GMR Classes

Gaseous State Slip Test

Total Marks : 40
Duration : 1:00 hrs

Chemistry XI

SECTION 1 - (SCQ) (Maximum Marks : 40)

- This section contains **10** questions
- Out of **10** questions,Only **10** needs to be attempted.
- From given options **,ONLY ONE** of these option(s) is correct.
- For each question, select the alphabets corresponding to the correct option(s) provided below the questions

  For each question, marks will be awarded in one of the following categories :

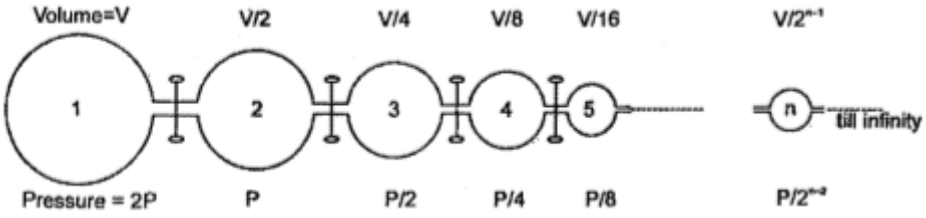
  Full Marks : **+4** If only corresponding option is chosen.
  Zero Marks : **0** If none of the options is chosen.(i.e the question is unanswered)
  Negative Marks : **- 10** In all other cases

1. A certain gas effuses out of two different vessels A and B. A has a circular orifice while B has a square orifice of length equal to the radius of the orifice of vessel A. The ratio of rate of diffusion of the gas from vessel A to that from vessel B is.

(A) π : 1 (B) 1 : π

(C) 1 : 1 (D) 3 : 2

2.



infinite number of flasks are connected to one another as shown above. The volume and pressure in each flask vary as shown. The stopcocks are initially closed. The common pressure, when all the stopcocks are opened, is: (Assume constant temperature)

(A) P

(B) $\frac{1}{2}P$

(C) $\frac{P}{4}$

(D) $\frac{4}{3}P$

3. If equal masses of oxygen and nitrogen are placed in separate containers of equal volume at the same temperature, which one of the following statements .is true?
(mol wt: N_2 = 28, O_2 = 32)

(A) Both flasks contain the same number of molecules

(B) The pressure in the nitrogen flask is greater than in the oxygen flask

(C) More molecules are present in the oxygen flask

(D) Molecules in the oxygen flask are moving faster on the average than the ones in the nitrogen flask

4. If the number of molecules of SO_2 (molecular weight = 64) effusing through an orifice of unit area of cross-section in unit time at O°C and 1 atm pressure is n. The number of fie molecules (atomic weight =4) effusing under similar conditions at 273°C and 0.25atrn is

(A) $\frac{n}{\sqrt{2}}$

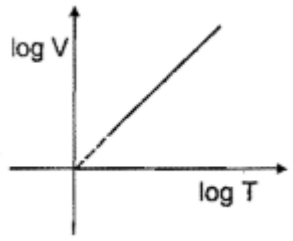
(B) $n\sqrt{2}$

(C) 2n

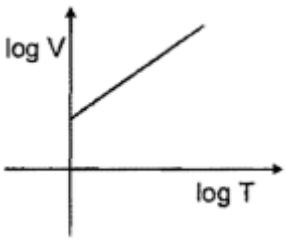
(D) $\frac{n}{2}$

5. Which of the following sketches is an isobar $\left(\frac{nR}{P} > 1\right)$

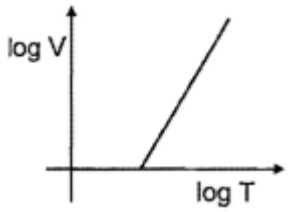
(A)



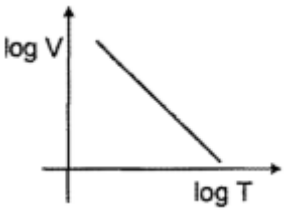
(B)



(C)



(D)



6. Three closed vessel 'A' , 'B' and 'C' are at the same temperatute 'T' and contain gases which obey Maxwellian distribution of velocity. Vessel 'A' contains only O_2 ;'B' only N_2 and 'C' a mixture of equal quantities of O_2 and N_2 . If the average speed of O_2 molecules in vessel A is v_1 , that of N_2 molecules in vessel B is v_2 the average speed of O_2 molecules in vessel C is:

(A) $\frac{v_1 + v_2}{2}$

(B) v_1

(C) $(v_1 v_2)^{1/2}$

(D) $\sqrt{\frac{M}{3kT}}$

7. Calculate the pressure exerted by 10^{23} gas molecules each of mass 10^{-22} g in a container of volume 1 litre, the rms speed is $10^5 cms^{-1}$

(A) $3.33 \times 10^7 dynecm^2$

(B) $2.22 \times 10^7 dynecm^{-2}$

(C) $1.11 \times 10^7 dynecm^{-2}$

(D) 4.44×10^7 $dynecm^{-2}$

8. A vessel has N_2 gas and water vapours at a total pressure of 1 atm. The partial pressure of water vapours is 0.3 atm. The contents of this vessel are transferred to another vessel having one third of the capacity of original volume, completely at the same temperature the total pressure of this system in the new vessel is

(A) 3.0 atm (B) 1 atm

(C) 3.33 atm (D) 2.4 atm

9. Calculate the pressure exerted by 8.5 g of ammonia (NH_3) contained in a 0.5 L vessel at 300 K. For ammonia, a = 4.0 atm L^2 mol^{-2} ,b = 0.036L mol^{-1} (in atm)

(A) 21.51 (B) 2.151

(C) 215.1 (D) 43.02

10. Oxygen gas generated by the decomposition of potassium chlorate is collected. The volume of oxygen collected at 24°C and atmospheric pressure of 760 mm Hg is 128 mL. Calculated the mass of oxygen gas obtained. The pressure of the water vapour at 24°C is 22.4 mm Hg.

(A) 0.123 g (B) 0.163 g

(C) 0.352 g (D) 1.526 g