

B.Sc. Semester - 5 (CBCS) Examination
Oct/Nov - 2021 (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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- Q.1(A) **Answer the following questions. (Any Two Out of Three)** (10)
1. Write note on discontinuous spectra.
 2. Explain Franck-Hertz experiment.
 3. Explain classical interpretation of normal Zeeman effect.
- Q.1(B) **Answer the following questions. (Any One Out of Two)** (04)
1. Write a short note on Sommerfeld elliptical orbits.
 2. Write short note on vector atom model and normal Zeeman effect.
- Q.2(A) **Answer the following questions. (Any Two Out of Three)** (10)
1. Write a note on experimental study of molecular spectra.
 2. Explain theory of pure rotational-vibration molecular spectra.
 3. Explain observation of Raman spectra.
- Q.2(B) **Answer the following questions. (Any One Out of Two)** (04)
1. Explain theory of electronic band molecular spectra.
 2. Explain Raman effect and its salient features.
- Q.3(A) **Answer the following questions. (Any Two Out of Three)** (10)
1. Write a note on production of x-rays.
 2. Describe continuous x-ray spectrum.
 3. Write a note on rotating crystal method.
- Q.3(B) **Answer the following questions. (Any One Out of Two)** (04)
1. Write a short note on Bragg's law.
 2. Write properties of x-rays.
- Q.4(A) **Answer the following questions. (Any Two Out of Three)** (10)
1. Write a note construction and working of Michelson's interferometer.
 2. Derive intensity distribution formula for multiple beam interference.
 3. Fabry-Perot interferometer.
- Q.4(B) **Answer the following questions. (Any One Out of Two)** (04)
1. If 180 fringes cross the field of view of a Michelson interferometer when the movable mirror is moved through 0.0530 mm. find the wavelength of light used.
 2. Explain Lummer and Gehrcke plate with neat diagram.
- Q.5(A) **Answer the following questions. (Any Two Out of Three)** (10)
1. Explain any two types of production of plane polarized light.
 2. Write a note on double refraction in calcite prism.
 3. Describe applications of polarized light.
- Q.5(B) **Answer the following questions. (Any One Out of Two)** (04)
1. Explain polarizer and analyzer.
 2. Write a short note on effect of polarizer on light of different polarization.
