CHEMISTRY (New Scheme) (INTER PART - I) 318 - (IV) Paper - I

Time: 20 Minutes OBJECTIVE Marks: 17

Code: 6487

NOTE: You have four choices for each objective type question as A, B, C and D. The choice which you think 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. Attempt as many questions as given in objective type question paper and leave others blank.

1. 1 - Which of the following molecules has zero dipole moment?
(A) NH_3 (B) $CHCl_3$ (C) H_2O (D) CS_2

2 - Splitting of spectral lines when atoms are subjected to strong electric field is called
(A) Compton effect (B) Zeeman effect (C) photoelectric effect (D) stark effect

3 - The boiling point of water at Murree hill is
(A) 99.8^oC (B) 98^oC (C) 100^oC (D) 89^oC

4 - If 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

5 - The largest number of molecules are present in
(A) 4.8g of C_2H_5OH (B) 2.8g of CO (C) 5.4g of N_2O_5 (D) 3.6g of H_2O

6 - Hydrolysis of tertiary butyl bromide is
(A) zero order reaction (B) first order reaction
(C) pseudo first order reaction (D) second order reaction

7 - 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

8 - The solubility product of $AgCl$ is 2.0×10^{-10} mol^2/dm^{-6}. The maximum concentration of Ag^+ ions in solution is
(A) 2.0×10^{-10} mol dm^{-3} (B) 1.41×10^{-5} mol dm^{-3}
(C) 1.0×10^{-10} mol dm^{-3} (D) 4.0×10^{-20} mol dm^{-3}

9 - For the reaction $NaOH + HCl \longrightarrow NaCl + H_2O$ the change in enthalpy is called
(A) heat of neutralization (B) heat of reaction
(C) heat of formation (D) heat of combustion

10 - The number of moles of CO_2 which contain 8.0g of oxygen.
(A) 0.25 (B) 0.50 (C) 1.0 (D) 1.50

11 - The comparative rates at which the solutes move in paper chromatography depend on
(A) size of paper (B) R_f value of solute
(C) temperature of experiment (D) size of chromatographic tank used

12 - Which of the following is pseudo solid
(A) CaF_2 (B) glass (C) NaCl (D) KBr

13 - The velocity of photon
(A) is independent of wavelength (B) depends upon its wavelength
(C) equals to square of its amplitude (D) depends on its source

14 - The molar volume of CO_2 is maximum at
(A) STP (B) 0^oC and 2atm (C) 127^oC and 1atm (D) 273^oC and 2atm

15 - 18g glucose is dissolved in 90g of water, the relative lowering of vapour pressure is
(A) $\frac{1}{5}$ (B) 5.1 (C) $\frac{1}{51}$ (D) 6

16 - Optimum temperature for synthesis of ammonia by Haber Process is
(A) 370^oC (B) 390^oC (C) 400^oC (D) 410^oC

17 - Which of the hydrogen halides has the highest percentage of ionic character?
(A) HCl (B) HBr (C) HF (D) HI

4. Write short answers to any SIX questions. **(2 x 6 = 12)**

i - Why is it necessary to decrease the pressure in the discharge tube to get the cathode rays?

ii - What is atomic emission spectrum?

iii - Write down the importance of Moseley's law.

iv - Distribute electrons in the orbitals of

a) $_{29}Cu$ b) $_{55}Cs$

v - Write down the difference between ionization and electrolysis.

vi - Impure Cu can be purified by electrolytic process. Give reasons.

vii - Differentiate between electrolytic cell and voltaic cell.

viii - Rate of chemical reaction is an ever changing parameter under the given conditions. Justify the statement.

ix - The sum of the co-efficients of a balanced chemical equation is not necessarily important to give the order of reaction. Give reasons in support of your answer.

(SECTION – II)

5. (a) An unknown metal 'M' reacts with S to form a compound with a formula M_2S_3 if 3.12 g of 'M' reacts with exactly 2.88 g of sulphar. What are the names of metal 'M' and the compound M_2S_3? **(4)**

(b) Define evaporation. Explain any three factors affecting evaporation rate. **(1+3)**

6. (a) State Graham's law of diffusion. Give its experimental verification. **(4)**

(b) Derive an expression to calculate the radius of revolving electron in nth orbit by Bohr's model of atom. **(4)**

7. (a) Define electron affinity. Give its trend in the periodic table. Also mention abnormal behaviour of electron affinity in different groups. **(4)**

(b) Define enthalpy. Prove $q_P = \Delta H$. **(4)**

8. (a) How can you predict the followings with the help of equilibrium constant (K_C) of reversible reaction: **(4)**

i) Direction of a reaction ii) Extent of a reaction

(b) i) Give explanation of electrolysis of fused sodium chloride. **(4)**

ii) Explain electrolytic method for the production of caustic soda on industrial scale.

9. (a) The boiling point of a solution containing 0.2g of a substance 'A' in 20.0 g of ether (molar mass = 74) is 0.17 K higher than that of pure ether. Calculate the molar mass of 'A'. Molal boiling point constant of ether is 2.16 K. **(4)**

(b) Name various factors affecting rate of reactions. Explain any one. **(4)**

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Time: 2:40 Hours SUBJECTIVE Marks: 68

Note: Section I is compulsory. Attempt any three (3) questions from Section II.

(SECTION – I)

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

i - One mole of H_2SO_4 should completely react with two moles of NaOH. How does Avogadro's number help to explain it?

ii - How does one mole of H_2O contain 2 moles of bonds, 3 moles of atoms, 10 moles of electrons and 20 moles of total fundamental particles?

iii - How N_2 and CO have same number of electrons, protons and neutrons?

iv - Write four characteristics of an ideal solvent used in solvent extraction.

v - Differentiate between partition chromatography and adsorption chromatography.

vi - Why are H_2 and He ideal at room temperature but SO_2 and $C\ell_2$ non-ideal at room temperature?

vii - Why is the plot of PV verses P a straight line at constant temperature and with a fixed number of moles of ideal gas?

viii - Why do water vapours not behave ideally at 273 K?

ix - What effect will be observed when we change pressure, on the production of NH_3 and SO_3 by following reactions:

$$N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$$

$$2SO_2(g) + O_2(g) \rightleftharpoons 2SO_3(g)$$

x - What will be the nature of solution having pH equal to 12?

xi - What is buffer capacity?

xii - Write the relationship of pH and pOH with pK_w.

3. Write short answers to any EIGHT questions. (2 x 8 = 16)

i - Graphite is good conductor of electricity but diamond is bad conductor of electricity. Give reason.

ii - Define symmetry and habit of crystal.

iii - Define lattice energy. Give an example.

iv - Explain electron gas theory for metallic bond.

v - Why does lone pair of electrons occupy more space as compared to bond pair?

vi - Why does Helium not exist in the form of He_2?

vii - Electronegativity difference between the bonded atoms is an index to the polar nature of covalent bond, justify.

viii - Why is MOT superior to VBT?

ix - What is non-spontaneous process? Give two examples.

x - Why is it necessary to mention the physical states of reactants in a thermochemical reactions?

xi - Differentiate between ideal and non-ideal solutions.

xii - Define colligative properties. Why are they so called?

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