



Attempt questions first; check the separate key afterward. Show all working. Draw accurate figures where required.

A. Very short answers - 1 mark each

1. Balance: $\text{Mg} + \text{O}_2 \rightarrow \text{MgO}$.
2. Why is a magnesium ribbon cleaned before burning?
3. Balance: $\text{H}_2 + \text{O}_2 \rightarrow \text{H}_2\text{O}$.
4. Explain why chemical equations must be balanced.
5. Name the gas evolved when zinc reacts with dilute HCl.
6. Write the balanced equation and its test.
7. Classify $\text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca}(\text{OH})_2$.
8. Describe the observations when water is added to quicklime.

B. Short answers / practice - 2 marks each

9. Write the decomposition equation for heated CaCO_3 .
10. Distinguish thermal, electrolytic and photolytic decomposition.
11. What colour does AgCl turn in sunlight?
12. Write its balanced photodecomposition equation.
13. Is respiration exothermic?
14. Explain why energy is released during respiration.
15. Identify the precipitate in $\text{Na}_2\text{SO}_4 + \text{BaCl}_2$ solution.
16. Write the balanced equation with physical states.
17. What happens to blue CuSO_4 solution when an iron nail is added?
18. Write the equation and identify the more reactive metal.

19. In $\text{CuO} + \text{H}_2 \rightarrow \text{Cu} + \text{H}_2\text{O}$, name the substance oxidised.

20. Identify the oxidising agent and explain.

C. Application / reasoning - 3 marks each

21. Is every combination reaction necessarily exothermic?

22. Distinguish oxidation and reduction using two examples.

23. On heating lead nitrate, name the brown gas.

24. Write the balanced decomposition equation.

25. Name the process that spoils oils by oxidation.

26. Explain how airtight packing and antioxidants reduce it.

27. Balance $\text{Al} + \text{O}_2 \rightarrow \text{Al}_2\text{O}_3$.

28. Identify reaction type: $2\text{KClO}_3 \rightarrow 2\text{KCl} + 3\text{O}_2$ on heating.

29. Explain why a sealed packet of oily snacks may be filled with nitrogen.

30. Write the reaction when zinc displaces copper from CuSO_4 solution.

31. In $\text{ZnO} + \text{C} \rightarrow \text{Zn} + \text{CO}$, identify the substances oxidised and reduced.

D. Extended practice - 5 marks per pair

32. State two conditions necessary for rusting of iron.

33. Design a three-test-tube comparison to demonstrate those conditions.

34. Balance $\text{Fe} + \text{H}_2\text{O}(\text{steam}) \rightarrow \text{Fe}_3\text{O}_4 + \text{H}_2$.

35. Compare displacement and double-displacement reactions using balanced equations and observations.

ANSWER KEY - Numerical / closed questions

- 1) $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$. 3) $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$. 5) Hydrogen. 6) $\text{Zn} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2$; burning splint gives a pop. 7) Combination; exothermic. 9) $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$. 11) Grey. 12) $2\text{AgCl} \rightarrow 2\text{Ag} + \text{Cl}_2$. 13) Yes. 15) BaSO_4 . 16) $\text{Na}_2\text{SO}_4(\text{aq}) + \text{BaCl}_2(\text{aq}) \rightarrow \text{BaSO}_4(\text{s}) + 2\text{NaCl}(\text{aq})$. 17) Turns green; copper deposits. 18) $\text{Fe} + \text{CuSO}_4 \rightarrow \text{FeSO}_4 + \text{Cu}$; iron. 19) H_2 . 20) CuO ; it supplies oxygen and is reduced. 21) No. 23) NO_2 . 24) $2\text{Pb}(\text{NO}_3)_2 \rightarrow 2\text{PbO} + 4\text{NO}_2 + \text{O}_2$. 25) Rancidity. 27) $4\text{Al} + 3\text{O}_2 \rightarrow 2\text{Al}_2\text{O}_3$. 28) Thermal decomposition. 30) $\text{Zn} + \text{CuSO}_4 \rightarrow \text{ZnSO}_4 + \text{Cu}$. 31) C oxidised; ZnO reduced. 32) Oxygen and moisture. 34) $3\text{Fe} + 4\text{H}_2\text{O} \rightarrow \text{Fe}_3\text{O}_4 + 4\text{H}_2$.