CENTRAL BOARD OF SECONDARY EDUCATION

# CBSE 2026-27

## Science

Subject Code: 086 | Class X

## Marking Scheme – Sample Question Paper – Set 7

**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) Urine is more diluted. [1]

**Q2.** **[1]**

(c) Carbon dioxide [1]

**Q3.** **[1]**

(a) Glucose [1]

**Q4.** **[1]**

(c) Hind-Brain - Cerebellum [1]

**Q5.** **[1]**

(c) Vegetative propagation [1]

**Q6.** **[1]**

(d) sex is not genetically determined in snails. [1]

**Q7.** **[1]**

(c) Secondary consumer [1]

**Q8.** **[1]**

(a) [1]

**Q9.** **[1]**

(c) [1]

**Q10.** **[2]**

A small bud (outgrowth) develops on the body wall by repeated cell division at one site. [1]
The bud develops tentacles and a mouth, then detaches to become a new Hydra. [1]

**Q11.** **[2]**

Working back with the 10% law: snake (4th level) 500 J, so frog (3rd level) has 5000 J. [1]
Grasshopper (2nd level) has 50000 J, so grass (1st level) has $5 \times 10^5$ J. [1]

**OR**

Pesticides are non-biodegradable, so they persist and accumulate in water bodies. [1]
They enter the food chains of aquatic organisms and biomagnify, harming fish and other organisms, and humans who eat them. [1]

**Q12.** **[2]**

Male (boy) foetus. [1]
It is used for sex-selective abortion of female foetuses, leading to female foeticide and an imbalance in the sex ratio. [1]

**Q13.** **[3]**

Asexual: one parent, no gametes, offspring identical to parent (for example yeast budding). [1]
Sexual: two parents, gametes fuse, offspring show variation (for example, flowering plants or humans). [1]
Examples given correctly for both modes (for example, yeast budding and human sexual reproduction). [1]

**OR**

It produces new individuals that replace those that die, so the species continues. [1]
It allows the population to spread into new habitats and use resources. [1]
Variation from reproduction helps the population survive changed conditions. [1]

**Q14.** **[3]**

Parents TT (tall) × tt (short); gametes T and t. [1]
Cross gives $F_1$ progeny that are all Tt and all tall. [1]
The short trait was not seen in $F_1$; tallness is dominant and shortness is recessive, but the short character is hidden, not lost. [1]

**OR**

Monohybrid cross. [1]
One pair of contrasting characters (height). [1]
Pea plant (pure-breeding, self-pollinating). [1]

**Q15.** **[4]**

**(i)** Ultraviolet (UV) radiation. [1]
**(ii)** Chlorofluorocarbons (CFCs). [1]
**(iii)** UV radiation splits O2 molecules into O atoms, which combine with O2 to form O3 (ozone). [1]
Stop or reduce the use of CFCs and use CFC-free substitutes, as agreed under the Montreal Protocol. [1]

**OR**

More UV radiation reaches the earth and causes skin cancer. [1]
It harms eyes (cataract) and plants and marine organisms such as phytoplankton. [1]

**Q16.** **[5]**

Insulin: pancreas; lowers blood glucose by promoting uptake and storage of glucose; deficiency causes diabetes. [$1\frac{1}{2}$]
Adrenaline: adrenal gland; prepares the body for emergency by raising heart rate and glucose; deficiency weakens the emergency response. [1]
Thyroxine: thyroid gland; regulates metabolic rate; deficiency causes goitre (with iodine deficiency) or myxoedema. [$1\frac{1}{2}$]
Each of the three hormones is secreted directly into the blood. [1]

**OR**

Fore-brain: cerebrum controls thinking, memory and voluntary actions. [1]
Fore-brain also contains the hypothalamus, which controls hunger, thirst and body temperature. [1]
Mid-brain: controls visual and auditory reflexes. [1]
Hind-brain: medulla controls involuntary actions; cerebellum controls balance and precision of voluntary movements. [2]

## 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]**

(d) $Fe_2O_3 + 3\,CO \longrightarrow 2\,Fe + 3\,CO_2$ [1]

**Q18.** **[1]**

(c) Sodium hydrogen carbonate + Tartaric acid [1]

**Q19.** **[1]**

(c) Copper(II) chloride, which is blue-green in colour [1]

