CBSE Class 10 Science – Chapter 1: Chemical Reactions and Equations

Practice Question Bank with Answers (Based on Previous Year CBSE Questions)

Section A: Multiple Choice Questions (1 Mark Each)

Q1. (2020) Which of the following is a balanced chemical equation?
A. $H_2 + O_2 \rightarrow H_2O$
B. $N_2 + 3H_2 \rightarrow 2NH_3$
C. $Ca + O_2 \rightarrow CaO$
D. $Zn + HCl \rightarrow ZnCl_2 + H_2$
Answer: B. $N_2 + 3H_2 \rightarrow 2NH_3$

Q2. (2019) The reaction: $Zn + 2HCl \rightarrow ZnCl_2 + H_2$ is an example of:
A. Decomposition
B. Combination
C. Displacement
D. Double displacement
Answer: C. Displacement

Q3. (2022) Which of the following reactions is an example of oxidation?
A. $2KClO_3 \rightarrow 2KCl + 3O_2$
B. $C + O_2 \rightarrow CO_2$
C. $2H_2 + O_2 \rightarrow 2H_2O$
D. $CaCO_3 \rightarrow CaO + CO_2$
Answer: B. $C + O_2 \rightarrow CO_2$

Q4. (2023) Which gas is evolved when dilute HCl reacts with zinc?
A. Oxygen
B. Nitrogen
C. Hydrogen
D. Carbon dioxide
Answer: C. Hydrogen

Q5. (2021) The brown coating on an iron article left in moist air is:
A. Iron oxide
B. Zinc oxide
C. Silver nitrate
D. Aluminum oxide
Answer: A. Iron oxide

Q6. (2022) A white precipitate is formed when barium chloride reacts with:
A. NaOH

B. HCl
C. Na_2SO_4
D. KNO_3
Answer: C. Na_2SO_4

Q7. (2020) Which of the following represents a decomposition reaction?
A. $NaOH + HCl \rightarrow NaCl + H_2O$
B. $CaCO_3 \rightarrow CaO + CO_2$
C. $Zn + CuSO_4 \rightarrow ZnSO_4 + Cu$
D. $C + O_2 \rightarrow CO_2$
Answer: B. $CaCO_3 \rightarrow CaO + CO_2$

Q8. (2018) Rancidity can be prevented by:
A. Keeping food in sunlight
B. Adding antioxidants
C. Keeping food in open
D. Storing food in metal containers
Answer: B. Adding antioxidants

Q9. (2021) Identify the exothermic reaction:
A. $NH_4Cl \rightarrow NH_3 + HCl$
B. $CaO + H_2O \rightarrow Ca(OH)_2$
C. $BaCl_2 + Na_2SO_4 \rightarrow BaSO_4 + 2NaCl$
D. $H_2 + Cl_2 \rightarrow 2HCl$ (with UV)
Answer: B. $CaO + H_2O \rightarrow Ca(OH)_2$

Q10. (2023) Which statement is true about a balanced chemical equation?
A. Atoms can differ on both sides
B. Mass of reactants > Mass of products
C. Mass of reactants = Mass of products
D. Reactants are always more than products
Answer: C. Mass of reactants = Mass of products

Q11. (2020) The process of rusting involves:
A. Only oxygen
B. Only moisture
C. Oxygen and moisture
D. Sunlight
Answer: C. Oxygen and moisture

Q12. (2019) In the reaction $2FeSO_4 \rightarrow Fe_2O_3 + SO_2 + SO_3$, the type of reaction is:
A. Combination
B. Displacement
C. Decomposition

D. Neutralisation
Answer: C. Decomposition

Q13. (2022) A reaction in which heat is absorbed is called:
A. Exothermic
B. Endothermic
C. Oxidation
D. Decomposition
Answer: B. Endothermic

Q14. (2018) The reaction between lead nitrate and potassium iodide is:
A. Displacement
B. Combination
C. Decomposition
D. Double displacement
Answer: D. Double displacement

Q15. (2017) Corrosion of iron is a:
A. Physical change
B. Chemical change
C. Reversible change
D. Natural process
Answer: B. Chemical change

Section B: 2-Mark Questions

Q16. (2023) What is a balanced chemical equation? Why should it be balanced?
Answer: A balanced equation has equal numbers of atoms of each element on both sides. Balancing obeys the **Law of Conservation of Mass**.

