CENTRAL BOARD OF SECONDARY EDUCATION

CBSE 2026-27

Science

Subject Code: 086 | Class X

Marking Scheme – Sample Question Paper – Set 3

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) insulin from pancreas [1]

Q2. **[1]**

(b) Vegetative buds produced in the notches of the leaf [1]

Q3. **[1]**

(c) Dominant trait, Inherited trait [1]

Q4. **[1]**

(b) Enrichment of oxygen in the atmosphere. [1]

Q5. **[1]**

(b) Contraction of left ventricle [1]

Q6. **[1]**

(d) Longer small intestine [1]

Q7. **[1]**

(b) Mushroom [1]

Q8. **[1]**

(b) [1]

Q9. **[1]**

(b) [1]

Q10. **[2]**

Two food chains with different producers, for example trees → zebra → tiger and grass → zebra → tiger (or any other valid chains). [1]
The two chains are joined at a common organism (zebra or tiger), forming a food web. [1]

Q11. **[2]**

Father BB (black hair), mother bb (red hair); the child receives B from the father and b from the mother, so the child is Bb. [1]
The child has black hair because black (B) is dominant over red (b). [1]

OR

Tt [1]
Tallness (T) is dominant over shortness (t), so the dominant allele masks the recessive allele in the hybrid. [1]

Q12. **[2]**

Bile cannot reach the small intestine, so fats are not emulsified into small droplets and fat digestion by lipase becomes slow and incomplete. [1]
The medium is not made alkaline, so pancreatic enzymes do not act efficiently. [1]

OR

Herbivores eating cellulose-rich food have a longer intestine for longer digestion. [1]
Carnivores have a shorter intestine because meat is easier to digest. [1]

Q13. **[3]**

Free earlobe (F) is dominant and attached earlobe (f) is recessive; the attached trait is expressed only in the homozygous ff condition. [1]
Progeny: 50% free earlobe (Ff) and 50% attached earlobe (ff). [1]
Father ff; mother Ff. [1]

OR

Snails: an individual may begin life as male and become female depending on environmental conditions. [1]
Reptiles such as turtles and crocodiles: the temperature during egg development decides the sex. [1]
Female has a pair of similar X chromosomes (XX); male has an unequal pair of X and Y, where Y is smaller. [1]

Q14. **[3]**

Damaging: at ground level ozone is a poisonous gas that damages lungs and plants. [1]
Beneficial: in the upper atmosphere it shields the earth from harmful UV radiation. [1]
Prevention: stop using CFCs and other synthetic ozone-depleting chemicals. [1]

OR

Energy flow in an ecosystem is unidirectional. [1]
Producers capture only about 1% of sunlight, and much of it is lost as heat. [1]
Only about 10% of the energy of one trophic level is transferred to the next (10% law). [1]

Q15. **[4]**

(i) Algae, because they make their own food by photosynthesis. [1]
(ii) Fourth trophic level (algae, larvae, small fish, large fish). [1]
(iii) Energy at large fish: 10 J (1000 J at larvae, 100 J at small fish, 10 J at large fish). [1]
Only 10% energy is passed on; the rest is lost as heat, used in respiration and in metabolism. [1]

OR

Energy available becomes too small to support another level. [1]
Energy is lost at each step, so the 10% law limits the number of levels. [1]

Q16. **[5]**

(I) Four-chambered heart. [1]
Separation of oxygenated and deoxygenated blood gives an efficient oxygen supply for the high energy needs that maintain body temperature. [2]
(II) Two-chambered heart. [1]
Blood is pumped to the gills, oxygenated there, and passes directly to the body; blood passes the heart only once per cycle. [1]

OR

Ribs lift up and out, and the diaphragm flattens, so the chest cavity becomes larger and air is sucked in. [2]
Haemoglobin in red blood cells binds oxygen strongly and carries it in the blood. [1]
The heart pumps oxygen-rich blood through arteries to all body tissues, where oxygen is released. [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]**

(b) B and C [1]

Q18. **[1]**

(b) X, Y and Z [1]

Q19. **[1]**

(a) Catenation [1]

