SMART SKILLS

2021-22

BIOLOGY

GRADE X

INDEX

SYLLABUS

FIRST TERM

March 2021

- Life Processes : Nutrition

April 2021

- Life Processes : Nutrition (Contd.)
- Life Process: Respiration and Transportation

June **2021**

- Life Processes: Transportation (Contd.)
- Life Process: Excretion.

July 2021

- Control and Coordination.
- Practical's:
- To prepare a temporary mount of a leaf peel to observe stomata.
- To show experimentally that carbon dioxide is given out during respiration.

August 2021

- Our Environment
- Practical's:
  - ➢ To study (a) Binary fission in *Amoeba* (b) Budding in Yeast and *Hydra* with the help of prepared slides.
  - ➢ To study the parts of a Dicot seed.

September 2021

- Term I Exams

SECOND TERM
October 2021 • How do organisms reproduce? • Heredity and Evolution
November 2021 • Heredity and Evolution (contd.) • Sustainable Management of Resources
December 2021 • Sustainable Management of Resources (Contd.) • Pre-Board exams
January 2022 • Pre- Board exams continued

Chapter 6

LIFE PROCESSES: Nutrition

Nutrition in plants

LEARNING OUTCOMES

GRADE X

TERM 1

Autotrophic Nutrition		
Students will be able to differentiate	between varied modes of nutrition, autotrophic and heterotrophic nutrition	After completing the topic Autotrophic nutrition and attempting SS Q 1
Students will be able to explain	the process of photosynthesis and sequence of events in photosynthesis	After completing the topic Autotrophic nutrition and attempting SS Q ,2,3,4,7, 8,9,10
Students will be able to	Understand the conditions essential for photosynthesis	After completing the topic Autotrophic nutrition and attempting SS Q ,11,,6
Students will be able to	Draw labelled diagram of Cross section of a leaf and stomata	After completing the topic Autotrophic nutrition and attempting SS Q 5
Students will be able to	Plan and conducts activity to investigate chlorophyll and CO2 are essential for photosynthesis	After completing the topic Autotrophic nutrition
Heterotrophic Nutrition		
Students will be able to understand	Heterotrophic nutrition -holozoic nutrition	After completing the topic Heterotrophic nutrition and attempting SS Q 1
Students will be able to explain	steps involved in nutrition in Amoeba , human beings and understand significance of digestion	After completing the topic Heterotrophic nutrition and attempting SS Q 2,6
Students will be able to identify and understand	the functions of various organs involved in the human digestive system	After completing the topic Heterotrophic nutrition and attempting SS Q 3, 4,5,7,8,9
Students will be able	labeled diagrams of Nutrition in	After completing the topic

to draw	Amoeba and human digestive system	Heterotrophic nutrition
Students will be able to Plan and conduct	activity to investigate effect of salivary amylase on digestion of starch	After completing the topic Heterotrophic nutrition

1. Define the following

   a) Saprophytic nutrition :

   _____

   _____

   b) Parasitic Nutrition:

   _____

   _____

   c) Holozoic Nutrition: _____

   _____

   _____

2. Define photosynthesis and write the equation. What is the source of oxygen that is produced during photosynthesis?

_____

_____

_____

3. List the events occurring during the process of photosynthesis.

_____

_____

_____

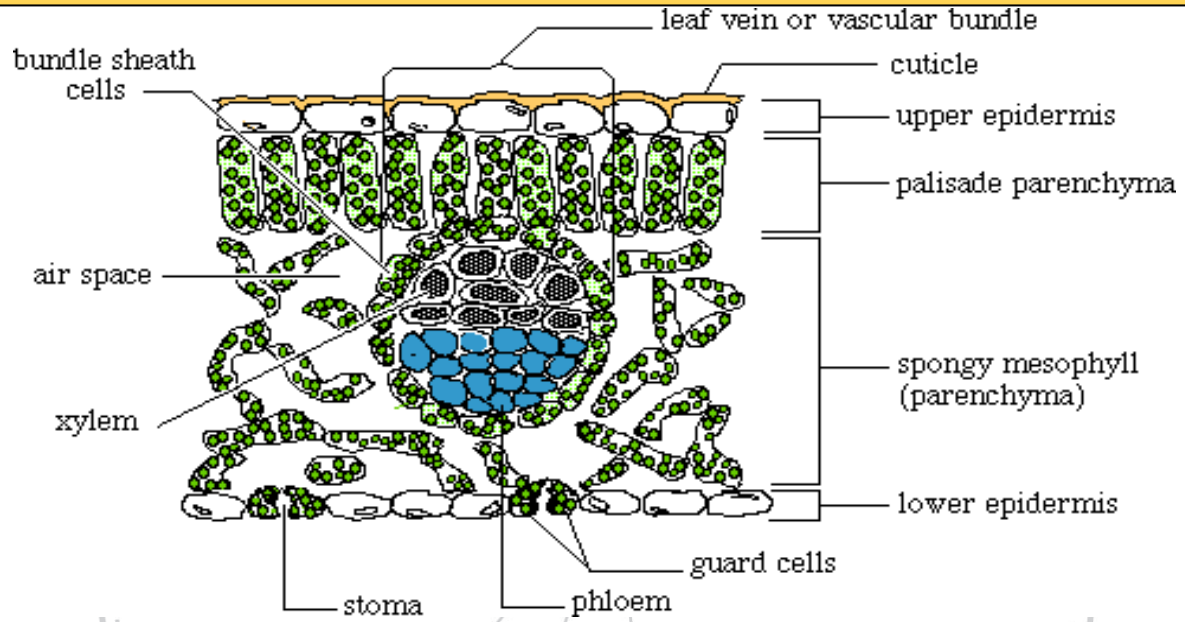
_____

4. If the surfaces of leaves are smeared with vaseline will it affect photosynthesis? Why?

_____

_____

_____



5. Identify the diagram given above and answer the following question –

a) Why it is that most of the stomata are present on the lower epidermis.

_____

_____

b) Name the two parts of mesophyll. What is the function of mesophyll tissue?

_____

_____

_____

c) Give two functions of stomata.

_____

_____

6. In desert plants stomata are closed during the day. How do they get CO_2 for photosynthesis?

_____

_____

_____

7. How do guard cells regulate the opening and closing of stomata?

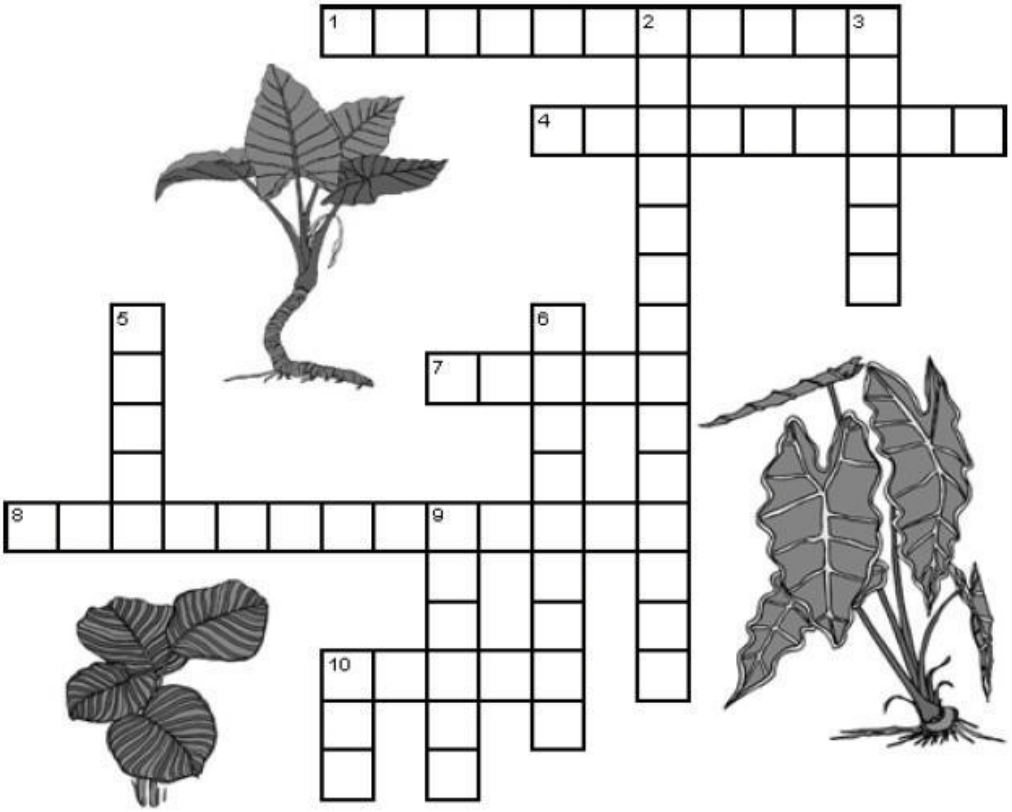
8. Mention the raw materials required for photosynthesis.

9. Name the carbohydrate that is the reserve food material in plants.

10. Photosynthesis converts energy **P** into energy **Q**. Identify **P** and **Q**

11. Two similar green plants **A** and **B** are kept separately in oxygen free containers, one in dark and the other in continuous light. Which will live longer? Give reason

Photosynthesis – Crossword puzzle



Across

1 A plant pigment that absorbs sunlight. (11)

4 The links between the energy that carnivores get from eating to the energy captured by photosynthesis. (4,5)

7 Chlorophyll absorbs every color of sunlight except this. (5)

8 A compound needed for photosynthesis. (6,7)

10 The product of photosynthesis. (5)

Down

2 The process by which plants and some bacteria use the energy from sunlight to produce sugar. (14)

3 Part of the plant where photosynthesis generally occurs. (6)

5 A compound needed for photosynthesis. (5)

6 An animal that eats plants. (9)

9 A by-product of photosynthesis. (6)

10 Number of molecules of oxygen produced along with one molecule of sugar. (3)

Chapter 6

Life Process

Nutrition In Animals

1. Name the mode of nutrition seen in *Amoeba*& Humans. _____
2. Name the 5 steps involved in nutrition in human beings._____, _____, _____, _____& _____.
3. In human beings digestion begins in the mouth. Justify.

   _____

   _____
4. Herbivores have longer intestine than carnivores. Explain.

   _____

   _____

   _____
5. **Three common features** are necessary in all surfaces through which **absorption occurs**. State the features. Name the structure in the digestive system where absorption occurs.

   _____

   _____

   _____

   _____

   _____
6. Name the digestive enzymes produced from the following along with their function/s

ORGAN	DIGESTIVE ENZYME/S PRODUCED	FUNCTION
Salivary Glands		
Stomach		
Pancreas		

Small Intestine		

7. How would digestion of food be affected if:

a) Bile duct is completely blocked.

_____

_____

b) No HCl is secreted in our stomach

_____

_____

c) Blockage in the pancreatic duct

_____

_____

8. What is emulsification of fats?

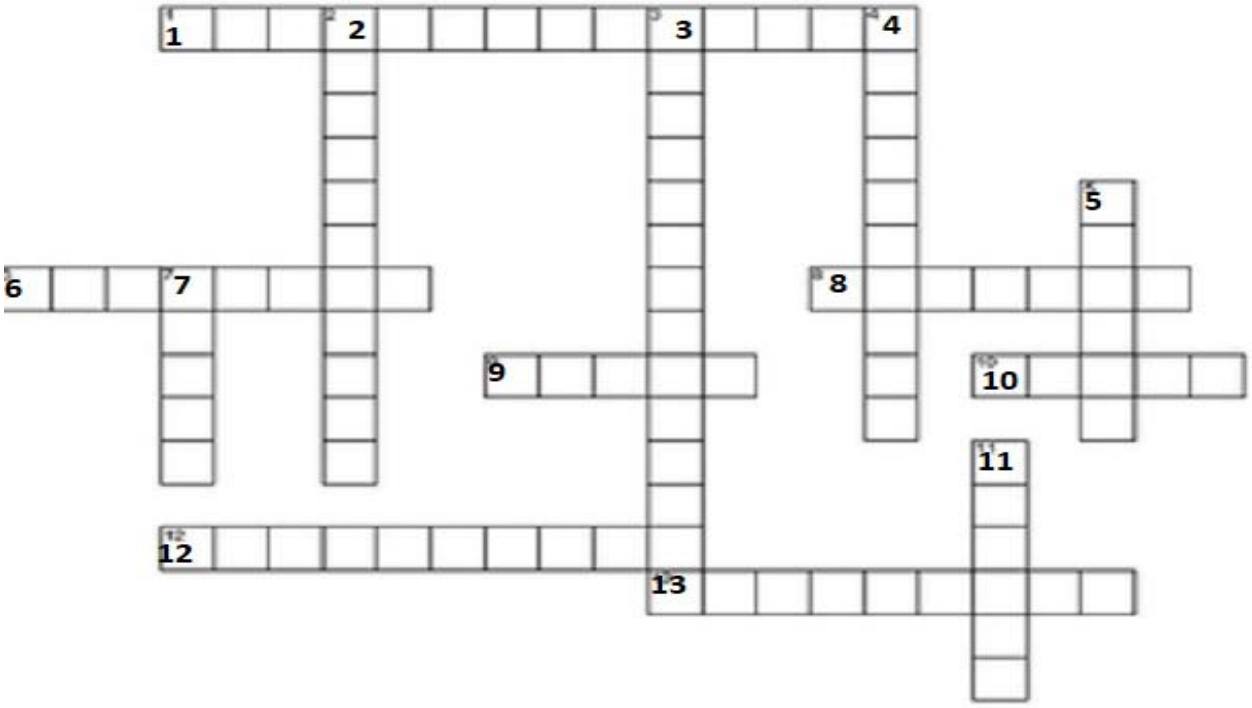
_____

_____

_____

Name:

Digestive System



ACROSS :

1. Large canal that absorbs water back into the body

6. An organ that makes digestive juice and also secretes a hormone

8. Large muscular sac that digests food

9. A large reddish organ that filters blood and secretes bile used for digestion

10. An oral cavity where digestion takes place

12. Process by which nutrients pass from wall of digestive cavity into the blood

13. A muscular passage that brings food from the mouth to the stomach

DOWN:

2. An organ located under the liver that stores bile which helps digestion

3. A winding, tightly coiled tube that absorbs digested food

4. The flap over trachea that prevents the food from entering the wind pipe

5.A section of large intestine that temporarily stores faeces before it exits the body

7. Another name for large intestine

11. Muscular organ that assists in chewing, swallowing and tasting of food

VERY SHORT ANSWER QUESTIONS (1 mark)

ASSERTION (A) and REASON(R) The following two questions 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 for A
b) Both A and R are true and R is not the correct explanation for A
c) A is true but R is false
d) A is false but R is true

1. ASSERTION (A): Opening and closing of stomatal pore is a function of guard cells.
REASON (R): Stomatal pores are site of exchange of gases by diffusion.

_____

2. ASSERTION (A): Saliva contains pepsin enzyme
REASON(R): Pepsin digests proteins

_____

3. **ASSERTION(A)**: The inner lining of small intestine has finger like projections

REASON(R): The villi increase surface area of absorption

_____

4. Assertion: Translocation of food occurs in Plants.

Reason: Xylem tissue is responsible for Translocation.

5. Answer question 4(a) to 4(b) on the basis of your understanding of the passage and related studied concepts:

The stomach is a sac-like organ at the end of the esophagus. It has thick muscular walls that contract and relax to squeeze and mix food. This helps break the food into smaller pieces. It also helps mix the food with enzymes and other secretions in the stomach. For example, the stomach secretes the enzyme pepsin, which helps digest proteins. However, most substances must undergo further digestion in the small intestine before they can be absorbed. The stomach stores the partly digested food until the small intestine is empty. Then a sphincter between the stomach and small intestine relaxes, allowing food to enter the small intestine.

4(a) Name the enzyme secreted by the wall of the stomach.

_____

4(b) Name the component of food on which this enzyme acts.

_____

4(c) How does the thick muscular wall of the stomach help in the process of digestion?

_____

_____

_____

4(d) What is the role of other secretions made by the wall of the stomach in the process of digestion?

_____

_____

Case Study –Paragraph Based Questions

From the mouth the food is taken to the food- pipe or oesophagus. The stomach is a large organ which expands when the food enters it. The muscular walls of the stomach help in mixing the food thoroughly with more digestive juices. The small intestine is the site of the complete digestion of carbohydrates, proteins and fats. It receives the secretions of the liver and pancreas for this purpose.

1. Which of the following is not a digestive enzyme contained in the pancreatic juice?

i. Lipase
ii. Hydrochloric acid
iii. Mucus
iv. Trypsin

a) (i) and (ii)
b) (i) and (iv)
c) (ii) and (iii)
d) (i) and (iii)

2. The enzymes pepsin and trypsin are secreted respectively by
a) Stomach and pancreas
b) Salivary gland and stomach
c) Liver and pancreas
d) Liver and salivary gland

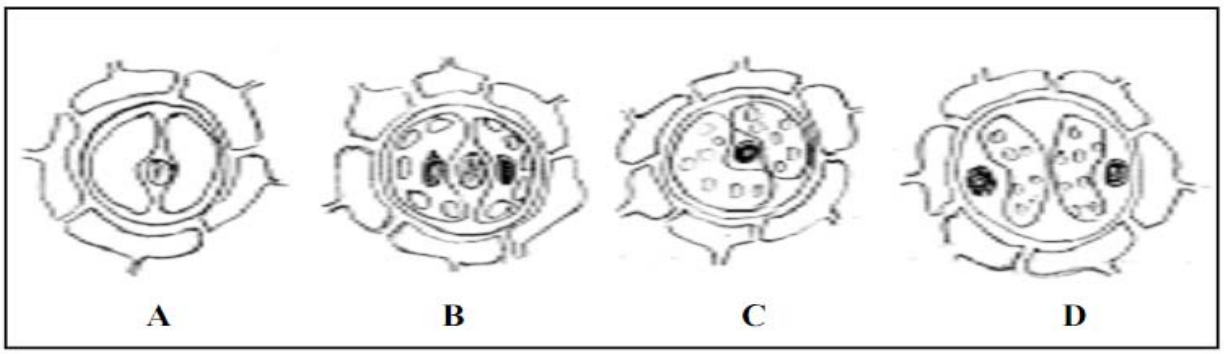
3. The enzymes contained in pancreatic juices help in the digestion of:
a) Fats and carbohydrates
b) Proteins and fats

c) Proteins and carbohydrates
d) Proteins, fats and carbohydrates

4. Which of the following help in protecting the inner lining of the stomach from the harmful effect of hydrochloric acid?
a) Mucus
b) Pepsin
c) Trypsin
d) Bile

Practical Based Multiple Choice Questions: Nutrition

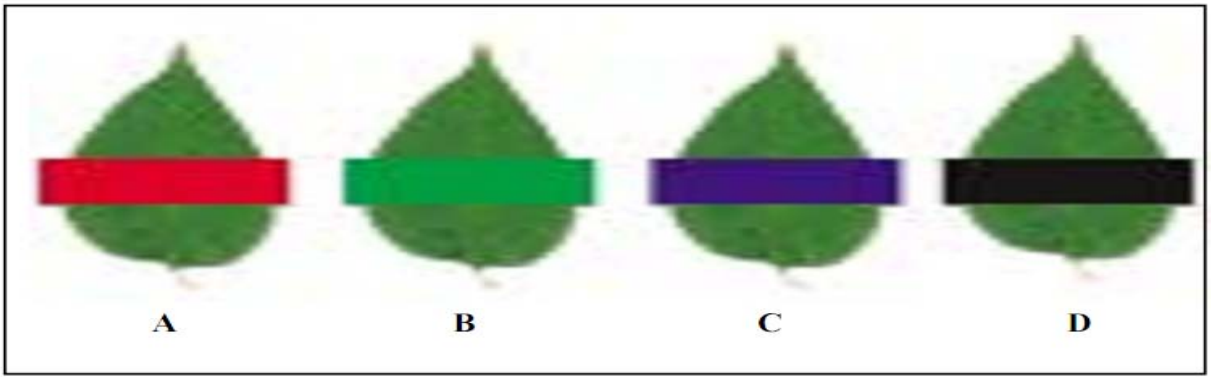
1. Students observed the epidermal peel of a leaf under the high power of a microscope. The following are the sketches made by them.



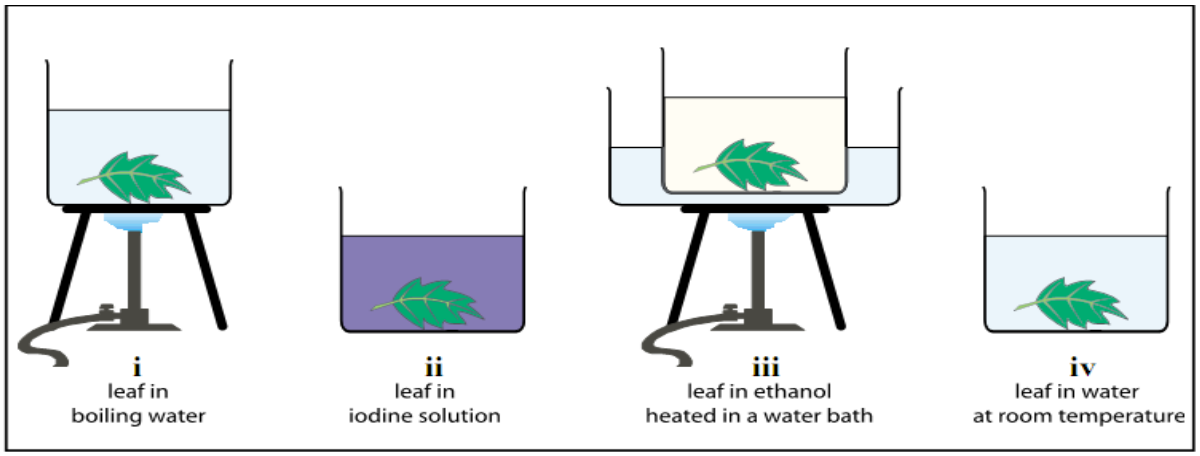
The correct sketch is
(a) A.
(b) B.
(c) C.
(d) D.

2. In an experiment on photosynthesis, students were instructed to cover a portion of a leaf of a destarched potted plant with opaque paper as shown in the figure. "A" covered one of the leaves with a redstripe, "B" with green, "C" with blue and "D" with black. When the starch test was done on the leaves after 4 hours, the result showed no starch in

(a) The portion covered with red, green and blue strips.
(b) The portion covered with green strip.
(c) The portion covered with black and blue strips.
(d) Any of the covered portions.



3. A student performed the starch test on a leaf. Some steps involved are shown below.



The correct sequence of steps should be

(a) iv; iii; ii; i. (b) i; ii; iii; iv. (c) ii; iii; iv; i. (d) i; iii; iv; ii .

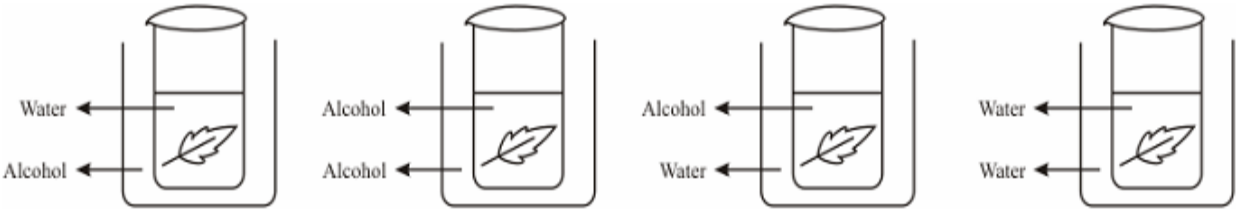
4. A part of de-starched leaf of a potted plant was covered with black paper strips on both sides and the plant was kept in sunlight for 8 hours. The leaf was then tested with iodine after boiling it in alcohol. Only the uncovered part of the leaf turned blue black. The inference is that
   (a) CO_2 is necessary for photosynthesis.
   (b) Light is necessary for photosynthesis.
   (c) Chlorophyll is necessary for photosynthesis.
   (d) Water is necessary for photosynthesis.

5. A student covered a leaf from a de-starched plant with a black paper strip and kept it in the garden outside his house in fresh air. In the evening, he tested the covered portion of the leaf for presence of starch. The student was trying to show that
   CO_2 is given out during respiration
   a. CO_2 is necessary for photosynthesis
   b. Chlorophyll is necessary for photosynthesis
   c. Light is necessary for photosynthesis

6. The best results for the experiment, that light is necessary for photosynthesis, would be yielded by using leaves from a plant kept for over twenty four hours
   a) In a pitch dark room
   b) In a dark room with the table lamp switched on.
   c) Outside in the garden
   d) Outside in the garden, covered by a glass case.

7. A student wanted to decolourise a leaf. He should boil the leaf in
   a) Alcohol b) water c) KOH solution d) glycerine

8. The figures given below illustrate boiling of leaf to remove chlorophyll. This is one of the steps in the experiment to show that light is necessary for photosynthesis

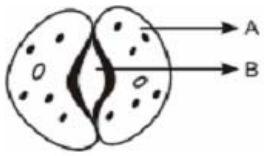


(I) (II) (III) (IV)

The correct method is

a) I b) II c) III d) IV

9. The parts shown as A and B in the given diagram are



a. A is epidermal cell, B is stomatal pore
b. A is guard cell, B is stomatal pore
c. A is epidermal cell, B is guard cell
d. A is guard cells, B is epidermal cell

10. When students observed a stained epidermal peel of a leaf under the microscope, it appeared pinkish red. The stain used was
(a) Iodine.
(b) Acetocarmine.
(c) Safranin.
(d) Colchicin.

11. The correct procedure to prepare a temporary mount of a stained leaf epidermis is

A	B	C	D
Take a peel of a leaf Stain it with safranin; Transfer the peel to the slide; Remove the excess stain; Put a cover slip on it.	Take a peel of a leaf; Wash it in water; Place it on the slide; Add a drop of glycerin on it; Put a cover slip gently.	Stain the leaf; Take a peel; Wash the peel in water; Place it on a slide; Put a cover slip on it.	Take a peel; Stain it with iodine; Transfer the peel to the slide; Remove excess stain with blotting paper; Put a cover slip on it.

