B

| Chemistry | (B) | L.K.No. 1109 | Paper Code No. 6483 |
|---|---|---|---|
| Paper I | ( Objective Type ) | Inter – A – 2021 | ( Group Ist ) |
| Time : | 20 Minutes | Inter ( Part - I ) | BWP-G1-24 |
| Marks : | 17 | Session (2017 -19) to (2020 – 22) | |

Note : Four possible choices A , B , C ,D to each question are given. Which choice is correct fill that circle in front of that Question No. Use Marker or Pen to fill the circles. Cutting or filling two or more circles will result in Zero Mark in that Question.

| | |
|---|---|
| Q.No.1 (1) | With increase of $10^{o}C$ temperature , the rate of reaction doubles. This increase in rate of reaction is due to : (A) Decrease in activation energy of reaction (B) Increase in activation energy of reactants (C) Decrease in number of Collisions between reactant molecules (D) Increase in number of effective collision |
| (2) | If the Salt Bridge is not used between two half cells , then the Voltage : (A) Decreases Rapidly (B) Decreases Slowly (C) Does not change (D) Drops to Zero |
| (3) | 18 g Glucose is dissolved in 90 g of water. The relative lowering of Vapour Pressure is equal to : (A) $\frac{1}{5}$ (B) 5.1 (C) $\frac{1}{51}$ (D) 6 |
| (4) | The pH of $10^{-3}$ moles $dm^{-3}$ of an aqueous solution of $H_2SO_4$ is : (A) 3.0 (B) 2.7 (C) 2.0 (D) 1.5 |
| (5) | The solution which resists change in its pH either an Acid or Base is added in it is called : (A) Buffer Solution (B) Acid (C) Base (D) Alkali |
| (6) | The change in Heat Contents of a chemical reaction at constant temperature and pressure is called : (A) Enthalpy Change (B) Bond Energy (C) Heat of Sublimation (D) Internal Energy Change |
| (7) | The Bond which is formed by mutual sharing of Electrons is called : (A) Ionic Bond (B) Covalent Bond (C) Metallic Bond (D) Coordinate Covalent Bond |
| (8) | Which of the following species has unpaired electrons in Antibonding Molecular Orbitals : (A) $O_2^{2+}$ (B) $N_2^{2-}$ (C) $B_2$ (D) $F_2$ |
| (9) | The velocity of Photon is : (A) Independent of its Wavelength (B) Depends on its Wavelength (C) Equal to square of its Amplitude (D) Depends on its source |
| (10) | The nature of the positive rays depends on : (A) The nature of the Electrode (B) The nature of the Discharge Tube (C) The nature of the Residual Gas (D) The nature of Anode |
| (11) | Ionic Solids are characterized by : (A) Low Melting Points (B) Good Conductivity in Solid State (C) High Vapour Pressure (D) Solubility in Polar Solvents |
| (12) | When water freezes at $0^{o}C$, its density decreases due to : (A) Cubic Structure of Ice (B) Empty Spaces present in the structure of Ice (C) Change of Bond lengths (D) Change of Bond Angles |
| (13) | The Molar Volume of $CO_2$ is maximum at : (A) S.T.P (B) $127^{o}C$ and 1 atm (C) $0^{o}C$ and 2 atm (D) $273^{o}C$ and 2 atm |
| (14) | Equal Masses of Methane and Oxygen are mixed in an empty container at $25^{o}C$. The fraction of total pressure exerted by Oxygen is : (A) $\frac{1}{3}$ (B) $\frac{8}{9}$ (C) $\frac{1}{9}$ (D) $\frac{16}{17}$ |
| (15) | The comparative rates at which the solutes move in Paper Chromatography depends on : (A) The Size of Paper (B) $R_f$ values of Solutes (C) Temperature of the Experiment (D) Size of the Chromatographic Tank used |
| (16) | The Branch of Chemistry which deals with the calculations based on balanced chemical equation is called : (A) Thermochemistry (B) Thermometry (C) Stoichiometry (D) Physical Chemistry |
| (17) | Average Atomic Mass of Neon is : (A) 20.00 (B) 20.18 (C) 20.20 (D) 22.0 |

B

| Roll No. | 1109 - 16000 | Session (2017 –19) to (2020 – 22) | Inter ( Part – I ) |
|---|---|---|---|
| Chemistry (Subjective ) | Inter – A – 2021 | Time 2 : 40 Hours Marks : 68 | Group Ist |

Note : It is compulsory to attempt any (8 – 8) Parts each from Q.No. 2, Q.No.3 and attempt any (6) Parts from Q.No.4. Attempt any (3) Questions from Part – II. Write same Question No. and its Part No. as given in the Question Paper.

