Discipline: Elect/Cse/Mech/Civil	Semester: 2nd	Name Of The Teaching Faculty: Sunil Kumar Martha
Subject: APPLIED CHEMISTRY	No. Of Days/Week Class Allotted: 4	No. Of Weeks:15 From – 04.02.2025 to 17.05.2025
Week	Class Day	Theory Topics
1	1	Rutherford Model of Atom
	2	Bohr’s Theory and Hydrogen Spectrum Explanation (Bohr's Model)
	3	Heisenberg Uncertainty Principle
	4	Quantum Numbers and Orbital Concept
2	1	Shapes of s, p, and d Orbitals
	2	Pauli’s Exclusion Principle, Hund’s Rule, and Aufbau Rule
	3	Electronic Configuration
	4	Concept of Chemical Bonding and Causes of Chemical Bonding
3	1	Ionic Bonding (Example: NaCl)
	2	Covalent Bond (Examples: H2, F2, HF) and Hybridization in BeCl2, BF3, CH4, NH3, H2O
	3	Coordination Bond in NH4+ and Anomalous Properties of NH3, H2O Due to Hydrogen Bonding
	4	Metallic Bonding
4	1	Graphical Presentation of Water Distribution on Earth (Pie or Bar Diagram)
	2	Classification of Soft and Hard Water Based on Soap Test
	3	Salts Causing Water Hardness
	4	Unit of Hardness and Simple Numerical Problems on Water Hardness
5	1	Cause of Poor Lathering of Soap in Hard Water
	2	Problems Caused by the Use of Hard Water in Boilers (Scale and Sludge, Foaming and Priming, Corrosion)
	3	Quantitative Measurement of Water Hardness by EDTA Method
	4	Total Dissolved Solids (TDS) and Alkalinity Estimation
6	1	Natural Occurrence of Metals: Minerals, Ores of Iron, Aluminium, and Copper
	2	Gangue (Matrix), Flux, Slag, and General Principles of Metallurgy

	3	Extraction of Iron from Haematite Ore Using Blast Furnace
	4	Extraction of Aluminium from Bauxite (Reactions)
7	1	Alloys: Definition, Purpose of Alloying, Ferrous and Non-Ferrous Alloys with Examples, Properties, and Applications
	2	General Chemical Composition and Composition-Based Applications: Portland Cement and Hardening
	3	Glasses: Composition and Applications
	4	Refractory and Composite Materials
8	1	Polymers: Monomer, Homo and Co-Polymers, Degree of Polymerization
	2	Simple Reactions Involved in Preparation of Thermoplastics and Thermosetting Plastics (PVC, PS, PTFE, Nylon-6, Nylon-6,6, Bakelite)
	3	Rubber and Vulcanization of Rubber
	4	Natural Occurrence of Metals: Minerals, Ores of Iron, Aluminium, and Copper
9	1	Definition of Fuel and Combustion of Fuel
	2	Classification of Fuels and Calorific Values (HCV and LCV)
	3	Calculation of HCV and LCV Using Dulong's Formula
	4	Proximate Analysis of Coal and Solid Fuel
10	1	Petrol and Diesel: Fuel Rating (Octane and Cetane Numbers)
	2	Chemical Composition, Calorific Values, and Applications of LPG, CNG, Water Gas, Coal Gas, Producer Gas, and Biogas
	3	Lubrication: Function and Characteristics of Good Lubricant
	4	Classification of Lubricants with Examples
11	1	Lubrication Mechanisms: Hydrodynamic and Boundary Lubrication
	2	Physical Properties of Lubricants: Viscosity, Viscosity Index, Oiliness, Flash and Fire Points, Cloud and Pour Points
	3	Chemical Properties of Lubricants: Coke Number, Total Acid Number, Saponification Value
	4	Definition of Fuel and Combustion of Fuel
12	1	Electronic Concept of Oxidation, Reduction, and Redox Reactions
	2	Definition of Electrolytes and Non-Electrolytes with Examples
	3	Faraday's Laws of Electrolysis and Simple Numerical Problems
	4	Industrial Applications of Electrolysis: Electrometallurgy
13	1	Industrial Applications of Electrolysis: Electroplating
	2	Industrial Applications of Electrolysis: Electrolytic Refining
	3	Application of Redox Reactions in Electrochemical Cells: Primary Cells

		(Dry Cell)
	4	Application of Redox Reactions in Electrochemical Cells: Secondary Cells (Lead Storage Battery)
14	1	Fuel Cells and Solar Cells
	2	Introduction to Corrosion of Metals: Definition and Types
	3	Electrochemical Corrosion: H2 Liberation and O2 Absorption Mechanism
	4	Corrosion Prevention: Internal Measures (Purification, Alloying, Heat Treatment) and External Measures (Metal Coatings, Organic Inhibitors)
15	1	Electronic Concept of Oxidation, Reduction, and Redox Reactions
	2	Definition of Electrolytes and Non-Electrolytes with Examples
	3	Faraday’s Laws of Electrolysis and Simple Numerical Problems
	4	Industrial Applications of Electrolysis: Electrometallurgy