(041140202/446121B)

M.Sc. DEGREE EXAMINATION, APRIL 2018

FOURTH SEMESTER

Branch — PHYSICS

Paper II — ANALYTICAL TECHNIQUES

Time : 3 Hours *Max. Marks : 70*

PART – A

Answer any FOUR questions. Each question carries 5 marks.

(Marks : 4 × 5 marks = 20 marks)

1. Explain the phenomenon of reciprocal lattice.
2. What is Bragg's law?
3. Explain the ESR theory.
4. What is the Mossbauer Effect?
5. Explain the theory of NMR.
6. State and define the basic concepts of NQR spectra.
7. Draw the instrumentation of scanning electron Microscopy.
8. Write note on X-ray fluorescence spectroscopy.

PART – B

Answer ONE question from each Unit.

Each question carries 12.5 marks.

(Marks : 4 × 12.5 marks = 50 marks)

9. (a) Describe the X-ray powder diffractometer for determination of crystal structures.

Or

(b) Discuss the principles and applications of electron and neutron diffraction.

10. (a) Describe the experimental methods and applications of ESR Spectroscopy.

Or

(b) Discuss the experimental methods and applications of Mossbauer spectroscopy.

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11. (a) State and explain the Bloch equation.

(b) What is the chemical shift?

Or

(c) Describe the half integrals and integral spins and instrumentation pulse RF NQR, it applications.

12. (a) Discuss the principle, instrumentation and applications of photoelectron spectroscopy.

Or

(b) Describe the principle, instrumentation and applications of transmission electro Microscopy.
