

SCIENCE
Sample Question Paper 16
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. In human cells, most energy from complete oxidation of pyruvate is released in the: **[1]**

(A) cell wall

(B) mitochondria

(C) nucleus

(D) vacuole

2. The hormone that inhibits plant growth and can cause wilting is: **[1]**

(A) abscisic acid

(B) gibberellin

(C) cytokinin

(D) auxin

3. The enzyme pepsin acts mainly on: **[1]**

(A) fats

(B) starch

(C) cellulose

(D) proteins

4. A potato sprout develops from a bud in an eye. Which part is involved in this propagation? **[1]**

(A) Pollen grain

(B) Seed coat

(C) Stem

(D) Root hair

5. 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

6. A fish living in a pond ecosystem feeds on small aquatic insects (larvae). These insect larvae, in turn, feed on green algae and small photosynthetic bacteria. In this specific food chain, what is the trophic level classification of fish? [1]

- (A) Producer (B) Primary Consumer
(C) Secondary Consumer (D) Tertiary Consumer

7. In a cross $rr \times rr$, the expected offspring genotype is: [1]

- (A) RR only (B) Rr only
(C) RR and Rr only (D) rr only

8. Assertion (A): A tendril can coil around a support.

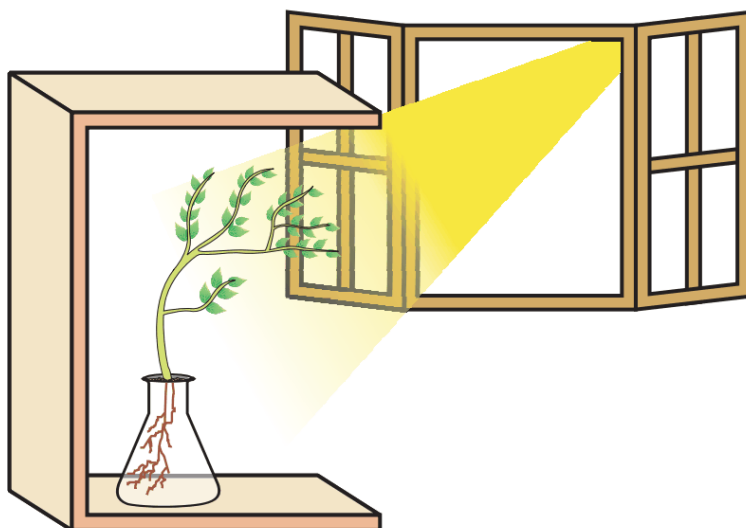
Reason (R): Differential growth on its two sides produces bending. [1]

9. Assertion (A): The amount of energy available generally decreases along a food chain.

Reason (R): Organisms use energy for life processes and lose energy as heat. [1]

10. Attempt either A or B. [2]

A. Explain the bending of the shoot shown when light enters from only one side. (2)



OR

B. Predict the appearance of this shoot if illumination were equal from all sides. Explain. (2)

11. What is meant by dominant and recessive traits? Give a Mendelian example. [2]

12. Attempt either A or B. [2]

A. How can hormones coordinate growth in parts of a plant far from where they are produced? (2)

OR

B. Why can a small amount of a hormone produce a noticeable bodily response? (2)

13. Explain how a dead leaf can supply nutrients to a new plant without recycling its original energy. [3]

14. Explain the three main events of photosynthesis. [3]

15. At Tiwari Academy, students pass equal volumes of inhaled and exhaled air through fresh limewater. (a) Which acts faster? (b) Name the gas responsible. (c) Explain its origin and transport to the lungs. [4]

16. Explain DNA copying and cell division in asexual reproduction and the origin of small differences. [5]

Attempt either A or B for the remaining 2 marks.

A. Why is variation not always beneficial to every individual? (2)

OR

B. Why is copying DNA alone insufficient? (2)

SECTION B

(Chemistry | Questions 17–29 | 25 marks)

17. Which pair can form an ester? [1]

- (A) Ethene and hydrogen
- (B) Propanoic acid and propanol
- (C) Sodium chloride and water
- (D) Methane and oxygen

18. Which reaction forms only one product from two reactants? [1]

- | | |
|--|---|
| (A) $\text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2$ | (B) $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$ |
| (C) $\text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2$ | (D) $\text{AgNO}_3 + \text{NaCl} \rightarrow \text{AgCl} + \text{NaNO}_3$ |

19. Which of the following salts contain water of crystallisation:

- (i) Plaster of Paris, (ii) Washing soda,
(iii) Baking soda and (iv) Gypsum.

