CENTRAL BOARD OF SECONDARY EDUCATION

CBSE 2026-27

Science

Subject Code: 086 | Class X

Solutions

Sample Question Paper – Set 8

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. Which secretion of the pancreas acts on proteins in the small intestine? **[1]**

(a) Pepsin (b) Trypsin
(c) Hydrochloric acid (d) Bile

Q2. Which feature of the wall of the small intestine increases the surface area for absorption of digested food? **[1]**

(a) Thick muscular wall (b) Villi and microvilli
(c) Sphincter at its exit (d) Gastric glands in the wall

Q3. In a synapse, the chemical signal is transmitted from: **[1]**

(a) Dendritic end of one neuron to axonal end of another neuron.
(b) Axon to cell body of the same neuron.
(c) Cell body to axonal end of the same neuron.
(d) Axonal end of one neuron to dendritic end of another neuron.

Q4. In a controlled experiment, the anthers of a mustard plant's flowers were carefully removed in the bud stage before they matured. The bud was covered with a paper bag. What will be the most likely result for these flowers? **[1]**

(a) They will still produce seeds and fruit through self-pollination.
(b) They will attract more insects and produce larger flowers but no fruit.
(c) They will not produce any seeds or fruits.
(d) They will produce seeds and fruits that are genetically identical to the parent.

Q5. A gene is best defined as: **[1]**

(a) a functional segment of DNA that carries information for a particular trait
(b) a protein molecule that is present only in the nucleus
(c) a chromosome that determines the sex of an individual
(d) the outer covering of a chromosome

Q6. Which one of the following is not a natural ecosystem? **[1]**

(a) Pond ecosystem (b) Grassland ecosystem
(c) Forest ecosystem (d) Cropland ecosystem

Q7. Sphincter muscles are present at the exit of: **[1]**

(a) Stomach and small intestine (b) Stomach and anus
(c) Small intestine and large intestine (d) Oesophagus and stomach

Q8. **Assertion (A):** If the lions are removed from a food chain it will not affect the food chain, however if the plants are removed from a food chain it will disturb the ecosystem.
Reason (R): Plants are producers who can make food using sunlight, while lions are consumers. **[1]**

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
(c) Assertion (A) is true, but Reason (R) is false.
(d) Assertion (A) is false, but Reason (R) is true.

Q9. **Assertion (A):** Asexual reproduction produces offspring that are genetically identical to the parent.
Reason (R): Asexual reproduction involves only one parent and does not involve the fusion of gametes. **[1]**

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
(c) Assertion (A) is true, but Reason (R) is false.
(d) Assertion (A) is false, but Reason (R) is true.

Q10. Excessive use of chemicals and pesticides in agriculture adversely affects the environment. Justify this statement. **[2]**

Q11. (a) Define the terms dominant trait and recessive trait.
(b) Give one example of each from pea plants. **[2]**

OR

State Mendel's law of independent assortment and explain it with an example from a dihybrid cross.

Q12. (A) List the steps for the synthesis of glucose by plants. What special feature is found in desert plants related to this process? **[2]**

OR

(B) Explain the role of salivary amylase, pepsin, trypsin and lipase in the digestion of food in humans.

Q13. How do Mendel's experiments show that traits may be dominant or recessive? **[3]**

OR

In a pea plant, the trait of flowers bearing purple colour (PP) is dominant over white colour (pp). Explain the inheritance pattern of F_1 and F_2 generations with the help of a cross following the rules of inheritance of traits. State the visible characters of F_1 and F_2 progenies.

Q14. Why is damage to the ozone layer a cause for concern? What are its causes and what steps are being taken to limit this damage? **[3]**

Case Study: Neha's breakfast Neha ate boiled sweet potatoes and boiled eggs for breakfast. Sweet potatoes are rich in starch, and eggs are rich in proteins and contain some fats. Each type of food is digested in different parts of the alimentary canal. Digested food is mainly absorbed in the small intestine, which is long and has a large inner surface.

Q15. Answer the following questions based on the above. **[4]**

(i) Which of these foods is rich in protein, in which part of the alimentary canal is its digestion started, and which enzyme and gland are involved? [1]

(ii) Where is the digestion of starch started, and by which enzyme? [1]

(iii) Which part of the alimentary canal will contain the maximum amount of digested food when digestion is complete, and how is the digested food taken up? [2]

OR

(iii) Which of these foods contains fats, and how is it digested? [2]

Q16. Analyse and describe the possible impact on a person in each situation: (a) Testes of a male boy are not able to descend into the scrotum during embryonic development. (b) Vas deferens of a man is plugged. (c) Prostate and seminal vesicles are not functional. (d) Egg is not fertilised in a human female. (e) Placenta does not attach to the uterus optimally. **[5]**

