Name: **Enrolment No:**	

UPES
End Semester Examination, June 2025

Course: Fundamentals of Astronomy **Semester : VI**
Program: B. Sc. (Hons) Physics **Time : 03 hrs.**
Course Code: PHYS3023P **Max. Marks: 100**

Instructions:
1. **All questions are compulsory.**
2. **Question 7 in section B has an internal choice.**
3. **Question 10 in section C has an internal choice.**
4. **Use of scientific calculators is allowed.**

Number of Pages: 2.

SECTION A
(5 Q x 4 Marks = 20 Marks)

S. No.		Marks	CO
1	Mention key references to celestial bodies in Rig Veda and their importance in Indian astronomy.	**4**	**CO1**
2	What are solstices and equinoxes? Explain their astronomical significance.	**4**	**CO2**
3	Define tidal force. How do they influence ocean tides on Earth?	**4**	**CO3**
4	Discuss the Chandrasekhar limit. What does it tell us about stellar evolution?	**4**	**CO1**
5	Explain the structure of the Milky Way Galaxy.	**4**	**CO2**

SECTION B
(4 Q x 10 Marks = 40 Marks)

6	Compare the geocentric and heliocentric models. How did Copernicus and Galileo contribute to the acceptance of the heliocentric view?	**10**	**CO1**
7	Explain how the Earth's circumference can be measured using Eratosthenes' method.	**10**	**CO3**

	OR Calculate the orbital period of a planet at 2 AU from the Sun using Kepler's third law.		
8	Explain the role of spectroscopy in modern astronomy. Discuss Doppler broadening and its astrophysical applications.	**10**	**CO3**
9	Analyze the types of galaxies and their classification based on Hubble's tuning fork diagram. Explain how galaxy morphology relates to their evolution.	**10**	**CO4**
SECTION-C **(2 Q x 20 Marks = 40 Marks)**			
10	Describe the precession of equinoxes and estimate its time period. How has this phenomenon been used to date ancient astronomical texts or observatories, with examples from Indian astronomy? ***OR*** Compute the distance to a Cepheid variable star that has an apparent magnitude of 10 and an absolute magnitude of −5. Additionally, determine the parallax angle in arcseconds, and comment on whether such a star would be resolvable with ground-based parallax measurements.	**20**	**CO3**
11	Analyze the observational evidence for the Big Bang theory including the CMB radiation. Discuss how the accelerating universe was discovered using Type Ia supernovae.	**20**	**CO4**