Q20. **[1]**

(c) Addition of hydrogen in the presence of a catalyst changes B to A. [1]

Q21. **[1]**

(b) X = Mg; Y = MgO; type of reaction = combination [1]

Q22. **[1]**

(a) Clove oil and vanilla essence [1]

Q23. **[1]**

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

Q24. **[1]**

(a) [1]

Q25. **[2]**

Displacement reaction. [$\frac{1}{2}$]
$Cu + 2\,AgNO_3 \longrightarrow Cu(NO_3)_2 + 2\,Ag$ [1]
Electrolytic refining. [$\frac{1}{2}$]

Q26. **[3]**

Isomers are compounds with the same molecular formula but different structural formulae. [1]
Methane, ethane and propane have only one possible arrangement; branching of the carbon chain is not possible with up to three carbon atoms. [1]
n-Butane: $CH_3-CH_2-CH_2-CH_3$ and iso-butane (2-methylpropane): $CH_3-CH(CH_3)-CH_3$. [1]

OR

X: ethanol C_2H_5OH; Y: ethanoic acid CH_3COOH; Z: ethyl ethanoate $CH_3COOC_2H_5$. [1]
$CH_3CH_2OH \xrightarrow{\text{alkaline } KMnO_4 \,+\, \text{heat, then acidify}} CH_3COOH$. [1]
$CH_3COOH + C_2H_5OH \xrightarrow{\text{conc}\cdot\ H_2SO_4} CH_3COOC_2H_5 + H_2O$. [1]

Q27. **[3]**

White colour. [$\frac{1}{2}$]
Decomposition (photodecomposition) reaction. [$\frac{1}{2}$]
$2\,AgCl \xrightarrow{\text{Sunlight}} 2\,Ag + Cl_2$ [1]
Used in photography; silver bromide (AgBr) is another chemical used for the same purpose. [1]

Q28. **[4]**

(i) A: ethanol; F: ethene. [1]
(ii) $CH_3CH_2OH \xrightarrow{\text{alkaline } KMnO_4,\ \text{heat, then acidify}} CH_3COOH$ (oxidation). [1]
(iii) Step (ii): oxidation; step (v): addition (hydrogenation). [1]
With the next homologue (propanol) as A: oxidation gives propanoic acid; dehydration gives propene, and hydrogenation of propene gives propane. [1]

OR

$CH_3CH_2OH \xrightarrow{\text{hot conc}\cdot\ H_2SO_4} CH_2=CH_2 + H_2O$. [1]
Conc. H_2SO_4 acts as a dehydrating agent (removes a water molecule from ethanol). [1]

Q29. **[5]**

(a) Catenation (self-linking of carbon atoms into chains and rings) and tetravalency (bonding with four other atoms). [2]
(b)(i) Carbon (2,4) cannot lose or gain 4 electrons on energy considerations, so it shares electrons; (ii) intermolecular

forces in covalent compounds are weak, so melting/boiling points are low. [2]
(c)(i) $2\,Na + 2\,CH_3CH_2OH \longrightarrow 2\,CH_3CH_2ONa + H_2$; (ii) $NaOH + CH_3COOH \longrightarrow CH_3COONa + H_2O$. [1]

OR

(a) Carbon has 4 valence electrons (2,4); gaining or losing 4 electrons is energetically unfavourable, so it shares electrons to attain a noble gas configuration. [2]
(b) Catenation and tetravalency. [2]
(c) Nitrogen (2,5) shares one electron with each of three hydrogen atoms to form three N-H covalent bonds: NH_3. [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]**

(b) 0.06 A [1]

Q31. **[1]**

(b) Two times [1]

Q32. **[1]**

(c) [1]

Q33. **[2]**

Current drawn $= \frac{P}{V} = \frac{750}{220} \approx 3.4$ A. [1]
Since 3.4 A is more than 3 A, the 3 A fuse would blow; the kettle cannot be used with it. [1]

Q34. **[2]**

Correct path of the ray through the prism, bending towards the base at both refracting faces. [1]
Angle of incidence marked between the incident ray and the normal at the first face; angle of deviation marked between the emergent ray and the direction of the incident ray. [1]

