

SCIENCE
Sample Question Paper 14
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. An organism digests food outside its body and then absorbs soluble products. It is most likely a: [1]

- | | |
|-----------------|-----------------|
| (A) grasshopper | (B) deer |
| (C) fish | (D) bread mould |

2. The chemical signal travelling through blood to a target organ is called a: [1]

- | | |
|--------------|-----------------------|
| (A) dendrite | (B) stimulus receptor |
| (C) hormone | (D) synapse |

3. Deepening or cracking of the voice in boys is associated with: [1]

- | | |
|-------------------|------------------|
| (A) menstruation | (B) puberty |
| (C) fertilisation | (D) implantation |

4. Which infection can be transmitted through sexual contact? [1]

- | | |
|----------------|-----------------------|
| (A) Gonorrhoea | (B) Goitre |
| (C) Scurvy | (D) Diabetes mellitus |

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 contraceptive method also reduces the risk of sexually transmitted infections? [1]

- (A) Oral hormonal pill alone
- (B) Condom
- (C) Copper-T alone
- (D) Tubectomy alone

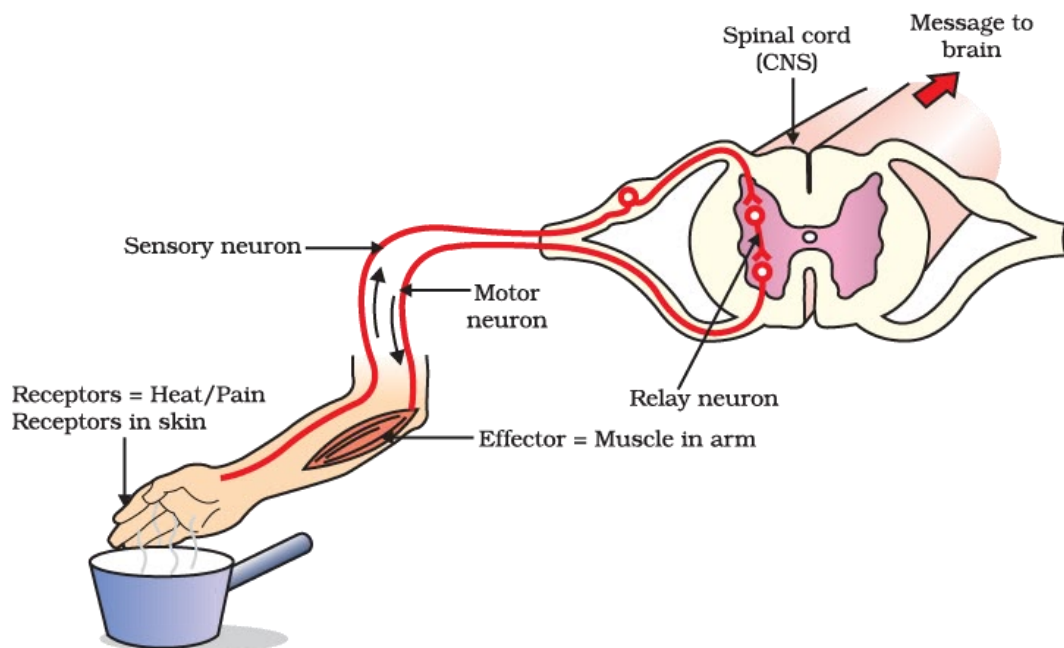
8. Assertion (A): All involuntary actions are identical to spinal reflexes.
Reason (R): Many involuntary activities are controlled by the brain. [1]

9. Assertion (A): The sex of a human child is determined by whether the egg carries X or Y.

Reason (R): Human eggs normally carry X, while sperm may carry X or Y. [1]

10. Attempt either A or B. [2]

A. In the reflex arc shown, why is the withdrawal response fast, and does the brain receive information about the event? (2)



OR

B. What would happen if the motor pathway in the illustrated reflex arc were damaged while the sensory pathway remained intact? (2)

11. State two ways in which a food web is more informative than a single food chain. [2]

12. Why is the small intestine longer in herbivores than in carnivores? **[2]**

13. Attempt either A or B. **[3]**

A. Give a four-level food chain and explain why its last level often supports fewer organisms. **(3)**

OR

B. Why can adding top predators not create more food energy? **(3)**

14. Explain the roles of saliva, hydrochloric acid and villi in human nutrition. **[3]**

15. A Tiwari Academy class crosses true-breeding round yellow peas with wrinkled green peas. (a) Give F_1 genotype using R/r and Y/y. (b) Give F_1 phenotype. (c) List its gametes and state the principle illustrated. **[4]**

16. Explain root water uptake, root pressure and transpiration pull. **[5]**

Attempt either A or B for the remaining 2 marks.

