CENTRAL BOARD OF SECONDARY EDUCATION

CBSE 2026-27

Science

Subject Code: 086 | Class X

Marking Scheme – Sample Question Paper – Set 4

Time Allowed: 3 Hours **Maximum Marks: 80**

General Instructions

1. This question paper comprises 39 questions. All questions are compulsory.
2. The question paper is divided into three sections: Section A (Biology), Section B (Chemistry) and Section C (Physics).
3. Section A – Questions No. 1 to 16: Q. Nos. 1 to 7 are Multiple Choice Questions of 1 mark each; Q. Nos. 8 and 9 are Assertion–Reason based questions of 1 mark each; Q. Nos. 10 to 12 are Very Short Answer questions of 2 marks each; Q. Nos. 13 and 14 are Short Answer questions of 3 marks each; Q. No. 15 is a case/source-based question of 4 marks and Q. No. 16 is a Long Answer question of 5 marks.
4. Section B – Questions No. 17 to 29: Q. Nos. 17 to 23 are Multiple Choice Questions of 1 mark each; Q. No. 24 is an Assertion–Reason based question of 1 mark; Q. No. 25 is a Very Short Answer question of 2 marks; Q. Nos. 26 and 27 are Short Answer questions of 3 marks each; Q. No. 28 is a case/source-based question of 4 marks and Q. No. 29 is a Long Answer question of 5 marks.
5. Section C – Questions No. 30 to 39: Q. Nos. 30 and 31 are Multiple Choice Questions of 1 mark each; Q. No. 32 is an Assertion–Reason based question of 1 mark; Q. Nos. 33 and 34 are Very Short Answer questions of 2 marks each; Q. Nos. 35 to 37 are Short Answer questions of 3 marks each; Q. No. 38 is a case/source-based question of 4 marks and Q. No. 39 is a Long Answer question of 5 marks.
6. There is no overall choice. However, an internal choice has been provided in some questions. Only one of the alternatives has to be attempted in such questions.
7. Use of calculators is not permitted.

Exam Pattern

Section	Type of Questions	No. of Qs	Marks each	Total Marks
A	Biology (Q1–16): MCQ (7), Assertion–Reason (2), VSA (3), SA (2), Case-based (1), LA (1)	16	–	30
B	Chemistry (Q17–29): MCQ (7), Assertion–Reason (1), VSA (1), SA (2), Case-based (1), LA (1)	13	–	25
C	Physics (Q30–39): MCQ (2), Assertion–Reason (1), VSA (2), SA (3), Case-based (1), LA (1)	10	–	25
	Total	**39**		**80**

Unit-wise Weightage of Marks

Unit	Unit Name	Chapter	Marks
I	Chemical Substances – Nature and Behaviour	Chemical Reactions and Equations; Acids, Bases and Salts; Metals and Non-metals; Carbon and its Compounds	25

Unit	Unit Name	Chapter	Marks
II	World of Living	Life Processes; Control and Coordination; How do Organisms Reproduce?; Heredity	25
III	Natural Phenomena	Light – Reflection and Refraction; The Human Eye and the Colourful World	12
IV	Effects of Current	Electricity; Magnetic Effects of Electric Current	13
V	Natural Resources	Our Environment	5
	Total		**80**

SECTION – A

Section A (Biology) consists of 16 questions: Q. Nos. 1–7 MCQs, 8–9 Assertion–Reason, 10–12 Very Short Answer, 13–14 Short Answer, 15 Case-based and 16 Long Answer.