OR

(a) Describe the path of sperms from the testis to the urethra. (3 marks)
(b) Why is the placenta important for the embryo? (2 marks)

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. Consider the following reactions: (i) Dilute hydrochloric acid reacts with sodium hydroxide. (ii) Magnesium oxide reacts with dilute hydrochloric acid. (iii) Carbon dioxide reacts with sodium hydroxide. It is found that in each case: **[1]**

(a) Salt and water is formed (b) Neutral salts are formed
(c) Hydrogen gas is formed (d) Acidic salts are formed

Q18. Select from the following salts those which may be used to prepare the hard water required for an experiment. A. $CaSO_4$ B. Na_2SO_4 C. $CaCl_2$ D. K_2SO_4 E. $NaHCO_3$ F. $MgCl_2$ **[1]**

(a) A, B and D (b) A, C and F (c) B, D and E (d) C, E and F

Q19. The metals obtained from their molten chlorides by the process of electrolytic reduction are: **[1]**

(a) Gold and silver (b) Calcium and magnesium
(c) Aluminium and silver (d) Sodium and iron

Q20. Two metals zinc and tin are dissolved separately in definite proportions in molten copper (the primary metal) to obtain two different alloys respectively known as: **[1]**

(a) Bronze and Brass (b) Brass and Solder
(c) Brass and Bronze (d) Solder and Bronze

Q21. Four organic compounds have molecular formulae: P: C_4H_{10} Q: C_4H_8 R: C_5H_{12} S: C_5H_{10} Which pair will show the same chemical properties? **[1]**

(a) P and Q (b) P and R (c) Q and S (d) R and S

Q22. The IUPAC name of the compound obtained by oxidising ethanol with acidified potassium dichromate is: **[1]**

(a) Ethanal (b) Ethanoic acid (c) Ethene (d) Ethyl ethanoate

Q23. The products formed when aluminium and magnesium are burnt in the presence of air respectively are: **[1]**

(a) Al_3O_4 and MgO_2 (b) Al_2O_3 and MgO (c) Al_3O_4 and MgO (d) Al_2O_3 and MgO_2

Q24. **Assertion (A):** C_4H_8, C_4H_6 and C_4H_{10} are members of the same homologous series.
Reason (R): C_4H_8, C_4H_6, C_3H_4, C_3H_6, C_2H_4, C_2H_2 are unsaturated hydrocarbons. **[1]**

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
(c) Assertion (A) is true, but Reason (R) is false.
(d) Assertion (A) is false, but Reason (R) is true.

Q25. Two solutions M and N give red and blue colours respectively with universal indicator. (i) In which solution is the hydrogen ion concentration more? Justify. (ii) If M and N are mixed and the mixture turns green on testing with universal indicator, what is the nature of the salt formed? Justify. **[2]**

Q26. Copper powder is heated in a china dish and then hydrogen gas is passed over the heated substance. What changes will be observed on heating, and what visible change will be seen when hydrogen is passed? Give the chemical equations involved, along with the names and colours of the products. **[3]**

OR

2 g of green-coloured crystals of ferrous sulphate are heated in a dry boiling tube. Name the type of chemical reaction taking place. Write the balanced chemical equation for the reaction. Is this an exothermic or an endothermic reaction?

Q27. Comment on the following: (i) A bee sting is treated with baking soda paste, whereas a wasp sting is treated with dilute vinegar. (ii) Farmers treat acidic soil with quicklime during tilling. (iii) Marble monuments are conserved by treating them with certain chemicals. **[3]**

Case Study: Iron nails in metal salt solutions A student put an iron nail into a blue copper sulphate solution in the first test tube. After twenty minutes, the nail was covered with a reddish-brown deposit and the blue colour of the solution had faded to pale green. In the second test tube, an iron nail was placed in zinc sulphate solution, and no change was seen after the same time. The student recorded these observations to compare the reactivity of the metals.

Q28. Answer the following questions based on the above. **[4]**

(i) Write the balanced chemical equation for the reaction in the first test tube. [1]

(ii) Name the type of reaction in the first test tube, and give the reason why no change is seen in the second test tube. [1]

(iii) What do the observations tell about the reactivity of iron, copper and zinc? Explain. [2]

OR

(iii) Would copper displace iron from ferrous sulphate solution? Justify. [2]

Q29. (I) Define oxidation and reduction in terms of oxygen and in terms of electrons.
(II) For the reaction $CuO + H_2 \longrightarrow Cu + H_2O$, identify the oxidising agent, the reducing agent, the substance oxidised and the substance reduced.
(III) Name the process in which iron articles get covered with a layer of rust when left in moist air, and write its balanced equation. **[5]**

OR

In the reaction $2\,Na + Cl_2 \longrightarrow 2\,NaCl$, identify the substance oxidised and the substance reduced, and explain using transfer of electrons.

