CENTRAL BOARD OF SECONDARY EDUCATION

CBSE 2026-27

Science

Subject Code: 086 | Class X

Marking Scheme – Sample Question Paper – Set 5

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]**

(d) 100%, 75% [1]

Q2. **[1]**

(b) (ii), (iii), (iv) [1]

Q3. **[1]**

(d) Amount of water in the guard cells [1]

Q4. **[1]**

(b) amylase, pepsin, trypsin [1]

Q5. **[1]**

(d) Shark, dog fish, sting ray [1]

Q6. **[1]**

(c) Chemotropism [1]

Q7. **[1]**

(c) Chemotropism [1]

Q8. **[1]**

(b) [1]

Q9. **[1]**

(d) [1]

Q10. **[2]**

Alveoli are thin-walled air sacs at the ends of bronchioles in the lungs; nephron is a long coiled tubule in the kidney. [1]
Alveoli exchange oxygen and carbon dioxide; nephron filters blood and forms urine. [1]

Q11. **[2]**

Hormone levels are regulated by feedback: when blood glucose rises, insulin secretion increases; as glucose falls, insulin secretion decreases. [1]
Example of insulin secretion in response to blood glucose changes. [1]

OR

They travel only along a specific path of nerve fibres and cannot reach all body cells. [1]
The effect of an electrical impulse is short-lived. [1]

Q12. **[2]**

(a) Vagina, then uterus, then fallopian tube (oviduct), where fertilisation takes place. [1]
(b) Two sets of chromosomes (2n). [1]

Q13. **[3]**

Before the starch test A is green; after the iodine test A turns blue-black because starch is formed in the green part. [1]
$6\,CO_2 + 12\,H_2O \longrightarrow C_6H_{12}O_6 + 6\,H_2O + 6\,O_2$ in the presence of sunlight and chlorophyll. [1]
The by-product oxygen is obtained from water, since water molecules are split during photosynthesis. [1]

OR

Aerobic (in mitochondria): glucose + oxygen → carbon dioxide + water + energy. [1]
Yeast (anaerobic): glucose → ethanol + carbon dioxide + energy. [1]
Muscle (anaerobic): glucose → lactic acid + energy. [1]

Q14. **[3]**

A hormone is a chemical messenger secreted by an endocrine gland directly into the blood, acting on a target organ. [1]
Example: rise in blood glucose stimulates insulin secretion; the lowered glucose then reduces insulin secretion. [1]
Feedback keeps the level of hormone close to the body's requirement. [1]

Q15. **[4]**

(i) Fallopian tube (oviduct). [1]
(ii) The uterine lining thickens and becomes richly supplied with blood vessels. [1]
(iii) The thickened uterine lining breaks down and is shed along with blood and mucus (menstruation). [1]
The unfertilised egg dies, as it survives only about one day, and is discharged with the lining. [1]

OR

The placenta, embedded in the uterine wall, has villi that increase the surface area for exchange. [1]
Glucose and oxygen pass from maternal blood to the embryo, and wastes pass back to the mother. [1]

Q16. **[5]**

Gamete formation: pollen grains (male gametes) form in the anther; egg cells form in ovules within the ovary. [1]
Pollination: pollen is transferred to the stigma, by self- or cross-pollination. [1]
A pollen tube grows through the style to the ovary; the male gamete fuses with the egg to form a zygote (fertilisation). [1]
The zygote divides to form an embryo; the ovule develops into a seed and the ovary ripens into a fruit. [1]
Petals, sepals, stamens, style and stigma shrivel and fall off. [1]

OR

(a) Complex organisms have specialised cells organised into tissues and organs; a fragment lacks this organisation. [1]
(a) Fragment cells cannot reorganise to form all the body parts of a new organism. [1]
(b) Germ cells (gametes) are produced only after the reproductive organs mature. [1]
(b) Puberty brings maturation of the reproductive tissues so that gametes can form and sexual reproduction can occur. [1]
(b) Without maturation, fertilisation and reproduction cannot take place. [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]**