Q1. **[1]**

(c) Ovary and testis both [1]

Q2. **[1]**

(c) 100% round and yellow [1]

Q3. **[1]**

(c) It utilizes 10% of light energy and transfers the rest to the next trophic level. [1]

Q4. **[1]**

(c) lack of oxygen and formation of lactic acid. [1]

Q5. **[1]**

(b) II, III [1]

Q6. **[1]**

(b) KOH [1]

Q7. **[1]**

(d) Auxins [1]

Q8. **[1]**

(a) [1]

Q9. **[1]**

(d) [1]

Q10. **[2]**

Cross Ll × Ll with a Punnett square showing gametes L and l from each parent. [1]
Genotypic ratio LL : Ll : ll = 1 : 2 : 1. [1]

Q11. **[2]**

The statement is incorrect: plants also produce waste such as oxygen from photosynthesis and excess water from transpiration. [1]
Plants store waste as resins and gums in old xylem and shed leaves and other parts, so they do have excretory products. [1]

OR

Fishes have 2 chambers; humans have 4 chambers. [1]
A septum separates the right and left sides of the human heart, so oxygenated and deoxygenated blood do not mix. [1]

Q12. **[2]**

Medulla oblongata, pons and cerebellum. [1]
Medulla oblongata controls involuntary actions such as blood pressure and salivation. [1]

Q13. **[3]**

(i) Four levels, for example grass → grasshopper → frog → snake. [2]
(ii) The energy available at a fifth level would be too small to support it (10% law). [1]

OR

A large jar filled with water, aquatic plants and animals. [1]
An oxygen supply or an aerator for the aquatic animals. [$\frac{1}{2}$]
Aquatic plants (producers) give out oxygen during photosynthesis, and animals release carbon dioxide used by plants. [1]
Decomposers break down waste and keep the aquarium clean. [$\frac{1}{2}$]

Q14. **[3]**

In yeast, glucose is converted into ethanol and carbon dioxide with release of energy. [1]
In muscle cells, glucose is converted into lactic acid with release of energy. [1]
Much less energy is released than in aerobic respiration because glucose is not fully oxidised. [1]

OR

Arteries carry blood away from the heart; veins carry blood to the heart. [1]
Arteries have thick elastic walls; veins have thinner walls. [1]
Veins have valves; arteries do not. [1]

Q15. **[4]**

(i) Tissue (cellular) respiration. [1]
(ii) Anaerobic respiration: oxygen was insufficient, so pyruvate was converted into lactic acid in the muscles. [1]
(iii) Aerobic respiration supplies energy steadily and in large amounts over a longer period. [1]
Anaerobic respiration supplies energy quickly but in small amounts, and cannot be sustained for long. [1]

OR

To repay the oxygen debt and remove the accumulated lactic acid. [1]
Extra oxygen is needed to oxidise lactic acid and restore energy stores. [1]

Q16. **[5]**

Diabetes. [1]
Insulin. [1]
Pancreas. [1]
Cytokinins are present in areas of rapid cell division. [1]
Abscisic acid inhibits growth. [1]

OR

Adrenal gland (medulla). [1]
Increases heart rate and breathing rate. [1]
Raises blood glucose for quick energy. [1]
Gibberellin. [1]
Promotes stem elongation (or seed germination). [1]

SECTION – B

Section B (Chemistry) consists of 13 questions: Q. Nos. 17–23 MCQs, 24 Assertion–Reason, 25 Very Short Answer, 26–27 Short Answer, 28 Case-based and 29 Long Answer.

Q17. **[1]**

(b) a - (iii), b - (i), c - (iv), d - (ii) [1]

Q18. **[1]**

(d) complete precipitation of the soap [1]

Q19. **[1]**

(a) (i) and (iii) [1]

Q20. **[1]**

(c) $CaO + H_2O \longrightarrow Ca(OH)_2 + Heat$ [1]

Q21. **[1]**

(d) Baking soda (sodium hydrogen carbonate) [1]

Q22. **[1]**

(c) Hydrogen chloride gas and water [1]

Q23. **[1]**

(c) X is a non-metal and Y is a metal. [1]

Q24. **[1]**

(a) [1]

Q25. **[2]**

Copper(II) chloride is formed; its solution is blue-green in colour. [1]
$CuO + 2\,HCl \longrightarrow CuCl_2 + H_2O$ [1]

