

Bhavan's Sheth R. A. College of Science, Ahmedabad-1

Allotment of Topics

B.Sc. Sem- I (General Chemistry)

| CHE-101 (General Chemistry) | | |
|------------------------------------|---|------------------|
| UNIT | TOPIC NAME | FACULTY |
| I | Inorganic Chemistry (14 Marks) | |
| | (a) Lanthanides Electron configuration, Oxidation states, Magnetic properties, Colour and absorption spectra of lanthanide ions, Lanthanide contraction, Separation and purification of Lanthanides: Ion-exchange and solvent extraction methods. | Prof. J. S. Rana |
| | (b) Actinides Electron configuration, Oxidation states, Magnetic properties, Color and absorption spectra of actinide ions, actinide contraction, Nuclear synthesis of trans uranic elements, Chain reaction, importance of Uranium, Comparison with lanthanide. | Prof. J. S. Rana |
| II | Organic Chemistry (14 Marks) | |
| | (a) Quantitative Analysis & Determination of Molecular Formula Determination of Nitrogen by Kjeldahl's method and Kjeldahl's method modified with boric acid. Molecular weight of organic acid by Ag-salt method and organic base by Chloroplatinate method, Numerical based on empirical and molecular formula. | Dr. H. C. Sonara |
| | (b) Fundamentals of Organic Reactions Fission of covalent bond, types of reagents, Substitution Nucleophilic Unimolecular reaction mechanism (SN1), Substitution Nucleophilic Bimolecular reaction mechanism (SN2), Electrophilic Aromatic Substitution-Elementary treatment only (Nitration, Sulfonation, Halogenation & Friedel-Crafts Alkylation and Acylation) | Dr. H. C. Sonara |
| III | Organic Chemistry (14 Marks) | |
| | (a) Alkanes:- (Saturated Hydrocarbons) Introduction, IUPAC nomenclature, Reduction of R-X, Wurtz's reaction, Hydrolysis of R-Mg-X, Decarboxylation of acid, Kolbe's electrolytic process, Free radical mechanism (Chlorination of Methane). | Dr. D. N. Dave |
| | (b) Alkenes & Alkynes:- (Unsaturated Hydrocarbons) Introduction, IUPAC nomenclature, Preparations (dehydration, dehalogenation, dehydrohalogenation), Reactions with H ₂ , X ₂ , HX, HOCl, H ₂ SO ₄ , and Hydroboration; Oxidation reactions: (i) with cold alkaline KMnO ₄ (Baeyer's reagent), (ii) Oxidative cleavage with acidified or hot KMnO ₄ , (iii) Ozonolysis (O ₃); Polymerization; Reactions of terminal Acetylenes: (i) Addition | Dr. D. N. Dave |

| | | |
|-----------|--|-------------------|
| | of water, (ii) Na / liquid NH ₃ . | |
| IV | Physical Chemistry | (14 Marks) |
| | (a) Thermodynamics:- Zeroth law, first law, Second law of thermodynamics; proof of 2nd law (Carnot's Cycle); Entropy, of Gas and calculation of entropy for different processes; Kirchhoff's equation. | Dr. P. T. Trivedi |
| | (b) Chemical Kinetics:- Basic terms: molecularity, order of reactions. Unit for rate constant; Derivation of: first order rate constant, Second order rate constant for (a=b) and (a ≠ b). Third order rate equation (a=b=c). Determination of Half Life Time for 1 st , 2 nd and 3 rd order reactions. | Dr. P. T. Trivedi |