

Paper IV — OPTICS AND SPECTROSCOPY

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

Each question carries equal marks.

(5 × 20 = 100)

1. (a) Explain the construction, working principle and application of Fabry-Perot interferometer.

Or

(b) Explain linear and circular polarization with an example.

2. (a) What do you mean by diffraction? Explain Fraunhofer diffraction briefly.

Or

(b) Explain double refraction with a neat diagram. Give the necessary theory.

3. (a) Explain the construction and working principle of microwave spectrometer.

Or

(b) Explain classical and quantum theory of Raman effect.

4. (a) State and explain Frank-Condon principle.

Or

(b) Explain Zeeman effect with a neat diagram. Discuss the experimental set up for the measurement of Zeeman effect.

5. (a) Explain isomer shift, quadruple and magnetic hyperfine interaction of Mossbauer spectroscopy.

Or

(b) Explain the principle of NMR and obtain the resonance condition.
