

Government Polytechnic Panchkula, Sector

Lesson Plan

Name- Ms.Binny Gaba

Discipline- Applied Science

Semester – 1st Sem

Subject –Applied

Chemistry

Duration –16 weeks (2022-23)

Work load (per week):- lectures-03 Practical :02

Week	Theory		Practical	
	Lect. day	Topic	Lect. day	Topic
1 st	1 st	UNIT 1 Atomic Structure, Periodic Table and Chemical Bonding.	1 st	To prepare standard solution of oxalic acid.
	2 nd	Bohr's model of atom (qualitative treatment only), dual character of matter: derivation of de-Broglie's equation,		
	3 rd	Heisenberg's Principle of Uncertainty,	2 nd	To prepare standard solution of oxalic acid.
2 nd	1 st	modern concept of atomic structure: definition of orbitals, shapes of s, p and d-orbitals, quantum numbers and their	1 st	To prepare standard solution of oxalic acid.
	2 nd	Electronic configuration: Aufbau and Pauli's exclusion principles and Hund's rule, electronic configuration of elements up to atomic number 30.		
	3 rd	Modern Periodic law and Periodic table,	2 nd	To prepare standard solution of oxalic acid.
3 rd	1 st	classification of elements into s, p, d and f-blocks, metals, non-metals and metalloids (periodicity in properties excluded).	1 st	To dilute the given KMnO ₄ solution

	2 nd	Chemical bonding: cause of bonding, ionic bond, covalent bond, and metallic bond (electron sea or gas model), Physical properties of ionic, covalent and metallic substances.		To dilute the given KMnO ₄ solution
	3 rd	Revision	2 nd	
3 rd	1 st	UNIT II Metals and Alloys: Metals: mechanical properties of metals such as conductivity, elasticity, strength and stiffness, luster, hardness, toughness, ductility, malleability, brittleness, and impact resistance and their uses.	1 st	To dilute the given KMnO ₄ solution
	2 nd	Definition of a mineral, ore, gangue, flux and slag.	2 nd	To dilute the given KMnO ₄ solution
	3 rd	Metallurgy of iron from haematite using a blast furnace. Commercial varieties of iron.	1 st	To find out the strength in grams per litre of an unknown solution of sodium hydroxide using a standard (N/10) oxalic acid solution.
4 th	1 st	Alloys: definition, necessity of making alloys, composition, properties and uses of duralumin and steel.	2 nd	To find out the strength in grams per litre of an unknown solution of sodium hydroxide using a standard (N/10) oxalic acid solution.
	2 nd	Heat treatment of steel- normalizing, annealing, quenching, tempering.	1 st	To find out the strength in grams per litre of an unknown solution of sodium hydroxide using a standard (N/10) oxalic acid solution.
	3 rd	UNIT III Water, Solutions, Acids and Bases	2 nd	To find out the strength in grams per litre of an unknown solution of sodium hydroxide using a standard (N/10) oxalic acid solution.

	4 th	Solutions: definition, expression of the concentration of a solution in percentage (w/w, w/v and v/v), normality, molarity and molality and ppm. Simple problems on solution preparation.	1 st	To find out the total alkalinity in parts per million (ppm) of a water sample with the help of a standard sulphuric acid solution.
5 th	1 st	Arrhenius concept of acids and bases, strong and weak acids and bases, pH value of a solution and its significance, pH scale. Simple numerical problems on pH of acids and bases.	2 nd	To find out the total alkalinity in parts per million (ppm) of a water sample with the help of a standard sulphuric acid solution.
	2 nd	Hard and soft water, causes of hardness of water, types of hardness – temporary and permanent hardness, expression of hardness of water, ppm unit of hardness; disadvantages of hard water; removal of hardness: removal of temporary hardness by boiling and Clark's method;		To determine the total hardness of given water sample by EDTA method
	3 rd	removal of permanent hardness of water by Ion-Exchange method; boiler problems caused by hard water: scale and sludge formation, priming and foaming, caustic embrittlement; water sterilization by chlorine, UV radiation and RO.		To determine the total hardness of given water sample by EDTA method
6 th	1 st	UNIT IV Fuels and Lubricants 4.1 Fuels: definition and classification of higher and lower calorific values, units of calorific value, characteristics of an ideal fuel.		To determine the amount of total dissolved solids(TDS) in ppm in a given sample of water gravimetrically
	2 nd	Petroleum: composition and refining of petroleum;		To determine the amount of total dissolved solids(TDS) in ppm in a given sample of water

				gravimetrically
	3 rd	composition, properties and uses of CNG, PNG, LNG, LPG; relative advantages of liquid and gaseous fuels over solid fuels. Scope of hydrogen as future fuel.		To determine the pH of different solutions using a digital pH meter.
7 th	1 st	Lubricants- Functions and qualities of a good lubricant, classification of lubricants with examples;		To determine the pH of different solutions using a digital pH meter.
	2 nd	Lubrication mechanism (brief idea only); physical properties (brief idea only) of a lubricant: oiliness, viscosity, viscosity index, flash and fire point, ignition temperature, pour point.		To determine the calorific value of a solid/liquid fuel using a Bomb calorimeter.
	3 rd	Lubrication mechanism (brief idea only); physical properties (brief idea only) of a lubricant: oiliness, viscosity, viscosity index, flash and fire point, ignition temperature, pour point.		To determine the calorific value of a solid/liquid fuel using a Bomb calorimeter.

8 th	1 st	UNIT V		
	2 nd	Polymers and Electrochemistry		To determine the viscosity of a lubricating oil using a Redwood viscometer
	3 rd	Polymers and Plastics: definition of polymer, classification, addition and condensation polymerization; preparation properties and uses of polythene, PVC, Nylon-66, Bakelite;		To determine the viscosity of a lubricating oil using a Redwood viscometer
9 th	1 st	definition of plastic, thermoplastics and thermosetting polymers; natural rubber and		To prepare a sample of Phenol-formaldehyde resin (Bakelite)/Nylon-66 in the lab.
	2 nd	neoprene, other synthetic rubbers (names only).		
	3 rd	Corrosion: definition, dry and wet corrosion		To prepare a sample of Phenol-formaldehyde resin (Bakelite)/Nylon-66 in the lab.
10 th	1 st	factors affecting rate of corrosion, methods of		To prepare a sample of Phenol-formaldehyde resin (Bakelite)/Nylon-66 in the lab.
	2 nd	prevention of corrosion		
	3 rd	hot dipping, metal cladding, cementation, quenching, cathodic protection methods		To prepare a sample of Phenol-formaldehyde resin (Bakelite)/Nylon-66 in the lab.
11 th	1 st	methods of		
	2 nd	prevention of corrosion—hot dipping, metal cladding, cementation, quenching, cathodic protection methods		Viva Voice
	3 rd	Introduction and application of nanotechnology: nano-materials and their classification, applications of nanotechnology in various engineering applications		Viva Voice
12 th	1 st	Revision		
	2 nd	Revision		Viva Voice

13 th	3 rd	Revision	Viva Voice
	1 st	Revision	Viva Voice
	2 nd		
14 th		Revision Revision	Viva Voice
	3 rd		Viva Voice
	1 st		Viva Voice
15 th	2 nd	Revision Revision	Viva Voice
	3 rd		Viva Voice
	1 st	Revision	Revision and file checking
16 th	2 nd		Revision and file checking
	3 rd	Revision Revision	Revision and file checking