

B.Sc. Semester - 5 (Remedial) (CBCS) Examination**March/April-2024 (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.

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- Que-1(A) Answer the following question (any two). (10)
- (1) Write note on discontinuous spectra.
 - (2) Explain quantum number and their physical interpretations.
 - (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 a short note on Sommerfeld elliptical orbits.
- Que-2(A) Answer the following question (any two). (10)
- (1) Explain theory of pure rotational-vibration molecular spectra.
 - (2) Explain theory of electronic band molecular spectra.
 - (3) Discuss classical theory of Raman effect.
- Que-2(B) Answer the following question (any one). (04)
- (1) Explain theory of pure rotational molecular spectra.
 - (2) Discuss the exciting source and sample tube Raman spectra.
- Que-3(A) Answer the following question (any two). (10)
- (1) Write a note on production of x-rays.
 - (2) Describe Bragg's spectrometer.
 - (3) Write a note on rotating crystal method
- Que-3(B) Answer the following question (any one). (04)
- (1) Write properties of x-rays.
 - (2) Describe continuous x-ray spectrum.
- Que-4(A) Answer the following question (any two). (10)
- (1) Write a note construction and working of Michelson's interferometer.
 - (2) Derive intensity distribution formula for multiple beam interference.
 - (3) Explain the Twyman and Green interferometer.
- Que-4(B) Answer the following question (any one). (04)
- (1) Discuss about Fabry-Perot interferometer.
 - (2) Write any two applications of Michelson interferometer.
- Que-5(A) Answer the following question (any two). (10)
- (1) Explain any two types of production of plane polarized light.
 - (2) Write a note on double refraction in calcite prism.
 - (3) Describe the construction and action of a Nicol prism. Explain its working as a polarizer and analyzer.
- Que-5(B) Answer the following question (any one). (04)
- (1) Describe applications of polarized light.
 - (2) State and prove Malus law.