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

12. The part of leaf commonly used for preparing the slide of stomata is

a. leaf margin
b. leaf apex
c. leaf epidermis
d. leaf petiole

13. The correct sequence, out of the following options, for focusing a slide of epidermal peel of a leaf under a microscope to show the stomatal apparatus is

a) Observe under low power.
b) Adjust mirror to get maximum light.
c) Place the slide on the stage.
d) Focus under high power

1. b, c, a, d 2. a, b, c, d 3. c, b, d, a 4. d, c, b, a

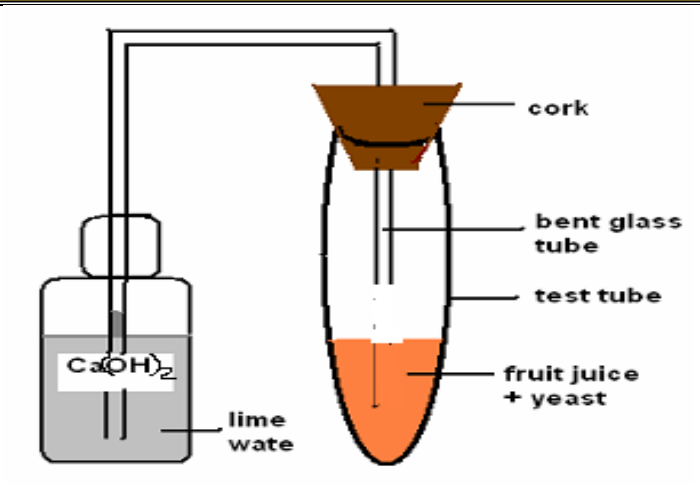
Chapter 6

LIFE PROCESSES

Respiration

	Learning Outcome	
Students will be able to understand	what is respiration and its significance	After completing the topic respiration and attempting SS Q 3
Students will be able to differentiate	between aerobic and anaerobic respiration and fate of glucose	After completing the topic respiration and attempting SS Q 4
Students will be able to Understand	the mechanism of breathing and respiration	After completing the topic respiration and attempting SS Q 2, 5
Students will be able to identify and explain	the function of different organs in the respiratory system	After completing the topic respiration and attempting SS Q 6, 7, 8,10,11,12
Students will be able to apply learning	to situation like why breathing rate is faster in aquatic animals	After completing the topic respiration
Students will be able to plan and conduct	activity to investigate end products anaerobic respiration	After completing the topic respiration and attempting SS Q 1
Students will be able to plan and conduct	activity to investigate that CO2 is given out during respiration	After completing the topic respiration and conducting practical activity in lab
Students will be able to draw	labelled diagram human respiratory system	After completing the topic respiration and attempting SS Q 9

1.



Answer the following questions for the above experimental setup.

a) Will there be any change in the lime water? If yes, what and why?

_____

_____

_____

b) Will there be a change in the taste of the fruit juice?

_____

_____

c) Name the process that takes place in the test tube and write the equation.

_____

2.

Point of difference	BREATHING	RESPIRATION
1. Type of process 2. Energy released 3. Location (cell) 4. Enzymes needed		

3. Respiration takes place at all the times in living organisms, but in plants CO_2 emission is not observed during the day. Give reason

_____

_____

_____

_____

4. Name the intermediate and final products of respiration in :

(a) Yeast (b) Human beings

_____

_____

_____

5. What is the role of ribs and diaphragm in exchange of gases?

_____

_____

_____

_____

_____

6. List the three common features seen in all respiratory organs (absorbing surfaces).

_____

_____

_____

7. What happens to the air after it reaches the lungs?

8. Give reasons for the following

a) Nasal cavity is lined with fine hair & sticky mucous

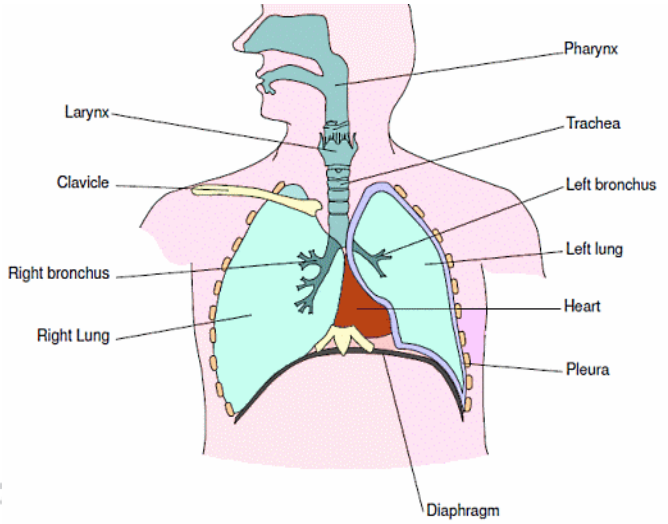
b) Epiglottis closes the mouth of the glottis.

c) Majority of CO_2 is carried by the plasma but not O_2.

d) If one holds breath after expiration for about 30 seconds, there will still be some exchange of gases occurring in the lungs during this period.

9. Observe the diagram of Human Respiratory System and draw the structure that helps in the

exchange of gases.



10. Why do the walls of the trachea not collapse even when there is less air in it?

_____

_____

11. Name the energy currency in living organisms. Where is it produced in the cell?

_____

12 Name the respiratory pigment in human beings. Where is it present?

_____

_____

VERY SHORT ANSWER BASED QUESTIONS (1 mark)

ASSERTION (A) and REASON(R) The following two questions 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 for A
b) Both A and R are true and R is not the correct explanation for A
c) A is true but R is false
d) A is false but R is true

Q.1 **ASSERTION (A):** Pyruvate is a 6- carbon molecule
REASON (R): It is prepared in cytoplasm as a first step in cellular respiration.

_____

Q.2. **ASSERTION(A)**: Rings of cartilage are present in the throat.
REASON (R): These ensure that the air passage does not collapse.

_____

Q.3. **ASSERTION (A)** : The rate of breathing of a normal person is 15-18 times per minute but during vigorous exercise it increases by about 20-25 times per minute
REASON (R): During vigorous activity the demand for oxygen increases to release more energy for extra work, so breathing rate increases to generate more energy

_____

Q.4. Read the passage and answer the questions that follow

Smoking is injurious to health. The upper part of respiratory tract is provided with columnar ciliated epithelium which has small hair like structures called cilia. These cilia help to remove germs, dust and other harmful particles from inhaled air. Smoking destroys these hairs due to which germs, dust, smoke and other particles enter lungs, cause infection, cough and even lung cancer.

4(a) Name the hair like structure present in the upper part of respiratory tract.

_____

4(b) What is the function of these hair like structure?

_____

_____

4(c) How does smoking lead to cancer?

_____

_____

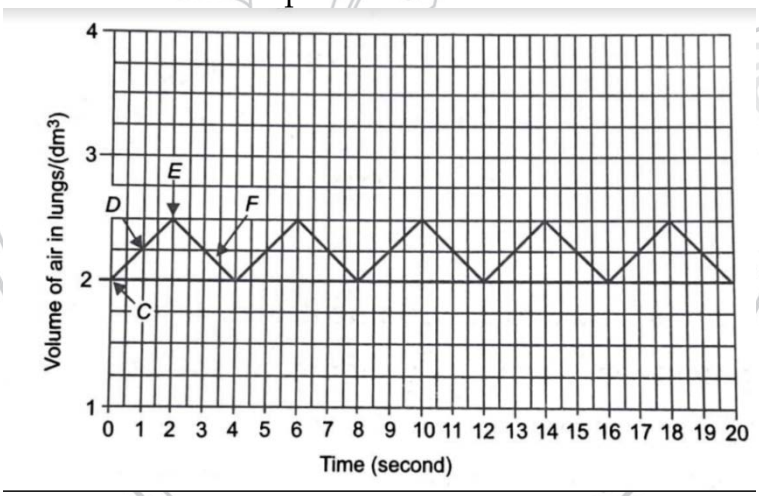
_____

4(d) Name the type of epithelium present in the upper respiratory tract.

_____

Case Study - Paragraph Based Questions

Study the graph related to the changes in the volume of lungs of a person at rest over a period of 20 seconds and answers the questions that follow.



A. How many breaths per minute is the person taking when at rest?
   a. 5
   b. 15
   c. 17
   d. 20

B. Which two points in the graph (C, D, E or F) shows inspiration and expiration?
   a. D, E
   b. D, F
   c. C, D
   d. E, F

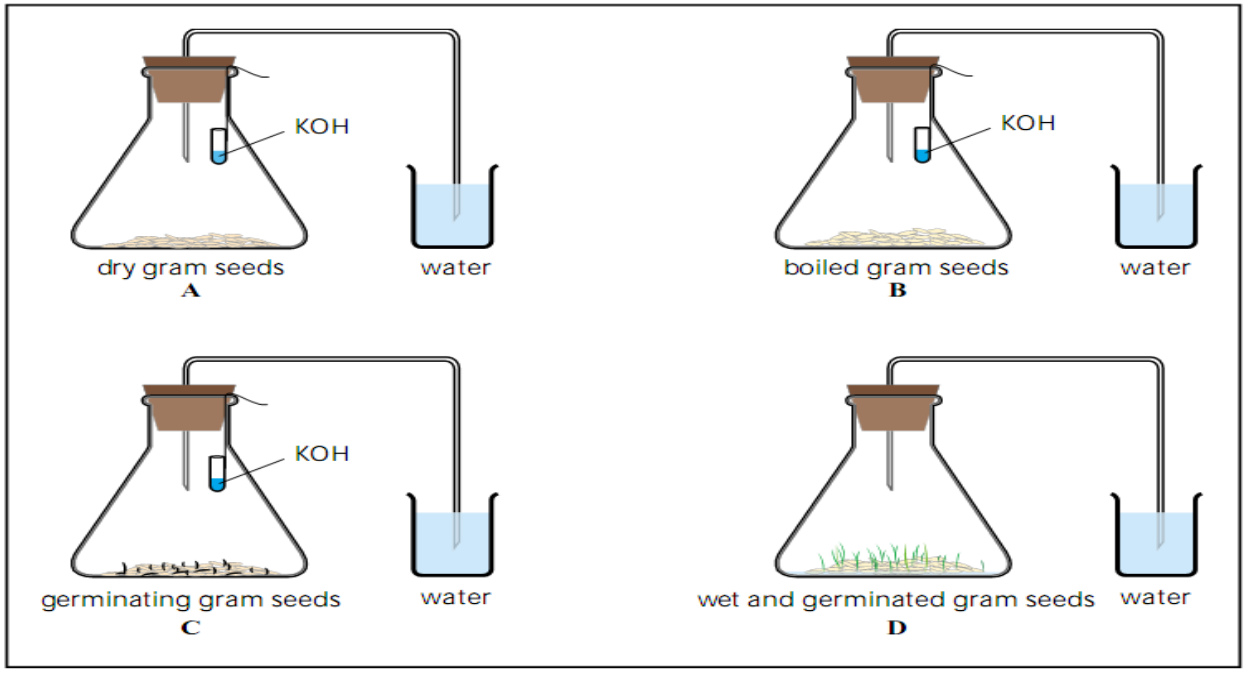
C. The windpipe is also called the _____.
   a. Larynx
   b. Lungs
   c. Trachea
   d. Oesophagus

D. What is the name of the tiny air sacs in our lungs?

a. Bronchioles
b. Bronchi
c. Alveoli
d. Larynx

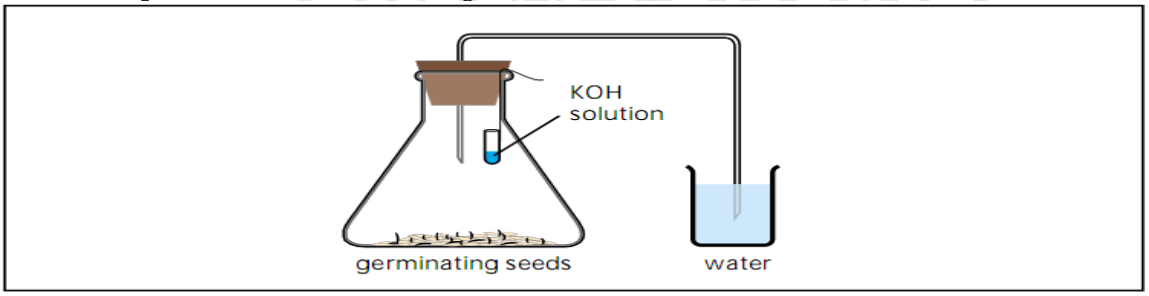
Practical Based Questions: Respiration

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

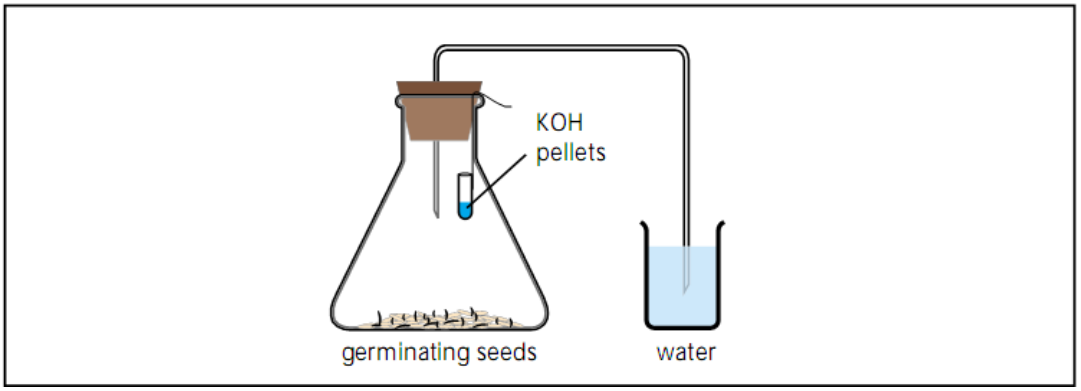


The set up that will give the desired result is
(a) A.
(b) B.
(c) C.
(d) D.

2. In the experiment shown in the figure, water is found to rise in the bent tube.

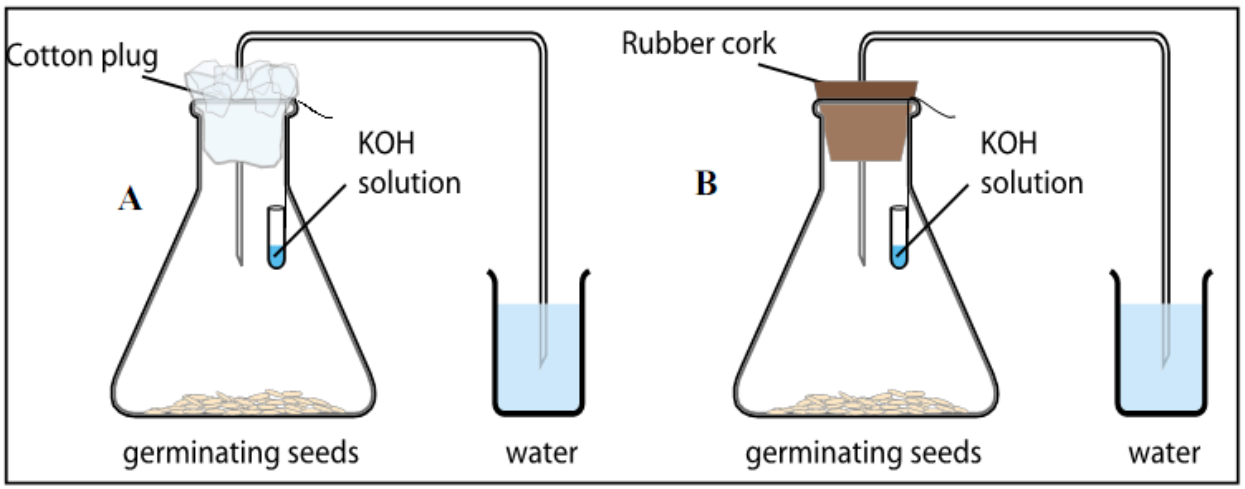


The reason is that
(a) Seeds use up oxygen in the flask.
(b) Carbon dioxide is given out by the germinating seeds.
(c) Germinating seeds attract water from the beaker.
(d) Seeds use oxygen and release carbon dioxide which is absorbed by potassium hydroxide.
3. The following experiment is set up to show that a gas is released during respiration.



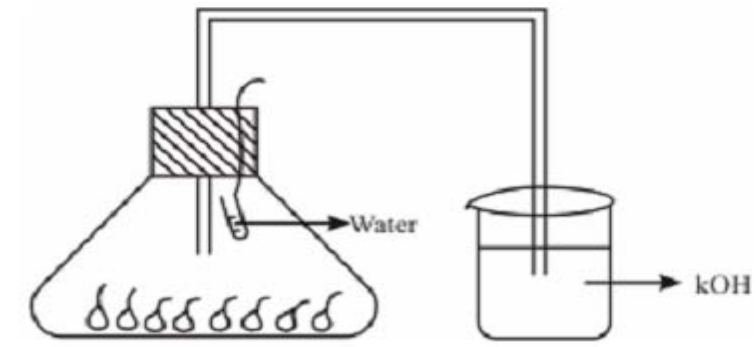
In this set up, the small test tube containing pellets of KOH is kept in the conical flask to absorb
(a) air in the flask.
(b) moisture in the flask in the air in the flask.
(c) O2
(d) CO2 released by the germinating seeds.

4. Using the same number of given germinating gram seeds, two students A and B set up the experiment separately. Student A used a cotton plug to hold the bent tube in the mouth of the flask. Student B used a rubber cork.



After 4 hours they noticed that
(a) water level increased in the bent tube only of A.
(b) water level increased in the bent tube only of B.
(c) the cotton plug was wet.
(d) the water in the beaker of B turned milky.

5. A student while setting up the experiment to show that CO2 is evolved during respiration committed some errors shown in the figure



What changes should be made in the set up to get the desired results?

a. KOH solution should be taken in the small test tube inside the flask and germinating seeds in the beaker.

b. Water should be taken in the beaker and KOH solution in the flask.

c. KOH solution should be taken in the small test tube inside the flask and water should be taken in the beaker

d. Water should be taken in the flask and KOH solution in the small test tube.

6. Why do we take germinating seeds?

_____

7. How can we make the connections of the given set up airtight?

_____

_____

Chapter 6

LIFE PROCESSES

Transportation

	Learning Outcome	
Students will be able to understand	the importance of transportation in plants and animals	After completing the topic transportation
Students will be able to identify and explain	the function of different components of transport system in human beings	After completing the topic transportation and attempting SS Q1, 2,8,9,
Students will be able to apply learning to	situation like what is advantage of complete partitioning of heart in birds and mammals	After completing the topic transportation and attempting SS Q3,4
Students will be able to draw	Draw labelled diagram of cross section of human heart	After completing the topic transportation
Students will be able to identify and explain	the function of different components of transport system in plants	After completing the topic transportation and attempting SS Q5,6,7,10,11,12

1. Blood is a liquid connective tissue. Identify the components of blood that perform the following functions:

a) Clotting of blood_____

b) Carrier of Oxygen _____

c) Carrier of essential components and waste _____

2. Tabulate three differences between arteries and veins

S.NO	Arteries	Veins

3. Define the following:

i) Single Circulation : _____

_____

_____

_____

ii) Double Circulation : _____

_____

_____

4. The internal structure of the vertebral heart explains why mammals and bird are warm-blooded animals while reptiles; amphibians and fish are cold-blooded animals. Justify.

_____

_____

_____

5. Fill the following table:

S No	Points of difference	Xylem	Phloem
1	Functional cells		
2	Dead /alive		
3	Function		
4	Direction of movement		

6. Movement of substances in Xylem is unidirectional while in Phloem it is multidirectional. Explain.

7. Give the role of transpiration and water column in the movement of water from roots to above ground parts.

_____

_____

_____

_____

_____

8. How would our body be affected if the blood vessels start bleeding due to an injury? How does the body avoid this damage?

9. State the functions of Lymph.

10. Why do plants have lower energy needs as compared to animals?

11. What are the two advantages of transpiration in plants?

12. List the two forces that help in movement of water from roots to the leaves.

VERY SHORT ANSWER BASED QUESTIONS (1 mark)

Q.1.Question 1 (a) to (d) are based on two tables given below. Study these tables related to hemoglobin levels and answer the questions that follow.

TABLE A :

Hemoglobin level chart	
Remarks	Hemoglobin (g/dl)
Doctor's advice needed	4-9
Good	10-13
Excellent	14-16

TABLE B :

Hemoglobin Level of patient X and Y		
	Hemoglobin (g/dl)	
	Patient X	Patient Y
	4	6

(a) Refer to Table B showing hemoglobin level reports of patient X and Y. Which disease can be diagnosed from the given data?

(b) Name the element that is transported by hemoglobin from lungs to all parts of the body.

(c) In human beings hemoglobin has a very high affinity for _____ and is carried by the _____.

(i) Oxygen, red blood cells
(ii) Carbon dioxide, Red blood cells
(iii) Oxygen, White blood cells
(iv) Carbon di oxide, White blood cells

(d) The haemoglobin level which is considered excellent is:

(i) 15g/dl
(ii) 10g/dl
(iii) 7 g/dl
(iv) 4g/dl

1. Valves are present in
   a) Arteries
   b) Veins
   c) Capillaries
   d) All the above

2. Deoxygenated blood is received by the _____.

a) left auricle

b) right auricle

c) left ventricle

d) right ventricle

3. The liquid portion of the blood is called _____.

a) water

b) plasma

c) serum

d) sap

4. Much of the transpiration takes place through _____.

a) stomata

b) lenticels

c) cuticle

d) epidermis

Assertion and Reason Questions:

1. **Assertion (A): Arteries are thick walled.**
Reason (R) : They carry blood away from the heart to organs at a high pressure

a) Both Assertion and reason are true but reason is the correct explanation of Assertion.
b) Both Assertion and reason are true but reason is not the correct explanation of Assertion
c) Assertion and reason are false.
d) Assertion is true but reason is false.

2.**Assertion: (A): Translocation is the process of movement of soluble products of photosynthesis through the phloem**
Reason (R): It involves use of simple physical forces.

a) Both Assertion and reason are true but reason is the correct explanation of Assertion.
b) Both Assertion and reason are true but reason is not the correct explanation of Assertion
c) Assertion and reason are false.
d) Assertion is true but reason is false.

Case Study – Paragraph Based Questions

1. Blood cells are made in the bone marrow. The main job of red blood cells, or erythrocytes, is to carry oxygen from the lungs to the body tissues. Types of white blood cells that are most important for helping protect the body from infection and foreign cells include the Neutrophils,Eosinophils, Lymphocytes Monocytes. The liquid part of the blood is called plasma.

A. Other than the Red blood cells and white blood cells which is the third type of cells found in human blood?

a) Lymphocytes
b) Platelets
c) Osteocytes
d) Monocytes

B. What is the function of these cells?

a) Carry oxygen to all cells of the body
b) Remove CO2 from the tissues
c) Clotting of blood
d) Provide immunity

C. Name the iron containing pigment present in the red blood cells.

D. Name any two substances carried by blood plasma

2. Transpiration is an important biochemical process. It creates a negative pressure gradient that helps draw water and minerals up through the plant from its roots. It is the procedure of water loss from leaves of plants through stomata. Transpiration forever happens alongside gravity. It involves mostly the xylem cells which become active during absorption procedure by the roots.Transpiration helps in absorption of water and its conduction to different parts of plants. It helps in receiving water and inorganic salts. So, transpiration indirectly helps in receiving mineral salts.The excess water absorbed by the root is given off from the plant body and thus a balance of water in the plant body is made.

A. Which is the major driving force for movement of water during the night?
B. Name the components of xylem that help in upward movement of water.
C. The loss of water in the form of water vapour largely through stomata of leaves is called:
   a) Translocation
   b) Transpiration
   c) Root pressure
   d) Osmotic pressure

D. **Assertion (A): Transpiration helps in upward movement of water through the xylem. Reason (R): It creates a column of water that is steadily pushed upwards.**

a) Both Assertion and reason are true but reason is the correct explanation of Assertion.
b) Both Assertion and reason are true but reason is not the correct explanation of Assertion
c) Assertion and reason are false.
d) Assertion is true but reason is false.

Chapter 6

LIFE PROCESSES

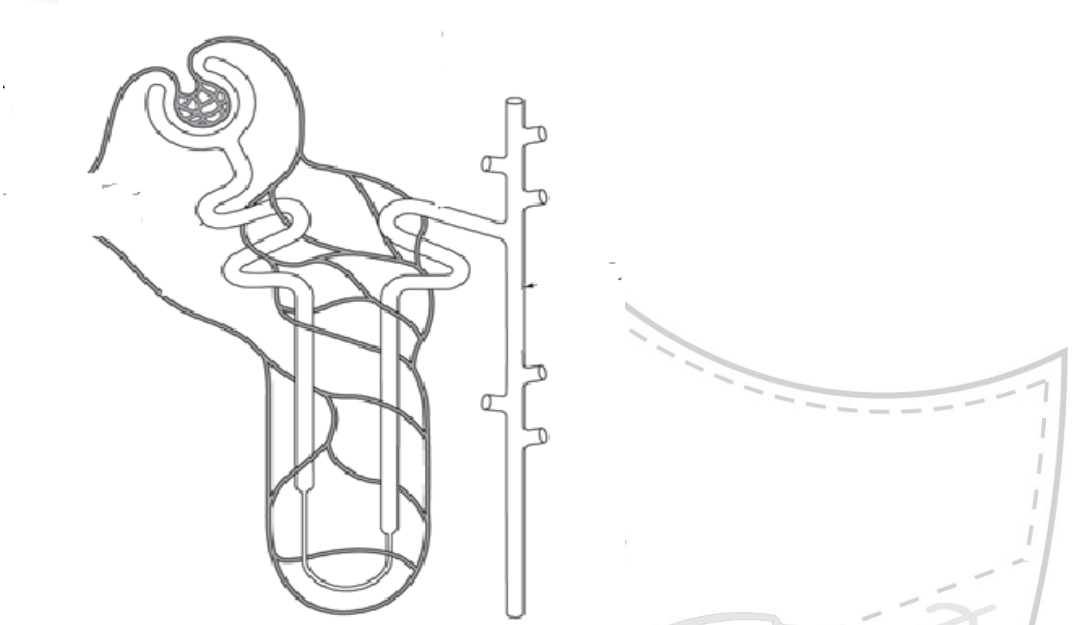
Excretion

	Learning Outcome	
Students will be able to understand	the importance of excretion in plants and animals	After completing the topic excretion and attempting SS Q 1,2, 9
Students will be able to explain	the process of excretion in human beings	After completing the topic excretion
Students will be able to identify and explain	the function of different organs of human excretory system	After completing the topic excretion and attempting SS Q8
Students will be able to understand	the structure of nephron and process of urine formation	After completing the topic excretion and attempting SS Q3,4,5,7
Students will be able to draw	labelled diagram of human excretory system and Nephron	After completing the topic excretion and attempting SS Q 3
Students will be able to explain	the process of excretion in plants	After completing the topic excretion and attempting SS Q 6,10

1.	Define the following Excretion : _____ _____ _____ _____
2.	Osmoregulation : _____ _____ _____

_____

3 Label the following diagram



STRUCTURE OF NEPHRON

4.. Write the functions of the following:

a) Glomerulus_____

b) Bowman's capsule_____

c) Collecting duct_____

Give reasons for the following---

a) Re- absorption is an important step in urine formation

_____

_____

_____

_____

b) The amount of water in the urine is variable

_____

_____

_____

_____

5.

