CENTRAL BOARD OF SECONDARY EDUCATION

CBSE 2026-27

Science

Subject Code: 086 | Class X

Solutions

Sample Question Paper – Set 6

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 of the following human activities has resulted in an increase of non-biodegradable substances? **[1]**

(a) Organic farming
(b) Increase in tree plantation
(c) Use of plastic as packaging material
(d) Composting of kitchen waste

Q2. What is common between the extensive network of blood vessels around the walls of alveoli and in the glomerulus of a nephron? **[1]**

(a) Thick walled arteries richly supplied with blood
(b) Thin walled veins poorly supplied with blood
(c) Thick walled capillaries poorly supplied with blood
(d) Thin walled capillaries richly supplied with blood

Q3. Plants use a completely different process for excretion as compared to animals. Which one of the following processes is NOT followed by plants for excretion? **[1]**

(a) They can get rid of excess water by transpiration.
(b) They selectively filter toxic substances through their leaves.
(c) Waste products are stored as resins and gums in old xylem.
(d) They excrete waste substances into the soil around them.

Q4. In which of the following groups of organisms is food material broken down outside the body and then absorbed? **[1]**

(a) Mushroom, green plants, amoeba
(b) Yeast, mushroom, bread mould
(c) Paramecium, amoeba, cuscuta
(d) Cuscuta, lice, tapeworm

Q5. In plants the role of cytokinin is: **[1]**

(a) Promote cell division.
(b) Wilting of leaves.
(c) Promote the opening of stomatal pore.
(d) Help in the growth of stem.

Q6. Spirogyra, despite being a multi-cellular organism, still shows a simple reproductive method. Select the correct option with regard to reproduction in Spirogyra. **[1]**

(a) Asexual reproduction by division of cells into two cells
(b) Sexual reproduction by division of cells into many cells
(c) Asexual reproduction by breaking up of Spirogyra filaments into smaller parts
(d) Sexual reproduction by the formation of gametes after meiosis of cells of filaments followed by fusion of male and female gametes

Q7. Height of a plant is regulated by: **[1]**

(a) DNA which is directly influenced by growth hormone.
(b) Genes which regulate the proteins directly.
(c) Growth hormones under the influence of the enzymes coded by a gene.
(d) Growth hormones directly under the influence of a gene.

Q8. **Assertion (A):** A mango seed will germinate to form a mango tree.
Reason (R): Heredity determines the process by which traits and characteristics are reliably inherited from parents to offspring. **[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):** The shoot of a plant grows upwards, against the pull of gravity.
Reason (R): Auxin accumulates on the lower 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. Adapted from the printed question (diagram of a neuron not reproduced). Name the part of a neuron that receives stimuli and carries impulses towards the cell body, and name the part that carries impulses away from the cell body. State the function of each. **[2]**

Q11. Rajesh observed a greenish black powdery mass on a stale piece of bread. (a) Name the organism responsible and its specific mode of asexual reproduction.
(b) Name its vegetative and reproductive parts. **[2]**

OR

In a mustard crop, field A produced plants showing only the parental trait over consecutive generations, whereas in field B most offspring showed variation. What are the probable reasons for these?

Q12. A lot of waste is generated in the neighbourhood. However, almost all of it is biodegradable. What impact will it have on the environment or human health? **[2]**

Q13. The leaves of the touch-me-not plant, when touched, begin to fold up and droop. (a) How is the information communicated in this plant? (b) What enables the plant cells to bring out this response? (c) Differentiate this movement from the movement of tendrils in a pea plant. **[3]**

OR

How do muscles move at the cellular level and respond when processed messages are received from the brain?

Q14. Government campaigns give information about AIDS prevention, testing and treatment. (a) To which category of diseases does AIDS belong? Name its causative organism. (b) Which value is the government trying to develop in citizens through such programmes? **[3]**

Case Study: Sex determination in human beings In some families, either rural or urban, females are tortured for giving birth to a female child. They do not seem to understand the scientific reason behind the birth of a boy or a girl. In fact the mother is not responsible for the sex of the child, and it has been genetically proved that the sex of a newborn is determined by what the child inherits from the father. Scientists have shown that the father's sex chromosomes decide the sex of the child, and that this is a chance event for every pregnancy.

