Roll No. | | | | | | | | | | | | | Total No. of Pages : 01

Total No. of Questions : 08

M.Tech. (Microelectronics) (Sem.–2)

MEASUREMENTS AND CHARACTERIZATION TECHNIQUES

Subject Code : ME-806

M.Code : 38406

Time : 3 Hrs. Max. Marks : 100

INSTRUCTIONS TO CANDIDATES :

1. **Attempt any FIVE questions out of EIGHT question.**
2. **Each question carry TWENTY marks.**

1. a) What is the role of temperature on resistivity of materials? Explain the process of resistivity measurement using four probe method (with neat and labelled diagram).
   b) What is the difference between four probe and two probe method?
2. a) Draw the basic components of Secondary ion mass spectrometry. Also, explain its working principle.
   b) Why is X-ray photo electron spectroscopy surface sensitive? Explain.
3. Why is confocal microscope used? Draw its schematic and explain its working principle. Compare confocal microscopy and fluorescence microscopy in terms of their limitations.
4. Why do we need electron microscopy? Draw and explain the working principle of Scanning Electron microscopy.
5. a) What kind of samples can be analyzed by Atomic Force Microscope (AFM)? Explain in detail the working principle of AFM (with neat and labelled diagram). What are the applications of AFM?
   b) Enlist at least five advantages of Scanning tunneling microscopy.
6. a) What are the various modes of operation of scanning near field optical microscopy (SNOM)? Explain all of them with the help of diagram.
   b) Differentiate scanning near field microscopy and deep level transient spectroscopy.
7. a) What do you mean by quantum tunneling of electrons? Explain in detail the working principle of Scanning tunneling microscopy (with neat and labelled diagram).
   b) Enlist at least five limitations of Secondary ion mass spectrometry (SIMS).
8. Write a short note on following :
   a) Nano scale current - voltage relationship
   b) Synthesis of nano-phosphors

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.