	What are the steps involved in urine formation in human beings.
6.	Name two excretory products other than oxygen and carbon dioxide in plants.
7.	What happens to the glucose that enters the nephron along with the filtrate?
8.	How is urine eliminated in human excretory system?
9.	The kidneys perform the essential function of removing waste from the blood and regulate the water fluid levels. Explain.
10.	How do the leaves of a plant help in excretion?

VERY SHORT ANSWER QUESTIONS (1 Mark)

1. Fig 1 given below shows the diagram of a kidney and associated structures. The table lists the percentage of certain components found in structures **B** and **C.**

In structure B

Component	Concentration 1%
Urea	**2.00**
Glucose	**0.00**
Amino acids	**0.00**
Salts	**1.50**
Proteins	**0.00**

In structure C

Component	Concentration 1%
Urea	0.03
Glucose	0.10
Amino acids	0.05
Salts	0.72
Proteins	8.00

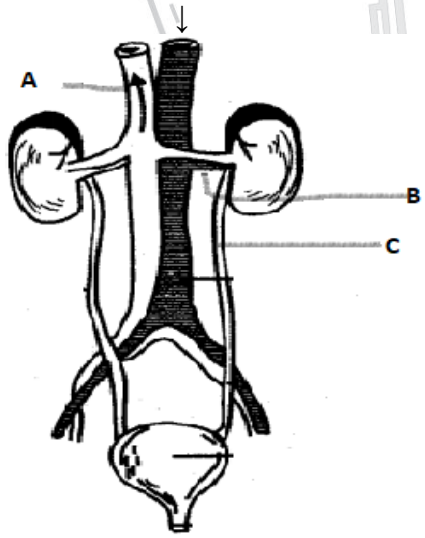


Fig 1

1(a) On the diagram label A, B and C

_____

_____

1(b) Using only the information in the tables, deduce the function of kidneys.

_____

1(c) Name the structural and functional unit of kidneys.

1(d) State the two factors on which the amount of water re-absorbed by the nephron depends on.

MCQs : Excretion

1. Urea is transported by

a) plasma
b) blood
c) RBC
d) WBC

2. The kidneys resemble the contractile vacuoles of *Amoeba* in

a) expelling out excess of water
b) expelling out glucose
c) expelling out waste material along with water
d) expelling out salts

3. The function of the mammalian kidney is to excrete

a) extra salts, urea and excess water
b) extra urea, excess water and excess amino acids
c) extra urea, extra carbohydrates and extra water
d) extra urea, extra salts and extra sugar

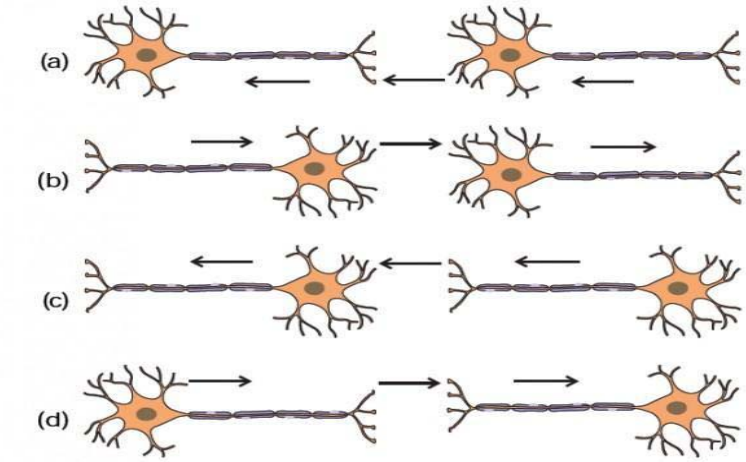
Chapter 7

CONTROL AND COORDINATION

	Learning Outcome	
Students will be able to understand	Need of control and coordination in animals and plants	After completing the topic control and coordination and attempting SS Q 7
Students will be able to recall	nerve cell as the basic structural and functional unit of nervous system and explain the term synapse	After completing the topic control and coordination and attempting SS Q 2,3,
Students will be able to define	reflex action and reflex arc	After completing the topic control and coordination and attempting SS Q 1, 3,6,
Students will be able to identify	the components of central nervous system in human beings	After completing the topic control and coordination and attempting SS Q 4,5
Students will be able to describe	the major regions of human brain and list their functions	After completing the topic control and coordination and attempting SS Q 8,12,14
Students will be able to list	the hormones secreted by pituitary, thyroid, pancreas, adrenal gland and their functions	After completing the topic control and coordination and attempting SS Q 11,13
Students will be able to describe	the different types of movements in plants	After completing the topic control and coordination and attempting SS Q 10
Students will be able to list	various plant hormones and discuss their functions	After completing the topic control and coordination and attempting SS Q 9

1.	Define a receptor. Give the functions of gustatory and olfactory receptors. _____ _____ _____ _____

2. a) Identify the correct direction of flow of nerve impulse in the diagram given below.



b) Give 2 differences between synapse and a neuromuscular junction.

3. Define reflex action and reflex arc. What is the importance of reflexes?

4. What provides protection to the brain and spinal cord?

5	What are the components of the Peripheral Nervous System (PNS) and its function?
6	Why are reflex arcs evolved in animals?
7.	How does the nervous tissue cause action? Explain
8	Our heart beats without our thinking about it. How?
9.	**What is the function of the following phytohormones?**

1	Auxin	
2	Cytokinin	
3	Gibberellin	
4	Absisic Acid	

10. Define the following.

1.Phototropism_____

_____

_____

2. Geotropism :_____

_____

_____

3.Chemotropism:_____

_____

_____

4.Thigmotropism:_____

_____

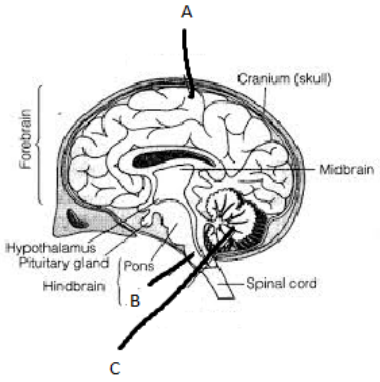
_____

_____

11. Give the function of the following hormones along with diseases/abnormalities caused due to their under secretion and Over secretion respectively of each

Hormone and its Function	Oversecretion	Undersecretion
Insulin		
Thyroxin		
Growth Hormone		

12 Observe the diagram given below and answer the questions that follow



HUMAN BRAIN

Label parts A, B and C and write their functions

_____

_____

_____

13. Give an example of feedback mechanism in human beings.

_____

_____

_____

_____

14. In which part of the brain is the hunger centre located?

_____

Very Short Answer Based Questions (1 mark)

ASSERTION (A) and REASON(R) The following two questions 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 for A
b) Both A and R are true and R is not the correct explanation for A
c) A is true but R is false
d) A is false but R is true

Q.1.**ASSERTION (A)**: Insulin regulates blood sugar level.
REASON(R): Insufficient secretion of insulin will cause diabetes.

_____

Q.2. **ASSERTION (A):** Transmission of messages at synapse takes place with the help of chemicals.
REASON (R): Nerve impulse is an electrochemical event

_____

Q.3. Answers to questions 3(a) to 3 (b) are based on information given in the passage and concepts studied.

Epilepsy is a common disorder of the brain. Symptoms include mild loss of concentration to full blown convulsions in which there is a black out and person falls on the floor. The underlying cause of epilepsy is random uncontrolled activity of some cells of the brain. This chaotic activity in sensory and motor nerves causes patients to see and hear variety of strange things and muscles jerk uncontrollably. Neuroscientists have discovered that corpus callosum that connect the cereberal hemispheres is involved in epileptic seizures.

3(a) List two symptoms of epilepsy.

_____

3(b) Name the cells that constitute the central nervous system.

_____

3(c) What are sensory and motor nerves?

_____

_____

3(d) What is the function of cerebral hemispheres?

_____

_____

MCQs : Control and Coordination

1. The cells in our body that can be over a foot long are _____.

   a) muscle cells

   b) nerve cells

   c) bone cells

   d) blood cells

2. The substance that accelerates the growth in the stem is ____.

   a) auxin

   b) cytokinin

   c) enzyme

   d) vitamin

3. Learning is related to _____.

   a) hypothalamus

   b) thalamus

   c) cerebrum

   d) Cerebellum

4. Male hormone is _____.

   a) oestrogen

   b) progesterone

   c) adrenaline

   d) testosterone

5. Endocrine glands are those which pour their secretions into _____.

   a) Blood

   b) Ducts

   c) Sinuses

   d) any of the above

6. In reflex action, the reflex arc is formed by _____.

a) muscles - receptor - brain

b) muscles - effector - brain

c) receptor - spinal cord - muscles

d) spinal cord - receptor - muscles

7. Auxins are _____.

a) Vitamins

b) Enzymes

c) Proteins

d) Phyto-hormones

8. The cerebellum is concerned with _____.

a) Conditioning

b)Memory

c) coordination and precision

d)Intelligence

9. The endocrine gland also known as 'master gland' is _____.

a) Hypothalamus

b) Pituitary

c) Pancreas

d) Adrenal

10. Which of the following acts as both endocrine and exocrine glands?

a) pituitary

b) Adrenal

c) Pancreas

d) Thyroid

11. Cerebral hemispheres are centres of _____.

a) Balance

b) Smell

c) Taste

d)Thinking

12. Adrenaline increases _____.

a) heart rate

b) blood pressure

c) amount of glucose in blood

d) all the above

13 Junction of two neurons is called _____.

a) Synapse

b) end plate

c) Axon

d) Dendrite

14. Growth hormone is produced in _____.

a) hypothalamus

b) Pituitary

c)Pancreas

d)Thyroid

15. An involuntary response to a stimulus is known as _____.

a) Jerking

b) Reflex

c) Conditioning

d) Synapse

16. The CNS consists of _____.

a) Brain

b) spinal cord

c) brain and spinal cord

d) brain, spinal cord and all the nerves

17. Cerebrum is present in the _____.

a) fore brain

b) mid brain

c) hind brain

d) partly in a and b each

18. Cerebellum is situated in _____.

a) fore brain

b) mid brain

c) hind brain

d) partly in a and b

19. Medulla oblongata is situated in _____.

a) fore brain

b) mid brain

c) hind brain

d) partly in b and c

20. The hormone that speeds up the ripening process is _____.

a) Auxin

b) gibberellin

c)cytokinin

d) Ethylene

Assertion and Reason Questions

1. Assertion (A): Phototropism is the process of growth of the plant in response to light.

Reason (R): Auxins are involved in growth

a. Both Assertion and reason are true and reason is the correct explanation of Assertion.
b. Both Assertion and reason are true but reason is not the correct explanation of Assertion
c. Assertion and reason are false.
d. Assertion is true but reason is false.

2. Assertion (A): Cerebellum controls activities like walking in a straight line, riding a bicycle, picking up a pencil.
Reason (R): Cerebellum is responsible for precision of voluntary actionsand maintaining the posture and balance of the body .

a. Both Assertion and reason are true and reason is the correct explanation of Assertion.
b. Both Assertion and reason are true but reason is not the correct explanation of Assertion
c. Assertion and reason are false.
d. Assertion is true but reason is false.

Case Study-Paragraph Based Questions

1. Different plant hormones help to coordinate growth, development and responses to the environment. They are synthesised at places away from where they act and simply diffuse to the area of action. When growing plants detect light, a hormone called auxin, synthesised at the shoot tip, helps the cells to grow longer. When light is coming from one side of the plant, auxin diffuses towards the shady side of the shoot. This concentration of auxin stimulates the cells to grow longer on the side of the shoot which is away from light. Thus, the plant appears to bend towards light.

A. What are the functions of phytohormones?
B. Name a plant hormone synthesized at the tip of shoot, which helps cells to grow longer.
C. Identify the plant hormone that stimulates cell division
   a. Abscisic acid
   b. Gibberellin
   c. Auxin
   d. Cytokinin

D. When light falls on the shoot tip from one side it stimulates auxinto :
   a. move to shady side
   b. diffuse to lighted side
   c. move to centre of shoot tip
   d. remain at the point of synthesis

2. The central nervous system consists of the brain and spinal cord. The communication between the central nervous system and the other parts of the body is facilitated by the peripheral nervous system consisting of cranial nerves arising from the brain and spinal

nerves arising from the spinal cord. The fore-brain is the main thinking part of the brain. It has regions which receive sensory impulses from various receptors. Many of these involuntary actions are controlled by the midbrain and hind-brain. All these involuntary actions including blood pressure, salivation and vomiting are controlled by the medulla in the hind-brain. The cerebellum is responsible for precision of voluntary actions and maintaining the posture and balance of the body.

A. The central nervous system consists of the :
a. Brain and spinal nerves
b. Spinal cord and brain
c. Brain and spinal nerves
d. Spinal cord and cranial nerves

B Activities like walking in a straight line is controlled by the :
a. Fore- brain
b. Cranial nerves
c. Hind- brain
d. Mid- brain

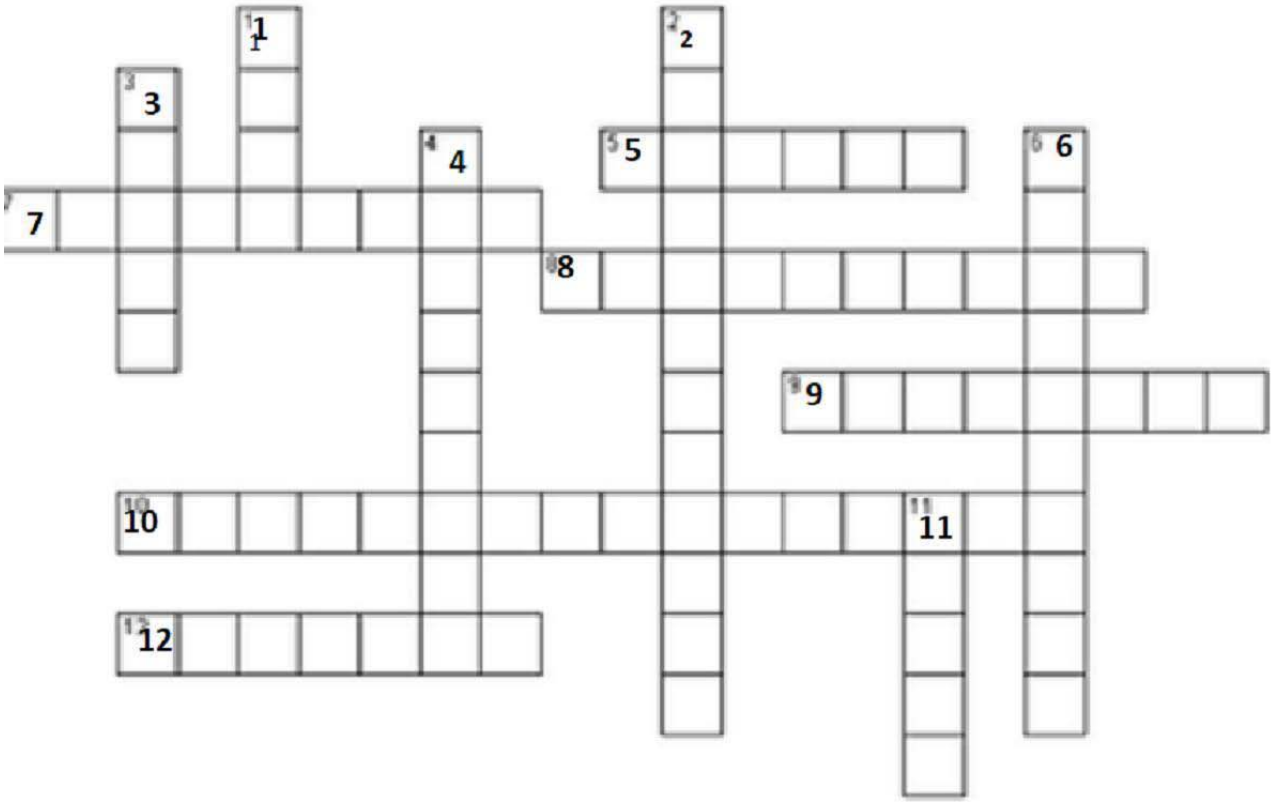
C. Identify the main parts of the human brain.

D. How is a delicate organ like the brain protected from damage and injury?

CROSSWORD :

Name:

Nervous System



ACROSS

5 A cell that carries messages between the brain and other parts of the body
7 The part of the brain connecting it to the spine and controls breathing and heart rate
8 A bundle of nerves enclosed in the spine that connects the body to the brain
9 The largest part of the brain controlling higher order thinking and decision making
10 A bulb at the end of a neuron where neurotransmitter molecules are released to the next cell
12 The space where a signal passes from one nerve cell to another

DOWN

1 The part of a neuron that sends impulses towards other cells
2 An insulating covering surrounding an axon that allows electrical impulses to travel faster
3 The organ that is the main control center of the nervous system
4 Short branches of a neuron that receive impulses from other cells
6 The part of the brain at the back of the skull controlling body movements and balance
11 A collection of neurons that allow impulses to travel through the body

REVISION ASSIGNMENT

TERM 1 **MM : 20**

Q.1 How do unicellular organisms like *Amoeba* remove the metabolic wastes? (1)

Q.2 Name the reserve food in animals. (1)

Q.3 Why is the existence of decomposers essential in the environment? Give two reasons. (1)

Q.4 Define reflex arc (1)

Q.5 Name the hormone that helps to maintain the blood glucose level in human Beings (1)

Q.6 What is the function of the following in the human circulatory system: (2)

i) Valves
ii) Septum
iii) Pulmonary Vein
iv) Vena cava from lower body

Q.7 Define trophic level. Why food chains do not go beyond 3-4 trophic levels? (2)

Q.8 Explain the role of auxin in bending of stem towards sunlight. (2)

Q.9 List three features found in the small intestine that helps it to carry out its function of absorption of digested food. (3)

Q.10 What are the different ways in which glucose is oxidized to provide energy in various organisms? (3)

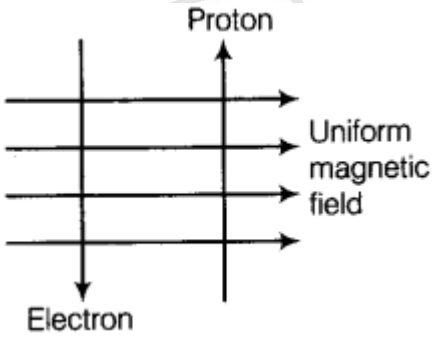
Q.11 a) Draw labelled diagrams to show different stages of nutrition in *Amoeba*
b) Identify the type of heterotrophic nutrition shown by:
i) Cuscutta ii) Mushroom (3)

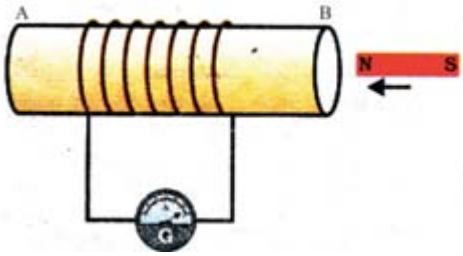
Academic Session 2019-20
First Term Examination
Subject - Science
M/3/1

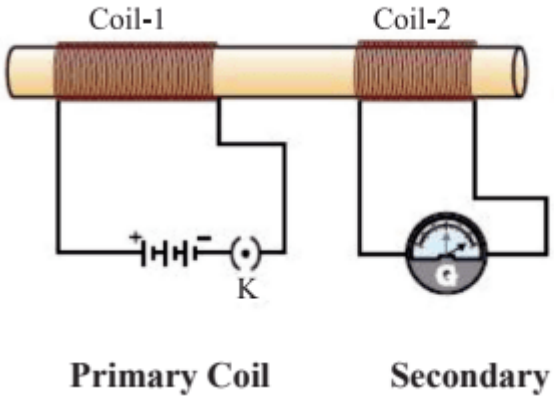
Time : 3hrs **MaximumMarks-80**

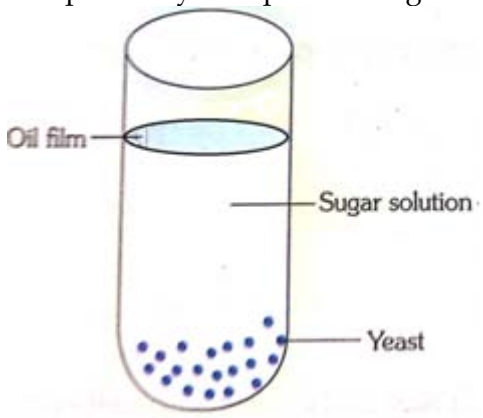
General instructions

- All questions are compulsory.
- The question paper comprises of three sections – A, B and C. You are to attempt all the sections.
- Internal choice is given in sections B and C.
- Question numbers 1 to 10 in section A are multiple choice questions and carry 1 mark each.
- Question numbers 11 and 20 in Section-A are very short answer type questions and carry 1 mark each.
- Question numbers 21 and 30 in Section-B are short answer type questions and carry 3 mark each
- Question numbers 31 and 36 in Section C are long answer type questions and carry 5 mark each
- This paper has **7** printed sides.

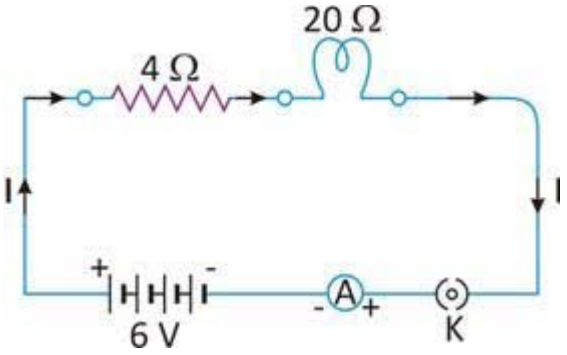
	SECTION A	
1.	The current rating for appliances of high power ratings like geyser and the current rating for low power rating appliances like bulb are (a) Both 15A (b) Both 5A (c) 5A and 15A respectively (d) 15A and 5A respectively	1
2.	A uniform magnetic field exists in the plane of paper pointing from left to right as shown in the figure. In the field an electron and a proton move as shown. The electron and proton experience forces  (a) Both pointing out of the plane of paper (b) Both pointing into the plane of paper (c) Pointing into the plane of paper and out of the plane of paper respectively (d) Pointing opposite to the direction of magnetic field.	1

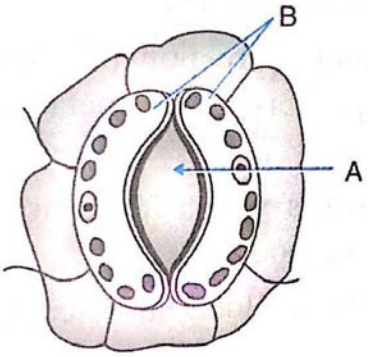
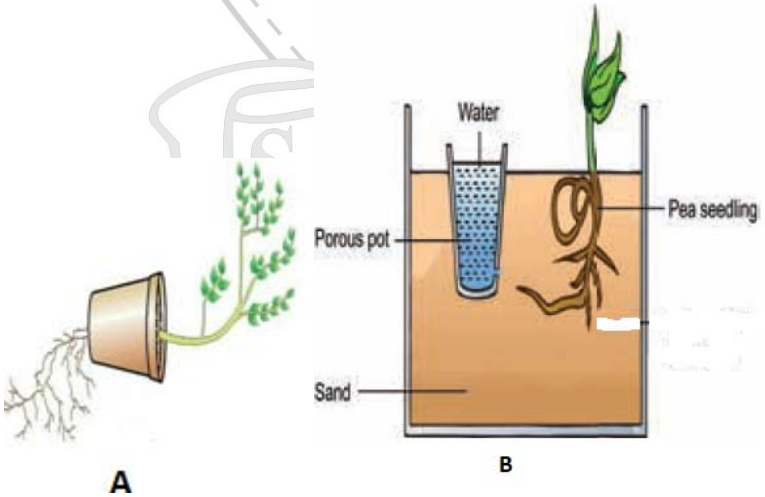
3.	In this experimental set up, what happens to the galvanometer and the circuit, when the north pole of the bar magnet is moved towards the end B and then moved away?  (a) Galvanometer deflects, current is induced (b) Galvanometer shows no deflection, no induced current (c) Galvanometer deflects in one direction, then changes direction and current is induced (d) Either (a) or (b)	
4.	The substance added to neutralise the acidity of soil is (a) Chalk (b) Quick lime (c) Slaked lime (d) All of these	1
5.	Which is the oxidising agent in the following reaction? $CuO + H_2 \rightarrow Cu + H_2O$ (a) CuO (b) H_2 (c) Cu (d) H_2O	1
6.	Which of the following properties is not exhibited by ionic compounds (a) Solubility in water (b) Electrical conductivity in solid state (c) High melting point (d) Electrical conductivity in molten state	1
7.	In the given food chain, suppose the amount of energy at the fourth trophic level is 5kJ, what will be the energy available at the producer level? Grass → Grasshopper → Frog → Snake → Hawk (a) 5kJ (b) 50 kJ (c) 500 kJ (d) 5000 kJ	1
8.	Food web is the: (a) Food that a spider collects using its web. (b) Network of interlinked trophic levels. (c) Network of interlinked food chains. (d) None of the above.	1

9.	The human body stores carbohydrates in the form of: (a) Glycogen (b) Glucose (c) Sucrose (d) Maltose	1
10.	Growth of pollen tube towards ovule during fertilization is an example of (a) Phototropism (b) Geotropism (c) Chemotropism (d) Hydrotropism	1
11.	Name the phenomenon that explains the deflection in the galvanometer when the current in the primary coil is turned on or off?  	1
12.	A compass needle is placed near a current carrying wire. What happens to the deflection in the needle when (a)Magnitude of electric current in the wire is increased? (b) The compass needle is displaced away from the wire?	1
13.	Name two safety measures commonly used in electric circuits and appliances.	1
14.	Name one metal and a nonmetal which are in liquid state at room temperature.	1
15.	Name the acid and the base which form potassium carbonate.	1
16.	What is the formula of the coating formed on silver articles when they get corroded?	1
17.	The phenomenon in which non-biodegradable chemicals get accumulated at each trophic level of a food chain is known as _____	1
18.	The process of _____ breaks down large globules of fats into smaller globules.	1

