

SIXTH SEMESTER

Code : **CHT-601**

Univ Code :601

Contact Hours :45

Work load : 4 hours per week

Credit Points :

Evaluation: Continuous Internal Assessment - 30 marks

Semester and Examination - 70 marks

PAPER - 6.1

UNIT-I:INORGANIC CHEMISTRY-7

15 Hours

Industrial chemistry

06 hours

(a) Cement - Definition & composition of Portland cement, manufacture of Portland cement by dry process, setting of cement, types of Portland cement & other types of cement. Cement Industries in India. 02 hours

(b) Glass – Definition & composition, physical properties, chemical properties, characteristics, manufacture of glass by pot furnace method. Types of glasses. 02 hours

(c) Paints & pigments – Constituents of paints, formulation of paints. Types of pigments, White lead: Manufacture, physical properties & uses. Setting of paint. 02 hours

Environmental chemistry

05 hours

Types & sources of air pollution. Determination of particulates, SO_x, NO_x & CO_x

Water pollution – Different types of water pollutants. Ground water pollution, surface water pollution and marine water pollution. Impacts of water pollution on environment, COD, BOD. Control of water pollution. Industrial effluents – their effects & treatment, sewage water treatment. Water & air quality standards (ISI & WHO)

Inorganic polymers

04 hours

General characteristics of Inorganic polymers. Types of Inorganic polymers, Silicones – preparation, general properties, types and applications. Polyphosphazenes.

UNIT-II: ORGANIC CHEMISTRY-7

15 Hours

Study of natural products-Alkaloids & Terpenes

06 hours

Alkaloids: Introduction, classification with examples. Elucidation of structure of nicotine and synthesis. Structural formula and uses of quinine and atropine.

Terpenes: Introduction, classification, isoprene rule. Elucidation of structure of citral and synthesis. Structural formula and uses of menthol and camphor.

Enzymes, hormones and vitamins

06 hours

Enzymes: Classification, characteristic properties of enzymes, mechanism of enzymatic action (Lock and Key theory and template hypothesis) & Coenzymes.

Hormones: Introduction, classification with examples, hormone secreting glands (in human beings). Synthesis and importance of adrenaline. Biological importance of thyroxin, insulin.

Vitamins: Introduction, classification with examples. Synthesis of vitamin C. Biological importance of vitamin A, B₁, B₂, C and D.

Peptides and proteins

03 hours

Peptides: Classification, peptide linkage, synthesis of a dipeptide glycylalanine.

Proteins: Classification of proteins based on molecular shape and composition. Primary and secondary structure of proteins (α -helix and β -sheet structures) .

UNIT-III:PHYSICAL CHEMISTRY -7

Spectroscopy

15 Hours

Electromagnetic radiations, regions of the spectrum, basic features of different spectrometers. Statement of Born-oppenheimer approximation, degree of freedom.

Rotational spectrum

Diatomic molecules, energy levels of a rigid rotator (semi classical principle), spacing of spectral lines, selection rule, spectral intensity, distribution using population distribution (Maxwell-Boltzmann distribution), determination of bond length, qualitative description of non-rigid rotator, isotopic effect, problems.

Vibrational spectrum

IR spectrum – Energy levels of simple harmonic oscillator, selection rule, pure vibrational spectrum, intensity determination of force constant, qualitative relation of

force constant and bond energy. Zero point energy. Effect of anharmonicity and isotope on the spectrum. Idea of vibrational frequencies of different functional groups – problems.

Raman spectrum

Concept of polarizability, pure rotational and pure vibrational Raman spectra of diatomic molecules, selection rules.

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Univ Code :601

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-7

45 Hours

Inorganic quantitative analysis

- Theory of individual estimation & calculation of conversion factor is to be explained.
 - Minimum 11 experiments are to be given for estimation.
1. Estimation of Fe as Fe_2O_3 in ferrous ammonium sulphate
 2. Estimation of barium as barium sulphate in barium chloride solution.
 3. Estimation of sulphate as barium sulphate in ammonium sulphate.
 4. Estimation of Ni as Ni-DMG in Ni-ammonium sulphate solution.
 5. Estimation of copper as cuprous thiocyanate.
 6. Estimation of magnesium as magnesium oxinate in magnesium sulphate solution.
 7. Estimation of chloride as silver chloride in sodium chloride.
 8. Estimation of aluminium as aluminium oxide in aluminium sulphate.
 9. Estimation of copper as copper oxide.
 10. Analysis of stainless steel
 11. Analysis of lime stone (SiO_2 by gravimetry & Ca by titrimetry).
 12. Gravimetric analysis of Cu-Ni alloy.