

"Section - B"Marks: 40

Q-2. Write short answers to any ten (10) of the following parts. All parts carry equal marks:-

- (i) Why actual yield of reaction is always lesser than its theoretical yield?
- (ii) Calculate the number of molecules present in 51 grams of NH_3 at S.T.P?
- (iii) What is Planck's Quantum theory? What are its postulates?
- (iv) What are the five series of spectral lines, observed for hydrogen atom?
- (v) Define resonance? What are the basic conditions for writing resonating structures?
- (vi) Define plasma. How it occurs in nature?
- (vii) What is meant by Joule Thomson effect?
- (viii) What are dipole-dipole forces?
- (ix) Why crystalline solids are anisotropic in nature?
- (x) How K_c value helps to predict the extent of reversible reaction?
- (xi) Calculate the pH of 0.0005M $\text{Ca}(\text{OH})_2$ solution.
- (xii) Calculate the mole fraction of $\text{C}_2\text{H}_5\text{OH}$ in one molal aqueous $\text{C}_2\text{H}_5\text{OH}$ solution.
- (xiii) Calculate the oxidation state of carbon in:
 - (a) CH_4
 - (b) CH_3Cl
 - (c) CH_2Cl_2
 - (d) CHCl_3

"Section - C"Marks: 27

Note: Answer any three (3) questions. All questions carry equal marks:-

- Q-3. (i) What are limiting and excess reactants? How limiting reactant controls the quantity of products?
- (ii) State and explain Moseley's law?
- Q-4. (i) Explain the shapes of NH_3 and BF_3 on the basis of VSEPR theory.
- (ii) Hydrogen gas diffuses through a porous plate at a rate of 500cm/min at 0°C . What will be the rate of diffusion of oxygen through the same plate at 0°C ?
- Q-5. (i) Why crystalline solids have definite shapes and sharp melting points?
- (ii) State and explain Le-Chatelier's principle.
- Q-6. (i) State and explain Hess's law of constant heat summation.
- (ii) Balance the following equations by ion-electron method:
 - (a) $\text{I}^- + \text{NO}_2 \rightarrow \text{I}_2 + \text{NO}$ (acidic medium)
 - (b) $\text{H}_2\text{O}_2 + \text{MnO}_4^- + \text{H}^+ \rightarrow \text{Mn}^{2+} + \text{O}_2 + \text{H}_2\text{O}$ (acidic medium)