

SCIENCE
Sample Question Paper 3
Class X | Code 086 | 2026-27

Time Allowed: 3 hours

Maximum Marks: 80

General Instructions

This paper has 39 questions in three sections: A Biology, B Chemistry and C Physics.

All questions are compulsory. Three internal choices are provided in each section; attempt only one alternative wherever a choice is given.

Marks are shown against each question. Draw neat labelled diagrams wherever required.

For Questions 8, 9, 24 and 32, use the Assertion–Reason codes below:

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

SECTION A

(Biology | Questions 1–16 | 30 marks)

1. Which process moves a swallowed food bolus through the oesophagus? **[1]**
(A) Transpiration (B) Ultrafiltration
(C) Peristalsis (D) Diffusion of proteins

2. The part of the brain that maintains balance while cycling is the: **[1]**
(A) spinal cord (B) cerebellum
(C) medulla only (D) hypothalamus only

3. Which organism has saprotrophic nutrition? **[1]**
(A) Rhizopus (B) Cuscuta
(C) Amoeba (D) Human

4. Which item is most likely to remain unchanged for a long time in soil? **[1]**
(A) A banana peel (B) A paper napkin
(C) A cotton leaf (D) A polythene bag

5. The Vas deferens and the Oviduct are both targets for surgical contraception (Vasectomy and Tubectomy respectively). Analysing the process of reproduction, what common biological event is prevented by blocking both these structures? **[1]**
(A) The production of gametes (sperm and egg).
(B) The implantation of the fertilized egg into the uterine wall.
(C) The successful meeting and fusion of the male and the female gametes.
(D) The release of hormones - testosterone and estrogen.

6. The male gamete of an apple plant has seventeen chromosomes. What is the number of chromosomes in the female gamete and in the cells of the adult plant respectively? [1]

(A) 17,17

(B) 17,34

(C) 34,34

(D) 34,51

7. A food chain normally starts with: [1]

(A) a producer that traps solar energy

(B) a carnivore that creates nutrients

(C) a decomposer that manufactures sunlight

(D) a parasite feeding on a herbivore

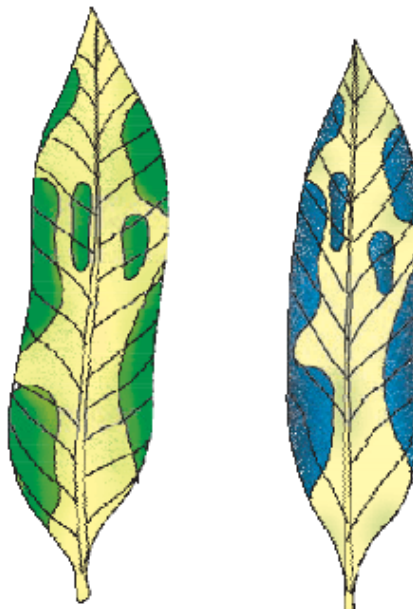
8. Assertion (A): Roots usually grow towards water.

Reason (R): Water is a directional stimulus for hydrotropism. [1]

9. Assertion (A): Removing decomposers would slow nutrient recycling.

Reason (R): Decomposers convert organic remains into simpler substances. [1]

10. The figure shows a variegated leaf before and after an iodine test. Explain the different colours observed and state the conclusion. [2]



11. Give two examples each of biotic and abiotic components of an ecosystem. [2]

12. Attempt either A or B. [2]

A. A plant breeder wants to preserve a particular seedless grape variety. Explain a suitable method. (2)

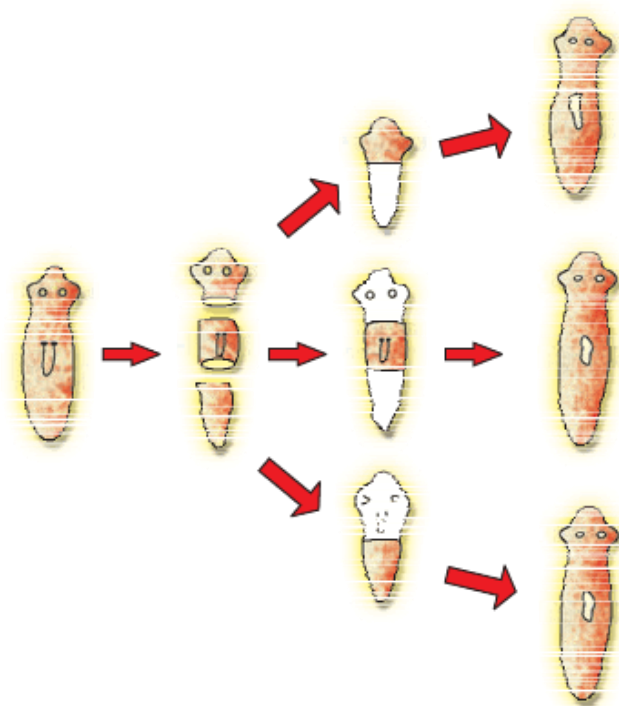
OR

B. How do buds on a Bryophyllum leaf differ from seeds as a means of producing new plants? (2)

13. Attempt either A or B.

[3]

A. Study the Planaria figure. Explain how a body fragment can form a complete animal and why this process is not available to every animal. (3)



OR

B. Distinguish the regeneration shown from ordinary wound healing and explain why cell specialisation is needed. (3)

14. Explain the usual chromosomal determination of sex in humans.

[3]

15. During a Tiwari Academy demonstration, a student blinks as an object approaches the eye. (a) What detects the stimulus? (b) Is the immediate blink voluntary? (c) Explain its value and name the effector tissue. (4)

16. Explain the volume and pressure changes during inhalation.

[5]

Attempt either A or B for the remaining 2 marks.

