LHR-011-11.19

CHEMISTRY   219-(INTER PART – I)   Time Allowed : 20 Minutes
Q.PAPER – I (Objective Type)   GROUP – I   Maximum Marks : 17

PAPER CODE = 6481

Note : Four possible answers A, B, C and D to each question are given. The choice which you think is correct, fill that circle in front of that question with Marker or Pen ink in the answer-book. Cutting or filling two or more circles will result in zero mark in that question.

1-1	The largest number of molecules is present in :
	(A) 5.4 g of N_2O_4 (B) 2.8 g of CO (C) 4.8 g of C_2H_6O (D) 3.6 g of H_2O
2	1.00 mole of SO_2 contains :
	(A) 6.02×10^{23} atoms of oxygen (B) 3.01×10^{23} molecules of SO_2
	(C) 6.02×10^{23} molecules of SO_2 (D) 3.01×10^{23} atoms of sulphur
3	Solvent extraction is a separation technique used for the product, which is :
	(A) Non-volatile; thermally unstable (B) Volatile; thermally stable
	(C) Non-volatile; thermally stable (D) Volatile; thermally unstable
4	The deviation of a gas from ideal behaviour is maximum at :
	(A) $-10\ ^{\circ}C$ and 5 atm (B) $-10\ ^{\circ}C$ and 2 atm (C) $100\ ^{\circ}C$ and 2 atm (D) $0\ ^{\circ}C$ and 2 atm
5	The order of effusion of NH_3, SO_2, Cl_2 and CO_2 gases is :
	(A) $NH_3 > SO_2 > Cl_2 > CO_2$ (B) $NH_3 > CO_2 > SO_2 > Cl_2$
	(C) $Cl_2 > SO_2 > CO_2 > NH_3$ (D) $NH_3 > CO_2 > Cl_2 > SO_2$
6	Density of ice is minimum at 4 $^{\circ}C$ due to :
	(A) Empty spaces in structure of ice (B) Tetrahedral shape of crystal of ice
	(C) Large bond lengths (D) Large bond angles
7	The solid which has no definite crystalline shape :
	(A) Sugar (B) Salt (C) Glass (D) Dry ice
8	Quantum numbers, which represents 2p orbitals are :
	(A) $n = 2$, $\ell = 1$ (B) $n = 1$, $\ell = 2$ (C) $n = 1$, $\ell = 0$ (D) $n = 2$, $\ell = 0$
9	The nature of positive rays in discharge tube depends upon nature of :
	(A) Anode (B) Cathode (C) Residual gas (D) Discharge tube
10	Nature of bonds in N_2 molecule is :
	(A) One sigma ; two pi bonds (B) Two sigma; two pi bonds
	(C) Two sigma; one pi bond (D) Three pi bonds
11	For HF molecule μ_{obs} is 1.90 D ; μ_{ionic} is 4.4 D. The percentage ionic character of HF molecule is :
	(A) 100 (B) 80 (C) 57 (D) 43
12	The amount of heat absorbed when one mole of gaseous atoms are formed from the element is called enthalpy of :
	(A) Formation (B) Reaction (C) Combustion (D) Atomization
13	For which of the following reaction, the unit of equilibrium constant (K_c) is reciprocal of molar concentration (M^{-1}) :
	(A) $3H_2(g) + N_2(g) \rightleftharpoons 2H_3N(g)$ (B) $2NO_2(g) \rightleftharpoons N_2O_4(g)$
	(C) $H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$ (D) $N_2(g) + O_2(g) \rightleftharpoons 2NO(g)$
14	18 g glucose dissolved in 90 g water has relative lowering of vapour pressure equal to :
	(A) $\dfrac{18}{90}$ (B) $\dfrac{1}{6}$ (C) $\dfrac{10}{51}$ (D) $\dfrac{1}{51}$
15	The salt dissolved in water forms a solution of pH greater than 7 :
	(A) $NaCl$ (B) Na_2CO_3 (C) $CuSO_4$ (D) NH_4Cl
16	The oxidation state of oxygen in OF_2 is :
	(A) -2 (B) -1 (C) $+1$ (D) $+2$
17	The unit of rate constant is same as that of rate of the reaction having order :
	(A) Zero (B) One (C) Fractional (D) Two

