DELHI PUBLIC SCHOOL, GURGAON
FIRST TERM EXAMINATION (2025-26)
SUBJECT: SCIENCE (086) (15/09/25)
CLASS: X
SET A

Time: 3 hours **M.M: 80**
No of pages: 11

General Instructions:

(i) This question paper consists of 39 questions in 3 sections. Section A is Biology, Section B is Chemistry and Section C is Physics.

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

SECTION – A

1. A shoot exposed to light on one side only,grew towards the light source after a few days. Which one of the following best explains the observation? 1

	Auxin concentration	Effect
A.	More on illuminated side	Cells elongate more rapidly on the illuminated side.
B.	More on shaded side	Cells elongate more rapidly on the shaded side.
C.	Less on illuminated side	Promotes cell elongation on the illuminated side.
D.	Less on shaded side	Retards cell elongation on the shaded side.

2. The thin branched processes of a neuron whose main function is to receive incoming signals are called 1

A. centron
B. axon
C. nerve endings
D. dendrites

3. A person consumes a meal high in protein and low in fat. Which organ shows increased enzyme activity based on the meal's composition, and why? 1

A. Stomach, because it produces pepsin which digests proteins.
B. Small intestine, because it mechanically digests proteins.
C. Stomach because it secretes lipase to break down proteins.
D. Large intestine, because it absorbs amino acids.

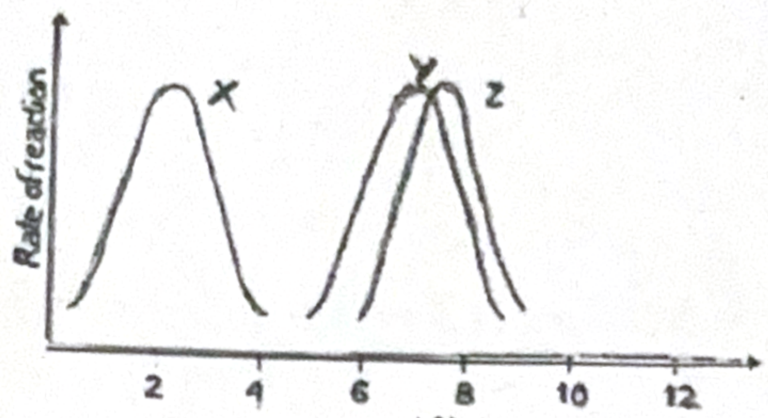
4. Which of the following explains why oxygen diffuses from the alveoli into the blood in capillaries? 1

I. The walls of alveoli are thin and permeable.
II. Blood has a higher oxygen concentration than the alveoli.
III. There is a lower oxygen concentration in the blood than in alveolar air.
IV. Blood and alveolar oxygen levels are always equal.

The correct answer would be

A. I and IV
B. II and IV
C. I and II
D. I and III

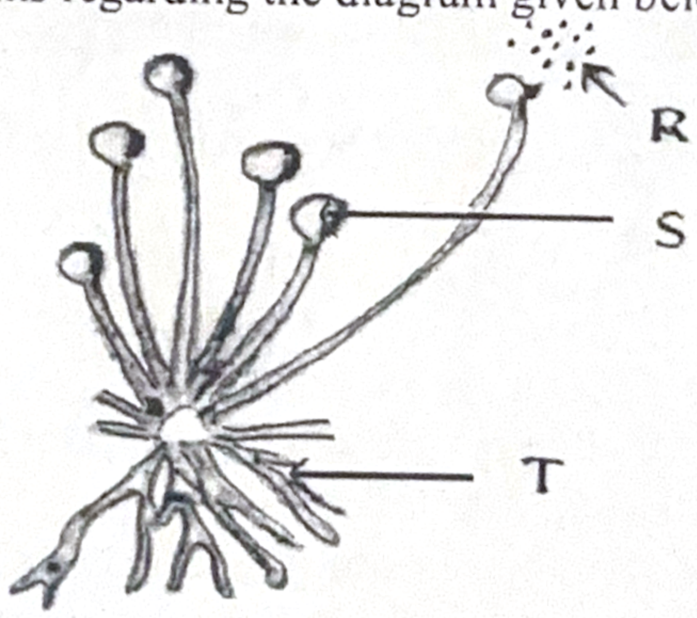
5. The graph shows the rate of reaction of three different enzymes (X, Y and Z) with respect to pH. Which of the following correctly identifies the likely location where each enzyme functions optimally in the human body?
Hint: Enzyme Y acts on starch and enzyme X and Z digest proteins.



