LHR-G2-11-19

Roll No _____ (To be filled in by the candidate) **(Academic Sessions 2015 – 2017 to 2018 – 2020)**

CHEMISTRY 219-(INTER PART – I) Time Allowed : 20 Minutes

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

PAPER CODE = 6488

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	Liquids which are practically immiscible : (A) $H_2O + C_6H_6$ (B) $H_2O + C_2H_5 - OH$ (C) $H_2O + HC\ell$ (D) $H_2O + CH_3 - O - CH_3$
2	The velocity of photon is : (A) Independent of its wavelength (B) Depend on its wavelength (C) Depend on its source (D) Depend upon its amplitude
3	The molar volume of CO_2 is maximum at : (A) S.T.P (B) 127 °C and 1 atm. (C) O °C and 2 atm. (D) 273 °C and 2 atm.
4	The type of hybridization in $BeC\ell_2$ is : (A) sp^3 (B) sp^2 (C) sp (D) dsp^2
5	Splitting of spectral lines when atoms are subjected to strong electrical field is called : (A) Zeeman effect (B) Stark effect (C) Photoelectric effect (D) Compton effect
6	The volume occupied by 16 g of CH_4 at STP is : (A) 2.24 dm^3 (B) 22.414 dm^3 (C) 1.3 dm^3 (D) 1.8 dm^3
7	In zero order reaction, the rate is independent of : (A) Temperature of reaction (B) Concentration of reactants (C) Concentration of products (D) Nature of reactants
8	Hydrogen bonding is maximum in : (A) HI (B) HBr (C) $HC\ell$ (D) H_2O
9	The pH of 10^{-3} mole dm^{-3} of an aqueous solution of H_2SO_4 is : (A) 3.0 (B) 2.7 (C) 2.0 (D) 1.5
10	The largest number of molecules are present in : (A) 3.6 g of H_2O (B) 4.8 g of C_2H_5OH (C) 2.8 g of CO (D) 5.4 g of N_2O_5
11	The dipole moment of CO_2 is : (A) 0.95 D (B) 1.85 D (C) 1.61 D (D) 0 D
12	Which one of the following compound is purified by sublimation : (A) Benzoic acid (B) SiO_2 (C) CS_2 (D) NaI
13	The molal boiling point constant is the ratio of the elevation in boiling point to : (A) Molarity (B) Molality (C) Mole fraction of solute (D) Mole fraction of solvent
14	The term that is not state function : (A) Enthalpy (B) Internal energy (C) Work (D) Volume
15	The oxidation state of Mn in $KMnO_4$ is : (A) +7 (B) +6 (C) +2 (D) +5
16	The molecules of CO_2 in dry ice form the : (A) Ionic crystals (B) Covalent crystals (C) Molecular crystals (D) Metallic crystals
17	The unit millibar is commonly used by : (A) Meteorologists (B) Astronauts (C) Engineers (D) Dalton

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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 – II Maximum Marks : 68

SECTION – I

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

(i) Define isotopes. Why they have same chemical properties?

(ii) What is mass spectrum?

(iii) Molecular formula is nth multiple of empirical formula. Explain with an example.

(iv) How can rate of filtration be increased by fluted filter paper?

(v) Define ether extraction.

(vi) Calculate the value of general gas constant (R) in SI units.

(vii) Why do we get straight line, when pressure is plotted against inverse of volume?

(viii) Why lighter gases diffuse more rapidly than heavier gases?

(ix) State Joule-Thomson effect.

(x) How will you prepare 10% w/v glucose solution in water?

(xi) One molal solution of urea is dilute as compared to one molar solution. Justify.

(xii) Define molarity. How is molarity related to mass of solute?

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

(i) Boiling point of water is greater than boiling point of HF, although hydrogen bonding is stronger in HF than in H_2O. Why?

(ii) Evaporation is a cooling process. Justify.

(iii) Define isomorphism and polymorphism giving one example in each.

(iv) Write two applications of liquid crystals.

(v) Write nuclear reaction for the production of neutron.

(vi) Write any two points of Planck's quantum theory.

(vii) State Hund's rule, giving an example.

(viii) Write any two defects of Bohr's atomic model.

(ix) Differentiate between reversible and irreversible reactions.

(x) How are acidic buffer and basic buffer prepared? Give one example in each case.

(xi) Define catalysis. Give its different types with one example in each case.

(xii) Justify that rate of chemical reaction is an ever changing parameter under the given conditions.

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

(i) Explain geometry of H_2S molecule on the basis of VSEPR theory.

(ii) Define ionization potentials of elements. How the ionization potential vary across the periods?

(iii) Cationic radius is smaller than that of its parent atomic radius. Why?

(iv) Differentiate between bonding and antibonding molecular orbitals with reference to relative energies and symmetry of electronic clouds (no figure required).

(v) Define state function. Write name of two such functions.

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4. (vi) Burning of natural gas is spontaneous reaction. Justify.

(vii) What are secondary cells? Write name of any two such cells.

(viii) Describe function of salt bridge in a voltaic cell.

(ix) Define electrode potential.

SECTION – II

Note : Attempt any THREE questions.

5. (a) Write detailed note on : (i) Avogadro's number (ii) Molar volume. 4

(b) Define vapour pressure. Write down manometric method for its determination with diagram. 4

6. (a) A sample of nitrogen gas is enclosed in a vessel of volume $380\,cm^3$ at 120 °C and pressure of 101325 Nm^{-2}. This gas is transferred to $10\,dm^3$ flask and cooled to 27 °C, calculate the pressure in Nm^{-2} exerted by the gas at 27 °C. 4

(b) Write any four properties of cathode rays. 4

7. (a) Explain the structure of ethyne (C_2H_2) according to hybridization concept. 4

(b) Explain the following terms : (i) Standard heat of neutralization.
(ii) Standard enthalpy of solution. 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) Explain the effect of temperature on the rate of reaction. 4

9. (a) Differentiate between ideal and non-ideal solutions. 4

(b) Define electrochemical series. Discuss calculation of the voltage of cell, giving one example. 4