Q8 Oxidation and reduction **[2 + 4 + 4 = 10 marks]**

a) i) Assign oxidation numbers to the atoms in the following compounds or ions:

[2 marks]

	Atom	**Oxidation number**	**Atom**	**Oxidation number**
MnO_4^{2-}	**Mn**		**O**	
H_3O^+	**H**		**O**	

b) From the half equations below, determine the balanced cell reaction and the standard electrode potential:
Hint: Determine which reaction will be oxidation and which reaction will be reduction.

$$Au^{3+}(aq) + 3\ e^- \rightleftharpoons Au(s)$$

$$I_2(s) + 2\ e^- \rightleftharpoons 2\ I^-(aq)$$

Data: $E°(\ Au^{3+}\ /\ Au\ ) = +1.42$ V and $E°(\ I_2\ /\ I^-\ ) = +0.54$ V

State the amount (measured in moles) of electrons that will be transferred in the reaction.

[4 marks]

Q8 (continued) Oxidation and reduction **[2 + 4 + 4 = 10 marks]**

c) Using half-reactions and showing your working, balance each half reaction separately for the following equation in acidic solution.
Hint: You do not need to write the overall balanced equation.

$$Cr^{3+}(aq) + BiO_3^-(aq) \rightarrow Cr_2O_7^{2-}(aq) + Bi^{3+}(aq)$$

[2 + 2 = 4 marks]

Oxidation reaction

Reduction reaction