OR

Magnesium chloride, MgCl2. [1]
$Mg(OH)_2 + 2\,HCl \longrightarrow MgCl_2 + 2\,H_2O$ [1]

Q26. **[3]**

Double displacement reaction: exchange of ions between two compounds in solution to form two new compounds. [1]
(i) $HCl + NaOH \longrightarrow NaCl + H_2O$: an acid and a base give a salt and water, so it is neutralisation. [1]
(ii) $BaCl_2 + Na_2SO_4 \longrightarrow BaSO_4\downarrow + 2\,NaCl$: an insoluble precipitate of BaSO4 is formed. [1]

OR

$Fe + CuSO_4 \longrightarrow FeSO_4 + Cu$ [1]
Displacement reaction: a more reactive element displaces a less reactive element from its compound. [1]
Zinc (Zn) and magnesium (Mg); any two metals more reactive than copper. [1]

Q27. **[3]**

Plaster of Paris, $(CaSO_4)_2 \cdot H_2O$. [1]
$2\,(CaSO_4 \cdot 2\,H_2O) \xrightarrow{\Delta} (CaSO_4)_2 \cdot H_2O + 3\,H_2O$ [1]
Gypsum must be heated carefully at about 373 K (100 °C); overheating gives anhydrous calcium sulphate, which does not set. [1]

OR

Bacteria act on sugar in the mouth to form acids, which lower the pH and attack enamel. [1]
Toothpaste is a mild base; it neutralises the acid and protects teeth from cavities. [1]
Toothpaste containing fluoride strengthens the enamel. [1]

Q28. **[4]**

(i) Tube C; salt makes the moist air a better electrolyte, which speeds up rusting. [1]
(ii) $4\,Fe + 3\,O_2 + xH_2O \longrightarrow 2\,Fe_2O_3 \cdot xH_2O$ [1]
(iii) Iron is oxidised and oxygen is reduced. [1]
The oil layer keeps air away from the water, and boiled water has very little dissolved oxygen. [1]

OR

Galvanisation: a zinc coating protects iron because zinc is oxidised first. [1]
Painting or oiling cuts off contact of iron with air and moisture. [1]

Q29. **[5]**

Alisha is correct: nitrogen gains hydrogen (is reduced) when ammonia is formed. [1]
Drishti is correct: iron is oxidised and oxygen is reduced in rusting; nitrogen is reduced in ammonia formation. [1]
Bhushan is partly correct: rusting is oxidation of iron, but it is part of a redox process. [1]
(i) AgCl2 should be AgCl and MgNO3 should be Mg(NO3)2: $MgCl_2 + 2\,AgNO_3 \longrightarrow 2\,AgCl\downarrow + Mg(NO_3)_2$. [1]
(ii) Al2SO4 should be Al2(SO4)3 and H2O should be H2: $2\,Al + 3\,H_2SO_4 \longrightarrow Al_2(SO_4)_3 + 3\,H_2\uparrow$. [1]

OR

Daljeet is correct: $MgCO_3 \xrightarrow{\Delta} MgO + CO_2$ is a decomposition into simpler substances. [1]
Avik is wrong: products of decomposition need not be elements. [1]
The first observation is incorrect: iron is less reactive than magnesium, so there is no reaction and the solution stays colourless. [1]
The second observation is correct: aluminium reacts with dilute acid and hydrogen gas causes the effervescence. [1]
$2\,Al + 3\,H_2SO_4 \longrightarrow Al_2(SO_4)_3 + 3\,H_2\uparrow$ [1]

SECTION – C

Section C (Physics) consists of 10 questions: Q. Nos. 30–31 MCQs, 32 Assertion–Reason, 33–34 Very Short Answer, 35–37 Short Answer, 38 Case-based and 39 Long Answer.

