of an object using a converging mirror of focal length 40 cm. 1. Specify the range of distance where the object can be placed in front of the mirror. Justify. 2. Draw a ray diagram to show image formation in this case. 3. State one use of the mirror based on the above kind of image formation.	3
31	(a) A lens of focal length 5 cm is being used by Debashree in the laboratory as a magnifying glass. Her least distance of distinct vision is 25 cm. 1. What is the magnification obtained by using the glass? 2. She keeps a book at a distance 10 cm from her eyes and tries to read. She is unable to read. What is the reason for this?	3
	(b) Ravi kept a book at a distance of 10 cm from the eyes of his friend Hari. Hari is not able to read anything written in the book. Give reasons for this?	

32	A student fixes a white sheet of paper on a drawing board. He places a bar magnet in the centre and sprinkles some iron filings uniformly around the bar magnet. Then he taps gently and observes that iron filings arrange themselves in a certain pattern. (a) Why do iron filings arrange themselves in a particular pattern? 1. Which physical quantity is indicated by the pattern of field lines around the bar magnet? 2. State any two properties of magnetic field lines. OR A compass needle is placed near a current carrying wire. State your observations for the following cases and give reasons for the same in each case- (a) Magnitude of electric current in wire is increased. (b) The compass needle is displaced away from the wire.	3
33	Why is damage to the ozone layer a cause for concern? What are its causes and what steps are being taken to limit this damage?	3
	SECTION - D Q.no. 34 to 36 are Long answer questions.	
34	Shristi heated Ethanol with a compound A in presence of a few drops of concentrated sulphuric acid and observed a sweet-smelling compound B is formed. When B is treated with sodium hydroxide it gives back Ethanol and a compound C. 1. Identify A and C 2. Give one use each of compound's A and B. **3.** Write the chemical reactions involved and name the reactions. OR 1. What is the role of concentrated Sulphuric acid when it is heated with Ethanol at 443 K. Give the reaction involved. 2. Reshu by mistake forgot to label the two test tubes containing Ethanol and Ethanoic acid. Suggest an experiment to identify the substances correctly? Illustrate the reactions with the help of chemical equations	5
35	1. Why is it not possible to reconstruct the whole organism from a fragment in complex multicellular organisms? 2. Sexual maturation of reproductive tissues and organs are necessary link for reproduction. Elucidate. OR 1. How are variations useful for species if there is drastic alteration in the niches? 2. Explain how the uterus and placenta provide necessary conditions for proper growth and development of the embryo after implantation?	5

36	 The diagram above is a schematic diagram of a household circuit. The house shown in the above diagram has 5 usable spaces where electrical connections are made. For this house, the mains have a voltage of 220 V and the net current coming from the mains is 22A. 1. What is the mode of connection to all the spaces in the house from the mains? 2. The spaces 5 and 4 have the same resistance and spaces 3 and 2 have respective resistances of 20Ω and 30Ω. Space 1 has a resistance double that of space 5. What is the net resistance for space 5. 3. What is the current in space 3? 4. What should be placed between the main connection and the rest of the house's electrical appliances to save them from accidental high electric current?	5

SECTION - E

Q.no. 37 to 39 are case - based/data -based questions with 2 to 3 short sub - parts. Internal choice is provided in one of these sub-parts.

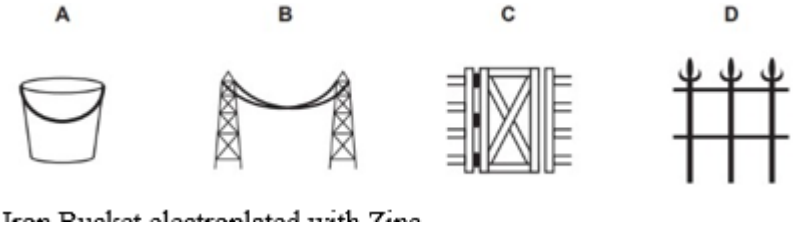
37 | Two students decided to investigate the effect of water and air on iron object under identical experimental conditions. They measured the mass of each object before placing it partially immersed in 10 ml of water. After a few days, the object was removed, dried and their masses were measured. The table shows their results. | 4

Student	Object	Mass of Object before Rusting in g	Mass of the coated obje in g
A	Nail	3.0	3.15
B	Thin plate	6.0	6.33

1. What might be the reason for the varied observations of the two students?
2. In another set up the students coated iron nails with zinc metal and noted that, iron nails coated with zinc prevents rusting. They also observed that zinc initially acts as a physical barrier, but an extra advantage of using zinc is that it continues to prevent rusting even if the layer of zinc is damaged. Name this process of rust prevention and give any two other methods to prevent rusting.

OR

(b) In which of the following applications of Iron, rusting will occur most? Support your answer with valid reason.



Iron Bucket electroplated with Zinc

A. - Iron Bucket electroplated with Zinc
B. - Electricity cables having iron wires covered with aluminium
C. - Iron hinges on a gate
D. - Painted iron fence

38 | | 4

Pooja has green eyes while her parents and brother have black eyes. Pooja's husband Ravi has black eyes while his mother has green eyes and father has black eyes.

1. On the basis of the above given information, is the green eye colour a dominant or recessive trait? Justify your answer.
2. What is the possible genetic makeup of Pooja's brother's eye colour?
3. What is the probability that the offspring of Pooja and Ravi will have green eyes? Also, show the inheritance of eye colour in the offspring with the help of a suitable cross.

OR

4. 50% of the offspring of Pooja's brother are green eyed. With help of cross show how this is possible.

39	 The above images are that of a specialized slide projector. Slides are small transparencies mounted in sturdy frames ideally suited to magnification and projection, since they have a very high resolution and a high image quality. There is a tray where the slides are to be put into a particular orientation so that the viewers can see the enlarged erect images of the transparent slides. This means that the slides will have to be inserted upside down in the projector tray. To show her students the images of insects that she investigated in the lab, Mrs. Iyer brought a slide projector. Her slide projector produced a 500 times enlarged and inverted image of a slide on a screen 10 m away.	4
	1. Based on the text and data given in the above paragraph, what kind of lens must the slide projector have? 2. If v is the symbol used for image distance and u for object distance then with one reason state what will be the sign for in the given case? 3. A slide projector has a convex lens with a focal length of 20 cm. The slide is placed upside down 21 cm from the lens. How far away should the screen be placed from the slide projector's lens so that the slide is in focus? OR (c)When a slide is placed 15 cm behind the lens in the projector, an image is formed 3 m in front of the lens. If the focal length of the lens is 14 cm, draw a ray diagram to show image formation. (not to scale)	

SCIENCE (086)
CLASS X
MARKING SCHEME (2022-23)

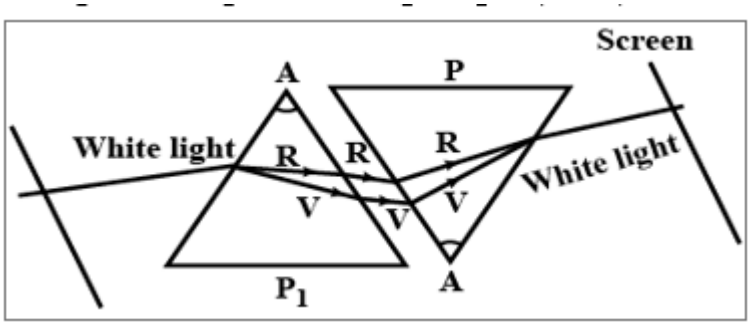
Q. No	**Questions**	Marks
	SECTION – A	
1.	(c) Only iii	1
2.	(b) MnO_2 is reduced to $MnCl_2$ & HCl is oxidized to Cl_2	1
3.	(c) Magnesium ribbon burns with brilliant white light	1
4.	(b) CO_2, Cl_2, CO_2, CO	1
5.	(d) Ferrous sulphate solution remains green with no change in the copper coin.	1
6.	(a) Only i	1
7.	(c) Addition of hydrogen in presence of catalyst changes A to C	1
8.	(b) II,III	1
9.	(b)	1
10.	(d)	1
11.	(d) C only	1
12.	(b) B and D	1
13.	(c) increases	1
14.	(b) 2 (Either North or South)	1
15.	(b) diameter d of the wire	1