SECTION – C

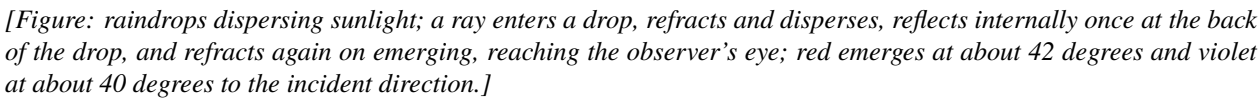
Section C (Physics) consists of 10 questions: Q. Nos. 30–31 MCQs, 32 Assertion–Reason, 33–34 Very Short Answer, 35–37 Short Answer, 38 Case-based and 39 Long Answer.

Q30. To trace the path of a ray of light through a triangular glass prism, a student observes that the emergent ray has **[1]**
(a) bent away from the base of the prism
(b) bent towards the base of the prism
(c) moved parallel to the direction of the incident ray
(d) gone perpendicular to the incident ray

Q31. The correct way to connect an ammeter and a voltmeter in an electric circuit is: **[1]**
(a) Ammeter in parallel and voltmeter in series
(b) Ammeter and voltmeter both in parallel
(c) Ammeter in series and voltmeter in parallel
(d) Ammeter and voltmeter both in series

Q32. **Assertion (A):** A current-carrying straight conductor experiences a force when placed perpendicular to the direction of a magnetic field.
Reason (R): The net charge on a current-carrying conductor is always zero. **[1]**
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
(b) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
(c) Assertion (A) is true, but Reason (R) is false.
(d) Assertion (A) is false, but Reason (R) is true.

Q33. (a) When and where does a rainbow appear in the sky? (b) Draw a labelled ray diagram to show the formation of a rainbow. **[2]**


[Figure: raindrops dispersing sunlight; a ray enters a drop, refracts and disperses, reflects internally once at the back of the drop, and refracts again on emerging, reaching the observer's eye; red emerges at about 42 degrees and violet at about 40 degrees to the incident direction.]

OR

What is scattering of light? Why does the clear sky appear blue?

Q34. Establish the relationship between 1 kWh and 1 joule. **[2]**

OR

(a) When is the potential difference between two points said to be 1 volt?
(b) State Ohm's law.

Q35. (a) An object of height 3 cm is focussed on a white screen using a concave mirror of focal length 12 cm. The object is 18 cm from the mirror. Find (i) the image distance and (ii) the height of the image. **[3]**

OR

(b) Define power of a lens. A convex lens has focal length 10 cm. State its power, and the sign of magnification when an object is placed 20 cm from its optical centre.

Q36. What is scattering of light? How is scattering of light different from reflection of light? Explain. **[3]**

OR

What happens when light is scattered from (i) very fine particles and (ii) very large size particles of the medium? Justify your answer in each case.

Q37. (a) Name a device which is used to maintain a constant potential difference in a circuit, and a device used to change the electric current in a circuit.
(b) When the potential difference between the terminals of an electric heater is 110 V, a current of 5 A flows through it. Find the current when the potential difference is increased to 220 V. **[3]**

OR

(a) Name the instrument used to measure current and state how it is connected.
(b) Why must a voltmeter have a high resistance?
(c) State how a voltmeter is connected in a circuit.

Case Study: Slide projector Slides are small transparencies mounted in sturdy frames. They are suited to magnification and projection because they give high resolution and image quality. In a slide projector, the slide is placed in the tray upside down so that viewers see an enlarged, erect image on the screen. The projector uses a convex lens.

Q38. Answer the following questions based on the above. **[4]**

(i) What kind of lens must the slide projector have? [1]

(ii) Why must the slide be inserted upside down in the projector tray? [1]

(iii) A projector lens has a focal length of 20 cm and the slide is placed 21 cm from the lens. How far from the lens should the screen be placed for a sharp image? [2]

OR

(iii) Draw a labelled ray diagram (not to scale) of the slide, the lens and the image on the screen. [2]

Q39. (i) A lens produces a magnification of -0.5. Is it a converging or diverging lens? If its focal length is 6 cm, draw a ray diagram showing the image formation. (ii) A thin laser beam directed through a convex lens along a particular direction continues along the same direction after passing through it. State the reason and draw a ray diagram. **[5]**

OR

(i) Find the refractive index of a medium whose speed of light is half that in air. (ii) A glass slab of refractive index n_1 is placed in a medium of refractive index n_2. Draw the path of the emergent ray for (1) $n_1 > n_2$, (2) $n_1 = n_2$, (3) $n_1 < n_2$.

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