OR

Towards the original direction it bends away from the incident ray: the emergent ray deviates (bends) from the incident direction by the angle of deviation. [$\frac{1}{2}$]
A prism deviates light towards its base, so the emergent ray makes an angle of 36 degrees with the direction of the incident ray extended. [1$\frac{1}{2}$]

Q35. **[3]**

The soft iron becomes a strong temporary magnet; the device is an electromagnet. [1]
It is called an electromagnet because its magnetism exists only while current flows. [$\frac{1}{2}$]
The field lines inside the solenoid are straight and parallel to its axis. [$\frac{1}{2}$]
The parallel lines indicate that the field is uniform, with the same strength and direction, inside the solenoid. [1]

OR

All appliances and the plug point are connected in parallel across the live and neutral wires, each with its own switch in the live wire. [1]
A fuse is placed in the live wire of the main supply line, before the circuit. [1]
The metallic bodies of the refrigerator and the plug point are connected to the earth wire. [1]

Q36. **[3]**

(i) $u = -24$ cm and $v = +24$ cm, so $\frac{1}{f} = \frac{1}{24} + \frac{1}{24}$ gives $f = 12$ cm [1]
(ii) Candle is then 12 cm from the lens, i.e. at the focus; image is formed at infinity and no sharp image is obtained on the screen [1]
(iii) Ray diagram: two rays from the tip of the object emerge parallel to the axis and do not converge [1]

OR

Concave mirror; object at the centre of curvature, $u = -30$ cm and $f = -15$ cm **[1]**
Object at 10 cm: $\frac{1}{v} = \frac{1}{f} - \frac{1}{u} = -\frac{1}{15} + \frac{1}{10}$, so $v = +30$ cm, i.e. 30 cm behind the mirror **[1]**
Image is virtual, erect and magnified; the object is between the pole and the focus (ray diagram) **[1]**

Q37. [3]

The defect is hypermetropia (long-sightedness); the corrective lens is convex (converging). **[1½]**
Before correction, rays from a nearby object, after refraction by the eye lens, converge behind the retina: labelled ray diagram showing the image behind the retina. **[1½]**

OR

Dispersion is the splitting of white light into its component colours (spectrum) on passing through a prism, because different colours bend through different angles. **[1]**
Dispersion occurs when light passes into a medium whose refractive index (and hence the speed of light) is different for different wavelengths, as in glass. **[1]**
Presbyopia is caused by the gradual weakening of the ciliary muscles and diminishing flexibility of the eye lens with age. **[1]**

Q38. [4]

(i) Electrical energy is converted into magnetic energy. **[1]**
(ii) The bar becomes a temporary magnet and is magnetised only while current flows, because soft iron loses its magnetism quickly. **[1]**
(iii) Statement (II) is correct for small currents, since the field increases in direct proportion to the current. **[1]**
Statements (I), (III) and (IV) are incorrect, and the increase becomes non-linear at larger currents. **[1]**

OR

The number of turns per unit length. **[1]**
The current through the solenoid. **[1]**

Q39. [5]

Activity: pass a straight wire vertically through a cardboard, connect it to a battery and key, sprinkle iron filings on the cardboard and tap gently; compass needles can also be placed around the wire. **[2]**
Pattern: concentric circles around the wire, seen on the cardboard. **[1]**
(i) Right-hand thumb rule. **[1]**
(ii) Alpha particles are positively charged and moving, so they produce a magnetic field; neutrons are uncharged, so they produce no magnetic field. **[1]**

OR

The fuse in series protects the whole circuit; placed in the live wire, it can cut off the entire supply. **[1]**
In parallel each appliance gets the full 220 V and works independently; switching one off does not affect the others. **[1]**
Total power $= 1500 + 500 = 2000$ W, so total current $I = \frac{P}{V} = \frac{2000}{220} \approx 9.1$ A. **[1½]**
The current of 9.1 A is less than 10 A, so the 10 A fuse is appropriate and will not blow. **[1½]**

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