Name _____ Period _____

AP Chemistry
Chapter 5 Test

R = 62.4 liter torr/(mole K) = 0.08206 liter atm/(mole K) = 8.31kPa liter/(mole K)

This test has more than 100 points of questions. If you score higher than 100 you will receive extra credit!

Part I: Multiple Choice (20 Points total)

1. ___ 2. ___ 3. ___ 4. ___ 5. ___ 6. ___ 7. ___ 8. ___ 9. ___ 10. ___

Part II: Open ended Questions

Two straight forward questions. 20 points each

1) The compound $KClO_3$ decomposes and produces oxygen gas and KCl. Calculate the volume of oxygen gas that is produced at 1.50 atm and 35°C from the reaction of 10.0 g of $KClO_3$.

2) A gas occupies 1.12 liters and weighs 0.40 grams at 0.50 atm and 273 K. It is 25% hydrogen and 75% carbon. What is the molecular formula of the gas?

From the 2009 AP Exam

$$2\ H_2O_2(aq) \rightarrow 2\ H_2O(l) + O_2(g)$$

The mass of an aqueous solution of H_2O_2 is 6.951 g. The H_2O_2 in the solution decomposes completely according to the reaction represented above. The $O_2(g)$ produced is collected in an inverted graduated tube over water at 23.4°C and has a volume of 182.4 mL when the water levels inside and outside of the tube are the same. The atmospheric pressure in the lab is 762.6 torr, and the equilibrium vapor pressure of water at 23.4°C is 21.6 torr.

(a) Calculate the partial pressure, in torr, of $O_2(g)$ in the gas-collection tube.

(b) Calculate the number of moles of $O_2(g)$ produced in the reaction.

(c) Calculate the mass, in grams, of H_2O_2 that decomposed.

(d) Calculate the percent of H_2O_2, by mass, in the original 6.951 g aqueous sample.

(e) Write the oxidation number of the oxygen atoms in H_2O_2 and the oxidation number of the oxygen atoms in O_2 in the appropriate cells in the table below.

Substance	Oxidation Number of Oxygen Atoms
H_2O_2	
O_2	

(f) Write the balanced oxidation half-reaction for the reaction.