CENTRAL BOARD OF SECONDARY EDUCATION

CBSE 2026-27

Science

Subject Code: 086 | Class X

Solutions

Sample Question Paper – Set 1

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. During photosynthesis, what happens to carbon dioxide and water as glucose is formed? **[1]**
(a) Carbon dioxide gains hydrogen, while water loses electrons.
(b) Carbon dioxide loses oxygen, while water gains oxygen.
(c) Carbon dioxide is oxidised, while water is reduced.
(d) Both carbon dioxide and water undergo reduction.

Q2. Lime water turns cloudy in the presence of carbon dioxide, a by-product of respiration. Four set-ups are kept in sunlight for 24 hours. P: a glass tank with a pot of soil and no plant, with lime water inside. Q: a glass tank with a potted plant and lime water. R: a potted plant and lime water placed inside a tank whose walls are painted black, so no light enters. S: a pot of soil with no plant and lime water. In which set-up is lime water expected to be the cloudiest? **[1]**
(a) P (b) Q (c) R (d) S

Q3. A patient has a dysfunction of the cerebellum. Which of the following activities will be disturbed in this patient? **[1]**
(a) Salivation
(b) Hunger control
(c) Posture and balance
(d) Regulation of blood pressure

Q4. The correct/true statement(s) for a bisexual flower is/are: (i) They possess both stamen and pistil. (ii) They possess either stamen or pistil. (iii) They exhibit either self-pollination or cross-pollination. (iv) They cannot produce fruits on their own. **[1]**
(a) (i) only (b) (iv) only (c) (i) and (iii) (d) (i) and (iv)

Q5. The genotype of a green-stemmed tomato plant is GG and that of a purple-stemmed tomato plant is gg. A hybrid obtained from a cross between these two plants is self-pollinated to obtain the F_2 progeny. What will be the ratio of GG, Gg and gg in this F_2 progeny? **[1]**
(a) 2 : 1 : 1 (b) 3 : 1 : 0 (c) 1 : 1 : 2 (d) 1 : 2 : 1

Q6. In 1987, an agreement was formulated by the United Nations Environment Programme (UNEP) to freeze the production of ”X” to prevent depletion of ”Y”. ”X” and ”Y” respectively referred to here are: **[1]**
(a) Ozone; CFCs
(b) CFCs; UV rays
(c) CFCs; Ozone
(d) UV rays; Diatomic oxygen

Q7. During urine formation, tubular reabsorption and secretion take place in the kidneys. Which of the following sets correctly indicates both the substances that are reabsorbed in the kidneys? **[1]**
(a) Glucose and salts
(b) Glucose and starch
(c) Glycogen and salts
(d) Glycogen and starch

Q8. **Assertion (A):** In humans, if gene B is responsible for black eyes and gene b for brown eyes, then the progeny having gene combinations Bb, bb or BB will have black eyes only.
Reason (R): The black colour of the eyes is a dominant trait. **[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):** A shoot bends towards a source of light.
Reason (R): Auxin accumulates on the shaded side of the shoot and promotes cell elongation there. **[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. (a) Name the part of the brain responsible for the following: (i) maintaining posture and balance; (ii) beating of the heart; (iii) thinking; (iv) regulation of blood pressure. **[2]**

OR

(b) Where are auxins synthesised in a plant? Which organ of the plant shows (i) positive phototropism, (ii) negative geotropism, (iii) positive hydrotropism?

Q11. Mention the four events that occur during binary fission in amoeba. **[2]**

OR

A student observed a permanent slide showing asexual reproduction in yeast. Name the process and describe the stages he would have seen on the slide.

Q12. DDT was sprayed in a lake to regulate breeding of mosquitoes. How would it affect the trophic levels in the following food chain associated with a lake? Justify your answer. Plankton $\rightarrow$ Small fish $\rightarrow$ Large fish $\rightarrow$ Hawk. **[2]**

OR

In the forest food chain green plants $\rightarrow$ deer $\rightarrow$ tiger, vertical arrows A, C and E show energy lost to the environment and horizontal arrows B and D show energy transferred. Which vertical arrow and which horizontal arrow represent more energy transfer? Give reason.

Q13. Name the hormone released and the gland which secretes it in human beings during scary situations. How does the body respond to enable it to deal with the situation? **[3]**

OR

Name the gland that secretes growth hormone and state the disorder caused in a child when its secretion is too low. Name the disorder caused by overproduction of this hormone.

Q14. Explain with the help of labelled diagrams the development that takes place in each of the three pieces when the body of Planaria is cut into three parts. Name this process and give an example of another organism that shows it. **[3]**

OR

Describe how bread mould (Rhizopus) multiplies asexually. Name the structure in which spores are formed.

Case Study: Pollination in flowers Pollination is an important process in sexual reproduction of plants. It is essential because it brings pollen to the stigma, which makes fertilisation possible. Pollinating agents can be wind, water, insects and birds. Insects are attracted to flowers by bright colours, scent and nectar, and in doing so they carry pollen from one flower to another. Several changes take place in the flower after fertilisation has occurred, and these changes lead to the formation of seeds and fruits.

