Review Sheet: Unit 9   Name_____

FILL IN THE BLANKS and SHORT ANSWER:

1. The theory that explains the behavior of gases at the molecular level is called the _____ _____ which is based on assumptions about a theoretical gas often referred to as an _____ _____.

2. Use the kinetic theory to explain why a helium filled balloon expands when it is brought inside to a warm room from the cold outdoors.

3. Define "IDEAL GAS"

4. Gases deviate most from ideal behavior under conditions of very _____temperature and very _____ pressure.

5. Pressure is defined as _____ per unit _____. The earth's atmosphere has weight, which creates _____ _____.

6. Standard temperature has been established as _____°C or_____ K. Standard pressure has been established as _____ atm, _____ torr, _____ mm Hg, or _____ kPa. The abbreviation for standard temperature and pressure is _____.

7. A _____ is used to measure atmospheric pressure, while a _____ is used to measure gas pressure.

8. When atmospheric pressure increases, how does the height of the column of mercury change?

9. If pressure is constant, the volume of a sample of gas (increases, decreases) as temperature increases.

10. At constant pressure, the volume of a sample of gas is _____ proportional to temperature as measured on the_____ temperature scale.

11. According to _____ law, pressure and volume are _____ proportional provided all other factors remain constant. Mathematically, this means that their _____ is a constant.

12. The _____ Gas Law permits calculation of any one term when temperature, pressure, and volume change for a gas.

13. If A and B are directly proportional and the value of A becomes 1/3 as much, what happens to the value of B?

14. State Avogadro's law:

15. At STP, 22.4 L of N_2 contain how many molecules?

16. Tire manufacturers recommend checking air pressure when tires are cold, before driving. WHY?

17. Ammonia (NH_3) and sulfur dioxide (SO_2) are both gases with readily distinguishable odors. If a cylinder of each were opened at the same time in a draftless room, which odor would you expect to smell first? EXPLAIN.

18. _____Law of Partial _____ states that in a mixture of gases the total pressure of the mixture is equal to the _____ of the pressures that each gas would exert by itself in the same volume.

19. Suppose you have 1 L of oxygen gas at a pressure of 1 atm, 1 L of nitrogen gas at a pressure of 2 atm, and 1 L of hydrogen gas at a pressure of 3 atm. All 3 samples are at room temperature. If you transfer the oxygen and nitrogen to the container occupied by the hydrogen, the pressure exerted by the oxygen in the final mixture will be _____. The pressure exerted by the mixture will be _____ .

20. At STP, _____ liters is the volume one mole of a gas occupies; this quantity is consequently called the _____ volume of a gas.

PROBLEMS: SHOW SET-UP AND CIRCLE FINAL ANSWER.

1. What volume does 2.50 moles of carbon monoxide occupy at 50.5 kPa pressure and 20.0 °C?

2. At 800 mm Hg, a gas has a volume of 380 L. What is its volume at standard pressure?

3. A quantity of gas has a volume of 121 L when confined under a pressure of 2.50 atm at a temperature of 20.0 °C. At what pressure will its volume be 30.0 L at 25.0 °C?

4. At constant pressure, the volume of a gas is increased from 150.0 L to 300.0 L by heating it. If the original temperature of the gas was 20.0 °C, what will its final temperature (in Kelvins) be?

5. A quantity of gas is collected over water at 15 °C. The manometer indicated a pressure of 24.0 kPa. What would be the pressure of the dry gas?

6. How many liters of pure oxygen at STP is consumed by a human being in 24 hours if the human body requires daily energy that comes from metabolizing 816 grams of sucrose ($C_{12}H_{22}O_{11}$)?

$$C_{12}H_{22}O_{11} \ (s) + 12 \ O_2 \ (g) \longrightarrow 12 \ CO_2 \ (g) + 11 \ H_2O \ (l)$$