	Enzyme X	Enzyme Y	Enzyme Z
A.	mouth	small intestine	stomach
B.	stomach	small intestine	mouth
C.	stomach	mouth	small intestine
D.	small intestine	stomach	mouth

6. Which of the following is an advantage of asexual reproduction in stable environmental conditions? 1
A. Produces genetically diverse organisms
B. Organisms produce gametes
C. Rapid population growth
D. Increased variation for evolution

7. Which of the following statements regarding the diagram given below is correct? 1



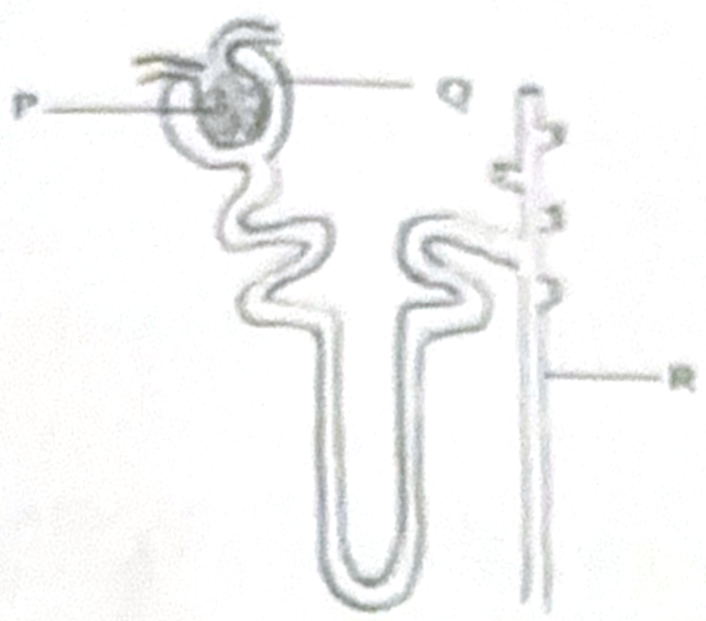
A. T stores spores but does not participate in reproduction.
B. S absorbs nutrients from the soil and anchors the fungus to the surface.
C. T helps in dispersal of spores formed in S.
D. R denotes mature spores that are released and grow into new individuals.

The following two questions consist of two statements – **Assertion** (A) and **Reason** (R). Answer these questions by selecting the appropriate option given below:
A. Both A and R are true, and R is the correct explanation of A.
B. Both A and R are true, and R is not the correct explanation of A.
C. A is true but R is false.
D. A is false but R is true.

8. **Assertion (A) :** Injury to the forebrain can be life-threatening. 1
Reason (R) : Forebrain regulates vital involuntary processes like heartbeat, breathing and blood pressure.

9. **Assertion (A) :** Vegetative propagation can be used to preserve desirable traits in plants. 1
Reason (R) : It involves reproduction from vegetative parts, which do not undergo genetic recombination.

10. Identify the part P and Q of the nephron. Explain how the structure of P is suited to its function. 2



11. *Attempt either option A or B* 2

A. Draw a well-labelled diagram showing the process of binary fission in *Amoeba*.

OR

B. Draw a well-labelled diagram showing the process of budding in *Hydra*.

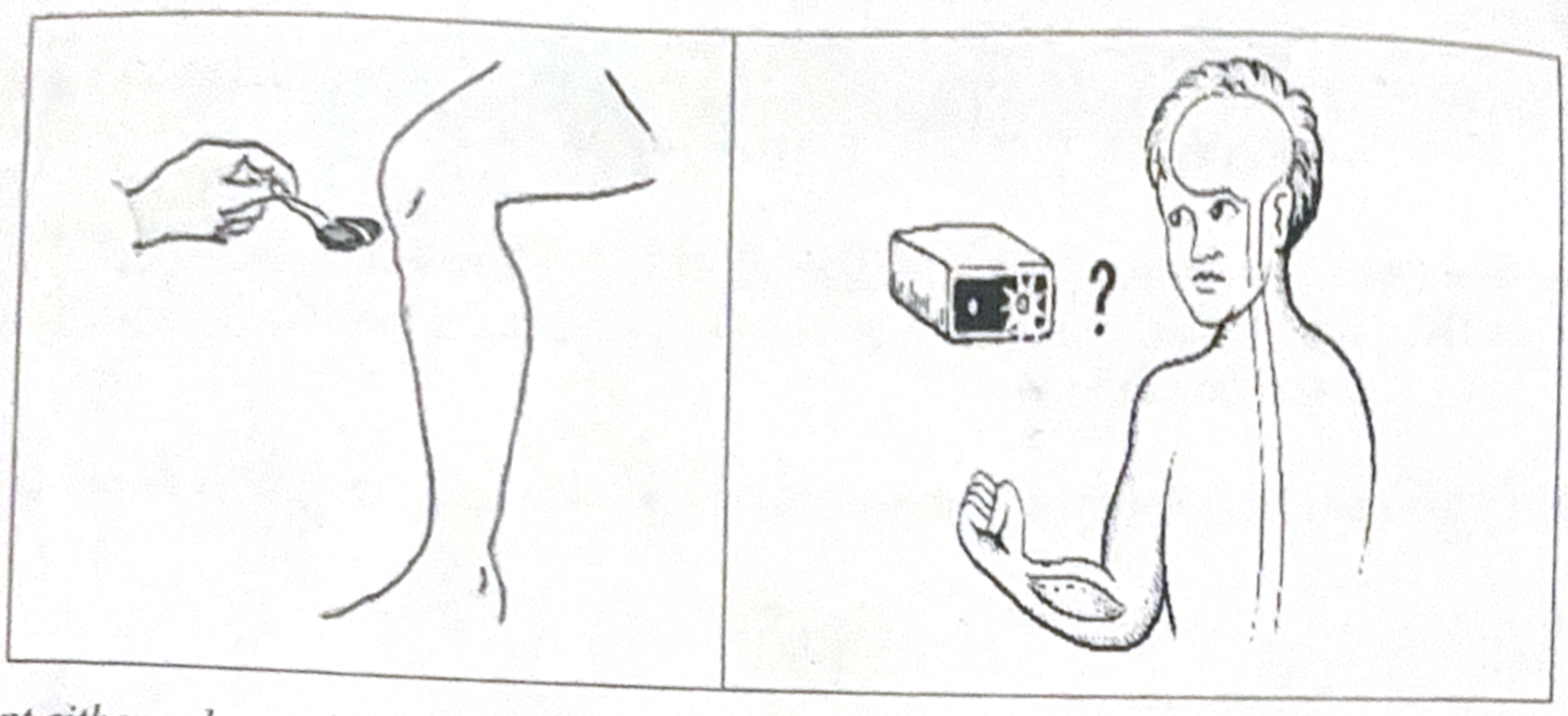
12. (i) Some specialised animal cells can divide and differentiate into various cell types, helping in organ repair. Name two multicellular organisms that use this ability to give rise to new individuals. 3
(ii) What happens when a *Bryophyllum* leaf falls on moist soil?

