

**GOVERNMENT POLYTECHNIC JAJPUR**

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<b>Discipline:</b> Math and Science	<b>Semester:</b> 1st/2nd	<b>Name of the Teaching faculty:</b> SUCHETA DHAL
<b>Subject:</b> Chemistry	<b>No of Days/Week class allotted:</b> 4	<b>From:</b> 16.08.23 <b>To:</b> 11.12.23  <b>No of weeks:</b> 16
<b>Week</b>	<b>Class Day</b>	<b>Topics</b>
1st	1st	Fundamental particles (Electron, proton & neutron)
	2nd	Rutherford's Atomic model (Postulates and failure), Atomic no. and massnumber
	3rd	Isotopes, isobars and isotone. Bohr's Atomic model (Postulates only)
	4th	Bohr-Bury scheme, Aufbau's principle
2nd	1st	Hund's rule, Electronic configuration (up to atomic no 30).
	2nd	Chemical Bonding: Definition, types (Electrovalent, Covalent and Coordinate bond with examples
	3rd	Formation of NaCl, MgCl <sub>2</sub> , H <sub>2</sub> Cl <sub>2</sub> , O <sub>2</sub> , N <sub>2</sub>
	4th	Formation of H <sub>2</sub> O, CH <sub>4</sub> , NH <sub>3</sub> , NH <sub>4</sub> <sup>+</sup> , SO <sub>2</sub>
3rd	1st	Concept of Arrhenius, Lowry Bronsted and Lewis theory for acid and base with examples (Postulates and limitations only)
	2nd	Neutralization of acid & base. Definition of Salt, Types of salts (Normal, acidic, basic, double, complex and mixed salts, definitions with 2 examples from each).
	3rd	Definitions of atomic weight, molecular weight, Equivalent weight.
	4th	Determination of equivalent weight of Acid, Base and Salt.
4th	1st	Modes of expression of the concentrations (Molarity , Normality & Molality)
	2nd	Simple Problems
	3rd	pH of solution (definition with simple numericals )
	4th	Importance of pH in industry
5th	1st	Definition and types (Strong & weak) of Electrolytes with example.
	2nd	Electrolysis (Principle & process)
	3rd	Electrolysis of NaCl (fused and aqueous solution).
	4th	Faraday's 1st and 2nd law of Electrolysis (Statement, mathematical expression)
6th	1st	Simple numericals and Industrial application of Electrolysis
	2nd	Definition of Corrosion, Types of Corrosion- Atmospheric Corrosion, Waterline corrosion.
	3rd	Mechanism of rusting of Iron only. Protection from Corrosion by (i) Alloying and (ii) Galvanization.
		Revision and Discussion
	4th	CLASS TEST 1, quiz test
7th	1st	Metallurgy: Definition of Mineral, ores , gangue with example. Distinction between Ores And Minerals.

	2nd	General methods of extraction of metals i) Ore Dressing ii) Concentration (Gravity separation, magnetic separation)
	3rd	Froth floatation & leaching
	4th	iii) Oxidation (Calcinations, Roasting)
	1st	iv) Reduction (Smelting, Definition & examples of flux, slag)
8th	2nd	v) Refining of the metal (Electro refining, & Distillation only)
	3rd	Alloys: Definition of alloy. Types of alloys (Ferro, Non Ferro & Amalgam) with example. Composition and uses of Brass, Bronze, Alnico, Duralumin
	4th	Revision and Discussion
	1st	Organic Chemistry: Introduction
9th	2nd	Hydrocarbons : Saturated and Unsaturated Hydrocarbons (Definition with examples)
	3rd	Homologous series
	4th	Aliphatic and Aromatic Hydrocarbons (Huckle's rule only). Difference between Aliphatic and aromatic hydrocarbons
10th	1st	IUPAC system of nomenclature of Alkane, Alkene, Alkyne (up to 6 carbons)
	2nd	IUPAC system of nomenclature of alkyl halide and alcohol (up to 6 carbons)
	3rd	Bond line notation.
	4th	Uses of some common aromatic compounds (Benzene, Toluene, BHC, Phenol, Naphthalene, Anthracene and Benzoic acid) in daily life.
11th	1st	Revision and Discussion
	2nd	CLASS TEST 2
	3rd	Water Treatment : Sources of water, Soft water, Hard water, hardness
	4th	Types of Hardness (temporary or carbonate and permanent or non-carbonate)
12th	1st	Removal of hardness by lime soda method (hot lime & cold lime—Principle, process & advantages)
	2nd	Advantages of Hot lime over cold lime process.
	3rd	Organic Ion exchange method (principle, process, and regeneration of exhausted resins)
	4th	Discussion
13th	1st	Lubricants: Definition of lubricant, Types (solid, liquid and semisolid with examples only)
	2nd	Specific uses of lubricants (Graphite, Oils, Grease), Purpose of lubrication
	3rd	Fuel: Definition and classification of fuel, Definition of calorific value of fuel, Choice of good fuel.
	4th	Liquid: Diesel, Petrol, and Kerosene - Composition and uses.
14th	1st	Gaseous: Producer gas and Water gas (Composition and uses).
	2nd	Elementary idea about LPG, CNG and coal gas (Composition and uses only).
	3rd	Polymer: Definition of Monomer, Polymer, Homo-polymer, Co-polymer and Degree of polymerization.
	4th	Composition and uses of Polythene, & Poly-Vinyl Chloride.
15th	1st	Thermoplastic and Thermosetting polymers. Composition and uses of Bakelite.
	2nd	Definition of Elastomer (Rubber). Natural Rubber (it's draw backs).
	3rd	Vulcanisation of Rubber. Advantages of Vulcanised rubber over raw rubber.
	4th	Chemicals in Agriculture: Pesticides: Insecticides, herbicides, fungicides- Examples and uses.
16th	1st	Bio Fertilizers: Definition, examples and uses.
	2nd	Revision and Discussion
	3rd	Previous year questions
	4th	CLASS TEST 3, quiz



**Books Recommended**

1. Text Book of Intermediate Chemistry Part-1 and Part-2 by Nanda, Das, Sharma, Kalyani Publishers
2. Engg. Chemistry by B.K. Sharma, Krishna Prakashan Media Pvt. Ltd
3. Engineering Chemistry by Y.R. Sharma and P. Mitra, Kalyani Publishers
4. Engineering Chemistry for Diploma – Dr. R K Mohapatra, PHI Publication, New Delhi.
5. Engineering Chemistry- Jain & Jain, Dhanpat Roy and Sons.

Sucheta Sheel  
Signature of the faculty 17/08/23