New West Charter High School -- Chemistry -- Unit 4 -- Exam #3 -- 70 points

As usual, show all your work. And, of course, partial credit for partial achievement.

Write TRUE if the statement is true OR write the word(s) that substitute(s) for the underlined word(s) that would make it true. Writing false only earns partial credit . Three points apiece.

_____ 1) Equal volumes of gases at the same temperature and pressure contain an equal number of particles is one way of expressing Avogadro's hypothesis.

_____ 2) Kilograms are the SI unit for force.

_____ 3) In a mixture of gases, Dalton says that the total pressure is the product of the partial pressures of the gases making up the mixture.

_____ 4) By decreasing the amount of gas actually present in a sample, we can better approach ideal gas conditions.

_____ 5) If temperature and volume remain constant in the ideal gas law, the relationship between the number of moles and the pressure would be an inverse relationship.

Multiple Choice. Write the letter that best answers each example. Three points each.

_____ 6) Squishing a half-filled balloon in your hand forced some of the balloon to push thru your fingers. This is an example of

a) The ideal gas law. b) Charles' Law.
c) Boyle's Law. d) Federal Law.

_____ 7) If we raise the temperature of a gas and increase the pressure as well, what happens to the volume?

a) It increases. b) It decreases. c) One cannot tell; it depends on how much each
d) It does not change. e) It depends on how many moles were present. increase was.

_____ 8) The reason why you're never supposed to hold your breath when SCUBA diving using compressed air tanks is

a) A full set of lungs will explode if you descend (go down) too quickly.
b) A full set of lungs will explode if you ascend (go up) too quickly.
c) The nitrogen will escape out of your blood causing you "the bends" if you don't exhale.
d) The SCUBA apparatus will not function properly if you don't breathe regularly thru it.

_____ 9) Recall the aluminum can demonstration in the lab. Watching it contract in the ice bath was a clear demonstration of

a) Charles' Law b) Boyle's Law c) The Ideal Gas Law d) The Ice Water Law

_____ 10) You often see the warning, "Do not incinerate (burn)" on aerosol cans, because they are liable to explode if you do. This would be an example of

a) Graham's Law b) Boyle's Law e) Charles' Law d) Combined Gas Law

Short answer/fill-in. Be clear, neat and complete in your answers. Three points.

11) Give an example of a perfectly ideal gas: _____

12) _____ Law relates the pressure and volume of a sample of gas at constant temperature.

13) A common device used to measure atmospheric pressure is the

_____.

14) Draw a graph of Boyle's Law with labelled axes.

Five points each on these.

14) Describe carefully what boiling is and why it takes a longer amount of time to cook spaghetti in the

mountains: _____

_____

_____.

15) What is the difference between heat and temperature? _____

_____.

Calculation Section -- Be clear and neat and show those formulas when needed.

16) We wish to remove the hydrogen selenide from a sample of natural gas by forcing it to react with oxygen gas under pressure...here's the recipe: (ten points)

$$\_\_\_\_\_\ H_2Se + \_\_\_\_\_\ O_2 \Longrightarrow \_\_\_\_\_\ Se_4 + \_\_\_\_\_\ H_2O$$

If we use 5000 grams of H_2Se, how many liters of water vapor would we get at 207 °C and 1.27 atm?

17) In a lab, you observe an 80 L cylinder of a diatomic gas to be at 5.75 atm and 395 K. How many molecules of gas are present within the cylinder?