13. Name the gland and the hormone responsible for the following changes:
(i) Development of broad shoulders and deep voice in adolescent boys.
(ii) A person turns pale on seeing sudden danger.
(iii) A child shows unusual rapid increase in height during early years.

14. (i) How do variations occur in asexually reproducing organisms? 3
(ii) A sugar solution with yeast was kept warm in an airtight test tube. When examined under the microscope, the yeast had multiplied. Explain the type of asexual reproduction seen in yeast.

15. The following experiments were conducted by a group of students. Ramesh demonstrated a faster response time compared to Rahul. 4

Experiment 1	Experiment 2
Ramesh was asked to sit with his legs dangling freely. When another student tapped just below his kneecap with a rubber hammer, his leg instantly jerked forward.	Rahul was asked to sit with one finger on a stopwatch, while another student stood in front of him holding a torch directed towards the wall. Rahul was instructed to start the stopwatch the moment he saw the light turn on.



Attempt either subpart A or B.

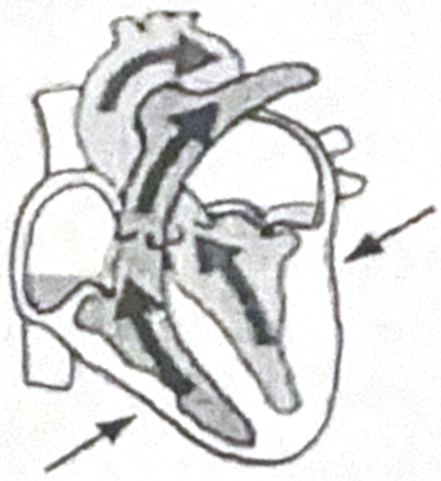
A. Explain with the help of a flowchart how the pathways of nerve impulses differ in Experiment 1 and Experiment 2.

OR

B. Why is it necessary for the body to have certain responses that occur automatically and instantly, while others require conscious thinking before acting?
C. Which part of the nervous system is primarily involved in Experiment 1, and why is the response so quick?
D. What is the main difference between the nature of movement in Experiment 1 and Experiment 2?