16.	(d) The field consists of concentric circles centred around the wire.	1
17.	(c) A is true but R is false	1
18.	(a) Both A and R are true and R is the correct explanation of A	1
19.	(c) A is true but R is false	1
20.	(a) Both A and R are true and R is the correct explanation of A	1
	SECTION – B	
21.	Calcium hydroxide reacts with Carbon dioxide present in the atmosphere to form Calcium carbonate which results in milkiness/white ppt / Formation of Calcium carbonate (1mark) $Ca(OH)_2 + CO_2 \rightarrow CaCO_3 + H_2O$ (1mark) **OR** $Fe + HCl \rightarrow FeCl_2 / FeCl_3 + H_2$ (1mark) (No deduction for balancing/ states) $Zn + HCl \rightarrow ZnCl_2 + H_2$ - 1M	2

22.		2

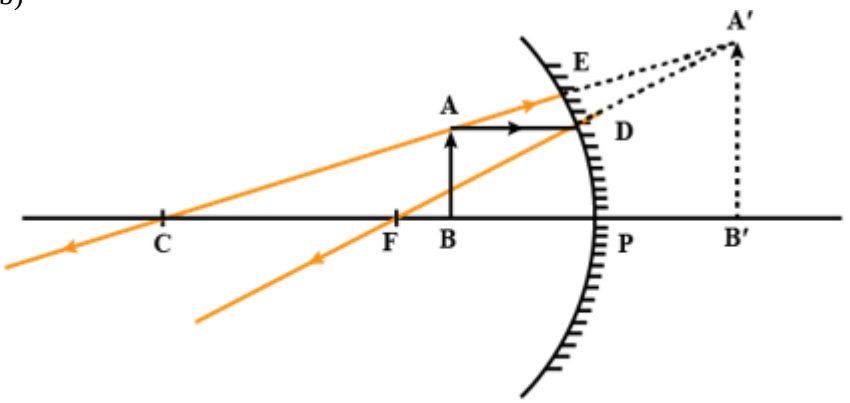
Beating of heart	Reflex actions
Involuntary actions are the actions which are not controlled by our will.	Reflex actions are the sudden action in response to something.
They do not need any kind of stimulus to work.	They required stimulus for its action.
These actions are regulated by the brain.	These actions are regulated by the spinal cord.
They do not involve skeletal muscle.	They do involve skeletal muscle.
These actions are performed throughout one's life.	These actions are produced in response to an event of an emergency.
This action may be quick or slow.	Reflex actions are always quick.

Any four points (½ x4=2 marks)

23.	Gallbladder stores bile which helps in emulsification of lipids (1mark). In the absence of stored bile, emulsification of fats will be negligible/ affected/ less (1mark) and thus fat digestion will be slow. Hence there are such diet restrictions.	2
24.	Glucose, amino acids, salts (any 2, 1 mark each) and a major amount of water are selectively re-absorbed as the urine flows along the tube. The amount of water reabsorbed depends on how much excess water there is in the body (0.5 marks), and on how much of dissolved waste there is to be excreted (0.5marks)	2
25.	Dispersion- The splitting of white light into seven colours on passing through a prism. (1 mark) Velocity is directly proportional to wavelength given constant frequency. So yellow will have greater wavelength than blue as the velocity of yellow light is greater than blue. (0.5 + 0.5 mark) **OR** Angle of deflections of the two prisms need to be equal and opposite. While the first prism splits the light in the seven colours due to different angles of deflection, the second prism combines the spectrum along a single ray and the colours again combine to give white light as the emergent light. (1mark)  (1mark)	2

26.	Excess generation of biodegradable wastes can be harmful as - Its decomposition is a slow process leading to production of foul smell and gases. (1mark) It can be the breeding ground for germs that create unhygienic conditions. (1 mark)	2

SECTION - C Q.no. 27 to 33 are short answer questions.		
27.	i) Displacement - ½ M 1. $Fe(s) + CuSO_4(aq) \rightarrow FeSO_4(aq) + Cu(s)$ (1 mark) 2. $Zn(s) + CuSO_4(aq) \rightarrow ZnSO_4(aq) + Cu(s)$ **3.** $Pb(s) + CuCl_2(aq) \rightarrow PbCl_2(aq) + Cu(s)$ (Any one of the reaction or other displacement reaction.) ii) Double displacement (½ mark) $Na_2SO_4(aq) + BaCl_2(aq) \rightarrow BaSO_4(s) + 2NaCl(aq)$ (1 mark) (Any one of the reaction or other double displacement reaction.)	3
28.	1. Anode: Chlorine; Cathode: Hydrogen 2. Chlor alkali process as the products obtained are alkali, chlorine gas and hydrogen gas 3. $2NaCl(aq) + 2H_2O(l) \xrightarrow{\text{Electric current}} 2NaOH(aq) + Cl_2(g) + H_2(g)$	3
29.	No photosynthesis will occur so no glucose will be made. Also, no respiration will take place as no Oxygen will be taken in. (1) No transpiration will occur so there would be no upward movement of water or minerals from the soil as there will be no transpirational pull. (1) Temperature regulation of leaf surface will be affected. (1) **OR** Lymph carries digested and absorbed fat from the intestine (1) and drains excess fluid from extracellular space back into the blood (1). Blockage of lymphatic system will lead to water retention and poor fat absorption in the body (1- any one)	3

30.	(a) The object has to be placed at a distance between 0 - 40 cm. This is because image is virtual, erect and magnified when the object is placed between F and P. (1mark) (b)  (1mark) (c) Used as shaving mirror or used by dentists to get enlarged image of teeth (any one use) (1mark)	3

31.	(a) Given, image distance = v = -25 cm, focal length = f = 5 cm, magnification = m = ? From lens formula, $\frac{1}{f} = \frac{1}{v} - \frac{1}{u} = \frac{1}{u} = \frac{1}{v} - \frac{1}{f}$ $\frac{1}{u} = \frac{1}{-25} - \frac{1}{5} = \frac{-1-5}{25} = \frac{-6}{25}$ Object distance $= u = \frac{-25}{6} cm.$ We know that, $m = \frac{v}{u} = \frac{-25 \times 6}{-25} = 6.$ (2 marks) (b) This is because the least distance of distinct vision is 25 cm. (1 mark)	3
32.	(a) When iron filings are placed in a magnetic field around a bar magnet, they behave like tiny magnets. The magnetic force experienced by these tiny magnets make them rotate and align themselves along the direction of field lines. (1 mark) (b)The physical property indicated by this arrangement is the magnetic field produced by the bar magnet. (1 mark) (c) Magnetic field lines never intersect, magnetic field lines are closed curves. (1mark) **OR** 1. The deflection in the compass needle increases as Magnetic field of the current carrying conductor is directly proportional to current flowing through it. (1.5marks) **2.** The deflection in the needle decreases as the magnetic field is inversely proportional to the perpendicular distance from the wire. (1.5marks)	3
33.	Damage to the ozone layer is a cause for concern because the ozone layer shields the surface of earth from harmful UV radiations from the sun which cause skin cancer in human beings. Synthetic chemicals like chlorofluorocarbons (CFCs) which are used as refrigerants and in the fire - extinguishers are the main reason for the depletion of the ozone layer. Steps taken to limit this damage - Many developing and developed countries have signed and are obeying the directions of UNEP (United Nations Environment Programme) to freeze or limit the production and usage of CFCs at 1986 levels. (1 x 3 = 3 marks)	3
SECTION - D		

34.	1. A – Ethanoic acid/ Or any other carboxylic acid, C- Sodium salt of ethanoic acid/ any other carboxylic acid/ sodium ethanoate (½ + ½ mark) 2. Use of A- dil solution used as vinegar in cooking/ preservative in pickles (1mark) Use of B – making perfumes, flavoring agent (1 mark) $CH_3COOH + C_2H_5OH$ ----------> $CH_3COOC_2H_5 + H_2O$ (1mark) $CH_3COOC_2H_5 + NaOH$----------> $CH_3COONa + C_2H_5OH$ (1mark) Conc H_2SO_4 (c) **OR**	5
	1. Sulphuric acid acts as dehydrating agent (1mark) Conc H_2SO_4, 443K C_2H_5OH —----------> $C_2H_4 + H_2O$ (1mark) **2.** By reaction with sodium carbonate/ bi carbonate 1M with the samples, ethanol will not react whereas ethanoic acid gives brisk effervescence (1mark) $2CH_3COOH + Na_2CO_3 \rightarrow 2CH_3COONa + H_2O + CO_2$ **OR** $CH_3COOH + NaHCO_3 \rightarrow CH_3COONa + H_2O + CO_2$ (1 mark)	