19.	Name the products of respiration you expect in the given experimental set up.  	1
20.	How is the ozone layer useful to us?	1
	SECTION B	
21.	(i) Name the device used in an electric circuit to change the resistance in the circuit. (ii) Give reasons for the following:- (a)Tungsten is used for making bulb filaments. (b)Cord of an electric heater does not glow but the heating element does.	3
22.	What are the causes of overloading? [any two] What is the difference between direct and alternating current? Mention one important advantage of AC over DC? **OR** Write an activity to show that there is a force exerted on a current carrying conductor when placed in a magnetic field. State the rule to find the direction of this force.	3
23.	What are the disadvantages of series circuit? [3 points]	3
24.	Solution A gives pink colour when a drop of phenolphthalein is added to it. Solution B gives red colour when a drop of methyl orange is added to it. What type of solutions are A and B and which one of them have a higher pH value? Name one salt which has pH more than 7 and one salt whose solution has pH less than 7	3
25.	What is observed when a solution of potassium iodide is added to a solution of lead nitrate in a test tube? a)What type of reaction is this? b)Write a balanced chemical equation to represent the above reaction	3
26.	Account for the following a) Hydrogen gas is not evolved when zinc metal reacts with nitric acid b) Carbon is not used for reducing aluminium from aluminiumoxide. c) Metals conduct electricity.	3

	OR a) Show ionic bonding in calcium chloride. b) Why does it have high melting point?	
27.	a. Define ecosystem. b. Give reasons for the following statements: i. The existence of decomposers is essential for an ecosystem. ii. Flow of energy in a food chain is unidirectional.	3
28.	a. Name the major driving force which helps in the movement of water in xylem during night. b. List the series of events that lead to inhalation in human beings.	3
29.	Illustrate with the help of a labeled diagram the pathway of response when you accidently touch a hot plate.	3
30.	a. State one function of the following parts of the brain: 1. Cerebrum 2. Medulla b. There are limitations to the use of electrical impulses to transmit information within an organism's body. Give two points to justify the given statement. **OR** a. Draw the structure of a neuron and label the following: i. Part which receives information. ii. Part which transmits the impulse. b. Explain the functioning of feedback mechanism with help of an example.	3
	SECTION C	
31.	(a) Three resistors R_1, R_2 and R_3 are connected in parallel and the combination is connected to a cell, voltmeter and key. Draw suitable circuit diagram and obtain an expression for the equivalent resistance of the combination of the resistors. Also find the expression for the equivalent resistance when all the three resistors are of same magnitude, R. (b) Observe the circuit below and answer the questions:-	5

	 (i) The current flowing through the circuit. (ii) The potential difference across the bulb. **OR** (a)Define electric power. An electric device of resistance R is connected across a source of voltage V and draws a current I. Derive an expression for power in terms of current and resistance. (b)A bulb is rated 110W, 220V. Find the current drawn by it when it is connected to a 220V supply. Find the resistance of the bulb. If the bulb is replaced by a bulb of rating 22W, 220V, will there be any change in the value of current and resistance. Justify your answer.	
32.	Name a device which converts mechanical energy into electrical energy. Explain its principle and working with a labeled diagram.	5
33.	State what happens when a concentrated solution of sodium chloride is electolysed. Name the process? Write the equation of the reaction involved. Name the products obtained in the process. Give one use of each of the product.	5
34.	What are amphoteric oxides? Show that zinc oxide is an amphoteric oxide. Write the steps involved in extraction of pure metals in the middle of the reactivity series from their carbonate ores. **OR** a) Two ores A and B were taken. On heating ore' A' gives CO_2 whereas ore 'B' gives SO_2. What steps will you take to convert them into metals? Give the name and formula of an ore of mercury. b) A metal 'X 'when dipped in a aqueous solution of aluminiumsulphate shows no reaction whereas when dipped in an aqueous solution of ferrous sulphate , a pale green solution turns colourless. Identify the metal 'X' with reason and write an equation for the reaction.	5
35.	a. State one function of lymph in the human body.	5

	b. Leakage of blood from vessels during injury reduces the efficiency of the pumping system. How is the leakage prevented? c. Draw a neat diagram of human heart and label the following: A. Vessel which collects deoxygenated blood from the body. B. An artery which carries deoxygenated blood. C. A vein which carries oxygenated blood D. Largest blood vessel of the body. **OR** a. The length of small intestine differs in various animals depending on the type of food they eat. Justify. b. Observe the given diagram and name the parts labeled A and B. Give one function of each of the labeled parts.  c. State two roles of bile in human digestion.	
36.	a. Why does the leaf of a sensitive plant droop on touching? b. Identify the stimulus and name the tropic movements shown by plants in the given diagrams:  c. Give one function of each of the following plant hormones: i. Cytokinin ii. Abscisic acid.	5

Chapter 8

How Do Organisms Reproduce?

	Learning Outcome	
Students will be able to	explain process of reproduction and its significance in continuity of life	After completing the topic how do organisms reproduce and attempting SS Q 1,2,4
Students will be able to differentiate	between asexual and sexual reproduction	After completing the topic how do organisms reproduce and attempting SS Q 3
Students will be able to explain	process of binary fission, multiple fission, fragmentation, regeneration, budding , vegetative propagation in organisms	After completing the topic how do organisms reproduce and attempting SS Q 5,6,
Students will be able to apply	scientific concepts in daily life such as raising plants through grafting, layering, tissue culture etc and its advantages	After completing the topic how do organisms reproduce and attempting SS Q
Students will be able to understand	mechanism of sexual reproduction in plants and human beings	After completing the topic how do organisms reproduce and attempting SS Q 7,8,9,
Students will be able to draw	labelled diagram of parts of a flower, fertilization in plants, human male and female reproductive system	After completing the topic how do organisms reproduce and attempting SS Q 10,11,12,14,15,18
Students will be able to apply	scientific concepts in solving problems, such as prevention of sexually transmitted infections and controlling population	After completing the topic how do organisms reproduce and attempting SS Q13,14,17
Students will be able to exhibit	value of rational thinking in preventing pre-natal sex determination	After completing the topic how do organisms reproduce and attempting SS Q,16

6 Identify the type of asexual reproduction/s seen in the given organisms.

Spirogyra -

Yeast

Penicillin-

Planaria-

Bryophyllum

Rhizopus-

Hydra-

Leishmania

1 What is the significance of reproduction?

2 Why DNA copying in reproduction is accompanied with the formation of additional cellular apparatus?

3. Compare asexual & sexual reproduction.

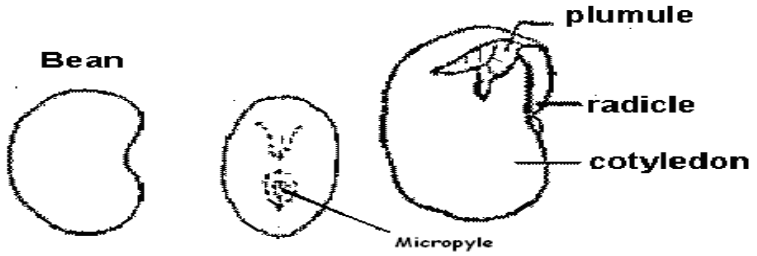
ASEXUAL	SEXUAL

4. What is the cause of variation? Write its significance.

5. What will be the number of chromosomes in the following cells of human body
i) Muscle cell
ii) Sperm
iii) Liver cell
iv) Egg/ovum

8. Why are testes located outside the abdominal cavity in human males?

9. What are the advantages of internal fertilization in animals?



10. Observe the above diagram and write the functions of the labeled parts. Is bean a monocot or a dicot? Why?

11. List the changes that take place in a flower after fertilization.

12. Name two unisexual and two bisexual flowers.

13. Write the full form of STD .Give 2 examples each of STDs caused by bacteria and virus.

14. How do oral pills help in contraception?

15. Draw a neat and well labeled diagram showing pollen germination on stigma. What happens to the ovules and ovary after fertilization?

16 There is an alarming decline in the sex ratio in our society. Comment.

_____

_____

_____

_____

_____

17 Name a permanent method of contraception in males and females.

_____

_____

18 Name the glands / organs that perform dual functions. Indicate their dual functions.

S no	**Organ**	**Function 1**	**Function 2**
1	Pancreas	As Exocrine gland:	As Endocrine gland:
2		Produces gamete - ova	Endocrine Function:
3			**Endocrine Function: Regulates male accessory organs & Secondary sexual characters through production of male sex hormone.**

Very Short Answer Based Questions (1 mark)

ASSERTION (A) and REASON(R) The following two questions 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 for A
b) Both A and R are true and R is not the correct explanation for A
c) A is true but R is false
d) A is false but R is true

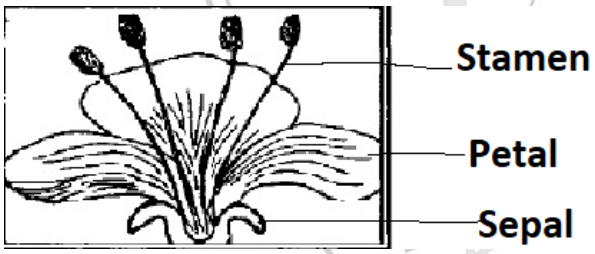
Q.1. **Assertion (A):** In human beings the female produces two types of gametes.
Reason(R): Female has two X chromosomes.

_____

Q.2. **Assertion (A)**: Regeneration is considered an asexual method of reproduction.
Reason (R): It is carried out by specialized cells that have ability to proliferate and form different types of cells and tissues.

_____

Q.3. Observe the diagram of the flower given below and answer the questions.



3(a) Identify the type of flower whether it's unisexual or bisexual.

_____

3(b) What type of pollination will most likely take place in this flower and why?

_____

_____

3(c) What is the significance of pollination for the plant?

_____

_____

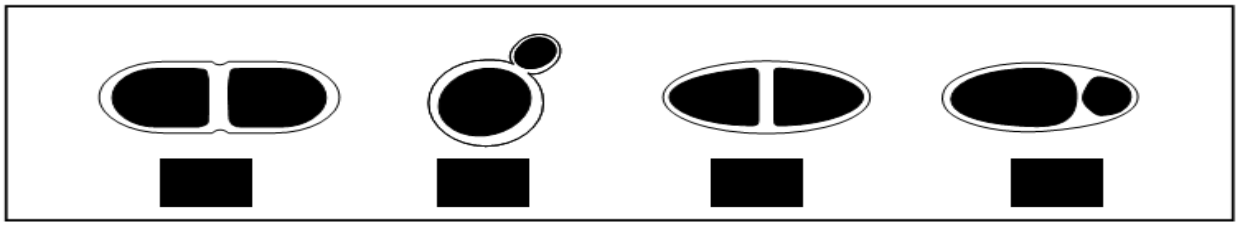
3(d) List two agents of pollination.

_____

MCQs: How do organisms reproduce?

1. The budding in yeast is illustrated by the diagram ABCD

A B C D



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

2. A student is given a permanent slide showing binary fission in *Amoeba*. The following are the steps in focusing the object under the microscope.

a) Place the slide on the stage; look through the eye piece and adjust the mirror and diaphragm to get even illumination.

b) Look through the eye piece and raise the objective using coarse adjustment until the object is focused.

c) Make the focus sharp with the help of fine adjustment.

d) Look through the eye piece and move the slide until the object is visible.

The proper sequence of steps is

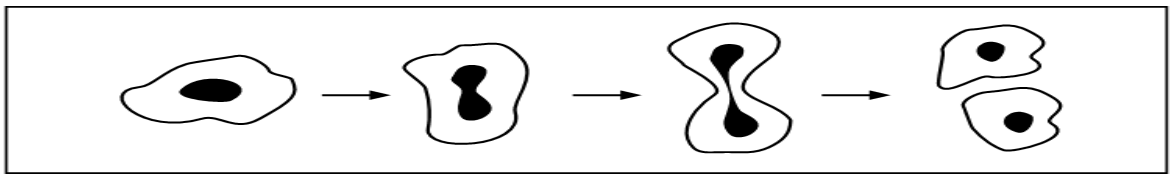
(a) (i), (iii), (iv), (ii).

(b) (ii), (iii), (iv), (i).

(c) (iv), (iii), (ii), (i).

(d) (i), (iv), (ii), (iii).

3.The process represented in the diagram below is the



(a) formation of spores in *Amoeba*.

(b) formation of bud taking place in *Amoeba*.

(c) identical gametes being formed in *Amoeba*.

(d) formation of daughter cells in *Amoeba*.

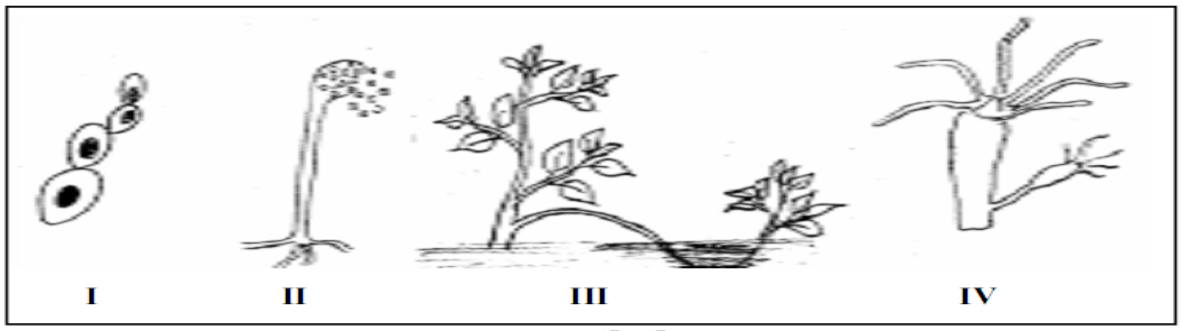
4. Two of the following four figures that illustrate budding are

(a) 1 and 2.

(b) 1 and 3.

(c) 1 and 4.

(d) 2 and 4.



5. Which one of the following is depicted in the sketch of a slide shown below :

a. Binary fission in yeast
b. Budding in yeast
c. Binary fission in *Amoeba*
d. Budding in *Amoeba*

6. Identify the mistake in the following sketch of budding in yeast.

a. Bud is shown to be smaller than parent cell.
b. Nuclei are present in both bud and parental cell.
c. Both parent and bud are shown as single cells.
d. Bud is wrongly labeled.

7. Following diagrams were drawn by four different students on having seen a prepared slide of budding in yeast

The correct diagram is

a. I
b. II
c. III

d. II and IV

8. A slide showing several *Amoeba*e was given to a student and was asked to focus the *Amoeba* undergoing binary fission. What will the student look for to correctly focus on a dividing *Amoeba*?

a) An *Amoeba* with many pseudopodia and a small nucleus.
b) A rounded *Amoeba* with rounded nucleus.
c) An *Amoeba* covered by a cyst and many nuclei
d) An *Amoeba* with elongated nucleus and a constriction in the middle.

1.Assertion (A): Pollination is the transfer of pollen to the

Assertion and Reason Questions:

1. **Assert** **1. 1.Ass1.Assertion (A):** Pollination is the transfer of pollen grain stigma.

Reason (R): Pollination is carried out by wind, birds and insects.

a. Both Assertion and reason are true and reason is the correct explanation of Assertion.
b. Both Assertion and reason are true but reason is not the correct explanation of Assertion
c. Assertion and reason are false.
d. Assertion is false but reason is true.

2.Assertion (A): Pollen grains from the carpel stick to the stigma of anther.
Reason (R): The fertilized egg cell grows inside the ovule and form fruit.

a. Both Assertion and reason are true and reason is the correct explanation of Assertion.
b. Both Assertion and reason are true but reason is not the correct explanation of Assertion
c. Assertion and reason are false.
d. Assertion is true but reason is false.

3. **ASSERTION (A):** As the sperms move along the organs of the human male reproductive system are finally in a fluid which makes their transport easier.
REASON(R): Along the path of the vas deferens, glands like the prostate and the seminal vesicles add their secretions.

a) Both Assertion and reason are true but reason is the correct explanation of Assertion.
b) Both Assertion and reason are true but reason is not the correct explanation of Assertion
c) Assertion and reason are false.

d) Assertion is true but reason is false.

Case Study – Paragraph Based Questions

1. Bisexual or perfect flowers have both male (Androecium) and female (Gynoecium) reproductive structures, including stamens and an ovary.
Many plants have complete flowers with both male and female parts, others only have male or female parts, and still, other plants have flowers on the same plant that are a mix of male and female flowers.
Some plants even have mixes that include all three types of flowers, where some flowers are the only male, some are only female and some are both male and female.

A. Flowers with both androecium and gynoecium are called:
   a. Bisexual flowers
   b. Anther
   c. Stamens
   d. Unisexual flowers

B. The male reproductive parts of a flower, the stamens, are collectively known as
   a. Androecium
   b. Filament
   c. Anther
   d. Gynoecium

C. The other name for gynoecium is:
   a. Pistil
   b. Stigma
   c. Androecium
   d. Style

D. The transfer of pollen from the anther to stigma is called
   a. Pollination
   b. Fertilization
   c. Adaptation
   d. Diffusion

2.Germination, the sprouting of a seed, spore, or other reproductive body, usually after a period of dormancy. The absorption of water, the passage of time, chilling, warming, oxygen availability, and light exposure may all operate in initiating the process. In the process of seed germination, water is absorbed by the embryo, which results in the rehydration and expansion of the cells. Shortly after the beginning of water uptake, or imbibitions, the rate of respiration increases, and various metabolic processes, suspended or much reduced during dormancy, resume.

A. The micropyle in a seed develop helps the entry of_____.
   a. water
   b. pollen tube
   c. male gamete
   d. None

B. Seed may be defined as:
   a. ripened ovule
   b. fertilized ovary

c. Gynoecium
d. Embryo

C. If moistened seeds are placed in the following flasks, they would germinate best in the flask containing:
   a. carbon dioxide
   b. oxygen
   c. nitrogen
   d. Water

D. Embryo axis above the cotyledon is known as
   a. hypocotyl
   b. funicle
   c. epicotyl
   d. raphe

3. The female germ-cells or eggs are made in the ovaries. They are also responsible for the production of some hormones. The egg is carried from the ovary to the womb through a thin oviduct or fallopian tube. The two oviducts unite into an elastic bag-like structure known as the uterus. The uterus opens into the vagina through the cervix. The fertilised egg (zygote) starts dividing and forms a ball of cells or embryos. The uterus prepares itself every month to receive and nurture the growing embryo. The lining thickens and is richly supplied with blood to nourish the growing embryo.

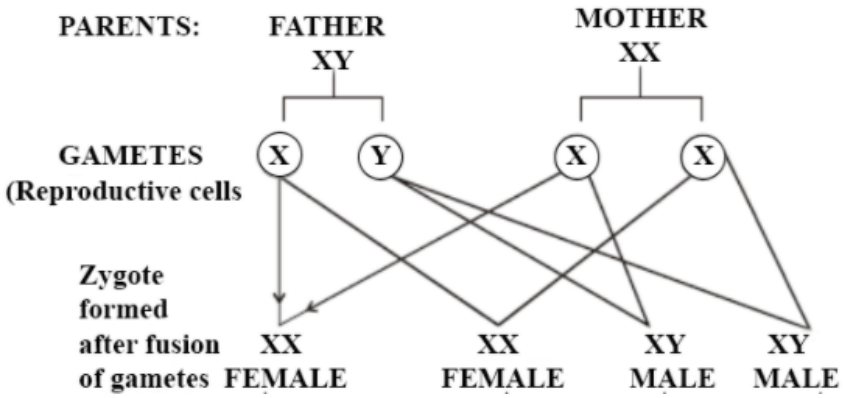
A. What are the two functions of the ovaries?

B. Name the hormone made by the ovaries.

C. The part of the female reproductive system where implantation takes place is the:
   a. Oviduct
   b. Uterus
   c. Cervix
   d. vagina

D. The embryo gets nutrition from the mother's blood with the help of a special tissue called:
   a. villi
   b. Placenta
   c. Uterine wall
   d. Fallopian tube

4. Observe the given flowchart and answer the following questions.



A. Name the two sex chromosomes found in human beings?

B. Assertion: All the female gametes will have only X- chromosomes.
Reason: Females are homogametic with two X-chromosomes.
   a. Both Assertion and reason are true but reason is the correct explanation of Assertion.
   b. Both Assertion and reason are true but reason is not the correct explanation of Assertion
   c. Assertion and reason are false.
   d. Assertion is true but reason is false.

C. A family of five daughters only is expecting sixth issue. The chance of its being a son is
   a. zero
   b. 25%
   c. 50%
   d. 100%

D. In humans, whose chromosomes determine whether a child is born male or female?
   a. The female
   b. The male
   c. The male's parents
   d. The female's parents

5. There are many ways to avoid pregnancy. These contraceptive methods fall in a number of categories. One category is the creation of a mechanical barrier so that sperm does not reach the egg. Another category of contraceptives acts by changing the hormonal balance of the body so that eggs are not released and fertilisation cannot occur. Other contraceptive devices such as the loop or the copper-T are placed in the uterus to prevent pregnancy. If the vas deferens in the male is blocked, sperm transfer will be prevented. If the fallopian tube in the female is blocked, the egg will not be able to reach the uterus.

A. State two reasons for use of contraceptives.
B. Name one sexually transmitted disease caused by a bacteria.

C. Which category of contraceptives mentioned above can help prevent sexually transmitted diseases?
   a. Mechanical barrier
   b. Change in hormonal balance
   c. Use of intrauterine devices
   d. Surgical method

D. Name a permanent method of contraception
   a. Use of pills
   b. Use of Copper-T
   c. Blockage of fallopian tube
   d. Use of mechanical barrier

CELL DIVISION :THE FUNDAMENTAL PROCESS IN ALL LIFE FORMS

- Cell is the fundamental unit of all life forms.
- An organism is called unicellular if it is made of one cell and multicellular if it is made up of many cells.
- All cells arise from pre-existing cells through a process called cell division.
- Cell division is of two types MITOSIS and MEIOSIS
- MITOSIS is a type of cell division during which one cell divides to give rise to two cells with the same number of chromosomes. It is also called Equational division. In all living organism it occurs during growth, repair and regeneration. In unicellular organisms this type of division is the same as reproduction.
- MEIOSIS is also called reduction division. This type of cell division plays an important role in keeping the chromosome number constant generation after generation. The cell division results in formation of four cells with half the number of chromosomes as the mother cell. For example if mother cell has 4 chromosomes after meiosis it will form four cells with two chromosomes each.
- Each species has a constant number of chromosomes. The organism can contain paired condition of chromosomes. Such organisms are called Diploid and are represented as 2n/2x. Organisms that contain single status of chromosomes are called Haploid n/x.
- In diploid organisms Meiosis occurs at the time of gamete formation so that the male and female gametes contain the haploid number half the chromosome number of

chromosomes. During fertilization when these gametes fuse the diploid number of the species is restored.

- The chromosome number for human beings is 46 or 23 pairs. Females contain 22 pairs and 1 pair of XX chromosomes and males contain 22 pairs and XY chromosomes.
- During male and female gamete formation Meiosis occurs in the testis and ovary to form sperms and Ova respectively. All ova contain 22 chromosomes and X chromosome. However 50% sperms contain 22 chromosomes and X chromosome and the other 50% contain 22 chromosomes and Y chromosome.
- A child inherits 23 chromosomes from the mother and 23 chromosomes from the father thus restoring the human diploid chromosome number of 46 (23 pairs).
- The child will always inherit X chromosome from the mother. If it gets Y chromosome from the sperm the sex of the child will be male. On the other hand if it receives another X chromosome from the sperm the child will be a female. It is clear that in human beings the sex of the child is determined by the father. The mother does not pay any role in determining the set of the child.

Chapter 9
Heredity and Evolution

1.	Name the molecule that carries the genetic information. What type of changes in the genetic material cause variations? _____ _____ _____ _____

	Learning Outcome	
Students will be able to understand	heredity and accumulation of variation in reproduction	After completing the topic heredity and evolution and attempting SS Q1,2,3,4,
Students will be able to understand	inherited and acquired traits giving examples	After completing the topic heredity and evolution and attempting SS Q 11
Students will be able to take initiative to know	about scientific discoveries such as Mendel's contribution in understanding the concept of inheritance	After completing the topic heredity and evolution and attempting SS Q 5,6,7,8,9,16,17,
Students will be able to explain	concept of sex determination in humans	After completing the topic heredity and evolution
Students will be able to attribute	natural selection and genetic drift to process of evolution	After completing the topic heredity and evolution and attempting SS Q 10,
Students will be able to define	speciation, gene flow, geographical , reproductive isolation	After completing the topic heredity and evolution and attempting SS Q5, 19,20
Students will be able to understand	role of homologous and analogous organs and fossils in evolutionary relationships	After completing the topic heredity and evolution and attempting SS Q 12,13,14,15,18,

2. What are the causes of variations in a species that reproduces asexually?

_____

_____

_____

_____

3. Why does sexual reproduction produce more variations?

_____

_____

_____

_____

4. Why is it necessary to have half the number of chromosomes in gametes?

_____

_____

_____

_____

_____

_____

5. Define the following terms:

a) Genes:_____

_____

b) Dominant trait:_____

_____

c) Recessive trait:_____

_____

d) Independent inheritance of traits:_____

_____

e) Acquired traits:_____

_____

f) Genetic drift:_____

_____

g) Natural selection:_____

_____

_____

h) Speciation:_____

_____

i) Artificial selection:_____

_____

j) Gene Flow _____

_____

6. Mendel did not get any plants of medium height when he crossed pure tall plants with pure dwarf plants. What inference can you draw from this observation?

_____

_____

_____

_____

7. Why did Mendel choose pea plants for his experiments on inheritance of characters?

_____

_____

_____

_____

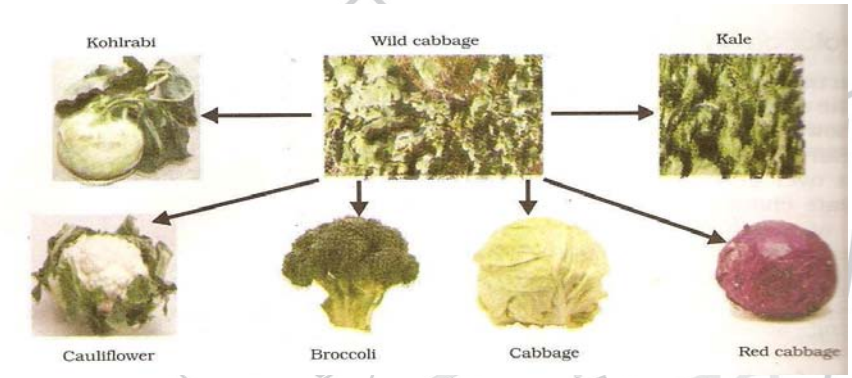
8. Which contrasting characters of pea plant did Mendel choose for his experiments?

_____

	_____ _____ _____
9.	Two organisms can have the same phenotype but may or may not have the same genotype. Explain taking an example. _____ _____ _____ _____
10.	What is the basis of the evolutionary process? _____ _____ _____
11.	Tabulate two differences between inherited and acquired traits. Give an example each. _____ _____ _____ _____ _____
12.	How do homologous and analogous organs point towards evolution? _____ _____ _____ _____
13.	Every living organism is an evolutionary success story. Explain. _____ _____ _____ _____ _____

14. Write a short on human evolution.

15. During the course of evolution very dissimilar looking structures evolved from a common ancestor. Explain this with the help of example of evolution of the wild cabbage.



