

Minor II

PYL729: Nano Probe Techniques

March 28, 2018

Marks: 20

Q1. What is diffraction limit? What is the difference between near field and far field optics? What is near field scanning optical microscope? What are the applications of NSOM? [7]

Q2. What is surface plasmon resonance? Why does surface plasmons can be excited on flat thin metal films? Ag, Au and Cu are said to be plasmonic materials, why? How does Raman spectroscopy different from infra-red spectroscopy? What is surface enhanced Raman spectroscopy (SERS)? How the enhancement factor in SERS is defined? SERS is observed for nanostructured plasmonic metal films but not on conventional thin films, why? SERS is observed by p -polarized light, why? [7]

Q3. What is total internal reflection of light at the interface? What are evanescent waves? Consider a dielectric/metal interface (xy -plane); draw the magnitude of electric field of evanescent wave as the function of distance perpendicular to this interface (z -direction). Write an expression of a wave with its electric field polarized in y direction and traveling along x direction. [6]
