Name of a student _Ali Mustafa Abd Ali_ Signature ------------------------ No. ---4-----

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

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

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

1: According to van der Waal's corrections if $V_{Real} < V_{Perfect}$ of any gas that means the gas has:
Answer: a) non-polar particles   b) polar particles   c) small particles   d) big particles

2: Calculate the weight of CO_2 gas (44 g mol⁻¹) in a 0.5×10^4 mL cylinder at 20×10^2 kPa and 25 °C.
Answer: a) 180 g mol⁻¹   b) 180 g   c) 180 mol   d) 180 kg

3: Calculate the density of CO_2 placed in a 22.4×10^3 mL cylinder at 20×10^2 kPa and 298 K.
Answer: a) 36.06 kg L⁻¹   b) 36.06 g L⁻¹   c) 36.06 g   d) 36.06 L⁻¹

4: According to Graham's law the heaviest gas has?
Answer: a) low rate   b) high rate   c) middle rate   d) low density

5: A gas occupies 20 dm³ at 90 °C and 760 torr pressure. What would be its volume at STP?   NO ANSWER
Answer: a) 15.04 mL   b) 15.04 dm³   c) 15.04 L⁻¹   d) 15.04 dm⁻³

6: A vessel contains a certain amount of gas at 80×10^5 Pa. The gas is transferred to another tank 20 dm³ with pressure of 20×10^5 Pa. What should be its volume?
Answer: a) 0.5 L   b) 0.5 Pa L   c) 0.5 Pa dm³   d) 0.5 L⁻¹

7: According to Avogadro's law n is directly proportional with volume at constant?
Answer: a) p & V   b) T & p   c) T & V   d) p & n   e) R & P

8: Attractive and repulsive forces between particles are present in a?
Answer: a) perfect gas   b) non-ideal gas   c) ideal gas   d) noble gas   NO ANSWER

9: It can follow the direct proportional between temperature and volume through the law of
Answer: a) Van der Waal   b) Graham   c) Charles   d) Gay-Lussac

10: The mol fraction of atmospheric pressure is equal to?
Answer: a) zero   b) one   c) two   d) three

Q2: The following data have been observed for 10000 mg of CO_2 gas at 273 K. Calculate the best value of the molar mass of CO_2.

p/10² kPa	1.00	2.00	3.00	(25 points)
V/L	4.00	7.50	11.75	

Q3: A perfect gas undergoes isothermal expansion, which increases its volume by 2.48 dm³. The p_i and V_i of the gas are 2×10^2 kPa and 2.14 dm³, respectively. Calculate the p_f of the gas in (i) bar, (ii) torr. (25 points)

Thur_11/11/2021   Best wishes   Dr Abduljabbar I. R. Rushdi

Q_2

$$PV = hRT$$

$$\frac{PV}{RT} = h$$

$$h = \frac{(1.00)(4.00)}{(0.082)(273)} \quad ?$$

units = ?

$$h = 0.17$$

$$\left(\!\!\!\bigcirc\; Q_2 \; 2\frac{5}{5}\!\!\!\right)$$

$$h = \frac{(2.00)(9.50)}{(0.082)(273)} = \frac{19}{22.386} \qquad h = 0.6$$

$$h = \frac{(3.00)(11.75)}{0.082(273)} = \frac{35.25}{22.386} \qquad h = 0.09$$

$\left(\!\!\bigcirc\; Q_3 \; \dfrac{0}{25}\!\!\right)$ NO ANSWER

Why?