(a) Propanal [1]

Q18. **[1]**

(c) (i), (ii) and (iii) [1]

Q19. **[1]**

(a) Na [1]

Q20. **[1]**

(c) (i) and (ii) [1]

Q21. **[1]**

(c) 7 [1]

Q22. **[1]**

(b) I and III [1]

Q23. **[1]**

(c) do not corrode easily as aluminium oxide forms a protective layer. [1]

Q24. **[1]**

(c) [1]

Q25. **[2]**

Copper(II) oxide, a black product. [1]

$2\,Cu + O_2 \xrightarrow{\Delta} 2\,CuO$ [1]

OR

$BaCl_2 + Na_2SO_4 \longrightarrow BaSO_4\downarrow + 2\,NaCl$ [1]

Ba^{2+} and $SO_4{}^{2-}$ ions are present in the precipitate BaSO4. [1]

Q26. **[3]**

X is sodium hydrogen carbonate (baking soda), $NaHCO_3$. [1]

$2\,NaHCO_3 \xrightarrow{\Delta} Na_2CO_3 + H_2O + CO_2$ [1]

Used in baking to make cakes soft and spongy, or in soda-acid fire extinguishers. [1]

OR

Add the concentrated acid slowly to water with constant stirring; never add water to the acid. [1]

Dilution releases a large amount of heat; adding acid to water spreads the heat safely and avoids splashing. [1]

The H3O+ concentration decreases on dilution, because the acid is spread in more water. [1]

Q27. **[3]**

No; X reacts vigorously with water and would catch fire or release hydrogen. [1]

X is sodium (Na), extracted by electrolytic reduction of molten sodium chloride. [1]

$2\,NaCl \xrightarrow{\text{electrolysis}} 2\,Na + Cl_2$ [1]

OR

Copper reacts with moisture, carbon dioxide and air to form green basic copper carbonate. [1]

No; iron would rust more readily, while copper is more resistant to corrosion. [1]

Copper is malleable and ductile, so it can be beaten into thin sheets. [1]

Q28. **[4]**

(i) $2\,NaCl + 2\,H_2O \longrightarrow 2\,NaOH + H_2 + Cl_2$ [1]

(ii) Chlorine: making bleaching powder, disinfecting drinking water, making PVC. [1]

(iii) A is sodium hydrogen carbonate (baking soda); B is sodium carbonate (washing soda, anhydrous). [1]

$2\,NaHCO_3 \xrightarrow{\Delta} Na_2CO_3 + H_2O + CO_2$ [1]

OR

Water of crystallisation is the fixed number of water molecules present in one formula unit of a crystalline salt. [1]

Examples: washing soda, $Na_2CO_3 \cdot 10\,H_2O$, and copper sulphate, $CuSO_4 \cdot 5\,H_2O$. [1]

Q29. **[5]**

$2\,NaCl + 2\,H_2O \longrightarrow 2\,NaOH + Cl_2 + H_2$ [1]

Chlorine is produced at the anode; the brine electrolysis forms NaOH at the cathode side. [1]

Other products: hydrogen gas and sodium hydroxide. [1]

Chlorine is used for making bleaching powder and for disinfecting drinking water. [1]

Hydrogen is used as a fuel and in making margarine; sodium hydroxide is used in soap making. [1]

OR

$NaCl + H_2O + NH_3 + CO_2 \longrightarrow NaHCO_3 + NH_4Cl$ [1]

Sodium hydrogen carbonate is less soluble and separates out as a precipitate. [1]

NH4Cl, the by-product, is used as a fertiliser. [1]

Used in baking to make cakes soft. [1]
Used as an antacid for acidity. [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]**

(a) Upwards in the plane of the paper [1]

Q31. **[1]**

(c) Concave mirror and concave lens [1]

Q32. **[1]**

(c) [1]

Q33. **[2]**

Resistance: the ratio of the potential difference across a conductor to the current through it, $R = V/I$. [1]
SI unit: ohm, Ω. [1]

