

PRINCIPAL SAAB

Periodic Assessment 1 (PA-1) — Sample Paper**Class X | Science (086) | Periodic Assessment 1 | Session 2026-27****Time: 40 minutes | Maximum Marks: 25 | Answer Key & Marking Scheme**

Worked answers with the marks that each point carries. Where a question says "any two" or "any three", a student needs only that many correct points; the extra points below are given so that a range of correct answers can be marked fairly.

Section A - Multiple Choice Questions (5 x 1 = 5 marks)**Q1.** (B) Combination. [1]

Two reactants, calcium oxide and water, combine to give only one product, calcium hydroxide, which makes this a combination reaction. It is also the reaction used to make slaked lime, and it is exothermic.

Q2. (B) Decomposition. [1]

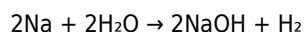
Here a single compound, water, breaks down into two simpler substances, hydrogen and oxygen. This is a decomposition reaction. Because electricity is used to bring it about, it is called an electrolytic decomposition.

Q3. (C) Baking soda solution. [1]

Baking soda, or sodium hydrogencarbonate, is a mild base and its solution has a pH of about 8 to 9, which is above 7. Lemon juice and vinegar are both acidic and have a pH below 7. Distilled water is neutral, with a pH of exactly 7, so it is not greater than 7.

Q4. (B) Sodium. [1]

Sodium reacts with cold water so vigorously that the heat released sets fire to the hydrogen gas that is produced:



Iron reacts only with steam, while copper and gold do not react with water at all.

Q5. (D) Potassium. [1]

In the reactivity series, potassium stands highest of these four metals, followed by zinc, then iron, with copper the least reactive of them.

Section B - Very Short Answer Questions (4 x 2 = 8 marks)**Q6.** Balanced equation and reaction type. [2]

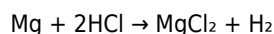
Check: Ag 2 = 2, N 2 = 2, O 6 = 6, Zn 1 = 1, so the equation is balanced.

This is a displacement reaction. Zinc displaces silver from its salt solution because zinc is more reactive than silver.

Q7. One mark for each substance (formula and use together). [2]

Baking soda — NaHCO_3 (sodium hydrogencarbonate). Use: as an antacid, to neutralise excess acid in the stomach; it is also used in baking powder, where it releases carbon dioxide gas and makes a cake rise.

Washing soda — $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$ (sodium carbonate decahydrate). Use: in the glass, soap and paper industries, and for removing the permanent hardness of water.

Q8. Balanced equation and two observations. [2]

Check: Mg 1 = 1, H 2 = 2, Cl 2 = 2, so the equation is balanced.

Observations: (i) There is brisk effervescence around the magnesium ribbon, with bubbles of a colourless gas. (ii) The ribbon slowly dissolves and the solution becomes warm, because the reaction is exothermic.

Note for the student: if a burning matchstick is brought near the gas, it burns with a pop sound, which confirms that the gas is hydrogen. This is the result of a confirmatory test rather than a direct observation, so write it separately if the question asks for a test.

Q9. Two parts, 1 mark each. [2]

The reactivity series is a list of metals arranged in decreasing order of their reactivity, running from the most reactive, potassium, down to the least reactive, gold.

Gold and silver lie at the very bottom of this series, so they are the least reactive metals. They do not react easily with oxygen, water or other substances and therefore do not readily form compounds. This is why they are found in nature in the free, or native, uncombined state.

Section C - Short Answer Questions (3 x 3 = 9 marks)

Q10. Equation, plus classification as displacement and as redox. [3]



Check: Al 2 = 2, Fe 2 = 2, O 3 = 3, so the equation is balanced. This is called the thermite reaction and it releases a very large amount of heat.

It is a displacement reaction, because aluminium displaces iron from its oxide.

It is also a redox reaction:

- Aluminium is oxidised, because it gains oxygen ($\text{Al} \rightarrow \text{Al}_2\text{O}_3$).
- Iron(III) oxide is reduced, because it loses oxygen ($\text{Fe}_2\text{O}_3 \rightarrow \text{Fe}$).

Q11. Three parts, 1 mark each. [3]

The pH scale runs from 0 to 14 and tells us how acidic or how basic a solution is. A pH below 7 means the solution is acidic, a pH of exactly 7 means it is neutral, and a pH above 7 means it is basic.

Food particles left in the mouth are broken down by bacteria, and this produces acid. When the pH in the mouth falls below about 5.5, the enamel of the teeth, which is made of calcium phosphate, begins to corrode and cavities form.

Toothpaste is basic so that it neutralises this excess acid and protects the enamel, which is why it is used for cleaning teeth.

Q12. Electron transfer, diagram and two properties. [3]

A magnesium atom has 2 valence electrons in its outermost shell and a chlorine atom has 7. To reach a stable octet:

- One Mg atom loses its 2 electrons and becomes an Mg^{2+} ion.
- Each Cl atom gains 1 electron and becomes a Cl^- ion, so 2 chlorine atoms are needed to accept the 2 electrons.

These oppositely charged ions, Mg^{2+} and two Cl^- , are held together by a strong electrostatic force of attraction, forming the ionic compound MgCl_2 .

Electron-dot diagram: show 2 dots around Mg with arrows carrying them to the two Cl atoms, each of which is drawn with 7 dots. After the transfer, Mg is shown as Mg^{2+} and each Cl as Cl^- with a completed octet of 8 dots.

Two properties of ionic compounds: (i) They have very high melting and boiling points. (ii) They conduct electricity when molten or when dissolved in water, because the ions are then free to move.

Section D - Case Study / Application (1 x 3 = 3 marks)

Q13. Case-study answer. [3]

(i) The rule is that a more reactive metal displaces a less reactive metal from its salt solution, and the less reactive metal is deposited in the solid form. (1 mark)

(ii) A displaced B, so A is more reactive than B. B displaced C, so B is more reactive than C. C displaced D, so C is more reactive than D. The decreasing order of reactivity is therefore:

$\text{A} > \text{B} > \text{C} > \text{D}$ (1 mark)

(iii) No, metal D will not be able to displace metal A. From the order above, D is the least reactive of the four and A is the most reactive, and a less reactive metal can never displace a more reactive metal from its salt solution. This also agrees with the observation given, in which D showed no reaction in the salt solution of A. (1 mark)

Apna Score Kaise Padhein

20-25 — All three chapters are strong. You are ready for PA-1.

14-19 — You need more practice either in balancing equations or in remembering the reactivity series.

Below 13 — Read the chapter notes again first, then solve this paper a second time three days later without looking at the answers.

Kaizen — The whole syllabus will not improve in a single day. Today, just balance again the one equation you got wrong, without looking at the answer. One small correction each day, and the difference will be clear by the time PA-1 arrives.