A. Why is transpiration important in tall trees during daytime? **(2)**

OR

B. Why can phloem transport require ATP? **(2)**

SECTION B

(Chemistry | Questions 17–29 | 25 marks)

17. Which metal is present in haemoglobin? **[1]**

- | | |
|---------------|----------|
| (A) Copper | (B) Zinc |
| (C) Aluminium | (D) Iron |

18. Which gas relights a glowing splint? **[1]**

- | | |
|--------------------|--------------|
| (A) Carbon dioxide | (B) Nitrogen |
| (C) Oxygen | (D) Hydrogen |

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 oxide generally produces a base on dissolving in water? [1]

- (A) Sodium oxide (B) Carbon dioxide
(C) Sulphur dioxide (D) Nitrogen dioxide

21. Why do ionic solids usually have high melting points? [1]

- (A) Their molecules are always gases
(B) They contain only weakly attracted atoms
(C) They have no bonds
(D) Strong electrostatic attraction holds their ions together

22. The functional group -CHO identifies an: [1]

- (A) ketone (B) carboxylic acid
(C) aldehyde (D) alcohol

23. A fuel burns with a clean blue flame when its air supply is sufficient. This indicates relatively: [1]

- (A) absence of carbon in every fuel (B) complete combustion
(C) rapid rusting (D) high salt content

24. Assertion (A): An ionic solid conducts well without melting or dissolving.
Reason (R): Ions in its solid lattice cannot move freely. [1]

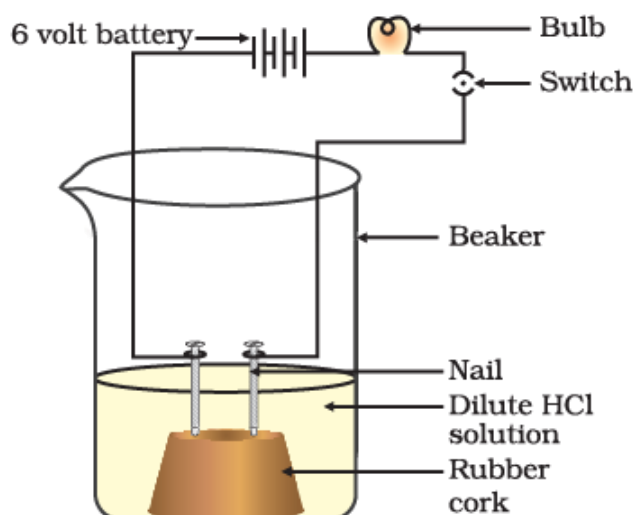
25. Attempt either A or B. [2]

A. Distinguish between roasting and calcination. (2)

OR

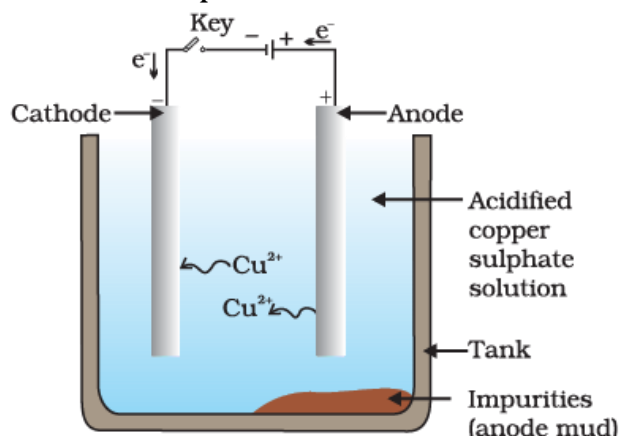
B. What is gangue and why must it be removed from an ore? (2)

26. Compare the bulb response in the illustrated circuit for dilute HCl, glucose solution and distilled water, and explain the difference. [3]



27. Describe the chemical changes when copper and iron are heated strongly in air, using equations. [3]

28. Copper is purified in the illustrated cell. (a) Which electrode receives pure copper? (b) Where do insoluble impurities collect? [4]



Attempt either A or B for the remaining 2 marks.

A. Explain the changes in anode and cathode mass during operation. (2)

OR

B. Explain why the electrolyte must contain copper ions and why a conducting circuit is required. (2)

29. Compare strong and weak acids with concentrated and dilute solutions, using clear definitions. [5]

Attempt either A or B for the remaining 2 marks.

