CENTRAL BOARD OF SECONDARY EDUCATION

CBSE 2026-27

Science

Subject Code: 086 | Class X

Solutions

Sample Question Paper – Set 5

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. A pure tall pea plant is crossed with a pure dwarf pea plant. What percentage of plants in the F_1 and F_2 generations, respectively, will be tall? **[1]**

(a) 25%, 25% (b) 50%, 50% (c) 75%, 100% (d) 100%, 75%

Q2. Which are the correct statements related to ozone? (i) Ozone layer helps in increasing the UV radiations reaching earth. (ii) Ozone is a deadly poison. (iii) Ozone layer shields the earth from UV radiations. (iv) Ozone layer prevents UV rays which cause skin cancer. (v) Ozone is formed with the help of chlorofluorocarbons. **[1]**

(a) (i), (ii), (iii) (b) (ii), (iii), (iv)
(c) (iii), (iv), (v) (d) (i), (iv), (v)

Q3. The opening and closing of stomatal pores is regulated by: **[1]**

(a) CO_2 concentration in the stomata (b) Temperature in the guard cells
(c) O_2 concentration in the stomata (d) Amount of water in the guard cells

Q4. Identify the option that gives the correct enzymes secreted in the mouth cavity, stomach and small intestine of a human being, respectively. **[1]**

(a) lipase, trypsin, pepsin (b) amylase, pepsin, trypsin
(c) trypsin, amylase, carboxylase (d) permease, carboxylase, oxidase

Q5. In which of the following groups of organisms does blood flow through the heart only once during one cycle of passage through the body? **[1]**

(a) Rabbit, parrot, turtle (b) Frog, crocodile, pigeon
(c) Whale, Labeo, penguin (d) Shark, dog fish, sting ray

Q6. Identify the type of tropic movement that is responsible for the movement of the pollen tube towards an ovule. **[1]**

(a) Hydrotropism (b) Geotropism (c) Chemotropism (d) Phototropism

Q7. Identify the type of tropic movement that is responsible for the movement of the pollen tube towards an ovule. **[1]**

(a) Hydrotropism (b) Geotropism (c) Chemotropism (d) Phototropism

Q8. **Assertion (A):** The basic filtration unit in the kidneys, like in the lungs, is a cluster of very thin-walled blood capillaries.
Reason (R): Each capillary cluster in the kidney is associated with the cup-shaped end of a coiled tube called Bowman's capsule. **[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):** Sex of the children will be determined by what they inherit from their mother.
Reason (R): Women have XX sex chromosomes. **[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. Differentiate between alveoli and nephron on the basis of (i) structure and location and (ii) function. **[2]**

Q11. (a) The timing and the amount of a hormone secreted by a gland are regulated in the human body. Justify

this statement with the help of an example. **[2]**

OR

(b) Electrical impulses are an excellent means of transmitting information in the animal body, but there are some limitations to their use. State any two limitations.

Q12. (a) Trace the path a male gamete takes to fertilise a female gamete after being released from the penis.
(b) State the number of sets of chromosomes present in a zygote. **[2]**

Q13. A variegated leaf with green and pale yellow patches is used for an experiment to prove that chlorophyll is required for photosynthesis. Before the experiment, the green portions (A) and the pale yellow portions (B) are observed. What will be the colour of A just before and after the starch test? Also write the equation of photosynthesis, and mark, as well as validate, from which molecule the by-product is obtained. **[3]**

OR

Explain the processes of aerobic respiration in mitochondria of a cell and anaerobic respiration in yeast and muscle with the help of word equations.

Q14. (a) Define hormone.
(b) "Hormones should be secreted in precise quantities. We have a feedback mechanism through which this is done." With the help of an example, justify the statement. **[3]**

Case Study: Female reproductive system When a girl is born, her ovaries already contain thousands of immature eggs. On reaching puberty, some of these start maturing, and one matured egg is released every month by one of the ovaries. The two fallopian tubes open into an elastic, bag-like organ called the uterus. Every month the uterus prepares itself to receive and nurture a growing embryo. If fertilisation does not take place, the lining of the uterus is shed.

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

(i) (a) Write the site of fertilisation in the human female. [1]

(ii) (b) How does the uterus prepare itself to receive and nurture the growing embryo? Explain. [1]

(iii) (c) (i) What happens when the egg is not fertilised? [2]

OR

(iii) (c) (ii) How does the developing embryo get nutrition from the mother's blood? Explain. [2]

Q16. Trace the changes that take place in a flower from gamete formation to fruit formation. **[5]**

OR

(a) Why is it not possible to reconstruct the whole organism from a fragment in complex multicellular organisms? (2 marks)
(b) Sexual maturation of reproductive tissues and organs is a necessary link for reproduction. Elucidate. (3 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. Which of the following is the correct IUPAC name of CH_3-CH_2-CHO? **[1]**

