

Week 1

(July 16 - July 21) → Optical activity, Polarization, Clausius-Mossotti equation, orientation of dipoles in electric field, dipole moment

Week-2 (July 23 - July 28) → Measurement of dipole moment, temperature method and refractivity method. Dipole moment and structure of molecule

Week 3 - (July 30 - August 4) → Magnetic permeability, magnetic susceptibility and its determination

Week-4 (Aug 06 - Aug 11) → Application of magnetic susceptibility, magnetic properties.

Week 5 (Aug 13 - Aug 18) → Paramagnetic, diamagnetic, Ferromagnetic

Week-6 (Aug 20 - Aug 25) → Test, Arrangement, Introduction of spectroscopy. Electromagnetic Radiation.

Week-7 (Aug 27 - ~~Sept~~ 01) → Region of spectrum, basic features of spectroscopy, statement of Born-Oppenheimer approximation.

Week 8 (Sept 03 - Sept 08) → Degree of freedom, Diatomic molecule. Energy level of rigid rotator, selection rule.

- Week-9 (Sept-15th - Sept 15) → spectral intensity (Maxwell-Boltzmann distribution) determination of bond length. isotope effect
- Week-10 (Sept-17 - Sept-22) → qualitative description of non-rigid rotor. class test.
- Week-11 (Sept 24 - Sept 29) → Infrared spectrum, energy level of S.N.O., selection rule, pure vibrational spectrum, intensity.
- Week-12 (Oct 1 - Oct 06) → force constant & bond energy determination, effect of Anharmonic oscillation
- Week-13 (Oct-08 - Oct-13) → Isotopic effect on spectral line, idea of vibrational frequency of different functional group.
- Week-14 (Oct-15 - Oct-20) → concept of polarizability, pure rotational & pure vibrational Raman spectra of diatomic molecules, selection rule, quantum theory of Raman spectra.
- Week-15 (Oct-22 - Oct-27) → Black-body radiation, Planck's radiation, photoelectric effect, heat capacity of solids, Compton effect.
- Week-16 (Oct-29 - Nov 3rd) wave function & its significance, Postulates of quantum mechanics, quantum mechanical operator, commutation relation, Hamiltonian operator, Hermitian operator.
- Week-17 (Nov-5 - Nov-17) - Role of operator in quantum, Determination of wave function & energy of Particle in 1-D. (Solved-6th - 17th)
- Week-18 (Nov-19 - Nov-23) - Factorial representation & its significance
- Week-19 (Nov-25 - Nov-30) - class test & Revision.