Content of the questions on Chemistry.

CHEMISTRY (last two years of high school)

1. Basic Contents


Dynamic concept of chemical equilibrium. Equilibrium constant: $k_c$ and $k_p$ and the relationship between them. Altering equilibrium: Le Chatelier's principle.
Heterogeneous equilibrium. Precipitation reactions: solubility and solubility product.
Factors that affect equilibrium.
Applications of kinetics and chemical equilibrium in daily life and in industrial processes: The Haber-Bosch process.

6. **Acids and Bases.**
General characteristics. Acid-base theories. Arrhenius and Brønsted-Lowry.
Ionic equilibrium of water.
Concept of pH. Calculation and measurement of pH in aqueous solutions of acids and bases.
Strong and weak acids and bases. Neutralization reaction.
Quantitative treatment of aqueous solutions of salts as special cases of acid-base equilibria.
Buffer solutions.
Some acids and bases of interest in industry and in daily life. The problem and consequences of acid rain.

7. **Electron Transfer Reactions.**
Concept of standard reduction potential. Scale of oxidizing and reducing agents.
Spontaneity of redox reactions.

8. **Organic Chemistry.**
Characteristics of the carbon atom.
Nomenclature and formulation of the main oxygenated and nitrogenated organic compounds. Types of organic reaction: substitution, addition, elimination and oxidation.
Structural and spatial isomerism.
Organic compounds of interest: alcohols, esters and acids: how they are obtained, their properties and importance.
Polymers and polymerization reactions by addition and condensation.

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