



BWP-11-011-18

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 number. 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	The Mass of One Mole of Electrons is :
(1)	(A) 1.008 mg (B) 0.55 mg (C) 0.184 mg (D) 1.673 mg
(2)	A ring has 6.0 g of diamond (c) in it. Calculate the number of atoms of Carbon in it : (A) 6.02×10^{23} (B) 3.01×10^{23} (C) 9.03×10^{23} (D) 1.8×10^{24}
(3)	Solvent Extraction is an equilibrium process and it is controlled by : (A) Law of Mass Action (B) The Amount of Solvent used (C) The Amount of Solute (D) Distribution Law
(4)	The Molar Volume of CO_2 is maximum at : (A) STP (B) 127°C and 1 atm (C) 0°C and 2 atm (D) 273°C and 2 atm
(5)	When water freezes at 0°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
(6)	Which of the given is a Pseudo Solid : (A) CaF_2 (B) Glass (C) NaCl (D) KBr
(7)	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
(8)	When 6d Orbital is complete, the entering electron goes into (A) 7f (B) 7s (C) 7p (D) 7d
(9)	Octet Rule is not followed in : (A) CH_4 (B) CF_4 (C) CCl_4 (D) PCl_5
(10)	Which one of the following Hydrogen Halide has the highest percentage of Ionic character : (A) HCl (B) HBr (C) HF (D) HI
(11)	For the reaction $\text{NaOH} + \text{HCl} \longrightarrow \text{NaCl} + \text{H}_2\text{O}$ the change in enthalpy is called : (A) Heat of Reaction (B) Heat of Formation (C) Heat of Neutralization (D) Heat of Combustion
(12)	The pH of Milk of Magnesia is : (A) 10.5 (B) 3.5 (C) 8.5 (D) 11.1
(13)	The solubility product of AgCl is $2.0 \times 10^{-10} \text{ mol}^2 \text{ dm}^{-6}$. The maximum concentration of Ag^+ Ions in the solution is : (A) $2.0 \times 10^{-10} \text{ mol dm}^{-3}$ (B) $1.41 \times 10^{-5} \text{ mol dm}^{-3}$ (C) $1.0 \times 10^{-10} \text{ mol dm}^{-3}$ (D) $4.0 \times 10^{-20} \text{ mol dm}^{-3}$
(14)	A solution of Glucose is 10% w/v. The volume in which 1g mole of it is dissolved, will be : (A) 1 dm^3 (B) 1.8 dm^3 (C) 200 cm^3 (D) 900 cm^3
(15)	The Number of Moles of Solute per kg of Solvent is called : (A) Molality (B) Molarity (C) Mole Fraction (D) Normality
(16)	The Cathodic Reaction in the electrolysis of dil H_2SO_4 with Pt electrodes is : (A) Reduction (B) Oxidation (C) Both Oxidation and Reduction (D) Neither Oxidation or Reduction
(17)	A substance which makes the Catalyst more effective is called : (A) Inhibitor (B) Retarder (C) Promotor (D) Autocatalyst

B

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Roll No.	813 - <i>2020</i>	New Pattern	Inter (Part - I) / Group Ist
Chemistry (Subjective)	Inter-A-2018	Time : 2 : 40 Hrs Marks = 68	Session (2015 - 17) to (2017 - 19)

Note : It is compulsory to attempt any (8 - 8) parts each from Q.No.2 and Q.No.3 and attempt any (6) parts from Q. No.4 .
Attempt any (03) questions from Part II Write same Question No. and its Part No. as given in the question paper.

Make Diagram where necessary.

Part - I

BWP-11-011-18 22 x 2 = 44

Q.No.2 (i) Define Mass Spectrum.

(ii) Write down only steps to determine Limiting Reactant.

(iii) Calculate Percentage of Nitrogen in Urea. $(\text{H}_2\text{N} - \overset{\text{O}}{\parallel} \text{C} - \text{NH}_2)$

(iv) Mention only steps involved in complete quantitative determination.

(v) Write down any two uses of Chromatography.

(vi) Why Liquids are less common than Solids and Gases?

(vii) Define Diffusion and Effusion.

(viii) Why is the Critical Temperature of Water higher than Argon?

(ix) Define Reversible Reaction. Give one example.

(x) State Law of Mass Action.

(xi) What is the effect of Catalyst on Equilibrium Position?

(xii) Write down any two uses of Buffer Solutions.

Q.No.3 (i) Ice Floats on Water. Give reason.

(ii) Describe the importance of Vacuum Distillation.

(iii) Define Transition Temperature with one example.

(iv) Ionic Crystals are highly brittle, why?

(v) Differentiate between Bonding and Antibonding Molecular Orbitals.

(vi) Define Electronegativity and Electron Affinity of an Atom.

(vii) Why is size of Anion greater than Parent Atom?

(viii) Why the Atomic Radii of the Atoms can not be determined precisely?

(ix) Burning of a Candle is a Spontaneous Process. Justify.