A. Why are respiratory surfaces moist and supplied with blood?

(2)

OR

B. Why do aquatic organisms often breathe faster?

(2)

SECTION B

(Chemistry | Questions 17–29 | 25 marks)

17. The chemical name of the main substance used for whitewashing after slaking is: (1)

(A) calcium carbonate only

(B) calcium sulphate

(C) calcium hydroxide

(D) calcium chloride

18. The symbol (aq) in a chemical equation means: **[1]**

- (A) a liquid is frozen (B) dissolved in water
(C) a gas has formed (D) a solid is heated

19. Manjeet wants to wash clothes, but the water available is hard. He compares the action of soap and detergent in hard water, to decide which one to use for washing his clothes. He observes:

- Soap forms scum in hard water.
- Detergent produces lather easily in hard water.

Which of the following inferences is correct? **[1]**

- (A) Ca^{2+} and Mg^{2+} ions react with soap, forming insoluble compounds, whereas detergents do not form such insoluble salts.
(B) Soap is acidic, and detergents are basic.
(C) Soap react with Na^+ ions in hard water to form scum while detergents do not react with Na^+ ions.
(D) Detergents form lather easily because they are ionic compounds and react with Ca^{2+} and Mg^{2+} ions while soaps do not react with hard water.

20. The ion responsible for basic character in aqueous solution is: **[1]**

- (A) H_3O^+ (B) Cl^-
(C) Na^+ alone (D) OH^-

21. Which non-metal conducts electricity well? **[1]**

- (A) Phosphorus (B) Oxygen
(C) Graphite (D) Sulphur

22. Which formula represents an alkene? **[1]**

- (A) CH_4 (B) C_3H_6
(C) C_3H_8 (D) C_2H_6

23. Which change would speed up the reaction of marble with dilute HCl most directly? **[1]**

- (A) Use powdered marble of the same mass
(B) Use one larger lump of the same mass
(C) Seal the test tube tightly
(D) Remove the acid

24. Assertion (A): The total number of atoms of each element changes in a balanced chemical reaction.

Reason (R): Atoms are rearranged during a chemical reaction. **[1]**

25. Attempt either A or B. [2]

A. Why does a copper vessel develop a green coating in moist air? (2)

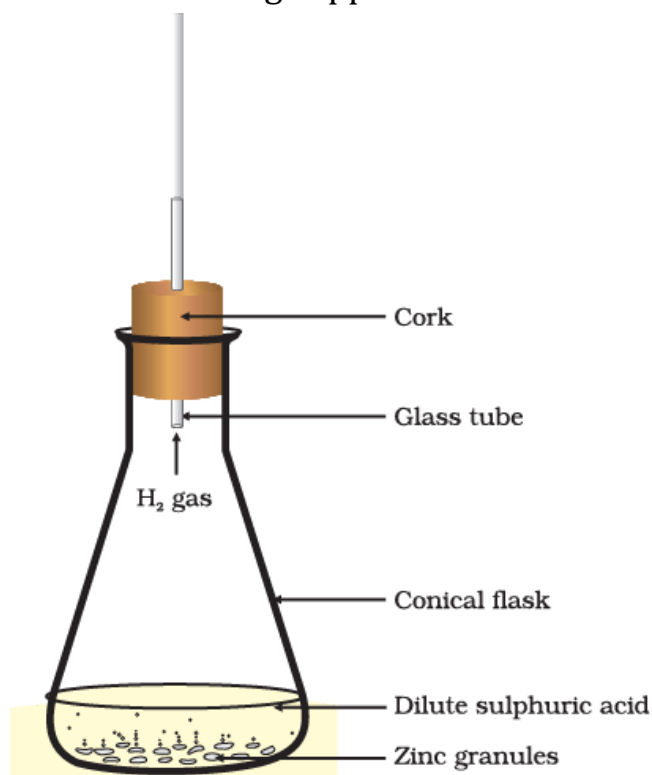
OR

B. Distinguish a physical change from a chemical change using one example each. (2)

26. Explain oxidation and reduction using the reaction $\text{CuO} + \text{H}_2 \rightarrow \text{Cu} + \text{H}_2\text{O}$. [3]

27. Attempt either A or B. [3]

A. The flask contains zinc and dilute sulphuric acid. Write the equation, explain the bubbling and predict the effect of using copper instead. (3)



OR

B. Why should the zinc–acid flask not be tightly sealed during the reaction? Explain the gas source and a suitable confirmation test. (3)

28. A student mixes dilute HCl and NaOH while monitoring pH. Initially pH is 2, then approaches 7. (a) Name the reaction. (b) Write its equation. [4]

Predict the pH trend after excess NaOH is added and explain it using ions. (2)

29. Explain tetravalency, catenation and stable bonding as reasons for carbon's many compounds. [5]

Attempt either A or B for the remaining 2 marks.

