



IERT EXAM SYLLABUS [CHEMISTRY]



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CHEMISTRY

A. GENERAL & PHYSICAL CHEMISTRY

1. Science & scientific method, definition of chemistry, branches of chemistry and importance of chemistry in the modern age.
2. Matter and its three physical states & deviation based on molecular kinetic theory.
3. Atom, molecule and laws of chemical combination (Statement and examples).
4. Atomic structure, nuclear proton, neutron, atomic mass unit, electrons and their orbits (Atomic no. & isotopes) Introduction of radio activity and nuclear energy.
5. Valency- electrovalency and co-valency.
6. Symbol, formula, chemical equation, and balancing of simple chemical equations.
7. Gas laws – Boyle's laws, charle's law, and gas equation; Gay-lussac's law of gaseous volumes, Dalton's law of partial pressure and Graham's law of diffusion.
8. Avogadro's Hypothesis and its importance.
9. Atomic weight, molecular weight & equivalent weight. Examples and methods of their determinations (for molecular weight only Victor Meyer's and Hoffman's method).
10. Faradays law of electrolysis, explanation of acid, base & salt, elementary concept of ionization. Principles of simple voltaic cell.
11. Different chemical reactions-addition, substitution, dissociation, hydrolysis, double decomposition, oxidation reduction and catalytic.
12. Explanation of solution- solution, solute, solvent saturated solution, unsaturated solution, and super saturated solution, normal solution-molal solution, molar solution, solubility, viz; reaction of solution, some important solvents water, benzene, ether, acetone, carbon tetrachloride and Alcohol.

B. INORGANIC CHEMISTRY:

1. Classification of elements, general characteristics of Mendeleev's periodic table.
2. Electronic configuration & position of the following elements in the periodic table, hydrogen, carbon, nitrogen, phosphorus, sulphur & chlorine.
3. Drinking water, volumetric composition of water, hard & soft water, temporary & permanent hard water. Physical & chemical methods for removal of hardness of water.
4. Laboratory method of preparation; properties and uses of the following gases; oxygen, nitrogen, chlorine, ammonia, sulphur dioxide, sulphurated hydrogen & hydrogen chloride.
5. Difference between metals & non metals, metallurgy of Aluminum.

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C. ORGANIC CHEMISTRY:

1. Introduction of organic chemistry. Definition and scope of organic chemistry, difference between organic & inorganic compounds. Preliminary introduction of tetrahedral nature of carbon atom.
2. Classification & nomenclature of organic compounds-Aliphatic & Aromatic (Homologous Series).
3. Methods of preparation and properties of Paraffins (Methane and Ethane) and unsaturated hydrocarbons (Ethylene and acetylene).
4. Simple introduction of Plastic, artificial fiber, medicines, explosives, soap and detergents.

D. NUMERICAL PROBLEMS:

Numerical problems based on the following topics – laws of chemical combination, percentage composition, Empirical and molecular formula, chemical equation, equivalent weight, valency, molecular weight of Volatile substances, Graham's Law of diffusion and Gas equation.