



RAN-2103000205030064

B.Sc. (Sem. V) Examination October - 2025

Physics

Astrophysics - I

Time: 2 Hours]

[Total Marks: 50

સૂચના : / Instructions

- (1) ઉપરોક્ત દર્શાવેલ વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fill up strictly the above details on your answer book
- (2) Draw neat diagrams wherever necessary.
- (3) Symbols used in the paper have their usual meaning.
- (4) Figures to the right indicate full marks of the question.
- (5) Scientific calculator may be used.

Seat No.:

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Student's Signature

Q-1. Answer all the following questions in brief: (10)

1. Explain the term f-ratio.
2. What does HST stand for, and when was it launched?
3. Name the different types of reflecting telescopes.
4. Name the Indian scientist who made pioneering contributions to astrophysics.
5. What do you understand by Fraunhofer lines?
6. Define a parsec.
7. What are spectroscopic binaries?
8. Which star is the brightest one seen in the night sky?
9. What is limb darkening?
10. Classify the types of binary stars based on their closeness and orientation as seen from Earth.

Q-2. (A) Answer any one the following questions in detail. (06)

- (1) Write a brief note on the working and importance of a Radio Telescope.
- (2) Discuss the Hubble Space Telescope, emphasizing its sensors, their functions, and related applications.

Q-2. (B) Answer any one the following questions in brief. (04)

- (1) Describe how prisms and diffraction gratings are used in the construction of astronomical spectrographs.
- (2) Provide a brief description of the instruments onboard the Hubble Space Telescope (HST).

Q-3. (A) Answer any one the following questions in detail. (06)

- (1) Write a short note on absolute magnitude and the distance modulus.
- (2) Explain the concept of radiometric magnitude in detail.

Q-3. (B) Answer any one the following questions in brief. (04)

- (1) Briefly describe the spectral classification of stars.
- (2) Discuss the luminosity of stars and derive the relation between total luminosity and the effective temperature of a star.

- Q-4. (A) Answer any one the following questions in detail. (06)**
(1) Describe the solar corona in detail, highlighting its different types.
(2) Write a short note on solar flares.
- Q-4 (B) Answer any one the following questions in brief. (04)**
(1) Explain the characteristics of the outer corona (F-corona) of the Sun.
(2) What are solar prominences? Discuss their nature and possible effects on Earth's environment.
- Q-5. (A) Answer any one the following questions in detail. (06)**
(1) Discuss in detail the different theories regarding the origin of binary star systems.
(2) Explain the light variation curve of eclipsing binary stars and what information it provides about the system.
- Q-5. (B) Answer any one the following questions in brief. (04)**
(1) Write a short note on multiple star systems and their significance.
(2) Explain in brief the origin of binary star systems.
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