

Reg No:.....

K24FY1612

Name :.....

First Semester FYUGP Physics Examination
November 2024 (2024 Admission onwards)
KU1DSCPHY113 (INTRODUCTION TO ASTROPHYSICS)
(EXAM DATE : 06-12-2024)

Time : 90 min

Maximum Marks : 50

Part A (Answer any 6 questions. Each carries 2 marks)

1. What colour are the hottest stars? 2
2. How is the temperature of a star related to its colour? 2
3. What are the characteristics of red giants as represented on the H-R diagram? 2
4. What is the interstellar medium (ISM)? 2
5. What happens in the convective zone? 2
6. What is the flatness problem? 2
7. What is the role of dark energy in cosmology? 2
8. Describe methods used to detect dark matter indirectly. 2

Part B (Answer any 4 questions. Each carries 6 marks)

9. Explain the relationship between a star's radius, luminosity, and temperature using the Stefan-Boltzmann law. 6
10. Explain how redshift can be used to measure the distance of galaxies. 6
11. Explain the role of gravitational collapse in star formation 6
12. What are solar flares, and how do they differ from solar prominences? 6
13. If the Hubble constant is 70 km/s/Mpc , calculate the age of the universe in years. 6
14. Discuss how Olbers' Paradox raises questions about the nature of the universe. 6

Part C (Answer any 1 question(s). Each carries 14 marks)

15. (a) Explain the structure of the Sun from its core to the surface. 7
(b) How do the processes in each layer contribute to solar phenomena like sunspots and solar flares? 7
16. Discuss the stages of stellar evolution from protostar to main sequence star. How does mass influence the evolution of a star? 14