



Q1) How many significant figures are there in the measurement  $1000 \pm 100$ ?

- A) 5      B) 2      C) 3      D) 4

Q2) How many significant figures should be retained in the result of the following calculation?

$$12.000 \times 0.98930 + 13.00335 \times 0.0107$$

- A) 2      B) 3      C) 4      D) 5

Q3) The quantity  $1.0 \text{ mg/cm}^2$  is the same as  $1.0 \times \dots\dots\dots \text{ g/mm}^2$ ?

- A) 10      B)  $10^{-2}$       C)  $10^{-5}$       D)  $10^{-6}$

Q4) If the temperature of dry ice is  $-78^\circ\text{C}$ , what is its temperature in Kelvin?

- A) 351 K      B) 95 K      C) 195 k      D) 451 K

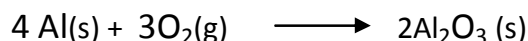
Q5) How many grams of hydrogen are in 65 g of  $\text{C}_2\text{H}_2\text{O}_2$  (molar mass = 58.0 g/mol)?

- A) 2.3      B) 27      C) 18      D) 36

Q6) How many carbon atoms are there in 1.00 g of  $\text{C}_6\text{H}_{12}\text{O}_6$  (molar mass = 180. g/mol)?

- A) 6.00      B)  $4.01 \times 10^{22}$       C)  $3.34 \times 10^{21}$       D)  $2.01 \times 10^{22}$

Q7) For complete reaction of 6.0 moles of Al (molar mass = 27.0 g/mol) according to the equation:



- A) You need 3.0 moles of  $\text{O}_2$  to produce 2.0 moles of  $\text{Al}_2\text{O}_3$   
B) You need 4.5 moles of  $\text{O}_2$  to produce 3.0 moles of  $\text{Al}_2\text{O}_3$   
C) You need 8.0 moles of  $\text{O}_2$  to produce 2.0 moles of  $\text{Al}_2\text{O}_3$   
D) You need 18.0 moles of  $\text{O}_2$  to produce 12.0 moles of  $\text{Al}_2\text{O}_3$

**Q8)** If you begin with 1.14 g of Al (molar mass = 27.0 g/mol), how many grams of Br<sub>2</sub> (molar mass = 159.8 g/mol) are required for complete reaction?



- A) 3.04 g      B) 10.1 g      C) 22.7 g      D) 15.1 g

**Q9)** The reaction of 2.5 g of Al (molar mass = 27.0 g/mol) with 2.5 g of O<sub>2</sub> (molar mass = 32.0 g/mol) produced 2.5 g of Al<sub>2</sub>O<sub>3</sub> (molar mass = 102.0 g/mol). The % yield of the reaction is:



- A) 74%      B) 37%      C) 53%      D) 66%

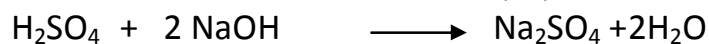
**Q10)** How many grams of KMnO<sub>4</sub> (molar mass = 158.0 g/mol) are needed to prepare 500. ml of a 0.0125 M solution?

- A) 0.494 g      B) 3.13 g      C) 0.395 g      D) .988 g

**Q11)** How many millilitres of 12.0 M HCl solution are needed to prepare 500. ml of 0.100 M HCl solution?

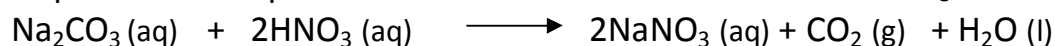
- A) 4.17 ml      B) 2.50 ml      C) 3.33 ml      D) 1.67 ml

**Q12)** A 31.5 ml of H<sub>2</sub>SO<sub>4</sub> of unknown concentration was titrated with 0.0134 M NaOH (aq). It took 47.8 ml of the base to reach the endpoint of the titration. The concentration (M) of the acid was:



- A) 0.0102      B) 0.00508      C) 0.0508      D) 0.102

**Q13)** How many grams of Na<sub>2</sub>CO<sub>3</sub> (molar mass = 106.0 g/mol) are required for complete reaction with 55.0 ml of 0.155 M HNO<sub>3</sub>?



