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| Discipline: MECHANICAL ENGG. | Semester : 1ST | Name of the Teaching Faculty: RAKESH RANJAN MAHALIK |
| Subject: ENGG CHEMISTRY | No. of days/per week class allotted: 04 | Semester From date :09/11/20 To Date: 31/03/21 No. of Weeks: 15 |
| Week | Class Day | Theory |
| 1 ST | 1 ST | Introduction |
| | 2 ND | Rutherford's atomic model (limitations), Atomic mass, mass number, isotopes, isobar |
| | 3 RD | Isotones, Bohr's atomic model, Bohr Bury scheme, |
| | 4 TH | Aufbau's principle, Hund's rule, Electronic configuration |
| 2 ND | 1 ST | CH-2: Chemical Bonding- Definition, types of bonding |
| | 2 ND | Ionic bonding, examples |
| | 3 RD | Covalent bonding , Examples |
| | 4 TH | Coordinate bonding, examples |
| 3 RD | 1 ST | Ch-3: Acid base theory-Arrhenius concept of acid & base |
| | 2 ND | Bronsted lowry & Lewis concept of acid & base |
| | 3 RD | Neutralization of acid & base, salts- definition & types. |
| | 4 TH | Definition of Atomic weight, molecular weight, equivalent weight, |
| 4 TH | 1 ST | Determination of equivalent weight of Acid, Base |
| | 2 ND | Determination of equivalent weight of salt |
| | 3 RD | Modes of expression of the concentrations (Molarity , Normality) with Simple Problems |
| | 4 TH | Molality with Simple Problems |
| 5 TH | 1 ST | pH of solution (definition with simple numerical) |
| | 2 ND | Importance of pH in industry (sugar, textile, paper industries only) |
| | 3 RD | Chapter 5 : Electrochemistry : Definition and types (Strong & weak) of Electrolytes with example. |
| | 4 TH | Electrolysis (Principle & process) with example of NaCl (fused and aqueous solution). |
| 6 TH | 1 ST | Faraday's 1st and 2nd law of Electrolysis (Statement, mathematical expression and Simple numerical) |
| | 2 ND | Industrial application of Electrolysis- Electroplating (Zinc only). |
| | 3 RD | Chapter 6 : Corrosion: Definition of Corrosion, Types of Corrosion- Atmospheric Corrosion, |

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| | 4 th | Waterline corrosion. Mechanism of rusting of Iron only. Protection from Corrosion by (i) Alloying and (ii) Galvanization. |
| 7 th | 1 st | Chapter 7 : Metallurgy: Definition of Mineral, ores , gangue with example. Distinction between Ores And Minerals. |
| | 2 nd | General methods of extraction of metals, i) Ore Dressing ii) Concentration (Gravity separation, magnetic separation, Froth floatation & leaching) |
| | 3 rd | iii) Oxidation (Calcinations, Roasting) iv) Reduction (Smelting, Definition & examples of flux, slag) |
| | 4 th | v) Refining of the metal (Electrorefining, & Distillation only) |
| 8 th | 1 st | Chapter 8 : Alloys: Definition of alloy. Types of alloys (Ferro, Non Ferro & Amalgam) with example. Composition and uses of Brass, Bronze, Alnico, Duralumin |
| | 2 nd | Doubt clear |
| | 3 rd | Chapter 9 : Hydrocarbons : Saturated and 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, |
| 9 th | 1 st | IUPAC system of nomenclature of Alkene, |
| | 2 nd | IUPAC system of nomenclature of Alkyne, |
| | 3 rd | IUPAC system of nomenclature of alkyl halide and alcohol |
| | 4 th | Uses of some common aromatic compounds (Benzene, Toluene, BHC, Phenol, Naphthalene, Anthracene and Benzoic acid) in daily life. |
| 10 th | 1 st | Doubt clear |
| | 2 nd | Chapter 10 : Water Treatment : Sources of water, Soft water, Hard water, hardness, types of Hardness (temporary or carbonate and permanent or non-carbonate), |
| | 3 rd | Removal of hardness by lime soda method (hot lime & cold lime—Principle, process & advantages) , Advantages of Hot lime over cold lime process. |
| | 4 th | Organic Ion exchange method (principle, process, and regeneration of exhausted resins) |
| 11 th | 1 st | Doubt clear |
| | 2 nd | Chapter 11 : Lubricants: Definition of lubricant, |

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

Learning Resources:

1. Textbook of Intermediate Chemistry Part-1 and Part-2 by Nanda, Das, Sharma,
2. Engineering Chemistry by Y.R. Sharma and P. Mitra, Kalyani Publishers
3. Engineering Chemistry for Diploma – Dr. R K Mohapatra, PHI Publication, New Delhi.