Name of a student --- Signature ------------------------------- No. ----

University of Mustansiriyah	1st Semester-2021
Department of Chemistry	1st Exam-paper G

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

1: A vessel of 5000 mL capacity contains a certain amount of gas at 313 °C and 2 bar pressure. The gas is transferred to another vessel of volume 10000 mL at 40 °C. What should be its pressure?

Answer: **a) 1.0 atm** b) 1.0 mmHg c) 75 cmHg d) 1.5 bar

2: If the particles of a gas are polar that means the difference between p_{ideal} and p_{real} is

Answer: a) low b) equal **c) high**

3: Calculate the temperature of 5000 mmol of a gas occupying 5.0 dm^3 at 3.3 10^5 Pa?

Answer: a) 40.2 °C **b) 40.2 K** c) 44.2 °C d) 44.2 K

4: Calculate the weight of NH_3 (17 g.mol^{-1}) in a 4 L cylinder at 8 atm and 300 K.

Answer: a) 22.11 kg **b) 22.11 g** c) 23 K d) 23 °C

5: Calculate the p_c of a gas, if the p_r is 0.44 and p is 1 bar.

Answer: **a) 2.27 K b) 2.27 atm** c) 2.27 L d) 2.27 mol

6: If the attraction forces are calculated, that means the gas is?

Answer: a) real b) noble c) perfect **d) compressed**

7: According to the Dalton's law total mole fraction is equal to?

Answer: a) Σn **b) Σp$_i$** c) Σp$_T$ d) Σχ

8: What is the partial pressure of a gas in a mixture, if the X_i is 1, and the conditions are at STP?

Answer: a) 0.99 torr b) 0.89 bar **c) 0.900 atm** d) 1.01 bar

9: At high pressure the Z > 1 which means the dominated forces are?

Answer: a) Van der Waal's **b) equal** c) repulsions d) attractions

10: According to Avogadro's law the amount of a gas at STP is?

Answer: **a) 1.00 mol** b) 2.00 mol c) 1.00 mmol d) 2.00 mmol

Q2: The air inside a flexible 3.5 L container has a pressure of 115 kPa. What should the volume of the container be increased to in order to decrease the pressure to 625 torr? (25 points)

Q3: A 3 dm^3 container holds 0.5 moles of N_2 gas at 42 °C. What is the pressure inside the container? (25 points)

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

Q2

$V_1 = 3.5 L$

$P_1 = 115 KPa$ → Because you convert torr to atm

Also, you have to convert Pa → atm

$V_2 = ?$

$P_2 = 625$ torr → $= \frac{625?}{760} = 0.822$ atm

$P_1 V_1 = P_2 V_2$

$V_2 = \frac{P_1 V_1}{P_2} = \frac{115,000 Pa \times 3.5}{0.822?} = \frac{402.5}{0.822}$

Q2 $\frac{15}{25}$

$P = $ units

$V_2 = 489.659 L$

Q3

$V = 3 dm^3$

$n = 0.5 \, mmol \rightarrow \frac{0.5}{1000} = 5 \times 10^{-4}$

$T = 42°C + 273k = 315 k$

Q3 $\frac{10}{25}$

$PV = nRT$ → Why!

$P = \frac{5 \times 10^{-4} \times 0.082? \times 315?}{3?}$

$P = 3.552$ atm