LHR-G11-11-18

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 – I Maximum Marks : 17

PAPER CODE = 6485

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	Which of the following molecules has zero dipole moment : (A) NH_3 (B) $CHC\ell_3$ (C) H_2O (D) CO_2
2	NH_3 shows maximum boiling point among the hydrides of Vth group element due to : (A) Very small size of nitrogen (B) Lone pair of electrons on nitrogen (C) Enhanced electronegative character of nitrogen (D) Pyramidal structure of NH_3
3	Approximate PH of apple is : (A) 2.7 (B) 3.1 (C) 4.2 (D) 4.5
4	27 g of $A\ell$ will react completely with how much mass of O_2 to produce $A\ell_2O_3$: (A) 8 g of oxygen (B) 16 g of oxygen (C) 32 g of oxygen (D) 24 g of oxygen
5	The rate of reaction : (A) Increases as reaction proceeds (B) Decreases as reaction proceeds (C) Remains same as reaction proceeds (D) May decrease or increase as reaction proceeds
6	When 6d orbital is complete, the entering electron goes into : (A) 7s (B) 7p (C) 7d (D) 7f
7	Equal masses of methane and oxygen are mixed in an empty container at 25 °C. The fraction of total pressure exerted by oxygen is : (A) $\frac{1}{3}$ (B) $\frac{8}{9}$ (C) $\frac{1}{9}$ (D) $\frac{16}{17}$
8	The number of moles of CO_2 which contain 8.0 g of oxygen : (A) 0.25 (B) 0.50 (C) 1.0 (D) 1.50
9	If an endothermic reaction is allowed to take place very rapidly in an air, the temperature of surrounding air : (A) Remains same (B) Increases (C) Decreases (D) Remains unchanged
10	An aqueous solution of ethanol in water may have vapour pressure : (A) Equal to water (B) More than that of water (C) Equal to ethanol (D) Less than that of water
11	The number of bonds in nitrogen molecule is : (A) One σ and one π (B) One σ and two π (C) Three σ only (D) Two σ and one π
12	Geometry of diamond is : (A) Tetragonal (B) Cubic (C) Rhombohedral (D) None of these
13	Oxidation number of chromium in Cr_2O_3 is : (A) +1 (B) +2 (C) +3 (D) +4
14	In the ground state of an atom, the electrons are present : (A) In the nucleus (B) In second shell (C) Nearest to the nucleus (D) Farthest from the nucleus
15	The chromatography in which stationary phase is liquid is called : (A) Thin layer chromatography (B) Partition chromatography (C) Absorption chromatography (D) Gel chromatography
16	The PH of human blood is maintained at : (A) 7.35 (B) 7.53 (C) 7.63 (D) 7.73
17	Ideal solutions obey : (A) Henry's law (B) Avogadro's law (C) Raoult's law (D) Smith's law

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

CHEMISTRY 218-(INTER PART – I) Time Allowed : 2.40 hours

PAPER – I (Essay Type) GROUP – I Maximum Marks : 68

SECTION – I

LHR-G1-11-18

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

(i) How is the law of conservation of mass obeyed during stoichiometric calculations?

(ii) How do many chemical reactions take place in our surroundings involve the limiting reactant?

(iii) How do no individual Ne atom in the sample of the element has mass of 20.18 a.m.u.?

(iv) Define qualitative analysis and quantitative analysis of a compound.

(v) What is difference between Gooch's crucible and sintered glass crucible?

(vi) Why is SO_2 comparatively non-ideal at 273 K but behaves ideally at 327 °C?

(vii) Derive expression of molecular mass of a gas by using general gas equation.

(viii) Where do natural plasma and artificial plasma exist?

(ix) Calculate pH of 10^{-4} mole dm^{-3} solution of $HC\ell$.

(x) Why does catalyst affect the equilibrium constant?

(xi) Write the relationship of K_p and K_c.

(xii) Why can solid ice at 0 °C be melted by applying pressure without supply of heat from outside?

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

(i) Define isomorphism and polymorphism.

(ii) How are liquid crystals used to locate veins, arteries, infections and tumors?

(iii) Lower alcohols are soluble in water but hydrocarbons are insoluble. Give reason.

(iv) Why electrical conductivity of the metals decrease by increasing temperature?

(v) Why is dipole moment of CO_2 is zero but that of CO is 0.12 D?

(vi) Why do ionic compounds not exhibit the phenomenon of isomerism but covalent compounds do?

(vii) On what factors strength of bond depends upon?

(viii) Differentiate between co-ordinate covalent bond and covalent bond.

(ix) What are exothermic and endothermic reactions? Give examples.

(x) Define enthalpy of solution. Give examples.

(xi) What are zeotropic and azeotropic mixtures?

(xii) What is fractional crystallization?

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

(i) What particles are formed by the decay of free neutron, give equation?

(ii) Justify that the distance gaps between different orbits go on increasing from lower to the higher orbits.

(iii) What is Zeeman effect?

(iv) Distribute electrons in orbitals of : (a) $_{24}Cr$ (b) $_{35}Br$

(v) A salt bridge maintains the electrical neutrality in the cell, give reasons to support your answer.

LHR-G1-11-18 (2)

(vi) Calculate the oxidation numbers of the elements underlined in the following compounds :
(i) $K_2\underline{Mn}O_4$ (ii) $Ca(\underline{Cl}O_3)_2$

(vii) SHE acts as anode when connected with Cu electrode but as cathode with Zn electrode, give reasons in support of your answer.

(viii) Define specific rate constant. Give equation to support your answer.

(ix) Define autocatalysis, give equation to support your answer.

SECTION – II

ote : Attempt any THREE questions.

(a) Serotenin (Molar mass = $176g\,mol^{-1}$) is a compound that conduct nerve impulse in brain and muscle. It contains 68.2% C, 6.86% H, 15.09% N and 9.08% O. What is its molecular formula? 4

(b) Write down any four properties of molecular solids. 1,1,1,1

(a) Derive Boyle's law and Charles's law from kinetic equation. 4

(b) Describe J.J. Thomson's experiment for determining e/m value of electron. 4

(a) Define dipole-moment. Give its units. How is it used to determine the geometry of molecule by an example? 4

(b) State Hess's law. Explain it giving two examples. 4

(a) State Le-Chatelier's principle. How is this principle used to explain effect of change in concentration on a reaction at equilibrium state? 4

(b) Define electrochemical series and give any two applications of it. 4

(a) The freezing point of pure camphor is 178.4 °C. Find the freezing point of a solution containing 2.0 g of a non-volatile compound, having molecular mass 140, in 40g of camphor. The molal freezing point constant of camphor is 37.7 °C kg mol^{-1}. 4

(b) What are enzymes? Mention the characteristics of enzyme catalysis. 4