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

(i) (a) State the basis on which the sex of a newborn baby is determined in humans. [1]

(ii) (b) Why is the pair of sex chromosomes called a mismatched pair in males? [1]

(iii) (c) Give two examples of organisms in which the sex is not genetically determined. [2]

OR

(iii) A couple has four daughters. What is the probability that their fifth child will be a boy? Justify your answer. [2]

Q16. (i) Name two chambers of the human heart which contain oxygenated blood and two which contain deoxygenated blood. (ii) Explain the process of double circulation with the help of a flow chart. **[5]**

OR

(a) Design an experiment to demonstrate that carbon dioxide is essential for photosynthesis. Write the observation and conclusion of the experiment.

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 $CH_3-CH_2-CH_2-OH$? **[1]**

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

Q18. To balance the following chemical equation, the values of the coefficients x, y and z must be respectively:
$x\,Zn(NO_3)_2 \longrightarrow y\,ZnO + z\,NO_2 + O_2$ **[1]**

(a) 4, 2, 2 (b) 4, 4, 2 (c) 2, 2, 4 (d) 2, 4, 2

Q19. A metal carbonate reacts with a solution X which forms a salt, water and a gas Y. What are X and Y? **[1]**

(a) X - Sodium hydroxide, Y - Carbon dioxide
(b) X - Sodium hydroxide, Y - Hydrogen
(c) X - Hydrochloric acid, Y - Carbon dioxide
(d) X - Hydrochloric acid, Y - Hydrogen

Q20. The pH of the gastric juices released during digestion is: **[1]**

(a) Less than 7 (b) More than 7 (c) Equal to 7 (d) Equal to 0

Q21. When zinc reacts with sodium hydroxide, the product formed is: **[1]**

(a) Na_2O (b) ZnO (c) Na_2ZnO_2 (d) $Zn(OH)_2$

Q22. The metal with the lowest density among the following is: **[1]**

(a) Lithium (b) Lead (c) Magnesium (d) Aluminium

Q23. The functional group present in propanone is: **[1]**

(a) $-CHO$ (b) $-CO-$ (c) $-COOH$ (d) $-OH$

Q24. **Assertion (A):** In the reaction $ZnO + C \longrightarrow Zn + CO$, ZnO undergoes reduction.
Reason (R): Carbon is a reducing agent that reduces ZnO to Zn. **[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. Carbon forms millions of compounds whereas silicon, which is just below it in the periodic table, forms only a few compounds. Explain the reason for the difference. **[2]**

Q26. Give reasons: (a) A solution of a sports electrolyte drink conducts electricity, but coconut oil does not.
(b) An iron bridge near the sea rusts much faster than an iron bridge in a dry hilly region.
(c) Aluminium is a very reactive metal, yet aluminium wires do not corrode easily. **[3]**

OR

List the two main differences between roasting and calcination, with suitable chemical equations. How is the metal reduced from the product obtained after roasting or calcination of the ore? Write the chemical equation for the reaction involved.

Q27. (a) How many isomers are possible for the compound with the molecular formula C_4H_8? Draw the electron dot structure of the branched-chain isomer.
(b) How will you prove that C_4H_8 and C_5H_{10} are homologues? **[3]**

OR

A carbon compound A with melting point 156 K and boiling point 351 K, molecular formula C_2H_6O, is soluble in water in all proportions. (a) Identify A and draw its electron dot structure.
(b) Give the molecular formulae of any two homologues of A.

Case Study: Ionic compounds Ionic compounds are formed when a metal atom transfers electrons to a non-metal atom, so that both attain a stable octet. The melting points of some of these compounds are: NaCl 1074 K, LiCl 887 K, CaCl2 1045 K, CaO 2850 K and MgCl2 981 K. Their boiling points are: NaCl 1686 K, LiCl 1600 K, CaCl2 1900 K, CaO 3120 K and MgCl2 1685 K. Ionic compounds have high melting and boiling points because strong electrostatic forces hold the ions together. Study the data and answer the questions.

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

(i) Show the electron transfer in the formation of magnesium chloride (Mg = 12, Cl = 17). [1]

(ii) List two properties of ionic compounds other than their high melting and boiling points. [1]

(iii) (a) While forming sodium chloride, how does a sodium atom attain a stable configuration? [2]

OR

(iii) Give reasons: (i) why ionic compounds in the solid state do not conduct electricity; (ii) what happens at the cathode when electricity is passed through aqueous sodium chloride. [2]

Q29. Metal X is found in nature as its sulphide XS and is used in the galvanisation of iron articles. Identify the metal X. How is this sulphide ore converted into the metal? Explain with equations. **[5]**

OR

State the reason for the following: (i) Aluminium oxide is called an amphoteric oxide.
(ii) An iron strip dipped in blue copper sulphate solution turns the solution pale green.
(iii) Hydrogen gas is not evolved when most metals react with nitric acid.
(iv) Calcium does not occur in free state in nature.
(v) Sodium or potassium metals are kept immersed under kerosene.

