

35131

M.Sc. DEGREE EXAMINATION, NOVEMBER 2017.

THIRD SEMESTER

Material Science and Nanotechnology

Paper I – CHARACTERISATION TECHNIQUES

Time : Three hours

Maximum : 75 marks

(No additional sheet will be supplied)

PART A — (5 × 3 = 15 marks)

Answer any FIVE questions.

Each question carries 3 marks.

Each answer should not exceed 1 page.

1. What is Beer's law? Explain.
2. What are different types of detectors and monochromators?
3. Explain different selection rules in IR spectroscopy.
4. What are sequences and progressions in vibrational spectroscopy?
5. Explain briefly about stokes and anti stokes Raman lines.
6. What are different types of molecules? Explain.
7. What is reciprocal lattice?
8. Give the examples for BCC and FCC lattices.

PART B — (4 × 15 = 60 marks)

Answer ALL questions.

Each questions carries 15 marks.

Each answer should not exceed 6 pages.

9. How do you analyse the trace metals in oils using atomic absorption spectroscopy.

Or

10. What are the essential parts ion UV-VIS spectrophotometer? Explain in detail.

11. What are the basic principles of IR spectrophotometry? Describe FTIR spectrometer with block diagram.

Or

12. How do you evaluate the vibrational frequencies using Deslander's table?

13. Describe the theory of vibrational Raman Spectra.

Or

14. Describe the experimental methods to study the Raman spectra in detail.

15. Describe the essential features of Weissenberg method and explain in detail.

Or

16. How do you interpret the powder photographs by analytical and graphical methods?