(a) Propanal (b) Propanone (c) Propanol (d) Propenoic acid

Q18. While doing a lab activity, four students recorded their observations on burning carbon compounds in air: (i) Ethanol burns with a clean blue flame. (ii) Camphor burns with a sooty flame leaving black deposits. (iii) CH_4 burns with a pale blue flame giving CO_2 and H_2O. (iv) Naphthalene on burning gives a clear, non-luminous flame. The correct observations are: **[1]**

(a) (i) and (iii) (b) (ii) and (iv)
(c) (i), (ii) and (iii) (d) All of these

Q19. Study the following chemical reaction: $2\,Na(s) + 2\,H_2O(l) \longrightarrow 2\,NaOH(aq) + H_2(g)$. The reducing agent in this reaction is: **[1]**

(a) Na (b) H_2O (c) NaOH (d) H_2

Q20. The electrodes of the set-up are separately dipped in each of the following solutions. In which solutions will the bulb glow? (i) Dilute hydrochloric acid (ii) Dilute sulphuric acid (iii) Glucose solution (iv) Alcohol **[1]**

[Figure: A bulb is connected in series with a battery and two electrodes, which are dipped in a test solution kept in a beaker.]

(a) (i) only (b) (ii) only
(c) (i) and (ii) (d) (ii), (iii) and (iv)

For visually impaired candidates: Which two of these solutions conduct electricity: dilute hydrochloric acid, dilute sulphuric acid, glucose solution, alcohol?

Q21. An aqueous solution of sodium chloride is prepared in distilled water. The pH of this solution is: **[1]**

(a) 6 (b) 8 (c) 7 (d) 3

Q22. Four statements about the reactions of oxides with dilute hydrochloric acid and aqueous sodium hydroxide are given. I. Aluminium oxide reacts with both dilute hydrochloric acid and aqueous sodium hydroxide. II. Calcium oxide reacts with both dilute hydrochloric acid and aqueous sodium hydroxide. III. Zinc oxide reacts with both dilute hydrochloric acid and aqueous sodium hydroxide. IV. Sulphur dioxide reacts with neither dilute hydrochloric acid nor aqueous sodium hydroxide. Which statements are correct? **[1]**

(a) I and II (b) I and III (c) II and IV (d) III and IV

Q23. Electrical wires made of aluminium: **[1]**

(a) corrode easily as aluminium is a very reactive metal.
(b) corrode easily because porous flaky aluminium oxide is formed.
(c) do not corrode easily as aluminium oxide forms a protective layer.
(d) do not corrode easily as aluminium is less reactive than metals like sodium, magnesium and zinc.

Q24. **Assertion (A):** On adding dilute HCl to a substance X, a colourless gas is produced which gives a pop sound when a burning match stick is brought near it.
Reason (R): In this reaction metal X is displaced by hydrogen. **[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. Copper powder is taken in a china dish and heated over a burner. Name the product formed, state its colour and write the chemical equation for the reaction involved. **[2]**

OR

Write the chemical equation for the reaction that occurs when aqueous solutions of barium chloride and sodium sulphate are mixed. Write the symbols of the ions present in the precipitate.

Q26. A compound X of sodium is used as an antacid, and it decomposes on strong heating. (i) Name X and give its formula. (ii) Write a balanced equation for the decomposition of X. (iii) Give one use of X other than as an antacid. **[3]**

OR

You are provided with 90 mL of distilled water and 10 mL of concentrated sulphuric acid to prepare dilute sulphuric acid. (i) What is the correct way to prepare it, and why? (ii) How does the concentration of H3O+ ions change on dilution?

Q27. An element X is stored in kerosene and cannot be extracted from its ore by using a reducing agent such as carbon. X forms an ionic compound with chlorine. (i) Can X be stored in water? Give a reason.
(ii) Identify X, name the process used for its extraction and write the equation for the extraction. **[3]**

OR

The domes of many buildings in Europe are made of copper and now look greenish. (i) Why do the domes look greenish?
(ii) Should copper be replaced by iron to avoid this? Justify.
(iii) Why did ancient architects use copper for making thin domes?

Case Study: Salt from the sea Seawater contains many salts dissolved in it. Common salt is separated from these salts, and it is also mined as rock salt. Common salt is an important raw material for many chemicals used in daily life. When brine, a concentrated solution of common salt, is electrolysed, several useful substances are obtained. Baking soda is also made from common salt. When baking soda is strongly heated, it gives a compound that is used to remove the permanent hardness of water.

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

(i) Write the balanced chemical equation for the electrolysis of brine. [1]

(ii) List two uses of any one product obtained during the electrolysis of brine. [1]

(iii) (i) Identify the substances A and B, and write the equation for the reaction that occurs when A is heated. [2]

OR

(iii) (ii) Define water of crystallisation, and give two examples of salts that contain it. [2]

Q29. Chlorine gas is prepared by electrolysis of brine. (i) Write the chemical equation for the change. (ii) Identify the other products formed in the process. (iii) Give one application of each of the products. OR (iv) Explain how baking soda is prepared from common salt (Solvay process) and give two uses. **[5]**

OR

Explain how baking soda is prepared from common salt and give two uses of it.

