

INTERMEDIATE PART-I (11th CLASS)**CHEMISTRY PAPER-I (OLD SCHEME)**

TIME ALLOWED: 2.40 Hours

GROUP-II**SUBJECTIVE**

MAXIMUM MARKS: 68

**NOTE: - Write same question number and its part number on answer book,
as given in the question paper.****SECTION-I****2. Attempt any eight parts.****8 × 2 = 16**

- (i) Law of Mass Action has to be obeyed during Stoichiometric Calculation.
- (ii) N_2 and CO have the same number of electrons, protons, and neutrons. Explain.
- (iii) Why is there a need to crystallize the crude product?
- (iv) How the Crystals are dried?
- (v) SO_2 is comparatively non-ideal at 273K but behaves ideally at $327^\circ C$. Why is it so?
- (vi) Give two uses of Plasma.
- (vii) Derive Graham's Law of diffusion from Kinetic molecular theory of gases.
- (viii) What is the effect of temperature and pressure on the density of a gas?
- (ix) Why evaporation causes cooling?
- (x) Heat of sublimation of a substance is greater than that of heat of vaporization.
- (xi) Diamond is hard and electrically insulator. Why?
- (xii) The electrical conductivity of the metal decreases by increasing temperature. Explain.

3. Attempt any eight parts.**8 × 2 = 16**

- (i) What is Zeeman effect?
- (ii) What is Moseley's Law? Give its two importance.
- (iii) Write down two defects of Rutherford's model of atom.
- (iv) Define Electron Affinity. How it varies in the periodic table?
- (v) Why MOT is superior to Valence Bond Theory?
- (vi) Define Ionic Bond. Also give an example.
- (vii) Prove that $\Delta E = q_v$
- (viii) What are Spontaneous reactions? Give an example.
- (ix) Define Standard Enthalpy of combustion. Support your answer with an example.
- (x) Calculate pK_a of acetic acid when $K_a = 1.8 \times 10^{-5}$
- (xi) How does a catalyst affect a reversible reaction?
- (xii) Work out units of K_C for the process $N_2 + 3H_2 \rightleftharpoons 2NH_3$

4. Attempt any six parts.**6 × 2 = 12**

- (i) Define Molarity and Molality and give one example of each.
- (ii) What is meant by Conjugate Solutions?
- (iii) What is the difference between Positive and Negative deviation of non-ideal solutions?
- (iv) Give two applications of Boiling Point Elevation and Freezing Point Depression Phenomena.
- (v) Calculate oxidation number of Cr in $K_2Cr_2O_7$.
- (vi) What is Reduction Potential of Standard Hydrogen Electrode under standard conditions?
- (vii) What is meant by Rate Determining Step?
- (viii) What is the difference between Rate of Reaction and Rate Constant?
- (ix) Name any two physical methods for determination of Rate of a Reaction.

P.T.O.

SECTION-II**NOTE: - Attempt any three questions.**

- 5.(a) What is Mass Spectrometer? Briefly explain its working. 4
- (b) Define Common Ion Effect. Give two examples. 4
- 6.(a) What are Colligative Properties? Write the conditions necessary for observing the Colligative properties. 4
- (b) Hydrogen (H_2) diffuses through a porous plate at rate of 500 cm^3 per minute at 0°C . What is rate of diffusion of Oxygen (O_2) gas through the same porous plate at 0°C ? 4
- 7.(a) Define Covalent Solids and discuss its properties. 4
- (b) By applying, Hess's Law calculate the enthalpy change for the formation of an aqueous solutions of NH_4Cl from $NH_{3(gas)}$ and $HCl_{(gas)}$. The results for the various reactions and pressures are as follows:- 4
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| (i) $NH_3(g) + aq \rightarrow NH_3(aq)$ | $\Delta H = -35.16\text{ kJ mol}^{-1}$ |
| (ii) $HCl(g) + aq \rightarrow HCl(aq)$ | $\Delta H = -72.41\text{ kJ mol}^{-1}$ |
| (iii) $NH_3(aq) + HCl(aq) \rightarrow NH_4Cl(aq)$ | $\Delta H = -51.48\text{ kJ mol}^{-1}$ |
- 8.(a) Derive the equation for the radius of nth orbit of Hydrogen atom using Bohr's Model. 4
- (b) How does Arrhenius equation help us to calculate the energy of activation of a reaction? 4
- 9.(a) Give main postulates of VSEPR Theory. Explain structure and geometry of NH_3 molecule on its basis. 4
- (b) Describe Standard Hydrogen Electrode. How it is used to measure Standard Reduction Potential of Copper electrode (i.e. Cu dipped in $1M\ CuSO_4$ solution) 4