(x) Define Standard Enthalpy of Atomization with an example.

(xi) Differentiate between Ideal and Non - Ideal Solution.

(xii) Aqueous Solution of CuSO_4 is Acidic in Nature. Justify it.

Q.No.4 (i) Write Electronic Configuration of Na = 11 and Cr = 24

(ii) Explain Hund's Rule by giving an example.

(iii) Explain Atomic Emission Spectrum.

(iv) Write down two equations when slow moving Neutrons hit the Cu Metal.

(v) How is the Surface Area affects the rate of Reaction?

(vi) Describe Half Life Method to determine order of reaction.

(vii) SHE acts as Anode when connected with Cu - Electrode but as Cathode with Zn - Electrode, give reason.

(viii) How Electrochemical Series helps to predict the feasibility of a chemical reaction? Give an example.

(ix) What is Anodized Aluminium? How is it prepared?

Part - II

Q.No.5 (a) Ethylene Glycol is used as Automobile Antifreeze. It has 38.7% Carbon, 9.7% Hydrogen and 51.6% Oxygen. Its Molar Mass is 62.1 g mol^{-1} . Determine its Empirical Formula. (4)

(b) What are Molecular Solids? Write their three properties. (4)

Q.No.6 (a) Define Joule Thomson Effect and write Linde's Method for Liquefaction of Gases. (4)

(b) Define Quantum Numbers and explain Principal Quantum Number. (4)

Q.No.7 (a) Define Atomic Orbital Hybridization and describe the structure of Ethyne by it. (4)

(b) Define Enthalpy. How is it determined with help of Bomb's Calorimeter. (4)

Q.No.8 (a) Explain the following applications of Equilibrium Constant. Give examples. (4)

(i) Direction of Reaction (ii) Extent of Reaction.

(b) Balance the following equation by Ion - Electron Method :



Q.No.9 (a) Calculate the Mole Fraction of each component in a solution having 92.0 g of Ethyl Alcohol, 96.0 g of Methyl Alcohol and 90.0 g of Water. (4)

(b) Explain Energy of Activation. (4)

2

Paper I (Objective Type)

(Inter-A-2018)

New Pattern

Time : 20 Minutes

Inter (Part - I)

Group 2nd

Marks : 17

Session (2015 - 17) to (2017 - 19)



BWP-11-02-18

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 number. 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	27 g of Al will react completely with how much mass of O_2 to produce Al_2O_3 :
(1)	(A) 8 g of Oxygen (B) 16 g of Oxygen (C) 32 g of Oxygen (D) 24 g of Oxygen
(2)	Pressure remaining constant at which temperature the volume of a gas will become twice of what it is at $0^\circ C$: (A) $546^\circ C$ (B) $200^\circ C$ (C) 546 K (D) 273 K
(3)	Solvent Extraction method is particularly useful technique for separation when the product to be separated is : (A) Non - Volatile or Thermally Unstable (B) Volatile or Thermally Stable (C) Non - Volatile or Thermally Stable (D) Volatile or Thermally Unstable
(4)	Isotopes differ in : (A) Properties which depend upon mass (B) Arrangement of Electrons in Orbitals (C) Chemical Properties (D) The extent to which they may be affected in electromagnetic field
(5)	If Absolute Temperature of a Gas is doubled and the pressure is reduced to one half, the volume of the gas will : (A) Remains unchanged (B) Increase four times (C) Reduce to $1/4$ (D) Be doubled
(6)	When 6d Orbital is complete, the entering electron goes into : (A) 7f (B) 7s (C) 7p (D) 7d
(7)	Ionic Solids are characterized by : (A) Low Melting Points (B) Good conductivity in solid state (C) High Vapour Pressure (D) Solubility in Polar Solvents
(8)	When water freezes at $0^\circ C$, 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
(9)	In the ground state of an atom, the electron is present : (A) In the Nucleus (B) In the Second Shell (C) Nearest to the Nucleus (D) Farthest from the Nucleus
(10)	For a given process, the heat changes at constant pressure (q_p) and at 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) $q_p = q_v/2$
(11)	Which of the following species has un-paired electrons in the anti-bonding molecular orbitals : (A) O_2^{-2} (B) N_2^{-2} (C) B_2 (D) F_2
(12)	Which of the following Molecules has zero Dipole Moment : (A) NH_3 (B) $CHCl_3$ (C) H_2O (D) BF_3
(13)	The pH of $10^{-3} \text{ mol dm}^{-3}$ of an aqueous solution of H_2SO_4 is : (A) 3.0 (B) 2.7 (C) 2.0 (D) 1.5
(14)	The Cathodic Reaction in the Electrolysis of dil H_2SO_4 with Pt electrodes is : (A) Reduction (B) Oxidation (C) Both Oxidation and Reduction (D) Neither Oxidation or Reduction
(15)	The molal boiling point constant is the ratio of the elevation in boiling point to : (A) Molarity (B) Molality (C) Mole Fraction of Solvent (D) Mole Fraction of Solute
(16)	For which system, does the equilibrium constant K_c has units (Concentration) $^{-1}$: (A) $N_2 + 3H_2 \rightleftharpoons 2NH_3$ (B) $H_2 + I_2 \rightleftharpoons 2HI$ (C) $2NO_2 \rightleftharpoons N_2O_4$ (D) $2HF \rightleftharpoons H_2 + F_2$
(17)	The rate of reaction : (A) Increases as the reaction proceeds (B) Decreases as the reaction proceeds (C) Remains the same as the reaction proceeds (D) May decrease or increase as the reaction proceeds