- | | |
|--------------------------|-------------------------|
| (A) (i), (ii) and (iii) | (B) (i), (iii) and (iv) |
| (C) (ii), (iii) and (iv) | (D) (i), (ii) and (iv) |

20. Why is gypsum heated carefully to about 373 K to make plaster of Paris? [1]

- (A) To form chlorine gas
- (B) To add extra sulphur to it
- (C) To remove only part of its water of crystallisation
- (D) To convert all calcium into a metal

21. The protective zinc coating on iron is produced by: [1]

- | | |
|------------------|-------------------|
| (A) fermentation | (B) galvanisation |
| (C) calcination | (D) roasting |

22. Which is the first member of the alkyne series? [1]

- (A) Ethyne (B) Methyne
(C) Propane (D) Ethene

23. Why are gold and silver often used for jewellery? [1]

- (A) They react violently with water
(B) They are brittle non-metals
(C) They form hydrogen easily with cold water
(D) They are lustrous and relatively unreactive

24. Assertion (A): Pure gold is often alloyed before making jewellery.
Reason (R): Alloying can increase hardness and durability. [1]

25. Attempt either A or B. [2]

A. Why are alloys often preferred to pure metals for electrical heating elements? (2)

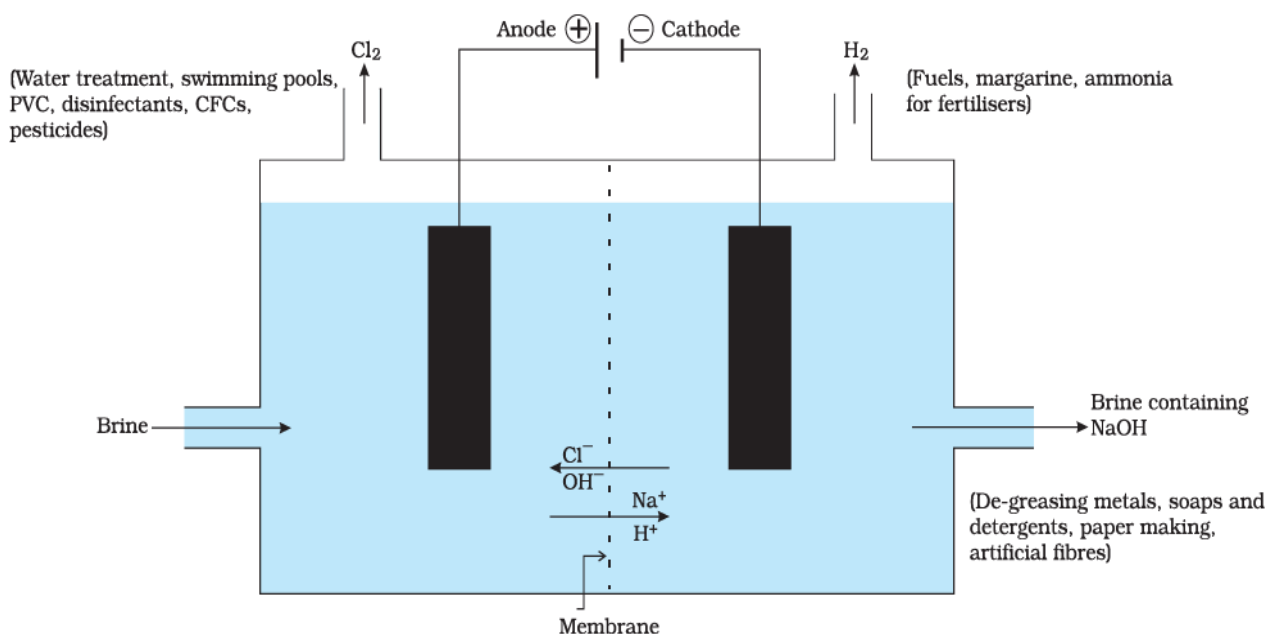
OR

B. Why is pure gold usually not used for everyday jewellery, and what is done instead? (2)

26. Explain why carbon forms covalent compounds and why so many carbon compounds exist. [3]

27. Attempt either A or B. [3]

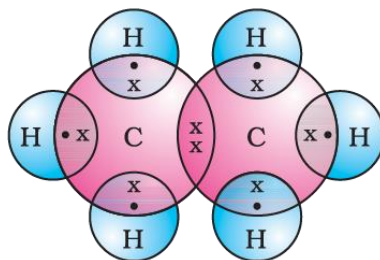
A. Use the chlor-alkali diagram to write the overall reaction and account for why products form at different places. (3)



OR

B. Identify one use of each chlor-alkali product other than simply naming the products from the labels. (3)

28. The ethane model shows its shared electrons. (a) Count C–H bonds. (b) Count C–C bonds. [4]



Attempt either A or B for the remaining 2 marks.