35.	1. The reason is that many multi-cellular organisms are not simply a random collection of cells. Specialised cells are organised as tissues, and tissues are organised into organs, which then have to be placed at definite positions in the body. Therefore, cell-by-cell division would be impractical. (2 marks) 2. Sexual maturation of reproductive tissues is a necessary link for reproduction because of the need for specialised cell called germ-cells to participate in sexual reproduction. The body of the individual organism has to grow to its adult size, the rate of general body growth begins to slow down, reproductive tissues begin to mature. (1½ marks) A whole new set of changes in the appearance of the body takes place like change in body proportions, new features appear. This period during adolescence is called puberty. There are also changes taking place that are different between boys and girls. In girls, breast size begins to increase, with darkening of the skin of the nipples at the tips of the breasts. Also, girls begin to menstruate at around this time. Boys begin to have new thick hair growth on the face and their voices begin to crack. (1½ marks) OR (a) If the niche were drastically altered, the population could be wiped out. However, if some variations were to be present in a few individuals in these populations, there would be some chance for them to survive. Variation is thus useful for the survival of species over time. (2 marks) (b) 1. The lining of the uterus thickens and is richly supplied with blood to nourish the growing embryo. (½ mark) 2. The embryo gets nutrition from the mother's blood with the help of placenta. It is embedded in the uterine wall. (½ mark) ● It contains villi on the embryo's side of the tissue. On the mother's side are blood spaces, which surround the villi. (½ mark) 3. This provides a large surface area for glucose and oxygen to pass from the mother to the embryo. The developing embryo will also generate waste substances which can be removed by transferring them into the mother's blood through the placenta. (1 mark) 4. The child is born as a result of rhythmic contractions of the muscles in the uterus. (½ mark)	5

36.	1. All spaces are connected in parallel. (1mark) **2.** Let Resistance of Space 5 and 4 be R ohms respectively (2marks) Resistance of Space 1 = 2 R ohms Resistance of Space 2 = 30 ohms Resistance of Space 3 = 20 ohms Current = 22 A V= 220 V Total Resistance= V/I	5
SECTION - E		
37.	a. Rusting occurs in both A and B so there is an increase in mass. (1 mark) As the surface area of B is more, extent of rusting is more (1 mark) b) Galvanization -(1 mark) Oiling/ greasing/ painting/ alloying/ chromium plating or any other (Any two ½ mark each) – (1 mark) **OR** b. C - Iron hinges on a gate - Iron is in contact with both atmospheric oxygen and moisture/ water vapour. (2 marks)	4

38.	a. Yes, green eye colour is recessive (½ mark) as it will express only in homozygous condition (½ mark) b. BB, Bb (1 mark) c. bb*Bb (0.5mark) Genetic cross - (1 mark) 50% of the offsprings can have green eye colour (0.5)	4

	B	b
b	Bb	bb
b	Bb	bb

OR

c. Brother is heterozygous (Bb) and wife is green(bb) - (1)
Wife bb*Bb brother

	B	b
b	Bb	bb
b	Bb	bb

50% of the offsprings can have green eye colour as per the cross shown. (1 mark)

39. 4

1. Convex Lens (1mark)
2. Negative as the image is real and inverted. (1mark)
3. 1/f= 1/v- 1/u

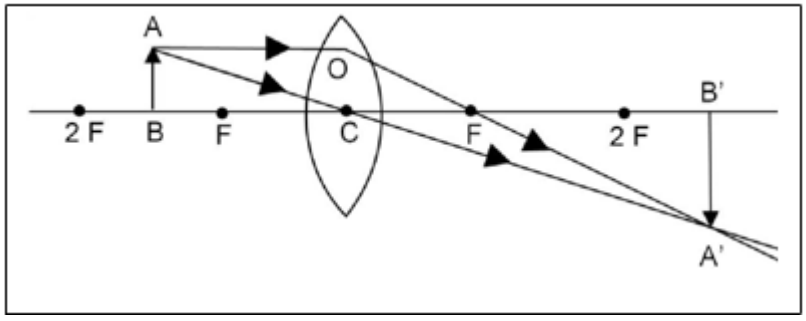
1/20 = 1/v- 1/-20

1/v = 1/20 - 1/21

= (21 - 20)/420

= 1/420 v= 420 cm (2 marks)

(c)



2mark

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Practice Questions
Session 2022-23
Class X
Subject - Science (086)

Maximum marks: 80 Time Allowed: 3 hours

General instructions:

i. This question paper consists of 39 questions in 5 sections.

ii. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.

iii. **Section A** consists of 20 objective type questions carrying 1 mark each.

iv. **Section B** consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should in the range of 30 to 50 words.

v. **Section C** consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should in the range of 50 to 80 words. vi. **Section D** consists of 3 Long Answer type questions carrying 05 marks each.
Answer to these questions should be in the range of 80 to 120 words.

vii. **Section E** consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.

Q.No	Question	Marks
	SECTION A Select and write one most appropriate option out of the four options given for each of the questions 1 – 20	
Q.1	The yellow colour of turmeric changes to red on addition of soap solution. When substance P is added to turmeric, there is no change in colour. Which of the following is definitely true about substance P? A. P is an acid. B. P is not a salt. C. P is not a base. D. P is a neutral substance.	1
Q.2	During the electrolytic refining of copper what happens at the anode? A. copper ions gain electrons to become neutral copper atoms B. neutral copper atoms gain electrons to become ions C. copper ions lose electrons to become neutral atoms D. neutral copper atoms lose electrons to become ions	1

Q.3	Identify the endothermic reaction(s) among the following: P) $6\ CO_2 + 12\ H_2O \xrightarrow[\text{chlorophyll}]{\text{Sunlight}} C_6H_{12}O_6 + 6\ O_2 + 6\ H_2O$ Q) $Na_2CO_3 + 2\ HCl \longrightarrow 2\ NaCl + CO_2 + H_2O$ R) $C_6H_{12}O_6 + 6\ O_2 \longrightarrow 6\ CO_2 + 6\ H_2O$ S) $CaCO_3 \dashrightarrow CaO + CO_2$ A. only P B. only S C. only Q and R D. only P and S	1
Q.4	Ashok has written the following reactions to show how metals can be obtained from their ores. P) $2\ Fe_2O_3 + 3C$ ---------> $4\ Fe + 3\ CO_2$ Q) $Na_2O + C$ --------> $2\ Na + CO$ R) $ZnO + C$ --------> $Zn + CO$ S) $CuO + C$ ----------> $Cu + CO$ Identify the INCORRECT reaction(s) among them. A. only P B. only Q C. only P and R D. only Q, R or S	1
Q.5	The following reactions are carried out in open vessels. P) $2Cu\ (s) + O_2\ (g) \xrightarrow{\text{Heat}} 2CuO\ (s)$ Q) $Zn\ (s) + CuSO_4\ (aq) \dashrightarrow ZnSO_4\ (aq) + Cu\ (s)$ R) $2FeSO_4\ (s) \xrightarrow{\text{Heat}} Fe_2O_3\ (s) + SO_2\ (g) + SO_3\ (g)$ Which of the following correctly shows if the weight of the reaction vessel and contents increases, decreases or remains the same after the reaction as compared to before the reaction?	1

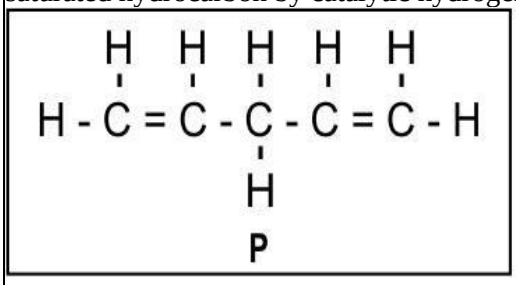
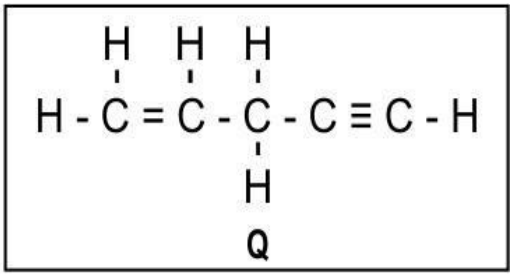
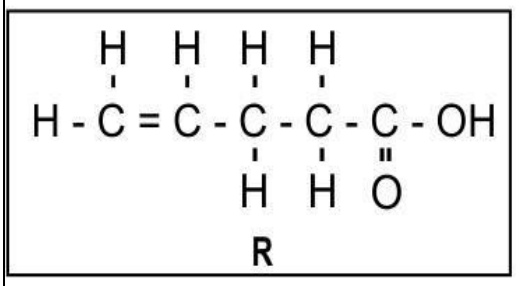
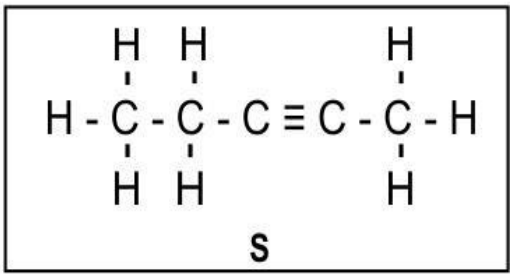
Option	Reaction P	Reaction Q	Reaction R
A	decreases	remains the same	increases
B	remains the same	increases	decreases
C	increases	decreases	increases
D	increases	remains the same	decreases

