


Discipline: <b>Mechanical Engg.</b>	Semester: 1st	Name of the Teaching Faculty: <b>BIPIN BIHARI MOHANTY</b>
Subject: <b>Engg. Chemistry</b>	No. of Days/per week class allotted: 04	Semester From Date: 16.08.2023 To Date: 11.12.2023 No. of Weeks : 15
<b>Week</b>	<b>Class Day</b>	<b>Theory Topics</b>
1 <sup>st</sup>	1 <sup>st</sup>	Fundamental particles ( electron, proton & neutron: Definition, Mass and charge).Rutherford's Atomic model (postulates and failure), Atomic mass and mass number.
	2 <sup>nd</sup>	Definition, examples and properties of isotopes, isobars and isotones. Bohr's Atomic model (Postulates only).
	3 <sup>rd</sup>	Bohr-Bury scheme, Aufbau's principle, Hund's rule.
	4 <sup>th</sup>	Electronic Configuration (up to atomic no. 30).
2 <sup>nd</sup>	1 <sup>st</sup>	Definition , types of bonds , Electrovalent bond formation in NaCl, MgCl <sub>2</sub> .
	2 <sup>nd</sup>	Definition of Covalent bond and its formation in H <sub>2</sub> , Cl <sub>2</sub> , O <sub>2</sub> , N <sub>2</sub> .
	3 <sup>rd</sup>	Definition of Covalent bond and its formation formation in H <sub>2</sub> O, CH <sub>4</sub> . Definition of Coordinate bond and its formation in NH <sub>4</sub> <sup>+</sup> .
	4 <sup>th</sup>	Concept of Arrhenius, Lowry-Bronsted and Lewis theory for acid and base with examples ( Postulates and Limitations only).
3 <sup>rd</sup>	1 <sup>st</sup>	Concept of Lewis theory for acid and base with examples (Postulates and Limitations only).
	2 <sup>nd</sup>	Neutralization of acid & base. Definition of Salt, Types of salts. Normal, acidic, basic salts (definitions with two examples from each).
	3 <sup>rd</sup>	Double, complex and mixed salts (definitions with two examples from each).
	4 <sup>th</sup>	Definitions of atomic weight, molecular weight, Equivalent weight.
4 <sup>th</sup>	1 <sup>st</sup>	Determination of equivalent weight of Acid, Base and Salt.
	2 <sup>nd</sup>	Modes of expression of the concentrations (Molarity, Normality & Molality) with Simple numerical.
	3 <sup>rd</sup>	pH of solution ( definition with simple numerical ), Importance of pH in industry (sugar, textile, paper industries only).
	4 <sup>th</sup>	Definition and types (Strong & weak) of Electrolytes with example.
5 <sup>th</sup>	1 <sup>st</sup>	Electrolysis (principle & process) with example of NaCl (fused and aqueous solution).
	2 <sup>nd</sup>	Faraday's 1st and 2 <sup>nd</sup> law of Electrolysis (Statement, mathematical expression and Simple numerical).
	3 <sup>rd</sup>	Industrial application of Electrolysis- Electroplating (Zinc only).
	4 <sup>th</sup>	Definition of Corrosion, Types of Corrosion.
6 <sup>th</sup>	1 <sup>st</sup>	Atmospheric Corrosion, Waterline corrosion. Mechanism of rusting of Iron only.
	2 <sup>nd</sup>	Protection from Corrosion by (i) Alloying and (ii) Galvanization.
	3 <sup>rd</sup>	Definition of Mineral, ores, gangue with example. Distinction between Ores And Minerals.
	4 <sup>th</sup>	General methods of extraction of metals. i) Ore Dressing ii) Concentration (Gravity separation, magnetic separation).
7 <sup>th</sup>	1 <sup>st</sup>	ii) Froth floatation & leaching.
	2 <sup>nd</sup>	iii) Oxidation (Calcinations, Roasting).
	3 <sup>rd</sup>	iv) Reduction (Smelting, Definition & examples of flux, slag).
	4 <sup>th</sup>	Refining of the metal (Electro refining, & Distillation only).

8 <sup>th</sup>	1 <sup>st</sup>	Definition of alloy Types of alloys ( Ferro, Non-Ferro & Amalgam) with example.
	2 <sup>nd</sup>	Composition and uses of Brass, Bronze, Alnico, Duralumin.
	3 <sup>rd</sup>	Saturated and Unsaturated Hydrocarbons ( Definition with example).
	4 <sup>th</sup>	Aliphatic and Aromatic Hydrocarbons (Huckle's rule only).
9 <sup>th</sup>	1 <sup>st</sup>	Difference between Aliphatic and aromatic hydrocarbons.
	2 <sup>nd</sup>	IUPAC system of nomenclature of up to 6 Carbons) with bond line notation.
	3 <sup>rd</sup>	IUPAC system of nomenclature of Alkane.
	4 <sup>th</sup>	IUPAC system of nomenclature of Alkene.
10 <sup>th</sup>	1 <sup>st</sup>	IUPAC system of nomenclature of Alkyne.
	2 <sup>nd</sup>	IUPAC system of nomenclature of alkyl halide.
	3 <sup>rd</sup>	IUPAC system of nomenclature of alcohol.
	4 <sup>th</sup>	Uses of some common aromatic compounds ( Benzene, Toluene, BHC, Phenol, Naphthalene, Anthracene and Benzoic acid) in daily life.
11 <sup>th</sup>	1 <sup>st</sup>	Sources of water, Soft water, Hard water.
	2 <sup>nd</sup>	Hardness, types of Hardness (temporary or carbonate and permanent or non-carbonate).
	3 <sup>rd</sup>	Removal of hardness by hot lime soda method (Principle, process & advantages).
	4 <sup>th</sup>	Removal of hardness by cold lime soda method (Principle, process & advantages), Advantages of Hot lime over cold lime process.
12 <sup>th</sup>	1 <sup>st</sup>	Organic Ion exchange method (principle, process, and regeneration of exhausted resins).
	2 <sup>nd</sup>	Definition of lubricant, Types ( solid, liquid and semisolid with examples only ).
	3 <sup>rd</sup>	Specific uses of lubricants (Graphite, Oils, Grease), Purpose of lubrication.
	4 <sup>th</sup>	Definition and classification of fuel, Definition of calorific value of fuel, Choice of good fuel.
13 <sup>th</sup>	1 <sup>st</sup>	Liquid: Diesel, Petrol and Kerosene (Composition and uses).
	2 <sup>nd</sup>	Gaseous: Producer gas and Water gas (Composition and uses).
	3 <sup>rd</sup>	Elementary idea about LPG, CNG and coal gas (Composition and uses only).
	4 <sup>th</sup>	Definition of Monomer, Polymer, Homo-polymer, Copolymer.
14 <sup>th</sup>	1 <sup>st</sup>	Degree of polymerization. Difference between Thermosetting and Thermoplastic.
	2 <sup>nd</sup>	Composition and uses of Polythene.
	3 <sup>rd</sup>	Composition and uses of Poly-Vinyl Chloride.
	4 <sup>th</sup>	Composition and uses of Bakelite.
15 <sup>th</sup>	1 <sup>st</sup>	Definition of Elastomer (Rubber). Natural Rubber (its drawbacks).
	2 <sup>nd</sup>	Vulcanisation of Rubber, Advantages of Vulcanised rubber over raw rubber.
	3 <sup>rd</sup>	Pesticides: Insecticides, herbicides, fungicides- Examples and uses.
	4 <sup>th</sup>	Bio Fertilizers: Definition, examples and uses.

  
 16/08/2023