A. Explain why it is saturated and write its molecular formula. (2)

OR

B. How would ethene differ in C–C bonding and hydrogen count? (2)

29. Describe preparation of bleaching powder from chlorine and slaked lime using the supplied textbook formula, and give two uses. [5]

Explain why its formation and use are chemical processes rather than mere colour mixing. (2)

SECTION C

(Physics | Questions 30–39 | 25 marks)

30. The resistance of a wire of fixed material and cross-section is directly proportional to its: [1]

- | | |
|------------------------|--------------------------|
| (A) length | (B) cross-sectional area |
| (C) mass density alone | (D) melting point |

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): An ohmic conductor has constant V/I at constant temperature. Reason (R): Its current is directly proportional to applied potential difference. [1]

33. Express one kilowatt-hour in joules, showing the conversion. [2]

34. A circular coil has ten turns instead of one, with the same current and radius. Explain the effect on the central magnetic field. [2]

35. List the factors affecting a wire's resistance, give the relation and state the SI unit of resistivity. [3]

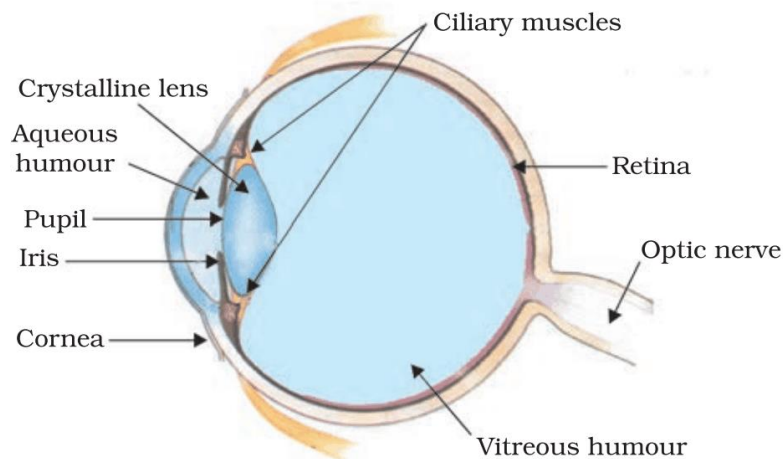
36. A. State the Right-Hand Thumb Rule and describe how it helps determine the direction of magnetic field around a current-carrying conductor.

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

37. Attempt either A or B.

[3]

A. Use the eye diagram to explain how the eye focuses a nearby book while the lens-retina distance remains nearly fixed.



OR

B. Use the eye diagram to distinguish the functions of iris, retina and optic nerve.

38. A student can see distant objects only up to 2 m. Identify the defect, locate the required virtual image for a distant object and calculate corrective power.

[5]

Attempt either A or B for the remaining 2 marks.

A. Explain two physical causes of this defect.

(2)

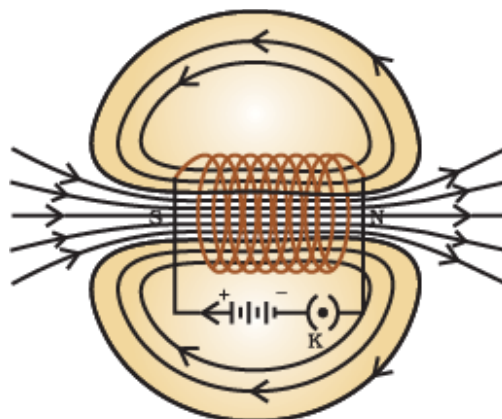
OR

B. Explain how the corrective lens changes the incoming rays.

(2)

39. The diagram shows field lines of a long solenoid. (a) Which region is nearly uniform? (b) What feature of the lines indicates this?

[4]



Attempt either A or B for the remaining 2 marks.

A. Explain why the two ends behave as opposite poles.

(2)

OR

B. Predict the effect of doubling the number of turns in the same length while keeping current unchanged.

(2)