

## LESSON PLAN

### JIARSUGUDA ENGINEERING SCHOOL, JIARSUGUDA

Name of the Faculty: Jagannath Oram, Sulagna Das

Academic Year: 2022-23

Course No.: TH.2b

Course Name: Engg. Chemistry

Program: Diploma

Department: Math and Science

Year/Sem: 2<sup>ND</sup> Semester(1<sup>ST</sup> Year)

Branch- Civil & Mechanical

Session: SUMMER

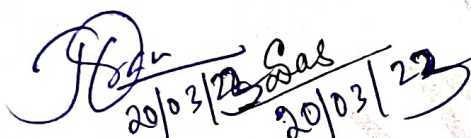
Section: C, M(a), M(b)

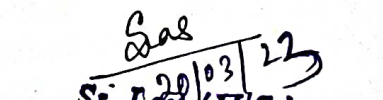
WEEK	PERIOD	TOPIC TO BE COVERED
1.	1.	<b>ATOMIC STRUCTURE:</b> Fundamental particles ( electron, proton & neutron Definition, mass and charge ).
	2.	Rutherford's Atomic model ( postulates and failure)
	3.	Atomic mass and mass number, Definition, examples and properties of Isotopes, isobars and isotones
	4.	Bohr's Atomic model ( Postulates only), Bohr-Bury scheme
2.	5.	Aufbau's principle, Hund's rule, Electronic configuration (up to atomic no 30).
	6.	<b>CHEMICAL BONDING:</b> Introduction on chemical bonding ,types of chemical bond (electrovalent bond, covalent bond , coordinate bond)
	7.	Definition of electrovalent bond, covalent bond, coordinate bond with suitable example such as NaCl, MgCl <sub>2</sub> , H <sub>2</sub> ,Cl <sub>2</sub> , O <sub>2</sub> , N <sub>2</sub> , H <sub>2</sub> O, CH <sub>4</sub> , NH <sub>3</sub> , NH <sub>4</sub> <sup>+</sup> , SO <sub>2</sub>
	8.	<b>ACID-BASE THEORY:</b> Introduction on Acid base theory, Concept of Arrhenius, (Postulates and limitations only)
3.	9.	Lowry Bronsted Theory for acid and base with examples (Postulates and limitations only)
	10.	Lewis theory for acid and base with examples (Postulates and limitations only)
	11.	Definition of Salt, Types of salts ( Normal, acidic, basic, double, complex and mixed salts,Definitions with 2 examples from each).
	12.	<b>SOLUTION:</b> Definitions of atomic weight, molecular weight, Equivalent weight
4.	13.	Determination of Equivalent weight of Acid, Base and Salt
	14.	Modes of expression of the concentrations ( Molarity , Normality & Molality) with Simple Problems.

	15.	pH of solution (definition with simple numerical)
	16.	Importance of pH in industry ( sugar, textile, paper industries only)
5.	17.	Definition and types ( Strong & weak) of Electrolytes with example. Electrolysis ( Principle & process) with example of NaCl (fused and aqueous solution).
	18.	Faraday's 1st law of Electrolysis (Statement, mathematical expression and Simple numerical)
	19.	Faraday's 2nd law of Electrolysis (Statement, mathematical expression and Simple numerical). Industrial application of Electrolysis- Electroplating ( Zinc only).
	20.	<b>CORROSION:</b> Definition of Corrosion, Types of Corrosion Atmospheric Corrosion
6.	21.	Waterline corrosion. Mechanism of rusting of Iron Mechanism of rusting of Iron only.
	22.	Protection from Corrosion by (i) Alloying and (ii) Galvanization.
	23.	Definition of Mineral, ores , gangue with example. Distinction between Ores And Minerals.
	24.	General methods of extraction of metals, i) Ore Dressing ii) Concentration ( Gravity separation, magnetic separation)
7.	25.	ii) Concentration ( Froth floatation & leaching)
	26.	iii) Oxidation (Calcinations, Roasting )
	27.	iv) Reduction (Smelting, Definition & examples of flux, slag)
	28.	v) Refining of the metal ( Electro refining, & Distillation only)
8.	29.	<b>ALLOY:</b> Definition of alloy. Types of alloys ( Ferro, Non Ferro & Amalgam) with example
	30.	Composition and uses of Brass, Bronze, Alnico, Duralumin
	31.	<b>HYDROCARBONS:</b> Saturated and Unsaturated Hydrocarbons ( Definition with example)
	32.	Aliphatic and Aromatic Hydrocarbons (Huckle's rule only), Difference between Aliphatic and aromatic hydrocarbons
9.	33.	IUPAC system of nomenclature of Alkane(straight chain)
	34.	IUPAC system of nomenclature of Alkene, Alkyne (straight chain)

	35.	IUPAC system of nomenclature alkyl halide and alcohol (straight chain)
	36.	IUPAC system of nomenclature of Alkane, Alkene, Alkyne (Branched chain)
10.	37.	IUPAC system of nomenclature alkyl halide and alcohol (Branched chain)
	38.	IUPAC system of nomenclature of Alkane, Alkene, Alkyne, alkyl halide and alcohol ( up to 6 carbons ) with bond line notation
	39.	IUPAC Nomenclature: Name to structure conversion
	40.	Uses of some common aromatic compounds ( Benzene, Toluene, BHC, Phenol, Naphthalene, Anthracene and Benzoic acid) in daily life.
11.	41.	<b>Water Treatment</b> : Sources of water, Soft water, Hard water, hardness, types of Hardness (temporary or carbonate and permanent or non-carbonate)
	42.	Removal of hardness by cold lime soda method (Principle, process & advantages )
	43.	Removal of hardness by hot lime soda method ( Principle, process & advantages )
	44.	Advantages of Hot lime over cold lime process. Disadvantages of L-S process
12.	45.	Organic Ion exchange method ( principle, process, and regeneration of exhausted resins)
	46.	<b>Lubricants</b> : Definition of lubricant, Types ( solid, liquid and semisolid with examples only )
	47.	specific uses of lubricants ( Graphite, Oils, Grease), Purpose of lubrication
	48.	<b>Fuel</b> : Definition and classification of fuel, Definition of calorific value of fuel, Choice of good fuel.
13.	49.	<b>Liquid</b> : Diesel, Petrol, and Kerosene --- Composition and uses.
	50.	<b>Gaseous</b> : Producer gas and Water gas (Composition and uses).
	51.	Elementary idea about LPG, CNG and coal gas (Composition and uses only).
	52.	<b>Polymer</b> : Definition of Monomer, Polymer, Homo-polymer, Co-polymer and Degree of polymerization.

14.	53.	Difference between Thermosetting and Thermoplastic polymers
	54.	Composition and uses of Polythene
	55.	Composition and uses of Polythene, & Poly-Vinyl Chloride and Bakelite.
	56.	Definition of Elastomer ( Rubber). Natural Rubber (it's draw backs ).
15.	57.	Vulcanisation of Rubber. Advantages of Vulcanised rubber over raw rubber.
	58.	<b>Chemicals in Agriculture: Pesticides: Insecticides(Examples and uses.)</b>
	59.	<b>Chemicals in Agriculture: Pesticides: Herbicides, fungicides- Examples and uses.</b>
	60.	<b>Bio Fertilizers: Definition, examples and uses</b>

  
 Signature of Faculty  
 20/03/22

  
 Counter Signature of HOD  
 Engg. School  
 Jharsuguda