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 uniform magnetic field exists in the plane of the paper and points into the paper. A positron (a positively charged particle) moves towards the right in the plane of the paper and enters the field at right angles to it. The direction of the force on the positron is: **[1]**

(a) Upwards in the plane of the paper
(b) Downwards in the plane of the paper
(c) Out of the plane of the paper
(d) Into the plane of the paper

Q31. Both a spherical mirror and a thin spherical lens have a focal length of -15 cm. What type of mirror and lens are these? **[1]**

(a) Convex mirror and convex lens
(b) Concave mirror and convex lens
(c) Concave mirror and concave lens
(d) Convex mirror and concave lens

Q32. **Assertion (A):** A point object is placed at a distance of 26 cm from a convex mirror of focal length 26 cm. The image will not form at infinity.
Reason (R): For this system, the mirror equation gives v = infinity. **[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. Name and define the physical quantity determined by the slope of the V–I graph of an ohmic conductor. State its SI unit. **[2]**

Q34. (a) A ray of light enters benzene from air. If the refractive index of benzene is 1.50, by what percent does the speed of light reduce on entering benzene? (b) For the same angle of incidence in media A, B and C, the angles of refraction are 20°, 30° and 40° respectively. In which medium is the speed of light maximum? Give reason. **[2]**

OR

Consider a ray of light passing through a rectangular glass slab for different angles of incidence. (a) When light goes from air into glass, which is greater: angle of incidence or angle of refraction? (b) State the conditions when no bending of light occurs at a refracting surface.

Q35. (a) A diagram shows an eye defect in which rays from a distant object meet in front of the retina. (i) Name the defect and the part of the eye mainly responsible for this condition. (ii) List two causes of this defect. (iii) Name the type of lens used to correct it and state its role in this case. **[3]**
[Figure: schematic eye; parallel rays from a distant object converge before the retina (image in front of retina), indicating myopia.]

OR

What is dispersion of white light? State its cause. Draw a diagram to show dispersion of a beam of white light by a glass prism.

Q36. Four 1.5 V cells are connected in series with a $5\,\Omega$, a $10\,\Omega$ and a $15\,\Omega$ resistor and a plug key. When the key is closed, find (I) the electric current in the circuit and (II) the potential difference across the $10\,\Omega$ resistor. **[3]**

OR

In the same circuit, calculate the power dissipated in the $15\,\Omega$ resistor.

Q37. (a) Why do iron filings arrange themselves in a particular pattern around a bar magnet? (b) Which physical quantity is indicated by the pattern of field lines? (c) State any two properties of magnetic field lines. **[3]**

OR

A compass needle is placed near a current-carrying wire. State the observation and give reason: (a) when the magnitude of the current is increased; (b) when the compass is moved away from the wire.

Case Study: Building a refracting telescope Sumati wanted to see the stars of the night sky. She learned that telescopes made of lenses are called refracting telescopes and those made of mirrors are called reflecting telescopes. She decided to build a refracting telescope and bought two convex lenses, L1 (larger) and L2 (smaller). The larger lens gathers and bends the incoming light, while the smaller lens magnifies the image. Big, thick lenses are more powerful, but heavy lenses are hard to make and hold, and any flaw in their surface spoils the image. To see far away, Sumati needed a big, powerful objective lens.

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

(i) What kind of lenses must both L1 and L2 be, and which of the two has the larger focal length? [1]

(ii) If the powers of lenses L1 and L2 are in the ratio 1:4, what is the ratio of their focal lengths $f_1 : f_2$? [1]

(iii) Sumati found that the magnification produced by the eyepiece L2 in her experiment was 3, with the image at 24 cm from the lens. (i) At what distance from L2 was the object placed? (ii) State one advantage of using not-so-thick (thinner) lenses in the telescope. [2]

OR

(iii) (i) A nearby star is viewed through the telescope: state what type of image of the star the objective lens forms. (ii) The human eye can also be thought of as an optical instrument: name the part of the eye that plays the role of the screen. [2]

Q39. Noopur needs a lens of power -4.5 D for correction of her vision. (a) What kind of defect in vision is she suffering from? (b) What is the focal length and nature of the corrective lens? (c) Draw ray diagrams showing the defective eye and the correction for this defect. (d) What are the causes of this defect? **[5]**

[Figure: (1) myopic eye: rays from a distant object converge in front of the retina; (2) correction: a concave lens before the eye diverges the rays so they focus on the retina.]

OR

A child, while playing with his father's spectacles, burnt a hole in a piece of tissue paper by focusing the image of the Sun on it. (a) Name the defect of vision his father is suffering from. (b) List two causes of the defect. (c) Draw a ray diagram to show how this defect may be corrected using a suitable lens. (d) What type of lens, in terms of its action on sunlight, do the spectacles carry?

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