**Q20.** **[1]**

(c) 5, 6 or 7 [1]

**Q21.** **[1]**

(b) X = Mg; Y = MgO; Type of reaction = Combination [1]

**Q22.** **[1]**

(a) $C_4H_{10}O$ [1]

**Q23.** **[1]**

(b) Alkenes [1]

**Q24.** **[1]**

(a) [1]

**Q25.** **[2]**

Test tube B (CuSO4): iron is more reactive than copper and displaces it; iron cannot displace zinc or aluminium, and it cannot displace iron itself. [1]
$Fe + CuSO_4 \longrightarrow FeSO_4 + Cu$ [1]

**Q26.** **[3]**

(a) Add $NaHCO_3$/$Na_2CO_3$: ethanoic acid gives brisk effervescence; ethanol does not react. (Or: ethanoic acid turns blue litmus red.) [1]
(b) $CH_3COOH + NaHCO_3 \longrightarrow CH_3COONa + H_2O + CO_2$. [1]
(c) Carbon dioxide; it turns lime water milky. [1]

**OR**

(a) Pure ethanoic acid freezes at about 290 K, forming ice-like crystals, hence "glacial". [1]
(b) About 5-8 per cent solution in water. [1]
(c) Used as a preservative in pickles / in manufacture of esters (perfumes). [1]

**Q27.** **[3]**

Decomposition: a single substance breaks down into two or more simpler substances. [1]
Any two correct equations: $CaCO_3 \xrightarrow{\Delta} CaO + CO_2$; $2\,AgBr \xrightarrow{light} 2\,Ag + Br_2$; $2\,H_2O \xrightarrow{electricity} 2\,H_2 + O_2$. [1]
Microorganisms oxidise organic matter and release heat, so the reaction is exothermic. [1]

**OR**

In combination, substances join to form one product; in decomposition, one substance breaks into simpler substances. [1]
$CaO + H_2O \longrightarrow Ca(OH)_2$ (combination). [1]
$CaCO_3 \xrightarrow{\Delta} CaO + CO_2$ (decomposition). [1]

**Q28.** **[4]**

**(i)** Add sodium carbonate/hydrogen carbonate to each: ethanoic acid gives brisk effervescence of $CO_2$; ethanol shows no reaction. [1]
**(ii)** Ethene: $C_2H_5OH \xrightarrow{\text{hot conc. } H_2SO_4} CH_2{=}CH_2 + H_2O$. [1]
**(iii)** Combustion adds oxygen (or removes hydrogen), so every combustion is an oxidation. [1]
Oxidation does not always release heat and light as combustion does, e.g. ethanol to ethanoic acid with acidified $K_2Cr_2O_7$ is oxidation but not combustion. [1]

**OR**

$2\,CH_3COOH + Na_2CO_3 \longrightarrow 2\,CH_3COONa + H_2O + CO_2$; the gas is carbon dioxide, which turns lime water milky. [1]
Alternative test: ethanoic acid turns blue litmus red; ethanol does not. [1]

**Q29.** **[5]**

A: ethanoic acid $CH_3COOH$; B: sodium ethanoate $CH_3COONa$; C: ethanol $C_2H_5OH$; D: ethyl ethanoate $CH_3COOC_2H_5$. [2]
$2\,CH_3COOH + 2\,Na \longrightarrow 2\,CH_3COONa + H_2$ (pop sound is hydrogen). [1]
$CH_3COOH + C_2H_5OH \xrightarrow{acid} CH_3COOC_2H_5 + H_2O$ (esterification). [1]

$CH_3COOC_2H_5 + NaOH \longrightarrow CH_3COONa + C_2H_5OH$ (saponification). [1]

**OR**

(i) D ($C_2H_6$) is the saturated hydrocarbon. [1]
(ii) B is the organic acid; structure $CH_3-COOH$ (with C=O and −OH on the same carbon). [1]
(iii) C (ethanol); conc. $H_2SO_4$ acts as a dehydrating agent: $C_2H_5OH \xrightarrow{443\ K,\ conc\cdot\ H_2SO_4} C_2H_4 + H_2O$. [1]
(iv) $CH_3COOH + C_2H_5OH \xrightarrow{conc\cdot\ H_2SO_4} CH_3COOC_2H_5 + H_2O$: ester (ethyl ethanoate), used in perfumes/as a flavouring agent. [2]

