

1. Nov/2022/Paper_11/No.11

Ammonium ions are converted into nitrate ions by bacteria.

What is the change in the oxidation number of nitrogen?

- A -6 B +6 C +8 D +9

2. Nov/2022/Paper_11/No.12

Sodium dichromate(VI), $\text{Na}_2\text{Cr}_2\text{O}_7$, reacts with hydrogen peroxide, H_2O_2 , producing Cr^{3+} ions, water and oxygen.

What is the correctly balanced ionic equation for this reaction?

- A $\text{Cr}_2\text{O}_7^{2-} + 2\text{H}^+ + \text{H}_2\text{O}_2 \rightarrow 2\text{Cr}^{3+} + 2\text{H}_2\text{O} + 4\text{O}_2$
B $\text{Cr}_2\text{O}_7^{2-} + 8\text{H}^+ + 3\text{H}_2\text{O}_2 \rightarrow 2\text{Cr}^{3+} + 7\text{H}_2\text{O} + 3\text{O}_2$
C $\text{Cr}_2\text{O}_7^{2-} + 8\text{H}^+ + 6\text{H}_2\text{O}_2 \rightarrow 2\text{Cr}^{3+} + 10\text{H}_2\text{O} + 6\text{O}_2$
D $\text{Cr}_2\text{O}_7^{2-} + 14\text{H}^+ + 3\text{H}_2\text{O}_2 \rightarrow 2\text{Cr}^{3+} + 7\text{H}_2\text{O} + 3\text{O}_2$

3. Nov/2022/Paper_12/No.5

Two moles of VO_2^+ ions react with one mole of zinc atoms in the presence of dilute acid. The products include Zn^{2+} ions and an ion, Y. Ion Y contains vanadium. Only zinc and vanadium change oxidation state in the reaction.

What is ion Y?

- A VO_3^- B VO^+ C VO^{2+} D VO_2^{2+}

4. Nov/2022/Paper_22/No.1(b)

(b) Complete Table 1.1 to show the total numbers of protons and electrons in the molecular ions NH_4^+ , CO_3^{2-} and PO_4^{3-} .

Table 1.1

molecular ion	total number of protons	total number of electrons
NH_4^+		
CO_3^{2-}		
PO_4^{3-}		

[3]