Q17. (2022) Define combination reaction with an example.
Answer: When two or more reactants combine to form a single product.
Example: $CaO + H_2O \rightarrow Ca(OH)_2$

Q18. (2018) Write the balanced equation for the decomposition of lead nitrate.
Answer: $2Pb(NO_3)_2 \rightarrow 2PbO + 4NO_2 + O_2$

Q19. (2021) Identify the type of reaction:
$Al + Fe_2O_3 \rightarrow Al_2O_3 + Fe$
Answer: Displacement reaction (Thermite Reaction)

Q20. (2019) Why is respiration an exothermic reaction?
Answer: It releases energy:
$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + energy$

Q21. (2020) Write the chemical reaction for rusting of iron.
Answer:
$4Fe + 3O_2 + 6H_2O \rightarrow 4Fe(OH)_3$

Q22. (2018) What is rancidity? How can it be prevented?
Answer: Oxidation of fats and oils. Prevented by **antioxidants** or airtight packaging.

Q23. (2022) Define displacement reaction.
Answer: A more reactive element displaces a less reactive one.
Example: $Zn + CuSO_4 \rightarrow ZnSO_4 + Cu$

Q24. (2023) What are antioxidants?
Answer: Substances that prevent oxidation, used in food preservation.

Q25. (2019) Products formed when:
(a) $Zinc + H_2SO_4 \rightarrow ZnSO_4 + H_2$
(b) $BaCl_2 + Na_2SO_4 \rightarrow BaSO_4 + 2NaCl$

Q26. (2020) Give one example each of:

- Double displacement: $Na_2SO_4 + BaCl_2 \rightarrow BaSO_4 + 2NaCl$
- Precipitation: Formation of $BaSO_4$ (white ppt)

Q27. (2018) Why is paint applied on iron?
Answer: To prevent rusting (corrosion)

Q28. (2019) Balanced equations for:
(a) $C + O_2 \rightarrow CO_2$ (combination)
(b) $2H_2O \rightarrow 2H_2 + O_2$ (decomposition)

Q29. (2021) Why is balancing necessary?
Answer: To satisfy the Law of Conservation of Mass

Q30. (2023) What happens when iron is placed in copper sulphate?
Answer:
$Fe + CuSO_4 \rightarrow FeSO_4 + Cu$
Blue color fades, brown copper deposits

Section C: Long Answer Questions (3–5 Marks)

Q31. (2021) What are decomposition reactions? Give 3 types with equations.
Answer:

- Thermal: $CaCO_3 \rightarrow CaO + CO_2$
- Photolytic: $2AgCl \rightarrow 2Ag + Cl_2$

- Electrolytic: $2H_2O \rightarrow 2H_2 + O_2$

Q32. (2020) Explain 5 types of reactions with examples.
Answer:

1. Combination – $CaO + H_2O \rightarrow Ca(OH)_2$
2. Decomposition – $2Pb(NO_3)_2 \rightarrow 2PbO + 4NO_2 + O_2$
3. Displacement – $Zn + CuSO_4 \rightarrow ZnSO_4 + Cu$
4. Double Displacement – $BaCl_2 + Na_2SO_4 \rightarrow BaSO_4 + NaCl$
5. Redox – $CuO + H_2 \rightarrow Cu + H_2O$

Q33. (2022) What is corrosion? Mechanism and prevention?
Answer:

- Iron reacts with air and moisture:
  $4Fe + 3O_2 + 6H_2O \rightarrow 4Fe(OH)_3$
- Prevention: painting, galvanization

Q34. (2019) Explain with examples:
(i) Combination: $CaO + H_2O \rightarrow Ca(OH)_2$
(ii) Displacement: $Zn + CuSO_4 \rightarrow ZnSO_4 + Cu$
(iii) Double Displacement: $Na_2SO_4 + BaCl_2 \rightarrow BaSO_4 + NaCl$

Q35. (2023) What are oxidation and reduction? Give a redox example.
Answer:
Oxidation: Gain of O_2 / Loss of H_2
Reduction: Loss of O_2 / Gain of H_2
Example:
$CuO + H_2 \rightarrow Cu + H_2O$

Q36. (2018) State the law of conservation of mass. Prove with example.
Answer:
Mass is neither created nor destroyed.
Example: $H_2 + Cl_2 \rightarrow 2HCl$ (same atoms on both sides)

Q37. (2021) How to identify chemical reactions? Give 4 indicators.
Answer:

- Change in color
- Gas evolved
- Heat/Light emitted

- Precipitate formed

Q38. (2019) Describe reaction of copper with nitric acid.
Answer:
$Cu + 4HNO_3 \rightarrow Cu(NO_3)_2 + 2NO_2 + 2H_2O$
Observation: Brown NO_2 gas, blue solution

Q39. (2020) Explain the thermite reaction.
Answer:
$2Al + Fe_2O_3 \rightarrow 2Fe + Al_2O_3 + Heat$
Used in rail welding

Q40. (2022) Compare decomposition and combination reactions.
Answer:

Reaction Type	Example	Description
Combination	$CaO + H_2O \rightarrow Ca(OH)_2$	Two substances combine
Decomposition	$2Pb(NO_3)_2 \rightarrow 2PbO + 4NO_2 + O_2$	One compound breaks into parts