## 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]**

(c) Concave mirror [1]

**Q31.** **[1]**

(a) As sunlight passes through the atmosphere, shorter wavelengths, such as blue, are scattered more than other colours [1]

**Q32.** **[1]**

(a) [1]

**Q33.** **[2]**

When the fuse melts, the appliance is disconnected from the live wire, so it is no longer at live potential. [1]
Even if the neutral wire is connected, the appliance stays at neutral potential, so the user is safe. [1]

**OR**

The earth wire. [1]
Without it, a fault can make the metallic body live, giving a shock to the user. [1]

**Q34.** **[2]**

Dispersion of light. [1]
P (deviated less) corresponds to the colour of longer wavelength (e.g. yellow/red side); the more-deviated light Q has the shorter wavelength. [1]

**OR**

Place the two identical prisms with their refracting edges (prism angles) opposite to each other, one upright and the other inverted, in the path of light. [1]
The first prism disperses the white light; the second prism recombines the colours because it produces equal and opposite deviations, so the emergent beam is white. [1]

**Q35.** **[3]**

Rule: the thumb points along the conventional current, and the curled fingers show the direction of the field around the conductor. [1]
The field lines are concentric circles, so the thumb rule fixes the field direction at every point around the wire. [1]
The field decreases with distance from the conductor; for a long straight wire $B \propto \frac{I}{r}$. [1]

**OR**

Fore finger: magnetic field; middle finger: current; thumb: force. The three are mutually perpendicular. [1]
Field upward and current eastward: the force points towards the south. [2]

**Q36.** **[3]**

(i) Speed of light is maximum in air, so $n = \frac{c}{v} > 1$ for any other material [1]
(ii) The ray falls along the normal to the curved surface, so the angle of incidence is zero [1]
(iii) Ray bends away from the normal on entering air (a rarer medium) [1]

**OR**

(i) Water, since its refractive index is lower ($v = \frac{c}{n}$) **[1]**
(ii) $n_{dw} = \frac{n_d}{n_w} = \frac{2.42}{1.33}$ **[1]**
$\approx 1.82$ **[1]**

**Q37.** **[3]**

Myopia; the image is formed in front of the retina. **[1]**
Causes: (i) excessive curvature of the eye lens; (ii) elongation of the eyeball. **[1]**
Corrected by a concave lens of suitable power placed before the eye; diagram showing parallel rays diverged by the concave lens and then focused on the retina. **[1]**

**OR**

In hypermetropia, nearby objects (not distant objects) are focused behind the retina, so near vision is blurred. **[1]**
Causes: (i) the eyeball is too short; (ii) the focal length of the eye lens is too long. **[1]**
A convex lens; it provides the extra convergence needed so that the image of nearby objects forms on the retina. **[1]**

**Q38.** **[4]**

**(i)** The iron core is magnetised strongly and concentrates the field, giving a stronger pull on the bolt. **[1]**
**(ii)** Using the right-hand thumb rule: curl the fingers along the direction of the current; the thumb points to the north pole. **[1]**
**(iii)** The field is directly proportional to the current, so it roughly doubles when the current doubles. **[1]**
The stronger pull on the bolt unlocks the door more effectively. **[1]**

**OR**

Increase the number of turns per unit length (or decrease the length of the solenoid). **[1]**
Insert a soft iron core inside the solenoid. **[1]**

**Q39.** **[5]**

Concentric circles centred on XY, in planes perpendicular to the conductor, with arrows showing the direction of the field. **[1]**
Right-hand thumb rule: the thumb points along the current from X to Y and the curled fingers give the field direction. **[1]**
Fleming left-hand rule: fore finger along the field, middle finger along the conventional current (opposite to the electron motion), and the thumb gives the force. **[2]**
The force on the electron is downwards in the plane of the paper, because the electron is negatively charged. **[1]**

**OR**

A solenoid is a long helical coil of insulated wire carrying current. **[1]**
Pattern like a bar magnet outside and nearly parallel lines inside, with the direction of current and of the field lines near the ends marked correctly. **[2]**
The region inside the solenoid, away from its ends, is where the field is uniform. **[1]**
Place a soft iron core inside the solenoid and pass current through the coil. **[1]**

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