

Name: _____ Date: _____

1. The Jovian planets have high masses and hence generate powerful gravitational fields, yet they have low average densities. What does this indicate about their interiors?
 - A) They are composed mainly of water.
 - B) The interiors are hot and gaseous, like those of cool stars.
 - C) They have not condensed to liquid or solid form.
 - D) They are composed mainly of very light elements, such as H and He.

2. The Earth has an average density of 5500 kg/m^3 , whereas the density of rock on its surface is about 3000 kg/m^3 . What conclusion can be reached about the Earth's core from this observation?
 - A) The core is composed of material with density about twice that of the surface material.
 - B) The core consists of lower density material than surface rock.
 - C) The core is very hot.
 - D) The core is made of material far denser than surface rock.

3. Viewed from a position above the north pole of the Sun, the directions of the motions of the planets in their orbits are
 - A) all clockwise.
 - B) all counterclockwise.
 - C) all clockwise except Venus.
 - D) all counterclockwise except Mercury.

4. To an astronomer, the word "ice" can mean any one or more of
 - A) water (H_2O), carbon dioxide (CO_2), methane (CH_4), or ammonia (NH_3).
 - B) hydrogen (H_2), water (H_2O), carbon dioxide (CO_2), methane (CH_4), or ammonia (NH_3).
 - C) only water (H_2O).
 - D) water (H_2O) or carbon dioxide (CO_2).

5. A nitrogen molecule (N_2) has a mass of 4.7×10^{-26} kg, and a carbon dioxide molecule (CO_2) has a mass of 7.3×10^{-26} kg. On a day when the temperature is 18°C (64°F), the N_2 molecules will have a
- A) greater average kinetic energy and greater average speed than the CO_2 molecules.
 - B) smaller average kinetic energy but greater average speed than the CO_2 molecules.
 - C) smaller average speed than the CO_2 molecules but the same average kinetic energy.
 - D) greater average speed than the CO_2 molecules but the same average kinetic energy.
6. A molecule moves within the atmosphere of a planet. It would be *less likely* that this molecule would be retained in the atmosphere of this planet if
- A) the molecule were more massive.
 - B) the planet were more massive.
 - C) the planet's atmosphere were hotter.
 - D) the planet's magnetic field were stronger.
7. A typical asteroid is made of
- A) ices of water, methane, and ammonia or perhaps ices with dust-sized grains of rock mixed in.
 - B) ice with a liquid water core.
 - C) rock and metal.
 - D) rock and ice.
8. Comets are typically
- A) chunks of ice that begin to vaporize if they pass close to the Sun.
 - B) chunks of rock a few tens to hundreds of kilometers in diameter.
 - C) slushy mixtures of liquid and ice.
 - D) gaseous bodies from which some of the gas is pushed out by the Sun to form a long tail.