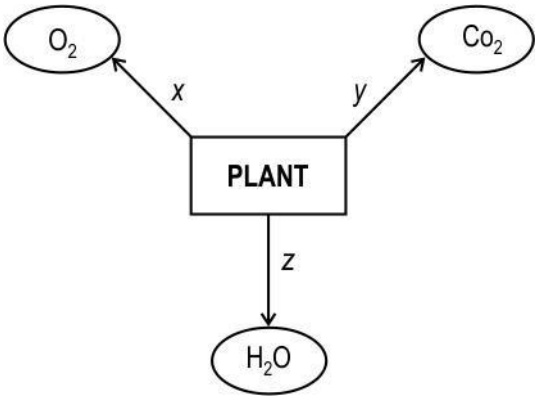
A. A
B. B
C. C
D. D

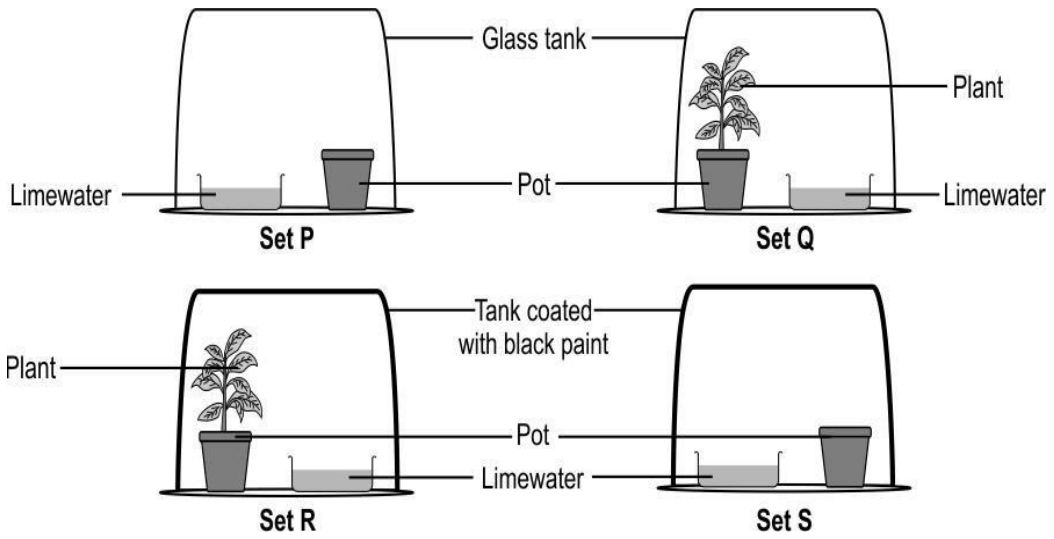
Q.6 A solution of a base with pH 12.1 is given. 1

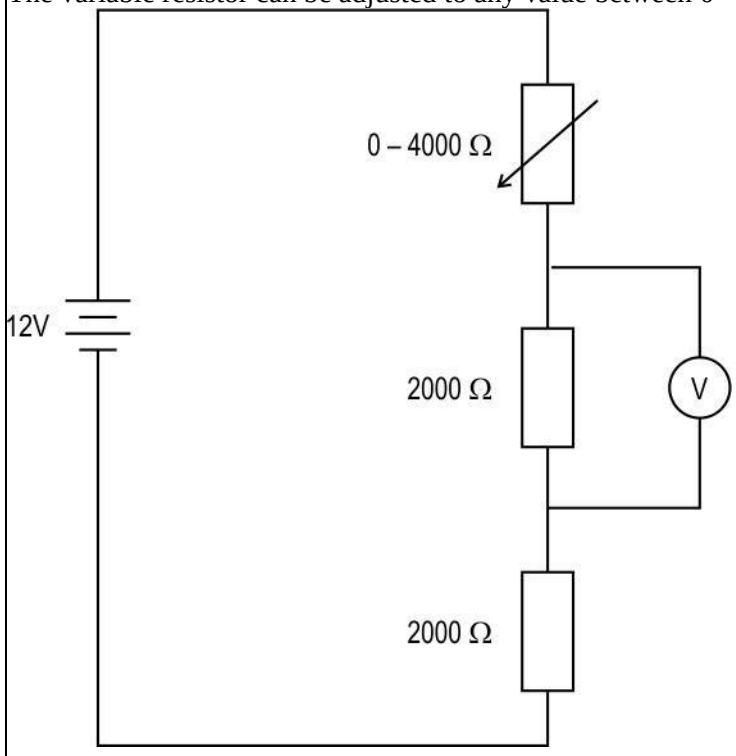
Which of the following can be done to decrease its pH?
P) add distilled water to it
Q) add a solution of a different base with pH 8.7
R) add few drops of an acid with an unknown pH

A. only P
B. only R
C. only P and Q
D. any of P, Q and R

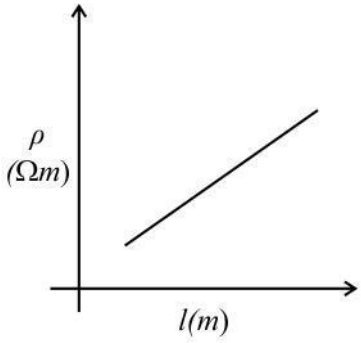
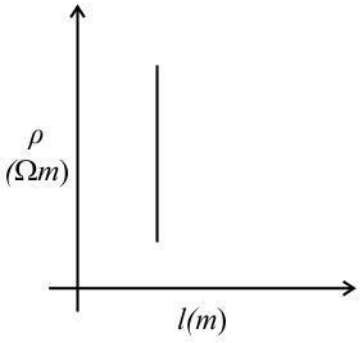
Q.7	One mole of which of the following compounds requires 2 moles of hydrogen to form a saturated hydrocarbon by catalytic hydrogenation?  P  Q  R  S A. only P and Q B. only R and S C. only P and S D. only P, Q and S	1

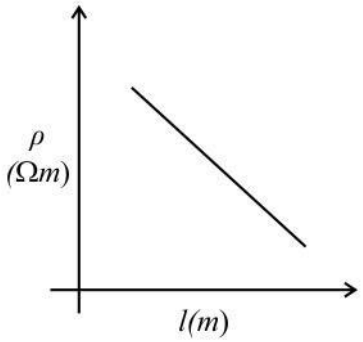
Q.8	Look at the diagram below carefully.  Identify the process taking place at Z. A. Reproduction B. Transpiration C. Photosynthesis D. Translocation	1

Q.9	Lime water turns cloudy in the presence of a gas which is a by-product of respiration. Shown below are four setups kept in sunlight for 24 hours.  In which setup is lime water expected to be the cloudiest? A. Setup P B. Setup Q C. Setup R D. Setup S	1
Q.10	A homozygous dominant guinea pig with black fur is crossed with a homozygous guinea pig with white fur. The F1 generation is crossed with itself. What percentage of F2 generation is expected to show white fur coat?	1
	A. 25% B. 50% C. 75% D. 100%	
Q.11	Person X suffers from a condition that affects the normal functioning of the pituitary gland. Which of the following is most likely a direct effect of person X's condition? A. insufficiency of iodine B. irregular heartbeat C. insufficient growth of the body D. inability to regulate blood sugar	1

