

SCIENCE
Sample Question Paper 19
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. Food stored in a potato is moved to growing buds primarily by: **[1]**
(A) stomatal diffusion (B) glomerular filtration
(C) phloem translocation (D) xylem transpiration

2. The spinal cord is protected by the: **[1]**
(A) sternum (B) vertebral column
(C) rib cage only (D) pelvic girdle

3. The expected F_2 phenotypic ratio for an independently inherited Mendelian dihybrid cross is: **[1]**
(A) 9:3:3:1 (B) 3:1
(C) 1:2:1 (D) 1:1

4. Two parents with free earlobes have a child with attached earlobes. Under a simple dominant–recessive model, the parents can both be: **[1]**
(A) homozygous recessive (B) lacking the relevant gene
(C) haploid (D) heterozygous

5. 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

6. During photosynthesis, what happens to carbon dioxide and water as glucose is formed? [1]

- (A) Carbon dioxide gains hydrogen, while water loses electrons.
- (B) Carbon dioxide loses oxygen, while water gains oxygen.
- (C) Carbon dioxide is oxidised, while water is reduced.
- (D) Both carbon dioxide and water undergo reduction.

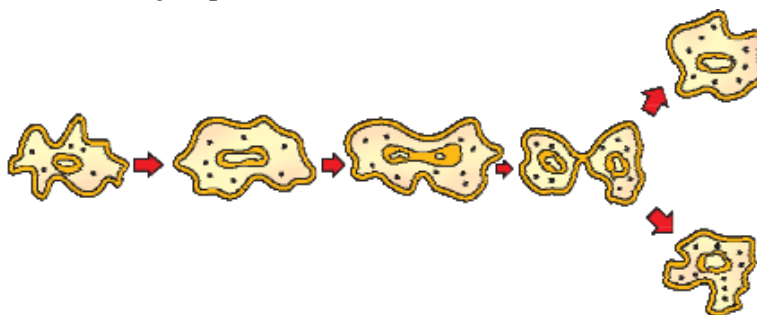
7. Which trait is least likely to be inherited genetically? [1]

- (A) A scar acquired after an injury
- (B) Natural eye colour
- (C) Blood group
- (D) A genetically determined seed shape

8. Assertion (A): Plant hormones can either promote or inhibit growth.
Reason (R): Absciscic acid is a growth inhibitor. [1]

9. Assertion (A): Non-biodegradable substances are always removed rapidly by decomposers.
Reason (R): Many synthetic materials resist microbial breakdown. [1]

10. Examine the sequence of division in Amoeba. Why must nuclear division accompany the division of cytoplasm? [2]



11. Distinguish between pollination and fertilisation. [2]

12. Attempt either A or B. [2]

A. Why is there a continuous flow of blood through body capillaries? (2)

OR

B. Why does a cut in a major artery require rapid control of bleeding? (2)

13. Attempt either A or B. [3]

A. Explain how pesticide sprayed on crops can eventually reach a bird that does not eat those crops. (3)

OR

B. Why can a low pollutant concentration in water harm fish-eating birds? (3)

14. Name the site of complete digestion in humans and explain two structural features that aid absorption there. **[3]**

15. A Tiwari Academy lesson follows high blood glucose after a meal. (a) Which hormone rises? (b) Which gland releases it? (c) Explain feedback as glucose returns towards normal. **[4]**

16. Trace pollen deposition to embryo formation. **[5]**

Attempt either A or B for the remaining 2 marks.

A. State ovule and ovary fates. **(2)**

OR

B. How do petals and nectar aid reproduction? **(2)**

SECTION B

(Chemistry | Questions 17–29 | 25 marks)

17. The chemical name of the main acid in vinegar is: **[1]**

- | | |
|-----------------------|--------------------|
| (A) hydrochloric acid | (B) citric acid |
| (C) ethanoic acid | (D) methanoic acid |

18. Oxidation and reduction in a redox reaction occur: **[1]**

- (A) only when no gas is formed
- (B) simultaneously
- (C) only on different days
- (D) without transfer of matter or electrons

