



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

A. Very short answers - 1 mark each

1. Name a metal liquid near room temperature.
2. Name a liquid non-metal near room temperature.
3. Are all metals hard?
4. Explain why sodium and potassium are stored under oil.
5. Which non-metal conducts electricity well in one allotrope?
6. Explain malleability and ductility with examples.
7. Write the reaction of magnesium with oxygen.
8. Describe the general acid-base character of metal and non-metal oxides.

B. Short answers / practice - 2 marks each

9. Name two amphoteric oxides.
10. Explain amphoterism using reactions of ZnO.
11. Which is more reactive: zinc or copper?
12. Predict and explain zinc's reaction with copper sulphate solution.
13. Can copper displace iron from FeSO_4 solution?
14. Explain displacement using the reactivity series.
15. Write the ion formed by sodium.
16. Show electron transfer in the formation of NaCl.
17. Do ionic compounds conduct electricity in solid form?
18. Explain why their molten forms conduct.
19. Name the major metal extracted from bauxite.
20. Distinguish minerals and ores.

C. Application / reasoning - 3 marks each

21. What process converts a sulphide ore into oxide in excess air?
22. Distinguish roasting from calcination with equations.

23. Which reducing agent is used in the thermite reaction?

24. Write the thermite equation and one use.

25. Name the coating metal used for galvanising iron.

26. Explain why galvanising protects iron.

27. Write the reaction of iron with steam.

28. Why can aluminium resist corrosion despite being reactive?

29. Can silver displace copper from aqueous copper sulphate?

30. Explain why highly reactive metals are extracted by electrolysis rather than carbon reduction.

31. Draw electron-transfer diagrams for MgCl_2 and state the ions formed.

D. Extended practice - 5 marks per pair

32. Name the principal metals in brass and bronze.
33. Explain why alloys are often preferred to pure metals.
34. During electrolytic refining of copper, which electrode is impure copper?
35. Describe electrolytic refining with a labelled diagram and the fate of soluble and insoluble impurities.

ANSWER KEY - Numerical / closed questions

1) Mercury. 2) Bromine. 3) No. 5) Carbon as graphite. 7) $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$. 9) Al_2O_3 , ZnO. 10) $\text{ZnO} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2\text{O}$; $\text{ZnO} + 2\text{NaOH} \rightarrow \text{Na}_2\text{ZnO}_2 + \text{H}_2\text{O}$. 11) Zinc. 12) $\text{Zn} + \text{CuSO}_4 \rightarrow \text{ZnSO}_4 + \text{Cu}$. 13) No. 15) Na^+ . 17) Generally no. 19) Aluminium. 21) Roasting. 23) Aluminium. 24) $\text{Fe}_2\text{O}_3 + 2\text{Al} \rightarrow \text{Al}_2\text{O}_3 + 2\text{Fe}$; welding. 25) Zinc. 27) $3\text{Fe} + 4\text{H}_2\text{O} \rightarrow \text{Fe}_3\text{O}_4 + 4\text{H}_2$. 29) No. 31) Mg^{2+} and two Cl^- . 32) Brass: Cu, Zn; bronze: Cu, Sn. 34) Anode.