Answers to practice exam questions for Chapter 1 Oxidation and reduction

Question 1

a **i** NH_4^+: –3 **iii** NO_3^-: + 5
ii NO_2^-: +3 **iv** N_2: 0
A = 2 correct, M = all correct

b **i** reduced, oxidation number goes from +5 to 0
ii neither, oxidation number stays the same
iii oxidised, oxidation number goes from –3 to +5
A = 2 correct answers, M = 2 correct with reasoning

Question 2

a iodine (or astatine) A

b I^- A

Question 3

a **i** $Fe \rightarrow Fe^{2+} + 2e^-$
ii $O_2 + 2H_2O + 4e^- \rightarrow 4OH^-$
OR $O_2 + 3H^+ + 4e^- \rightarrow OH^- + H_2O$
OR $O_2 + 2H^+ + 4e^- \rightarrow 2OH^-$

b $2Fe + O_2 + 2H_2O \rightarrow 2Fe(OH)_2$
A = both half-equations correct, M = combined equation correct

c **i** Neither, because the oxidation numbers do not change or because electrons have not be transferred.
ii Oxidation because the oxidation number of Fe changes from +2 to +3 or because the Fe^{2+} has lost an electron to form Fe^{3+}.
A = both correct, M = both justifications correct

d From green to orange/brown. A

Question 4

a +5 A

b V_2O_5 (or O^{2-}) A
The oxidation number of oxygen has increased, it has been oxidised. The oxygen in V_2O_5 has lost electrons while the chlorine gains electrons. M