16. *Attempt either option A or B.* 5

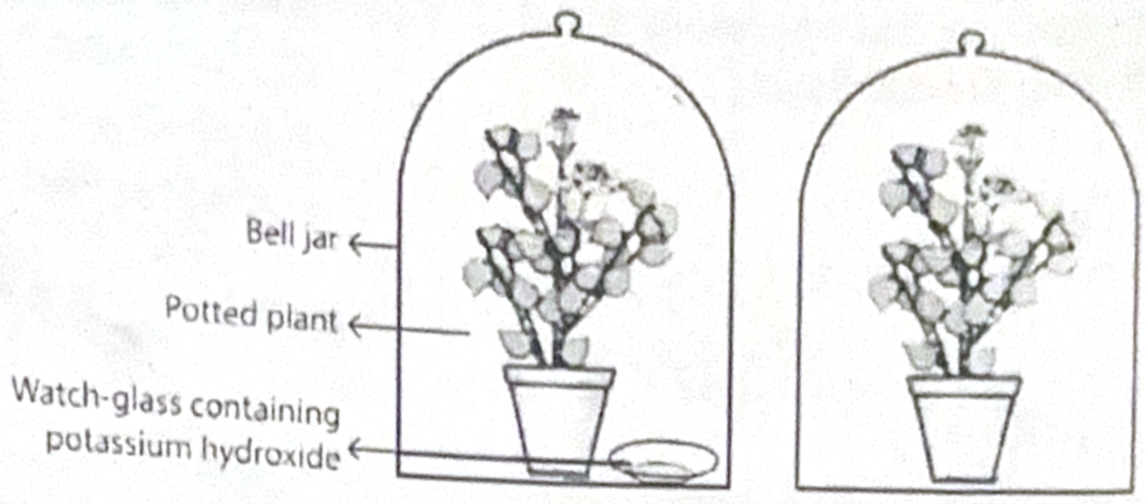
A. Observe the given diagram of the human heart. The direction of contraction is indicated by the arrows in the diagram.



Answer the following questions.
(i) Which chambers of the heart are undergoing (i) contraction (ii) and relaxation in the given diagram?
(ii) Explain briefly the movement of blood flow according to the arrows shown inside the heart.
(iii) How does the structure of the human heart ensure that oxygen-rich and oxygen-poor blood do not mix? Explain the significance of this separation in warm blooded animals.

OR

B. Observe the two setups shown in the figure – one with a watch-glass containing potassium hydroxide (KOH) (setup a) and one without KOH (setup b). Both contain healthy, destarched potted plants placed under sunlight.



(a) (b)

(i) What is the aim of this experiment? Why is potassium hydroxide placed inside the bell jar in setup (a)?

(ii) After a few hours of exposure to sunlight, a starch test is performed on leaves from both setups.

(I) What would be the expected result for each setup?

(II) Explain the scientific reason for the difference in the outcomes between setup (a) and setup (b).

(iii) How is the food prepared in the leaves transported to different parts of the plant through phloem?

SECTION – B

17. Calculate the sum of the balancing coefficients in the given chemical equation: 1

$$a\,HgS + b\,O_2 \longrightarrow c\,HgO + d\,SO_2$$

A. 6 B. 7 C. 8 D. 9

18. A student in the chemistry laboratory wants to prepare a salt of pH=5.5 using an acid and base. The table shows the acid and the base available in the laboratory. 1

1.	HCl
2.	NaOH
3.	H_2CO_3
4.	NH_4OH
5.	CH_3COOH

Which of the acid and base he should use for the reaction?

A. CH_3COOH and NaOH

B. HCl and NaOH

C. HCl and NH_4OH

D. H_2CO_3 and NaOH

19. When copper is heated in air, it turns black due to formation of copper oxide. To reverse this reaction, the black surface is treated with: 1