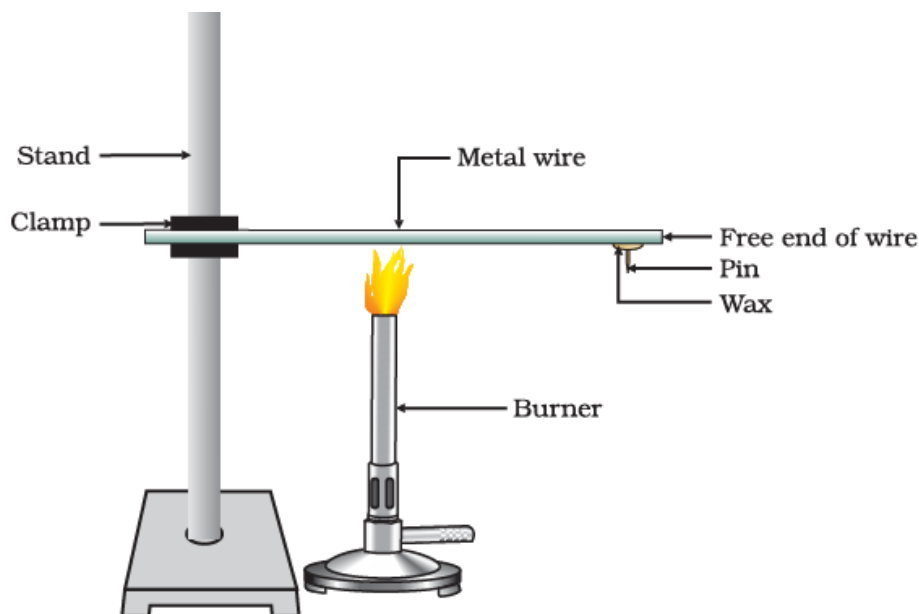
19. Manjeet wants to wash clothes, but the water available is hard. He compares the action of soap and detergent in hard water, to decide which one to use for washing his clothes. He observes:

- 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.

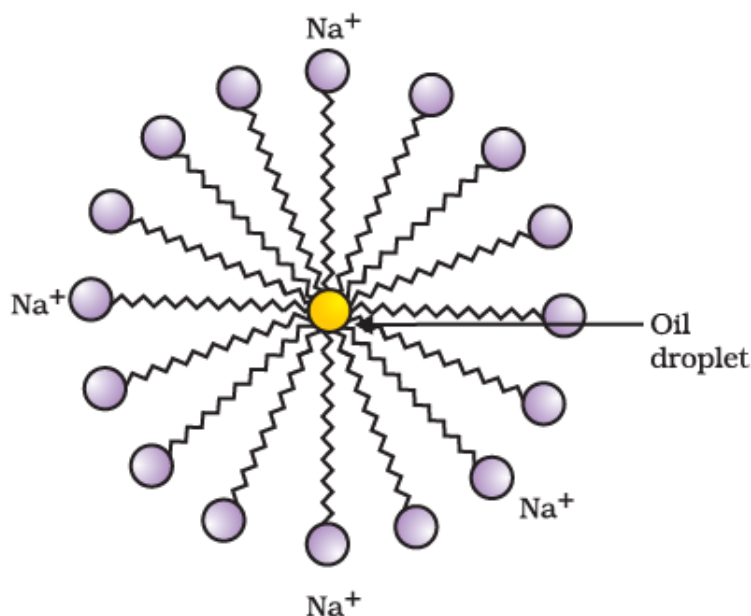
- 20.** The concentration of H_3O^+ decreases when an acid solution is diluted. Its pH generally: [1]
(A) decreases towards 0
(B) stays at 14
(C) becomes negative in every case
(D) increases towards 7
- 21.** An alloy containing mercury is called an: [1]
(A) oxide
(B) alkali
(C) amalgam
(D) ore
- 22.** The carbon atoms in ethene share: [1]
(A) no electrons with each other
(B) two electron pairs with each other
(C) one electron pair with each other
(D) three electron pairs with each other
- 23.** Which statement distinguishes an ore from an ordinary mineral? [1]
(A) A metal can be extracted profitably from an ore
(B) All minerals are ores
(C) An ore contains no impurities
(D) An ore is always a pure metal
- 24.** Assertion (A): Unsaturated hydrocarbons can undergo addition reactions.
Reason (R): Atoms can add across a carbon-carbon multiple bond. [1]
- 25.** Attempt either A or B. [2]
A. What is glacial acetic acid? Why is it so named? (2)
OR
B. What is a functional group? Identify it in propanol. (2)
- 26.** Explain esterification using ethanol and ethanoic acid, giving the equation and reaction condition. [3]
- 27.** Attempt either A or B. [3]
A. In the metal-wire heating experiment, explain why the pin falls, identify the property tested and state one condition needed for comparing two metals fairly. (3)



