PRACTICE PAPER (2026–27)

Chapter 01: Chemical Reactions and Equations

CLASS: X **SUBJECT: SCIENCE** **DURATION: 1½ hrs** **MAX. MARKS: 40**

General Instructions:

1. All questions are compulsory.
2. This question paper contains 20 questions divided into five Sections: **A**, **B**, **C**, **D**, and **E**.
3. **Section A** comprises 10 Multiple Choice Questions (including Assertion-Reason) of 1 mark each.
4. **Section B** comprises 4 questions of 2 marks each.
5. **Section C** comprises 3 questions of 3 marks each.
6. **Section D** comprises 1 question of 5 marks (with internal choice).
7. **Section E** comprises 2 Case Study Based Questions of 4 marks each.
8. Use of calculators is strictly prohibited.

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. Before burning in air, a magnesium ribbon is cleaned by rubbing with sandpaper to:

   (a) Make the ribbon shiny and smooth
   (b) Remove the protective layer of basic magnesium oxide
   (c) Remove moisture absorbed from the atmosphere
   (d) Reduce the ignition temperature of magnesium

2. In the balanced chemical equation:
   $p\ Fe + q\ H_2O \rightarrow r\ Fe_3O_4 + s\ H_2$
   The values of stoichiometric coefficients p, q, r, and s respectively are:

   (a) 3, 4, 1, 4
   (b) 3, 2, 1, 2
   (c) 2, 4, 3, 4
   (d) 1, 4, 3, 2

3. When solid lead nitrate is heated strongly in a dry boiling tube, the observation made is:

   (a) Brown fumes of NO_2 gas and a yellow residue
   (b) Colourless gas with suffocating smell and red residue
   (c) White precipitate and a pop sound
   (d) Green crystals decompose to give dark brown fumes

4. Barium chloride on reacting with ammonium sulphate forms barium sulphate and ammonium chloride. Which type of chemical reaction is this?
   (I) Displacement reaction (II) Precipitation reaction
   (III) Combination reaction (IV) Double displacement reaction

   (a) (I) only
   (b) (II) only
   (c) (IV) only
   (d) Both (II) and (IV)

5. In the reaction: $MnO_2 + 4HCl \rightarrow MnCl_2 + 2H_2O + Cl_2$, the substance oxidised and the oxidising agent are respectively:

   (a) HCl and MnO_2
   (b) MnO_2 and HCl
   (c) HCl and Cl_2
   (d) MnO_2 and $MnCl_2$

6. Which of the following processes represents an endothermic process?

   (a) Dilution of sulphuric acid
   (b) Decomposition of calcium carbonate
   (c) Respiration in human cells
   (d) Slaking of quicklime with water

7. Silver articles become black after some days when exposed to air because of the formation of:

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(a) Silver oxide (Ag_2O)
(b) Silver sulphide (Ag_2S)
(c) Silver chloride (AgCl)
(d) Silver carbonate (Ag_2CO_3)

8. An iron nail is immersed in a solution of copper sulphate for 30 minutes. What change in colour is observed in the solution?
(a) Blue to colourless
(b) Blue to pale green
(c) Pale green to deep blue
(d) Remains unchanged

Directions for Q9 and Q10: In each question, 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):** A chemical equation must always be balanced in accordance with the law of conservation of mass.
Reason (R): Total mass of the elements present in the products of a chemical reaction is equal to the total mass of the elements present in the reactants.

10. **Assertion (A):** White silver chloride turns grey when exposed to sunlight.
Reason (R): Decomposition of silver chloride into silver metal and chlorine gas takes place in the presence of light.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. A shining brown-coloured element X on heating in air becomes black in colour.
    a. Identify element X and the black-coloured compound formed.
    b. Write the balanced chemical equation for the reaction involved.

12. Write balanced chemical equations along with physical state symbols for the following reactions:
    a. Thermite reaction between iron(III) oxide and aluminium powder.
    b. Photosynthesis reaction taking place in green plants.

