Roll No _____ (To be filled in by the candidate) (Academic Sessions 2015 – 2017 to 2017 – 2019)

CHEMISTRY 218-(INTER PART – I) Time Allowed : 20 Minutes

Q.PAPER – I (Objective Type) GROUP – II Maximum Marks : 17

PAPER CODE = 6486

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	Bond energy of hydrogen (H_2) molecule is :	
	(A) $470\,KJ\,mol^{-1}$ (B) $450\,KJ\,mol^{-1}$ (C) $436\,KJ\,mol^{-1}$ (D) $415\,KJ\,mol^{-1}$	
2	Boiling point of water at Mount Everest is :	
	(A) $69\,^{\circ}C$ (B) $78\,^{\circ}C$ (C) $98\,^{\circ}C$ (D) $45\,^{\circ}C$	
3	An excess of aqueous silver nitrate is added to aqueous barium chloride and precipitate is removed by filtration, what are main ions in the filtrate :	
	(A) Ag^+ and NO_3^- only (B) Ag^+, Ba^{2+} and NO_3^-	
	(C) Ba^{2+} and NO_3^- only (D) Ba^{2+}, NO_3^- and $C\ell^-$	
4	Number of isotopes of arsenic are :	
	(A) 1 (B) 2 (C) 9 (D) 11	
5	Photochemical reactions are usually :	
	(A) Zero order (B) First order (C) Second order (D) Third order	
6	Rutherford's model of atom failed because :	
	(A) The atom did not have a nucleus and electrons	
	(B) It did not account for attraction between protons and neutrons	
	(C) It did not account for the stability of the atom	
	(D) There is actually no space between nucleus and electrons	
7	Partial pressure of oxygen in air is :	
	(A) 110 torr (B) 112 torr (C) 114 torr (D) 159 torr	
8	One mole of SO_2 contains :	
	(A) 6.02×10^{23} atoms of oxygen (B) 18.1×10^{23} molecules of SO_2	
	(C) 6.02×10^{23} atoms of sulphur (D) 4 gram atoms of sulphur	
9	For the given process the heat changes at constant pressure (q_p) and constant volume (q_v) are related to each other as :	
	(A) $q_p = q_v$ (B) $q_p < q_v$ (C) $q_p > q_v$ (D) $q_p = q_v / 2$	
10	The molal boiling point constant is the ratio of the elevation of boiling point to :	
	(A) Molality (B) Molarity (C) Mole fraction of solute (D) Mole fraction of solvent	
11	Which one of the following molecules has zero dipole moment :	
	(A) H_2S (B) SO_2 (C) H_2O (D) CH_4	
12	An ionic solids are characterized by :	
	(A) Low melting point (B) Good conductivity in solid state	
	(C) High vapour pressure (D) Solubility in polar solvents	
13	Stronger is the oxidizing agent, greater is the :	
	(A) Oxidation potential (B) Reduction potential (C) Redox potential (D) EMF of cell	
14	Quantum number values of 2P orbitals are :	
	(A) $n = 2$, $\ell = 1$ (B) $n = 1$, $\ell = 2$ (C) $n = 1$, $\ell = 0$ (D) $n = 2$, $\ell = 0$	
15	Solvent extraction is an equilibrium process and is controlled by :	
	(A) Law of mass action (B) Distribution law	
	(C) Amount of solute used (D) Amount of solvent used	
16	Rain water is :	
	(A) Slightly acidic (B) Slightly basic (C) Neutral (D) Highly basic	
17	Molarity of pure water is :	
	(A) 45.5 (B) 55.5 (C) 65.5 (D) 75.5	

SECTION – I

2. **Write short answers to any EIGHT (8) questions :** LHR-G2-11-18 16

(i) How have 4.9 g of H_2SO_4 when completely ionized in water produces equal number of positive and negative charges but the number of positively charged ions are twice than the number of negatively charged ions?

(ii) How has one mg of K_2CrO_4 thrice the number of ions than the number of formula units when ionized in water?

(iii) Why do 2g of H_2, 16g of CH_4, 44g of CO_2 occupy separately the volume of 22.414 dm^3 although the sizes and masses of molecules of three gases are very different from each other?

(iv) How does rate of filtration increase by using fluted filter paper?

(v) Name the various experimental techniques which are used for purification of substances?

(vi) Derive expression of density of gas with help of general gas equation.

(vii) Write two characteristics of plasma state.

(viii) Calculate value of the general gas constant (R) in unit of $dm^3\ atm\ K^{-1}\ mol^{-1}$.

(ix) Why do the rate of forward reaction slow down when a reversible reaction approaches the equilibrium stage?

(x) Prove by equations that what happens when Na_2CrO_4 is added to saturated solution of $PbCrO_4$?

(xi) Define Lowry Bronsted concept of acids and bases.

(xii) What is the formula to calculate the percentage ionization of weak acid?

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

(i) Why boiling point of H_2O is different at Murree hills and at Mount Everest?

(ii) Define transition temperature. Give two examples.

(iii) Why does ice float on water?

(iv) What are Debye forces?

(v) Define the term bond order with one example.

(vi) Ionization energy is an index to the metallic nature of element. Justify.

(vii) 75.4 pm is compromise distance between the bonded hydrogen atoms. Justify.

(viii) Why is no bond in chemistry 100% ionic?

(ix) Burning of candle is spontaneous process. Explain.

(x) Define enthalpy of solution and enthalpy of neutralization.

(xi) Define upper consulate temperature. Give two examples.

(xii) Give two statements of Raoult's law.

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

(i) State Pauli's exclusion principle and Hund's rule.

(ii) Calculate the number of electrons in s, p, d and f sub shells from the formula and write separately.

(iii) Write down any two postulate of Plank's quantum theory.

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

(Turn Over)

(v) What is electrochemistry?

(vi) Write down the function of salt bridge.

(vii) A porous plate or salt bridge is not required in lead storage cell. Why?

(viii) The radioactive decay is always the first order reaction, give reasons.

(ix) How are enthalpy changes of reaction and energy of activation of reaction distinguished?

SECTION – II

ote : Attempt any THREE questions.

(a) Ethylene glycol is used as automobile antifreeze. It has 38.7% C, 9.7% hydrogen and 51.6% oxygen. Determine its empirical formula.

(b) How vapour pressure can be measured by manometric method? Explain with diagram.

(a) Explain Linde's method of liquefaction of gases.

(b) Write down the four properties of neutron.

(a) How does molecular orbital theory explain the paramagnetic character of O_2 molecule? Also calculate the bond order.

(b) State first law of thermodynamics. How does it explain that $q_p = \Delta H$?

(a) What is common ion effect? How is this effect used in salt analysis, give two examples?

(b) Give explanation of discharging and recharging of lead accumulator, alongwith reactions occurring at electrode.

(a) The boiling point of water is 99.725 °C. To a sample of 600g of water are added 24.0 g of a solute having molecular mass of $58g\ mol^{-1}$, to form a solution. Calculate the boiling point of the solution.

(b) Define order of reaction and explain 2nd and zero order reaction.