CENTRAL BOARD OF SECONDARY EDUCATION

CBSE 2026-27

Science

Subject Code: 086 | Class X

Marking Scheme – Sample Question Paper – Set 2

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) Cuscuta, ticks, lice, leeches and tapeworm [1]

Q2. **[1]**

(d) Blood pressure: Medulla in hindbrain [1]

Q3. **[1]**

(d) Halving of chromosomes at the time of gamete formation. [1]

Q4. **[1]**

(c) 3 : 1 [1]

Q5. **[1]**

(a) Broken down by biological processes [1]

Q6. **[1]**

(b) Lactic acid + energy [1]

Q7. **[1]**

(d) carbon dioxide in human cells [1]

Q8. **[1]**

(a) [1]

Q9. **[1]**

(b) [1]

Q10. **[2]**

The zygote divides several times to form an embryo. [1]
The ovule develops into a seed; the ovary grows and ripens into a fruit. [1]

Q11. **[2]**

(a) 10000 J, since 100 J at level 3 is 10% of 1000 J at level 2, which is 10% of 10000 J at the producer level. [1]
(b) No, because the energy loss at each step leaves very little usable energy to support more levels. [1]

OR

The pesticide is non-biodegradable and accumulates at each trophic level. [1]
Humans at the last trophic level will have the highest concentration, leading to biological magnification and health hazards. [1]

Q12. **[2]**

Tt (all F_1 plants are tall hybrids). [1]
Tallness (T) is dominant over shortness (t), so the dominant trait is expressed in the hybrid. [1]

OR

Phenotypic ratio tall : short = 3 : 1. [1]
Genotypic ratio TT : Tt : tt = 1 : 2 : 1. [1]

Q13. **[3]**

Any four, each 0.5 mark: condoms; oral pills; Copper-T (IUCD); surgical methods (tubectomy or vasectomy). [2]
A smaller family reduces the burden on resources, and the health of mother and children improves. [1]

OR

Ovaries: produce the egg (ovum). [$\frac{1}{2}$]
Ovaries: secrete female hormones (oestrogen and progesterone). [$\frac{1}{2}$]
Fallopian tubes: carry the egg from the ovary and are the site of fertilisation. [1]
Uterus: receives and implants the zygote and nourishes the developing embryo. [1]

Q14. **[3]**

All F_1 plants are tall; gene combination Tt. [1]
The gene for tallness (T) is dominant, so the recessive allele t is masked in the hybrid. [1]
Tall : short = 3 : 1 in F_2; the recessive trait reappears in about 25% of plants, showing dominance and segregation of alleles. [1]

OR

The F_1 plants (Tt) form T and t gametes in equal numbers (segregation). [1]
Random fusion of gametes gives TT : Tt : tt = 1 : 2 : 1, so tall : short = 3 : 1. [1]
Short plants (tt) appear in about 25% of the progeny. [1]

Q15. **[4]**

(i) The offspring inherit a new mixture of genes from both parents, so its combination of traits differs from that of either parent. [1]
(ii) F_1 is the first generation produced by crossing two pure parents; F_2 is produced by self-pollinating the F_1 plants. [1]
(iii) New combinations: round green and wrinkled yellow. [1]
Seed shape and seed colour are inherited independently, so their alleles recombine during gamete formation. [1]

OR

Each character segregates in a 3 : 1 ratio separately. [1]
Independent assortment of two pairs of alleles gives 16 gamete combinations and the 9 : 3 : 3 : 1 ratio. [1]

Q16. **[5]**

Fallopian tube (oviduct): the place of the surgical block in tubectomy. [1]
Uterus: the place where Copper-T is inserted. [1]
Vagina: the place where a female condom is placed. [1]
Condoms prevent sexually transmitted diseases and give privacy to the user. [1]
Principle: a mechanical barrier prevents sperms and the ovum from meeting. [1]

OR

DNA duplicates and the two copies move apart, while the cell elongates. [1]
The cell membrane pinches in and the cytoplasm divides into two daughter cells. [1]
Labelled diagram showing these stages. [1]
Multicellular bodies have specialised cells organised into tissues and organs that a simple division cannot make. [1]
Sexual reproduction with gametes ensures variation and maintains the chromosome number of the species. [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) Sodium hydroxide is a base which is soluble in water, while ferric hydroxide is insoluble in water. [1]