Q.12	The time duration from the sowing of seeds to the harvest of crops is critical for agricultural purposes. Based on the information above, select a reason why farmers prefer vegetative propagation for growing crops. A. Seedless crops can also be reproduced. B. Offspring plants are genetically similar to parent plants. C. Plants grown by vegetative propagation bear fruits earlier. D. Vegetative propagation does not depend on external agents of pollination.	1
Q.13	The circuit below consists of a variable resistor connected in series with two 2000 Ω resistors. The variable resistor can be adjusted to any value between 0 - 4000 Ω.  As the resistance of the variable resistor is changed, what is the smallest possible reading on the voltmeter?	1

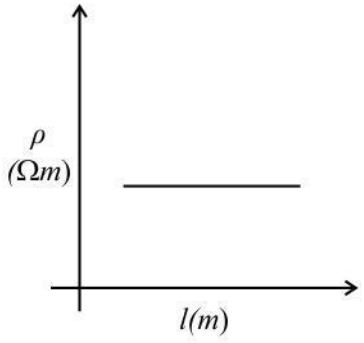
	A. 0 V B. 3 V C. 4 V D. 6 V	

Q.14	The frequency of AC in some countries is 60 Hz. What does this mean? A. The current changes direction 60 times in a second. B. The current changes direction 120 times in a second. C. The current changes direction after every 60 seconds. D. The current changes direction after every 120 seconds.	1
Q.15	Raman wants to draw a graph to show how the resistivity (ρ) of a wire change with the length (l) of the wire. What should his graph look like?  A.  	1



B.

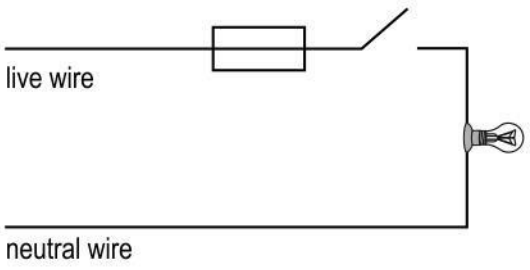
C.



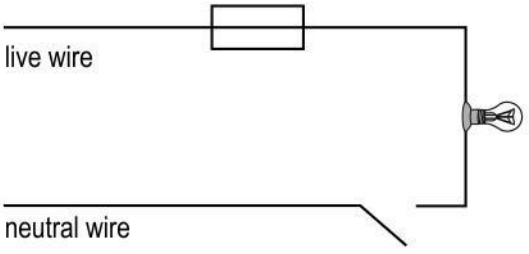
D.

Q.16	Which circuit shows the correct and safe positions for the fuse and the switch?	1

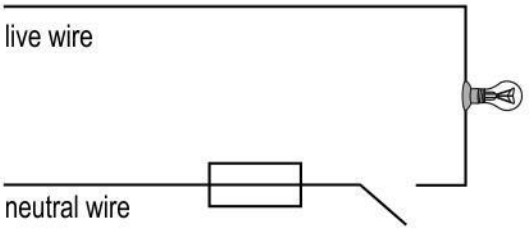
A.



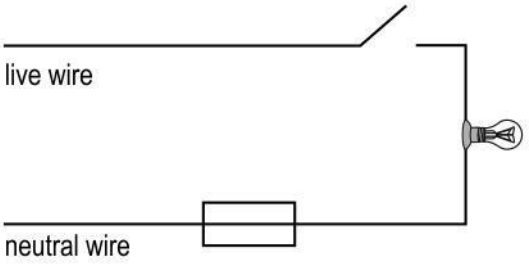
B.



C.



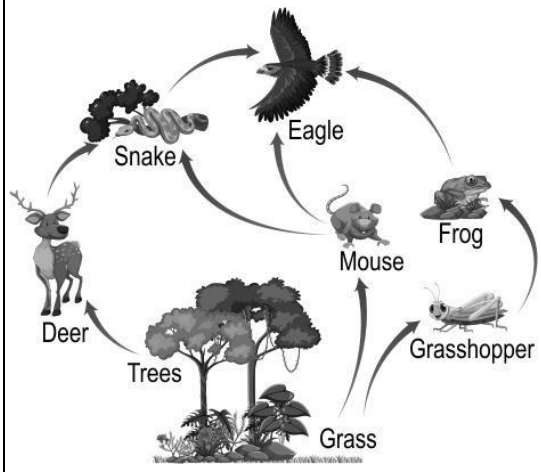
D.



Q. no 17 to 20 are Assertion - Reasoning based questions.
These consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:
Both A and R are true and R is the correct explanation of A
Both A and R are true and R is not the correct explanation of A
(c) A is true but R is false
(d) A is False but R is true

Q.17	Assertion (A): A whitewashed wall develops a coating of calcium carbonate after a few days. Reason (R): Calcium oxide on the wall reacts slowly with carbon dioxide in the air.	1
Q.18	Assertion (A): Offsprings produced by sexual reproduction show variation. Reason (R): Each offspring produced by sexual reproduction inherits all the genes from each parent.	1
Q.19	Assertion (A): Capillaries have walls that are just one cell thick. Reason (R): Exchange of material between the blood and surrounding cells takes place across the capillaries.	1
Q.20	Assertion (A): A stationary charged particle placed in a magnetic field experiences a force. Reason (R): A stationary charged particle does not produce a magnetic field.	1
	SECTION B Q. no. 21 to 26 are very short answer questions.	
Q.21	Diana prepared a cake by two methods. Method i) She added baking soda to the cake mixture and let the mixture stand for one hour before placing it in the oven to bake. Method ii) She added baking powder to the cake mixture and let the mixture stand for one hour before placing it in the oven to bake. State the difference in the cake mixtures that Diana is likely to have observed before baking. Explain why. **OR** Compare the stability of a neutral sodium atom and a positive sodium ion. Justify your answer.	2
Q.22	How do control and coordination in plants differ from that in animals? Give any FOUR points of difference.	2
Q.23	A person suffering from liver disease is advised to avoid fatty and highly acidic foods. Give a reason why each of the foods mentioned should be avoided by a person suffering from liver disease.	2

Q.24	Oxygen, mostly, is carried by a pigment in our blood whereas carbon dioxide is transported in dissolved form in our blood. Give TWO reasons that make the above statement correct.	2

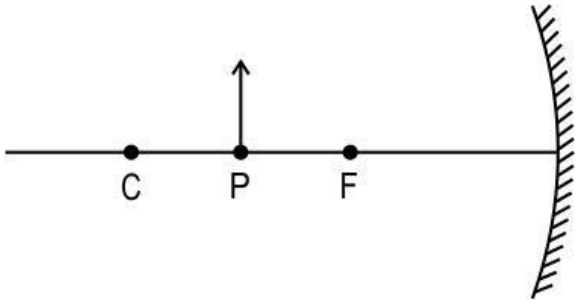
Q.25	White light is passed through a prism to yield a spectrum. The ray of which color will show the maximum angle of deviation and which one will show the least angle of deviation? A blue-coloured ray is passed through a glass prism. What will be the colour of the emergent ray? Justify your answer. **OR** Myopia is also known as near-sightedness. A person with this defect has the far point nearer than infinity. Draw a neat ray diagram to depict image correction for a myopic eye using a suitable lens.	2
Q.26	Study the food web shown below.  Identify and write the food chain from the food web shown, in which the eagle will receive the highest percentage of the energy from the producers. Which organism will be the most affected when a non-biodegradable pesticide is introduced into the soil? What is the phenomenon responsible for this called?	2

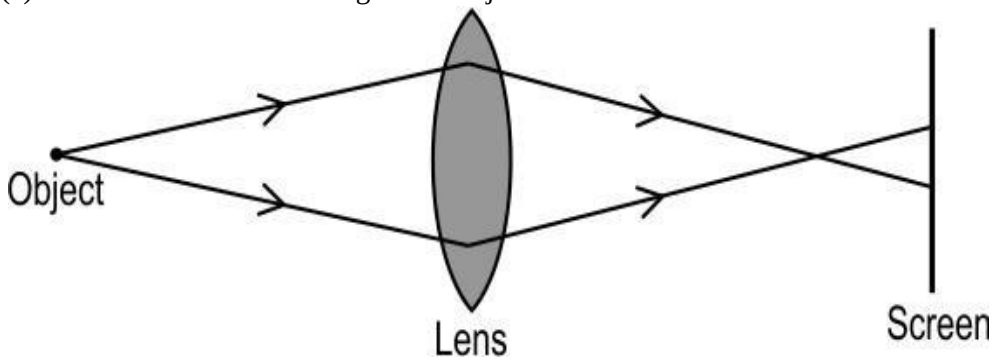
SECTION C

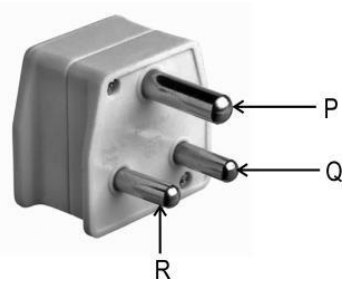
Q.no. 27 to 33 are short answer questions.

