PREVIOUS YEARS' QUESTIONS EXERCISE-II

1. How many moles of e– weight one Kg : **[JEE '2002 (Scr), 1]**

(1) 6.023×10^{23}

(2) $\frac{1}{9.108} \times 10^{31}$

(3) $\frac{6.023}{9.108} \times 10^{54}$

(4) $\frac{1}{9.108 \times 6.023} \times 10^{8}$

2. As the temperature is raised from 20°C to 40°C, the average kinetic energy of neon atoms changes by factor of which of the following ? **[AIEEE-2004]**

(1) 1/2 (2) $\sqrt{(313/293)}$

(3) 313/293 (4) 2

3. In Van der Waals equation of state of the gas law, the constant 'b' is a measure of : **[AIEEE-04]**

(1) intermolecular repulsions

(2) intermolecular attractions

(3) volume occupied by the molecules

(4) intermolecular collisions per unit volume

4. Calculate the amount of Calcium oxide required when it reacts with 852 g of P_4O_{10}. **[JEE 2005]**

$6CaO + P_4O_{10} \longrightarrow 2\ Ca_3(PO_4)_2$ [Ca = 40, P= 31]

(1) 2000 g (2) 3008 g

(3) 1008 g (4) 500 g

5. Given that the abundances of isotopes ^{54}Fe, ^{56}Fe and ^{57}Fe are 5%, 90% and 5%, respectively, the atomic mass of Fe is : **[JEE 2009]**

(1) 55.85 (2) 55.95

(3) 55.75 (4) 56.05

6. A 5.2 molal aqueous solution of methyl alcohol, CH_3OH, is supplied. What is the mole fraction of methyl alcohol in the solution ? **[AIEEE-2011]**

(1) 0.086 (2) 0.050

(3) 0.100 (4) 0.190

7. 'a' and 'b' are Van der Waals constants for gases. Chlorine is more easily liquefied than ethane because :- **[AIEEE-2011]**

(1) a for Cl_2 < a for C_2H_6 but b for Cl_2 > b for C_2H_6

(2) a for Cl_2 > a for C_2H_6 but b for Cl_2 < b for C_2H_6

(3) a and b for Cl_2 > a and b for C_2H_6

(4) a and b for Cl_2 < a and b for C_2H_6

8. The compressibility factor for a real gas **at high** pressure is :- **[AIEEE-2012]**

(1) $1-\frac{Pb}{RT}$ (2) $1+\frac{RT}{Pb}$ (3) 1 (4) $1+\frac{Pb}{RT}$

9. The concentrated sulphuric acid that is peddled commercially is 95% H_2SO_4 by weight. If the density of this commerical acid is 1.834 g cm^{-3}, the molarity of this solution is :- **[JEE-(Main)-2012]**

(1) 17.8 M (2) 15.7 M (3) 10.5 M (4) 12.0 M

10. The density of a solution prepared by dissolving 120 g of urea (mol. mass = 60 u) in 1000 g of water is 1.15 g/mL. The molarity of this solution is **[JEE-(Main)-2012]**

(1) 2.05 M (2) 0.50 M (3) 1.78 M (4) 1.02 M

11. A transition metal M forms a volatile chloride which has a vapour density of 94.8. If it contains 74.75% of chlorine the formula of the metal chloride will be **[AIEEE 2012 (Online)]**

(1) MCl_2 (2) MCl_4 (3) MCl_5 (4) MCl_3

12. The ratio of number of oxygen atoms (O) in 16.0 g ozone (O_3), 28.0 g carbon monoxide (CO) and 16.0 g oxygen (O_2) is :-

(Atomic mass : C = 12, O = 16 and Avogadro's constant $N_A = 6.0 \times 10^{23}\ mol^{-1}$) **[AIEEE 2012 (Online)]**

(1) 3 : 1 : 1 (2) 1 : 1 : 2

(3) 3 : 1 : 2 (4) 1 : 1 : 1

13. The relationship among most probable velocity, average velocity and root mean square velocity is respectively :- **[JEE(Main-online)-2012]**

(1) $\sqrt{2} : \sqrt{8/\pi} : \sqrt{3}$ (2) $\sqrt{2} : \sqrt{3} : \sqrt{8/\pi}$

(3) $\sqrt{3} : \sqrt{8/\pi} : \sqrt{2}$ (4) $\sqrt{8/\pi} : \sqrt{3} : \sqrt{2}$

14. A gaseous hydrocarbon gives upon combustion 0.72 g of water and 3.08 g of CO_2. The empirical formula of the hydrocarbon is **[JEE(Main)-2013]**

