Question 1
On a day when atmospheric pressure is 75.83 cmHg, a pressure gauge on a tank of gas reads a pressure of 258.5 cmHg. What is the absolute pressure (in atmospheres and kPa) of the gas in the tank?

A) 334.3 cm Hg = 4.399 atm = 445.7 kPa
B) 182.7 cmHg = 2.40 atm = 243.2 kPa
C) 334.3 cmHg = 4.398 atm = 445.6 kPa
D) 258.5 cmHg = 3.40 atm = 345 kPa

Question 2
A certain mass of an ideal gas occupies a volume of 4.00 m^3 at 758 mmHg. Compute its volume at 635 mmHg if the temperature remains unchanged.

A) 3.55 m^3
B) 0.298 m^3
C) 1.19 m^3
D) 4.77 m^3

Question 3
A given mass of ideal gas occupies 38 mL at 20° C. If its pressure is held constant, what volume does it occupy at a temperature of 45° C?

A) 86 mL
B) 35 mL
C) 17 mL
D) 41 mL

Question 4
A tank of ideal gas is sealed off at 20° C and 1.00 atm pressure. What will be the pressure (in kPa and mmHg) in the tank if the gas temperature is decreased to -35° C?

A) 125 kPa = 9.35 x 10^2 mmHg
B) 82 kPa = 1.08 mmHg
C) 1.75 kPa = 13 mmHg
D) 82 kPa = 6.2 x 10^2 mmHg

Question 5
Given 1000mL of helium at 15° C and 763 mmHg, determine its volume at -6° C and 420 mmHg.

A) 1.68 x 10^3 mL
B) 7.27 x 10^2 mL
C) 1.97 x 10^3 mL
D) 5.08 x 10^2 mL

Question 6
A 5000-cm3 tank contains an ideal gas (M=40 kg/kmol) at a gauge pressure of 530 kPa and a temperature of 25° C. Assuming atmospheric pressure to be 100 kPa, what mass of gas is in the tank?

A) 0.051 kg

B) 0.61 kg
C) 51 kg
D) 5.1 x 104 kg

Question 7
An air bubble of volume V0 is released near the bottom of a lake at a depth of 11.0 m. What will be its new volume at the surface? Assume its temperature to be 4.0° C at the release point and 12° C at the surface. The water has a density of 1000 kg/m3, and atmospheric pressure is 75 cmHg.
A) 1.1 Vo
B) 2.1 Vo
C) 2.0 Vo
D) 6.2 Vo

Question 8
Find the mass of a neon atom. The atomic mass of neon is 20.2 kg/kmol.
A) 3.36 kg
B) 3.36×10^{-23} kg
C) 3.36×10^{-26} kg
D) 2.98×10^{-27} kg

Question 9
At what temperature will the molecules of an ideal gas have twice the rms speed they have at 20° C?
A) 586 K = 313° C (approximately)
B) 1172 K = 899° C (approximately)
C) 414 K = 141° C (approximately)
D) 73 K = -200° C (approximately)

Question 10
An object must have a speed of at least 11.2 km/s to escape from the Earth's gravitational field. At what temperature will urms for H2 molecules equal the escape speed? Repeat for N2 molecules. (MH2=2.0 kg/kmol and MN2=28 kg/kmol.)
A) 1.0×10^4 K; 1.4×10^5 K
B) 5.0×10^3 K; 7.0×10^4 K
C) 1.0×10^7 K; 1.4×10^8 K
D) 3.0×10^4 K; 4.2×10^6 K