Q.27	Observe the two chemical equations given below. P) $Ca(OH)_2 + HNO_3$ -----> $Ca(NO_3)_2 + H_2O$ Q) $KBr + AgNO_3$ -----> $KNO_3 + AgBr$ Explain how a balanced equation can be identified. Which of the two equations is/are NOT balanced? Balance the equation(s) by rewriting.	3
Q.28	The Thermit process is used for repairing cracks in railway tracks on site. Write the equation for the reaction taking place in the process, mentioning the physical states of the reactants and products. What information in the chemical equation indicates that the reaction is exothermic?	3

Q.29	Given below is a table representing the characteristics of two fluids involved in the transportation of substances in the human body. **Fluid A** / **Fluid B** colourless / coloured contains less oxygen / contains more oxygen contains less protein / contains more protein (a) Identify fluid A and fluid B. (b) With the help of a flow chart, describe the movement of fluid A from the intercellular spaces to the main circulatory system. (c) What role does fluid A play in the digestion of food in humans? OR Two major forces help in the transport of water in a plant. Force A is the driving force in the movement of water during the day, whereas force B helps the movement of water in a plant during the night or during the day when humidity is very high. (a) Identify force A and force B. (b) Describe how each of these forces helps in the movement of water in a plant	3

Q.30	An object of height h is kept at point P in front of a mirror as shown below. The height of the image produced is h'. In the diagram, F is the focus and C is the centre of curvature.  If the object is now moved to point C, will the height of the image now produced be less than, equal to, or greater than h'? Give a reason for your answer. If the focal length of the mirror is 20 cm and the distance between points P and C is 10 cm, determine the distance between the images produced when the object is kept at P and C.	3

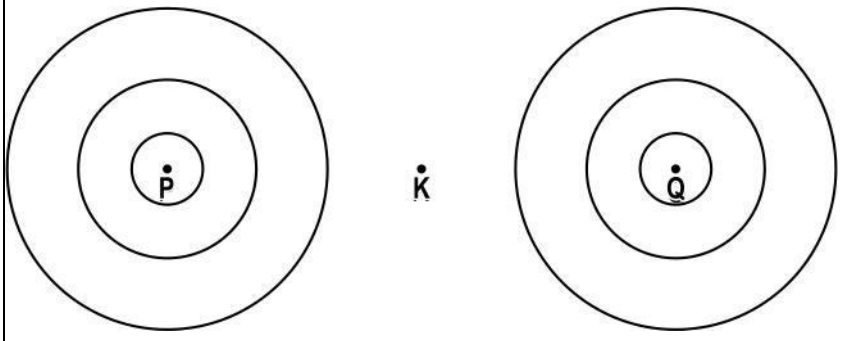
Q.31	(a) A lens forms a blurred image of an object on the screen as shown below:  What changes can you make to the following to form a sharp and in-focus image on the screen? (i) object distance (ii) focal length of the lens (b) Sunita's ophthalmologist suggests her to use a lens of power -2 D to correct her vision. What type of lens should she use? What should be the focal length of the lens? An object is kept at 10 cm in front of the lens of power -2 D. Find the distance where the image is produced.	3

Q.32	Sunita had to replace the electrical plug of her clothes iron. She bought a three-pin plug as shown below.  When she removed the old plug, she saw that there were three wires coloured red, black and green. To which pin on the plug should she connect the green wire? To which part of the clothes iron is the green wire connected? (c) State the function of the green wire. **OR** (a) Direct contact between which of the three coloured wires will result in a short circuit? (b) State what happens to the current in the circuit in the case of a short circuit. Give a reason for your answer.	3
Q.33	Ozone formation takes place in the stratosphere of our atmosphere. (a) Explain how the energy of the Sun helps in the formation of ozone. (b) Why is ozone formation at ground level considered a pollutant? (c) State any two health consequences of ozone layer depletion on human health.	3

	SECTION D Q.no. 24 to 36 are long answer questions.	

Q.34	Prasad has a saturated alcohol X of chemical formula C_4H_9OH. (a) Write the chemical formula of a member Y that comes two places after X in the homologous series and state by how much will its molecular mass differ from that of X. (b) How do the chemical properties of X compare with those of Y? Give reason for your answer. (c) Write the chemical formula of the product Z formed by heating Y with acidified potassium dichromate. Write the general formula for compounds in the homologous series that Z belongs to. **OR** An unsaturated hydrocarbon P has the chemical formula C_4H_6. Write two possible structural formulae for hydrocarbon P. Write the reaction conditions to convert 1-butanol (CH_3 - CH_2 - CH_2 - CH_2OH) to hydrocarbon P. Write the general formula for the homologous series of hydrocarbon P.	5
Q.35	(a) Variation in DNA is beneficial for the survival of species over time. Explain. (b) Explain an instance where reproduction would be counterproductive to the sustenance of species. (c) What is the sequence of events that take place in human reproduction when an egg is not fertilised? **OR** Describe the process of seed formation in a flowering plant. Suggest any two reasons why child marriages are a hazard to the reproductive health of women. Give any three advantages of using a mechanical barrier over other contraceptive measures to avoid pregnancy.	5

Q.36 P and Q represent two straight wires carrying equal current (I) in a direction perpendicular to the plane of the screen **outwards**. K is the midpoint of the line joining P and Q. The image shows the magnetic field lines around the wire. But the direction of the magnetic field is not marked. 5



(a) Draw the above image and mark the direction of the magnetic field.

If the current in the wires is increased, how will the strength of the magnetic field around P and Q change? Draw the magnetic field lines around P and Q to represent this change.

If B is the magnetic field at point K due to the current in wire P, what will be the magnetic field due to P and Q at the midpoint K? Give a reason for your answer.

If B is the magnetic field at point K due to the current in wire P and the current in wire Q is reversed, what will be the magnetic field at midpoint K?

SECTION E

Q.no. 37 to 39 are case - based/data -based questions with 2 to 3 short sub - parts. Internal choice is provided in one of these sub-parts.

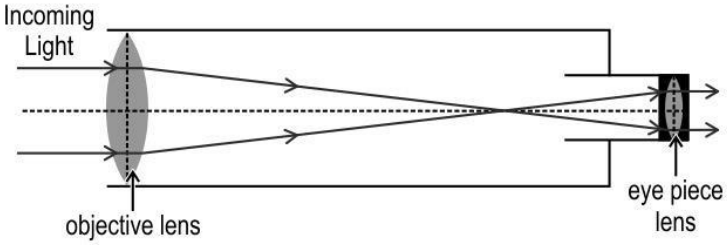
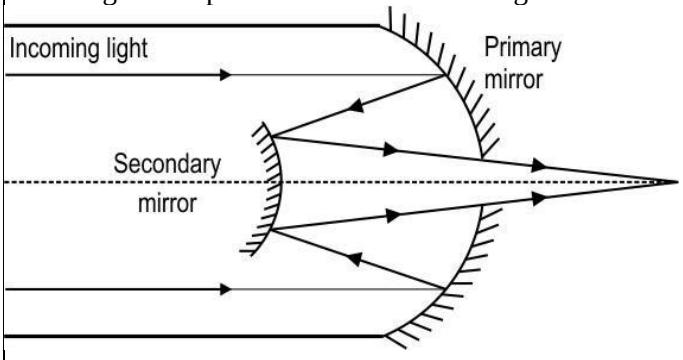
Q.37 Pure gold is very soft and therefore not suitable for making jewellery. To make it hard, gold is alloyed with other metals. The purity of gold is measured in carats according to the table below. Carat number is the number of parts of gold in 24 parts. 4