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

(i) (a) Write the main difference between self-pollination and cross-pollination. [1]

(ii) (b) Name the part of the flower which attracts insects for pollination. What happens to this part after fertilisation? [1]

(iii) (c) (i) Define fertilisation. What is the fate of the ovules and the ovary after fertilisation? [2]

OR

(iii) (c) (ii) In a germinating seed, which parts are known as the future shoot and future root? Mention the function of the cotyledon. [2]

Q16. (a) Name the hind-brain region which controls involuntary actions such as blood pressure and salivation. Name the region which controls precision of voluntary movements and balance, and state the region in which both lie.
(b) "Both overproduction and underproduction of growth hormone lead to disorders in the body." Explain. **[5]**

OR

(a) (i) List three points of difference between nervous and hormonal mechanisms for control and coordination in animals.
(ii) How are auxins related with the bending of a plant shoot towards unidirectional light? Explain.

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. When sodium bicarbonate reacts with dilute hydrochloric acid, the gas evolved is: **[1]**
(a) Hydrogen; it gives a pop sound with a burning match stick
(b) Hydrogen; it turns lime water milky
(c) Carbon dioxide; it turns lime water milky
(d) Carbon dioxide; it blows off a burning match stick with a pop sound

Q18. Which acid is present in tomato? **[1]**
(a) Methanoic acid (b) Acetic acid (c) Lactic acid (d) Oxalic acid

Q19. The colour of the solution observed after 30 minutes of placing zinc metal in copper sulphate solution is: **[1]**
(a) Blue (b) Colourless (c) Dirty green (d) Reddish brown

Q20. On adding dilute sulphuric acid to a test tube containing a metal X, a colourless gas is produced which burns with a pop sound when a burning match stick is brought near it. Which of the following correctly represents metal X? **[1]**
(a) Sodium (b) Sulphur (c) Copper (d) Silver

Q21. Manjeet wants to wash clothes, but the water available is hard. He compares the action of soap and detergent in hard water. Soap forms scum in hard water while a detergent easily produces lather. Which inference is correct? **[1]**
(a) Ca^{2+} and Mg^{2+} ions in hard water react with soap forming insoluble compounds, whereas detergents do not form such insoluble salts.
(b) Soap is acidic and detergents are basic, so detergents work better in hard water.
(c) Soap reacts with Na^{+} ions in hard water to form scum, while detergents do not react with Na^{+} ions.
(d) Detergents form lather easily because they are ionic compounds and react with Ca^{2+} and Mg^{2+} ions.

Q22. The number of electrons shared between the two carbon atoms in an ethyne molecule is: **[1]**
(a) 6 (b) 3 (c) 10 (d) 4

Q23. In order to balance the following chemical equation, the values of the coefficients x and y respectively are:
$x\,Pb(NO_3)_2 \xrightarrow{Heat} 2\,PbO + y\,NO_2 + O_2$ **[1]**
(a) 2, 4 (b) 2, 2 (c) 2, 3 (d) 4, 2

Q24. **Assertion (A):** Rusting of iron is endothermic in nature.
Reason (R): As the reaction is slow, the release of heat is barely evident. **[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. What is observed when aqueous solutions of potassium iodide and lead nitrate are mixed together? Name the type of reaction and write the chemical equation for the reaction that occurs. **[2]**

OR

When copper powder is heated on a watch glass, a black substance is formed. Why is this black substance formed, and how can it be reversed to its original form?

Q26. "pH has great importance in our daily life." Explain this statement by giving three examples. **[3]**

OR

Explain neutralisation with reference to the reaction of hydrochloric acid with sodium hydroxide, and give one everyday example.

Q27. The reaction $3\,MnO_2(s) + 4\,Al(s) \longrightarrow 3\,Mn(l) + 2\,Al_2O_3(s) + Heat$ is used to extract manganese. (a) Give a reason why it is known as a thermite reaction.
(b) Identify the substance oxidised and the substance reduced.
(c) Give a reason why aluminium is preferred in thermite reactions. **[3]**

Case Study: Testing pH in the laboratory During a practical on pH, a teacher divided the students into three groups. Group A tested lemon juice, vinegar and a colourless aerated drink. Group B tested tomato juice, coffee and ginger juice. Group C tested sodium hydroxide, sodium chloride and lime water. Students used pH paper and universal indicator to decide whether each solution was acidic, basic or neutral. They were also asked why sour substances such as lemon juice can clean tarnished copper vessels.

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

(i) For the solutions provided, which group(s) is likely to have pH (i) less than 7 and (ii) greater than 7? [1]

(ii) List two ways of determining the pH of a solution. [1]

(iii) Explain why sour substances such as lemon juice are effective in cleaning tarnished copper vessels. [2]

OR

(iii) Explain why a solution with pH 7 is neutral, and give two examples of neutral substances. [2]

Q29. (i) Match the pH values 1, 7, 10 and 13 to gastric juice, brine, milk of magnesia and aqueous NaOH respectively, giving reasons. (ii) Amit and Rita added baking soda to their cake batter. Explain the role of baking soda with a balanced reaction. **[5]**

OR

(i) Four samples A, B, C and D change pH paper to green, reddish-pink, blue and orange, with pH values 7, 2, 10.5 and 6 respectively. Which sample has the highest H+ concentration? Arrange them in decreasing order of pH. (ii) Plaster of Paris stored in an open container lost its binding property. Explain why, with an equation. (iii) Give one use of Plaster of Paris other than for plastering walls.

