

SCIENCE
Sample Question Paper 18
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.** The main purpose of cartilage rings in the trachea is to: **[1]**
(A) produce oxygen
(B) absorb digested food
(C) pump air by contraction
(D) prevent collapse of the air passage
- 2.** Which response is usually slower but may last longer? **[1]**
(A) An immediate withdrawal reflex
(B) A blink triggered by dust
(C) Hormonal coordination
(D) A nerve impulse along an axon
- 3.** Which molecule is commonly called the energy currency of the cell? **[1]**
(A) Urea (B) ATP
(C) DNA (D) Starch
- 4.** In a food web, one organism can: **[1]**
(A) feed at more than one trophic level
(B) always occupy only the first trophic level
(C) create energy from nothing
(D) replace all producers

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 pollen grain germinates on a compatible stigma to produce a: [1]

(A) sporangium

(B) pollen tube

(C) root hair

(D) cotyledon

8. Assertion (A): Chemical coordination can reach cells not connected by nerve endings.

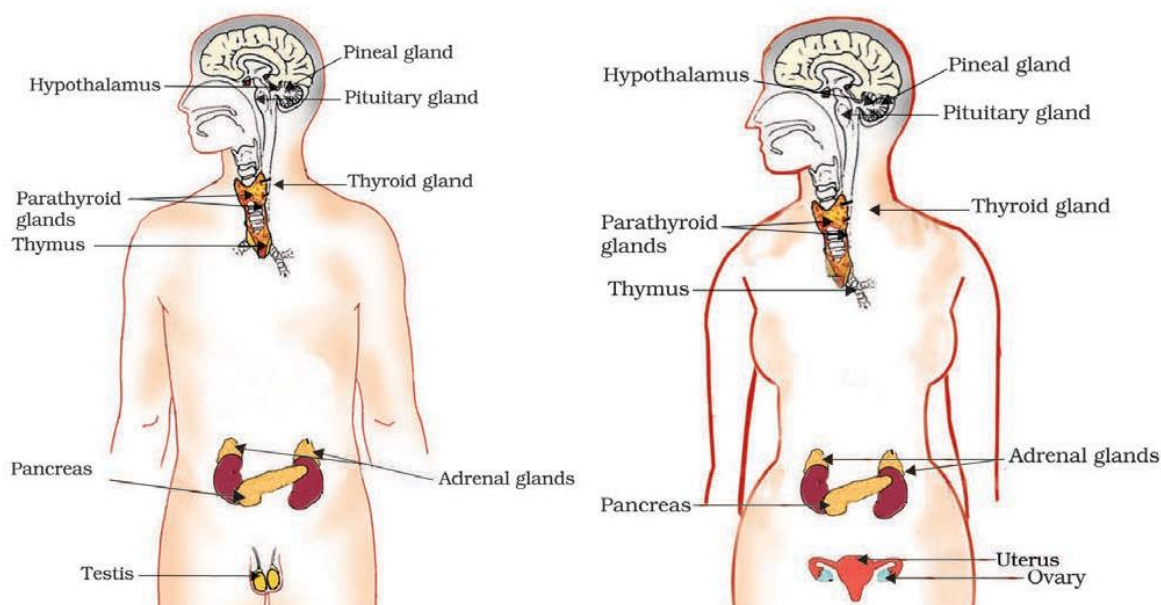
Reason (R): Hormones are transported in blood. [1]

9. Assertion (A): A food web may provide alternative feeding routes.

Reason (R): Some consumers feed on more than one kind of organism. [1]

10. Attempt either A or B. [2]

A. The diagram locates endocrine glands. Explain how a hormone from the pancreas can affect distant tissues. (2)



OR

B. Use the endocrine diagram to compare the route of a thyroid hormone signal with a nerve impulse. (2)

11. Why is iodised salt recommended in our diet? [2]

12. Why do plants need a transport system even though every green leaf can make food? [2]

13. Attempt either A or B. [3]

A. Why are decomposers important to plants and animals? Give three connected reasons. (3)

OR

B. Predict three consequences if forest decomposer activity nearly stopped. (3)

14. Explain why testes lie outside the abdominal cavity and name their two main products. [3]

15. At a Tiwari Academy workshop, students destarch a plant and cover part of a leaf with opaque paper. After sunlight exposure, they test it with iodine. (a) Why destarch? (b) Which region turns blue-black? (c) Explain the conclusion and the uncovered region's role. [4]

16. Explain how a gene can influence pea-plant height through the production of an enzyme. [5]

Attempt either A or B for the remaining 2 marks.

A. Why does a change in the DNA sequence sometimes change the expressed trait? (2)

OR

B. Explain why genes influence traits indirectly rather than acting as miniature visible body features. (2)

SECTION B

(Chemistry | Questions 17–29 | 25 marks)

17. The first member of the ketone family has how many carbon atoms? [1]

(A) One

(B) Two

(C) Five

(D) Three

18. Which statement about a chemical equation is correct? [1]

(A) Atoms disappear when gas escapes

(B) States of substances are always identical

(C) Coefficients may be changed to balance it

(D) Chemical formulae may be changed arbitrarily

19. Chameleons contain crystals that reflect light and produce colour. Adjusting the spacing between these crystals, they can alter the wavelengths of light reflected, thus changing their skin colour. Based on the above information, we can infer that the change in colour by chameleons is a: [1]

- (A) chemical change because change in colour takes place.
- (B) chemical change because wavelength of reflected light changes.
- (C) physical change because the space between crystals is adjusted.
- (D) physical change because light is reflected by crystals.

