Exam.Code:1030
Sub. Code: 7856

1059

M. Tech. (Material Science and Technology)
Second Semester
MST-201: Advanced Materials Characterization

Time allowed: 3 Hours Max. Marks: 50

NOTE: *Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.*

x-x-x

I. Answer the following briefly:-

a) Which elements can be detected by Auger electron spectroscopy? Why it is not possible to detect hydrogen?

b) Define magnification in SEM. How it can be controlled?

c) What are the limitations of Rutherford Backscattering technique in probing the thickness and composition of the films?

d) Should the diffraction pattern from low energy electron diffraction always be symmetric? Why?

e) What are the application fields of spectroscopic ellipsometry? (5x2)

UNIT – I

II. a) Define the terms 'sputtering' and 'surface sensitivity' and 'surface damage' in reference to Secondary Ion Mass Spectroscopy.

b) Discuss the application of Rutherford Backscattering spectroscopy in analysis of model catalysts. (5,5)

III. What is low energy electron diffraction? Explain its principle of operation. What type of information it gives about the material?' (10)

IV. Elaborate the various capabilities of ellipsometry for measurements at the nanoscale. (10)

UNIT – II

V. a) Is it possible to combine Augur electron spectroscopy with electron microscopy? Discuss the benefits and disadvantages.

b) Briefly explain the astigmation effect, its cause and how it can be corrected. (5,5)

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VI. Discuss about the operating conditions of SEM and preparation of SEM specimen. (10)

VII. With the help of a diagram, explain the construction and working principles of AFM. (10)

x-x-x