Use the following table of standard reduction potentials to assist in answering the questions.

Li^{+}	✹	Li	-3.0V
Na+	✹	Na	-2.7V
Al^{+3}	✹	Al	-1.7V
Zn^{+2}	✹	Zn	-0.7V
Fe^{+3}	✹	Fe	-0.1V
H^{+}	✹	H_2	0.0V
Cu^{+2}	✹	Cu	0.3V
NO_3^{-}	✹	NO	1.0V
Cl_2	✹	$2Cl^{-}$	1.4V
MnO_4-	✹	Mn^{+2}	1.5V
Au^{+}	✹	Au	1.7V
F_2	✹	$2\ F^{-}$	2.9V

1. Consider the formation of copper fluoride. Using the half cell reactions written above, what is the final reaction?
   a. copper ion is oxidized and fluorine gas is reduced
   b. copper ion is reduced and fluorine ion is oxidized
   c. copper ion is reduced and fluorine gas is reduced
   d. copper is oxidized and fluorine gas is reduced
   e. copper is reduced and fluorine gas is oxidized

2. What is the sum of the coefficients when the following reaction is balanced in base?
$MnO_4^{-} + Na_2SO_3 \rightarrow MnO_2 + Na_2SO_4$
   a. 4
   b. 13
   c. 27
   d. 7

3. Which of the following statements is true for a cell with E = 1.2 V?
   a. The sign of ΔG is negative.
   b. The sign at the cathode is positive.
   c. Reduction occurs at the anode.
   d. The sign at the anode is positive.

4. Consider the table of half cell reactions above. Which of the following statements is true?
   a. As written, the reactions occur at ion concentrations of .1 M.
   b. Sodium is a strong reducing agent.
   c. The table provides standard potentials for oxidation.
   d. Manganese ion is a strong reducing agent.

5. Calculate the standard cell potential of a voltaic cell given the following half reactions:
Zn^{2+} (aq) + $2e^{-} \rightarrow$ Zn (s) $\quad E^{o}_{1/2} = -0.8$ V
Cu^{2+} (aq) + $2e^{-} \rightarrow$ Cu (s) $\quad E^{o}_{1/2} = 0.3$ V
   a. -0.11 V
   b. -0.5 V
   c. 0.11 V
   d. 0.5 V

6. Consider a cell with the half reactions below and a copper ion concentration of 1M and lithium ion 2M . What is potential of the cell?
Cu^{2+} (aq) + $2e^{-} \rightarrow$ Cu (s) $\quad E^{o}_{1/2} = 0.3$ V

$2Li^+ (aq) + 2e^- \rightarrow 2Li \quad E^o_{1/2} = -3.0\ V$

a. 5.8V
b. 6V
c. 6.02V
d. 0V

7. Rank the following from weakest to strongest reducing agents: K^+, Cl_2, Zn, Zn^{2+}

$Zn^{+2} \rightarrow Zn \qquad E^o_{1/2} = -0.7V$

$Cl_2 \rightarrow 2Cl^- \qquad E^o_{1/2} = 1.4V$

$K^+ (aq) + e^- \rightarrow K(s) \qquad E^o_{1/2} = -2.92V$

1. $K^+ < Zn < Zn^{2+} < Cl_2$
2. $K^+ < Zn^{2+} < Zn < Cl_2$
3. $Cl_2 < Zn^{+2} < Zn < K^+$
4. $Cl_2 < Zn < Zn^{+2} < K^+$

8. How many grams of Au were used in the reduction reaction of Au^+ to Au if 9.65×10^3 C are used?

a. 7.9 g
b. 0.79 g
c. 79 g
d. 790 g