

Question 26 (Answer: **B**)

- Order the metals by how readily they lose electrons.
- Copper is below hydrogen and barely reacts; calcium reacts vigorously with cold water.
- So from least to most reactive: copper, zinc, magnesium, calcium.

Question 27 (Answer: **D**)

- Aluminium removes the oxygen from the iron oxide, so aluminium is *oxidised*.
- A species that is oxidised is the reducing agent, not the oxidising agent.
- The reaction also shows aluminium is more reactive than iron, since it takes the oxygen.

Question 26 (Answer: **A**)

- A metal that reacts with cold water is very reactive – Group I or Group II.
- A metal oxide that carbon can reduce belongs to a metal *less* reactive than carbon.
- Those two behaviours are mutually exclusive, and that is what orders the four metals.

Question 28 (Answer: **B**)

- P does not react with dilute acid, so it lies below hydrogen – the least reactive.
- R reacts rapidly with *cold water*, so it is the most reactive of the four.
- Q is more reactive than magnesium but does not attack cold water, so it sits between them.

Question 26 (Answer: **B**)

- It gives hydrogen with dilute acid and conducts heat, so it is a metal.
- Reacting only slowly with cold water but quickly with steam puts it in the middle of the reactivity series.
- That fits magnesium or zinc – not sodium (violent with cold water) or copper (no reaction with acid).

Question 27 (Answer: **A**)

- A metal displaces the ions of any metal *less* reactive than itself.
- So count how many solutions each metal reacts with: the most reactive reacts with the most.
- Order them from the metal that reacts with everything down to the one that reacts with nothing.

Question 26 (Answer: **A**)

- Each equation shows the metal on the left displacing the metal in the ion, so it is the more reactive of the two.
- Chaining them gives $\text{Mg} > \text{Zn} > \text{Sn} > \text{Cu} > \text{Ag}$.
- To place a metal not yet in that chain you need one more experiment linking it to one already there.

Question 25 (Answer: **A**)

- Rank the four metals by reactivity: magnesium > zinc > iron > copper.
- Copper gives no reaction at all, magnesium fizzes vigorously.
- Iron reacts steadily but slowly, giving a pale green solution – neither the fastest nor the inert one.

Question 29 (Answer: **A**)

- Aluminium is actually more reactive than copper, so the observation looks backwards.
- But aluminium carries a tough, unreactive oxide layer that seals its surface.
- That layer keeps air away from the metal beneath, so no further reaction is seen.