

PRACTICE PAPER 01 (2026-27)
CHAPTER 03: METALS AND NON-METALS

SUBJECT: SCIENCE

MAX. MARKS : 40

CLASS : X

DURATION : 1½ hrs

General Instructions:

- (i) All questions are compulsory.
- (ii) This question paper contains **20** questions divided into five Sections A, B, C, D and E.
- (iii) **Section A** comprises 10 MCQs and Assertion-Reason questions of **1 mark** each. **Section B** comprises 4 Very Short Answer questions of **2 marks** each. **Section C** comprises 3 Short Answer questions of **3 marks** each. **Section D** comprises 1 Long Answer question of **5 marks**. **Section E** comprises 2 Case Study Based questions of **4 marks** each.
- (iv) There is no overall choice. Internal choice is provided in Section E.
- (v) Use of calculators is not permitted.

SECTION - A

Questions 1 to 10 carry 1 mark each.

1. Which of the following metals exists as a liquid at room temperature?
(a) Gallium (b) Mercury
(c) Bromine (d) Caesium
2. Which of the following non-metals is lustrous?
(a) Iodine (b) Sulphur
(c) Phosphorus (d) Coal
3. Which one of the following is an amphoteric oxide?
(a) Na_2O (b) MgO
(c) Al_2O_3 (d) SO_2
4. A metal does not react with cold water or hot water, but reacts with steam to form a metal oxide and hydrogen. The metal is
(a) Sodium (b) Calcium
(c) Magnesium (d) Iron
5. In which of the following will a displacement reaction take place?
(a) Zinc in aluminium sulphate solution (b) Zinc in lead nitrate solution
(c) Copper in iron(II) sulphate solution (d) Lead in zinc sulphate solution
6. Zinc blende (ZnS) is converted into zinc oxide before reduction by heating it strongly in excess air. This process is called
(a) calcination (b) roasting
(c) electrolytic refining (d) thermit process
7. In the electrolytic refining of copper, the impure copper is made the
(a) cathode (b) anode
(c) electrolyte (d) anode mud

8. Ornaments in India are generally made of 22 carat gold. This means the ornament contains
- (a) 22 parts pure gold and 2 parts copper or silver
 - (b) 22% gold and 78% copper
 - (c) 2 parts gold and 22 parts silver
 - (d) pure gold with 22 g of copper

In the following questions 9 and 10, a statement of Assertion (A) is followed by a statement of Reason (R). Mark the correct choice as:

- (a) Both (A) and (R) are true and (R) is the correct explanation of (A).
- (b) Both (A) and (R) are true but (R) is not the correct explanation of (A).
- (c) (A) is true but (R) is false.
- (d) (A) is false but (R) is true.

9. **Assertion (A):** Sodium and potassium metals are stored immersed in kerosene oil.

Reason (R): Sodium and potassium react so vigorously with oxygen that they catch fire if kept in the open.

10. **Assertion (A):** Solid sodium chloride conducts electricity.

Reason (R): Ionic compounds are made of oppositely charged ions held by strong electrostatic forces.

SECTION - B

Questions 11 to 14 carry 2 marks each.

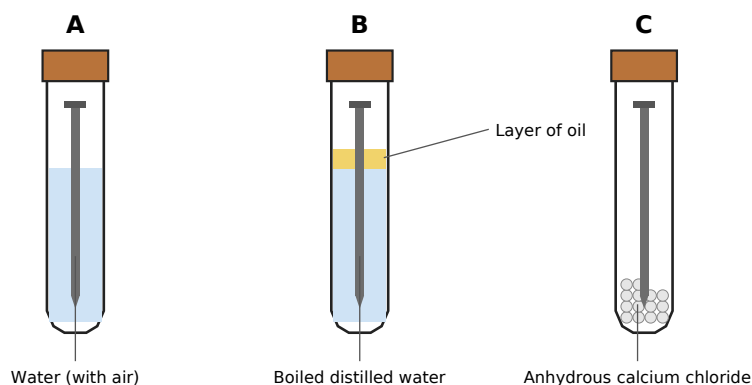
11. Show the formation of magnesium chloride by the transfer of electrons, writing the electronic configuration of each atom and ion. Name the cation and anion present in it. (Atomic numbers: Mg = 12, Cl = 17)
12. A piece of calcium is dropped into a beaker of cold water.
- (a) Write the balanced equation for the reaction.
 - (b) Why does calcium start floating? Why does the hydrogen evolved not catch fire, as it does with sodium?
13. (a) Why is hydrogen gas usually not evolved when a metal reacts with nitric acid? Name two metals that do give hydrogen with very dilute nitric acid.
- (b) What is aqua regia? State one special property of it.
14. (a) Why is pure iron not used for making articles? How is stainless steel different from iron?
- (b) Why is solder used for joining electrical wires, while copper and not brass is used for making electrical circuits?