15 Black coat colour is dominant over white coat colour in guinea pigs. What kind of offspring would you expect in the F1 generation when a pure black animal is crossed with a pure white animal? If the siblings were crossed, what would the F2 generation be like?

16. In a hybridization experiment **tall pea plants with wrinkled seeds** were crossed with **short peaplants with round seeds.** Find out the phenotype of pea plants in F1 generation.

Also give the phenotypic ratio of the F2 generation obtained by self- pollinating plants of F1 generation. Show the working of the cross to support your answer

17.	Name any 3 organs of other animals that are homologous to the human hand. _____ _____ _____ _____
18.	When does the process of gene flow take place? _____ _____ _____ _____
19.	Bacteria have simple body plan as compared to human beings. Does it mean that human beings are far more evolved than bacteria? Justify. _____ _____ _____ _____

Activity to be performed in Groups of 5 each

Objective: To analyse seed sample of Red Kidney Beans for Mendelian ratio

Requirement : Red kidney Beans, white sheet, Notebook, Pencil

Procedure:

1. Empty the contents of the packet on the sheet provided.
2. Separate the seeds on the basis of size and colour and make separate heaps.
3. Count the number of seeds in each heap.
4. Find out the ratio of seeds.
5. Observation of all groups to be shared and noted in columns given.

Observations:

Present your findings in the form of a table

Groups	Total no. of seeds	No of big and Dark seeds	No. of Big and light seeds	No. of Small size dark seeds	No. of small sized light seeds	Approximate Ratio
I						
II						
III						
IV						
V						
VI						

Conclusion :

Precautions :

Very Short Answer Based Questions (1 mark)

ASSERTION (A) and REASON(R) The following questions 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 for A
b) Both A and R are true and R is not the correct explanation for A
c) A is true but R is false
d) A is false but R is true

Q.1. **ASSERTION (A):** Evolution is extremely slow process.
REASON(R): New characters are accumulated in an organisms during its life time.

_____

Q.2**. ASSERTION (A):** Geographical isolation cannot be major factor in speciation of asexually reproducing organism.
REASON(R): Asexually reproducing organisms do not require any other organism for reproduction.

_____

3. Answers to question 3(a) to 3(d) are based on the following passage and concepts studies

Fossils are the remains or traces of ancient life that have been preserved by natural processes, from spectacular skeletons to tiny sea shells. By studying the remains of life and the traces it left behind we can learn a lot about how animals and plants lived and behaved millions of years ago. Usually, when organisms die, their bodies will decompose and be lost. But every once in a while, the body or at least some parts may be in an environment that does not let it decompose completely. If a dead insect gets caught in hot mud, for example, it will not decompose quickly, and the mud will eventually harden and retain the impression of the body parts of the insect.

3(a) What are fossils?

_____

_____

3(b) What are the techniques used to determine the age of fossils?

_____

_____

3(c) How are fossils formed?

_____

_____

_____

3(d) What do they tell us about evolution? (2 points)

_____

_____

MCQs : Heredity and Evolution

1. Alternative forms of a gene are called _____.

a.	loci
b.	multiples
c.	chromosomes
d.	alleles

2. Heredity or inheritance of specific traits became clearer due to

a.	Lamarck's theory
b.	Mendel's work on garden peas
c.	Darwinism
d.	Neo-Darwinism

3. Which of these is homozygous recessive?

a.	Ss
b.	ss
c.	SS
d.	s

4. What will be the genotypic ratio of the cross between Rr and rr?

a.	1:2:1
b.	3:1
c.	1:1
d.	1:1:1

5. What will be the genotypic ratio of the cross between Rr and Rr?

a.	1:1
b.	3:1
c.	1:2:1
d.	1:1:1

6. The offspring resulting from a cross between two pure homozygous recessives would be _____.

a.	50% homozygous recessive and 50% homozygous dominant
b.	75% homozygous recessive and 25% heterozygous dominant
c.	75% homozygous recessive and 25% homozygous dominant
d.	100% homozygous recessive

7. On what cellular structures are genes in eukaryotes carried?

a.	Endoplasmic reticulum
b.	Nuclear membrane
c.	Chromosomes
d.	Mitochondria

8. Which of the following sentences is true about the evolutionary process?

a.	There is no real 'progress' in the idea of evolution.
b.	humans are unique, a totally new type of organism.
c.	progress is nature's religion.
d.	evolution of life forms was rapid in the beginning ages.

9. In man the chromosome number is 46. How many chromosomes are present in man's muscle cells?

a.	23
b.	46
c.	69
d.	variable

10. The component of a chromosome that controls heredity is ____.

a.	proteins
b.	histones
c.	DNA
d.	RNA

11. Speciation takes place when variation occurs with

a.	mood changes
b.	death of an organism
c.	changes due to accidents
d.	geographical isolation

12. Number of chromosomes in a human male is _____.

a.	23
b.	23 pairs
c.	22 pairs +XY
d.	22 pairs

13. By studying analogous structures we look for _____.

a.	similarities in appearance and function but different in structure
b.	similarities in appearance bur differences if functions
c.	Similarities in organ structure
	Similarities in cell make up

14. Which of the following are not examples of analogous structures?

a.	Wings of bat and butterfly
b.	Wings of bat and forelimb of cattle
c.	Thorn and spine
d.	Tendril of *Lathyrus* and tendril of*Gloriosa*

15. Speciation is the evolutionary process by which _____.

a.	a new gene pool is formed
b.	evolutionary paths of species converge
c.	New species are formed
d.	Shows up differences in physical traits

16. Evidences of evolutionary relationships are found in _____.

a.	atmosphere
b.	fossils
c.	ocean beds
d.	rocks

Assertion and Reason Questions:

1.Assertion: Forelimbs of vertebrates are homologous organs.
Reason: Analogous organs have the same origin but different functions.

a) Both Assertion and reason are true but reason is the correct explanation of Assertion.
b) Both Assertion and reason are true but reason is not the correct explanation of Assertion
c) Assertion and reason are false.
d) Assertion is true but reason is false.

2.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 .

a) Both Assertion and reason are true but reason is the correct explanation of Assertion.
b) Both Assertion and reason are true but reason is not the correct explanation of Assertion
c) Assertion and reason are false.
d) Assertion is true but reason is false.

3.**Assertion (A)**: Speciation is the phenomenon of development of new species from existing species
Reason (R): Species is a reproductively isolated natural population of individuals where individuals resemble one another in morphological characters and can interbreed.

a) Both Assertion and reason are true but reason is the correct explanation of Assertion.
b) Both Assertion and reason are true but reason is not the correct explanation of Assertion
c) Assertion and reason are false.
d) Assertion is true but reason is false.

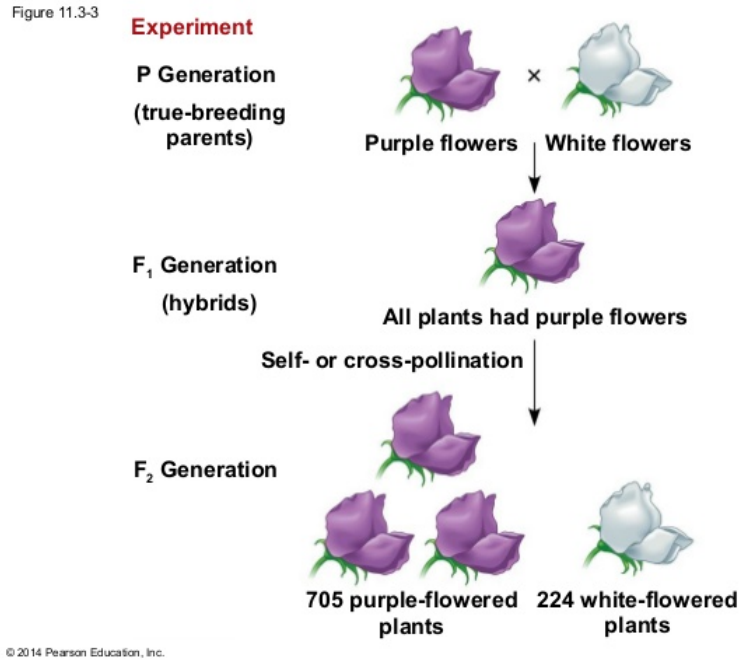
4.**Assertion (A)**: Human forelimbs and birds wings are homologous

Reason (R): Both these have common origin , basic structure but they are modified to perform different functions

a) Both Assertion and reason are true but reason is the correct explanation of Assertion.
b) Both Assertion and reason are true but reason is not the correct explanation of Assertion
c) Assertion and reason are false.
d) Assertion is true but reason is false.

Case Study – Paragraph Based Questions

1.Study the given cross and answer the questions that follow.



A. What is the maximum number of alleles that monohybrid cross can consider?
   a. 1
   b. 2
   c. 4
   d. 8
B. The genotypic ratio of a monohybrid cross is:
   a. 1:2:1
   b. 3:1
   c. 2:1:1
   d. 9:3:3:1
C. The geometrical device that helps to find out all the possible combinations of male and female gametes is known as:
   a. Bateson Square
   b. Mendel Square
   c. Punnett Square
   d. Mendel's Cube

D. Assertion: At F2 stage in monohybrid cross, both parental traits are expressed in the proportion of 3:1.
Reason: The contrasting parental traits show blending at F2 stage.
   a. Both Assertion and reason are true but reason is the correct explanation of Assertion.
   b. Both Assertion and reason are true but reason is not the correct explanation of Assertion
   c. Assertion and reason are false.
   d. Assertion is true but reason is false.

EVOLUTION

Case Study – Paragraph Based Questions

1. Evolution is a process that results in changes in the genetic material of a population over time. Evolution reflects the adaptations of organisms to their changing environments and can result in altered genes, novel traits, and new species. One mechanism that drives evolution is natural selection, which is a process that increases the frequency of advantageous alleles in a population.

A. Who proposed the theory of evolution?

B. In which case doesthe change in DNA contributes to speciation?
   (a) changes in the DNA of muscle cells
   (b) changes in the DNA of brain cells
   (c) changes in the DNA of bone cells
   (d) changes in the DNA of sperm cells

C.Select the incorrect statement
   (a) Frequency of certain genes in a population change over several generations resulting in evolution
   (b) Reduction in weight of the organism due to starvation is genetically controlled
   (c) Low weight parents can have heavy weight progeny
   (d) Traits which are not inherited over generations do not cause evolution

D. According to the evolutionary theory, formation of a new species is generally due to

a) sudden creation by nature
b) accumulation of variations over several generations
c) clones formed during asexual reproduction
d) movement of individuals from one habitat to another

2. Acquired traits are the one that a person develops during his lifetime. These are not passed from one generation to another. On the other hand, inherited traits are present in the person

since the time of his birth and are passed on from one generation to another. An acquired trait is the character developed in an individual as a result of environmental influence. These traits are not coded by the DNA of a living organism and therefore cannot be passed on to future generations. Inherited traits are the traits that are inherited from the parents to the offspring. Hair, skin, eye colour, body type, height, and susceptibility to certain diseases are some of the examples of inherited traits in humans. The inherited traits of an individual are determined by their genes. A single cell in a human body contains 25,000 to 35,000 genes. These genes carry the traits inherited by an individual from his parents.

Gregor Mendel explained the concept of inherited traits in his experiments with the pea plant. He depicted that the traits that can express themselves in both homozygous and heterozygous form are called dominant traits.

A. From the list given below, select the character which can be acquired but not inherited

(a) colour of eye
(b) colour of skin
(c) size of body
(d) nature of hair

B. Inherited traits in human beings are determined by:

(a) Genes
(b) Ribosomes
(c) Mitochondria
(d) Proteins

C. The physical manifestation of a trait is called :

(a) Genotype
(b) Phenotype
(c) Dominant trait
(d) Recessive trait

D. **Assertion (A):** Acquired traits cannot be passed on from one generation to next generation.

Reason (R): Inaccuracy during DNA copying of acquired traits is minimum.

(a) Both Assertion and reason are true but reason is the correct explanation of Assertion.
(b) Both Assertion and reason are true but reason is not the correct explanation of Assertion
(c) Assertion and reason are false.
(d) Assertion is true but reason is false.

Chapter 15

OUR ENVIRONMENT

	Learning Outcome	
Students will be able to define	ecosystem ,its components biotic and abiotic and appreciate their inter - dependency	After completing the topic Our environment and attempting SS Q 2,3,4,5
Students will be able to understand	Role of producers, consumers and decomposers in the ecosystem and transfer of energy	After completing the topic Our environment and attempting SS Q 6,7,8,9,10
Students will be able to apply	learning to hypothetical situations, such as what happens if all herbivores removed from an ecosystem	After completing the topic Our environment and attempting SS Q 13
Students will be able to analyse	Effect of human activities on environment like biomagnifications, ozone layer depletion, waste generation	After completing the topic Our environment and attempting SS Q 11,12,14
Students will be able to differentiate and appreciate	segregation of biodegradable and non - biodegradable waste	After completing the topic Our environment and attempting SS Q 1,

1) Give some examples of biodegradable substances. Why are they called so? How does degradation occur in nature?

_____

_____

_____

_____

_____

_____

_____

2) Define ecosystem.

_____

_____

_____

_____

3) What are the components of the ecosystem?

_____

_____

4) Which among the following are the abiotic components of an ecosystem?

Herbs, sunlight, bacteria, soil, wind, water.

5) Name two man-made ecosystems.

6) What is the role of the producers and decomposers in an ecosystem?

7) Explain the 10% Law with respect to movement of energy in the ecosystem.

8) Why is a food chain never more than 3- 4 trophic levels?

9) Consider the following food chains:

   a) Plants → Mice → Snakes → Hawks

   b) Plants → Mice → Hawks

   If energy available at the producer level in both the food chains is 100J, in which case will hawks get more energy? Justify your answer.

10) Draw a food web of a terrestrial habitat.

11) Why does biological magnification happen?

_____

_____

_____

_____

12) State the causes and effects of ozone depletion.

_____

_____

_____

_____

13) What will be the effect of the extinction of carnivores in a forest ecosystem?

_____

_____

_____

_____

_____

14) How can you help to reduce the problem of waste disposal? Give any two methods.

_____

_____

_____

_____

_____

Very Short Answer Based Questions (1 mark)

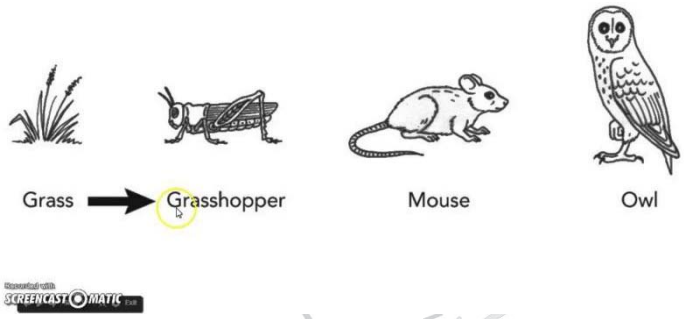
ASSERTION (A) and REASON(R) The following questions consists of two statements- ASSERTION (A) and REASON(R), answer these questions selecting the appropriate option given below

a) Both A and R are true and R is the correct explanation for A
b) Both A and R are true and R is not the correct explanation for A
c) A is true but R is false
d) A is false but R is true

Q.1. **ASSERTION (A)** : The concentration of a chemical increases as trophic level increases due to biological magnification
REASON (R): DDT is a harmful chemical

_____

Q.2. Answers to questions 2(a) to 2(d) are based on information provided in the picture and concepts studied.



2(a) What is the ultimate source of energy for the earth?

_____

2(b) On the Earth solar energy is trapped by which organisms?

_____

2(c) State the trophic level of Mouse in the above food chain.

_____

2(d) How much energy will be available to the owl in the given food chain if the energy trapped by the plants from the sun is 1000J?

_____

MCQs : Our Environment

1. A natural phenomenon that becomes harmful due to pollution is _____.

a	global warming
b	ecological balance
c	Deforestation
d	Desertification

2. The chemical responsible for ozone holes is _____.

a	CO_2
b	SO_2
c	CO
d.	CFC

3 Animal dung is _____ waste.

a	Biodegradable
b	non-biodegradable
c	Hazardous
d	Toxic

4. Which of the following is biodegradable?

a	iron nails
b	plastic mugs
c	Paper plates
d.	Donas made of plant leaves

5. Which of the following is non-biodegradable?

a	animal bones
b	Nylon
c	tea leaves
d.	Kitchen waste

6. In a lake polluted with pesticides, which one of the following will contain the maximum amount of pesticides?

a	small fish
b	microscopic animals
c	big fish
d.	water birds

7. Name the process in which a harmful chemical enters the food chain and gets concentrated at each level in the food chain.

a	Concentration
b	Biomagnifications
c	Expansion
d	Pollution

Chapter 16

SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES

Sustainable management of Resources	Learning Outcome	
Students will be able to define and explain	sustainable management and its significance	After completing the topic sustainable management of resources and attempting SS Q 3,4,
Students will be able to understand	5 R's and apply it in their daily life	After completing the topic sustainable management of resources and attempting SS Q 6,7,
Students will be able to appreciate	forests, water and fossil fuels as a natural resource and need to use them in sustainable manner	After completing the topic sustainable management of resources and attempting SS Q 5,8,9,10,11,
Students will be able to take steps	to promote sustainable management of these resources in day to day life	After completing the topic sustainable management of resources and attempting SS Q 12,
Students will be able to advocate	use of fuels which produces less pollutants, use energy efficient electric devices	After completing the topic sustainable management of resources

1) Why was the Ganga Action Plan started?

_____

_____

_____

_____

_____

2) The presence of coliform bacteria in water is a pointer towards its polluted state. Justify.

_____

_____

_____

_____

_____

3) Why has it become imperative to manage our resources well?

_____

_____

_____

4) What do you mean by sustainable management of resources? Explain two ways by which we can manage our fossil fuels and water.

5) Name some of the biodiversity hotspots of our country.

6) What are the 5R's?

7) Recycling of articles results in wastage of energy and money, therefore, one should practice reuse. Justify.

8) Name any two industries that are dependent on forests?

9) Why is it beneficial to involve local people to take care of the forest resources? Explain with the help of an example.

10) What are the major criticisms against construction of large dams like SardarSarovar dam? Explain

11) Name a few traditional methods of water harvesting practiced in various parts of the country.

12) Enlist at least 5 ways by which energy consumption can be reduced.

Very Short Answer Based Questions (1 mark)

ASSERTION (A) and REASON(R) The following questions 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 for A
b) Both A and R are true and R is not the correct explanation for A
c) A is true but R is false
d) A is false but R is true

Q.1. **ASSERTION (A):** Different human activities and chemical effluents from industries increase toxicity in River Ganga.

REASON (R): Ganga Action Plan is a project to clean Ganga river

_____

Q.2. **Q.2. Answers to questions 2(a) to 2(d) are based on information provided in the paragraph and concepts studied.**

Forests are 'biodiversity hotspots'. One measure of the biodiversity of an area is the number of species found there. However, the range of different life forms (bacteria, fungi, ferns, flowering plants, nematodes, insects, birds, reptiles and so on) found, is also important. One of the main aims of conservation is to try and preserve the biodiversity we have inherited. We all use various forest produce. But our dependency on forest resources varies. Some of us have access to alternatives, some do not. When we consider the conservation of forests, we need to look at the stakeholders

2 (a) Why are forests 'biodiversity hotspots'?

_____

_____

2(b) What is the main aim of conservation?

_____

_____

2(c) List any 2 stakeholders in the forests.

_____

_____

2(d) Amrita Devi Bishnoi Award has been instituted by the Government of India for what purpose?

_____

_____

MCQs : Sustainable Management of Natural Resources

1. Which one of the following is an example of biotic component of environment?

a.	Wind
b.	Water
c.	vegetation
d.	temperature

2. Which of the following is a non- renewable resource?

a.	solar Energy
b.	hydrocarbon fuel
c.	flora and fauna
d.	nuclear power

3. Sanctuaries are established to_____.

a.	develop commercial tree plantation
b.	conduct ecotourism on wildlife
c.	protect animals
d.	conduct research on Biodiversity

4. Global warming has resulted due to

a.	increased emissions of fine particulates from automobiles
b.	increased emissions of CO_2 from automobiles
c.	Oxides of sulphur and nitrogen
d.	lack of rainfall worldwide

Assertion and Reason Questions:

1. **ASSERTION (A)** : Forests are biodiversity hotspots.
   REASON (R):The area or spots where a large variety of wildlife and different life forms are found are called biodiversity hotspots.

   a) Both Assertion and reason are true but reason is the correct explanation of Assertion.
   b) Both Assertion and reason are true but reason is not the correct explanation of Assertion
   c) Assertion and reason are false.
   d) Assertion is true but reason is false.

2. Assertion: Mismanagement of the water has largely led to the benefits being cornered by a few people.
Reason: People close to the source grow water-intensive crops like sugarcane and rice while people farther downstream do not get any water.

   a. Both Assertion and reason are true but reason is the correct explanation of Assertion.
   b. Both Assertion and reason are true but reason is not the correct explanation of Assertion

c. Assertion and reason are false.
d. Assertion is true but reason is false.

3. Assertion: Coal is one of the major sources for the production of electricity.
Reason: Coal is a non-renewable source of energy.

a. Both Assertion and reason are true but reason is the correct explanation of Assertion.
b. Both Assertion and reason are true but reason is not the correct explanation of Assertion
c. Assertion and reason are false.
d. Assertion is true but reason is false.

Case Study – Paragraph based Questions

1. Forests are 'biodiversity hotspots'. One measure of the biodiversity of an area is the number of species found there. However, the range of different life forms (bacteria, fungi, ferns, flowering plants, nematodes, insects, birds, reptiles and so on) found, is also important. One of the main aims of conservation is to try and preserve the biodiversity we have inherited. Management of protected areas by keeping the local people out or by using force cannot possibly be successful in the long run. In any case, the damage caused to forests cannot be attributed to only the local people – one cannot turn a blind eye to the deforestation caused by industrial needs or development projects like building roads or dams. The damage caused in these reserves by tourists or the arrangements made for their convenience is also to be considered.

A. Which of the following stakeholders cause maximum damage to forest?
(a) People who live in and around forest
(b) The wildlife and nature enthusiast
(c) The Forest department
(d) The industrialist

B. Chipkoandolan is concerned with
(a) Conservation of fossil fuel
(b) Development of new breeds of forest trees
(c) Forest conservation
(d) Conservation of water

C. Amrita Devi Bishnoi sacrificed her life for protection of:
(a) Sal trees
(b) Pine trees
(c) Tendu leaves
(d) Khejri trees

D. The disadvantages of monocultures are :
(a) Loss of biodiversity
(b) Inability of area to meet needs of local people
(c) Deforestation

(d)All of the above

2. Sustainable natural resources conservation is a process of rational use and skilful management and preservation of the natural environment with all its resources. Integrated environmental education can provide knowledge which is useful in sustainable management of natural resources. All human efforts towards development are based upon the presence of natural resources. Although the earth has continued to support life for thousands of years, today it is facing serious environmental challenges which are as a result of human impact and this is a threat to life support systems. This is a potential ecological disaster.

A. Select the ecofriendly activity among them :
   a. using car for transportation
   b. using poly bags for shopping
   c. using dyes for colouring clothes
   d. using windmills to generate power for irrigation.

B. Khadins, Bundhis, Ahars and kattas are ancient structure that are examples for :
   a. Grain storage
   b. wood storage
   c. water harvesting
   d. soil conservation

C. Assertion: Large dams ensure storage of adequate water and also generate electricity, but still get criticism..
   Reason: Criticism about large dams address economic, environment and social problems.
   a. Both Assertion and reason are true but reason is the correct explanation of Assertion.
   b. Both Assertion and reason are true but reason is not the correct explanation of Assertion
   c. Assertion and reason are false.
   d. Assertion is true but reason is false.

D. Following is the advantage of water stored in ground :
   a. It does not evaporate
   b. It spreads out to recharge wells
   c. It provides moisture to vegetation over a wide area
   d. All of the above

REVISION ASSIGNMENT

TERM 2 **MM: 20**

Q .1. Why forests are called biodiversity hotspots? (1)

Q. 2 If the weight of beetles is reduced due to starvation can this change lead to evolution? Give reason. (1)

Q. 3 What do the fossils tell us about the process of evolution? (2 points) (1)

Q.4 What changes are observed in the uterus if fertilization does not take place? (1)

Q.5 State two functions of the ovaries. (1)

Q .6 Classify the following as homologous/ analogous organs and comment on how closely related the two species are in terms of evolution

i) Eyespots of P*lanaria* and human eye
ii) Fore limb of frog and fore limbs of human beings (2)

Q.7 Give two reasons for appearance of variations among the progeny formed by sexual reproduction. (2)

Q.8 List the four stakeholders in forests and their interest (2)

Q.9 A pure bred tall pea plant with round seeds (TTRR) is crossed with a pure bred short pea plant with wrinkled seeds (ttrr).

i) What will be the phenotype of F1 generation?
ii) What will be the phenotypic ratio of the progeny (F2 generation) if F1 hybrids are self-pollinated?
Show the working of the cross (3)

Q.10. List two advantages of the following:

i) Dams
ii) Stored underground water

iii) Watershed management (3)

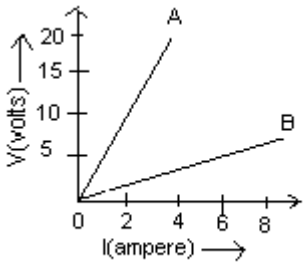
Q.11 Draw a neat diagram showing germination of pollen tube on the stigma of a flower. (3)

Academic Session: 2019- 20
Practice Examination
Subject - Science
M/3

Time : 2 hrs **MM 55**

General Instructions

- Attempt each section on separate sheet.
- This paper has 6 printed sides.
- Read the questions carefully. Marks will be deducted for not following instructions given in the questions.
- Write question numbers as given in the paper and choose the correct option in the multiple choice questions.