BWP-61-21

Make Diagram where necessary. | Part - I | 22 x 2 = 44

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|---|---|---|---|---|
| Q.No.2 | (i) | Chemical properties of Isotopes of same element are same , why ? | | |
| | (ii) | No individual Neon Atom in the Sample of the Element has a mass of 20 . 18 amu. Explain it. | | |
| | (iii) | Write any two applications of Boiling Point Elevation and Freezing Point Depression Phenomena. | | |
| | (iv) | Write any two applications of Chromatography. | | |
| | (v) | Define Boyle's Law with its mathematical equation. | | |
| | (vi) | Draw Isotherms of a Gas at two different temperatures. | | |
| | (vii) | Define Absolute Zero and write its value in Celsius Scale. | | |
| | (viii) | Define Heat of a Solution by giving two examples. | | |
| | (ix) | Write number of Isotopes of Cadmium and Tin. | (x) | Write Quantitative Statement of Charles' Law. |
| | (xi) | Define Sublimation with an example. | (xii) | Define Solubility and Solubility Curves. |
| Q.No.3 | (i) | What are types of Intermolecular Forces ? | (ii) | What are Cleavage Planes ? |
| | (iii) | How Neutron is used as Projectile ? | (iv) | Draw Shapes of d – Orbitals. |
| | (v) | Define Law of Mass Action. | (vi) | What is a Zero Order Reaction ? |
| | (vii) | How detergents perform cleansing action ? | (viii) | What is method of Large Excess ? |
| | (ix) | What is Symmetry and Symmetry Elements? | (x) | Why the Energy of Bound Electron is Zero? |
| | (xi) | What is Common Ion Effect? Give example. | (xii) | Name different lines of Hydrogen Spectrum. |
| Q.No.4 | (i) | Define Ionic Bond by giving one example. | (ii) | Define and explain Octet Rule. |
| | (iii) | Define Ionization Energy by giving an example. | (iv) | Define Electronegativity by giving one example. |
| | (v) | State Ist Law of Thermodynamics. Also write its mathematical form. | | |
| | (vi) | Define Standard Enthalpy of Neutralization by giving one example. | | |
| | (vii) | SHE acts as Anode when connected with Cu – electrode. Explain. | | |
| | (viii) | The standard oxidation potential of Zn is + 0 . 76 V and its reduction potential is - 0 . 76 V. Explain with reason. | | |
| | (ix) | How Impure Copper can be purified by Electrolytic Process ? Explain with reason. | | |

( Part – II )

| | | | |
|---|---|---|---|
| Q.No.5 | (a) | When Limestone ( $CaCO_3$ ) is roasted , quicklime ( CaO ) is produced as $CaCO_3 \longrightarrow CaO + CO_2$ The actual yield of CaO is 2 . 5 Kg , when 4 . 5 Kg of Limestone is roasted. What is the percentage yield of this reaction ? | (4) |
| | (b) | What are London Dispersion Forces ? Give factors affecting them specially for Halogens and Hydrocarbons . | (4) |
| Q.No.6 | (a) | Derive General Gas Equation. Also verified Gas Laws from it. | (4) |
| | (b) | What is J.J. Thomson's Experiment for determining e/m value of Electron? | (4) |
| Q.No.7 | (a) | What is Ionization Energy ? What is its Trend in Periodic Table ? | (4) |
| | (b) | Explain Glass Calorimeter for the measurement of Enthalpy of a Reaction. | (4) |
| Q.No.8 | (a) | Explain Arrhenius Equation. How does it help us to calculate the energy of activation of a reaction? | (4) |
| | (b) | The equilibrium constant for the reaction between Acetic Acid and Ethyl Alcohol is 4 . 0. A mixture of 3 moles of Acetic Acid and one mole of $C_2H_5OH$ is allowed to come to equilibrium. Calculate the amount of Ethyl Acetate at equilibrium stage in number of moles and grams. Also calculate the masses of reactants left behind. | (4) |
| Q.No.9 | (a) | (i) Differentiate between Ideal and Non – Ideal Solution with any two points of difference. (ii) Define the term Solubility and Solubility Curves. | (4) |
| | (b) | Define Oxidation Number and state any six rules for assigning of Oxidation Number. | (4) |

31-07-2021

B

| Chemistry | (B) | L.K.No. 1110 | Paper Code No. 6484 |
|---|---|---|---|
| Paper I | ( Objective Type ) | Inter – A – 2021 | ( Group 2nd ) |
| Time : | 20 Minutes | Inter ( Part - I ) | BWP-42-24 |
| Marks : | 17 | Session (2017 -19) to (2020 – 22) | |

