CHM 1046 Chapter 14 Homework

1. Review Examples 14.01 and 14.03, then complete the following equilibrium table. Write both lines with variables only for H_2 and I_2. (1 pt)

	$2HI_{(g)}$	$\rightleftharpoons$	$H_{2(g)}$	+ $I_{2(g)}$
Initial	0.1600 M		0	0
Change				
Equilibrium				

2. Determine equilibrium values for [HI] and [H_2] if [I_2] = 0.0227 M at equilibrium. (1 pt)

3. Review Example 14.02 and write the expression (with substances in brackets) for K_C. (1 pt)

4. Substitute equilibrium concentrations in the expression, and determine the value for K_C. (1 pt)

5. Write the expression (with substances in brackets) for $Q_{C.}$ Include the "i" subscripts. What does the "i" stand for? Describe the difference between Q_C and K_C. (1 pt)

6. Review Example 14.05. Determine the value for Q_C when $[H_2]_i$ = 0.050 M, $[I_2]_i$ = 0.050 M, and $[HI]_i$ = 0.100 M. Which way will the reaction go to reach equilibrium? Explain your answer. (1 pt)

7. Suppose the reaction system in problem 1 is at equilibrium and more I_2 is added. Describe what happens to Q_c and explain which way the equilibrium will shift. (1 pt)

8. Review Example 14.09. Describe LeChatelier's principle of dynamic equilibrium. Then, explain why the equilibrium shifts, and which way it shifts, if I_2 is removed from the reaction system in problem 1. (1 pt)

9. Review Example 14.10, along with pages 5-6 in the chapter 14 notes. In terms of LeChatelier's principle, explain how the equilibrium of a gas phase reaction will generally shift when the partial pressure (or concentration) of each gaseous reactant and product is increased (doubled) proportionally. Determine which way the equilibrium will shift for the HI reaction if it is initially at equilibrium, and then all three partial pressures are doubled. (1 pt)

10. Review K_P expressions and example 14. 04 in the chapter notes. Write the K_P expression for the reaction in problem 1 with P's (not brackets) to represent the partial pressure of each substance. Next, find Δn = (sum of product coeffs) – (sum of reactant coeffs). Then, determine the value of K_P at 298 K using $K_P = K_C(RT)^{\Delta n}$. (1 pt)