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. A ray of light passes through a rectangular glass slab placed in air. Which statement describes the emergent ray? **[1]**

(a) Bent towards the normal, so the angle of emergence is smaller than the angle of incidence

(b) Parallel to the incident ray but laterally displaced

(c) Deviated by 90° from the direction of the incident ray

(d) Bent away from the normal, so the angle of emergence is greater than the angle of incidence

Q31. When we enter a dark room coming from outside bright sunlight, immediately the things inside the room do not appear clear to our eyes. This is because **[1]**

(a) pupils do not open at all in the dark

(b) pupils take time to adjust

(c) light travels slower in a dark room

(d) pupils open very quickly in the dark

Q32. **Assertion (A):** A convex mirror always forms an image behind it and the image formed is virtual.
Reason (R): According to the sign convention, the focal length of a convex mirror is positive. **[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) A wire of resistance R is cut into three equal parts. If these three parts are joined in parallel, calculate the total resistance of the combination so formed. **[2]**

OR

(b) Define electric power. When do we say that the power consumed in an electric circuit is 1 watt?

Q34. A concave mirror has a focus 10 cm from its pole. A 2 cm candle flame is placed 20 cm in front of the mirror on its principal axis. Find where a screen should be placed to get a sharp image, and the size of the image. **[2]**

OR

A student obtained a sharp image of a lighted candle on a screen using a convex lens. He now wants to focus a distant lamp on a faraway pole. In which direction should the lens be moved with respect to the screen? Justify.

Q35. (a) What is the fundamental difference between hypermetropia and myopia in terms of the optical experience of a person? (b) A diagram shows a special case of an eye defect in which the rays from a nearby point meet behind the retina. (i) Name the defect. (ii) State one cause. (iii) Explain with reason whether a concave lens can be used to correct this defect. **[3]**

[Figure: schematic eye; rays from a nearby object converge behind the retina (image behind retina), indicating hypermetropia.]

OR

(a) State two causes of myopia in the human eye. (b) Name the type of lens used to correct it and state the defect in which a person cannot read a book held at 25 cm clearly although distant objects are seen distinctly.

Q36. The three resistors can each withstand a maximum power of 16 W without melting. Find the maximum current that can flow through the circuit. **[3]**

[Figure: Circuit with a cell, a key and an ammeter in series with a 4 Ω resistor, followed by two 8 Ω resistors in parallel; a voltmeter is connected across the parallel pair.]

OR

Using the maximum current found above, find the potential difference across the parallel combination of the two $8\,\Omega$ resistors.

Q37. (a) Explain the meaning of overloading of an electrical circuit. (b) List two possible causes of overloading in household circuits. (c) Write one preventive measure to avoid overloading of domestic circuits. **[3]**

OR

Why should a fuse of correct rating be used in a household circuit? Distinguish overloading from short circuit.

Case Study: Spectrum on the screen A student allowed a narrow beam of white light from the Sun to enter a dark room through a small aperture and placed a glass prism in its path so that the beam fell on the face AB of the prism. A screen S was placed on the other side of the prism, facing face AC. On turning the prism slowly, a beautiful band of colours was obtained on the screen: it is the spectrum of sunlight. The student notices that the red end of the band is near the top of the screen and the violet end near the bottom, and that the violet rays are bent noticeably more than the red rays.

[Figure: narrow beam of white light incident on face AB of a glass prism; a screen S placed on the other side facing face AC shows a vertical band of seven colours.]

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

(i) Name the phenomenon due to which the prism splits the incident white light into a band of colours. [1]

(ii) State the reason for getting a band of seven colours in the above case. [1]

(iii) Explain, with the help of a labelled ray diagram, an experimental arrangement to show the recombination of the spectrum of white light. [2]

OR

(iii) Draw a labelled ray diagram to show the formation of a rainbow. [2]

Q39. (a) What is meant by the term 'power of accommodation'? Name the component of the eye that is responsible for the power of accommodation. (b) A student sitting at the back bench in a class has difficulty in reading the blackboard. What could be his defect of vision? State two possible causes of this defect. Explain the method of correcting this defect with the help of a ray diagram, and describe how the image forms on his retina when he is seated at (i) the back seat and (ii) the front seat. **[5]**

[Figure: two ray diagrams of a myopic eye: (i) parallel rays from the board converge in front of the retina; (ii) correction with a concave lens before the eye diverging the rays so they focus on the retina.]

OR

(a) Draw labelled ray diagrams to show (i) a hypermetropic eye forming the image of a nearby object behind the retina, and (ii) the correction of this defect using a suitable lens. (b) State two causes of this defect. (c) A person with this defect cannot read a newspaper at 25 cm unless he holds it at 50 cm. Calculate the power of the corrective lens he needs.

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