	Section A-Physics	**MM-18**
Q1.	A virtual image is formed by the mirror of an object which is less than the size of the object. Which mirror is it? (a) Concave mirror (b) Convex mirror (c) Plane mirror (d) Both concave and convex mirror	1
Q2.	An electric bulb is rated 100W, 220V. When it is operated at 110V, the power consumed will be (a) 100W (b) 75W (c) 50W (d) 25W	1
Q3.	The V-I graph is shown for A and B. Which one represents the resistors connected in series? Justify your answer. 	1

Q4.	Why is a voltmeter used in a circuit? How is it different from an ammeter?	1
Q5.	If the magnification produced by spherical mirror is -2, identify the type of spherical mirror. Draw and relevant ray diagram and mention the position of the object and image. What is the nature of the image formed	3
Q6.	a) What is meant by absolute refractive index? b) What will be the angle of emergence if a ray of light strikes the rectangular glass slab at an angle of 40^0 with normal. c) Find the refractive index of water if speed of light in vacuum is 3 x 10^8m/s and speed of light in water is 2.25 x 10^8m/s.	3
Q7.	a) Why is tungsten metal selected for making filaments of incandescent lamps? b) Power of a lamp is 60 W. Find the energy in joules consumed by it in 1 s. c) Draw a schematic diagram of a circuit consisting of a battery of three cells of 2 V each, a 5 Ω resistor, an 8 Ω resistor and a 12 Ω resistor, an ammeter and a plug key, all connected in series.	3
Q8.	(a) A convex lens of focal length 20cm can produce a magnified real image as well as a magnified virtual image. Is the statement correct? If yes, where shall the object be placed in each case to get the image? If no, justify your answer. (b) A 1m tall object is placed on the principal axis of a convex lens and its 40cm tall image is formed on the screen placed at a distance of 70cm from the object. Find the focal length of the lens. Also mention the position and nature of the image formed. **OR** A student focused the image of a candle flame on a screen using a convex lens. He noted down the following readings:- Position of the candle = 12cm Position of the lens = 50cm Position of the screen = 88cm (a) Find the focal length of the lens. (b) Where will the image be formed if he shifts the candle towards the lens at a position of 31cm? (c) What will be the nature of the image formed if he further shifts the candle towards the lens? Draw the relevant ray diagram.	5

	Section B-Chemistry	MM-18
Q1	Which of the following statements are usually correct for carbon compounds ? These a) Are Good conductors of electricity in molten state. b) Are Poor conductors of electricity in molten state. c) Have strong forces of attraction between their molecules . d) Have low melting and boiling point a) (i) and (iii) b) (ii) and (iii) c) (i) and (iv) d) (ii) and (iv)	1
Q2.	Oils on treatment with hydrogen in the presence of palladium or nickel catalyst form fats . This is an example of a) Addition reaction b) Substitution reaction c) Displacement reaction d) Oxidation reaction	1
Q3.	Fe_2O_3 + 2Al Al_2O_3 + Fe The above reaction is an example of a a) Combination reaction b) Double displacement reaction c) Decomposition reaction d) Displacement reaction	1
Q4.	How is Etheneprepared from ethanol ? Give the reaction involved in it .	1
Q5.	Name the functional group present in a) $CH_3CH_2CH_2COCH_3$ b) CH_3CH_2CHO	2
Q6.	Translate the following statements into chemical equations and balance them - a) Hydrogen sulphide gas burns in air to give water and sulphur dioxide gas b) Barium chloride reacts with Aluminiumsulphate to give aluminium chloride and a precipitate of barium sulphate .	2
Q7.	Draw the electron dot structure of a) Water b) Ethyne	2
Q8.	a) Name the products formed when Ethane burns in air .Write a balanced chemical equation for the reaction.	3

	b) Give a test that can be used to differentiate between butter and cooking oil.	
Q9.	What are hydrophobic and hydrophilic parts in soap? With the help of diagram, Explain the cleansing action of soap.	3
Q10.	Complete and balance the following equations and name the products – a) $CH_3COOH + CH_3CH_2OH$ b) $CH_3CH_2OH + Na$ c) $CH_2=CH_2 + H_2$	3
	Section C-Biology	**MM-19**
Q1.	Read the following statements and choose the correct option i. Wings of bird and wings of bat are analogous organs ii. Fore limb of horse and human arm are homologous organs iii. Potato and sweet potato are homologous organs a. i. ii. and iii. are correct b. i. and iii are correct c. ii. and iii are correct d. i. and ii are correct	1
Q2.	Chances of variation is more in: a. Sexual reproduction b. Asexual reproduction **c.** Vegetative reproduction d. Budding	1
Q3.	State two functions of testes in human males. **OR** Why are testes present outside the body of a male?	1
Q4.	Define Genetic drift.	1
Q5.	List two factors that could lead to speciation.	1
Q6.	a) Give a barrier method and a surgical method for contraception. b) List any two reasons for adopting contraceptive methods	3
Q7	Tabulate one difference between the following. a. Inherited and acquired traits. b. Dominant allel and recessive allel.	3

	c. Monohybrid and dihybrid cross.	
Q8.	a. Name the following parts : i. Organ which produces the hormone estrogen ii. Site of fertilization. b. Explain the changes that take place in the uterus : (i) To receive the zygote. (ii) When zygote is not formed. **OR** a. Give the role of Vas Deferens in the male reproductive system. b. Name one sexually transmitted disease caused by: (i) bacteria (ii) virus c. If a female is using copper –T, will it help in protecting her from sexually transmitted diseases? Give reason for your answer.	3
Q9.	a. Genotype of a plant bearing purple flower is PP and one with white flower is pp. When these are crossed. i. What would be the colour of the flowers in F_1 generation? ii. Give the percentage of the white flower when F_1 plants are self pollinated. iii. In what ratio would you find PP and Pp in F_2 progeny? Draw flow chart/Punnett square in support of your answer. b. In human beings the statistical probability of getting either a male or female child is 50:50. Give a suitable genetic explanation. **OR** a. What are fossils? How are they formed? b. State any two role of fossils in the study of the process of evolution. c. List two methods of determining the age of fossils.	5

PRACTICAL STUDY MATERIAL

INSTRUCTIONS FOR MAKING PRACTICAL FILE

- **Index to be made on first page (Refer to format given below)**
- **Written work to be done on ruled side with a pen**
- **Titles to be written in black ink and rest in blue ink only**
- **All diagrams corresponding to written work to be drawn and labelled on blank pages with pencil only**
- **Each experiment to begin on a fresh page**
- **Note book to be covered with brown paper**
- **Name. Class and Section of the student to be mentioned outside the practical file**

FORMAT FOR INDEX

Experiment No.	Name of Experiment	Date	Teachers Remarks

EXPERIMENT 1

AIM

To prepare temporary mounts of leaf peels to observe stomata and to differentiate between dicot and monocot stomata.

THEORY

In plants, physiological processes such as respiration and photosynthesis involve exchange of gases between plant tissues and the external atmosphere. This occurs through minute microscopic pores called stomata (singular; stoma) present in the leaf. Stoma is an elliptical pore with two kidney shaped guard cells on either side in dicots and dumbel- shaped guard cells in monocots. The guard cells have thin outer and thick inner walls. When guard cells are turgid, the stoma opens and it closes when the guard cells are flaccid.

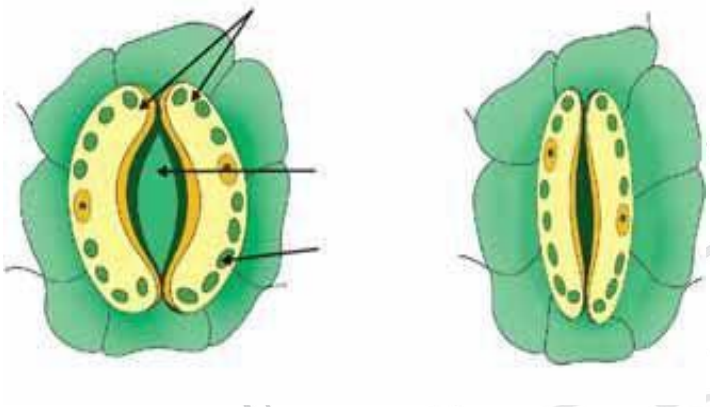
The number, distribution and type of stomata varies in different plants. Within a plant, the number and distribution may vary between the upper and lower surfaces of leaf. However, the type of stomata remains the same in a particular plant species.

MATERIALS REQUIRED

Fresh leaves of a dicot plant (such as Petunia, Dianthus, Solanum) and a monocot plant (such as maize, grass), compound microscope, slide, cover slip, needle, brush, a piece of blotting paper, and a razor blade.

PROCEDURE

1. Remove a peel from the lower surface of a dicot leaf. This can be done by folding or tearing the leaf and pulling out the thin membranous transparent peel.
2. Mount the peel on a slide in a drop of water and stain it in safranin for 1 minute.
3. Add a drop of glycerin and place a cover slip on it. Avoid air bubbles. Blot the excess stain from the slide.
4. Focus the peel under the low power of compound microscope and observe the stomata, guard cells and epidermal cells.
5. Draw the diagram of a stoma and label its parts.
6. Repeat the process with peels removed from a monocot leaf. Record your observations.
7. Following the same procedure, study the stomata of other dicot and monocot plants.



(a) (b)

Fig: (a) An open dicot stoma; and (b) closed dicot stoma

RESULTS AND DISCUSSION

Based on the observation compare the characteristic of the dicot and monocot stomata and draw your conclusion.

- It is found that number, size, and distribution of stomata vary in different plants. In general, the stomata are lesser on the upper surface as compared to that on the lower surface of leaf.
- The stomata are kidney shaped in dicots and dumbell- shaped in monocots.
- Fewer stomata on the upper surface prevent excessive loss of water due to transpiration as this surface is directly exposed to sunlight.
- In aquatic plants stomata are either absent or non-functional. Stomata are absent in roots also.

PRECAUTIONS :

1. The epidermal peel should be taken from a freshly plucked leaf
2. The peel should be mounted in center of the slide
3. The peel should not be allowed to dry
4. Place the cover slip gently to avoid air bubbles
5. Oozing of glycerin should be avoided

6. Do not add too much stain
7. The peel should not be allowed to curl

QUESTIONS

- What is the function of guard cells in stomata?
- Why is the number of stomata greater on the lower surface of a leaf?
- Why are stomata absent in roots?
- What is the shape of guard cells in stoma of grass leaf?
- Do guard cells have rigid or elastic walls? Justify your answer.

EXPERIMENT 2

AIM

To study the liberation of carbon dioxide gas during aerobic respiration.

THEORY

Respiration is a catabolic process wherein food is oxidized to release energy for various life processes. It is of two types, namely (i) aerobic respiration that takes place in the presence of oxygen, and (ii) anaerobic respiration that takes place in the absence of oxygen. In aerobic respiration the breakdown of food (glucose) leads to the release of carbon dioxide gas, water and energy in the form of adenosine triphosphate (ATP). Most organisms that we see around us undergo aerobic respiration. Yeast and certain microorganisms and cells of skeletal muscles in our body undergo anaerobic respiration.

MATERIALS REQUIRED

Germinating gram seeds, KOH solution, petroleum jelly, a conical flask (100 mL), a beaker (250 mL), a single-bore cork, a clean delivery (bent) tube, a small test tube, a piece of thread, and a measuring scale.

PROCEDURE

1. Take about forty germinating seeds in a conical flask.
2. Fix the cork to the mouth of the conical flask and with the help of a thread, suspend the tube containing KOH solution (as shown in Fig).
3. Insert one end of a clean delivery tube in the conical flask through the cork. Dip the other end of the delivery tube in a beaker filled with water as shown in Fig. There will be a rise of water level inside the delivery tube at the end dipped in the water due to capillary action. Mark the position of water level in the tube. This is the initial reading (h) of water level in the delivery tube. (Mark the initial position of water level on the delivery tube with a sketch pen.)
4. Make the conical flask air-tight by applying a thin smear of petroleum jelly so that the gas evolved during the process of respiration by the germinating seeds does not leak out.
5. Keep this set-up undisturbed for about forty five minutes in bright sunlight.

6. Do you find any change in the water level inside the delivery tube after forty five minutes? Does it increase? Note and record the final water level (h2) in the delivery tube. (Mark the final level of water in the delivery tube with a sketch pen.)

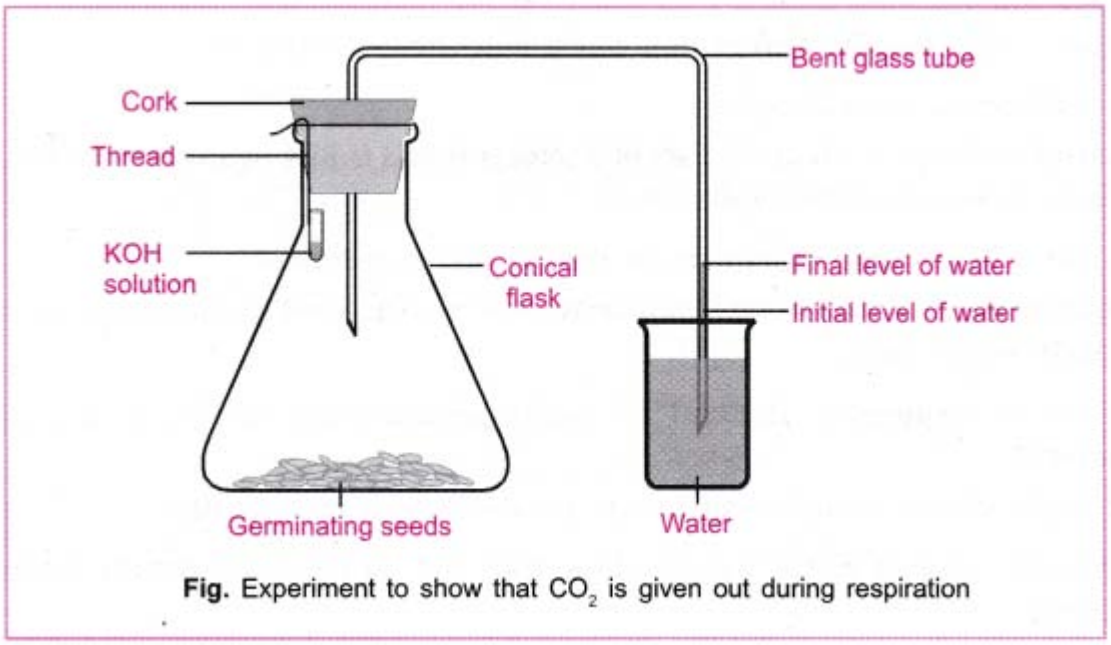


Fig. Experiment to show that CO_2 is given out during respiration

OBSERVATIONS: After sometime the water level rises in the bent tube.

RESULT: The rising of water level indicates that CO2 is produced by germinating seeds. The CO2 produced is absorbed by KOH solution. This creates a partial vacuum in the conical flask. The air from bent tube moves into the conical flask which pulls the water up in the bent tube. Thus the level of water rises in the bent tube.

PRECAUTIONS:

1. All connections should be air tight.
2. Freshly prepared concentrated solution of potassium hydroxide should be used.
3. KOH is corrosive. Handle it carefully.

EXPERIMENT 3

AIM

To study binary fission in *Amoeba* or *Paramecium* and budding in yeast and *Hydra.*

THEORY

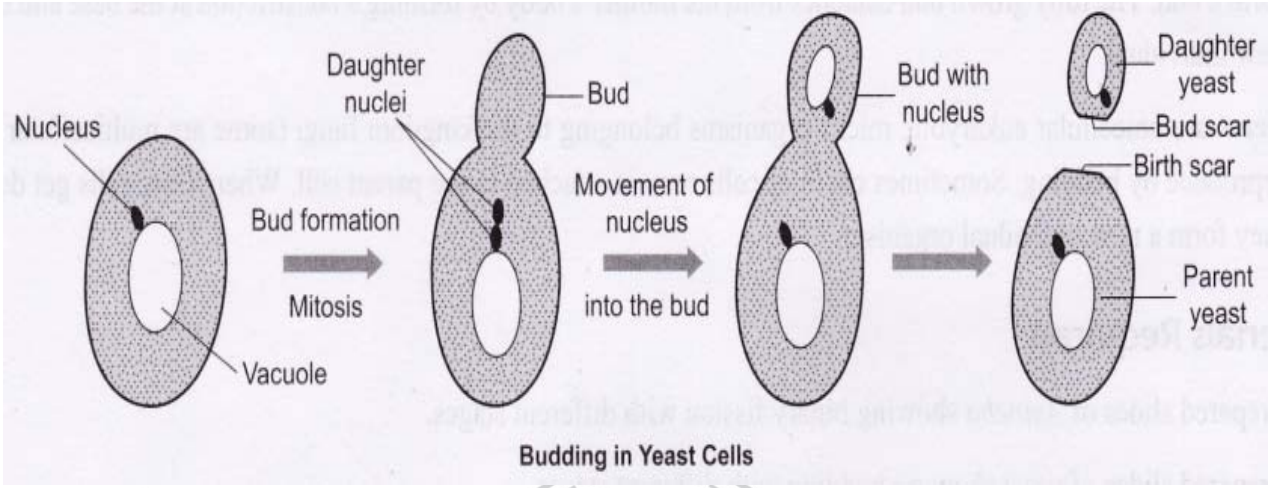
Binary fission and budding are forms of asexual reproduction in lower organisms, like bacteria, unicellular protozoans, and a few other animals. In binary fission, the parent cell divides into two daughter cells by amitosis and each daughter cell grows into an adult. The division of nucleus is called amitosis because the stages of a typical mitotic division are not observed in these cells. Budding is commonly seen in yeast and *Hydra.Hydra* is a tiny freshwater organism which produces young ones from its body laterally. Yeast is a unicellular organism which produces a chain of cells attached to the parent cell.

MATERIALS REQUIRED

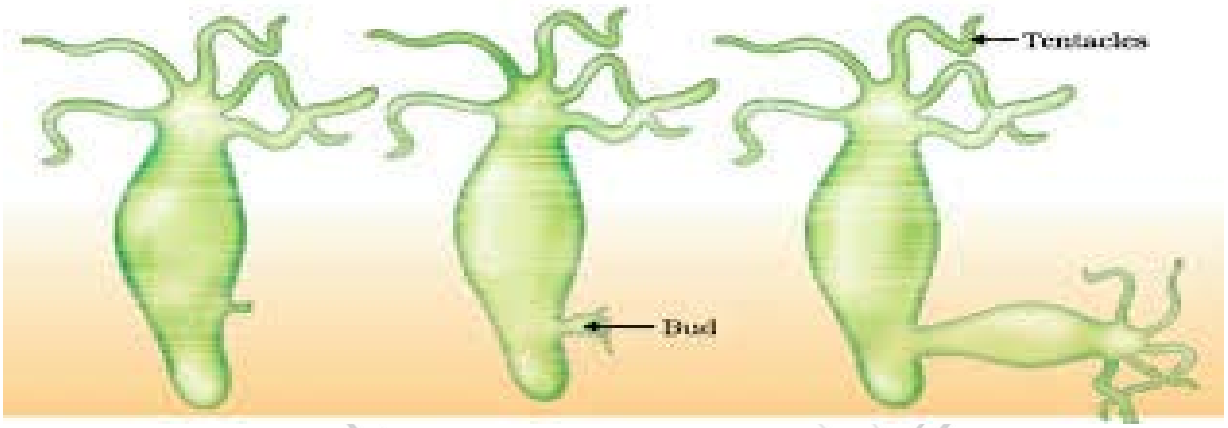
A compound microscope, permanent slides of binary fission in *Amoeba or Paramecium*; budding in yeast and *Hydra*; charts of binary fission and budding.

PROCEDURE

1. Focus the slide under high power of compound microscope.
2. Observe the stages in binary fission and budding
3. Draw diagrams of the stages in binary fission and budding.



Budding in Yeast Cells



Budding in *Hydra*

EXPERIMENT 4

IDENTIFICATION OF PARTS OF AN EMBRYO OF DICOT SEED

EXPERIMENT 10

Aim

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

Requirements

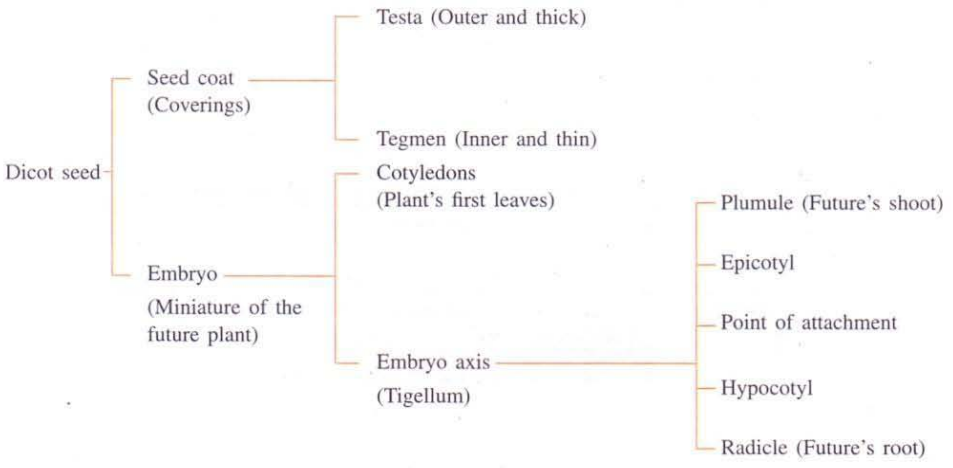
Dicot seeds (Pea, gram or red kidney bean), needle, petri plate, blotting papers.

Basic Principle Involved

Ripened ovule is called seed. This is a final product of sexual reproduction. Seeds are of two types.

(i) Endospermic or albuminous seeds. Examples are monocot plants like wheat, rice and maize.

(ii) Non-Endospermic or exalbuminous seeds. Examples are dicot plants like pea, gram, red kidney bean. Various parts of a dicot seed are shown in the following flow-chart:



Procedure

1. Keep the bean seed on wet cotton in petri plate for one day.
2. With the help of the needle, remove the seed coat and display it on wet blotting paper.
3. On removing the seed coat, the embryo of the seed is seen. Gently open the cotyledons and observe the attachment of embryo axis to the cotyledons.
4. Remove the embryo axis from the cotyledons.
5. Display the cotyledons and embryo axis on the blotting paper.

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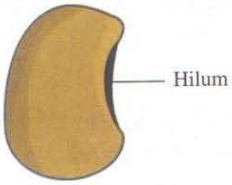
Observations

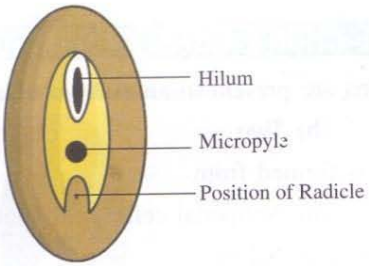
1. Concave side of red kidney bean seed is darker with a whitish scar called hilum. It is the point where the stalk or funicle of the seed was attached. Hilum may be called as belly button of the seed.
2. Micropyle is a pore on one end of hilum, water enters the seed through this pore during seed germination. This pore can be seen on pressing a soaked seed when a drop of water or air is found to ooze out of it.
3. The seed is covered by a thick outer seed coat called testa and a thin inner transparent tegmen.
4. Embryo has two large cotyledons and one embryo axis or tigellum. Cotyledons are curved and have become large due to storage of food. These become the first leaves of the plant.
5. The upper end of embryo axis is the plumule (future shoot). It has two small folded leaves.
6. The lower end of embryo axis which projects beyond the cotyledons is the radicle (future root).
7. The part of embryo axis between plumule and point of attachment is called epicotyl.
8. The part of embryo axis between radicle and point of attachment is called hypocotyl.

Precautions

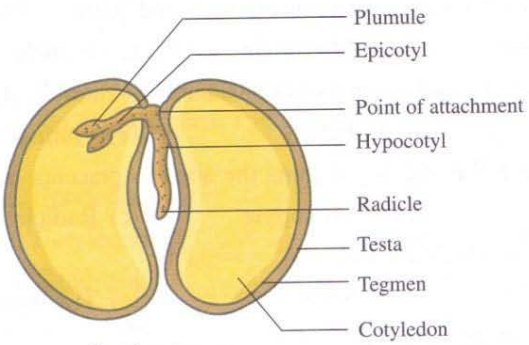
- Seeds must be soaked in water before observing its parts.
- The seed coat should be removed gently.



Lateral view



Ventral view



Seed cut open

Red kidney bean seed with different views

VIVA VOCE

T. *What is seed?*

S. Ripened ovule is called seed.

T. *How many seed coats are generally present in a seed?*

S. Two, outer one is called testa and inner one is called tegmen.

T. *Name the part of embryo axis which is present between point of attachment and plumule.*

S. Epicotyl.

T. *Name the point where funicle was attached.*

S. Hilum.

T. *Which seed coat is thin and transparent?*

S. Tegmen.

T. *What is embryo?*

S. Embryo is a part of seed, it has two main parts. (a) Cotyledons (b) Embryo axis.

T. *What is a radicle?*

S. It is the lowermost part of embryo axis which is destined to be the root.

T. *What is a plumule?*

S. It is the uppermost part of embryo axis which is destined to be the stem.

T. *Name the part of seed which is present in monocot seeds but generally absent in dicot seeds.*

S. Endosperm.

T. *What are cotyledons?*

S. The cotyledons are the organs which adhere to the embryo axis, called point of attachment. These become the first leaves of the plant. Their purpose is to supply nourishment to the young plant until it is in a condition to make food for itself.

SANSKRITI SCHOOL
Dr. S. Radhakrishnan Marg,

Academic Session: 2020-21 Pre-board-Examination
Subject: Science
Class -X

Time:3Hours **Max marks:80**

General Instructions:

- The reading time is from 9:25 am to 9:40am.
- The writing time is from 9:40 am to 12:40pm.
- By 1:00 pm, the PDF file of the answer sheets needs to be created, attached and submitted. Once submitted, it can't beresubmitted.
- Children who avail extra time, may submit the answer sheets by 2:00pm.
- The Answer sheets need to be scanned and uploaded as a single PDF file in portrait mode. Make sure that you turn in the work in the time frameassigned.
- No image to beuploaded.
- This paper has _14_pages.