Roll No.	814 - 18000	New Pattern	Inter (Part - I) / Group 2nd
Chemistry (Subjective)	Inter-A-2018	Time : 2 : 40 Hrs Marks = 68	Session (2015 - 17) to (2017 - 19)

Note : It is compulsory to attempt any (8 - 8) parts each from Q.No.2 and Q.No.3 and attempt any (6) parts from Q.No.4 .
Attempt any (03) questions from Part II Write same Question No. and its Part No. as given in the question paper.

Make Diagram where necessary.

Part - I

BWP-11-C12-18

22 x 2 = 44

- Q.No.2** (i) What is Molecular Ion? How is it formed?
(ii) Why Actual Yield is usually less than Theoretical Yield?
(iii) What is Avogadro's Number? Give its numerical value.
(iv) How undesirable Colour can be removed from a Crude Crystalline Product?
(v) What is the difference between Adsorption Chromatography and Partition Chromatography?
(vi) Write two characteristics of Plasma.
(vii) State Avogadro's Law and give an example.
(viii) SO_2 is comparatively non-ideal at 273 K but behaves ideally at 327°C , why?
(ix) What are Irreversible Reactions? Give an example.
(x) How does a Catalyst affect the equilibrium position of a reversible reaction?
(xi) Define pH of a Solution. Give its mathematical formula.
(xii) What are Basic Buffers? How are they prepared?
- Q.No.3** (i) Ice Floats on Water. Give reason.
(ii) The Crystals showing Isomorphism mostly have the same atomic ratio, give reason.
(iii) Earthenware Vessels keep water cool, give reason.
(iv) Heat of Sublimation of Iodine is very high, give reason.
(v) Ionic Bonds are stronger than Covalent Bonds, give reason.
(vi) Helium shows diamagnetic behaviour, give reason.
(vii) Bond Distance is the Compromise Distance between two atoms, justify.
(viii) How Dipole Moment is helpful to determine the Molecular Structure?
(ix) Define State Function and write two properties that are State Function.
(x) Define Standard Enthalpy of Combustion and Standard Enthalpy of Solution.
(xi) Calculate the Molality of 8% w/w NaCl Solution.
(xii) State Rault's Law.
- Q.No.4** (i) Differentiate between Atomic Emission Spectrum and Atomic Absorption Spectrum.
(ii) Why are the Positive Rays called " Canal Rays "? Give reason.
(iii) Why the e/m value of Positive Rays obtained from H_2 Gas is 1836 times lesser than that of Cathode Rays?
(iv) Differentiate between Zeeman Effect and Stark Effect.
(v) Why is the Porous Plate or a Salt Bridge not required in Lead Storage Accumulator?
(vi) How is the Standard Oxidation Potential of Zn is + 0.76 V but the Reduction Potential is - 0.76 V ?
(vii) Why can Na and K displace H_2 from Acids but Pt, Pd and Cu can not displace?
(viii) How Electrochemical Series helps to predict the feasibility of a chemical reaction? Give an example.
(ix) Justify that a Catalyst is specific for a chemical reaction using HCOOH as reactant producing different products.

Part - II

- Q.No.5** (a) A well known Ideal Gas is enclosed in a container having volume 500 cm^3 at S.T.P. (4)
Its mass comes out to be 0.72 g. What is the Molar Mass of this Gas?
(b) Define Liquid Crystal. Give four applications of Liquid Crystals. (4)
- Q.No.6** (a) Write four applications of Dalton's Law of Partial Pressure. (4)
(b) Derive Radius of Revolving Electron in the nth Orbit of Hydrogen (H) Atom. (4)
- Q.No.7** (a) Define Ionization Energy. Write down factors influencing Ionization Energy. (4)
(b) State Ist Law of Thermodynamics. Prove that $\Delta H = q_p$ (4)
- Q.No.8** (a) Define pH and pOH. How are they related with pK_w ? (4)
(b) Define Electrochemical Series. Give its three applications. (4)
- Q.No.9** (a) Pure Benzene has Vapour Pressure of 122.0 torr at 32°C . When 20 g of a non-volatile solute were dissolved in 300 g of Benzene, a vapour pressure of 120 torr was observed. Calculate the Molecular Mass of the solute. The Molecular Mass of Benzene being 78.1. (4)
(b) How does Arrhenius Equation help us to calculate the energy of activation of a reaction? (4)