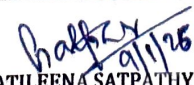


LESSON PLAN: APPLIED CHEMISTRY TH 5(b)

DISCIPLINE: CE & IOT/IT/ETC/ MECHANICAL	SEMESTER:1ST	NAME OF FACULTY: SWATILEENA SATPATHY, LECT.STAGE-II (CHEMISTRY)
Subject: Applied Chemistry	No. Of days / Per Week class allotted: 4	Semester From Date: 09/01/2026 To Date:08/05/2026
Week	Class/ Day	Theory
1st	1st	Rutherford model of atom
	2nd	Bohr's theory (expression of energy and radius to be omitted)
	3rd	Hydrogen spectrum explanation based on Bohr's model of atom
	4th	Heisenberg uncertainty principle, Quantum numbers – orbital concept
2nd	1st	Shapes of s,p and d orbitals
	2nd	Pauli's exclusion principle, Hund's rule of maximum multiplicity
	3rd	Aufbau rule, electronic configuration.
	4th	Concept of chemical bonding – cause of chemical bonding, types of bonds: ionic bonding (NaCl example), covalent bond (H ₂ , F ₂ , HF)
3rd	1st	Hybridization in (BeCl ₂ , BF ₃ , CH ₄)
	2nd	Hybridization in (NH ₃ , H ₂ O), Coordination bond in NH ₄ ⁺
	3rd	Anomalous properties of NH ₃ , H ₂ O due to hydrogen bonding, Metallic Bonding
	4th	Solution – idea of solute, solvent and solution
4th	1st	methods to express the concentration of solution molarity (M = mole per liter), ppm
	2nd	mass percentage, volume percentage and mole fraction.
	3rd	Graphical presentation of water distribution on Earth (pie or bar diagram). Classification of soft and hard water based on soap test, salts causing water hardness
	4th	Unit of hardness and simple numerical on water hardness
5th	1st	Cause of poor lathering of soap in hard water, problems caused by the use of hard water in boiler (scale and sludge, foaming)
	2nd	Problems caused by the use of hard water in boiler (priming, corrosion etc)
	3rd	Quantitative measurement of water hardness by ETDA method
	4th	Total dissolved solids (TDS) alkalinity estimation.
6th	1st	Water softening techniques – soda lime process
	2nd	zeolite process and ion exchange process.
	3rd	Municipal water treatment (in brief only) – sedimentation, coagulation
	4th	Municipal water treatment- filtration, sterilization.
7th	1st	Water for human consumption for drinking and cooking purposes from any
	2nd	Natural occurrence of metals – minerals, ores of iron, aluminium and copper, gangue (matrix), flux, slag,
	3rd	Metallurgy – brief account of general principles of metallurgy
	4th	Extraction of - iron from haematite ore using blast furnace
8th	1st	Extraction of -aluminium from bauxite along with reactions.
	2nd	Alloys – definition, purposes of alloying, ferrous alloys and non- ferrous with suitable examples
	3rd	Alloys – properties and applications

	4th	General chemical composition, composition based applications :Port land cement and hardening
9th	1st	Glasses Refractory and Composite materials
	2nd	Polymers – monomer, homo and co polymers, degree of polymerization
	3rd	Simple reactions involved in preparation and their application of thermoplastics and thermosetting plastics (using PVC, PS, PTFE)
	4th	Simple reactions involved in preparation and their application of thermoplastics and thermosetting plastics (using nylon – 6, nylon-6,6 and Bakelite)
10th	1st	Rubber and vulcanization of rubber
	2nd	Definition of fuel and combustion of fuel, classification of fuels
	3rd	Calorific values (HCV and LCV), calculation of HCV and LCV using Dulong's formula
	4th	Proximate analysis of coal solid fuel
11th	1st	Petrol and Diesel - fuel rating (octane and cetane numbers)
	2nd	Chemical composition, calorific values and applications of LPG, CNG, water gas
	3rd	Chemical composition, calorific values and applications of coal gas, producer gas and biogas
	4th	Lubrication – function and characteristic properties of good lubricant
12th	1st	Classification with examples, lubrication mechanism – hydrodynamic lubrication
	2nd	Lubrication mechanism-boundary lubrication, physical proper- ties (viscosity and viscosity index)
	3rd	Physical properties (oiliness, flash and fire point, could and pour point only)
	4th	Chemical properties (coke number, total acid number saponification value) of lubricants
13th	1st	Electronic concept of oxidation, reduction and redox reactions.
	4th	Faradays 2nd law of electrolysis and simple numerical problems.
14th	1st	Industrial Application of Electrolysis –Electrometallurgy & Electroplating
	2nd	Industrial Application of Electrolysis –Electrolytic Refining, Application of redox reactions in electrochemical cells - Primary cells – dry cell
	3rd	Application of redox reactions in electrochemical cells - Secondary cell - commercially used lead storage battery, Fuel Cell
	4th	Solar Cell,Introduction to Corrosion of metals- definition
15th	1st	Types of corrosion (chemical and electrochemical), H ₂ liberation and O ₂ absorption mechanism of electrochemical corrosion
	2nd	Factors affecting rate of corrosion
	3rd	Internal corrosion preventive measures –Purification, alloying and heat treatment
	4th	External corrosion preventive measures: a) metal (anodic, cathodic) coatings, b) organic inhibitors


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