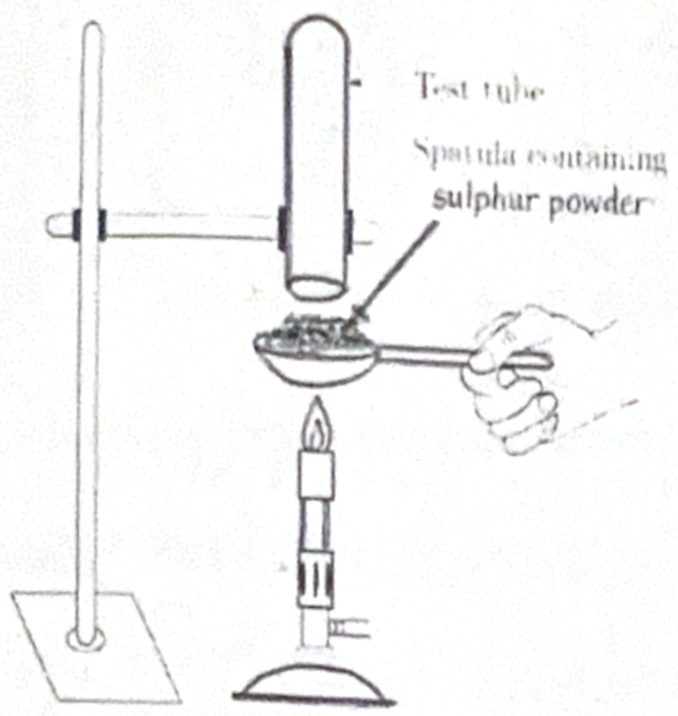
A. Hydrogen

B. Carbon dioxide

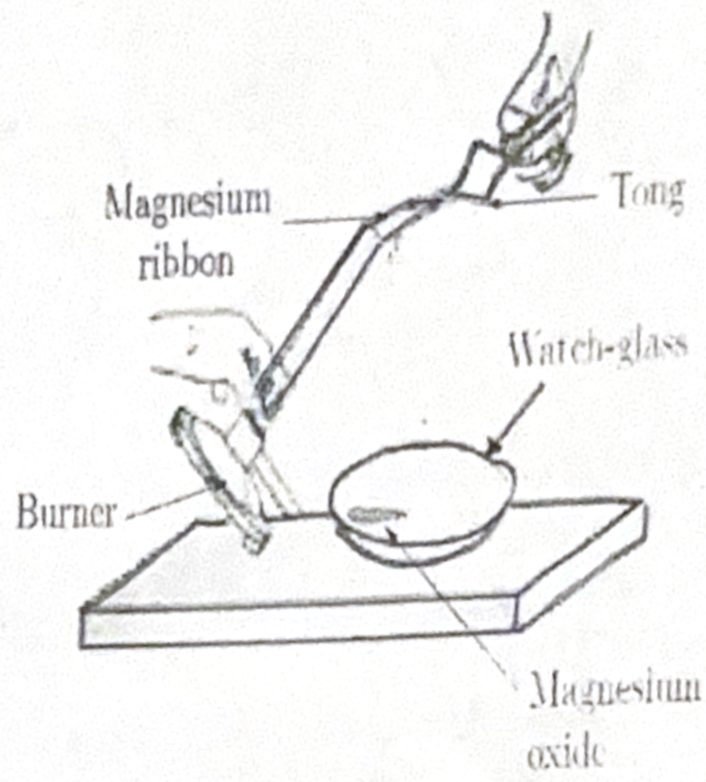
C. Steam

D. Sulphur trioxide

20. When the products of both the reactions shown in the diagrams, I and II given below are mixed with water separately to make solutions A and B respectively, the changes observed in both the solutions with phenolphthalein are:



I



II

A. Both solutions, A and B change to pink.
B. Solution A changes to pink while B remains colourless.
C. No change observed in both the solutions.
D. Solution A remains colourless while B changes to pink.

21. An element X (atomic number 12) reacts with another element Y (atomic number 17) to form a compound Z. Which of the following statements are true regarding this compound? 1

I. Chemical formula of Z is XY_2. .
II. It is soluble in water.
III. X and Y are combined by sharing of electrons.
IV. It would conduct electricity in the molten state.

A. II and III
B. I and II
C. I, III and IV
D. I, II and IV

22. In the reaction of copper with silver nitrate solution, which option in the table given below correctly represents the substance oxidised and the reducing agent ? 1

$$Cu + 2\ AgNO_3 \longrightarrow 2\ Ag + Cu(NO_3)_2$$

	SUBSTANCE OXIDISED	REDUCING AGENT
A.	$AgNO_3$	Cu
B.	Cu	Cu
C.	Ag	Ag
D.	$Cu(NO_3)_2$	$AgNO_3$

23. Which of the following statements is **correct** about an aqueous solution of an acid and a base? 1

I. Higher the pH, stronger the acid.
II. Higher the pH, weaker the acid.
III. Lower the pH, stronger the base.
IV. Lower the pH, weaker the base.

A. I and III
B. II and III
C. I and IV
D. II and IV

The following question consists of two statements – **Assertion** (A) and **Reason** (R). Answer the question by selecting the appropriate option given below:

A. Both A and R are true, and R is the correct explanation of A.
B. Both A and R are true, and R is not the correct explanation of A.
C. A is true but R is false.
D. A is false but R is true.

24. **Assertion(A):** White silver chloride turns grey in sunlight with evolution of a reddish brown gas. 1
Reason(R) : Photodecomposition of silver chloride results in the formation of silver metal and chlorine gas.

25. A substance **X** which is used in the cement industry, on treatment with water forms a solution which is used for whitewashing walls. Identify the substance **X** and write the chemical equation for the reaction of **X** with water. Name the type of chemical reaction taking place. 2