A. Compare ethane and ethyne in formula and bonding. (2)

OR

B. Compare ethanol and ethanoic acid by functional group. (2)

SECTION C

(Physics | Questions 30–39 | 25 marks)

30. The image formed by a plane mirror is: [1]

- (A) virtual and inverted (B) virtual and erect
(C) real and erect (D) real and inverted

31. An electrical appliance rated 1000 W is operated at 250 V. What current does it draw? [1]

- (A) 0.25 A (B) 2.5 A
(C) 4.0 A (D) 10 A

32. Assertion (A): A convex mirror is useful for a wide rear view.
Reason (R): It forms erect diminished images over a wide field of view. [1]

33. Light enters kerosene of refractive index 1.47 from air. Calculate its speed in kerosene, taking $c = 3 \times 10^8$ m/s. [2]

34. Attempt either A or B. [2]

A. A cell does 18 J of work in moving 6 C of charge. Find its potential difference and explain the meaning of the result. (2)

OR

B. Explain why a battery maintains current in a closed circuit but charge does not build up indefinitely at a resistor. (2)

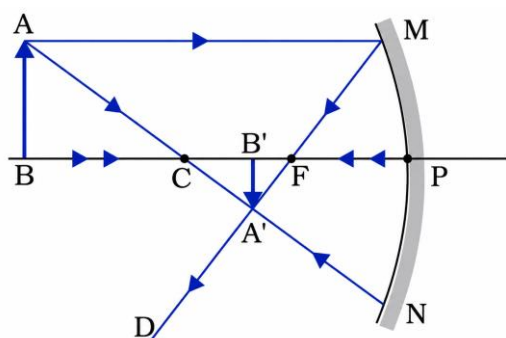
35. State the two laws of refraction and define absolute refractive index. [3]

36. A. State the Right-Hand Thumb Rule and describe how it helps determine the direction of magnetic field around a current-carrying conductor.

B. Explain how the magnetic field changes with distance from the conductor. [3]

37. Attempt either A or B. [3]

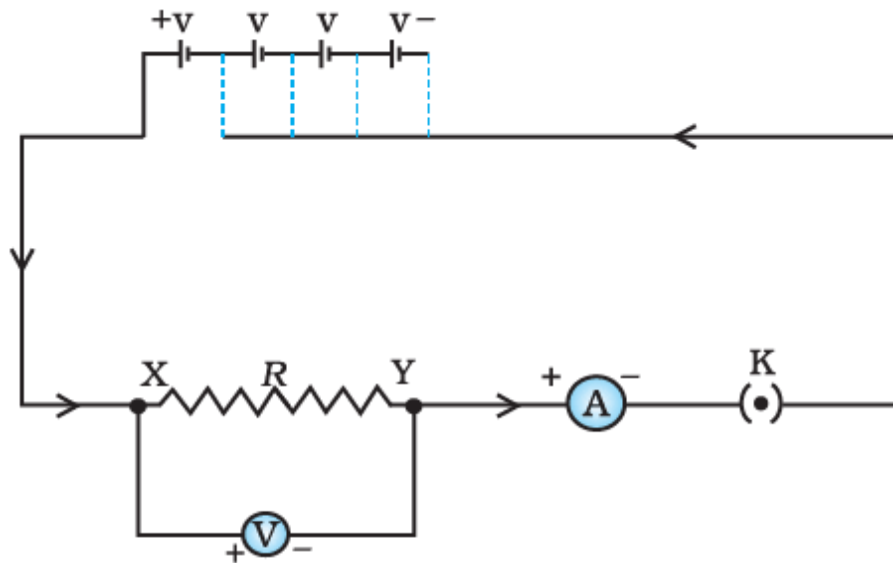
A. The diagram shows an object beyond the centre of curvature of a concave mirror. For $f = -12$ cm and $u = -36$ cm, calculate v and magnification, then compare with the drawing. (3)



OR

B. Without calculation, use the ray paths to explain why the image is real, inverted and smaller than an object beyond C. (3)

38. In the illustrated Ohm's-law experiment, the readings are 1.5 V and 0.25 A. (a) Find the wire's resistance. (b) How is the voltmeter connected? [4]



Attempt either A or B for the remaining 2 marks.

A. Predict the current at 4.5 V and explain the condition necessary for this prediction. (2)

OR

B. What happens to the graph if resistance stays constant, and what does its slope mean with V vertical? (2)

39. A $24\ \Omega$ heating coil is cut into two equal pieces, then the pieces are connected in parallel across 12 V. Determine each piece's resistance, combined resistance and supply current. [5]

Compare the new total power with the uncut coil across 12 V. (2)