CBSE CLASS X

Science (086)

QUESTION PAPER

AI-generated question paper

Code: OFFFV9 **Questions: 22** **Maximum Marks: 45** **Generated: 2026-06-25 12:59**

SELECTIONS USED

Subject	Science
Lessons	1 Chemical Reactions and Equations
Level of understanding	Initial understanding
Question selection	Curated chapter coverage (~3 questions per section)
Model	claude-sonnet-4-6

Composition — Difficulty: 9 straightforward · 12 medium · 1 deep | Types: 15 Short · 5 Very short · 1 MCQ · 1 Long

Q1. straightforward · initial-understanding · § Chapter Introduction **[1]**

Which of the following is NOT a reliable indicator that a chemical reaction has taken place?
(A) Change in colour
(B) Change in shape
(C) Evolution of a gas
(D) Change in temperature

A Change in colour
B Change in shape
C Evolution of a gas
D Change in temperature

◆ **Chemical Reactions and Equations**

Q2. medium · initial-understanding · § Chapter Introduction **[2]**

When a magnesium ribbon is burned in air, a new substance is formed. (i) Name the substance formed. (ii) Is this change physical or chemical? Give one reason to justify your answer.

◆ **Chemical Reactions and Equations**

Q3. straightforward · initial-understanding · § 1.1 CHEMICAL EQUATIONS **[2]**

Why is it necessary to balance a chemical equation?

◆ **Chemical Reactions and Equations**

Q4. straightforward · initial-understanding · § 1.1.1 Writing a Chemical Equation **[2]**

$Mg + O_2 \rightarrow MgO$ is written using correct chemical formulae, yet it is not accepted as a complete chemical equation. Why not?

◆ **Chemical Reactions and Equations**

Q5. straightforward · initial-understanding · § 1.1.2 Balanced Chemical Equations **[1]**

What law of nature makes it necessary to balance a chemical equation?

◆ **Chemical Reactions and Equations**

Q6. straightforward | initial-understanding | § 1.1.2 Balanced Chemical Equations **[1]**

Iron reacts with oxygen to form iron oxide. A student writes: $Fe + O_2 \rightarrow Fe_2O_3$. What term is used to describe this type of equation, and what is missing from it to make it chemically correct?

◆ **Chemical Reactions and Equations**

Q7. medium | initial-understanding | § 1.1.2 Balanced Chemical Equations **[2]**

While balancing a chemical equation, why is it not allowed to change the formula of a compound — for example, writing H_2O_4 instead of placing the coefficient 4 in front of H_2O?

◆ **Chemical Reactions and Equations**

Q8. medium | initial-understanding | § 1.1.2 Balanced Chemical Equations **[2]**

Balance the following chemical equation:
$Mg + O_2 \rightarrow MgO$
Write the balanced equation and state the ratio in which magnesium and oxygen combine.

◆ **Chemical Reactions and Equations**

Q9. straightforward | initial-understanding | § 1.1.2 Balanced Chemical Equations **[2]**

In a balanced chemical equation, state symbols are used alongside the formulae of substances. What do the symbols (s), (l), (g), and (aq) represent? Why is it important to include these symbols in a chemical equation?

◆ **Chemical Reactions and Equations**

Q10. deep | initial-understanding | § 1.1.2 Balanced Chemical Equations **[5]**

A student writes the following equation for the reaction between iron and steam:
$Fe + H_2O \rightarrow Fe_3O_4 + H_2$
(a) Explain why this equation is considered unbalanced.
(b) Write the fully balanced chemical equation for this reaction, including state symbols.

◆ **Chemical Reactions and Equations**

Q11. medium | initial-understanding | § 1.2 TYPES OF CHEMICAL REACTIONS **[2]**

Iron nails are immersed in copper sulphate solution. After some time, the blue colour of the solution begins to fade. What type of chemical reaction is taking place? Identify the substance that gets displaced in this reaction and give a reason for your answer.

◆ **Chemical Reactions and Equations**

Q12. straightforward | initial-understanding | § 1.2.1 Combination Reaction **[1]**

When calcium oxide is added to water, is heat released or absorbed? What type of reaction (in terms of energy) does this represent?

◆ **Chemical Reactions and Equations**

Q13. medium | initial-understanding | § 1.2.1 Combination Reaction **[2]**

Burning of coal can be represented as $C + O_2 \rightarrow CO_2$, and hydrogen reacting with oxygen produces water ($2H_2 + O_2 \rightarrow 2H_2O$). What type of chemical reaction do both of these represent, and what common feature of the two reactions leads you to this classification?

◆ **Chemical Reactions and Equations**

Q14. straightforward | initial-understanding | § 1.2.2 Decomposition Reaction **[1]**

When lead nitrate is heated strongly, brown fumes are produced along with a solid residue and oxygen gas. What are the brown fumes, and what is the solid residue formed?

◆ **Chemical Reactions and Equations**

Q15. medium | initial-understanding | § 1.2.2 Decomposition Reaction **[3]**

Decomposition reactions can be driven by different forms of energy. Name the forms of energy that can cause decomposition reactions and give one example of a decomposition reaction for any one of them.

◆ **Chemical Reactions and Equations**

Q16. medium | initial-understanding | § 1.2.2 Decomposition Reaction **[2]**

White silver chloride turns grey when left in sunlight. What type of reaction is this, and what products are formed?

◆ **Chemical Reactions and Equations**

Q17. medium | initial-understanding | § 1.2.2 Decomposition Reaction **[2]**

Decomposition reactions are described as endothermic. What does the term 'endothermic' mean? Explain why decomposition reactions require an external supply of energy to proceed.

◆ **Chemical Reactions and Equations**

Q18. medium | initial-understanding | § 1.2.3 Displacement Reaction **[3]**

When iron nails are dipped in copper sulphate solution, the blue colour of the solution gradually fades. What type of chemical reaction is this? Give a reason for the change in colour.

◆ **Chemical Reactions and Equations**

Q19. medium | initial-understanding | § 1.2.4 Double Displacement Reaction **[3]**

When sodium sulphate solution is mixed with barium chloride solution, an insoluble white solid settles at the bottom of the test tube. What type of chemical reaction is this?

◆ **Chemical Reactions and Equations**

Q20. medium | initial-understanding | § 1.2.5 Oxidation and Reduction **[3]**

When copper(II) oxide reacts with hydrogen gas, copper and water are formed. Which substance is oxidised and which is reduced in this reaction? Give a reason for each.

◆ **Chemical Reactions and Equations**

Q21. straightforward | initial-understanding | § 1.2.5 Oxidation and Reduction **[1]**

A substance gains oxygen during a chemical reaction. Is it oxidised or reduced?

◆ **Chemical Reactions and Equations**

Q22. medium | initial-understanding | § 1.3 HAVE YOU OBSERVED THE EFFECTS OF OXIDATION REACTIONS IN EVERYDAY LIFE? **[2]**

Chips manufacturers flush packets with nitrogen gas before sealing them. What problem does this prevent, and why does nitrogen help?

◆ **Chemical Reactions and Equations**

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