(1) C_2H_4 (2) C_3H_4 (3) C_6H_5 (4) C_7H_8

15. For gaseous state, if most probable speed is denoted by C, average speed by $\bar{C}$ and mean square speed by C, then for a large number of molecules the ratios of these speeds are :- **[JEE(Main-offline)-2013]**

(1) C : $\bar{C}$: C = 1.225 : 1.128 : 1

(2) C : $\bar{C}$: C = 1.128 : 1.225 : 1

(3) C : $\bar{C}$: C = 1 : 1.128 : 1.225

(4) C : $\bar{C}$: C = 1 : 1.225 : 1.128

16. 10 mL of 2(M) NaOH solution is added to 200 mL of 0.5 (M) of NaOH solution. What is the final concentration ? **[JEE(Main-online)-2013]**

(1) 0.57 M (2) 5.7 M

(3) 11.4 M (4) 1.14 M

17. The density of 3M solution of sodium chloride is 1.252 g mL^{-1}. The molality of the solution will be (molar mass, NaCl = 58.5 g mol^{-1})

[JEE(Main-online)-2013]

(1) 2.18 m (2) 3.00 m

(3) 2.60 m (4) 2.79 m

18. The ratio of masses of oxygen and nitrogen in a particular gaseous mixture is 1 : 4. The ratio of number of their molecule is : **[JEE(Main)-2014]**

(1) 1 : 8 (2) 3 : 16

(3) 1 : 4 (4) 7 : 32

19. If Z is the compressibility factor, Van der Waals equation **at low** pressure can be written as : **[JEE-MAINS-2014]**

(1) $Z = 1 - \frac{Pb}{RT}$ (2) $Z = 1 + \frac{Pb}{RT}$

(3) $Z = 1 + \frac{RT}{Pb}$ (4) $Z = 1 - \frac{a}{V_m RT}$

20. The amount of $BaSO_4$ formed upon mixing 100 mL of 20.8% $BaCl_2$ solution with 50 mL of 9.8% H_2SO_4 solution will be : **[JEE(Main-online)-2014]**

(Ba = l37, Cl = 35.5, S=32, H = l and O = 16)

(1) 33.2 g (2) 11.65 g

(3) 23.3 g (4) 30.6 g

21. For the estimation of nitrogen, 1.4 g of an organic compound was digested by Kjeldahl method and the evolved ammonia was absorbed in 60 mL of $\frac{M}{10}$ sulphuric acid. The unreacted acid required 20 mL of $\frac{M}{10}$ sodium hydroxide for complete neutralizaton. The percentage of nitrogen in the compound is : **[JEE(Main-online)-2014]**

(1) 3% (2) 5%

(3) 6% (4) 10%

22. The temperature at which oxygen molecules have the same root mean square speed as helium atoms have at 300 K is : **[JEE(Main-online)-2014]**

(Atomic masses : He = 4 u, O = 16 u)

(1) 1200 K (2) 600 K

(3) 300 K (4) 2400 K

23. In Carius method of estimation of halogens, 250 mg of an organic compound gave 141 mg of AgBr. The percentage of bromine in the compound is :

(Atomic mass Ag = 108; Br = 80)

[JEE(Main)-2015]

(1) 48 (2) 60

(3) 24 (4) 36

24. When does a gas deviate the most from it's ideal behaviour ? **[JEE-MAINS(ONLINE)-2015]**

(1) At high pressure and low temperature

(2) At high pressure and high temperature

(3) At low pressure and low temperature

(4) At low pressure and high temperature

25. The most abundant elements by mass in the body of a healthy human adult are :

Oxygen (61.4%) ; Carbon (22.9%), Hydrogen (10.0%) ; and Nitrogen (2.6%). The weight which a 75 kg person would gain if all ^1H atoms are replaced by ^2H atoms is **[JEE(Main)-2017]**

(1) 15 kg (2) 37.5 kg

(3) 7.5 kg (4) 10 kg

26. 1 gram of a carbonate (M_2CO_3) on treatment with excess HCl produces 0.01186 mole of CO_2. the molar mass of M_2CO_3 in g mol^{-1} is :-

[JEE(Main)-2017]

(1) 1186 (2) 84.3

(3)118.6 (4) 11.86

PREVIOUS YEARS QUESTIONS				ANSWER KEY						Exercise-II
Que.	1	2	3	4	5	6	7	8	9	10
Ans.	**4**	**3**	**3**	**3**	**2**	**1**	**2**	**4**	**1**	**1**
Que.	11	12	13	14	15	16	17	18	19	20
Ans.	**2**	**4**	**1**	**4**	**3**	**1**	**4**	**4**	**4**	**2**
Que.	21	22	23	24	25	26				
Ans.	**4**	**4**	**3**	**1**	**3**	**2**				