

SCIENCE
Sample Question Paper 5
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 secretion protects the stomach lining from its acidic contents? **[1]**
(A) Mucus (B) Salivary amylase
(C) Bile pigments (D) Trypsin

2. The hormone that prepares the body for an emergency is secreted by the: **[1]**
(A) salivary glands (B) testes only
(C) pituitary posterior lobe only (D) adrenal glands

3. Which is a unisexual flower? **[1]**
(A) Mustard (B) Rose
(C) Papaya (D) Hibiscus

4. Which organisms break down dead material into simpler substances? **[1]**
(A) Only flowering plants (B) Decomposers
(C) Only top carnivores (D) Only herbivores

5. During urine formation, tubular reabsorption and secretion take place in the kidneys. Which of the following sets correctly indicates both the substances that are reabsorbed in the kidneys? **[1]**
(A) Glucose and salts
(B) Glucose and starch
(C) Glycogen and salts
(D) Glycogen and starch

6. 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.

7. A newly formed zygote differs from a gamete mainly because it: [1]

- (A) cannot divide
- (B) has only a cell wall
- (C) contains paired chromosome sets
- (D) contains no DNA

8. Assertion (A): Insulin is released only when blood glucose is low.

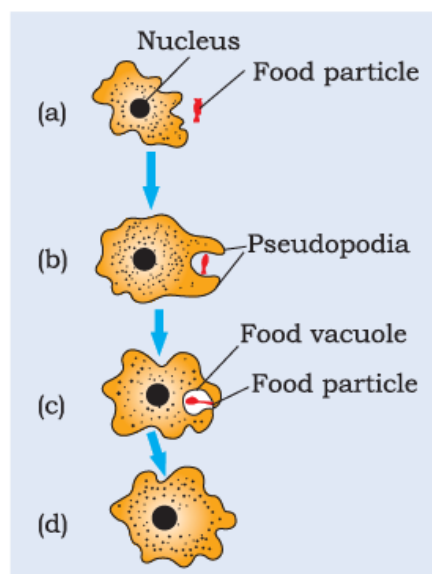
Reason (R): Insulin helps lower a raised blood glucose level. [1]

9. Assertion (A): Gametes normally contain one chromosome from each pair.

Reason (R): Reduction division halves the chromosome number. [1]

10. Attempt either A or B. [2]

A. Use the feeding sequence shown to explain how Amoeba brings food inside and digests it. (2)



OR

B. From the Amoeba sequence, distinguish ingestion from egestion. (2)

11. Why is variation useful to a species when its environment changes? [2]

12. Attempt either A or B. [2]

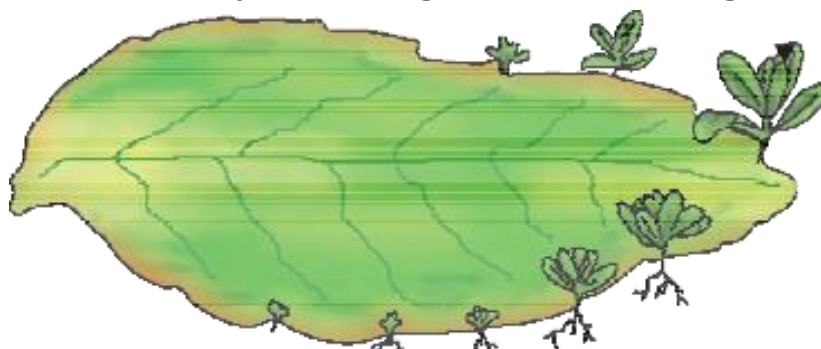
A. Why is an offspring similar to its parents but not an exact copy of either in sexual reproduction? (2)

OR

B. Why can a dominant phenotype conceal different genotypes? (2)

13. Attempt either A or B. [3]

A. The Bryophyllum leaf is placed on moist soil. Explain where new plants arise, why fertilisation is unnecessary and one agricultural advantage. (3)



OR

B. Why is leaf propagation useful but potentially risky when all the plants face a new disease? (3)

14. Explain why plants have relatively low energy needs compared with many animals. [3]

15. A Tiwari Academy activity compares a seedling near a window with one receiving uniform light. (a) Name the directional response. (b) Name the hormone involved. (c) Explain the different growth patterns. [4]

