

CHEMISTRY (Subjective) GROUP - I

Time: 02:40 Hours

Marks: 68

SECTION – I**2. Write short answers of any EIGHT parts.**

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- (i) Calculate average atomic mass of neon.
- (ii) Define molar volume. Give one example.
- (iii) What is the function of electric field in mass spectrometer?
- (iv) How crystals are dried in an oven?
- (v) Write any two uses of chromatography.
- (vi) Define crystallization.
- (vii) Write any four properties of gases.
- (viii) Convert 40°C into Kelvin scale.
- (ix) Write two faulty assumptions of kinetic molecular theory.
- (x) Differentiate between reversible and irreversible reactions.
- (xi) State law of mass action.
- (xii) State common ion effect.

3. Write short answers of any EIGHT parts.

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- (i) What are dipole dipole forces? Give one example.
- (ii) Name the factors which affect the London forces.
- (iii) Cleavage of crystals is itself anisotropic behaviour. Explain.
- (iv) Why ice occupies 9% more volume than liquid water?
- (v) Why cathode rays are also called as electrons?
- (vi) Write any four properties of positive rays.
- (vii) Define spectrum and name any two types of spectrums.
- (viii) For azimuthal quantum number, $\ell = 2$ and $\ell = 3$; calculate total values of magnetic quantum number.
- (ix) Define solubility curve. Name its two types.
- (x) Sum of mole fractions of a mixture is always equal to unity. Justify.
- (xi) What do you mean by order of reaction? Give two examples.
- (xii) What is the effect of temperature on rate of chemical reaction?

4. Write short answers of any SIX parts.

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- (i) Name the factors influencing the ionization energy.
- (ii) How sigma and pi bonds are formed?
- (iii) Draw the structure of ethene ($\text{CH}_2=\text{CH}_2$) using sp^2 hybridization approach.
- (iv) The bond angles of H_2O and NH_3 are not 109.5° like CH_4 . Give reason.
- (v) Define system and surroundings.
- (vi) What is standard enthalpy of atomization? Give an example.
- (vii) Differentiate between endothermic and exothermic reactions.
- (viii) Define (a) Electrolysis (b) Oxidation state.
- (ix) A salt bridge maintains electrical neutrality in the cell. Give reason.

SECTION – II Attempt any THREE questions. Each question carries 08 marks.

5. (a) How can we determine the percentage of carbon, hydrogen and oxygen in the given organic compound by combustion analysis? 04

(b) Define the boiling point. Explain the variation of boiling point with external pressure. 04

6. (a) Discuss defects of Bohr's atomic model. 04

(b) 250cm^3 of a sample of hydrogen effuses four times as rapidly as 250cm^3 of an unknown gas. Calculate the molar mass of unknown gas. 04

7. (a) Write postulates of VSEPR Theory. Also explain the structures of AB_3 type molecules in detail. (Any two molecules) 02,02

(b) $\text{N}_2(\text{g})$ and $\text{H}_2(\text{g})$ combine to give $\text{NH}_3(\text{g})$. The value of K_c in this reaction at 500°C is 6.0×10^{-2} . Calculate the value of K_p for this reaction: $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightleftharpoons 2\text{NH}_3(\text{g})$ 04

8. (a) Differentiate between spontaneous and non-spontaneous reactions with examples. 04

(b) Write four important industrial applications of electrolysis. 04

9. (a) Describe phenol-water system in detail for partially miscible liquid. 04

(b) Write any four characteristics of a catalyst. 04