647510 **BSc5PhyC503x** **Seat No :_____**

B.Sc. Semester - 5 (Remedial) (*CBCS*) Examination
March/April-2022 (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 questions (any two out of three)** (10)

1. Write note on absorption spectra.
2. Explain principal and orbital quantum number.
3. Explain classical interpretation of normal Zeeman effect.

Que-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 experimental study of Zeeman effect.

Que-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 electronic band molecular spectra.
3. Explain Raman effect and its salient features.

Que-2 (B) **Answer the following questions (any one out of two)** (04)

1. Explain theory of pure rotational-vibration molecular spectra.
2. Give the applications of Raman spectra.

Que-3 (A) **Answer the following questions (any two out of three)** (10)

1. Describe continuous x-ray spectrum.
2. Explain diffraction of X-rays and Bragg's law.
3. Write a note on Laue method.

Que-3 (B) **Answer the following questions (any one out of two)** (04)

1. Write a short note on production of X-rays.
2. Write note on powder diffraction method.

Que-4 (A) **Answer the following questions (any two out of three)** (10)

1. Write a note on construction and working of Michelson's interferometer.
2. Explain Twyman and Green interferometer.
3. Write a note on Fabry-Perot interferometer and etalon.

Que-4 (B) **Answer the following questions (any one out of two)** (04)

1. If 115 fringes cross the field of view of a Michelson interferometer when the movable mirror is moved through 0.0258 mm. Calculate the wavelength of light used.
2. Explain Lummer and Gehrcke plate with neat diagram.

Que-5 (A) **Answer the following questions (any two out of three)** (10)

1. Explain elliptically and circularly polarized light.
2. Write a note on double refraction in calcite prism.
3. Write a note on Nicol prism.

Que-5 (B) **Answer the following questions (any one out of two)** (04)

1. Explain polarizer and analyzer.
2. Write applications of polarized light.

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