CHEMISTRY

Part B

Time—40 minutes

NO CALCULATORS MAY BE USED FOR PART B.

Answer Question 4 below. The Section II score weighting for this question is 10 percent.

4. For each of the following three reactions, in part (i) write a balanced equation for the reaction and in part (ii) answer the question about the reaction. In part (i), coefficients should be in terms of lowest whole numbers. Assume that solutions are aqueous unless otherwise indicated. Represent substances in solutions as ions if the substances are extensively ionized. Omit formulas for any ions or molecules that are unchanged by the reaction. You may use the empty space at the bottom of the next page for scratch work, but only equations that are written in the answer boxes provided will be graded.

EXAMPLE:

A strip of magnesium metal is added to a solution of silver(I) nitrate.

(i) Balanced equation:

$Mg + 2\,Ag^{+} \longrightarrow Mg^{2+} + 2\,Ag$

(ii) Which substance is oxidized in the reaction?

Mg is oxidized.

(a) Chlorine gas, an oxidizing agent, is bubbled into a solution of potassium bromide at 25°C.

(i) Balanced equation:

(ii) Predict the sign of $\Delta S°$ for the reaction at 25°C. Justify your prediction.