Carat number	**Number of parts of gold in 24 parts**	**Number of parts of other metals in 24 parts**
24	24	0
22	22	2
18	18	6
14	14	10
12	12	12

sting. Name the

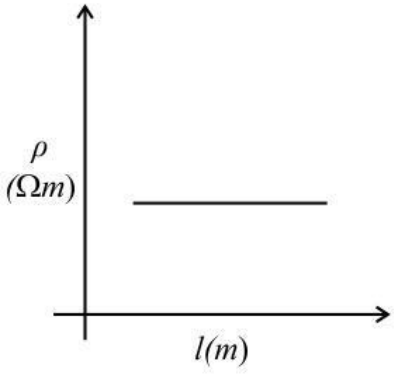
of the pure

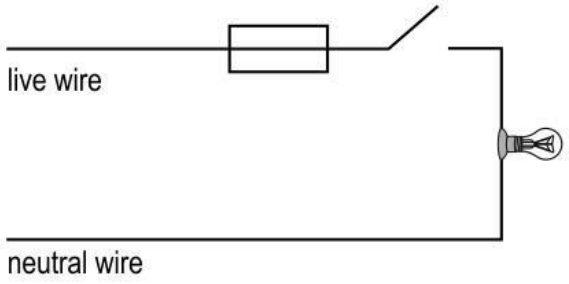
	What is the percentage of gold in 18 carat gold? Name any two metals that are u to make 22 carat gold. Like gold, pure iron is also comparatively soft and also substance that is mixed iron. (i) to make it hard. (ii) to change it to stainless steel to prevent rusting. **OR** (b) (i) What type of mixture is an alloy? (ii) How does the electrical conductivity of an alloy compare metal?	
Q.38	Two human beings who can both roll their tongues produced 11 children. 3 of these children could not roll their tongues and 8 children could roll their tongues. Which trait (rolling or not rolling) is controlled by the recessive allele? State all possible genotypes of the F1 generation of the cross. Show the inheritance of the tongue rolling in humans in the given example using a suitable cross. What percentage of offspring will show the same genotype as the parents? **OR**	4
	(c) If one of the parents could not roll their tongue, with the help of a cross, calculate the ratio of tongue-rollers to non-tongue-rollers in the off springs.	

Q.39	The image below shows the design of a refracting telescope.  When light passes through prism different colours split and dispersion takes place. The same thing happens with a lens but to a much lesser degree. This is called chromatic aberration and causes the different colours of light to focus at different points. To overcome this problem, the reflecting telescope was invented. One design of the reflecting telescope is shown below.  Why is there no chromatic aberration in reflecting telescopes? One of the critical factors affecting a telescope is the amount of light it can gather. The more light a telescope can gather, the better the image it produces. What can be done to the lens to increase the amount of light a telescope gathers? In the refracting telescope given in the passage, what should be the distance between the two lenses? (Use the first ray diagram in the passage to answer it.) The light that reaches the telescopes comes from very far away celestial objects. Draw a ray diagram to show what happens when light from a far away object falls on a convex lens and a concave lens. **OR** (d)The light that reaches the telescopes comes from very far away celestial objects. Draw a ray diagram to show what happens when light from a far away object falls on a convex mirror and a concave mirror.	4

Practice Questions - MARKING SCHEME

Session 2022-23
Class X
Subject - Science (086)

Q.No	Question	Marks
	SECTION A	
Q.1	C. P is not a base.	1
Q.2	D. neutral copper atoms lose electrons to become ions	1
Q.3	D. only P and S	1
Q.4	B. only Q	1
Q.5	D. D	1
Q.6	D. any of P, Q and R	1
Q.7	C. only P and S	1
Q.8	B. Transpiration	1
Q.9	C. Setup R	1
Q.10	A. 25%	1
Q.11	C. insufficient growth of the body	1
Q.12	C. Plants grown by vegetative propagation bear fruits earlier.	1
Q.13	B. 3 V	1
Q.14	B. The current changes direction 120 times in a second.	1
Q.15	D. 	1

Q.16	A.  	1
Q.17	C. A is true but R is false.	1
Q.18	C. A is true, but R is false.	1
Q.19	A. Both A and R are true, and R is the correct explanation of A.	1

Q.20	D. A is false but R is true.	1
SECTION B		
Q.21	Diana is likely to see that the cake mixture (ii) has risen while cake mixture (i) has not. 1 mark for each of the following: The sodium bicarbonate and tartaric acid in baking powder react on mixing with one another, producing carbon dioxide that causes the cake mixture to rise. Baking soda does not contain tartaric acid and hence does not produce carbon dioxide before baking. OR 1 mark for each of the following: A positive sodium is more stable than a neutral sodium atom. A positive sodium ion has a complete octet of electrons in its penultimate shell.	2
Q.22	0.5 marks for each point of difference:	2

Control in plants	Control in animals
Plant hormones diffuse to the place of action.	Animal hormones are carried in blood vessels.
Plants depend on hormones for control and coordination.	Animals depend on nerve impulses and hormones for control and coordination.
Hormones in plants are not secreted by specialised glands.	Hormones in animals are secreted by specialised glands.

	Movement in plants occurs through a change in the water content of the action cells.	Movement in animals occurs through a change in the shape and arrangement of proteins in the muscle cells.
	(Accept any other valid point of difference)	
Q.23	1 mark for each correct description/explanation: Since the liver produces bile which creates an alkaline medium for effective digestion, in absence of bile acidic foods may cause more acidity and poor digestion. Since bile is responsible for fat digestion by converting large fat globules to smaller ones for efficient digestion, in absence of which fats will not be properly digested. (Accept any other valid answer.)	2
Q.24	1 mark for each correct reason: Carbon dioxide is more soluble in water than oxygen. Haemoglobin (the red pigment in RBC) has a very high affinity for oxygen.	2

Q.25	(a) 0.5 marks for each correct answer: maximum angle of deviation - violet colour ray minimum angle of deviation - red colour ray (b) 0.5 marks each for both correct points: The emergent ray will be blue in colour. Since blue colour ray cannot be split any further it will pass through the prism undispersed. OR Neat diagram drawn with the following components marked: light rays coming from infinity [0.5 marks] concave lens in front of the eye [0.5 marks] lens of the eye [0.5 marks] image formed on retina [0.5 marks] (No marks are to be awarded for incomplete diagram.)	2

Q.26	(a) Grass --> Mouse --> Eagle [1 mark] (No marks to be given for incomplete food chain.) (b) 0.5 marks each for both correct points: The eagle will be the most affected. Biomagnification.	2
SECTION C		
Q.27	(a) The number of atoms of each element should be the same on the reactants' side and the products' side. (b) P [1 mark] Balanced equation: $Ca(OH)_2 + 2\ HNO_3$ -----> $Ca(NO_3)_2 + 2\ H_2O$ [1 mark]	3
Q.28	(a) 0.5 marks each for writing the correct formulae and physical state of the reactants and products: $2Al\ (s) + Fe_2O_3\ (s)$ ----> $2\ Fe\ (l) + Al_2O_3\ (s)$ [2marks] (Note: (i) balancing of the equation is not required. (ii) no marks to be awarded if the state or formula of the reactant/product is incorrect) (b) The iron formed is in the molten(liquid) state due to the heat generated in the reaction. [1 mark]	3
Q.29	(a) 0.5 marks for each correct answer: Fluid A - Lymph Fluid B – Blood	3

	0.5 marks for all four nodes stated correctly, 0.5 marks for the correct direction of arrows: intercellular spaces --> lymphatic capillaries --> lymph vessels --> larger veins [1 mark] Lymph carries digested and absorbed fat from the intestines back to the blood. [1 mark] OR (a) 0.5 marks for each correct answer: force A: transpirational pull force B: root pressure (b) 1 mark for each correct point: Transpirational pull: evaporation of water molecules from the stomata of a leaf due to transpiration creates a suction that pulls water from the xylem cells of roots. Root pressure: Active absorption of ions by roots from the soil causes water to steadily move into the root xylem creating a column of water that is pushed upwards.	
Q.30	The height of the image produced when the object is at C will be less than h'. The magnification is more when the object is at point P than at C. (1 mark for the correct answer.) To find the distance between the two images we need to find the image distance when the object is at P and when it is at C. To find the image distance when the object is at P: u = -30 cm f = -20 cm Using mirror formula v_1 = -60 cm (1 mark for finding v_1.) To find the image distance when the object is at C: Since C is the centre of curvature, image distance = object distance (i.e.) v_2 = 40 cm (0.5 marks for finding v_2.) Distance between the images = $\|v_2\|$ - $\|v_1\|$ = 60 - 40 = 20 cm (0.5 marks for finding the distance between the images.)	3

