

## JNC310 (Aug) 3:0

### Structure and Chemical Crystallography

History of crystallography, structure of solids, structural relations in known compounds, defects in solids, concepts of symmetry, point groups and space groups, crystal lattices, elements of scattering theory, X-ray diffraction, diffraction principles, reciprocal space, Ewald construction, powder X-ray diffraction, XRD line broadening, Rietveld refinement in powder diffraction, single crystal X-ray diffraction methods, different method to grow good crystals, data collection and processing strategies, image plate and CCD detectors, intensity statistics, structure factor, phase problem in crystallography, Patterson and direct methods, electron density maps, structure refinement, structure data bases, synchrotron radiation, basics of neutron diffraction, basics of electron diffraction.

#### References:

1. A.R. West, *Solid State Chemistry and its applications*
2. L. Smart and E. Moore, *Solid state chemistry: An introduction*
3. M F C Ladd, R A Palmer, *Structure Determination by X- Ray*
4. W. Massa, *Crystal Structure Determination*
5. C. Hammond, *The Basics of Crystallography and Diffraction*
6. G. H. Stout and B001HML0Y6 L. H. Jensen, *X-Ray Structure Determination: A Practical Guide*
7. B. E. Warren, *X-Ray Diffraction*
8. C. Hammond, *The basics of crystallography and diffraction*
9. T. Hahn, *International tables for Crystallography*
10. P. Müller, R. Herbst-Irmer, A. Thomas Schneider, M. Sawaya, *Crystal Structure Refinement: A Crystallographer's Guide to SHELXL*