

Lesson Plan

Name : Sonia
Discipline : Common for all branches
Semester : 1st
Subject : Applied Chemistry
Code : 220014
Session : 2022-23
Work Load : 3Lectures, and 2 practical per week

Day	Lecture	Practical
	Topic	Topic
1.	Bohr's model of atom (qualitative treatment only), dual character of matter: derivation of de-Broglie's equation,	To prepare standard solution of oxalic acid.
2.	Heisenberg's Principle of Uncertainty, modern concept of atomic structure: definition of orbitals, shapes of s, p and d-orbitals	
3.	Quantum numbers and their significance. Electronic configuration: Aufbau and Pauli's exclusion principles and Hund's rule, electronic configuration of elements up to atomic number 30.	To prepare standard solution of oxalic acid.
4.	Quantum numbers and their significance. Electronic configuration: Aufbau and Pauli's exclusion principles and Hund's rule, electronic configuration of elements up to atomic number 30.	
5.	Revision of Topic	Revision and Checking of practical file
6.	Heisenberg's Principle of Uncertainty, modern concept of atomic structure: definition of orbitals, shapes of s, p and d-orbitals	
7.	Modern Periodic law and Periodic table, classification of elements into s, p, d and f-blocks, metals, non-metals and metalloids (periodicity in properties excluded).	To dilute the given KMnO ₄ solution
8.	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.	
9.	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
10.	Revision of Topic	
11.	Metals: mechanical properties of metals such as conductivity, elasticity, strength and stiffness, luster, hardness, toughness, ductility, malleability, brittleness, and impact resistance and their uses.	
12.	Definition of a mineral, ore, gangue, flux and slag.	

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	Metallurgy of iron from haematite using a blast furnace. Commercial varieties of iron.	
13.	Alloys: definition, necessity of making alloys, composition, properties and uses of duralumin and steel. Heat treatment of steel- normalizing, annealing, quenching, tempering.	Revision and Checking of practical file
14.	Alloys: definition, necessity of making alloys, composition, properties and uses of duralumin and steel. Heat treatment of steel- normalizing, annealing, quenching, tempering.	
15.	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.	To find out the strength in grams per litre of an unknown solution of sodium hydroxide using a standard (N/10) oxalic acid solution.
16.	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.	
17.	Arrhenius concept of acids and bases, strong and weak acids and bases, pH value of a solution and its significance, pH scal	
18.	Simple numerical problems on pH of acids and bases.	
19.	Revision of Topic	
20.	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	To find out the strength in grams per litre of an unknown solution of sodium hydroxide using a standard (N/10) oxalic acid solution.
21.	Disadvantages of hard water; removal of hardness: removal of temporary hardness by boiling and Clark's method;	Revision and Checking of practical file
22.	Removal of permanent hardness of water by Ion-Exchange method; boiler problems caused by hard water: scale and sludge formation	
23.	Priming and foaming, caustic embrittlement; water sterilization by chlorine, UV radiation and RO.	To find out the total alkalinity in parts per million (ppm) of a water sample with the help of a

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24.	Revision of Topic	standard sulphuric acid solution.
25.	Fuels: definition and classification of higher and lower calorific values, units of calorific value, characteristics of an ideal fuel	To find out the total alkalinity in parts per million (ppm) of a water sample with the help of a standard sulphuric acid solution.
26.	Petroleum: composition and refining of petroleum; gaseous fuels: composition, properties and uses of CNG, PNG, LNG, LPG;	. Revision and Checking of practical file
27.	Relative advantages of liquid and gaseous fuels over solid fuels. Scope of hydrogen as future fuel.	
28.	Lubricants- Functions and qualities of a good lubricant, classification of lubricants with examples; lubrication mechanism (brief idea only)	
29.	Lubricants- Functions and qualities of a good lubricant, classification of lubricants with examples; lubrication mechanism (brief idea only)	To determine the total hardness of given water sample by EDTA method
30.	Physical properties (brief idea only) of a lubricant: oiliness, viscosity, viscosity index, flash and fire point, ignition temperature, pour point.	To determine the total hardness of given water sample by EDTA method
31.	Physical properties (brief idea only) of a lubricant: oiliness, viscosity, viscosity index, flash and fire point, ignition temperature, pour point.	
32.	Revision of Topic	Revision and Checking of practical file
33.	Revision of Topic	To determine the amount of total dissolved solids(TDS) in ppm in a given sample of water gravimetrically
34.	Polymers and Plastics: definition of polymer, classification, addition and condensation polymerization; preparation properties and uses of polythene, PVC, Nylon-66,	
35.	Bakelite; definition of plastic, thermoplastics and thermosetting polymers; natural rubber and neoprene, other synthetic rubbers (names only).	To determine the amount of total dissolved solids(TDS) in ppm in a given sample of water gravimetrically
36.	Corrosion: definition, dry and wet corrosion, factors affecting rate of corrosion, methods of prevention of corrosion	
37.	Hot dipping, metal cladding, cementation,	

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	quenching, cathodic protection methods	
38.	Introduction and application of nanotechnology: nano-materials and their classification	
39.	applications of nanotechnology in various engineering applications (brief).	
40.	Bakelite; definition of plastic, thermoplastics and thermosetting polymers; natural rubber and neoprene, other synthetic rubbers (names only).	To determine the pH of different solutions using a digital pH meter.
41.	Applications of nanotechnology in various engineering applications (brief).	To determine the calorific value of a solid/liquid fuel using a Bomb calorimeter.
42.	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	To determine the viscosity of a lubricating oil using a Redwood viscometer
43.	Bakelite; definition of plastic, thermoplastics and thermosetting polymers; natural rubber and neoprene, other synthetic rubbers (names only).	To determine the viscosity of a lubricating oil using a Redwood viscometer
44.	Hot dipping, metal cladding, cementation, quenching, cathodic protection methods	Revision and Checking of practical file
45.	Revision of Topic	
46.	Revision of Topic	
47.	Doubt Clearing Session	To prepare a sample of Phenol-formaldehyde resin (Bakelite)/Nylon-66 in the lab.
48.	Doubt Clearing Session	Revision and Checking of practical file

Note: Class Test and Sessional Exam will be given as per Academic Calendar.