

## Chapter 16, 17, and 18

1. The amount of heat needed to raise the temperature of 1 kg of water by  $1^{\circ}\text{C}$ 
  - a. is 1 kJ
  - b. is 4.19 kJ
  - c. is 9.8 kJ
  - d. varies between 1 kJ and 100 kJ depending on the initial temperature of the water
2. When heat is added to a body of matter, the resulting temperature increase does not depend upon
  - a. its mass
  - b. its shape
  - c. what kind of material it consists of
  - d. whether it is in the solid, liquid, or gaseous shape
3. Heat can be transferred through a vacuum by which one or more of the following?
  - a. conduction
  - b. convection
  - c. radiation
  - d. condensation
4. Heat can be transferred through a solid by which one or more of the following?
  - a. conduction
  - b. convection
  - c. radiation
  - d. condensation
5. Which of the following quantities is independent of the size and shape of an object composed of a given material?
  - a. volume
  - b. mass
  - c. weight
  - d. density
6. The properties of several different materials are being compared. If the samples all have the same volume, the one with the greatest mass also has the greatest
  - a. density
  - b. buoyancy
  - c. pressure
  - d. temperature
7. A temperature of  $100^{\circ}\text{F}$  is almost exactly
  - a.  $38^{\circ}\text{C}$
  - b.  $56^{\circ}\text{C}$
  - c.  $122^{\circ}\text{C}$

- d.  $212^{\circ}\text{C}$
8. At which of the following Celsius temperatures will a Fahrenheit thermometer show the same reading in degrees?
- $-40^{\circ}\text{C}$
  - $0^{\circ}\text{C}$
  - $32^{\circ}\text{C}$
  - $40^{\circ}\text{C}$
9. The density of air is  $1.3\text{ kg/m}^3$ . The air in a room 5 m long, 4 m wide, and 2.5 m high has a mass of
- 0.26 kg
  - 6.5 kg
  - 38 kg
  - 65 kg
10. A 3-kg pine board is 20 cm wide, 2 cm thick, and 2 m long. The density of the board is
- $240\text{ kg/m}^3$
  - $267\text{ kg/m}^3$
  - $375\text{ kg/m}^3$
  - $469\text{ kg/m}^3$
1. A 2-kg brick has the dimensions 7.5 cm  $\times$  15 cm  $\times$  30 cm. The pressure the brick exerts when standing on its smallest face is
- 0.0178 Pa
  - 0.0225 Pa
  - 178 Pa
  - 225 Pa
2. Which of the following is not true of molecular motion in a gas?
- There is no order in the motion
  - There is no uniformity of speed or direction
  - There is a definite average speed at a given temperature
  - There is a definite average direction of motion at a given temperature
3. A sample of a gas is compressed to half its original volume while its temperature is held constant. Relative to their original average energy, the new average energy of the molecules is
- half as great
  - the same
  - twice as great
  - four times as great
4. When a gas is forced into a smaller volume without a change in temperature, its pressure increases because its molecules.

- a. strike the container walls more often
  - b. strike the container walls at higher speeds
  - c. strike the container walls with greater force
  - d. have more energy
5. The temperature of a gas sample in a rigid container is raised. The pressure the gas exerts on the container walls increase because
- a. The molecules are in contact with the walls for briefer intervals
  - b. the molecular masses increase
  - c. the molecules have higher average speeds and so strike the walls more often with greater momentum
  - d. the molecules lose more kinetic energy each time they strike the wall
6. Suppose there were molecules that had no attraction whatever for one another. A collection of such molecules would form a
- a. gas
  - b. liquid
  - c. amorphous solid
  - d. crystalline solid
7. Molecular motion in a gas is the minimum possible at
- a.  $0^{\circ}\text{F}$
  - b.  $0^{\circ}\text{C}$
  - c.  $0\text{ K}$
  - d.  $-273\text{ K}$
8. A barometer measures
- a. atmospheric density
  - b. atmospheric pressure
  - c. water density
  - d. water pressure
9. The pressure at the bottom of a barrel filled with liquid does not depend on the
- a. acceleration of gravity
  - b. liquid density
  - c. height of the liquid
  - d. area of the liquid surface.
10. A Celsius thermometer and an absolute thermometer are used to measure the temperature of the same gas sample. The readings on the thermometers are respectively  $T_{\text{C}}$  and  $T_{\text{K}}$
- a.  $T_{\text{C}}$  is smaller than  $T_{\text{K}}$
  - b.  $T_{\text{C}}$  is larger than  $T_{\text{K}}$
  - c.  $T_{\text{C}}$  is equal to  $T_{\text{K}}$

- d. Any of the above, depending on the temperature
11. Which of the following formulas expresses the relationship between the pressure and absolute temperature of a gas sample whose volume is fixed?
- a.  $P_1/T_2 = P_2/T_1$
  - b.  $P_1/T_1 = P_2/T_2$
  - c.  $P_1/P_2 = T_2/T_1$
  - d.  $P_1/T_1 = T_2/P_2$
12. Of the following, a molecule is best described as
- a. any very tiny particle
  - b. the smallest particle found in nature
  - c. the smallest particle of a substance that is representative of the substance
  - d. the ultimate particle of which all matter is composed
13. Molecules are, in general, farthest apart from one another in
- a. gases
  - b. liquids
  - c. crystalline solids
  - d. amorphous solids