Q34. **[2]**

(a) $v = \frac{c}{n} = \frac{2}{3}c$, so the speed reduces by $\frac{1}{3}$, i.e. about 33.3 % [1]
(b) Medium C; a larger angle of refraction means a smaller refractive index ($\sin r = \frac{\sin i}{n}$), hence a higher speed [1]

OR

(a) Angle of incidence is greater than the angle of refraction, because light bends towards the normal in the denser medium [1]
(b) Normal incidence (angle of incidence zero), or both media having the same refractive index [1]

Q35. **[3]**

(i) Myopia (short-sightedness); caused mainly by the excessive curvature of the eye lens or the elongated eyeball. [1]
(ii) Causes: (1) excessive curvature (power) of the eye lens; (2) elongation of the eyeball. [1]
(iii) A concave (diverging) lens; it diverges the rays from distant objects so that the image is effectively formed at the far point, and the eye lens then focuses it on the retina. [1]

OR

Dispersion is the splitting of white light into its seven constituent colours on passing through a prism. [1]
Cause: different colours have different wavelengths and hence different speeds and refractive indices in glass, so each colour bends through a different angle. [1]
Diagram: prism with white light entering one face and the spectrum (red to violet) emerging from the other face. [1]

Q36. **[3]**

EMF $= 4 \times 1.5 = 6\,\text{V}$; total resistance $= 5 + 10 + 15 = 30\,\Omega$. [1]
Current $I = 6/30 = 0.2\,\text{A}$. [1]
Potential difference across $10\,\Omega$: $V = IR = 0.2 \times 10 = 2\,\text{V}$. [1]

OR

$P = I^2R$. [1]
$P = (0.2)^2 \times 15$. [1]
$P = 0.6\,\text{W}$. [1]

Q37. **[3]**

Each filing becomes a small magnet and aligns itself along the local magnetic field. [1]
The pattern indicates the magnetic field, its direction and relative strength. [$\frac{1}{2}$]

Field lines never intersect each other. [$\frac{1}{2}$]
Field lines are closed curves that emerge from the north pole and enter the south pole outside; closer lines mean a stronger field. [1]

OR

(a) The deflection increases, because the field strength is directly proportional to the current. [1$\frac{1}{2}$]
(b) The deflection decreases, because the field of the wire becomes weaker with distance. [1$\frac{1}{2}$]

Q38. [4]

(i) Both are convex (converging) lenses; the larger objective lens L1 has the larger focal length (smaller power). [1]
(ii) Since $P = \frac{1}{f}$, focal length is inversely proportional to power: $f_1 : f_2 = 4 : 1$. [1]
(iii) (i) $m = \frac{v}{u}$, so $3 = \frac{24}{u}$ giving $u = 8$ cm from the lens. [1]
(ii) Thinner lenses are lighter and allow more light to pass through with fewer flaws, giving sharper images and easier handling. [1]

OR

(i) A real and inverted image (at the focus of the objective, since the star is effectively at infinity). [1]
(ii) The retina. [1]

Q39. [5]

She suffers from myopia (short-sightedness). [1]
$f = \frac{1}{P} = \frac{1}{-4.5}$ m ≈ -0.22 m $= -22$ cm; the lens is concave (diverging). [1]
Ray diagrams: myopic eye with the image in front of the retina; correction with a concave lens focusing distant objects on the retina. [2]
Causes: (i) excessive curvature of the eye lens; (ii) elongation of the eyeball. [1]

OR

The father suffers from hypermetropia (far-sightedness); his spectacles carry convex (converging) lenses, which focus sunlight to a burning point. [1]
Causes: (i) the eyeball is too short; (ii) the focal length of the eye lens is too long. [1]
Diagram: hypermetropic eye with the image of a nearby object behind the retina; correction with a convex lens forming the image on the retina. [2]
A convex (converging) lens: it converges the parallel rays of sunlight to its focus, where the concentrated energy burns the paper. [1]

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