

B.Sc. Semester - 5 (CBCS) Examination
Oct/Nov - 2025 (NEW COURSE)
Spectroscopy and Optics(Core)

Time: 2:30 Hours**Marks: 70****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate marks.

-
- Que.1(A) Answer the following question (any two). (10)
- (1) Write note on discontinuous spectra.
 - (2) Write note on Bohr's theory of an atom.
 - (3) Explain classical interpretation of normal Zeeman effect.
- Que.1(B) Answer the following question (any one). (04)
- (1) Explain Franck-Hertz experiment.
 - (2) Write short note on experimental study of Zeeman effect.
- Que.2(A) Answer the following question (any two). (10)
- (1) Write a note on experimental study of molecular spectra.
 - (2) Explain theory of pure rotational-vibrational molecular spectra.
 - (3) Discuss classical theory of Raman effect.
- Que.2(B) Answer the following question (any one). (04)
- (1) Explain theory of electronic band molecular spectra.
 - (2) Explain Raman effect and its salient features.
- Que.3(A) Answer the following question (any two). (10)
- (1) Explain production of x-rays.
 - (2) Describe Bragg's spectrometer.
 - (3) Write a note on powder crystal method.
- Que.3(B) Answer the following question (any one). (04)
- (1) Explain continuous x-ray spectrum .
 - (2) Write properties of x-rays.
- Que.4(A) Answer the following question (any two). (10)
- (1) Write a note construction and working of Michelson's interferometer.
 - (2) Explain the Twyman and Green interferometer.
 - (3) Explain Lummer and Gehrcke plate with neat diagram.
- Que.4(B) Answer the following question (any one). (04)
- (1) Write any two applications of Michelson interferometer.
 - (2) Discuss about Fabry-Perot interferometer.
- Que.5(A) Answer the following question (any two). (10)
- (1) Explain any two types of production of plane polarized light.
 - (2) Describe the construction and action of a Nicol prism. Explain its working as a polarizer and analyzer.
 - (3) Explain types of polarized light.
- Que.5(B) Answer the following question (any one). (04)
- (1) State and prove Malus law.
 - (2) A ray of light is incident on the surface of a glass plate of refractive index 1.55 at the polarizing angle. Calculate the angle of refraction.
