

Name: Solutions

StudID#: \_\_\_\_\_

**1) Think of a gas as a bunch of molecules buzzing around.****Note: Kinetic Energy of a body scales like Mass times Speed squared**

$$(E = M/2 \cdot v^2)$$

**Temperature is a measure of the energy of the individual particles in the gas**a) Gas A and B are both pure oxygen. The molecules in gas A have a higher speed than the ones in gas B. Which gas is hotter? Ab) Gas A is pure hydrogen and B pure oxygen. Oxygen is 16 times the mass of hydrogen. The molecules in both gases have the same speed. Which gas is hotter? Bc) Gas A (pure hydrogen) and B (pure oxygen) have the same temperature. In which gas is the speed of the molecules higher, in A or in B? A**2) Objects that exceed a certain minimum speed will be able to leave the Earth. (A space probe to the planets needs a minimum speed to break away from Earth's gravity.)****Now use this argument for the gases from task 1:**a) Which gas in 1a) (A or B or neither) will more likely escape from Earth Ab) Which gas in 1b) (A or B or neither) will more likely escape from Earth neitherc) Which gas in 1c) (A or B or neither) will more likely escape from Earth ARemember the moon! It has more or less gravity than Earth? lessWill it be able to retain an atmosphere as well as the Earth does or not? Yes No**ONE MINUTE Paper:****3) List two main topics of today's class in one or two sentences.**

- Impact of meteors on Earth, craters; size of craters and energy of meteors
- Volcanoes on Io, Europa, Triton and comets
- Temperature of gas and energy of molecules
- Escape of gases from a planet, planetary atmospheres
- Greenhouse effect

Anything that alludes to these topics will be o.k..

**4) Mention one or two issues that you have not understood from today's class.****Any 1 or 2 (or saying "none" explicitly) will do here!****Each item = 1 Point in 1) and 2); 3) and 4) each 1 Point.**