Chemistry Assignment for Sem V Students (2025-26)

Paper: Physical Chemistry

❖ *This assignment is common for both Major-1 and Major-2 students.*
❖ *Use a fair register to answer the questions*

Q1- Define Second law of thermodynamics in at least three different ways.

Q2- What do you mean by Carnot Cycle? Explain in detail the efficiency of the engine on the basis of Carnot cycle.

Q3- Write short note on Carnot Theorem.

Q4- Describe thermodynamic scale of temperature.

Q5- State and explain Le-Chatelier's Principle. Discuss its some important application.

Q6- Derive Van't Hoff isotherm on the basis of thermodynamics.

Q7- Write note on Van't Hoff isochore.

Q8- Give the thermodynamic derivation of Clapeyron equation and Clausius- Clapeyron equation. Discuss their application also.

Q9- Explain the term Entropy. Show that it is a state function.

Q10- Explain Physical significance of entropy.

Q11- Explain that in a reversible process, there is no net entropy change.

Q12- Explain Entropy change in irreversible process.

Q13- Write short notes on Entropy as Criteria of spontaneity and equilibrium.

Q14- Write short notes on Clausius Inequality.

Q15- Write short notes on Entropy change in of an ideal gas when:

    (a) Entropy is function of V and T

    (b) Entropy is function of P and T

Q16- Explain Entropy of mixing of ideal gases.

Q17- Write Short notes on Entropy change in Physical change.

Q18- Write short notes on Gibbs free energy.

Q19- How Gibbs free energy change with change in temperature and pressure.

Q20- Write short notes on Helmholtz free energy.

Q21- How Helmholtz free energy change with change in temperature and volume.

Q22- What do you understand by Gibbs-Helmholtz equation. Give application of Gibbs-Helmholtz equation.

Q23- State and explain Kohalrausch's law of ionic mobilities. Discuss its applications.

Q24- Explain Arrhenius Theory of electrolytic dissociation. Describe its limitation.

Q25- What is Ostwald's dilution law? Give limitation of this law?

Q26- Write Debye-Huckel-Onsagar equation in complete form. What do different symbols signify?

Q27- What do you mean by transport number of an ion. Describe Hittorf's method to determine transport number.

Q28- Wrire a short note on application of conductivity measurement.

(a) How is solubility of a springly soluble salt is determined.

(b) How ionic product of water is determined.

Q29- What is Reference Electrodes. Explain the Standard Hydrogen Electrode and Calomel Electrode.

Q30- Derive Nernst equation for e. m. f. of a cell reaction.

Q31- Discuss the Electrochemical series. Give application of electrochemical series.

Q32- What are Concentration cells? How are they classified into different types? Give one example of each. Taking suitable example of a concentration cell, derive expression for the EMF of a concentration cell.

Q33- Write a short note on liquid junction potential.

Q34- Explain the types of Adsorption.

Q35- Write short notes on Freundlich adsorption isotherm.

Q36- Write short notes on Langmuir adsorption isotherm.

Q37- Write short notes on BET isotherm for multilayer adsorption.

Q38- Write short notes on factor affecting Adsorption.

Q39- Write short notes on calculation of thermodynamic quantity of cell reaction.

Q40- Write short notes on Galvanic cell.