

Discipline: Math & Science	Semester : 2 <sup>nd</sup> Sem(2020-21) Branch- Civil and Mechanical Engg.	Name of the Teaching Faculty: Sushreeta Behera, Lect. In Chemistry
<b>Subject: Engineering Chemistry</b>	<b>No. of Days/week Class Allotted: 60</b>	<b>Semester from date: 10/04/2021 to date: 10/07/2021</b> <b>No of weeks: 18</b>
<b>week</b>	<b>Class Day</b>	<b>Theory Topics</b>
1 <sup>st</sup>	1 <sup>st</sup>	Basic concepts of Chemistry :(elements, atom ,molecule ,radicals) Chemical formulae
	2 <sup>nd</sup>	Definitions of atomic weight, molecular weight, Equivalent weight. Determination of equivalent weight of Acid, Base and Salt.
	3 <sup>rd</sup>	Fundamental particles ( electron, proton & neutron Definition, mass and charge ).Rutherford's Atomic model
	4 <sup>th</sup>	Failures of Rutherford atomic Model. Atomic mass and mass number. Definition, examples and properties of Isotopes ,Isobars and Isotones.
2 <sup>nd</sup>	1 <sup>st</sup>	Bohr's Atomic model, Bohr-Bury scheme
	2 <sup>nd</sup>	Aufbau's principle, Hund's rule, Electronic configuration (up to atomic no 30).
	3 <sup>rd</sup>	Definition, types of chemical bond. Electrovalent bond with examples (formation of NaCl, MgCl <sub>2</sub> )
	4 <sup>th</sup>	Covalent Bond with examples (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> )
3 <sup>rd</sup>	1 <sup>st</sup>	Coordinate bond with examples (formation of NH <sub>4</sub> <sup>+</sup> , SO <sub>2</sub> )
	2 <sup>nd</sup>	Concepts of Arrhenius theory and its limitation
	3 <sup>rd</sup>	Bronsted-Lowry theory of acid and base
	4 <sup>th</sup>	Limitations of Bronsted-Lowry theory and previous year question discussion
4 <sup>th</sup>	1 <sup>st</sup>	Lewis theory and its limitations.
	2 <sup>nd</sup>	Molarity and normality with Simple problems.
	3 <sup>rd</sup>	Molality and simple problems
	4 <sup>th</sup>	pH of solution ( definition with simple numericals)
5 <sup>th</sup>	1 <sup>st</sup>	Importance of pH in industry ( sugar, textile, paper industries)
	2 <sup>nd</sup>	Definition of Salt, Types of salts ( Normal, acidic, basic, double, complex and mixed salts)
	3 <sup>rd</sup>	Definition and types (Strong & weak) of Electrolytes with example. Electrolysis (Principle & process)
	4 <sup>th</sup>	Electrolysis of NaCl (fused and aqueous solution). Faraday's 1st of Electrolysis ( Statement, mathematical expression and Simple numerical)
6 <sup>th</sup>	1 <sup>st</sup>	Faraday's 2nd law of Electrolysis ( Statement, mathematical expression and Simple numerical). Industrial application of Electrolysis- Electroplating ( Zinc plating)
	2 <sup>nd</sup>	Definition of Corrosion, Types of Corrosion- Atmospheric Corrosion, Waterline corrosion.
	3 <sup>rd</sup>	Mechanism of rusting of Iron. Protection from Corrosion by (i) Alloying and (ii) Galvanization.
	4 <sup>th</sup>	Definition of Mineral, ores, gangue with example. Distinction between Ores and Minerals. Ore Dressing
7 <sup>th</sup>	1 <sup>st</sup>	Concentration ( Gravity separation, magnetic separation, Froth floatation & leaching)

