## Physical Chemistry\_Chpt\_One\_Properties of Gases Name of a student Rugia Munaf abdallah signature 1st Semester-2021 University of Mustansiriyah 1st Exam-paper C **Department of Chemistry** (50 points) Q1: Circle the right answer for all of the following: 1: If a gas has polar particles then the difference between the volume of this gas is: C VReal = VPerfect b) V<sub>Real</sub> < V<sub>Perfect</sub> a) V<sub>Real</sub> > V<sub>Perfect</sub> Answer: 2: A gas occupies $60 \times 10^3$ mL at 150 °C and 760 mmHg pressure. What would be its volume at STP? d) 38.7 dm<sup>-3</sup> c) 38.7 L<sup>-1</sup> **b)** 38.7 dm<sup>3</sup> a) 38.7 mL Answer: 3. Calculate the weight of $H_2O$ gas (18 g.mol<sup>-1</sup>) in a 5 L cylinder at $10 \times 10^2$ kPa and 373 K. a) 29.40 g mol<sup>-1</sup> b) 29.40 g c) 29.40 mol d) 29.40 kg Answer: 4: Calculate the density of H<sub>2</sub>O placed in a 22400 mL cylinder at 10<sup>5</sup> Pa and 0 °C. d) 0.804 L-1 b) 0.804 g L<sup>-1</sup> c) 0.804 g a) 0.804 kg L-1 5: According to Graham's law the heaviest gas is? c) NH<sub>3</sub> d) Cl<sub>2</sub> b) CH4 a) H2O Answer: 6: A tank contains a certain amount of gas at 10<sup>5</sup> Pa. The gas is transferred to another tank 40 dm<sup>3</sup> with pressure of $200 \times 10^3$ Pa. What should be its volume? b) 80 Pa L c) 80 Pa dm3 a) 80 L Answer: 7: According to Boyle's law the pressure of a gas is inversly proportional with? d) V c) R 8: The difference between real and ideal gas, that the real gas interested in? c) p & n a) V & p b) V & T Answer: 9: It can follow the direct proportional between temperature and pressure through the law of c) Charles a) Van der Waal b) Graham Answer: 10: The behaviour of real gas is ideal when the value of Z is equal to d) Vm ≠ VOm blym > Vom a) Vm < Vom

Q2: The following data have been observed for 800 mg of nitrogen gas at 273 K. Calculate the best value of the

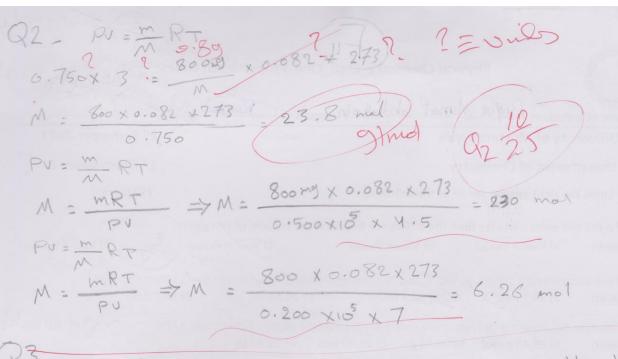
molar mass of  $N_2$ .  $p/10^5 Pa$  0.750 0.500 0.200 (25 points)  $V/dm^3$  3.0 4.5 7.0

Q3: A perfect gas undergoes isothermal compression, which reduces its volume by 1.80 dm<sup>3</sup>. The  $p_f$  and  $V_f$  of the gas are 2 × 10<sup>2</sup> kPa and 2.14 dm<sup>3</sup>, respectively. Calculate the  $p_{original}$  of the gas in (i) bar, (ii) torr. (25 points)

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**Best wishes** 

Dr Abduljabbar I. R. Rushdi



 $\frac{P_{1}}{\sqrt{2}} = \frac{P_{2}}{\sqrt{2}}$   $\frac{2 \times 10^{2}?}{2.14} = \frac{P_{2}?}{1.80?}$   $P_{2} = \frac{2 \times 10^{2} \times 1.80}{2.14?} = \frac{168.22?}{2.14?}$ 

V2 = 1.80 P2= ?