Name of a student ——————————— Signature ——————————— No. ——————

University of Mustansiriyah   **1st Semester-2021**

Department of Chemistry   **1st Exam-paper A**

Q1: Circle the right answer for all of the following: **(50 points)**

1: If a gas has a non-polar particle then the difference between the volume of this gas is:

Answer: a) $V_{Real} > V_{Perfect}$ b) $V_{Real} < V_{Perfect}$ c) $V_{Real} = V_{Perfect}$ d) $V_{Real} \neq V_{Perfect}$

2: A gas occupies 300000 mL at 130 °C and 760 mmHg pressure. What would be its volume at STP?

Answer: a) 203.22 mL   b) 203.22 dm^3 c) 204 L   d) 204 dm^3

3: Calculate the weight of CH$_4$ (16 g.mol^{-1}) in a 10 L cylinder at 15 x 10^5 Pa and 307 K.

Answer: a) 95.33 g mol^{-1} b) 95.33 g   c) 95.33 mol   d) 95.33 kg

4: Calculate the number of moles for CH$_4$ in a 10000 mL cylinder at 10^6 Pa and 32 °C.

Answer: a) 4.5 mol   b) 4.0 mol   c) 4.0 mmol   d) 4.5 mmol

5: According to Graham's law the heaviest gas is?

Answer: a) H$_2$O   b) CH$_4$ c) NH$_3$ d) CO

6: A 20 L tank contains a certain amount of gas at 10^5 Pa. The gas is transferred to another tank 40 dm^3. What should be its pressure?

Answer: a) 0.50 atm   b) 50 dm^3 c) 50 atm   d) 0.50 mmHg

7: According to the Avogadro's law the amount of a substance is directly proportional with?

Answer: a) p   b) T   c) R   d) V   e) n

8: The difference between real and ideal gas is one of the following?

Answer: a) law p & high T   b) high p & law T   c) high p & high T   d) law p & law T

9: It can know the density of a gas by applying one of the following?

Answer: a) Van der Waal's law   b) Graham's law   c) Charles's law   d) Gay-Lussac's law

10: If V$_m$ is bigger than V^O_m then this means the behaviour of a gas is?

Answer: a) Real   b) Ideal   c) Real & ideal   d) Z < 1

Q2: A (28 mol) gas sample has a mass of 10000 mg. The volume of a container is 22 dm^3 at a temperature of 76 °C and a pressure of 641 Torr. What is the density of the gas?   **(25 points)**

Q3: An Ar gas is placed in a container at 30 °C at a pressure of 730 torr. What is the volume of the container in ml?   **(25 points)**

09/11/2021   **Best wishes**   **Dr Abduljabbar I. R. Rushdi**

Q3

$T = 30°C + 273 = 303 K$ $P = 730 \text{ torr}$

$P = \dfrac{V}{T}$

$V = PT$

$V = 730 \times 303$ (torr)

$V = 22190 \text{ L.torr}$

$Q_3 \quad \dfrac{5}{25}$

Q2

$PV = \dfrac{dRt}{M}$

$d = \dfrac{PVM}{PT}$

$M = 28$

$V = 22 \text{ dm}^3$

$T = 76 + 273 = 1059 K$ $\quad \begin{array}{c} 273 \\ 76 \, °C \end{array}$

$P = 641 \text{ Torr}$

$349 K$

$Q_2 \quad \dfrac{0}{25}$