Atmospheric Retention – Posttest

Answer the following questions.

Question 1: If a particle is launched from the surface of the earth with a velocity of 18 km/s, what happens to the particle?
   a) It will go up and keep on going, never coming back down.
   b) It will go up, but must come down.
   c) It will go up with just enough speed to not come back down.

Question 2: Planet A has a mass M and radius R. Planet B has a mass 2M and a radius 1 R. How do the escape velocities of the two planets compare?
   a) Planet B's escape velocity is less than planet A's escape velocity
   b) Planet B's escape velocity is equal to planet A's escape velocity
   c) Planet B's escape velocity is greater than planet A's escape velocity

Question 3: Which of the following looks most like the distribution one would expect for the speeds of gases at a particular temperature?

Question 4: What fraction of particles will have a speed greater than the average speed?
   a) more than half of the particles
   b) less than half of the particles
   c) exactly half of the particles

Question 5: How does the average kinetic energy depend on temperature?
   a) $K \propto T^2$
   b) $K \propto T$
   c) $K \propto 1/T$
   d) $K \propto 1/T^2$
Question 6: All three gases have the same mass. Which gas is has the lowest temperature?

Question 7: Which gas is most easily retained?
   a) NH₃
   b) CO₂
   c) He

Question 8: All of the bodies below have reasonably close escape velocities. Which has an atmosphere?
   a) Mercury
   b) Moon
   c) Titan