Q.31	(a) (i) decrease the object distance (ii) increase the focal length (0.5 marks for each correct answer) (b) (i) diverging lens/ concave lens (0.5 marks) (ii) f = 1/P = 1/(-2) = - 0.5 m	3

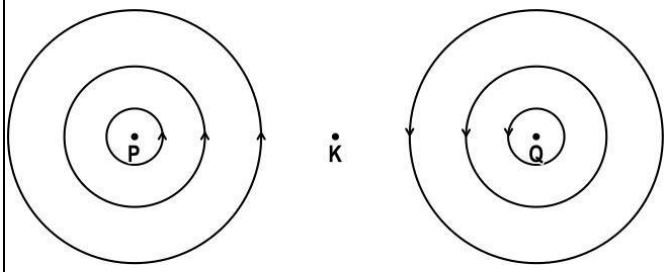
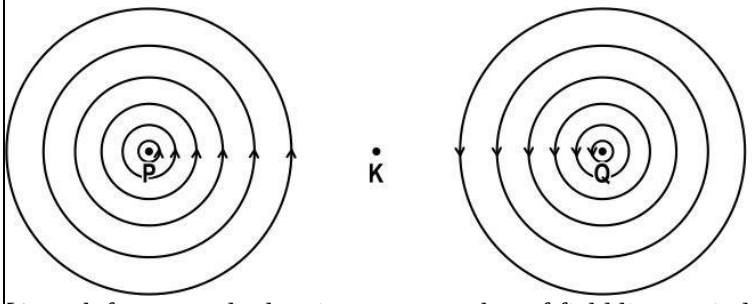
	(0.5 marks. No marks are to be allotted if the negative sign and unit is not mentioned.) (iii) Given u = -10 cm; P=-2 D f = -0.5 m = -50 cm $\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$ $v = \frac{uf}{u+f}$ $v = \frac{(-10)(-50)}{-10-50}$ $v = -8.33\ cm$ (0.5 marks for the use of correct formula and 0.5 marks for correct calculation.)	
Q.32	pin P [1 mark] to the metallic body of the clothes iron [1 mark] It prevents severe shocks by providing a low resistance path for any leakage current to the metallic body of the iron. [1 mark] OR (a) the red and the black wire [1 mark] (b) there is a drastic increase in the current [1 mark] Reason: The resistance in the circuit decreases. [1 mark]	3

Q.33	(a) 0.5 marks for each correct point: High energy UV radiation from the Sun breaks apart some of the molecular oxygen into free oxygen. The free oxygen then combines with the remaining molecular oxygen to form ozone. (b) Ozone is deadly to humans at lower levels of the atmosphere. [1 mark] (c) 0.5 marks each for any two consequences stated below: skin cancer cataract (Accept any other valid answer.)	3
SECTION D		
Q.34	(a) 0.5 marks each for the following: - Y: $C_6H_{13}OH$	5

	- molecular mass of Y = X + 28; (where 28 = atomic wt. of C X 2 + atomic wt. of H X 4 = 12 x 2 + 1 x 4) (b)1 mark each for the following The chemical properties of X and Y will be similar. Both X and Y are have an alcoholic functional group which determines their chemical properties. (c) 1 mark each for the following: chemical formula of Z: $C_5H_{11}COOH$ $C_nH_{2n+1}COOH$ OR $C_nH_{2n}O_2$. OR (a) 1 mark each for any two of the following: $-HC \equiv C - CH_2 - CH_3$ $-H_3C - C \equiv C - CH_3$ $-H_2C = C = CH - CH_3$ $-H_2C = CH - CH = CH_2$ (b) 1 mark each for the following: concentrated sulphuric acid heat (c) C_nH_{2n-2}	

Q.35	(a) 1 mark for each correct point: Variation allows diversity in organisms. In case of drastic alteration of niches, a population with variation is most likely to have some surviving members to ensure continuity of species. A higher rate of reproduction would lead to unchecked population growth leading to competition for resources and subsequent lower standards of living. [1 mark] 1 mark for each correct point: The egg survives for a day in the reproductive system. In case the egg is not fertilised, it is shed along with the lining of the uterus	5

	out of the vagina as blood and mucus. OR (a) 0.5 marks for each correct point: The pollen from the stamen is transferred to the stigma. The pollen tube germinates and penetrates the style to reach the ovary. The male germ cell and the female germ cells combine to form the zygote. The zygote undergoes rapid division to form the embryo inside the ovule. The ovule develops a seed coat and turns into a seed. (b) 0.5 marks for each correct reason: Females will not have reached full sexual maturity at the time of marriage. There are possibilities of pregnancy in the teenage years that may cause adverse effects on the female's body. (Accept any other valid answer.) (c) 0.5 marks for each correct point: Contraceptive pills can cause hormonal imbalances. CopperT and IUD can cause irritation to the uterine lining if not placed correctly. Surgical methods, if not performed properly, can lead to infections and complications. (Accept any other valid answer.)	

Q.36	(a)  [1 mark] (b) The strength of the magnetic field around P and Q will increase. [0.5 mark]	5
	 [1 mark for correctly drawing more number of field lines to indicate a stronger magnetic field.] (c) Zero. [0.5 marks] The magnetic fields at point K due to current in the wires P and Q are equal in magnitude but opposite in direction. The two fields cancel each other. [1 mark] (d) 2B. [1 mark]	
SECTION E		

Q.37	(a) 1 mark each for the following: 75% silver, copper (no marks if only one metal is mentioned) (b) 1 mark each for the following: (i) carbon (ii) nickel and chromium OR (b) 1 mark each for the following: homogeneous The electrical conductivity of an alloy is less than that of the pure metal.	4
Q.38	(a) not rolling [0.5 marks] (b) 0.5 marks for each correct genotype: - RR Rr, rr (Homozygous dominant, heterozygous dominant, homozygous recessive) (c) 1 mark for correct cross:	4

	R	r
R	RR	Rr
r	Rr	rr

offspring will show the same genotype as the parents. [1 mark]

- 50 or the correct cross:

OR

(c) 1

	R	r

r	Rr	rr	
r	Rr	rr	

ıgue roller to non-tongue roller offspring = 1:1 [1 mark]

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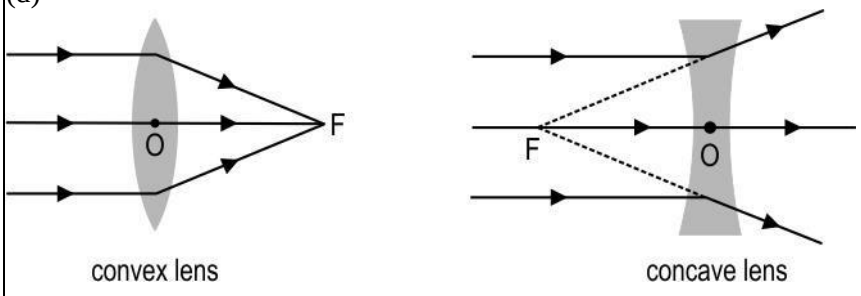
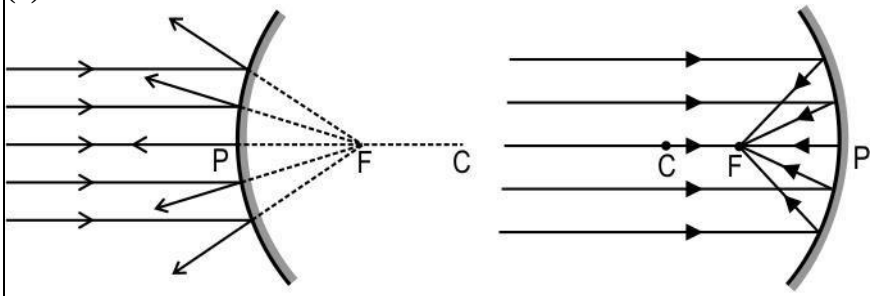
Q.39	Light does NOT pass through a second medium and hence there is no refraction and splitting of colours. [1 mark] Increase the diameter/aperture of the objective lens/ primary mirror. [1 mark] equal to the sum of the focal length of the objective and eyepiece. [1 mark] (d)  convex lens concave lens [0.5 marks each for convex lens and concave lens ray diagram.] OR (d)  convex mirror concave mirror [0.5 marks each for convex mirror and concave mirror ray diagram.]	4