

Class: B. Tech. 1st Semester
Branch: Common to all Branches
Course Title: Engineering Chemistry-I
Course Code: CHM-103
Duration of Exam: 3 hours

UNIT 1

SPECTROSCOPY:

UV Spectroscopy –Electronic transitions, spectrum, shift of bonds with solvents for double bonds, carbonyl compounds and aromatic compounds.

IR-Spectroscopy –Introduction, brief idea about instrumentation, applications and interpretation of IR Spectra, characterization of functional groups and frequency shift associated with structural changes.

¹H-NMR Spectroscopy –Theory of ¹H-NMR Spectroscopy, equivalent and non-equivalent protons, chemical shift, spin-spin coupling, spin-spin splitting, ¹H-NMR spectrum of a few organic compounds.

UNIT 2

COORDINATION & ORGANOMETALLIC COMPOUNDS

Complex formation and Stability Constants, Factors affecting stability of complexes, Bonding in coordination compounds (Werner's, VBT, CFT), Explanation to Magnetic & Spectral Properties.

Introduction to Organometallic compounds, 18 & 16-electron rules. Application of organometallic compounds.

UNIT 3

ELECTROCHEMISTRY:

Reduction potential, Redox stability in water, the diagrammatic presentation of potential data, the effect of complex formation on potentials, Electrolytes & Non-electrolytes, Kind of electrodes, Electrochemical & electrolytic cells, Faradays Laws of electrolysis, Batteries.

UNIT 4

LUBRICANTS, DYES & DRUGS

Definition & functions of lubricants, mechanism of lubrication, classification of lubricants (Lubricating oils, semi-solid lubricants and solid lubricants) synthetic lubricants, flash and fire points, oiliness, Cloud and Aniline points.

Classification of dyes and drugs. Application of following class of drugs:

- a) Narcotics b) Tranquilizers c) Antipyretics d) Antibiotics

BOOKS RECOMMENDED:

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|--------------------------------------|----------------|
| 1. Engineering Chemistry | Jain & Jain |
| 2. Engineering Chemistry | Sharma, B.K. |
| 3. Engineering Chemistry | Dara, S.S. |
| 4. Organic Chemistry | Bahl, B.S. |
| 5. Organic Chemistry | Soni, P.L. |
| 6. Organic Chemistry | Jain, M.K. |
| 7. Spectroscopy of Organic Compounds | Silverstain |
| 8. Spectroscopy of Organic Compounds | Kalsi, P.S. |
| 9. Inorganic Chemistry | Shriver Atkins |