(i) *The question paper comprises four sections A, B, C and D. There are 36 questions in the question paper. All questions arecompulsory.*

(ii) *Section–A - question no. 1 to 20 - all questions and parts thereof are of one mark each. These questions contain multiple choice questions (MCQs), very short answer questions and assertion - reason type questions. Answers to these should be given in one word or onesentence.*

(iii) *Section–B - question no. 21 to 26 are short answer type questions, carrying 2 marks each. Answers to these questions should be in the range of 30 to 50words.*

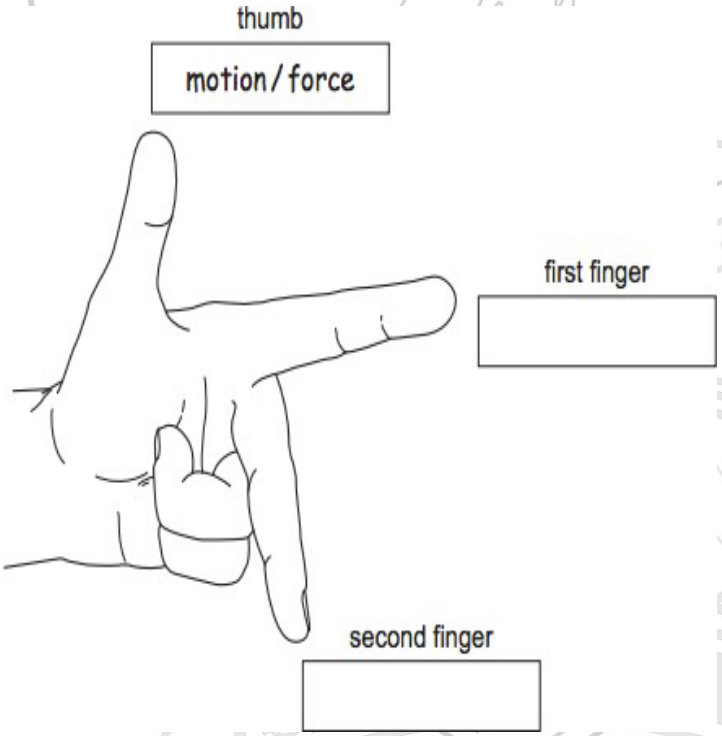
(iv) *Section–C - question no. 27 to 33 are short answer type questions, carrying 3 marks each. Answers to these questions should be in the range of 50 to 80words.*

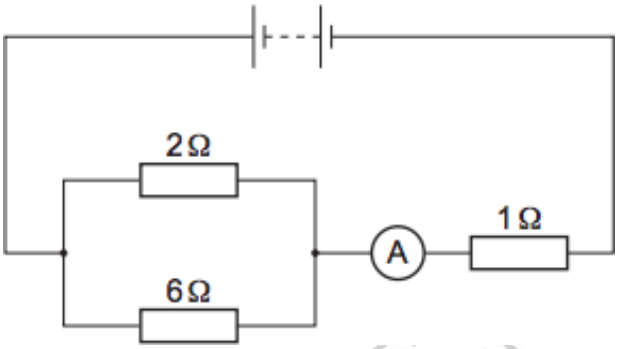
(v) Sections–D – question no. - 34 to 36 are long answer type questions carrying 5 marks each. Answers to these questions should be in the range of 80 to 120words.

(vi) *There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in suchquestions.*

(vii) *Wherever necessary, neat and properly labeled diagrams should bedrawn.*

Q1.	Write balanced chemical equations for the following reaction Sodium metal reacts with water to form sodium hydroxide and hydrogen gas. OR What is the colour of ferrous sulphate crystals? Explain with equation, how does this colour change after heating?	1

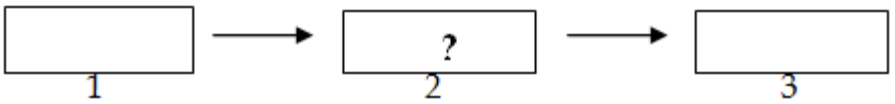
Q2.	"Sodium hydrogencarbonate is a basic salt". Justify the statement.	1
Q3.	What is the difference in the molecular formula of any two consecutive members of a homologous series of organic compounds? Write the second homologue of the Alkane series.	1
Q4.	Why are the danger signals Red?	1
Q5.	If the radius of curvature of a convex mirror is 30 cm, find its focal length.	1
Q6.	The image formed by a mirror is real inverted and highly enlarged, where will you place the object? Also name the type of the mirror. OR The Sunrays are converged at a point by a lens. Name the point at which the rays are converged and the type of the lens.	1
Q7.	 Observe the above figure and fill in the blanks. The firstfingerrepresents_____and the second fingerrepresent _____.	1

Q8.	Draw magnetic field lines around a current carrying circular coil.	1
Q9.	From the given figure, find the effective resistance of the given circuit.  	1
Q10.	Why is transpiration important for plants?	1
Q11.	How is the wall of small intestine adapted for performing the function of absorption of nutrients? Any two points OR Out of a rabbit and a tiger, which one will have a longer small intestine? Justify.	1
Q12.	If salivary amylase is lacking in the saliva, which event in the mouth will be affected?	1

Q13.	Name two contents of the initial filtrate that are reabsorbed.	1
	Directions: For question number 14,15 and 16, one labelled Assertions (A) and the other labeled Reason (R) select the correct answerto these questions from the codes (a), (b),(c), and(d). (a) Both the A and R are correct and the R is thecorrect explanation of theassertion (b) Both A and the R are correct but the R is not thecorrect explanation of theassertion (c) A is true but the R isfalse (d) A is false but the R istrue.	
Q14.	Assertion: White Silver chloride turns grey in the presence of sunlight. Reason: In the presence of sunlight, silver chloride decomposes into silver metal and chlorine gas.	1

Q15.	Assertion: In the alveoli exchange of gases takes place, oxygen from alveoli diffuses into blood and carbon dioxide from blood diffuses into alveoli. Reason: Alveoli increases surface area for exchange of gases. a. Both Assertion and Reason are true, and Reason is the correct explanationof theassertion. b. Both Assertion and Reason are true, but Reason is not the correctexplanation of theassertion. c. Assertion is true, but Reason isfalse. d. Assertion is false, but Reason istrue.	1
Q16.	Assertion: A geneticist crossed a pea plant having violet flowers with a pea plant with white flowers; he got all violet flowers in first generation. Reason: White colour gene is not passed on to next generation. a. Both Assertion and Reason are true, and Reason is the correct explanationof theassertion. b. Both Assertion and Reason are true, but Reason is not the correctexplanation of theassertion. c. Assertion is true, but Reason isfalse. d. Assertion is false, but Reason istrue.	1
	QUESTION NUMBERS 17-20 CONTAIN 5 SUBPARTS EACH, YOU ARE EXPECTED TO ANSWER ANY 4 SUBPARTS IN EACH	1X4
Q17.	Read the following and answer any four questions from 17 A to 17 E The various components of an ecosystem are interdependent. The producers make the energy from sunlight, which is available to the rest of the ecosystem. There is a flow and loss of energy from one trophic level to the next limits the number of trophic levels in a food-chain. Toxic substances accumulate in the food chain due to the use of several pesticides and other chemicals to protect our crops from diseases and pests. As these chemicals are not degradable, these get accumulated progressively at each trophic level. Human activities also have an impact on the environment. The use of chemicals like CFCs has endangered the ozone layer, this could damage the environment. A. Which of the following statements about the autotrophs is incorrect? a. They synthesize carbohydrates from carbon dioxide and water inthe presence of sunlight andchlorophyll b. They store carbohydrates in the form ofstarch c. They convert carbon dioxide and water into carbohydrates in the absenceof sunlight d. They constitute the first trophic level in foodchains.	1X4

B. In a food chain the second trophic level is occupied by:

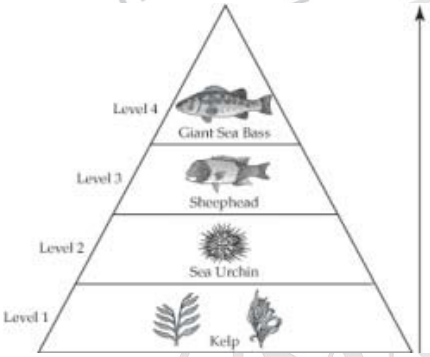


a. Carnivores
b. Autotrophs
c. Herbivores
d. Producers

C. Which of the following may be the conclusions of the excessive exposure of humans to sun's ultraviolet rays?
1 Peptic ulcers
2. Eye disease likecataract
3. Damage tolungs
4. Skincancer

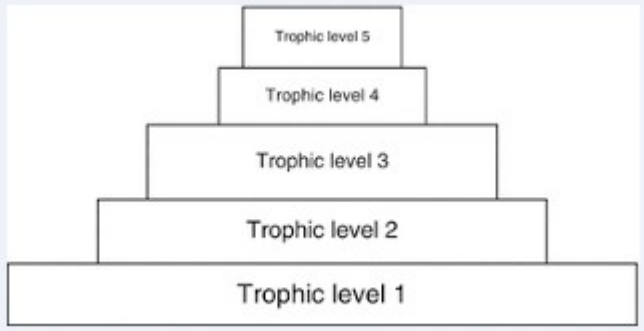
a. 1 and4
b. 2, 3 and4
c. 2 and4
d. Only4

D. If 100 J energy is available at the producer level in a food chain then the energy available to the secondary consumer will be:



a. 10J
b. 0.1J
c. 1J
d. 0.01J

E. The process of accumulation of harmful chemical substances like pesticides, in the body of living organisms at each trophic level of a food chain is known as:



a. Biologicalmagnification
b. Biologicalaccumulation
c. Chemicalmagnification

Chemicalaccumulation

Q18. Read the given passage and answer the questions that follow: 1 x 4

Elements are arranged in the Modern Periodic table in increasing order of their atomic numbers. Metals are on the left hand side and middle of the periodic table mainly and nonmetals are on the right hand side. A zig-zag diagonal line divides metals and non-metals. Elements near the zig-zag line are called metalloids. Metals are electropositive whereas non-metals are electronegative.

Elements of the same group have the same number of valence electrons but different number of shells. Elements of the same period have different number of valence electrons but same number of shells.

Elements in the middle of periodic tables are called transition metals.

(a) Which one of the following statements is correct
(i) All groups contain both metal and non-metals.
(ii) In group 17, reactivity increases down thegroup.
(iii) In group 1, reactivity decreases down thegroup.
(iv) Atoms of the same group have the same number of valenceelectrons.

(b) How does atomic size change down the group and across theperiod.

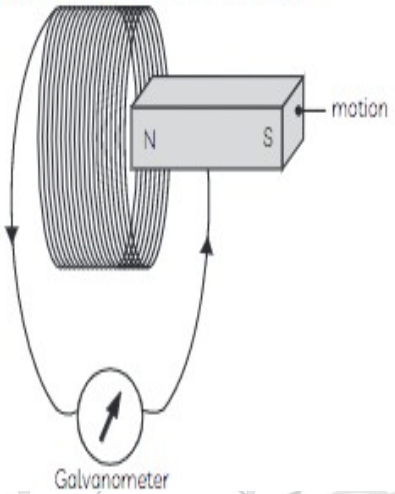
(c) Why group 1 elements are called alkalimetals.

(d) How does the reactivity of non- metals change andwhy?
(i) Decreases down thegroup
(ii) Increases down thegroup
(iii) Does not change down thegroup
(iv) Shows irregular trends down thegroup.

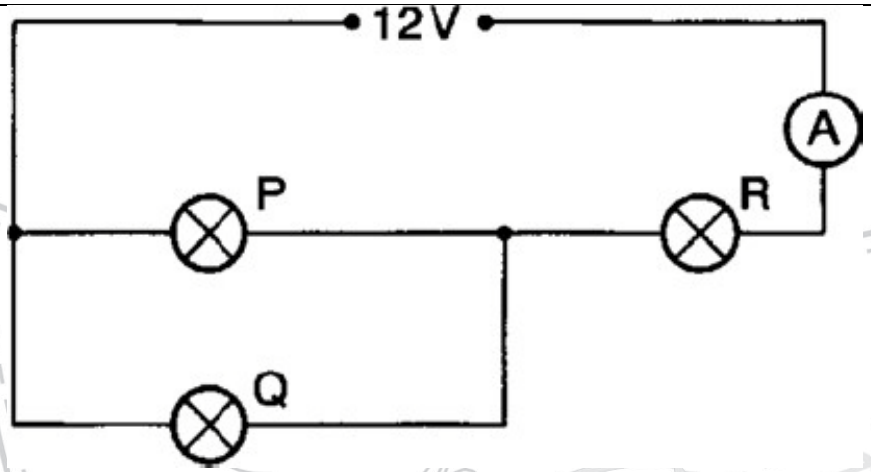
(e) Out of the alkali metals Sodium and Potassium, which one is more metallic and why?

Q19.	Analyze the table given below for a convex lens and answer the following questions 19 (i) The focal length of the convex lens is a) – 10cm b) +10cm c) – 20cm d) + 20 cm 19 (ii) For what object distance, the corresponding image distance is incorrect a) -60cm b) – 30cm c) -9cm d) -12cm 19 (iii) If a student wants to find the focal length of the this lens where should the object be placed a) Atfocus b) At center ofcurvature c) Atinfinity d) At the optical center 19(iv) The magnification of the lens when the object is placed at 15 cm in front of the mirror is a) -2 b) -1 c)+2 d) +1 19 (v) A student writes a few statements for convex lens. I. The convex lens forms only realimages II. The convex lens forms real image of the same size as theobject. III. The convex lens never forms the image on the same side as theobject is. The incorrect statement(s) is/are a) Ionly b) I and IIonly c) I and IIIonly All I, II andIII	1X4

S.No.	OBJECT DISTANCE (u) cm	IMAGE DISTANCE (v) cm
1.	- 60	+12
2.	- 30	+ 15
3.	- 20	+ 20
4.	- 15	+ 30
5.	-12	+ 60
6.	- 9	+ 90

Q20.	The space surrounding a magnet in which magnetic force is exerted, is called a magnetic field. The direction of magnetic field lines at a place can be determined by using a compass needle. A compass needle placed near a magnet gets deflected due to the magnetic force exerted by the magnet. The north end of the needle of the compass indicates the direction of magnetic field at the point where it is placed. When the magnet shown in the diagram below is moving towards the coil, the galvanometer gives a reading to the right.  20 (I) The direction of induced current is given by a) Right hand thumbrule b) Fleming's right handrule c) Fleming's left handrule d) Maxwell's right handrule 20 (II) What is the condition of electromagnetic induction? a) There has be a relative motion between galvanometer andcoil b) There has be a relative motion between galvanometer andmagnet c) There has be a relative motion between magnet andcoil d) None ofthese 20 (III) The induced current is highest when a) Direction of magnetic field is perpendicular to the direction of motionof thecoil b) Direction of magnetic field is parallel to the direction of motion ofthe coil c) Direction of magnetic field is opposite to the direction of motion ofthe coil d) None ofthese 20(IV) When the magnet is moved towards the coil a) There is nodeflection b) There is a momentarydeflection	1X4

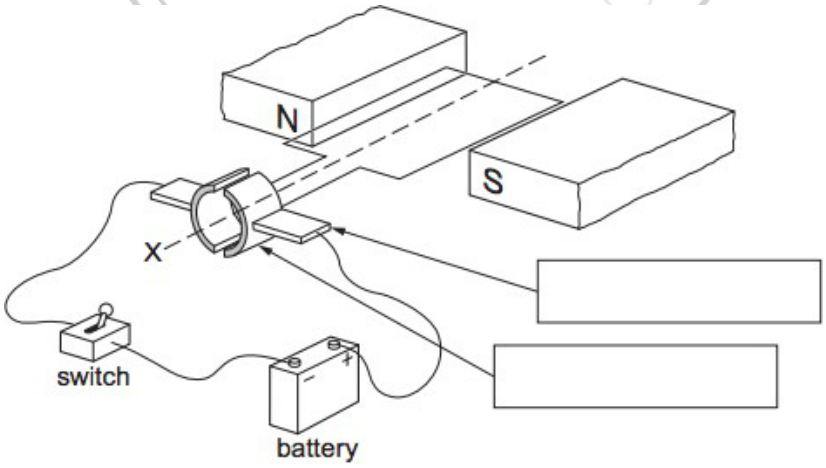
	c) The galvanometer needle keepsswinging d) None ofthese 20 (V) The induced current will be more when I) A strong magnet isused II) There is more number of turns per unitlength III) A soft iron core isinserted a) Ionly b) I andII c) I, II andIII d) None ofthese	
	SECTION – B	
Q21.	All plants give out oxygen only during the day but carbon dioxide is given out during the day and night. Do you agree with this statement? Give reason. OR Bile juice does not have any digestive enzyme but still plays a significant role in the process of digestion. Justify the statement.	2
Q22.	Why binary fission, budding, and fragmentation are considered as asexual types of reproduction? With a neat diagram explain the process of regenerationin *Planaria*.	2
Q23.	Give reasons for the following observations: (a) The element carbon forms a very large number ofcompounds. (b) The covalent bond between carbon atoms is verystrong. OR (a) How many covalent bonds are there in a molecule of ethane(C_2H_6)? (b)Write the electron dot structure of ethane molecule(C_2H_6).	2
Q24.	(a) Define reactivity series of metals. Arrange the metals gold, copper, ironand magnesium in order of their increase inreactivity. (b) What will you observewhen: (i) Some zinc pieces are put in copper sulphatesolution.	2

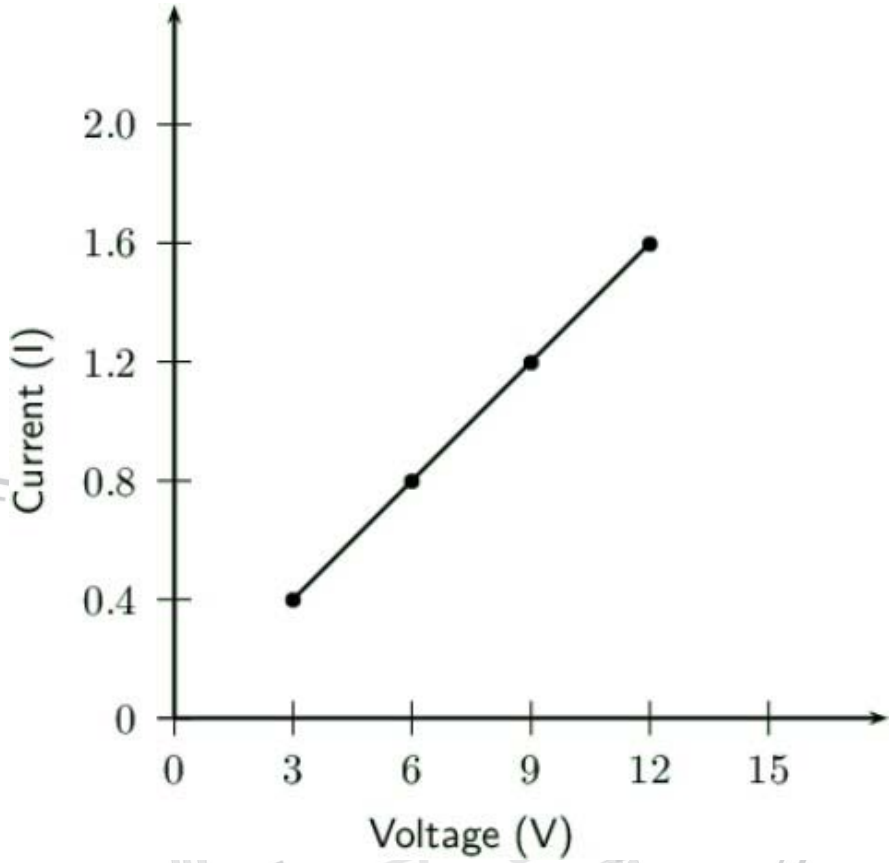
	(ii) Some silver pieces are put into green coloured ferrous sulphatesolution. OR When a metal X is treated with cold water, it gives a base Y with molecular formula XOH (Molecular mass = 40) and liberates a gas Z which easily catches fire. Identify X, Y and Z and write the chemical reactions involved.	
Q25.	Draw a neat-labeled diagram to show refraction through a glass prism.	2
Q26.	 From the figure given above I) Find the effective resistance of the circuit. (All three lamps are identical and having rating 24 W, 12V) II) Find the value of current throughammeter.	2

	SECTION – C	
Q27.	Draw a diagram of the longitudinal section of a bisexual flower and label the following parts: a. Gamete producing organ in female reproductivesystem b. Gamete producing organ in male reproductivesystem c. Part that attracts insects forpollination d. Part that protects thebuds OR Draw a diagram showing the germination of pollen in a flower and Label the following parts: a. Part of a flower on which the germination of pollenoccurs b. Part that transfers the male germ cell forfertilization c. Part that formsfruit d. Part that develops a tough coat and is converted into aseed	3

Q28.	a. Give two points of difference between aerobic respiration andanaerobic respiration. b. Give reason, During the breathing cycle, when air is taken in and let out,the lungs always contain a residual volume ofair.	3(2+1)
Q29.	When a tall pea plant is crossed with a dwarf pea plant, F_1 generation plants are obtained, the pea plants of the F_1 generation are then self-crossed. With the help of the Punnett square state the following in the resultant plants. a. Which trait was expressed in F_1Generation b. State the Genotype ratio and Phenotype ratio of tall plants todwarf plants in F_2Generation. c. Give reason, the trait that was expressed in F_2 generation did not appear in F1generation.	3
Q30.	i) When a solution of potassium iodide is added to a solution of lead nitrate in a test tube, a reaction takes place. (a) What type of reaction is this? (b) Write a balanced chemical equation to represent the above reaction. ii)Define combination reaction. Give one example of a combination reaction which is also exothermic.	3
Q31.	The elements of the second period of the Periodic Table are given below: Li Be B C N O F (a) Give reason to explain why atomic radii decrease from Li to F. (b) Identify the most (i) metallic and (ii) non-metallic element. (c) How does the valency change when we move from Li to F	3

Q32.	(a) Write the electron dot structures for potassium andchlorine. (b) Show the formation of KCl by the transfer ofelectrons. (c) Name the ions present in the compound,KCl.	3
Q33.	I) Define magnification in terms of sphericalmirrors. II) If a converging mirror forms a real image, 40 cm away from the mirrorwhen an object is placed at a distance of 20 cm in front of the pole of the mirror. Find the focal length of themirror.	3

	SECTION-D	
Q34.	i) Explain why is hydrochloric acid a strong acid and acetic acid, a weak acid. How can it be verified? (ii) Explain why aqueous solution of an acid conductselectricity. (iii) You have four solutions A, B, C and D. The pH of solution A is 6, B is 9,C is 12 and D is7, (a) Identify the most acidic and most basicsolutions. (b) Arrange the above four solutions in the increasing order of H^+ion concentration. (c) State the change in colour of pH paper on dipping it in solution C and D. OR i) A metal compound 'X' reacts with dil. H_2SO_4 to produce effervescence, The gas evolved extinguishes a burning candle. If one of the compounds formedis calcium sulphate, then what is 'X' and the gas evolved? Also, write abalanced chemical equation for the reaction whichoccurred. ii) State the chemical name of Plaster of Paris. Write a chemical equationto show the reaction between Plaster of Paris andwater.	5
Q35.	a. State any two methods ofcontraception. b. What could be the reasons for adopting contraceptivemethods.(any two) c. Name one sexually transmitted disease caused due to bacteria andvirus.	5
Q36.	i) Name the device shown in the above figure. ii) Label the parts indicated byarrows. iii) State which way the coil will rotate when viewed from positionX. iv) Give two ways to increase the speed of rotation of thecoil. OR  i) Name and state the law depicted by the above figure. ii) Draw a neat – labeled circuit diagram required to prove thislaw. iii) Find the resistance from thefigure.	5



Sample Question Paper

2020-21Class X

Science(086)Theory

Time:3Hours **MaximumMarks:80**

GeneralInstructions:

(i) *The question paper comprises four sections A, B, C and D. There are 36 questions inthequestion paper. All questions arecompulsory.*

(ii) *Section–A - question no. 1 to 20 - all questions and parts thereof are of one mark each.Thesequestionscontainmultiplechoicequestions(MCQs),veryshortanswerquestions and assertion - reason type questions. Answers to these should be given inoneword or onesentence.*

(iii) *Section–B - question no. 21 to 26 are short answer type questions, carrying 2 markseach.Answers to thesequestions should in therangeof 30 to 50 words.*

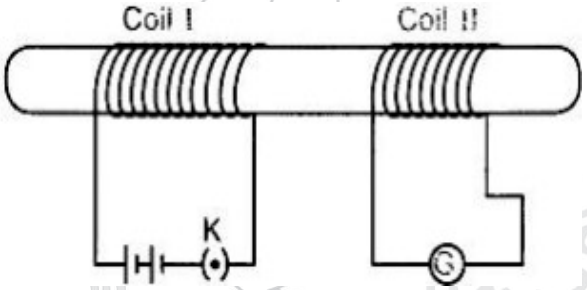
(iv) *Section–C - question no. 27 to 33 are short answer type questions, carrying 3 markseach.Answers to thesequestions should in therangeof 50 to 80 words.*

(v) *Section–D – question no. - 34 to 36 are long answer type questions carrying 5 markseach.Answer to thesequestionsshould bein therangeof80 to 120 words.*

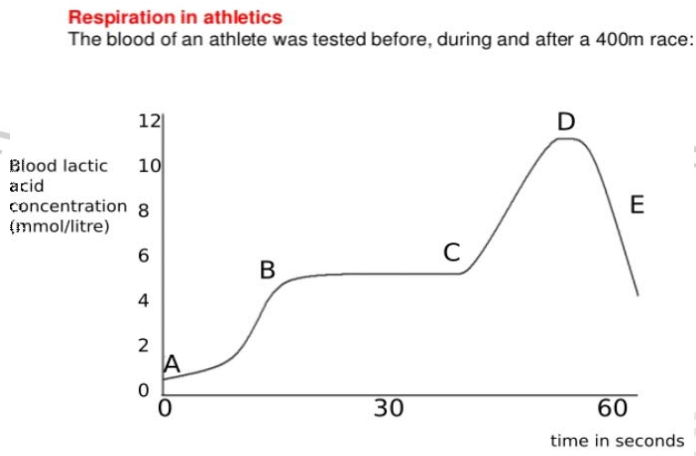
(vi) *There is no overall choice. However, internal choices have been provided in somequestions.Astudenthasto attemptonlyoneofthealternatives insuch questions.*

(vii) *Wherevernecessary,neatandproperlylabeleddiagramsshouldbedrawn.*

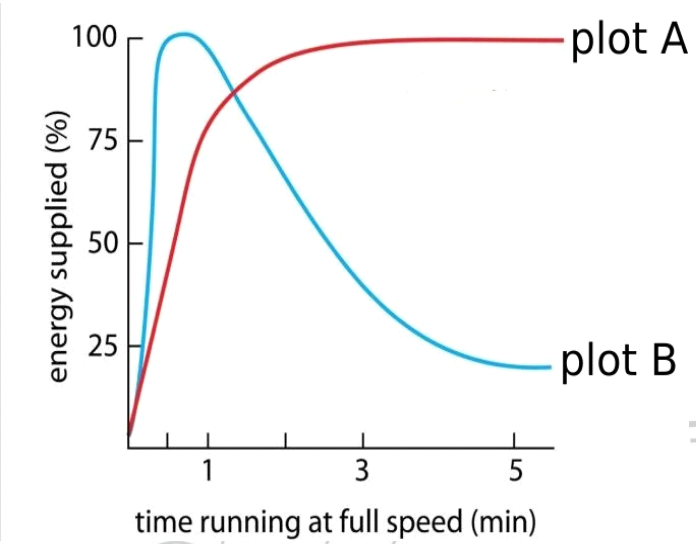
SECTIONA		
No.	Questions	Marks
1	ListanytwoobservationswhenFerrousSulphateisheatedinadrytest tube? **OR** Identifytheproductsformedwhen1mLofdil.Hydrochloricacidisaddedto1gof Sodiummetal?	1
2	Writethechemicalnameandchemicalformulaofthesaltusedtoremovepermanenthardness of water.	1
3	Whichofthefollowingis**not**observedinahomologousseries?Givereasonforyour choice. a) Changeinchemicalproperties b) Differencein-CH_2and14umolecularmass c) Gradationinphysicalproperties d) Samefunctionalgroup	1

