

45131

M.Sc. DEGREE EXAMINATION, APRIL 2018.

Material Science and Nano Technology

FOURTH SEMESTER

Paper I — ADVANCED CHARACTERIZATION 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 are the applications of Scanning Electron microscope?
2. What is STM?
3. Explain the working principle involved in TGA.
4. Explain any three applications of TMA?
5. What is the difference between Paper Chromatography and Column Chromatography?
6. Explain the Column in Gas Chromatography.
7. Express the concept of EDAX.
8. What is Dynamic Light Scattering?

PART B — (4 × 15 = 60 marks)

Answer ALL questions.

Each question carries 15 marks.

Each answer should not exceed 6 pages.

9. What is surface topography? Explain the working principle and Construction in Transmission Electron Microscopy.

Or

10. Explain the principle, construction and Working of Atomic force Microscopy. Write any two applications of AFM.

11. Explain the difference between Differential Thermal analysis (DTA) and Differential Scanning Calorimetry (DSC).

Or

12. What are the Thermal decomposition reactions of Polymers? Explain the Thermo Mechanical Analysis with suitable applications.
13. Explain the difference between Ion Exchange Chromatography (IEC) and High Performance Liquid Chromatography (HPLC).

Or

14. Describe the Principle and Instrumentation of Gas Chromatography.
15. Give a detailed note on X-ray photoelectron spectroscopy (XPS) with suitable applications.

Or

16. Explain the principle and construction of Augur Electronic Spectroscopy (AES).