20. Which sample gives a pungent smell of vinegar? [1]

- (A) Dilute ethanoic acid
- (B) Sodium hydroxide solution
- (C) Sodium chloride solution
- (D) Distilled water

21. Which gas is usually released when zinc reacts with dilute hydrochloric acid? [1]

- (A) Oxygen
- (B) Chlorine
- (C) Sulphur dioxide
- (D) Hydrogen

22. Which pair has the same functional group? [1]

- (A) Ethene and ethyne
- (B) Methanal and propanone
- (C) Methanol and ethanol
- (D) Ethanol and ethanoic acid

23. A gas evolved from a metal–acid reaction burns with a pop. It is: [1]

- (A) sulphur dioxide
- (B) hydrogen
- (C) carbon dioxide
- (D) nitrogen

24. Assertion (A): All compounds containing carbon are hydrocarbons.
Reason (R): Hydrocarbons contain only carbon and hydrogen. [1]

25. Attempt either A or B. [2]

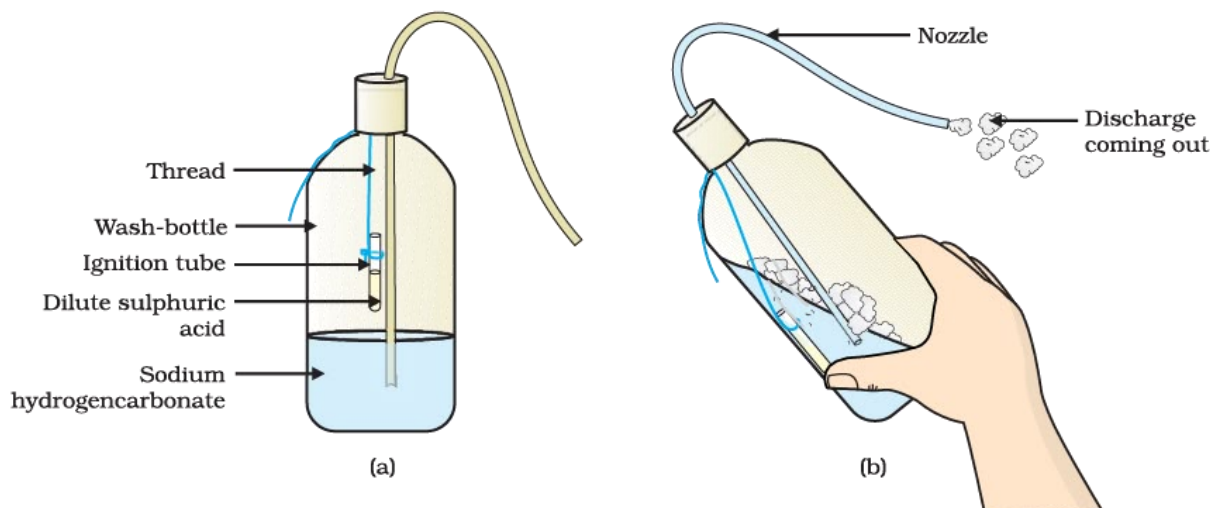
A. Why do most covalent compounds conduct electricity poorly? (2)

OR

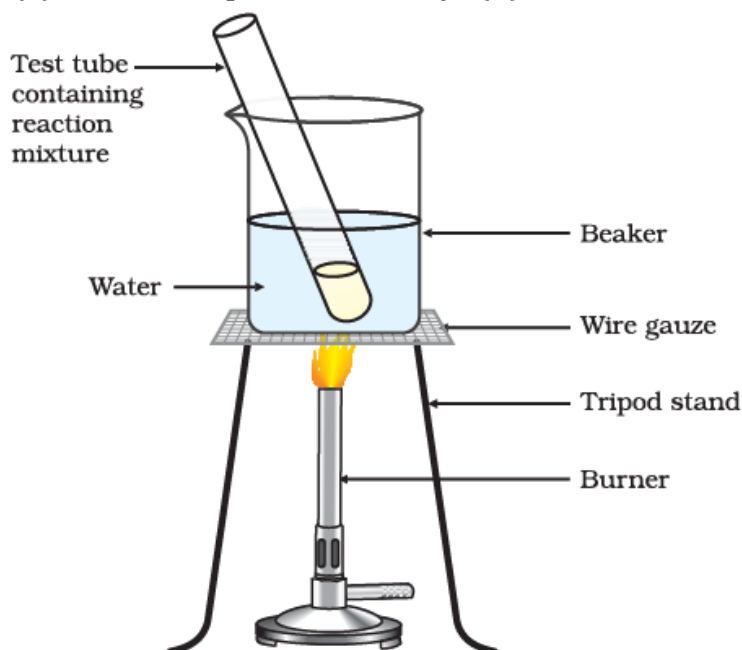
B. Distinguish saturated from unsaturated hydrocarbons. (2)

26. Explain complete and incomplete combustion of carbon fuels and the effect of opening a burner's air holes. [3]

27. Explain the soda–acid extinguisher model shown using an equation and two properties of the evolved gas relevant to its use. **[3]**



28. Ethanol and ethanoic acid are warmed with concentrated sulphuric acid in the water bath shown. (a) Name the product family. (b) State a characteristic smell. **[4]**



Attempt either A or B for the remaining 2 marks.