Note : Four possible choices A , B , C ,D to each question are given. Which choice is correct fill that circle in front of that Question No. Use Marker or Pen to fill the circles. Cutting or filling two or more circles will result in Zero Mark in that Question.

| Q.No.1 | |
|---|---|
| (1) | In Zero Order Reaction , the rate is independent of :<br>(A) Temperature of Reaction (B) Concentration of Reactants<br>(C) Concentration of Products (D) Pressure of Reaction |
| (2) | If the Salt Bridge is not used between two half cells , then the Voltage :<br>(A) Decreases Rapidly (B) Decreases Slowly (C) Does not change (D) Drops to Zero |
| (3) | 18 g Glucose is dissolved in 90 g of water. The relative lowering of Vapour Pressure is equal to :<br>(A) $\frac{1}{51}$ (B) 5.1 (C) $\frac{1}{5}$ (D) 6 |
| (4) | The pH of $10^{-3}$ mole $dm^{-3}$ of an aqueous solution of $H_2SO_4$ is :<br>(A) 3.0 (B) 2.7 (C) 2.0 (D) 1.5 |
| (5) | For which system does the equilibrium Constant $K_C$ has units of ( concentration )$^{-1}$ ? :<br>(A) $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$ (B) $2NO_2(g) \rightleftharpoons N_2O_4(g)$<br>(C) $H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$ (D) $2HF(g) \rightleftharpoons H_2(g) + F_2(g)$ |
| (6) | One Calorie is equivalent to : (A) 0.4184 J (B) 4.184 J (C) 41.84 J (D) 418.4 J |
| (7) | Type of Hybridization in $H_2O$ is : (A) sp (B) $sp^2$ (C) $sp^3$ (D) $dsp^2$ |
| (8) | Which of the Hydrogen Halide has the highest percentage of Ionic Character :<br>(A) HF (B) HCl (C) HBr (D) HI |
| (9) | The value of Quantum Number $\ell$ = 0, 1, 2, 3, ------ (n – 1) is for :<br>(A) Principal Quantum Number (B) Azimuthal Quantum Number<br>(C) Magnetic Quantum Number (D) Spin Quantum Number |
| (10) | The Velocity of Photon is : (A) Independent of its Wavelength (B) Depends on its Wavelength<br>(C) Equal to square of its Amplitude (D) Depends on its source |
| (11) | The Crystal System of Sugar is : (A) Monoclinic (B) Cubic (C) Hexagonal (D) Triclinic |
| (12) | London Dispersion Forces are the only forces present among the :<br>(A) Molecules of Water in Liquid State (B) Atoms of Helium in Gaseous State at high temperature<br>(C) Molecules of Solid Iodine (D) Molecules of Hydrogen Chloride Gas |
| (13) | The value of R in SI Units System is :<br>(A) 8.3143 Nm $K^{-1}$ $mole^{-1}$ (B) 0.0821 $dm^3$ atm $K^{-1}$ $mole^{-1}$<br>(C) 8.3143 $dm^3$ atm $K^{-1}$ $mole^{-1}$ (D) 0.0821 Nm $K^{-1}$ $mole^{-1}$ |
| (14) | Number of Molecules in One $dm^3$ of water is close to :<br>(A) $\frac{6.02}{22.4} \times 10^{23}$ (B) $\frac{12.04}{22.4} \times 10^{23}$ (C) $\frac{18}{22.4} \times 10^{23}$ (D) $55.6 \times 6.02 \times 10^{23}$ |
| (15) | Solvent Extraction method is a particularly useful technique for separation when the product to be separated is :<br>(A) Non – Volatile or Thermally Unstable (B) Volatile or Thermally Stable<br>(C) Non – Volatile or Thermally Stable (D) Volatile or Thermally Unstable |
| (16) | Number of Isotopes of Nickel is : (A) 2 (B) 3 (C) 4 (D) 5 |
| (17) | 27g of Al will react completely with how much mass of $O_2$ to produce $Al_2O_3$ :<br>(A) 8 g of Oxygen (B) 16 g of Oxygen (C) 32 g of Oxygen (D) 24 g of Oxygen |

B

| Roll No. | 1110 - 14000 | Session (2017 –19) to (2020 – 22) | Inter ( Part – I ) |
|---|---|---|---|
| Chemistry (Subjective ) | Inter – A – 2021 | Time 2 : 40 Hours Marks : 68 | Group 2nd |

Note : It is compulsory to attempt any (8 – 8) Parts each from Q.No. 2, Q.No.3 and attempt any (6) Parts from Q.No.4. Attempt any (3) Questions from Part – II. Write same Question No. and its Part No. as given in the Question Paper.

