

SIXTH SEMESTER

Code : **CHT-602**

Univ Code :602

Contact Hours :45

Work load : 4 hours per week

Credit Points :

Evaluation: Continuous Internal Assessment - 30 Marks

Semester End Examination - 70 Marks

PAPER - 6.2

UNIT-I:INORGANIC CHEMISTRY-8

15 Hours

Organo metallic chemistry

05 hours

Classification & nomenclature of organometallic Compounds, EAN (16 & 18 electron) rule, General methods of preparation. Organo-lithium & Organo-Aluminium compounds. Grignard reagent.

Ferrocene - preparation, properties & structure, Metal-Olefinic complexes- structure & bonding, Metal carbonyls - preparation, structure & bonding in metal carbonyls, Catalytic property of organometallic compounds, Ziegler-Natta catalysis.

Bio-Inorganic chemistry

05 hours

Macro elements, micro elements (Trace elements)- Essential trace elements, non-essential trace elements.

Metalloporphyrins, hemoproteins. Myoglobin & hemoglobin-structure & functions, oxygenation.

Metalloenzymes: Heme containing enzymes - carbonic anhydrase, carboxy peptidase, peroxidase, cytochrome.

Materials chemistry

05 hours

Introduction, classification of materials.

Multi-phase materials: ferrous & non-ferrous alloys, Fe-C phase transformation in ferrous alloys.

Composites: particle reinforced, fiber reinforced & structural composites.

Nano materials: Introduction about nanoscience & nanotechnology and applications.

UNIT-II:ORGANIC CHEMISTRY-8**15 Hours****Heterocyclic compounds****05 hours**

Definition and classification. Two methods of synthesis of furan, pyrrole, thiophene and pyridine. Molecular orbital picture and aromaticity of furan and pyridine. Electrophilic substitution reactions of pyrrole.

Food analysis**05 hours**

Reasons for food analysis. Analysis of moisture in vegetable oils & spices. Analysis of ash in honey. Analysis of crude fibers in spices and condiments. Food adulteration, common adulterants in food. Contamination of food stuffs. Common micro-organisms of food stuffs. Pesticide analysis in food products by TLC technique.

Medicinal chemistry**05 hours**

Introduction to chemotherapy. Different types of drugs with examples (Analgesics, antiseptics, antimalarials, antibiotics, tranquilizers). Synthesis and uses of aspirin paracetamol and sulphanilamide.

Antibiotics: Definition, examples and importance. Synthesis of antipyrine and chloramines-T. Pesticides – types with examples. Synthesis and uses of gammexane.

UNIT-III: PHYSICAL CHEMISTRY-8**15 Hours****E.M.F****12 hours**

Electrolytic and Galvanic cells, reversible and irreversible cells. Types of reversible electrodes, metal-metal ion electrode, metal-metal insoluble salt electrode, amalgam electrode, gas electrode and redox electrode. Electrode reaction in Daniel cell, sign convention of electrode potential (reduction potential is to be applied). EMF of the cell and its measurement. Standard electrode potential, Nernst equation for electrode potential (to be derived). Reference electrodes-calomel electrode. Weston standard cell, polarization, over voltage and hydrogen over voltage. Problems on the electrode potential and E.M.F of the cell. Concentration cells-with and without transference, liquid-junction potential.

Application of E.M.F measurements: (1) Determination of pH of a solution using quinhydrone and glass electrode. (2) Potentiometric titrations:Acid-base and redox titrations.

Electrochemical energy sources

03 hours

Primary cell (dry cell), secondary cell (Ni-Cd cell), Fuel cells. Construction and working of hydrogen-oxygen fuel cell and its importance.

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Univ Code :602

Contact Hours :45

Work load : 4 hours per week

Credit Points :

Evaluation: Continuous Internal Assessment - 10 marks

Semester and Examination - 40 marks (30 marks for examination, 05 marks for Practical record and 05 marks for viva-voce)

LABORATORY COURSE-8

45 Hours

Physical chemistry Instrumental experiments-II

- **In the beginning two practical durations may be used for instructions and demonstration. Instructions should cover theory and principles of each experiment.**
- **Minimum 11 experiments should be given for practical exercises.**

1. Determination of equivalent conductance at infinite dilution of strong electrolyte.
2. Determination of degree of dissociation of weak electrolyte.
3. Determination of dissociation constant of weak electrolyte.
4. Determination of solubility & solubility product of a sparingly soluble salt (BaSO_4 , AgCl , AgBr) by conductometric method.
5. Estimation of Fe by colourimetry.
6. Determination of percentage composition of liquid mixture by graph method using Abbey's refractometer.
7. Percentage composition by formula method using Abbey's refractometer.
8. Determination of pH of an unknown solution using quinhydrone or glass electrode by potentiometer.
9. Determination of ionic product of water by E.M.F method at 25°C .
10. Determine the pH of various mixtures of sodium acetate and acetic acid in aqueous solution and hence determine the dissociation constant of acetic acid.
11. Conductometric determination of the kinetic order of saponification of ethyl acetate by NaOH.
12. Determination of equivalent conductance of weak electrolyte at infinite dilution following Kohlrausch's law.