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 concave mirror forms a real, inverted image that is larger than the object. Where is the object placed? **[1]**

(a) Between the pole and the focus
(b) At the focus
(c) Between the focus and the centre of curvature
(d) Beyond the centre of curvature

Q31. Name the part of a lens through which a ray of light passes without suffering any deviation. **[1]**

(a) Principal focus (b) Pole
(c) Optical centre (d) Centre of curvature

Q32. **Assertion (A):** A fuse wire is always connected in parallel with the mainline.
Reason (R): If a current larger than the specified value flows through the circuit, the fuse wire melts. **[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 depressed (concave) mirror forms an erect, enlarged image of a face. It is placed on a stand at the 15 cm mark of a metre scale. A sharp, inverted image of a distant tree forms on a screen at the 35 cm mark. (a) Name the mirror and find its focal length. (b) Why is the image of the distant tree sharp at the 35 cm mark? **[2]**

Q34. (i) What is the function of the earth wire in electrical appliances? (ii) Explain what is meant by short circuiting of an electric supply. **[2]**

OR

Why is the metallic body of an electric iron connected to the earth wire? State the advantage.

Q35. A copper wire has a diameter of $0.2\,\text{mm}$ and resistivity $1.6 \times 10^{-8}\,\Omega\,\text{m}$. (I) What length of this wire will make its resistance $14\,\Omega$?
(II) How much does the resistance change if the diameter of the wire is doubled? **[3]**

OR

The current I through a resistor for the potential difference V across it is: I = 0.4, 0.8, 1.2, 1.6, 2.0 A and V = 1.2, 2.4, 3.6, 4.8, 6.0 V. Plot a graph between V and I and calculate the resistance of the resistor.

Q36. A compass is moved away from a current-carrying straight wire and the deflection of its needle reduces. (a) Explain why the deflection reduces. (b) Mention one change in the circuit that could increase the deflection. (c) Explain how the direction of the magnetic field changes if the battery polarity is reversed. **[3]**

OR

Magnetic field lines of a bar magnet are drawn. Point X is where the lines are closely spaced and point Y is where they are widely spaced. A student says that the field at X is stronger than at Y. (a) Explain with reason whether the student is correct. (b) Redraw the field lines of the bar magnet and mark their direction.

Q37. Debashree uses a lens of focal length 5 cm as a magnifying glass. Her least distance of distinct vision is 25 cm. (i) What is the magnification obtained? (ii) Where should the object be placed relative to the lens for the image to be virtual and erect? **[3]**

Case Study: Car lamp circuit Vinita and Ahmed demonstrated a circuit that operates two lamps X and two lamps Y of a car at a school exhibition. The lamps are connected to a 12 V battery through a switch A, which can be thrown to contact 2 or contact 3. Each lamp X has a resistance of $4\,\Omega$ and the two lamps X are connected in parallel to contact 3. Each lamp Y has a resistance of $12\,\Omega$ and the two lamps Y are connected in parallel to contact 2. All lamps return to the battery.

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

(i) (i) State what happens when switch A is connected to (a) position 2 and (b) position 3. [1]

(ii) (ii) Find the potential difference across each lamp when it is lit. [1]

(iii) (iii) Calculate (a) the current in each $12\,\Omega$ lamp when lit and (b) the current in each $4\,\Omega$ lamp when lit. [2]

OR

(iii) (iv) Show with calculations which lamp, the $4\,\Omega$ or the $12\,\Omega$ lamp, has the higher power. [2]

Q39. (A) A $100\,\Omega$ resistor is in series with two $25\,\Omega$ resistors in parallel. The power dissipated in the $100\,\Omega$ resistor is $81\,\text{W}$. Calculate (i) the current in the circuit, (ii) the reading of voltmeter V2, and (iii) the reading of voltmeter V1. **[5]**
[Figure: A battery supplies a 100 Ω resistor in series with two 25 Ω resistors in parallel. Voltmeter V1 is across the battery and voltmeter V2 is across the parallel pair. Assume an ideal battery.]

OR

(B) Two resistors $R_1 = 6\,\Omega$ and $R_2 = 12\,\Omega$ are connected in parallel to a $24\,\text{V}$ battery for 5 minutes. (i) Calculate the heat produced in each resistor and the total heat. (ii) If each resistor has a power rating of 100 W, state whether it is safe to use these resistors in this circuit.

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