

B.Sc. Semester - 6 (NEP-2020) Examination

March/April-2026

PHY: Indian Knowledge System (IKS) (Major-15)

Time: 2:00 Hours

Marks: 50

Instructions:

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

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- Que.1 Answer the following questions (Any two): (10)
- 1) Give the historical background on ancient Indian astronomy.
 - 2) Explain the different scales and dimensions in astronomy.
 - 3) Write a short note on 'Constellations'.
- Que.2 Answer the following questions (Any two): (10)
- 1) What are quantum numbers? Give the physical interpretation of various quantum numbers.
 - 2) Describe the experimental arrangement for studying the Zeeman effect.
 - 3) What is normal Zeeman effect? Explain the normal Zeeman effect with help of vector atom model.
- Que.3 Answer the following questions (Any two): (10)
- 1) What is Raman effect? Give the salient features of Raman effect.
 - 2) Discuss the classical theory of Raman effect with necessary formulas.
 - 3) Explain the quantum theory of Raman effect with the help of energy level diagram of molecules.
- Que.4 Answer the following questions (Any two): (10)
- 1) Explain the concept of Phase Space in details.
 - 2) Deduce the classical Maxwell – Boltzmann distribution law in statistics.
 - 3) Explain the Bose–Einstein statistics. Derive the distribution law of Bose–Einstein statistics.
- Que.5 Answer the following questions (Any five): (10)
- 1) Explain the Equatorial plane and Ecliptic plane with figure.
 - 2) What is Sidereal time? Give the importance of the Sidereal time in astronomy.
 - 3) Determine the normal Zeeman effect of the cadmium red line of 6438 Å when the atoms are placed in a magnetic field of 0.008 T.
 - 4) Calculate Lande's g factor for $^2D_{5/2}$ state.
 - 5) Explain the pure rotational Raman spectra.
 - 6) State the important applications of Raman spectroscopy.
 - 7) State and prove Stirling's approximate formula.
 - 8) Explain the concept of Macro states and Micro states in statistical mechanics.
