

LESSON PLAN : ENGINEERING CHEMISTRY

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| Discipline: ELECTRICAL ENGG. | Semester : 1st | Name of the Teaching Faculty: SWATILEENA SATPATHY |
| Subject: ENGINEERING CHEMISTRY | No. of days/per week class allotted: 04 | Semester From date : 25/10/2022 To Date: 31/01/2023 No. of Weeks: 15 |
| Week | Class Day | Theory |
| 1ST | 1ST | Introduction ,Fundamental particles : Electron, Proton & Neutron (mass and charge) Rutherford's Atomic model (Experiment, postulates) |
| | 2ND | Failures of Rutherford's Atomic model, Atomic mass and mass number, Definition, examples and properties of Isotopes, isobars and isotones |
| | 3RD | Bohr's Atomic model (Postulates & drawbacks only), Bohr-Bury scheme |
| | 4TH | Aufbau's principle, Pauli's Exclusion Principle, Hund's rule, Quantum Numbers |
| 2ND | 1ST | Electronic configuration (up to atomic no. 30) |
| | 2ND | Chemical Bonding: Definition, Types, Electrovalent bond: NaCl , MgCl ₂ , Covalent Bond with examples H ₂ , Cl ₂ . |
| | 3RD | Covalent Bond (contd.): O ₂ , N ₂ , H ₂ O, CH ₄ , NH ₃ , Coordinate bond : NH ₄ ⁺ , SO ₂ |
| | 4TH | Concept of Arrhenius, Bronsted Lowry Theory with examples (Postulates and limitations only). |
| 3RD | 1ST | Concept of Lewis theory for acid and base with examples (Postulates and limitations only). Neutralization of acid & base. |
| | 2ND | Types of salts (Normal, acidic, basic, double, complex and mixed salts, definitions with 2 examples from each). |
| | 3RD | Definitions of atomic weight, molecular weight, Equivalent weight |
| | 4TH | Determination of equivalent weight of Acid, Base ,Salt & Ion. |
| 4TH | 1ST | Modes of expression of the concentrations (Molarity , Normality) with Simple Problems |
| | 2ND | Modes of expression of the concentrations (Molality), pH of solution (definition with simple numerical) |
| | 3RD | Importance of pH in industry (sugar, textile, paper industries only), Definition and types of Electrolytes (Strong & weak) with example. |
| | 4TH | CLASS TEST |
| 5TH | 1ST | Electrolysis (Principle & process) with example of NaCl (fused and aqueous solution). |
| | 2ND | Faraday's 1st law of Electrolysis (Statement, mathematical expression, numerical) Faraday's 2nd law of Electrolysis (Statement, Mathematical expression) |
| | 3RD | Industrial application of Electrolysis- Electroplating (Zinc only) Corrosion : Definition & Types, Atmospheric Corrosion |
| | 4TH | Waterline corrosion. Mechanism of rusting of Iron only. Protection from Corrosion by (i) Alloying and (ii) Galvanization |

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| 6 TH | 1 ST | Definition of Mineral, ores , gangue with example. Distinction between Ores And Minerals, Steps of Metallurgy : Ore Dressing, Concentration of Ore (Gravity Separation Method) |
| | 2 ND | Concentration of Ore(contd.) : Froth floatation , Leaching & Magnetic separation method. |
| | 3 RD | Oxidation (Calcinations, Roasting), Reduction (Smelting, Definition & examples of flux, slag) |
| | 4 TH | Refining of the metal (Electro refining & Distillation only) Definition of alloy. |
| 7 TH | 1 ST | Types of alloys (Ferro, Non Ferro & Amalgam) with example, Composition and uses of Brass, Bronze, Alnico, Duralumin |
| | 2 ND | Hydrocarbons & Homologous Series |
| | 3 RD | Classification of Hydrocarbons , Saturated & Unsaturated hydrocarbons (Definition with example), Aliphatic and Aromatic Hydrocarbons (Huckle's rule only). Difference between Aliphatic and Aromatic hydrocarbons |
| | 4 TH | IUPAC system of nomenclature of Alkane (up to 6 carbons) with bond line notation. |
| 8 TH | 1 ST | INTERNAL EXAMINATION |
| | 2 ND | INTERNAL EXAMINATION |
| | 3 RD | IUPAC system of nomenclature of Alkene (up to 6 carbons) with bond line notation. |
| | 4 TH | IUPAC system of nomenclature of Alkyne (up to 6 carbons) with bond line notation. |
| 9 TH | 1 ST | IUPAC system of nomenclature of alkyl halide and alcohol (up to 6 carbons) with bond line notation. |
| | 2 ND | Uses of some common aromatic compounds (Benzene, Toluene, BHC, Phenol) in daily life |
| | 3 RD | Uses of some common aromatic compounds (Naphthalene, Anthracene and Benzoic acid) in daily life. |
| | 4 TH | Sources of water, Soft water, Hard water, hardness, types of Hardness (temporary or carbonate and permanent or non-carbonate) |
| 10 TH | 1 ST | X'MAS HOLIDAYS |
| | 2 ND | X'MAS HOLIDAYS |
| | 3 RD | X'MAS HOLIDAYS |
| | 4 TH | X'MAS HOLIDAYS |
| 11 TH | 1 ST | Removal of hardness by lime soda method (Cold lime soda method---Principle, process & advantages) |
| | 2 ND | Removal of hardness by lime soda method (Hot lime soda method---Principle, process & advantages) , Advantages of Hot lime over cold lime process |
| | 3 RD | Organic Ion exchange method (principle, process, and Regeneration of exhausted resins). |

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| | 4TH | Definition of lubricant, Types (solid, liquid and semisolidwith examples only) |
| 12TH | 1ST | Specific uses of lubricants (Graphite, Oils, Grease),Purpose of lubrication |
| | 2ND | Definition and classification of fuel, Definition of calorific value of fuel, Choice of good fuel |
| | 3RD | Liquid Fuel: Diesel, Petrol, and Kerosene (Composition and uses) |
| | 4TH | Gaseous Fuel: Producer gas and Water gas (Composition and uses). |
| 13TH | 1ST | Elementary idea about LPG, CNG and coal gas(Composition and uses only). |
| | 2ND | CLASS TEST |
| | 3RD | Definition of Monomer, Polymer, Homo-polymer, Co-polymer and Degree of polymerization |
| | 4TH | Difference between Thermosetting and Thermoplastic, Composition and uses of Polythene |
| 14TH | 1ST | Composition and uses of Poly-Vinyl Chloride and Bakelite , Definition of Elastomer (Rubber). |
| | 2ND | Natural Rubber (it's draw backs), Vulcanisation of Rubber. Advantages of Vulcanized rubber over raw rubber. |
| | 3RD | Pesticides: Insecticides, herbicides, fungicides Examples and uses, Bio Fertilizers: Definition, examples and uses. |
| | 4TH | DOUBT CLEARING |
| 15TH | 1ST | REVISION |
| | 2ND | REVISION |

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