16. Compare oxygen and ozone chemically and explain upper-atmospheric ozone's significance. [5]

Why is international cooperation needed to control ozone-depleting chemicals? (2)

SECTION B

(Chemistry | Questions 17–29 | 25 marks)

17. The precipitate formed on mixing barium chloride and sodium sulphate solutions is: [1]

- (A) white barium sulphate
- (B) green iron sulphate
- (C) blue copper sulphate
- (D) yellow sodium chloride

18. A reaction in which heat is absorbed from the surroundings is: [1]

- (A) exothermic
- (B) always a precipitation
- (C) always a neutralisation
- (D) endothermic

19. Electrical wires made of aluminum [1]

- (A) corrode easily as aluminium is a very reactive metal.
- (B) corrode easily because porous flaky aluminium oxide is formed.
- (C) do not corrode easily as aluminium oxide forms a protective layer.
- (D) do not corrode easily as aluminium is less reactive than metals like sodium, magnesium and zinc.

20. A solution with pH 9 has, compared with pH 6: [1]

- (A) no ions at all
- (B) lower hydrogen ion concentration
- (C) higher hydrogen ion concentration
- (D) the same hydrogen ion concentration

21. Which metal is kept under kerosene to prevent violent reaction with air or moisture? [1]

- | | |
|---------------|------------|
| (A) Potassium | (B) Gold |
| (C) Silver | (D) Copper |

22. Which compound contains a carbon-carbon triple bond? [1]

- | | |
|-------------|-------------|
| (A) Ethane | (B) Methane |
| (C) Ethanol | (D) Ethyne |

23. Which observation best distinguishes burning magnesium from melting wax? [1]

- (A) Both can involve heating
- (B) Light is present in the room
- (C) A new white solid is formed from magnesium
- (D) Both processes need a container

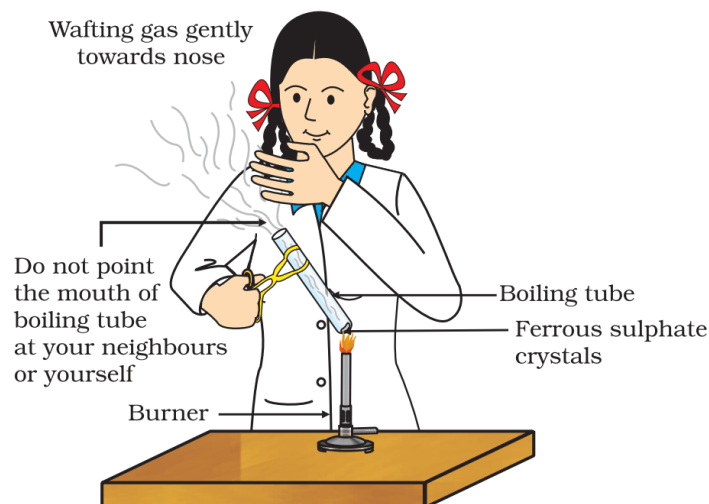
24. Assertion (A): A reaction that releases heat must be a decomposition reaction.
Reason (R): Combustion of methane releases heat. [1]

25. Why does dry hydrogen chloride not change dry litmus, while its aqueous solution does? [2]

26. How is plaster of Paris prepared from gypsum? Give the equation and explain why it is stored in moisture-proof containers. [3]

27. Attempt either A or B. [3]

A. Study the ferrous-sulphate heating arrangement. Describe the initial change of hydrated crystals, the final residue and the balanced decomposition equation. (3)



OR

B. Why does strong heating of ferrous sulphate demonstrate chemical change rather than only drying? [3]

28. A baker compares dough made with baking soda alone and with baking powder. (a) Name the gas that makes the dough rise. (b) Write the formula of baking soda. [4]

Attempt either A or B for the remaining 2 marks.

A. Explain why baking powder may avoid a bitter taste after heating. (2)

OR

B. Write the thermal decomposition equation and explain how gas makes the product porous. (2)

29. Classify CH_4 , C_2H_4 and C_2H_2 by hydrocarbon family and explain their carbon bonding. [5]

Attempt either A or B for the remaining 2 marks.

