1. A sample of a gas is contained in a closed rigid cylinder. According to kinetic molecular theory, what occurs when the gas inside the cylinder is heated?

   A) The number of gas molecules increases.
   B) The number of collisions between gas molecules per unit time decreases.
   C) The average velocity of the gas molecules increases.
   D) The volume of the gas decreases.

2. Under which conditions of temperature and pressure would helium behave most like an ideal gas?

   A) 50 K and 20 kPa B) 50 K and 600 kPa
   C) 750 K and 20 kPa D) 750 K and 600 kPa

3. Two basic properties of the gas phase are

   A) a definite shape and a definite volume
   B) a definite shape but no definite volume
   C) no definite shape but a definite volume
   D) no definite shape and no definite volume

4. An assumption of the kinetic theory of gases is that the particles of a gas have

   A) little attraction for each other and a significant volume
   B) little attraction for each other and an insignificant volume
   C) strong attraction for each other and a significant volume
   D) strong attraction for each other and an insignificant volume

5. Which gas is *least* likely to obey the ideal gas laws at very high pressures and very low temperatures?

   A) He B) Ne C) Kr **D) Xe**

6. A real gas behaves more like an ideal gas when the gas molecules are

   A) close and have strong attractive forces between them
   B) close and have weak attractive forces between them
   C) far apart and have strong attractive forces between them
   D) far apart and have weak attractive forces between them

7. Which gas would behave most nearly like an ideal gas at STP?

   A) CO_2 **B) H_2** C) Cl_2 D) NH_3

8. The table below shows mass and volume data for four samples of substances at 298 K and 1 atmosphere.

Masses and Volumes of Four Samples

Sample	Mass (g)	Volume (mL)
A	30.	60.
B	40.	50.
C	45	90.
D	90.	120.

   Which two samples could consist of the same substance?

   A) *A* and *B* **B) *A* and *C***
   C) *B* and *C* D) *C* and *D*

9. A sample of oxygen gas is sealed in container X. A sample of hydrogen gas is sealed in container Z. Both samples have the same volume, temperature, and pressure. Which statement is true?

   A) Container X contains more gas molecules than container Z.
   B) Container X contains fewer gas molecules than container Z.
   C) Containers X and Z both contain the same number of gas molecules.
   D) Containers X and Z both contain the same mass of gas.

10. A sample of helium gas has a volume of 900. milliliters and a pressure of 2.50 atm at 298 K. What is the new pressure when the temperature is changed to 336 K and the volume is decreased to 450. milliliters?

    A) 0.177 atm B) 4.43 atm
    C) 5.64 atm D) 14.1 atm

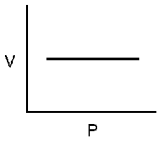
11. A gas occupies a volume of 444 mL at 273 K and 79.0 kPa. What is the final kelvin temperature when the volume of the gas is changed to 1880 mL and the pressure is changed to 38.7 kPa?

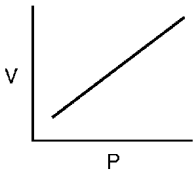
    A) 31.5 K B) 292 K
    C) 566 K D) 2360 K

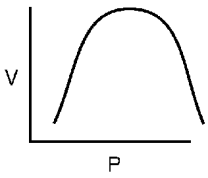
12. A sample of gas is held at constant pressure. Increasing the kelvin temperature of this gas sample causes the average kinetic energy of its molecules to

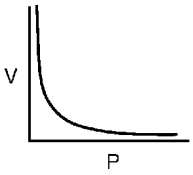
A) decrease and the volume of the gas sample to decrease
B) decrease and the volume of the gas sample to increase
C) increase and the volume of the gas sample to decrease
D) increase and the volume of the gas sample to increase

13. Which graph best represents the pressure-volume relationship for an ideal gas at constant temperature?

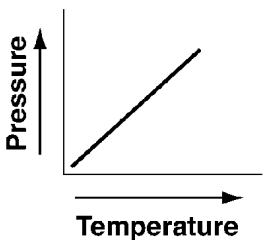
A) 

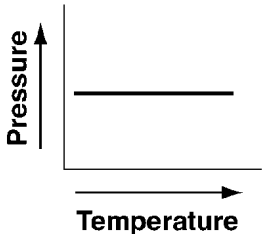
B) 

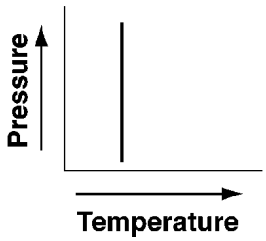
C) 

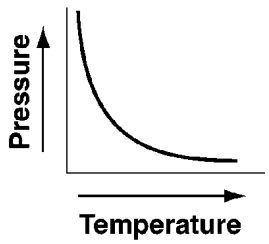
D) 

14. Which graph shows the pressure-temperature relationship expected for an ideal gas?

A) 

B) 

C) 

D) 

15. A 3.00-liter sample of gas is at 288 K and 1.00 atm. If the pressure of the gas is increased to 2.00 atm and its volume is decreased to 1.50 liters, the Kelvin temperature of the sample will be

A) 144 K **B) 288 K**
C) 432 K D) 576 K

16. Which temperature change would cause the volume of a sample of an ideal gas to double when the pressure of the sample remains the same?

A) from 200ºC to 400ºC
B) from 400ºC to 200ºC
C) from 200 K to 400 K
D) from 400 K to 200 K

17. As the temperature of a gas increases at constant pressure, the volume of the gas

A) decreases **B) increases**
C) remains the same

18. A sample of a gas occupies 6.00 liters at a temperature of 200. K. If the pressure remains constant and the temperature is raised to 600. K, the volume of the gas sample would be

A) 18.0 L B) 2.00 L
C) 3.00 L D) 12.0 L

19. The volume of a sample of a gas is 1.0 liter at STP. If the pressure remains constant and the temperature is raised to 546 K, the new volume of the gas will be

A) 0.25 L **B) 2.0 L**
C) 0.50 L D) 4.0 L

20. Under which conditions will the volume of a given sample of a gas decrease?

A) decreased pressure and decreased temperature
B) decreased pressure and increased temperature
C) increased pressure and decreased temperature
D) increased pressure and increased temperature

21. At STP, which gas diffuses at the faster rate?

A) H_2 B) N_2 C) CO_2 D) NH_3

Answer Key
Unit 8 Gases Multiple Choice Review

1. **C**
2. **C**
3. **D**
4. **B**
5. **D**
6. **D**
7. **B**
8. **B**
9. **C**
10. **C**
11. **C**
12. **D**
13. **D**
14. **A**
15. **B**
16. **C**
17. **B**
18. **A**
19. **B**
20. **C**
21. **A**