

Sr. No. of Question paper : 3565

Your Roll No.....

B.Sc (Hons.)- Physics NEP UGCF-2022 / I- Semester

Paper Code - 2224001001

Introductory Astronomy (GE paper)

Time: 3 Hours

Maximum Marks: 90

(Write your Roll No. on the top immediately on receipt of this question paper.)

Question 1 is compulsory.

Attempt FIVE Questions in all.

All questions have equal marks.

1. Attempt any **six** questions:

- a) Explain and illustrate the trajectory of the Sun on summer solstice when observed from the North Pole.
- b) Distinguish between apparent and absolute magnitude scales of stars.
- c) Calculate the magnitude limit in the visible range that can be detected by 2.08 m telescope.
- d) What are solar flares? Explain the source of their energy.
- e) Explain the goals and expected outcomes of the Aditya L1 mission. Write the importance of this mission for solar research.
- f) What is cosmic distance ladder? Name at least three 'steps' of this ladder.
- g) Give an outline of the various stages in the evolution of the universe.

(6×3)

2. Using a well-labeled diagram, explain the universal equatorial coordinate system of a star on the celestial sphere. Show the yearly motion of the Sun in the universal equatorial system, and give its coordinates on spring and autumn equinoxes, and summer and winter solstices.
3. What is Saha's ionization formula? How is it used in the study of stellar spectra? Describe one instance where this formula correctly explained the prevalence of a specific feature of Sun's spectrum. Describe the classification of various types of stars with the help of well-labeled Hertzsprung–Russell diagram.
4. What are atmospheric windows? Explain how atmospheric effects determine the location, design, location, and choices for astronomical telescopes. Describe the use of internet in contemporary astronomy.
5. Give a description of the internal structure of the Sun. What are sunspots? Explain the Sunspot cycle? Why is the temperature of sunspots lower than their surroundings?
6. What is Olber's paradox? How does our current understanding of cosmology resolve this paradox? Explain how does cosmology help in understanding the origin of life.

Discuss the chances of life in the solar system.

7. Give the location, brief history, and unique features of these observatories in India: Mount Abu Infrared Observatory, Giant Metre-wave Radio Telescope observatory, Devasthal Observatory, and Hanle Indian Astronomical Observatory. Discuss properties of the James Webb telescope. How is it helping in understanding the early history of the Universe?