A. Explain dilution's effect on acid pH and heat release. (2)

OR

B. State the safe order of dilution and justify it. (2)

SECTION C

(Physics | Questions 30–39 | 25 marks)

30. Which instrument measures potential difference across a component? [1]

- (A) Rheostat
(C) Voltmeter

- (B) Fuse
(D) Ammeter

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

- (A) 0.25 A
(C) 4.0 A

- (B) 2.5 A
(D) 10 A

32. Assertion (A): White light can be recombined after dispersion.
Reason (R): An inverted identical prism can reverse the separation of colours. [1]

33. How is a voltmeter connected and why is high resistance desirable? [2]

34. Attempt either A or B. [2]

A. A current-carrying wire is parallel to a uniform magnetic field. Predict its magnetic force and the effect of turning it perpendicular. (2)

OR

B. A charged particle is stationary in a magnetic field. Does the field alone exert a magnetic force? What changes when it moves perpendicular to the field? (2)

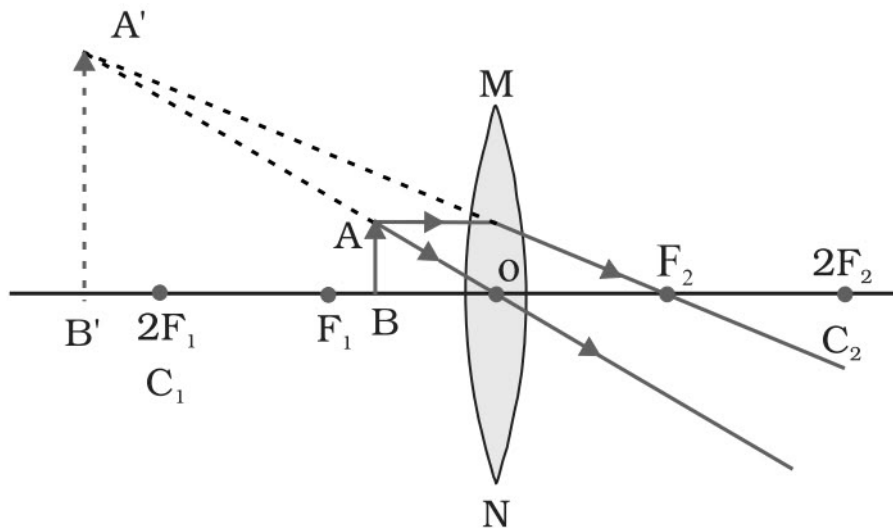
35. Explain three advantages of connecting household appliances in parallel. [3]

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. The convex lens is used as shown with $f = +10$ cm and $u = -6$ cm. Calculate v and m and explain why no screen image is obtained. (3)



OR

B. Explain how the convex lens acts as a magnifier in the figure using position, apparent image and orientation. (3)

38. A concave lens makes a 2 cm image of a 6 cm object placed 30 cm in front. Determine magnification, image distance and focal length. [5]

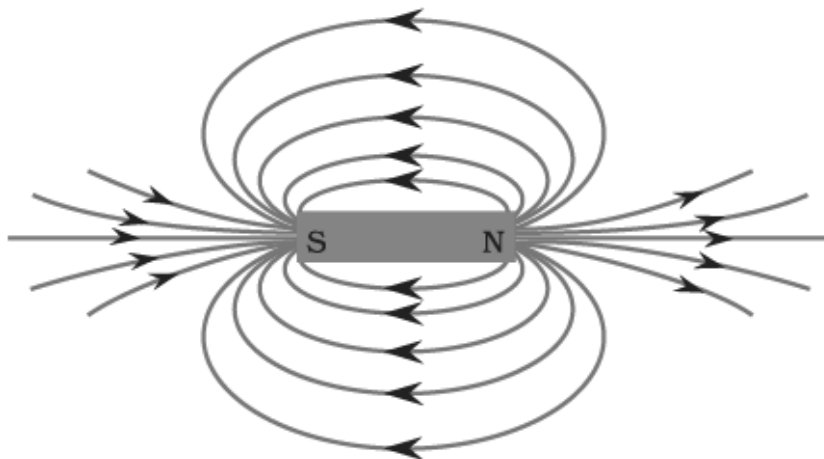
Attempt either A or B for the remaining 2 marks.

A. Calculate power and explain its sign. (2)

OR

B. Why can this image be seen by looking through the lens but not obtained on a screen at its apparent position? (2)

39. The bar-magnet field pattern is shown. (a) State the external direction of a field line. (b) How is relative field strength indicated? **[4]**



Explain why two lines cannot cross and why a tangent is useful. **(2)**