	2 <sup>nd</sup>	Oxidation (Calcinations, Roasting )
	3 <sup>rd</sup>	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. Composition and uses of Brass, Bronze, Alnico, Duralumin
	2 <sup>nd</sup>	Saturated and Unsaturated Hydrocarbons ( Definition with example)
	3 <sup>rd</sup>	Aliphatic and Aromatic Hydrocarbons ( Huckle's rule). Difference between Aliphatic and aromatic hydrocarbons
	4 <sup>th</sup>	IUPAC system of nomenclature of Alkanes
9 <sup>th</sup>	1 <sup>st</sup>	IUPAC system of nomenclature of Alkenes and Alkynes
	2 <sup>nd</sup>	IUPAC name of Bond line notations.
	3 <sup>rd</sup>	IUPAC system of nomenclature of alkyl halide and alcohol
	4 <sup>th</sup>	Uses of some common aromatic compounds ( Benzene, Toluene, BHC, Phenol, Naphthalene, Anthracene and Benzoic acid) in daily life
10 <sup>th</sup>	1 <sup>st</sup>	Previous year question discussion
	2 <sup>nd</sup>	Sources of water, Soft water, Hard water
	3 <sup>rd</sup>	Types of Hardness (temporary or carbonate and permanent or non-carbonate)
	4 <sup>th</sup>	Removal of temporary hardness of water
11 <sup>th</sup>	1 <sup>st</sup>	Hot lime & cold lime—Principle, process & advantages, Advantages of Hot lime over cold lime process
	2 <sup>nd</sup>	Organic ion-exchange process- Principle, process and regeneration of exhausted Resin.
	3 <sup>rd</sup>	Lubricants; Definition and Types (solid, Liquid and semisolid) and examples
	4 <sup>th</sup>	Specific uses or lubricants (graphite, oils and Grease), Purpose of lubrication.
12 <sup>th</sup>	1 <sup>st</sup>	Fuel: Definition and classification of fuels. Calorific value of fuel, Choice of good fuel.
	2 <sup>nd</sup>	Liquid: Diesel, Petrol, and Kerosene --- Composition and uses
	3 <sup>rd</sup>	Gaseous: Producer gas and Water gas-Composition and uses. Elementary idea about LPG, CNG and coal gas (Composition and uses).
	4 <sup>th</sup>	Definition of Monomer, Polymer, Homo-polymer, Co-polymer and Degree of polymerization
13 <sup>th</sup>	1 <sup>st</sup>	Difference between Thermosetting and Thermoplastic. Composition and uses of Polythene
	2 <sup>nd</sup>	Composition and uses of Poly-Vinyl Chloride and Bakelite.
	3 <sup>rd</sup>	Definition of Elastomer ( Rubber). Natural Rubber (it's drawbacks ).
	4 <sup>th</sup>	Vulcanisation of Rubber. Advantages of Vulcanised rubber over raw rubber.
14 <sup>th</sup>	1 <sup>st</sup>	Pesticides: Insecticides, herbicides, fungicides (Examples and uses). Bio Fertilizers: Definition, examples and uses.
	2 <sup>nd</sup>	Previous year question discussion
	3 <sup>rd</sup>	Doubt clearing session
	4 <sup>th</sup>	Revision of Chapter – 01
15 <sup>th</sup>	1 <sup>st</sup>	Revision of Chapter – 02
	2 <sup>nd</sup>	Revision of Chapter – 03
	3 <sup>rd</sup>	Revision of Chapter – 04
	4 <sup>th</sup>	Revision of Chapter – 05 and 06

16 <sup>th</sup>	1 <sup>st</sup>	Revision of Chapter – 07 and 08
	2 <sup>nd</sup>	Revision of Chapter – 09
	3 <sup>rd</sup>	Revision of Chapter –10
	4 <sup>th</sup>	Revision of Chapter – 11
17 <sup>th</sup>	1 <sup>st</sup>	Revision of Chapter – 12
	2 <sup>nd</sup>	Revision of Chapter – 13 and 14
	3 <sup>rd</sup>	Doubt clearing session
	4 <sup>th</sup>	Discussion of Probable Questions
18 <sup>th</sup>	1 <sup>st</sup>	Discussion of Probable Questions
	2 <sup>nd</sup>	Discussion of Probable Questions
	3 <sup>rd</sup>	Discussion of Probable Questions
	4 <sup>th</sup>	Doubt clearing session