A. Write hydrogenation of ethene and state a catalyst. (2)

OR

B. Explain how substitution differs from addition using methane and ethene. (2)

SECTION C

(Physics | Questions 30–39 | 25 marks)

30. A concave mirror gives an erect enlarged image when the object lies: [1]

- | | |
|------------------------------------|----------------------------|
| (A) beyond the centre of curvature | (B) at infinity |
| (C) at the centre of curvature | (D) between pole and focus |

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 real image can be obtained on a screen.

Reason (R): Light rays actually converge at a real image.

[1]

33. What happens when a ray crosses between two media with equal refractive indices? State the usual cause of refraction.

[2]

34. Attempt either A or B.

[2]

A. A uniform wire is cut into four equal pieces. How does one piece's resistance compare with the original, and what happens if all four are connected in series? (2)

OR

B. A wire is stretched to twice its length without loss of volume. Determine its new area and resistance in terms of the originals, assuming unchanged resistivity. (2)

35. An object is 15 cm in front of a convex lens of focal length 30 cm. Determine the image position and two other characteristics.

[3]

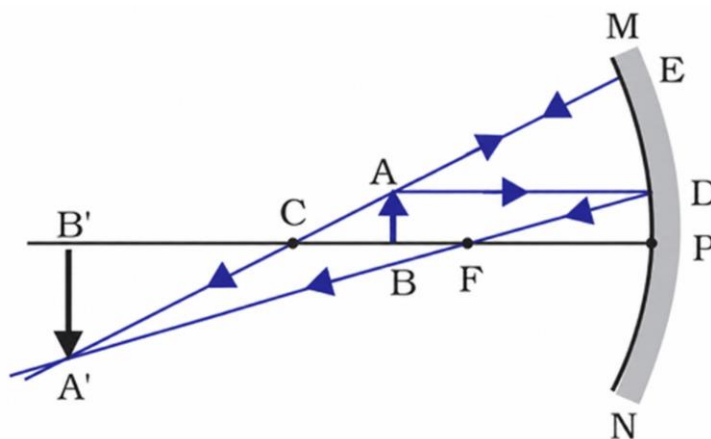
36. A. State the Right-Hand Thumb Rule and describe how it helps determine the direction of magnetic field around a current-carrying conductor.

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

[3]

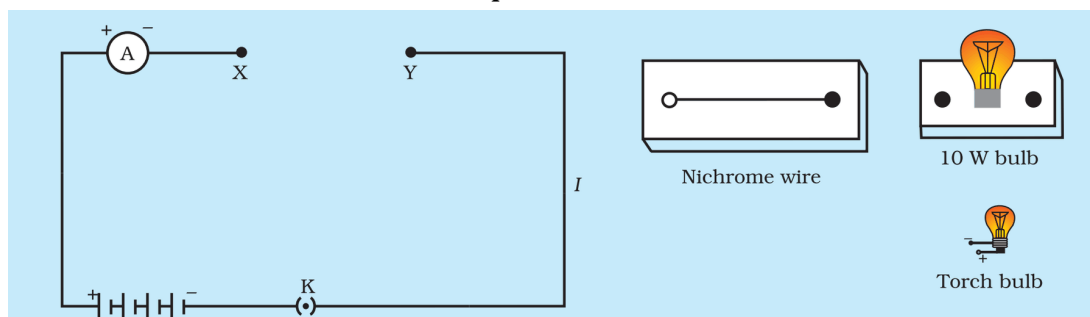
37. For the concave-mirror arrangement shown, take $f = -10$ cm and $u = -15$ cm. Calculate image distance, magnification and the screen position.

[3]



38. The gap XY is filled successively with a wire and two different bulbs as shown. The supply is unchanged. (a) Which meter measures current? (b) What does a different current indicate about a component?

[4]



Attempt either A or B for the remaining 2 marks.

A. If two components draw 0.2 A and 0.5 A at 3 V, calculate their resistances. (2)

OR

B. Why must the same supply and good contacts be used for a fair comparison? (2)

39. A wire of resistivity $1.1 \times 10^{-6} \Omega \text{ m}$ has length 5 m and area 0.5 mm^2 . Calculate its resistance, current at 22 V and power. **[5]**

Attempt either A or B for the remaining 2 marks.

A. If its length is doubled using the same thickness and material, find new resistance and power at 22 V. (2)

OR

B. If instead its area is doubled at the original length, find resistance and current. (2)