

In.M.Sc. Applied Physics, 5 years

10TH SEMESTER

FPYE-1006: ADVANCED CHARACTERIZATION TECHNIQUES

Mark-100

Unit-I

X-ray diffraction and reciprocal lattices

Choice of x ray , electron and Neutron for crystal structure determination, Bragg diffraction, Reciprocallattices, Thebragg's condition and ewald construction, Brillouinzones, Brillouin zones of SC, BCC, FCC lattices, Atomic scattering factor, Geometrical Structure factor, Lauemethod, Rotating crystal method, powder method, Electron diffraction, Geometrical nature of electron diffraction patterns, Indexing of electron diffraction spot pattern, electron microscope , transmission electron microscopy, scanning electron microscopy, DebyeScherrer Technique, - Analysis of the powder photograph, The determination of lattice type and space group, crystal structure determination. (20)

Unit-II

Microscope techniques:

Electron Microscope:SEM, TEM, FESEM, HRTEM

Scanning probe microscopy:Atomic Force microscopy, Scanning tunneling microscopy. (10)

Unit-III

Spectroscopic Techniques:

UV-visible spectroscopy, Ramanspectroscopy, electronspectroscopy, Neutronsattering, X-ray scattering, x-ray photoelectron spectroscopy (10)