BIOP-42-21

Make Diagram where necessary. | Part - I | 22 x 2 = 44

| | | | | |
|---|---|---|---|---|
| Q.No.2 | (i) | Why Actual Yield is less than Theoretical Yield ? | | |
| | (ii) | Define Adsorption Chromatography and Partition Chromatography. | | |
| | (iii) | What is Gram Atom and Gram Molecule ? | (iv) | What are Monoisotopic Elements? |
| | (v) | What is $R_f$ Value ? | (vi) | What is Fractional Crystallization ? |
| | (vii) | Why Pilots feel Uncomfortable Breathing ? | (viii) | What is Natural and Artificial Plasma? |
| | (ix) | Derive Charles's Law from KMT. | (x) | What are Continuous Solubility Curves? |
| | (xi) | What is Absolute or Kelvin Scale of Temperature? | (xii) | Name four Colligative properties of Solutions. |
| Q.No.3 | (i) | How concept of Hydrogen Bonding helps to explain structure of Ice ? | | |
| | (ii) | What are Amorphous Solids ? Give two suitable examples. | | |
| | (iii) | Write axes and angles of Tetragonal and Monoclinic Crystal System. | | |
| | (iv) | Define Dipole Dipole Forces and London Dispersion Forces. | | |
| | (v) | Write any four properties of Cathode Rays. | | |
| | (vi) | Give reason for the production of Positive Rays. | | |
| | (vii) | Write down defects of Rutherford's Model of an Atom. | | |
| | (viii) | Differentiate between Atomic Emission Spectrum and Atomic Absorption Spectrum. | | |
| | (ix) | How value of Equilibrium Constant ( $K_c$ ) helps to predict extent of a reaction ? | | |
| | (x) | State Le – Chatelier's Principle. | | |
| | (xi) | Define Instantaneous and Average Rate of Reaction. | | |
| | (xii) | Write down concept of Activation Energy and Activated Complex. | | |
| Q.No.4 | (i) | Cationic Radius is smaller than that of its Parent Atomic Radius why ? | | |
| | (ii) | Draw the structure of $H_2O$ according to VSEPR Theory. | | |
| | (iii) | Define Enthalpy of Neutralization with example. | | |
| | (iv) | Calculate the Oxidation Numbers of the elements underlined : (a) $Na_2\underline{P}O_4$ (b) $H\underline{P}O_3$ | | |
| | (v) | Why SHE acts as Cathode when connected with $Z_n$ Electrode but SHE acts as Anode when connected with Cu ? Justify. | | |
| | (vi) | State Hess's Law of Constant Heat Summation. | | |
| | (vii) | $\pi$ Bonds are more diffused than $\sigma$ Bonds , justify. | | |
| | (viii) | Write down the function of Salt Bridge. | | |
| | (ix) | Define Ionic Bond with an example . | | |

( Part – II )

| | | | |
|---|---|---|---|
| Q.No.5 | (a) | 10 gram of $H_3PO_4$ has been dissolved in excess of water to dissociate it completely into its ions . Calculate the number of Molecules in it. Also find out the number of positive and negative ions in case of complete dissociation in water $H_3PO_4 \rightleftharpoons 3H^+ + PO_4^{-3}$ | (4) |
| | (b) | What is Liquid Crystal ? Also give its applications in daily life ? | (4) |
| Q.No.6 | (a) | What is Plasma ? How it is formed ? Also give its characteristics. | (4) |
| | (b) | How the discovery of positive rays takes place ? Also give its only two characteristics. | (4) |
| Q.No.7 | (a) | What is $sp^3$ Hybridization ? Explain the structure of Ammonia Molecule. | (4) |
| | (b) | Define and explain Hess's Law of constant heat summations with one example. | (4) |
| Q.No.8 | (a) | Calculate the pH of a Buffer Solution in which 0 . 11 Molar $CH_3COONa$ and 0 . 09 Molar Acetic Acid solutions are present . $K_a$ for $CH_3COOH$ is $1.85 \times 10^{-5}$ | (4) |
| | (b) | Define and explain energy of activation by using Collision Theory. | (4) |
| Q.No.9 | (a) | What is Raoult's Law ? Explain it . | (4) |
| | (b) | What is Electrochemical Series ? Give its two applications in detail. | (4) |

31-07-2021