Lesson Plan

Name : Sonia
Discipline : Civil Engg.
Semester : 1st
Subject : Applied Chemistry
Code : 220014
Session : 2024 –2025
Work Load : 3 Lectures, and 2 practical per week

Day	Lecture	Practical
Sr. No.	Topic	Topic
1.	Bohr'smodelofatom(qualitativetreatmentonly),dualcharacterofmatter	1. To prepare standard solution of oxalic acid
2.	Derivation of de-Broglis equation	
3.	Heisenberg's Principle of Uncertainty	
4.	Modern concept of atomic structure: definition of orbitals, shapes of s,p and d-orbitals	Revision and Checking of Practical file
5.	Quantum numbers and their significance. Electronic configuration	2. To dilute the given $KMnO_4$solution
6.	Aufbau and Pauli's exclusion principles and Hund's rule,	Revision and Checking of Practical file
7.	Electronicconfigurationofelementsuptoatomicnumber30.	3. To find out the strength in grams per litre of an unknown solution of sodium hydroxide using a standard (N/10) oxalic acid solution.
8.	Modern Periodic law and Periodic table,	Revision and Checking of Practical file
9.	Classification of elements in to s,p, d and f-blocks	4. To find out the total alkalinity in parts per million (ppm) of a water sample with the help of a standard sulphuric acid solution.
10.	Metals, non-metals and metalloids (periodicity in properties excluded).	Revision and Checking of Practical file
11.	Chemical bonding: cause of bonding	5. To determine the total hardness of given water sample by EDTA method
12.	Ionic bond, covalent bond, and metallic bond(electron sea or gas model),	Revision and Checking of Practical file
13.	Physical properties of ionic, covalent and metallic substances	6. To determine the amount of total dissolved solids(TDS) in ppm in a given sample of water gravimetrically
14.	Revisionofunit1/Problem solving	
15.	Metals: mechanical properties of metals such as conductivity, elasticity, strength and stiffness, luster, hardness, toughness, ductility, malleability, brittleness, and impact resistance and their uses.	7. To determine the pH of different solutions using a digital pH meter
16.	Definitionofamineral,ore,gangue,fluxandslag.Metallurgyofironfromhaematite using a blast furnace. Commercial varieties of iron	Revision and Checking of Practical file
17.	Alloys: definition, necessity of making alloys, composition, properties and uses of duralumin and steel.	8. To determine the calorific value of a solid/liquid fuel using a Bomb calorimeter.
18.	Heat treatment of steel-normalizing, annealing, quenching, tempering.	
19.	Solutions: definition, expression of the	9. To determine the

	concentration of a solution in percentage(w/w/w/v and v/v), normality, molarity and molality and ppm.	viscosity of lubricating oil using a Redwood viscometer
20.	Simple problems on solution preparation.	Revision and Checking of Practical file
21.	Arrhenius concept of acids and bases, strong and weak acids and bases,	10. To prepare a sample of Phenol-formaldehyde resin(Bakelite)/Nylon-66inthelab.
22	PH value of a solution and its significance,	Revision and Checking of Practical file
23.	PH scale. Simple numerical problems on pH of acids and bases.	Revision and Checking of Practical file
24.	Hard and soft water, causes of hardness of water, types of hardness	Revision and Checking of Practical file
25.	Temporary and permanent hardness, expression of hardness of water, ppm unit of hardness	Revision and Checking of Practical file
26.	Disadvantages of hard water; removal of hardness: removal of temporary hardness by boiling	Revision and Checking of Practical file
27.	Clark's method; removal of permanent hardness of water by Ion-Exchange method	Revision and Checking of Practical file
28.	Boiler problems caused by hard water: scale and sludge formation, priming and foaming,	Revision and Checking of Practical file
29.	Caustic embrittlement; water sterilization by chlorine, UV radiation and RO.	Revision and Checking of Practical file
30.	Fuels: definition and classification of higher and lower calorific values, units of calorific value	Revision and Checking of Practical file
31.	Characteristics of an ideal fuel. Petroleum: Composition and refining of petroleum;	Revision and Checking of Practical file
32.	Gaseous fuels: composition, properties and uses of CNG, PNG, LNG, LPG;	Revision and Checking of Practical file
33.	Relative advantages of liquid and gaseous fuels over solid fuels. Scope of Hydrogen as future fuel.	Revision and Checking of Practical file
34.	Lubricants- Functions and qualities of a good lubricant, classification of lubricants with examples;	Revision and Checking of Practical file
35.	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.	Revision and Checking of Practical file
36.	Polymers and Plastics: definition of polymer, classification, addition polymerization	Revision and Checking of Practical file
37.	Condensation polymerization; preparation properties and uses Of polythene, PVC, Nylon-66,Bakelite;	Revision and Checking of Practical file
38.	Definition of plastic, thermoplastics and thermo setting polymers; natural rubber and Neoprene, other synthetic rubbers(names	Revision and Checking of Practical file

	only).	
39.	Corrosion: definition, dry and wet corrosion, factor affecting rate of corrosion	Revision and Checking of Practical file
40.	Methods of prevention of corrosion—hot dipping, metal cladding, cementation, quenching,	Revision and Checking of Practical file
41.	Cathodic protection methods	Revision and Checking of Practical file
42.	Introduction and application of nanotechnology:	Revision and Checking of Practical file
43.	Nano-materials and their classification, applications of Nano technology in various	Revision and Checking of Practical file
44.	Engineering applications(brief) of Nano-materials	
45.	**Revision of Unit -1**	
46.	**Revision of Unit -2**	
47.	**Revision of Unit -3**	
48.	**Revision of Unit -4**	
49.	**Revision of Unit -5**	