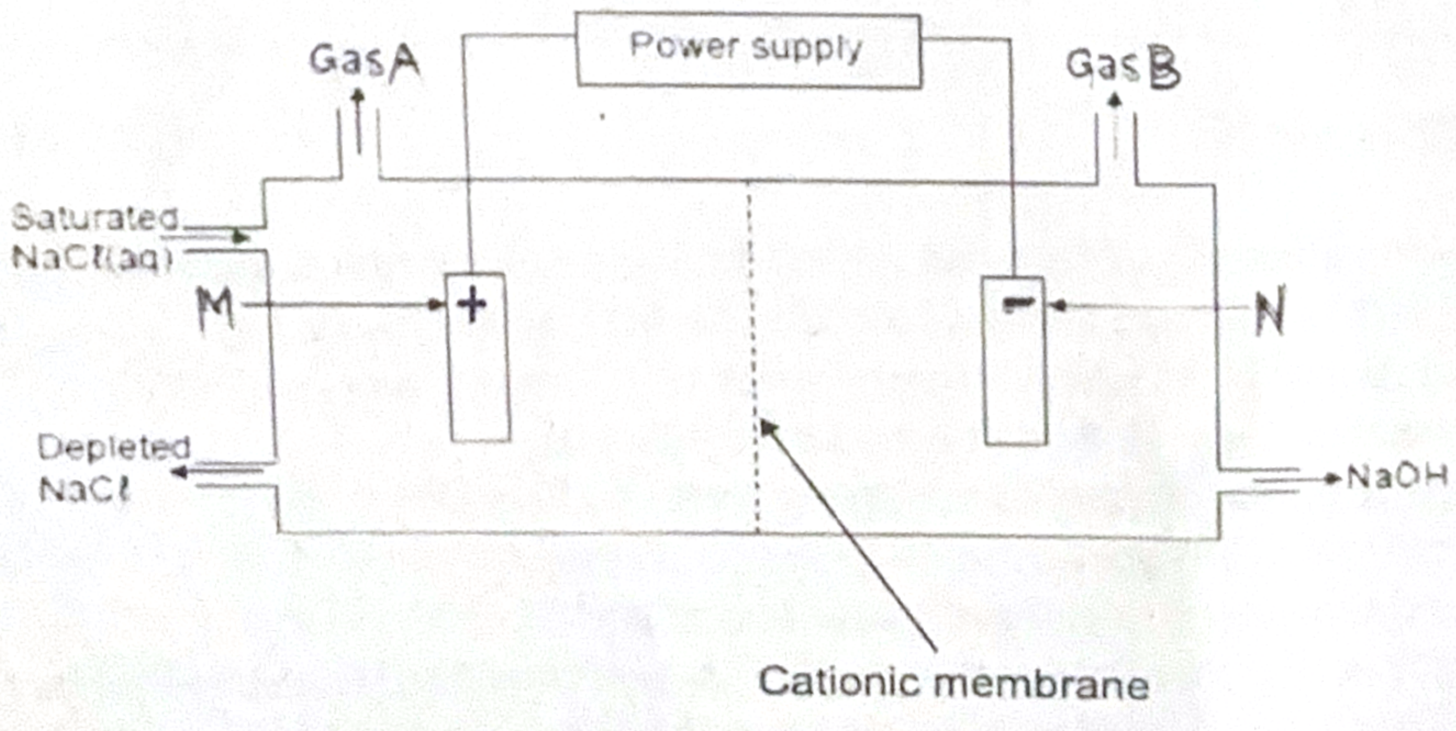
26. *Attempt either option A or B.* 3

A. Ravi treated a metal oxide with sodium hydroxide solution. He also observed that this same metal oxide was able to react with hydrochloric acid. What are such metal oxides called ? Taking a suitable example, write balanced chemical equations for both the reactions.

OR

B. Compare the reactivities of the following metals by specifying the condition of water necessary for the reaction to take place along with one significant characteristic observation that can be made during the reaction.
(i) Magnesium (ii) Sodium

27. Study the schematic diagram given below: 3



(i) Name the two electrodes M and N and identify the gases A and B evolved at the respective electrodes when electric current is passed through the saturated solution of sodium chloride.
(ii) Write a balanced chemical equation for the above process.

28. A metal is an element that readily forms positive ions and has metallic bonds. A metal is a material that shows a lustrous appearance and conducts electricity and heat relatively well. Metals are typically malleable or ductile. Metals differ widely in their chemical reactivity. More reactive metals displace the less reactive metals from their compounds. 4
For example consider the following reactions involving metals P, Q, R and S and their salt solutions in water.

Metal P salt solution + Q ⟶ Metal Q salt solution + P
Metal Q salt solution + R ⟶ Metal R salt solution + Q
Metal S salt solution + Q ⟶ Metal Q salt solution + S
Metal P salt solution + S ⟶ No reaction

A. Identify the most reactive and the least reactive metal from the above series of reactions.
B. Potassium metal combines with a non-metal oxygen to form a compound potassium oxide. Show the ionic bond formation of this compound by the transfer of electrons.

Attempt either subpart C or D.

C. You are provided with an aluminium wire, pin, wax, stand with a clamp and a burner. How would you use them to show that metals are good conductors of heat and have high melting points?

OR

D. Match the metals given in **column I** with their characteristic property in **column II**:

	COLUMN I		**COLUMN II**
I	Iron	(a)	Hydrogen gas is evolved when the metal reacts with dilute nitric acid.
II	Lithium	(b)	Formation of a greenish layer on exposure to moist air.
III	Manganese	(c)	Deposition of reddish brown layer on exposure to moist air
IV	Copper	(d)	It has low density and low melting point

29. *Attempt either option A or B.* 5

A. (i) In a reaction, carbon dioxide gas was passed through a brine solution, saturated with ammonia. Write a balanced chemical equation for the reaction taking place. Also, which of the product formed in the reaction is used to get relief from ant sting and why?
(ii) Write the common name of the salt used for the following:
(a) To remove permanent hardness of water.
(b) For treatment of indigestion.
(c) As an oxidising agent in many chemical industries.
(iii) The presence or absence of water of crystallisation in a compound makes a difference in the colour of the compound. Explain your answer with a suitable example.