SECTION - C

Questions 15 to 17 carry 3 marks each.

15. Zinc occurs in nature as zinc blende (ZnS) and calamine (ZnCO₃).
- (a) Why are these ores first converted into zinc oxide? Name the process used for each ore and write the equations.
 - (b) How is zinc obtained from zinc oxide? Write the equation and identify the reducing agent.
16. Explain the following properties of ionic compounds:
- (a) They have high melting and boiling points.
 - (b) They conduct electricity in the molten state but not in the solid state.
 - (c) They dissolve in water but not in kerosene or petrol.

17. A student set up three test tubes, each containing a clean iron nail, as shown below, and left them for a few days.



- (a) In which test tube(s) will the iron nail rust? Give a reason.
 (b) Why was the water in test tube B boiled, and why was a layer of oil added?
 (c) What is the role of anhydrous calcium chloride in test tube C? What do you conclude about the conditions needed for rusting?

SECTION - D

Question 18 carries 5 marks.

18. (a) Why can sodium, magnesium and aluminium not be obtained by heating their oxides with carbon? How is sodium obtained? Write the reactions at the cathode and the anode.
 (b) Write the balanced equation for the thermite reaction. Why is the iron produced in the molten state? Give one use of this reaction.
 (c) In the reaction $3\text{MnO}_2(\text{s}) + 4\text{Al}(\text{s}) \rightarrow 3\text{Mn}(\text{l}) + 2\text{Al}_2\text{O}_3(\text{s}) + \text{Heat}$, identify the substance oxidised and the substance reduced.

SECTION - E (Case Study Based Questions)

Questions 19 and 20 carry 4 marks each.

19. Samples of four metals W, X, Y and Z were added one by one to the solutions listed below. The observations are tabulated:

Metal	Iron(II) sulphate	Copper(II) sulphate	Zinc sulphate	Silver nitrate
W	Displacement	Displacement	Displacement	Displacement
X	No reaction	Displacement	No reaction	Displacement
Y	No reaction	No reaction	No reaction	Displacement
Z	No reaction	No reaction	No reaction	No reaction

- (a) Which is the most reactive and which is the least reactive of these metals? **(1)**
 (b) Arrange W, X, Y and Z in decreasing order of reactivity. **(1)**
 (c) Y is a reddish-brown metal used in electrical wiring. What would you observe when Y is placed in silver nitrate solution? Write the balanced equation. **(2)**

OR

- (c) Which of the four solutions can be safely stored in a container made of metal X? Give reasons. **(2)**

20. Read the passage and answer the questions that follow.

A student burnt two elements separately. Element **A**, a silvery-white ribbon, burnt with a dazzling white flame, and its ash dissolved in water to give a solution that turned red litmus blue. Element **B**, a yellow powder, burnt with a blue flame giving pungent fumes; when these fumes were dissolved in water, the solution turned blue litmus red.

(a) Identify elements A and B. **(1)**

(b) What is the nature of the oxides of A and B? What general rule does this illustrate? **(1)**

(c) Write balanced equations for (i) the burning of A and the reaction of its oxide with water, and (ii) the burning of B and the reaction of its oxide with water. **(2)**

OR

(c) Element A does not react with cold water but reacts with hot water. Write the balanced equation and explain why A starts floating on the water. **(2)**

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