

**M.Sc. 3rd Semester Examination, 2022****PHYSICS***( Introductory Astrophysics )***PAPER — C-PHS-304***Full Marks : 40**Time : 2 hours**The figures in the right hand margin indicate marks**Candidates are required to give their answers in their own words as far as practicable***A. Answer any four questions : 2 × 4**

- 1. Write the differences between a planet and a proto-planet. 2**
- 2. What is constellation in the sky ? Write the names of “Belt Stars” at Orion. 2**
- 3. Calculate the period in which the star stays**

*( Turn Over )*

on the main sequence. Given, the mass of the star is two times the mass of the sun. 2

4. What is meant by persec ? What is the use of it for different celestial objects ? 2

5. What is the difference between Optical astronomy and X-ray astronomy ? 2

6. What do you mean by stellar nebula and planetary nebula ? 2

B. Answer any *four* questions : 4 × 4

7. Write a short note on 'dwarf planets'. 4

8. Describe the solar eclipse and draw a figure for different phases of solar eclipse. 4

9. Write the compositions of asteroids and comets. 4

10. (i) Mention two observations that strongly confirm the Big Bang theory.

(ii) If a star is 2 times bigger in diameter and

two times warmer than Sun then find out the ratio of luminosity of that star in terms of Sun.

2 + 2

11. (i) What is meant by Binary Star ?

(ii) Explain the formation of X-ray binary star.

1 + 3

12. (i) Differentiate red giant star and dwarf star ?

(ii) What do you mean by 'failed star' ?

2 + 2

C. Answer any *two* questions :

2 × 8

13. (i) Explain the concept of celestial sphere and the conventions of angular measurement that enable us to locate the objects in the sky.

(ii) Based on the current hydrogen reserved in the sun, if the efficiency of generating radiation from the p-p chain is 90%, how many years can the sun keep burning ?

5 + 3

14. Explain the origin of solar flares, coronal mass ejections, high-speed solar wind and solar energetic particles. 8
15. (i) Schematically explain the evolution of Sun-like star and heavier than Sun-like star.
- (ii) Why carbon is expected as the end product of the Sun like star ?
- (iii) Find out the Schwarzschild radius of Black hole. 3 + 3 + 2
16. (i) With proper explanation of axis demonstrate the 'main sequence' in complete H-R diagram.
- (ii) Write down the difference between red giant and dwarf star.
- (iii) What do you mean by active galactic nuclei (AGN) ? 4 + 2 + 2
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