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10NT63

Sixth Semester B.E. Degree Examination, June/July 2016

Characterization Techniques

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. Write the principles and applications of x-ray diffraction. **(10 Marks)**

b. Write about x-ray photoelectron spectroscopy and energy dispersive x-ray analysis. **(10 Marks)**

2 a. Explain hot stage microscopy and phase contrast microscopy. **(10 Marks)**

b. Write a brief note on phase contrast microscopy with a neat diagram. **(10 Marks)**

3 a. Write a note on FTIR and its principle of operation with applications. **(10 Marks)**

b. Explain in brief on Raman spectroscopy and it principle of operation. **(10 Marks)**

4 a. Explain working of transmission electron microscopy with a neat diagram. **(10 Marks)**

b. Give a note on atomic force microscopy. **(10 Marks)**

PART – B

5 a. Write about nano indentation data analysis and draw load-depth plot for nano indentation experiment. **(10 Marks)**

b. Explain any four models for nano indentation with equations. **(10 Marks)**

6 a. Write a note on Nuclear Magnetic Resonance and give any five applications. **(10 Marks)**

b. Explain:
   i) Electron spin resonance
   ii) Mossbauer spectroscopy **(10 Marks)**

7 a. What is surface characterization? Write principle and name its different techniques. **(10 Marks)**

b. Write a note on Auger electron spectroscopy with a neat diagram. **(10 Marks)**

8 a. Explain:
   i) Differential thermal analysis
   ii) Differential scanning calorimetry. **(10 Marks)**

b. Give a brief note on importance of thermal analysis for nanostructures. **(10 Marks)**

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