LESSON PLAN

Name of the Faculty: Smt. Pooja Rani
Discipline: Civil Engg. & Agriculture Engg.
Semester: 1st
Subject: Applied Chemistry
Lesson Plan Duration: 16 weeks (From 01/09/2023 to 15/12/2023)
Work Load (Lecture/Practical) Per Week (In Hours): Lectures – 03, Practical's – 04

Week	Theory		Practical	
	Lecture Day	Topic (Including assignment/Test)	Practical Day	Topic
1st	1st	**Unit – 1 Atomic Structure, Periodic Table & Chemical Bonding -** Introduction	1st	**To prepare standard solution of oxalic acid** – introduction (G-1).
	2nd	Bohr's Model of an Atom	2nd	To prepare standard solution of oxalic acid – introduction (G-2).
	3rd	Dual character of matter – derivation of de-Broglie's equation		
2nd	4th	Heisenberg's Principle of Uncertainty	3rd	Perform the experiment & prepare a std. solution of oxalic acid (G-1).
	5th	Modern concept of atomic structure: Definition & shape of orbitals (s, p & d)	4th	Perform the experiment & prepare a std. solution of oxalic acid (G-2).
	6th	Quantum numbers & their significance		
3rd	7th	Electronic configuration: Aufbau, Pauli Exclusion Principles & Hund's rule.	5th	**To dilute the given $KMnO_4$ solution** – introduction (G-1).
	8th	Electronic configuration of elements up to Z = 30.	6th	To dilute the given $KMnO_4$ solution – introduction (G-2).
	9th	Modern Periodic Law & Table, Classification of elements s, p, d, & f-blocks Class Test		
4th	10th	Metals, Non-metals & Metalloids	7th	Perform the experiment & dilute the given solution (G-1).
	11th	Chemical Bonding: cause & types of bonding	8th	Perform the experiment & dilute the given solution (G-2).
	12th	Physical properties of ionic, covalent & metallic substances.		
5th	13th	**Assignment** Solution of problems	9th	**To find out the strength in g/l of an unknown solution of NaOH using a std. (N/10) oxalic acid solution** – introduction (G-1)
	14th	**1st Sessional Test**	10th	To find out the strength in g/l of an unknown solution of NaOH using a std. (N/10) oxalic acid solution – introduction (G-2).
	15th	Analysis of Sessional test **Unit - 2 Metals & Alloys -** introduction Metals: Mechanical properties, Impact resistance & their uses		
6th	16th	PTM Def. of mineral, ore, gangue, flux & slag Commercial varieties of Fe	11th	Perform the experiment and find out the strength of given NaOH Solution (G-1).
	17th	Metallurgy of Fe from Hematite using Blast furnance,	12th	Perform the experiment and find out the strength of given NaOH Solution (G-2).
	18th	Alloy: Def., necessity, composition, properties & uses of Duralumin & steel		
7th	19th	Heat treatment of steel -normalizing, annualizing, quenching, tempering	13th	**To find out the total alkalinity in ppm of a water sample with the help of a std. sulphuric acid solution** – introduction (G-1).
	20th	**Unit – 3 Water, Solutions, Acids & Bases -** introduction Solutions: Def., expression of the conc. of a solution in % (w/w, w/v, v/v), normality, molarity, molality & ppm	14th	To find out the total alkalinity in ppm of a water sample with the help of a std. sulphuric acid solution – introduction (G-2).
	21st	Arrhenius concept of Acids & Bases, Strong and weak acids & bases		
8th	22nd	Ph value & its significance	15th	Perform the experiment and find out the

		Ph scale Numerical problems on ph		total alkalinity (G-1).
	23th	Class Test Types of water & causes of hardness of water, Types of hardness Disadvantages of hard water	16th	Perform the experiment and find out the total alkalinity (G-2).
	24th	Expression of hardness of water – ppm unit of hardness, Removal of Temporary hardness – boiling & Clark's method		
9th	25th	Removal of Permanent hardness – Ion-exchange method	17th	**To determine the total hardness of given water sample by EDTA method** (G-1).
	26th	Boiler problems caused by hard water – scale & sludge formation, Priming & foaming	18th	To determine the total hardness of given water sample by EDTA method (G-2).
	27th	Caustic embrittlement, Water sterilization by Cl, UV radiation and RO		
10th	28th	**Assignment** Solution of problems	19th	**To determine the TDS in ppm in a given sample of water gravimetrically** (G-1).
	29th	**2nd Sessional Test**	20th	To determine the TDS in ppm in a given sample of water gravimetrically (G-2).
	30th	Analysis of Sessional test		
11th	31th	PTM **Unit – 4 Fuels & Lubricants** - introduction Fuels: def., Calorific value – def., types & units Characteristics of an ideal fuel	21th	**To determine the pH of different solutions using a digital pH meter** (G-1).
	32th	Petroleum: composition & refining Gaseous fuels: Composition, properties & uses of CNG, PNG, LNG, LPG	22th	To determine the pH of different solutions using a digital pH meter (G-2).
	33th	Relative advantages of liquid & gaseous fuels over solid fuels Scope of Hydrogen as future fuel		
12th	34th	Lubricants: classification, functions & Qualities of lubricants	23th	**To determine the calorific value of a solid/liquid fuel using a Bomb calorimeter** (G-1).
	35th	Mechanism of Lubrication Physical properties of Lubricant	24th	To determine the calorific value of a solid/liquid fuel using a Bomb calorimeter (G-2).
	36th	Class Test **Unit – 5 Polymer & Electrochemistry** - introduction		
13th	37th	Polymers: Def., classification	25th	**To determine the viscosity of lubricating oil using a Redwood viscometer** – introduction (G-1).
	38th	Preparation properties & uses of polythene, PVC, Nylon-66, Bakelite	26th	To determine the viscosity of lubricating oil using a Redwood viscometer – introduction (G-2).
	39th	Plastic: Def. & types Natural rubber, neoprene & other synthetic rubber		
14th	40th	Corrosion: Def., types & factors affecting rate of corrosion	27th	Perform the experiment and find out the viscosity of given lubricant oil (G-1).
	41th	Methods of prevention of corrosion – Hot dipping, metal cladding, cementation	28th	Perform the experiment and find out the viscosity of given lubricant oil (G-2).
	42th	Quenching & cathodic protection Nanotechnology: intro & applications Nano-materials & their classification		
15th	43th	Applications of nanotechnology in various engineering applications. **Assignment** Solution of problems	29th	**To prepare a sample of Phenol-formaldehyde resin (Bakelite)/Nylon-66 in the lab** (G-1).
	44th	**3rd Sessional Test**	30th	To prepare a sample of Phenol-formaldehyde resin (Bakelite)/Nylon-66 in the lab (G-2).
	45th	Analysis of Sessional test		
16th	46th	Taking Problems & solve them PTM	31th	Revision
	47th	Practice of sample papers	32th	Revision
	48th	Revision		