4	WhydoestheSunappearwhiteat noon?	1
5	Bothasphericalmirrorandathinsphericallenshaveafocallengthof**(-)15cm**.What typeof mirror and lens arethese?	1
6	Theimageformedbyaconcavemirrorisobservedtobereal,invertedandlargerthan theobject. Whereis theobject placed? **OR** Namethepartofalensthroughwhicharayoflightpasseswithoutsufferinganydeviation.	1
7	Inthearrangementshowninfiguretherearetwocoilswoundonanon-conducting cylindrical rod. Initially the key is not inserted in the circuit. Laterthekey is inserted and thenremoved shortly after.  Whatarethetwoobservationsthatcanbenotedfromthegalvanometerreading?	1
8	Drawthemagneticfieldlinesaroundastraightcurrentcarryingconductor.	1
9	Two unequal resistances are connected in parallel. If you are not provided withany other parameters (eg. numerical values of I and R), what can be said aboutthevoltagedrop across thetwo resistors? **OR** Some work is done to move a charge Q from infinity to a point A in space. Thepotential of the point A is given as V. What is the work done to move thischargefrominfinity in terms of Q and V?	1
10	Veinsarethinwalledandhavevalves.Justify.	1
11	Howisthewallofsmallintestineadaptedforperformingthefunctionofabsorptionof food? **OR** Outofagoatandatiger,whichonewillhavealongersmallintestine?Justifyyouranswer.	1

12	Explainhowozonebeingadeadlypoisoncanstillperformanessentialfunctionfor our environment. **OR** Givereasonwhyafoodchain cannothavemorethanfourtrophiclevels.	1
13	Statetheroleofpancreasindigestion offood.	1
	For question numbers **14, 15** and **16**, two statements are given- one labeled **Assertion (A)** and theother labeled **Reason (R)**. Select the correct answer to these questions from the codes (a), (b), (c)and(d) as given below: a) BothAandRaretrue,andRiscorrectexplanationoftheassertion. b) BothAandRaretrue,butRisnotthecorrectexplanationoftheassertion. c) Ais true, butR is false. d) Ais false, butR is true.	
14	**Assertion**:Afterwhitewashingthewalls,ashinywhitefinishonwallsisobtainedafter two to threedays. **Reason**:CalciumOxidereactswithCarbondioxidetoformCalciumHydrogenCarbonatewhich gives shinywhitefinish.	1
15	**Assertion:**Foodchainisresponsiblefortheentryofharmfulchemicalsinourbodies. **Reason:**Thelengthandcomplexityoffoodchainsvarygreatly. **OR** **Assertion:**Greaternumberofindividualsarepresentinlowertrophiclevels. **Reason:**Theflowofenergyisunidirectional.	1
16	**Assertion:**Ageneticistcrossedapeaplanthavingvioletflowerswithapeaplantwith whiteflowers, hegotall violetflowers infirst generation. **Reason:**Whitecolourgeneisnotpassedontonextgeneration.	1
Answer Q. No 17 - 20 contain five sub-parts each. You are expected to answer <u>any four</u> sub-partsin thesequestions.		
17	<u>Readthefollowing andanswerany **four**questionsfrom17(i) to17(v)</u> All living cells require energy for various activities. This energy is available bythe breakdown of simple carbohydrates either using oxygen or without usingoxygen.	1x4

	(i) Energyinthecaseofhigherplantsandanimalsisobtainedby a) Breathing b) Tissuerespiration c) Organrespiration d) Digestionof food	
	(ii)The graph below represents the blood lactic acid concentration of an athleteduringaraceof 400 m andshows apeak at pointD.	
	 Lactic acidproductionhasoccurredintheathlete whilerunninginthe400mrace.Which ofthefollowingprocesses explainsthis event? a) Aerobicrespiration b) Anaerobicrespiration c) Fermentation d) Breathing	

(iii)Study the graph below that represents the amount of energy supplied withrespectto thetimewhileanathleteis runningat fullspeed.



Choosethecorrectcombinationofplotsandjustificationprovidedinthefollowingtable.

	PlotA	PlotB	Justification
a)	Aerobic	Anaerobic	Amountofenergyislowandinconsistentin aerobic and highin anaerobic
b)	Aerobic	Anaerobic	Amountofenergyishighandconsistentin aerobic and lowin anaerobic
c)	Anaerobic	Aerobic	Amountofenergyishighandconsistentin aerobic and lowin anaerobic
d)	Anaerobic	Aerobic	Amountofenergyishighandinconsistentin anaerobic and lowin aerobic

(iv) Thecharacteristicprocessesobservedinanaerobicrespirationare

i) presenceofoxygen
ii) releaseofcarbondioxide
iii) releaseofenergy
iv) releaseoflacticacid

a) i),ii)only
b) i),ii), iii) only
c) ii),iii), iv) only
iv)only

(v) Studythetablebelowandselecttherowthathastheincorrectinformation.

		Aerobic	Anaerobic
a)	**Location**	Cytoplasm	Mitochondria
b)	**EndProduct**	CO_2andH_20	EthanolandCO_2
c)	**Amountof ATP**	High	Low
d)	**Oxygen**	Needed	Notneeded

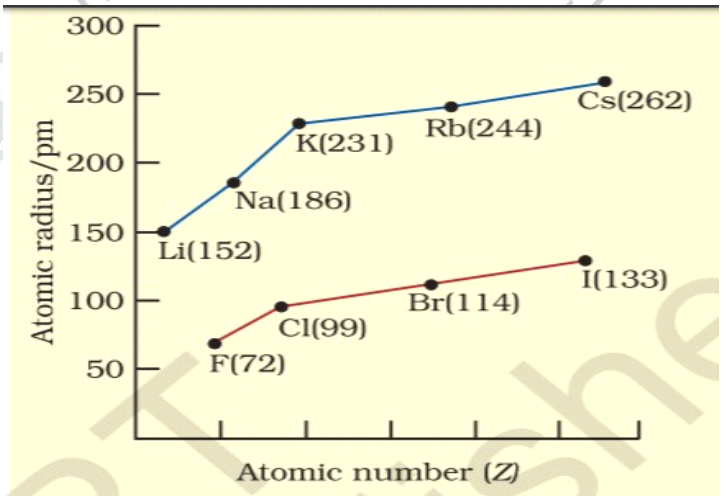
18 Readthefollowing andanswerany **four**questionsfrom18(i) to18(v). 1x 4

MetallicCharacter

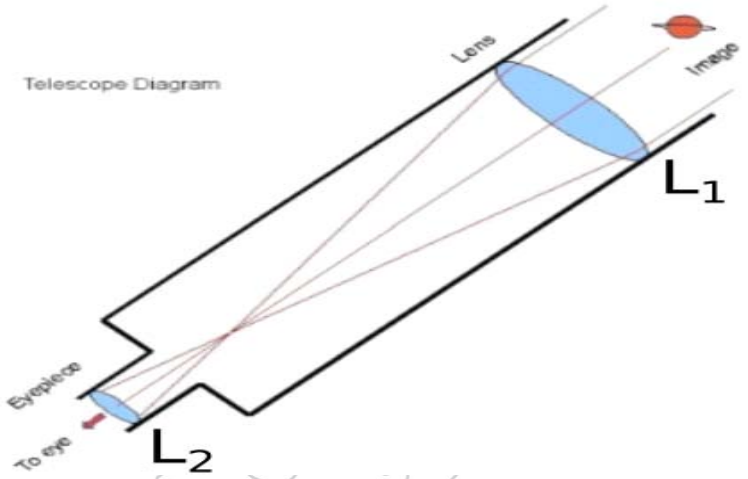
The ability of an atom to donate electrons and form positive ion (cation) isknown as electropositivity or metallic character. Down the group, metalliccharacterincreasesduetoincreaseinatomicsizeandacrosstheperiod,from lefttorightelectropositivitydecreasesduetodecreaseinatomicsize.

Non-MetallicCharacter

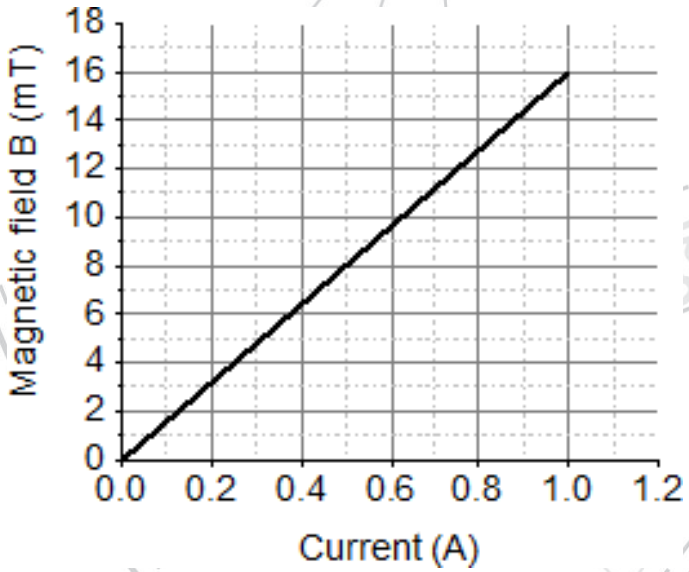
The ability of an atom to accept electrons to form a negative ion (anion) iscalled non-metallic character or electronegativity. The elements having highelectro-negativity have a higher tendency to gain electrons and form anion.Down the group, electronegativity decreases due to increase in atomic size andacross the period, from left to right electronegativity increases due to decreaseinatomicsize.



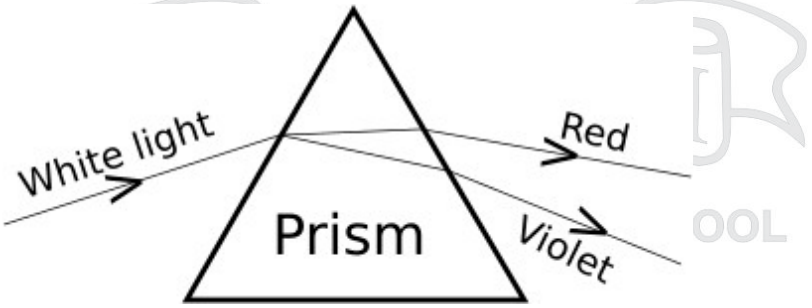
18(i)	Whichofthefollowingcorrectlyrepresentsthedecreasingorderofmetalliccharactero f Alkali metals plottedin thegraph? a) Cs>Rb>Li>Na>K b) K>Rb>Li>Na>Cs c) Cs>Rb>K>Na>Li d) Cs>K>Rb>Na>Li	
18(ii)	HydrogenisplacedalongwithAlkalimetalsinthemodernperiodictablethoughit shows non-metalliccharacter a) asHydrogenhasoneelectron&readilyloseselectrontoformnegativeion b) asHydrogencaneasilyloseoneelectronlikealkalimetalstoformpositiveion c) asHydrogencangainoneelectroneasilylikeHalogenstoformnegativeion d) asHydrogenshows theproperties ofnon-metals	
18(iii)	Whichofthefollowinghashighestelectronegativity? a) F b) Cl c) Br d) I	
18(iv)	Identifythereasonforthegradualchangeinelectronegativityinhalogensdown thegroup. a) Electronegativityincreasesdownthegroupduetodecreaseinatomicsize b) Electronegativitydecreasesdownthegroupduetodecreaseintendencyto loseelectrons c) Electronegativitydecreasesdownthegroupduetoincreaseinatomicradius/t endency to gainelectron decreases d) Electronegativityincreasesdownthegroupduetoincreaseinforcesofattracti onsbetween nucleus &valenceelectrons	
18 (v)	Whichofthefollowingreasoncorrectlyjustifiesthat“Fluorine(72pm)hassmallerato micradius than Lithium(152pm)”? a) FandLiareinthesamegroup.Atomicsizeincreasesdownthegroup b) FandLiareinthesameperiod. Atomicsizeincreasesacrosstheperioddueto increasein number of shells c) FandLiarein thesamegroup.Atomicsizedecreasesdownthegroup d) F and Li are in the same period and across the period atomic size/radiusdecreasesfromleft to right.	

19	Readthefollowing andanswerany **four**questionsfrom19(i) to19(v) Sumati wanted to see the stars of the night sky. She knows that she needs atelescope to see those distant stars. She finds out that the telescopes, which aremade of lenses, are called refracting telescopes and the ones which are made ofmirrorsarecalled reflecting telescopes.  So she decided to make a refracting telescope. She bought two lenses, L_1 andL_2. out of which L_1 wasbigger and L_2 was smaller. The larger lens gathers andbends the light, while the smaller lens magnifies the image. Big, thick lensesaremorepowerful.Sotoseefaraway,sheneededabigpowerfullens.Unfortunately,sherealized thatabig lens isvery heavy. Heavylensesarehardtomakeanddifficulttoholdintherightplace.Also	1x 4
	since the light is passing through the lens, the surface of the lens has to beextremelysmooth.Anyflawsinthelenswillchangetheimage.Itwouldbelikelooking through adirty window.	
19(i)	Basedonthediagramshown,whatkindoflenseswouldSumatineedtomakethetelescope? a) Concavelenses b) Convexlenses c) Bifocallenses d) Flatlenses	
19(ii)	IfthepowersofthelensesL$_1$andL$_2$areintheratioof4:1,whatwouldbetheratioof thefocal length of L_1 and L_2? a)4:1 b)1:4 c)2:1 d)1:1	

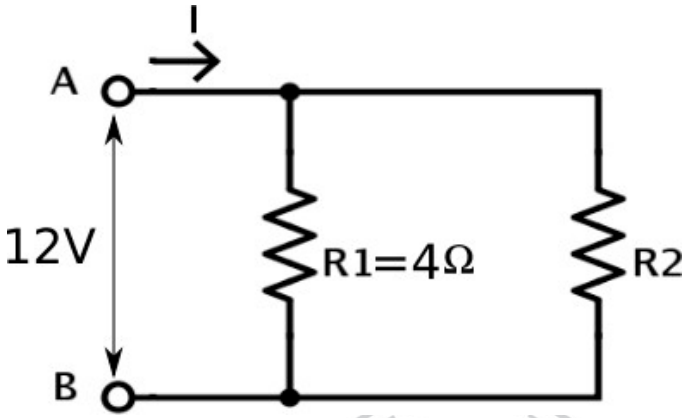
19(iii)	Whatistheformulaformagnificationobtainedwithalens? a) Ratioofheightof imagetoheightof object b) Doublethefocallength. c) Inverseoftheradiusofcurvature. d) Inverseoftheobjectdistance.	
19(iv)	Sumati did some preliminary experiment with the lenses and found out that themagnification of the eyepiece (L_2) is 3. If in her experiment with L_2 she foundanimageat24 cmfromthelens, atwhat distancedid sheputtheobject? a) 72cm b) 12cm c) 8cm d) 6cm	
19 (v)	Sumatiboughtnot-so-thicklensesforthetelescopeandpolishedthem.Whatadvantages,if any,would shehavewith her choiceof lenses? a) Shewillnothaveanyadvantageaseventhickerlenseswouldgiveclearerimages. b) Thickerlenseswouldhavemadethetelescopeeasiertohandle. c) Not-so-thicklenseswouldnotmakethetelescopeveryheavyandalsoallowconsiderableamountof lightto pass. d) Not-so-thicklenseswillgivehermoremagnification.	

20	Readthefollowing andanswer any4 questionsfrom20 (i)to 20(v). A solenoid isa longhelical coil of wire throughwhicha current is run inorder to create a magnetic field. The magnetic field of the solenoid is thesuperposition of the fields due to the current through each coil.It is nearlyuniform inside the solenoid and close to zero outside and is similar to the fieldof a bar magnet having a north pole at one end and a south pole at the otherdepending upon the direction of current flow. The magnetic field produced inthe solenoid is dependent on a few factors such as, the current in the coil,numberof turns per unit length etc. The following graph is obtained by a researcher while doing an experiment toseethevariationofthemagneticfieldwithrespecttothecurrentinthesolenoid. The unit of magnetic field as given in the graph attached is in milli-Tesla (mT)andthecurrentis given in Ampere.  	4
20(i)	Whattypeofenergyconversionisobservedinalinearsolenoid? a. MechanicaltoMagnetic b. ElectricaltoMagnetic c. ElectricaltoMechanical d. MagnetictoMechanical	
20(ii)	Whatwillhappenifasoftironbarisplacedinsidethesolenoid? a. Thebarwillbeelectrocutedresultinginshort-circuit. b. Thebarwillbemagnetisedaslong asthereiscurrentinthecircuit. c. Thebarwillbemagnetisedpermanently. d. Thebarwillnotbeaffectedby anymeans.	

20(iii)	Themagneticfieldlinesproducedinsidethesolenoidaresimilartothatof … a.abarmagnet	
	b. astraightcurrentcarryingconductor c. acircularcurrentcarryingloop d. electromagnetofanyshape	
20(iv)	Afteranalysingthegraphastudentwritesthefollowingstatements. I. Themagneticfieldproducedbythesolenoidisinverselyproportionaltothe current. II. Themagneticfieldproducedbythesolenoidisdirectlyproportionaltothecurr ent. III. Themagneticfieldproducedbythesolenoidisdirectlyproportionaltosquare of thecurrent. IV. Themagneticfieldproducedbythesolenoidisindependentofthecurrent. Choosefromthefollowingwhichofthefollowingwouldbethecorrectstatement(s). a. OnlyIV b. Iand IIIand IV c. Iand II d. OnlyII	
20 (v)	Fromthegraphdeducewhichofthefollowingstatementsiscorrect. a. Foracurrentof 0.8Athemagneticfield is 13mT b. Forlargercurrents,themagneticfieldincreasesnon-linearly. c. Foracurrentof 0.8Athemagneticfield is 1.3mT d. There is not enough information to find the magnetic fieldcorrespondingto 0.8A current.	
	SECTION B	
21	Bilejuicedoesnothaveanydigestiveenzymebutstillplaysasignificantroleintheproces s of digestion. Justify thestatement. **OR** Inbirdsandmammalstheleftandrightsideoftheheartareseparated.Givereasons.	2
22	Statetheeventsoccurringduringtheprocessofphotosynthesis.Isitessentialthattheses tepstakeplaceoneafter theotherimmediately?	2

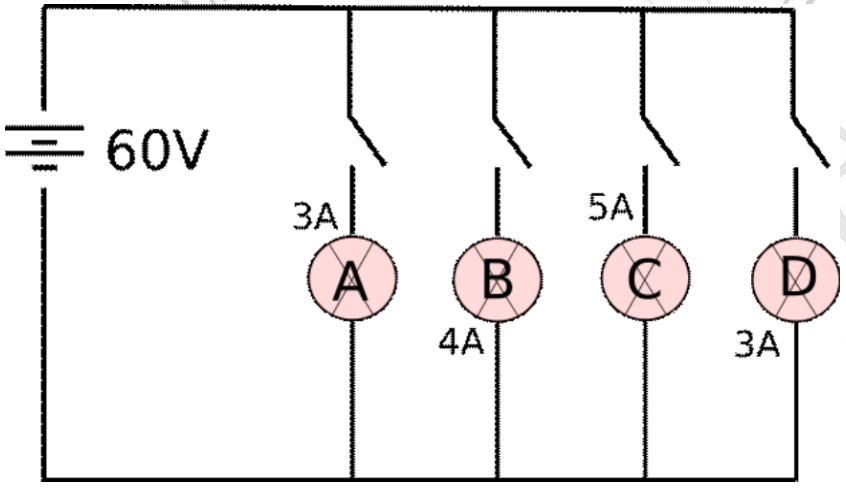
23	Give a test that can be used to confirm the presence of carbon in a compound.Withavalencyof4,howiscarbonabletoattainnoblegasconfigurationinits compounds? **OR** Thenumberofcarboncompoundsismorethanthoseformedbyallotherelementsputto gether.Justify thestatementbygiving two reasons.	2
24	Thefollowingobservationsweremadebyastudentontreatingfourmetals P,Q,R and S with thegiven salt solutions: Basedontheaboveobservations: (a) Arrangethegivensamplesintheincreasingorderofreactivity (b) Writethechemicalformulaeofproductsformedwhen Q reacts with $CuSO_4$ soluti on.	2
25	 A student observes the above phenomenon in the lab as a white light passesthrough a prism. Among many other colours, he observed the position of thetwocolours Red and Violet. What is the phenomenon called? What is the reason for the violet light to bendmorethan thered light?	2

Sample	**$MgSO_4$(aq)**	**$Zn(NO_3)_2$(aq)**	**$CaSO_4$(aq)**	**Na_2SO_4(aq)**
P	Noreaction	Reaction occurs	Reaction occurs	Noreaction
Q	Reaction occurs	Reaction occurs	Reaction occurs	Reaction occurs
R	NoReaction	Reaction Occurs	NoReaction	NoReaction
S	NoReaction	NoReaction	NoReaction	NoReaction

26	 Astudenthastworesistors-2Ωand3Ω.Shehastoputoneoftheminplaceof R2 as shown in the circuit. The current that she needs in the entire circuit isexactly9A.Showbycalculationwhichofthetworesistorssheshouldchoose.	2
	SectionC	
27	Afterself-pollinationinpeaplantswithround,yellowseeds,followingtypesofseeds wereobtained by Mendel: Seeds — Number Round,yellow — 630 Round,green — 216 Wrinkled,yellow — 202 Wrinkled,green — 64 Analyse the result and describe the mechanism of inheritance which explainstheseresults. **OR** Inhumans,thereisa50%probabilityofthebirthofaboyand50%probability that a girl will be born. Justify the statement on the basis of themechanismof sex-determination in humanbeings.	3
28	Plastic cups were used to serve tea in trains in early days- these could bereturnedtothevendors,cleanedandreused.Later,*Kulhads*wereusedinsteadofplas ticcups. Now,paper cups areusedfor serving tea. What are the reasons for the shift from Plastic to *Kulhads*and then finally topapercups?	3

<table>
<tr><td>29</td><td>Explainwhereandhowurineisproduced?</td><td>3</td></tr>
<tr><td>30</td><td>a. Whichofthefollowingreactionsis/areaanendothermicreaction(s)where decompositionalsohappens?
• Respiration
• Heatingofleadnitrate
• Decompositionoforganicmatter
• Electrolysisofacidifiedwater

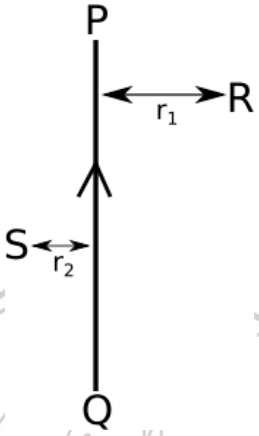
b.
Silverchloridewhenkeptintheopenturnsgrey.Illustratethiswithabalancedchemical equation.</td><td>3</td></tr>
<tr><td>31</td><td>ThefollowingtableshowsthepositionoffiveelementsA,B,C,DandEinthemodern periodictable.
<table>
<tr><td>Group→
Period↓</td><td>1</td><td>2</td><td>3 to 12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td></tr>
<tr><td>2</td><td>A</td><td></td><td></td><td></td><td></td><td></td><td></td><td>B</td><td>C</td></tr>
<tr><td>3</td><td></td><td>D</td><td></td><td></td><td></td><td>E</td><td></td><td></td><td></td></tr>
</table>
Answerthefollowinggivingreasons:
(i) Whichelementisametalwithvalencytwo?
(ii) Whichelementisleastreactive?
(iii) OutofDandEwhichelementhasasmalleratomicradius?</td><td>3</td></tr>
<tr><td>32</td><td>a.
ExplaintheformationofCalciumChloridewiththehelpofelectrondotstructure.(At numbers: Ca= 20;Cl= 17)
b.
Whydoioniccompoundsnotconductelectricityinsolidstatebutconductelectricityin molten and aqueous state?</td><td>3</td></tr>
<tr><td>33</td><td>Refractiveindexofwaterwithrespecttoairis1.33andthatofdiamondis2.42.
(i) Inwhichmediumdoesthelightmovefaster,waterordiamond?
(ii) Whatistherefractiveindexofdiamondwithrespecttowater?</td><td>3</td></tr>
<tr><td colspan="3">SectionD</td></tr>
</table>

34	MatchthefollowingpH values*1,7, 10,13*to thesolutionsgivenbelow: • Milkofmagnesia • Gastricjuices • Brine • AqueousSodiumhydroxide. Amitand Rita decided to bake a cake and added baking soda to the cake batter.	5
	Explainwithabalancedreaction,theroleofthebakingsoda.Mentionanyotheruseof baking soda. **OR** (i) Four samples A, B, C and D change the colour of pH paper or solution toGreen, Reddish-pink, Blue and Orange.Their pH was recorded as 7, 2, 10.5 &6 respectively. Which of the samples has the highest amount of Hydrogen ionconcentration?Arrangethefoursamplesinthedecreasingorderoftheir pH. (ii) Rahul found that the Plaster of Paris, which he stored in a container, hasbecome very hard and lost its binding nature.What is the reason for this?Also,writeachemicalequationto representthereaction takingplace. (iii) Give any one use of Plaster of Paris other than for plastering orsmootheningof walls.	
35	Tracethechangesthattakeplaceinaflowerfromgameteformationtofruitformation.	5
36	Inthegivencircuit,A,B,CandDarefourlampsconnectedwithabatteryof60V.  Analysethecircuittoanswerthefollowingquestions. (i) Whatkindofcombinationarethelampsarrangedin(seriesorparallel)? (ii) Explainwithreferencetoyouraboveanswer,whataretheadvantages(anytwo)of this combination of lamps? (iii) Explainwithpropercalculationswhichlampglowsthebrightest?	5

(iv) Findoutthetotalresistanceofthecircuit.

OR

PQisacurrentcarryingconductorintheplaneofthepaperasshowninthefigurebelow.



(i) Findthedirectionsofthemagneticfieldsproducedbyit atpointsRand S?

(ii) Given$r_1 > r_2$,wherewillthestrengthofthemagneticfieldbelarger?Givereasons.

(iii) Ifthepolarityofthebatteryconnectedtothewireisreversed,howwouldthedirection of themagneticfield bechanged?

(iv) Explainthe rule thatisusedtofindthe directionofthe magnetic fieldforastraightcurrentcarrying conductor.