A. Write the equation and explain the role of the acid catalyst. **(2)**

OR

B. Name the product and predict its alkaline hydrolysis products. **(2)**

29. A salt X is obtained by heating gypsum gently and hardens on adding water. Identify X, give its formula and explain setting. **[5]**

Attempt either A or B for the remaining 2 marks.

A. Give two uses linked to this setting property. **(2)**

OR

B. Why must heating be controlled and storage be dry? **(2)**

SECTION C

(Physics | Questions 30–39 | 25 marks)

30. In the experiment to verify Ohm's law, the correct connections are: [1]

- (A) ammeter in parallel and voltmeter in series
- (B) both meters in parallel
- (C) ammeter in series and voltmeter in parallel
- (D) both meters in series

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 fuse is connected in parallel with an appliance.
Reason (R): It must interrupt the appliance circuit when excess current flows. [1]

33. What is overloading of an electric circuit? Give one cause. [2]

34. Attempt either A or B. [2]

A. What happens to the force on a wire when both current and magnetic field are reversed? Explain. (2)

OR

B. What happens to a wire's force direction when only the magnetic poles are interchanged? (2)

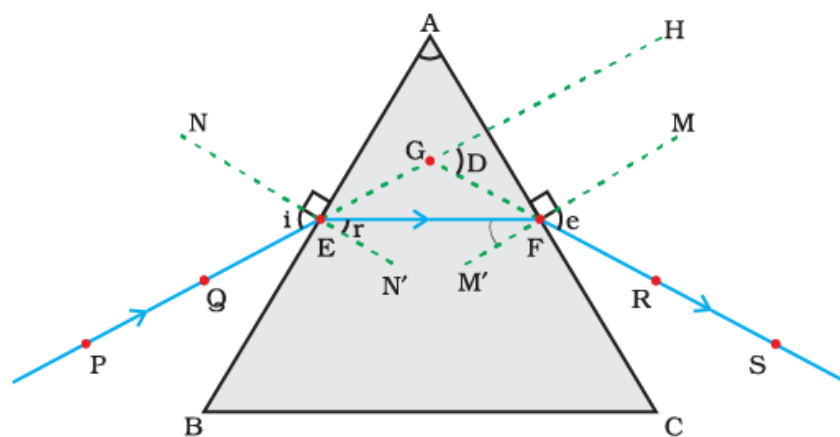
35. Give three different ways of obtaining a magnetic field using familiar school-level arrangements. [3]

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. Use the prism diagram to explain bending at both faces and identify the angle of deviation geometrically. (3)



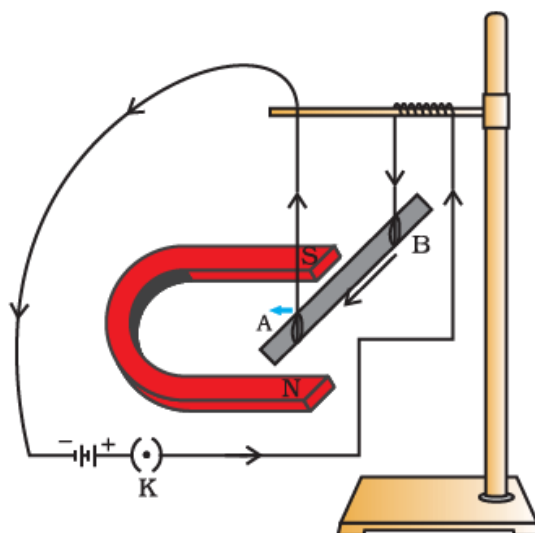
PE – Incident ray
EF – Refracted ray
FS – Emergent ray
 $\angle A$ – Angle of the prism

$\angle i$ – Angle of incidence
 $\angle r$ – Angle of refraction
 $\angle e$ – Angle of emergence
 $\angle D$ – Angle of deviation

OR

B. Why can a prism change a ray's direction even though it enters and finally leaves the same surrounding medium? (3)

38. The current-carrying aluminium rod moves between the magnet poles as shown. (a) What interaction causes motion? (b) Which rule gives its direction? [4]



Predict the effects of reversing only current and then reversing both current and field. (2)

39. A 4 cm object forms an inverted 8 cm image on a screen 40 cm beyond a lens. Determine magnification, object distance and focal length. [5]

Attempt either A or B for the remaining 2 marks.

A. State the lens type and explain the object's region relative to F and 2F. (2)

OR

B. If only the aperture is reduced, predict image size and brightness. (2)