OR

B. Why would changing wire thickness while comparing metals make the heating experiment inconclusive? (3)

28. The micelle shown surrounds an oil droplet in water. (a) Which part of soap faces oil? (b) Which part faces water? [4]



Explain why the droplet becomes washable and why agitation helps. (2)

29. Explain the meaning of oxidation and reduction using both oxygen and electron-transfer descriptions at school level. [5]

Attempt either A or B for the remaining 2 marks.

A. Identify the changes in $\text{Zn} + \text{Cu}^{2+} \rightarrow \text{Zn}^{2+} + \text{Cu}$.

OR

B. Explain why burning magnesium is oxidation even though the final oxide is white.

SECTION C

(Physics | Questions 30–39 | 25 marks)

30. The best core for a readily switchable electromagnet is: [1]

- (A) dry wood (B) soft iron
(C) hard steel (D) glass

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 magnetic field line can have two directions at the same point.
Reason (R): Intersecting field lines would imply two field directions at one point. [1]

33. What is an electromagnet, and which material is generally used for its core? [2]

34. Attempt either A or B. [2]

A. An appliance is rated 220 V, 440 W. Calculate its rated current and resistance. (2)

OR

B. A 100 W and a 25 W lamp have the same rated voltage. Which has greater resistance, and by what factor at rating? (2)

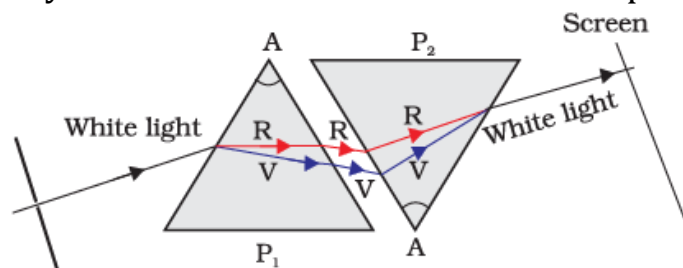
35. What is a solenoid? Describe its internal field and explain how it can act as a magnet. [3]

36. A. State the Right-Hand Thumb Rule and describe how it helps determine the direction of magnetic field around a current-carrying conductor. [3]

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

37. Attempt either A or B. [3]

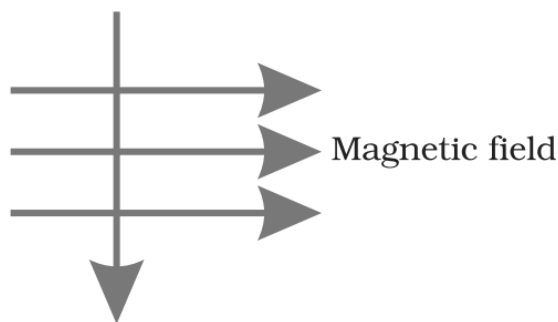
A. In the two-prism arrangement shown, explain the role of each prism and predict the screen colour if only a narrow red beam enters the first prism. (3)



OR

B. Explain what the two-prism experiment shows about white light and why the second prism is inverted. (3)

38. The diagram shows an electron moving down the page in a magnetic field directed rightwards. (a) What direction is the equivalent conventional current? (b) What is the force direction? **[4]**



Attempt either A or B for the remaining 2 marks.

A. Explain the result using the left-hand rule and state whether the force is along the motion. **(2)**

OR

B. Predict the force on a proton moving in the same downward direction, and explain the difference. **(2)**

39. Two resistors in series draw 1 A from 10 V. In parallel across the same source, they draw 6.25 A. Find their sum, product and individual resistances. **[5]**

Calculate power in each complete arrangement and compare.