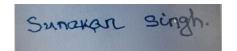
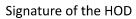
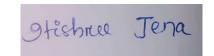
## PNS SCHOOL OF ENGINEERING & TECHNOLOGY, MARSHAGHAI DEPARTMENT OF SCIENCE AND HUMANITIES LESSON PLAN OF APPLIED CHEMISTRY (TH 5 b)

DDAN	CIL . CIVIII CCE ETC	FIFCT MECH	NAME OF THE TEACHING FACULTY: MR KSHITISH KUMAR SINGH
SUBJEC	CH : CIVIL,CSE,ETC SCIPLINE : SEMES CT: APPLIED CHEM DAYS/WEEK CLAS	STER: 2ND HSTRY (TH 5 b)	SEMESTER FROM DATE: 04/02/2025 TO DATE: 17/05 /2025 NO OF WEEKS: 14
WEEK	UNIT	CLASS DAY	THEORY TOPICS
	UNIT - 1: Atomic Structure, Chemical Bonding and Solutions	1	Rutherford model of atom, Bohr's theory (expression of energy and radius to be
		2	hydrogen spectrum explanation based on Bohr's model of atom,
1st		3	Heisenberg uncertainty principle, Quantum numbers – orbital concept.
		4	Shapes of s,p and d orbitals, Pauli's exclusion principle,
		5	Hund's rule of maximum multiplicity Aufbau rule, electronic configuration.
			Concept of chemical bonding – cause of chemical bonding, types of bonds: ionic
		6	bonding (NaCl example),
		7	covalent bond (H2, F2, HF hybridization in BeCl2, BF3,
2nd		8	CH4, NH3, H2O), coordination bond in NH4 +
		9	anomalous properties of NH3, H2O due to hydrogen bonding, and metallic bonding.
			Solution – idea of solute, solvent and solution, methods to express the concentration
	È	10	of solution molarity (M = mole per liter), ppm,
	5	11	mass percentage, volume percentage and mole fraction
		12	Graphical presentation of water distribution on Earth (pie or bar diagram).
3rd	UNIT - 2: Water	13	Classification of soft and hard water based on soap test
		14	salts causing water hardness, unit of hardness
		15	simple numerical on water hardness.
			Cause of poor lathering of soap in hard water, problems caused by the use of hard
		16	water in boiler (scale and sludge, foaming and priming, corrosion etc
4th		17	quantitative measurement of water hardness by ETDA method
		18	total dissolved solids (TDS) alkalinity estimation.
		19	I) Water softening techniques – soda lime process, zeolite process
		20	ion exchange process.
		21	II) Municipal water treatment (in brief only) – sedimentation, coagulation,
		22	filtration, sterilization.
			Water for human consumption for drinking and cooking purposes from any water
5th		23	sources
			enlist Indian standard specification of drinking water (collect data and understand
		24	standards).
			Natural occurrence of metals – minerals, ores of iron, aluminium and copper, gangue
	<b>,</b>	25	(matrix)-
	gineering Materials	26	flux, slag, metallurgy – brief account of general principles of metallurgy.
		27	Extraction of - iron from haematite ore using blast furnace, aluminium from bauxite
			Alloys – definition, purposes of alloying, ferrous alloys and non- ferrous with
6th		28	suitable examples, properties and applications.
		22	General chemical composition, compositionbased applications (elementaryidea only
		29	details omitted):
	. <u>e</u> o	30	Port land cement and hardening, Glasses Refractory

	UNIT - 3: Enį	31	Composite materials.
7th		32	Polymers – monomer, homo and co polymers, degree of polymerization
			simple reactions involved in preparation and their application of
7111		33	thermoplastics and thermosetting plastics
		34	using PVC, PS, PTFE, nylon – 6, nylon-6,6 and Bakelite),
		35	rubber and vulcanization of rubber.
8th	UNIT - 4: Chemistry of Fuels and Lubricants	36	Definition of fuel and combustion of fuel, classification of fuels
		37	calorific values (HCV and LCV)
		38	calculation of HCV and LCV using Dulong's formula.
		39	Proximate analysis of coal solid fuel
		40	petrol and diesel - fuel rating (octane and cetane numbers)
9th		41	Chemical composition, calorific values and applications of LPG, CNG
		42	water gas, coal gas, producer gas and biogas.
		43	Lubrication – function and characteristic properties of good lubricant
		44	classification with examples, lubrication mechanism
		45	hydrodynamic and boundary lubrication
10th		46	physical proper- ties viscosity and viscosity index
		47	oiliness, flash and fire point could and pour point only
			chemical properties (coke number, total acid number saponification value) of
		48	lubricants.
	UNIT - 5: Electro Chemistry	49	Electronic concept of oxidation, reduction and redox reactions.
		50	Definition of terms: electrolytes, non-electrolytes with suitable examples,
11th		51	Faradays laws of electrolysis and simple numerical problems.
		52	Industrial Application of Electrolysis – Electrometallurgy
		53	Electroplating
		54	Electrolytic refining
		55	Application of redox reactions in electrochemical cells – Primary cells – dry cell
12th		56	Secondary cell - commercially used lead storage battery, fuel
		57	Solar cells. Introduction to Corrosion of metals
		58	definition, types of corrosion (chemical and electrochemical)
			H2 liberation and O2 absorption mechanism of electrochemical corrosion
		59	factors affecting rate of corrosion
			Internal corrosion preventive measures – Purification, alloying and heat treatment
		60	and External corrosion preventive measures: a) metal (anodic, cathodic) coatings, b) organic inhibitors.
		60	organic initialitors.







Signature of Lecturer