Q18. **[1]**

(a) Copper [1]

Q19. **[1]**

(b) Magnesium reacts with dilute hydrochloric acid to produce H_2 gas which helps it float. [1]

Q20. **[1]**

(a) Change in chemical properties [1]

Q21. **[1]**

(a) Hydrogenation [1]

Q22. **[1]**

(b) $2\,KI + Pb(NO_3)_2 \longrightarrow PbI_2 + 2\,KNO_3$ [1]

Q23. **[1]**

(c) $Na_2CO_3 \cdot 10\,H_2O$, sodium carbonate decahydrate [1]

Q24. **[1]**

(a) [1]

Q25. **[2]**

Burn the compound in air/oxygen; the CO_2 evolved turns lime water milky. [1]
By sharing its four valence electrons with other atoms (covalent bonding). [1]

OR

Catenation: the self-linking of carbon atoms into long chains and rings. [1]
Tetravalency: carbon forms four bonds with carbon or other atoms; small size gives strong stable bonds. [1]

Q26. **[3]**

X is copper (Cu). [1]
Y is copper(II) oxide (CuO): $2\,Cu + O_2 \longrightarrow 2\,CuO$. [1]
Labelled diagram: impure copper anode, pure copper cathode, acidified copper sulphate electrolyte, battery; pure copper deposited on the cathode. [1]

OR

Test each with dilute HCl and dilute NaOH: Al2O3 dissolves in both (amphoteric), while MgO dissolves only in acid (basic). [2]
Label the sample that dissolves in both as Al2O3 and the other as MgO. [1]

Q27. **[3]**

Electron dot structure of ethanol: two C atoms bonded to each other and to an O atom; O bonded to H; all bonds shown as shared electron pairs. [1]
Propanol, C_3H_7OH. [1]
$C_2H_5OH + CH_3COOH \xrightarrow{\text{conc}\cdot\ H_2SO_4} CH_3COOC_2H_5 + H_2O$ (esterification). [1]

OR

A is ethene; B is ethane. [1]
$CH_3CH_2OH \xrightarrow{\text{conc}\cdot\ H_2SO_4,\ 170\,^\circ C} CH_2{=}CH_2 + H_2O$. [1]
$CH_2{=}CH_2 + H_2 \xrightarrow{Ni} CH_3CH_3$. [1]

Q28. **[4]**

(i) Silver, because its candle drops first (about 10 s). [1]
(ii) (ii) 20 s, because gold conducts heat better than aluminium (30 s) but not as well as copper (15 s). [1]
(iii) Yes, the time increases because heat has to travel a longer distance to reach the candle. [1]
The rate of heat flow along a longer rod is lower, so the wax takes longer to melt. [1]

OR

The time decreases, because the candle drops sooner. [1]

A thicker rod has a larger cross-section, so more heat flows along it per second. [1]

Q29. **[5]**

Reactivity series: the arrangement of metals in decreasing order of their reactivity. [1]
A more reactive metal displaces a less reactive metal from its compound or salt solution, so relative activities can be predicted. [1]
Middle metals are reduced by heating with carbon, e.g. $ZnO + C \longrightarrow Zn + CO$. [1]
Metals at the top (K, Na, Ca, Mg, Al) are obtained by electrolytic reduction, e.g. $2\,Al_2O_3 \xrightarrow{\text{electrolysis}} 4\,Al + 3\,O_2$. [1]
Metals at the top have a very high affinity for oxygen, so carbon cannot reduce their oxides. [1]

OR

Fix pins with wax at equal distances along a metal rod (e.g. copper) and heat one end. [1]
The wax melts progressively and the pins drop one after another, showing that heat travels along the metal. [1]
Cinnabar is concentrated by froth floatation, then roasted: $2\,HgS + 3\,O_2 \xrightarrow{\Delta} 2\,HgO + 2\,SO_2$. [1]
$2\,HgO \xrightarrow{\Delta} 2\,Hg + O_2$: mercury is obtained by self-reduction of the oxide. [1]
Mercury is a liquid metal and is collected from the furnace. [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]**