13. Why is respiration considered an exothermic reaction? Explain with the help of a balanced chemical equation.

14. What is rancidity? Suggest two effective methods to prevent the oxidation of fats and oils in food items.

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. A small amount of calcium oxide (quicklime) is taken in a beaker and water is added slowly to it.
    a. State two key observations made during this experiment.
    b. Write the balanced chemical equation and identify the type of reaction.
    c. How does the solution formed react when carbon dioxide gas is passed through it?

16. Identify the type of chemical reactions in each of the following cases and write balanced equations:
    a. Zinc carbonate is heated in the absence of oxygen.
    b. Potassium iodide solution is added to lead nitrate solution.
    c. Methane gas burns in the presence of excess oxygen.

17. Define a redox reaction. In the following reactions, identify the substance oxidised, substance reduced, oxidising agent, and reducing agent:

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a. $CuO + H_2 \rightarrow Cu + H_2O$

b. $H_2S + Cl_2 \rightarrow 2HCl + S$

SECTION – D

Question 18 carries 5 marks.

18. a. What is meant by a decomposition reaction? Why are decomposition reactions called the opposite of combination reactions?

b. Give one example each of decomposition reactions carried out with the help of:
(i) Heat energy (Thermal decomposition)
(ii) Light energy (Photochemical decomposition)
(iii) Electrical energy (Electrolytic decomposition)

c. Write balanced chemical equations for all three examples mentioned in part (b).

OR

a. Distinguish between displacement and double displacement reactions with suitable balanced chemical equations.

b. A green crystalline substance P on heating in a dry test tube loses water of crystallisation and changes colour. On further heating, a suffocating gas with the smell of burning sulphur is evolved leaving a reddish-brown residue Q.

i. Identify substance P and residue Q.

ii. Write the complete balanced chemical equation for the thermal decomposition of substance P.

iii. Classify the reaction on the basis of energy change (exothermic or endothermic).

SECTION – E (Case Study Based Questions)

Questions 19 and 20 carry 4 marks each.

19. **Read the passage given below and answer the questions that follow:**

> *Corrosion is a slow natural process in which metals are gradually degraded by chemical or electrochemical reactions with components of their environment, such as oxygen, water vapour, and acidic gases. The most familiar example of corrosion is the rusting of iron, which causes massive financial and infrastructural damage every year across bridges, ships, railway tracks, and vehicles. When iron is exposed to moist air, a reddish-brown flakey powder coats its surface. Unlike aluminium oxide, which forms a tenacious protective barrier, rust flakes off, continuously exposing fresh iron beneath to further corrosive attack.*

a. What are the two essential conditions required for the rusting of iron? **[1 Mark]**

b. State the chemical name and formula of rust. **[1 Mark]**

c. Corrosion of aluminium is considered a boon while corrosion of iron is a bane. Justify this statement with scientific reasoning. **[2 Marks]**

OR

c. Explain the process of galvanisation. Why does a galvanised iron pipe not rust even if its outer zinc coating gets scratched or broken? **[2 Marks]**

20. **Read the passage given below and answer the questions that follow:**

> *In an experimental setup to demonstrate the electrolysis of water, a plastic mug is drilled with two holes at its base and fitted with rubber stoppers carrying carbon (graphite) electrodes. Two graduated test tubes filled with water are inverted over the electrodes. A small quantity of dilute sulphuric acid is added to the water, and the electrodes are connected to a 6V battery. As electric current flows, bubbles of gas begin forming at both electrodes, displacing water in the inverted test tubes at unequal rates.*

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a. Why is a few drops of dilute sulphuric acid added to pure water during this electrolysis? **[1 Mark]**

b. Name the gases collected at the anode and the cathode respectively. **[1 Mark]**

c. Why is the volume of gas collected over one electrode double that collected over the other? Write the balanced chemical equation representing this decomposition. **[2 Marks]**

OR

c. How will you test and confirm the identities of the two gases collected at the respective electrodes? Explain with expected observations. **[2 Marks]**

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