- A) 0.370 g      B) 0.452 g      C) 0.205 g      D) 0.287 g

Q14) Which of the following represents the largest gas pressure?

- A) 1.0 atm    B) 1.0 Pa    C) 1.0 mm Hg    D) 1.0 kPa

Q15) A sample of  $N_2$  is contained in a 255 ml flask at  $24^\circ C$  and a pressure of 45.6 mmHg. What is the pressure of the gas if its volume becomes 750 ml at  $14^\circ C$  ?

- A) 16.1 mm Hg    B) 39.0 mm Hg    C) 15.0 mm Hg    D) 26.8 mm Hg

Q16) What is the molar mass of unknown gas if 1.38 grams of that gas occupies a volume of 673 mL at STP?

- A) 97 g/mol    B) 63 g/mol    C) 57 g/mol    D) 46 g/mol

Q17) Which of the following gases diffuses the fastest?

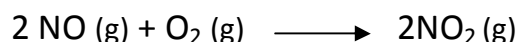
- A)  $Cl_2$     B) CO    C)  $NO_2$     D)  $CO_2$

Q18) Equal masses of helium and neon are placed in separate containers of equal volume at the same temperature.

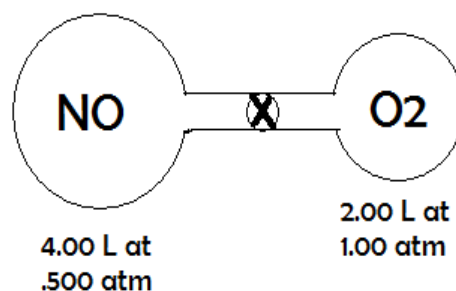
- A) Pressure of He is greater than that of Ne.  
B) Density of He is larger than that of Ne.  
C) Number of Ne atoms is larger than that of He.  
D) Both have the same number of moles.

Q19) Initially NO and  $O_2$  are separated as shown to the right. When the valve is opened, the reaction quickly goes to completion. Calculate the partial pressure of  $NO_2$  when the reaction is finished.

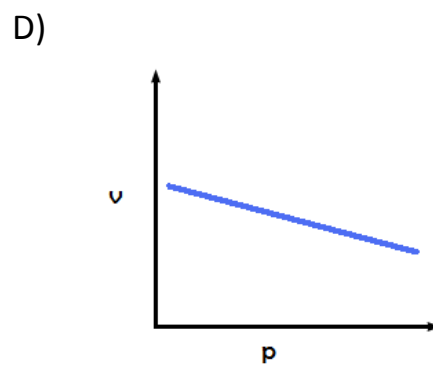
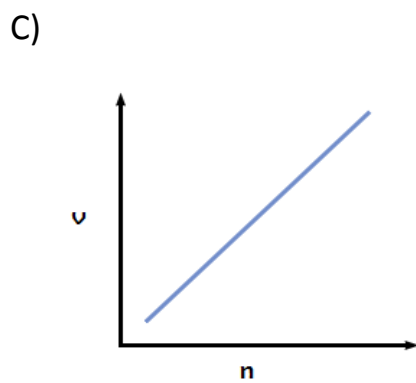
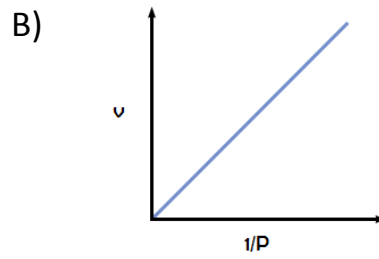
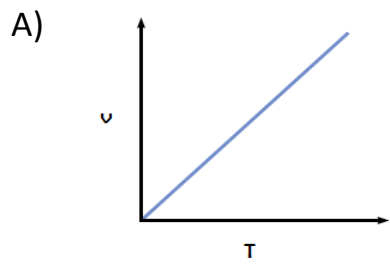
Assume the temperature remains constant at  $25^\circ C$ .



- A) 0.666 atm    B) 0.222 atm    C) 0.444 atm    D) 0.333 atm



Q20) Which of the following plots represents Avogadro's law?



**GOOD LUCK**

The Answers:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
	D	C	C	A	D	B	B	C	D	A		B	A	C	D	B		D	C