(c) scattering of light [1]

Q31. **[1]**

(b) 300% [1]

Q32. **[1]**

(c) [1]

Q33. **[2]**

$\frac{1}{u} = \frac{1}{f} - \frac{1}{v} = -\frac{1}{20} + \frac{1}{60}$, so $u = -30$ cm: object 30 cm in front of the mirror [1]
$m = -\frac{v}{u} = -2$, so image height $= 2 \times 1.2 = 2.4$ m, inverted [1]

Q34. **[2]**

The field is stronger where the lines are closely spaced, that is, near the two ends. [1]
The field direction is reversed (the poles interchange); its magnitude stays the same. [1]

OR

Current drawn $= \frac{P}{V} = \frac{1000}{220} \approx 4.5$ A, so fuse B (5 A) is used. [1]
Fuse A (2 A) would melt during normal operation, so it is unsuitable. [1]

Q35. **[3]**

Series: $R_1 = 484\,\Omega$, $R_2 = 242\,\Omega$, so $I = 220/(484 + 242) \approx 0.30$ A. [1]
Parallel: $I_1 = 100/220 \approx 0.45$ A and $I_2 = 200/220 \approx 0.91$ A. [1]
Total parallel current ≈ 1.36 A. [1]

OR

100 W lamp: $R = V^2/P = 220^2/100 = 484\,\Omega$. [1½]
200 W lamp: $R = 220^2/200 = 242\,\Omega$. [1½]

Q36. **[3]**

AC can be stepped up to a high voltage by a transformer, which reduces the current and the heat loss in the lines. [1]
Household supply is AC, whose direction changes periodically (50 cycles per second); a dry cell gives DC flowing in one direction. [1]
The fuse wire melts when the current exceeds the safe limit, cutting off the supply and protecting the appliances. [1]

OR

The displacement increases when the current is increased, and also when a stronger magnet is used. [1]
Reversing the current displaces the conductor towards the right, that is, in the opposite direction. [$\frac{1}{2}$]
Fleming left-hand rule: fore finger along the field, middle finger along the current, and the thumb gives the direction of force. [$1\frac{1}{2}$]

Q37. [3]

Converging (convex) lens, since a real, magnified image is to be projected [1]
Real image with $|m| = 3$ and $|u| + |v| = 600$ cm gives $u = -150$ cm and $v = +450$ cm [1]
$\frac{1}{f} = \frac{1}{v} - \frac{1}{u} = \frac{1}{450} + \frac{1}{150}$, so $f = 112.5$ cm (≈ 1.125 m) [1]

OR

Object at $2F = 40$ cm from the lens [1]
Image is real, inverted and of the same size, formed at 40 cm on the other side [1]
Ray diagram with F and 2F marked, showing the object and image at 2F [1]

Q38. [4]

(i) Heat is produced by the heating effect of the electric current in the resistive coils and motor of the refrigerator, and is released into the room. [1]
(ii) $H = I^2Rt$, which can also be written as $H = V^2t/R$. [1]
(iii) Electric iron, electric heater or toaster (any one). [1]
Electric geyser, electric kettle or fuse wire (any one). [1]

OR

The commercial unit is the kilowatt-hour (kWh): the energy consumed at the rate of 1 kW for 1 hour. [1]
$1\,\text{kWh} = 3.6 \times 10^6$ J. [1]

Q39. [5]

(i) Resistivity remains ρ. [1]
(i) It is an intrinsic property depending only on the material (and temperature), not on the length or area. [1]
(ii)(a) Each part has $R/4$; four in parallel give $R_p = (R/4)/4 = R/16$. [1]
(ii)(b) In series $R_s = 4 \times R/4 = R$. [1]
(iii) The parallel combination ($R/16$) consumes more power, since $P = V^2/R$ is largest for the smallest resistance. [1]

OR

Area $A \propto d^2$, so doubling d makes the area four times. [2]
New resistance $R' = \rho L/(4A) = R/4$. [2]
Reason: $R \propto 1/A$ for fixed L and ρ. [1]

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