OR

B. (i) Identify and give the chemical name of the compound of calcium which is used for plastering of fractured bones. With the help of a chemical equation explain how it is prepared.

(ii) Justify the following:

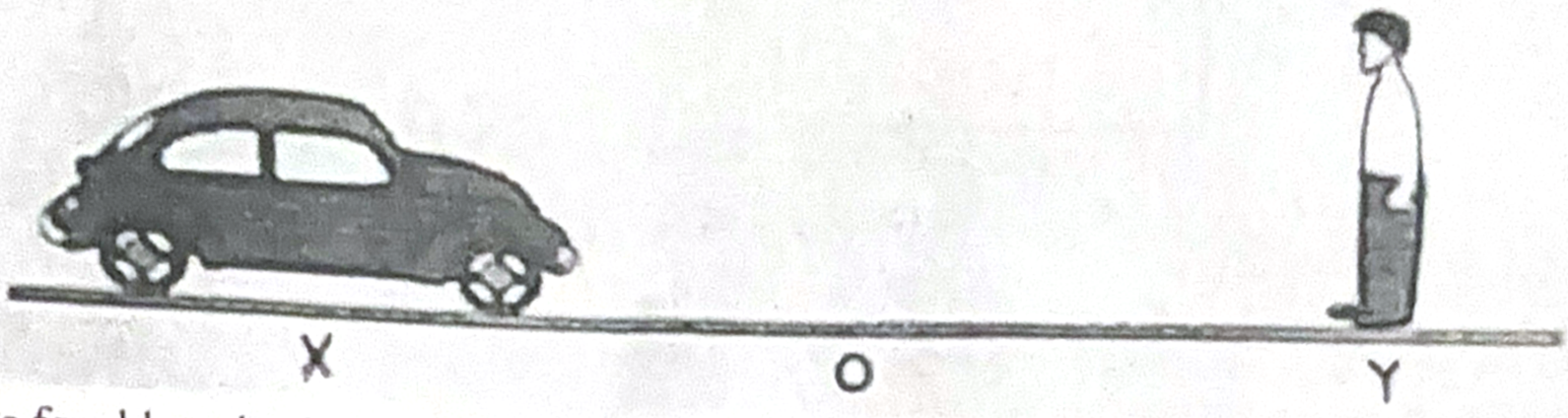
(a) Compounds such as glucose contain hydrogen but are not considered as acids.

(b) Tap water conducts electricity but distilled water does not.

(c) A visually impaired student uses clove oil to identify an acidic and basic solution instead of a litmus paper.

SECTION – C

30. A person standing at point Y is watching a car coming from X towards O as shown in the following figure. 1



The focal length of the eye lens of the observer

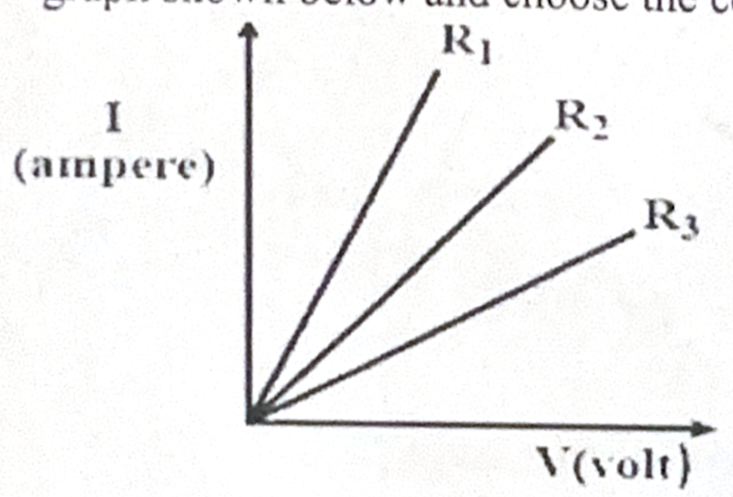
A. will be higher at O than at X and ciliary muscles will be much more relaxed.

B. will be higher at X than at O and ciliary muscles will be much more tensed.

C. will be higher at X than at O and ciliary muscles will be much more relaxed.

D. will be same for both the positions.

31. Observe the I-V graph shown below and choose the correct option. 1



A. $R_1 > R_2 > R_3$

B. $R_2 > R_3 > R_1$

C. $R_1 = R_2 = R_3$

D. $R_1 < R_2 < R_3$

The following question consists of two statements – **Assertion** (A) and **Reason** (R). Answer the question by selecting the appropriate option given below:

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

B. Both A and R are true, and R is not the correct explanation of A.

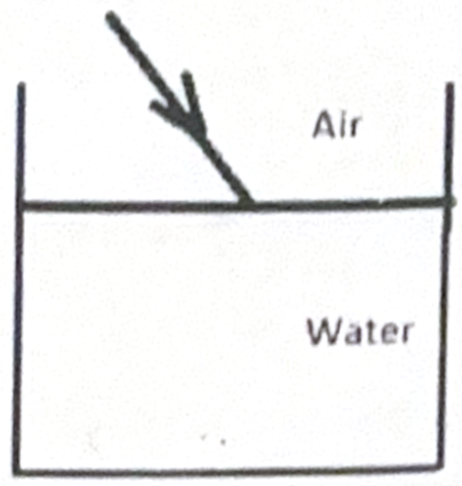
C. A is true but R is false.

