School of Basic Sciences
Bachelor of Science Honours in Physics
Semester End Examination - May 2024

Duration : 180 Minutes
Max Marks : 100

Sem VI - C1UD602T - Astronomy and Astrophysics

General Instructions
Answer to the specific question asked
Draw neat, labelled diagrams wherever necessary
Approved data hand books are allowed subject to verification by the Invigilator

1) The apparent magnitudes of two stars are 0.06 and 1.06 respectively. Find the ratio of their brightness. — K1 (3)

2) Compare two characteristics which distinguish Population-I stars from Population-II stars. — K2 (4)

3) Compare the brightness of the Sun and α-Centauri using the apparent magnitudes. If magnitudes of the Sun and α-Centauri are − 26.81 and − 0.10 respectively. — K2 (6)

4) Make use of nuclear reaction, a massive star has a much shorter lifespan than the Sun. — K3 (6)

5) Develop Hayashi line in the HR diagram and show almost vertically in the temperature range of 3000 to 5000 K. — K3 (6)

6) The absolute visual magnitude of a star is 8.7 and for its temperature, the bolometric correction is − 0.5. Solve for the absolute bolometric magnitude and the luminosity of the star. — K3 (9)

7) Develop the basic equilibrium conditions that must be satisfied by a stable stellar structure. — K3 (9)

8) List the major processes of formation of elements inside stars. Why can elements beyond iron not be formed by fusion? — K4 (8)

9) Simplify the nebular model for the formation of the solar system. — K4 (12)

10) Explain the resolving power of a telescope and the Rayleigh criterion for resolution. Calculate the diffraction limit of resolution of a 3 m telescope for the wavelength of 600 nm. — K5 (10)

11) Explain in brief the radiation pressure in Star Formation and Stellar Evolution System.

K5 (15)

OR

Discuss the main sequence on the H-R diagram and establish the relation between luminosity (L) and mass (M) of a main sequence star.

K5 (15)

12) Develop the concept of Atmospheric Windows in Astronomy and Astrophysics.

K6 (12)

OR

Discuss Sidereal Time with proper diagram.

K6 (12)