Roll No _____ - ___ (To be filled in by the candidate) (Academic Sessions 2015 – 2017 to 2018 – 2020 ,
CHEMISTRY   219-(INTER PART – I)   Time Allowed : 2.40 hours
PAPER – I (Essay Type)   GROUP – I   Maximum Marks : 68

SECTION – I

2. Write short answers to any EIGHT (8) questions :   16

  (i) Define relative atomic mass. Give two examples.

  (ii) Calculate the percentage of nitrogen in NH_2CONH_2. (Atomic masses of C = 12 , N = 14 , O = 16 and H = 1)

  (iii) Define gram formula giving one example.

  (iv) Write two disadvantages of drying crystals in the folds of filter paper.

  (v) Define distribution law about solvent extraction.

  (vi) Derive Graham's law of diffusion from kinetic equation.

  (vii) Give two reasons for deviation of real gases from ideal behaviour.

  (viii) Write down two characteristics of plasma.

  (ix) Derive the SI units of van der Waal's constant 'a'.

  (x) Sea water has $5.65\times10^{-3}\,g$ of dissolved oxygen in one kg of water. Calculate the concentration of oxygen in sea water in parts per million (ppm).

  (xi) Define molal boiling point constant. Give one example.

  (xii) Define solubility curve. Name its two types.

3. Write short answers to any EIGHT (8) questions :   16

  (i) Why ice occupies 9% more volume than liquid water?

  (ii) Why evaporation causes cooling?

  (iii) Write two applications of liquid crystals.

  (iv) Why heat of sublimation of I_2 is very high than other halogens?

  (v) Write defects of Rutherford atomic model.

  (vi) State Moseley law and also give its importance.

  (vii) Why e/m value of cathode rays is equal to that of electron?

  (viii) State Hund's rule.

  (ix) How does buffer act?

  (x) Give optimum conditions to get maximum yield of NH_3.

  (xi) Justify that radioactive decay is always a first order reaction.

  (xii) Describe auto catalysis with example.

4. Write short answers to any SIX (6) questions :   12

  (i) Why the radius of an atom can not be determined precisely?

  (ii) Define ionization energy. Give its trend in periods and group of periodic table.

  (iii) How electronegativity changes in a group?

  (iv) Define coordinate covalent bond. Give one example.

  (v) Explain that burning of candle is a spontaneous process. Justify.

(Turn Over)

4. (vi) Define state and state function.

(vii) Write reactions taking place at anode and cathode in silver oxide battery.

(viii) How is aluminum anodized in an electrolytic cell?

(ix) Calculate oxidation number of Cr in K_2CrO_4.

SECTION – II

Note : Attempt any THREE questions.

5. (a) Describe combustion analysis method for the determination of percentage composition of an organic compound.   4

(b) Define ionic solids. Give their three properties.   4

6. (a) One mole of methane gas is maintained at 300 K, its volume is $250\,cm^3$. Calculate the pressure exerted by the gas, when the gas is ideal.   4

(b) Write four defects of Bohr's atomic model.   4

7. (a) Draw the molecular orbital picture of O_2 molecule.   4

(b) State Hess's law of constant heat summation. Explain it giving two examples.   4

8. (a) $Ca(OH)_2$ is a sparingly soluble compound. Its solubility product is 6.5×10^{-6}. Calculate the solubility of $Ca(OH)_2$.   4

(b) How does the Arrhenius equation help us to calculate energy of activation of a reaction?   4

9. (a) Give the three statements of Raoult's law.   4

(b) Describe the electrolysis of concentrated solution of $NaNO_3$ in aqueous solution.   4

42-219-I-(Essay Type) – 53500