Q30. **[1]**

(d) 5 A [1]

Q31. **[1]**

(d) Concentric circles centred around the wire [1]

Q32. **[1]**

(a) [1]

Q33. **[2]**

Dispersion of light. [1]
The speed of violet light in glass is the least and its refractive index is the largest, so violet deviates (bends) the most; red has the greatest speed and least deviation. [1]

OR

In a prism, the two refracting faces are inclined; each colour bends through a different net angle, so the colours fan out (dispersion). [1]
In a parallel-faced slab, the deviations at the two faces are equal and opposite for each colour, so all colours emerge parallel and mixed, appearing white. [1]

Q34. **[2]**

Current drawn $I = P/V = 750/220 \approx 3.4$ A. [1]
No. The current 3.4 A is more than the 3 A rating, so the fuse would melt and break the circuit. [1]

OR

Graph of V (on y-axis) against I (on x-axis) is a straight line passing through the origin. [1]
Resistance is the slope $R = V/I \approx 3.3\,\Omega$ (3.2 to 3.4 Ω accepted). [1]

Q35. **[3]**

(i) Object between the pole and the focus: $0 < |u| < 12$ cm [1]
(ii) Image is larger (virtual, erect, magnified); ray diagram with object between P and F [1]
(iii) Object at 2F: image at 24 cm in front of the mirror, real, inverted and of the same size [1]

OR

(a) $0 < |u| < 40$ cm, i.e. between the pole and the focus, so the image is virtual and erect [1]
(b) Ray diagram: object between P and F; reflected rays diverge and appear to come from an enlarged virtual image behind the mirror [1]
(c) Shaving mirror, dentist mirror or make-up mirror (any one) [1]

Q36. **[3]**

Retina: it contains light-sensitive cells (rods and cones) and converts the optical image formed on it into electrical signals. [1]
Pupil: it regulates and controls the amount of light entering the eye. [1]

Ciliary muscles contract or relax to change the curvature (and hence the focal length) of the eye lens so that the image of objects at different distances is focused on the retina. [1]

OR

The cornea (its outer surface) produces the greatest convergence of the light entering the eye. [1]
The image is formed on the retina. [$\frac{1}{2}$]
The image is real and inverted; the brain interprets (processes) the signals so that we perceive objects erect. [1$\frac{1}{2}$]

Q37. [3]

Resistivity is the same for all three, since they are all copper (it is an intrinsic property of the material). [1]
Resistance of (a) is $R_a = \rho L/A$; for (b) $R_b = \rho(3L)/(A/3) = 9R_a$. [1]
For (c) $R_c = \rho(L/3)/(3A) = R_a/9$; so $R_b : R_a : R_c = 9 : 1 : 1/9$. [1]

Q38. [4]

(i) Convex (converging) lenses [1]
(ii) $f \propto \frac{1}{P}$, so $f_1 : f_2 = 1 : 4$ [1]
(iii) Magnification formula: $m = \frac{h'}{h} = \frac{v}{u}$ [1]
Virtual image: $v = -24$ cm and $m = 3$, so $u = \frac{v}{m} = -8$ cm: object 8 cm from L2 [1]

OR

Thinner lenses are lighter and easier to hold in place [1]
They let more light pass and are easier to make with a smooth surface [1]

Q39. [5]

(i) Erect and magnified image is formed when the face is placed within the focus (object between pole and focus) [1]
(ii) Ray diagram: the emergent ray is parallel to the incident ray but laterally displaced [2]
(iii) $P = \frac{1}{f} = \frac{1}{-0.5\,\text{m}} = -2\,\text{D}$ [2]

OR

(i) No; a concave lens always forms a virtual, erect and diminished image [1]
(ii) Object placed at $2F$ (twice the focal length) of the convex lens [1]
(ii) Image is real, inverted and of the same size, formed at $2F$ on the other side of the lens [1]
(iii) Ray diagram: the image moves to between the optical centre and F on the object side, becomes virtual, erect and diminished [2]

***** END OF PAPER *****