LESSON PLAN : ENGINEERING CHEMISTRY
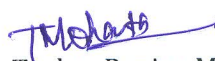
Discipline: **ELECTRICAL ENGG.**	Semester : **1st**	Name of the Teaching Faculty: **TUSHAR RANJAN MOHANTA**	
Subject: **ENGINEERING CHEMISTRY**	No. of days/per week class allotted: **04**	Semester From date : 25/10/2022 To Date: 31/01/2023 No. of Weeks: 15	
Week	**Class Day**	**Theory**	
1ST	1ST	Introduction ,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 wth examples H_2, Cl_2 .	
	3RD	Covalent Bond (contd.): O_2, N_2, H_2O, 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 acidand 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, Equivalentweight	
	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 industriesonly), Definition and types of Electrolytes (Strong & weak) withexample.	
	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 : Defination & Types, Atmospheric Corrosion	
	4TH	Waterline corrosion. Mechanism of rusting of Iron only.Protection from Corrosion by (i) Alloying and (ii) Galvanization	

LESSON PLAN : ENGINEERING CHEMISTRY

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

LESSON PLAN : ENGINEERING CHEMISTRY

	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 ofcalorific 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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