D. A is false but R is true.

32. **Assertion (A) :** The angle through which a ray of light bends on passing through a prism is called the angle of prism.

Reason (R) : It is the peculiar shape of the prism which makes the emergent ray deviate through certain angle with respect to the incident ray. 2

33. Complete the path of ray of light as it passes through water filled in the glass tank and then emerges into air again.



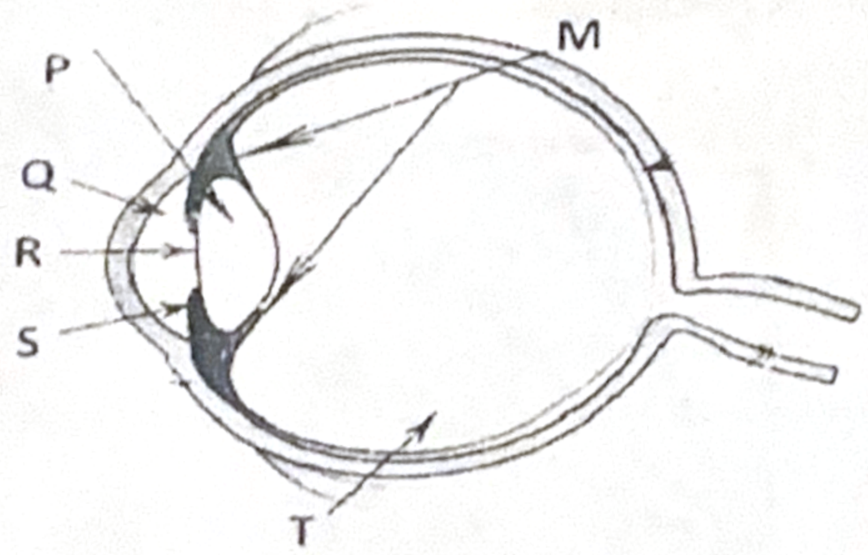
2

34. *Attempt either option A or B.*

A. The far point of a person is 75 cm. Identify the defect of vision he is suffering from. Also, calculate the focal length of corrective lens required in this case.

OR

B. The structure of human eye is shown in the following figure. Identify and name the part of eye which is responsible for accommodation in the eye. Explain its role in proper functioning of human eye.



Structure of Human Eye

35. (i) **X** represents a colour of light that is scattered the least by smoke or fog. Identify **X.** Justify your answer. 3

(ii) The sun is apparently visible 2 minutes before the actual sunrise. Give reason.

36. List the phenomena involved in the formation of a rainbow. Draw a ray diagram to support your answer. 3

37. An object of height 15 cm is placed at a distance of 15 cm from a convex lens of focal length 45 cm. Calculate the height of the image. 3

38. Electricity requires an electric path to flow and there are many conducting materials used for this purpose. Also, we need to create a potential difference across the two ends of the given conductor for the current to pass through it. The relationship between the potential difference and current was given by a German physicist Georg Simon Ohm. 4

A. How is a voltmeter and an ammeter connected with respect to a resistor, in a circuit to verify Ohm's law?

B. State Ohm's law.

Attempt either subpart C or D.

C. Calculate the amount of work done in moving a charge of 5C across the two points, having a potential difference of 12V.

OR

D. Name the component that is used to
(i) regulate current without changing the voltage source.
(ii) maintain potential difference across the two ends of the conductor.
Also draw the symbol of both the components.

39. *Attempt either option A or B.* 5

A. (i) Mention the position of (a) person while using a concave mirror as a shaving mirror,
(b) bulb while using concave mirror as a reflector of a torch.
(ii) An object is placed at a distance of 60 cm from a spherical mirror. The linear magnification produced by the spherical mirror is +1/3. Calculate its focal length.

OR

B. (i) The refractive index of medium **X** is 1.31 and that of medium **Y** is 1.54. Calculate the refractive index of **Y** with respect to **X**.
(ii) Observe the table given below and answer the following questions.

Convex lens	Focal length (cm)	Position of object (cm)
A	20	45
B	15	30
C	30	20

(a) Which of the three lenses will form a diminished image and what will be its nature?
(b) Is there any similarity between the image formed by lens C and the image formed by a plane mirror? Justify **both** your answers without doing any calculation.