D 100637 (Pages : 2) Name.....

Reg. No.....

SIXTH SEMESTER U.G. (CBCSS–UG) DEGREE EXAMINATION, MARCH 2024

Physics/Applied Physics

PHY6B13/APH 6B 13—RELATIVISTIC MECHANICS AND ASTROPHYSICS

(2019 Admission onwards)

Time : Two Hours Maximum : 60 Marks

The symbols used in this question paper have their usual meanings.

Section A - Short Answer type.

Answer **all** *questions in two or three sentences, each correct answer carries a maximum of 2 marks.*

1. State the postulates of special theory of relativity.
2. Explain the conditions of photoelectric emission.
3. Obtain the expression for rest mass of photon.
4. What are red giant stars ?
5. Explain the principle of equivalence.
6. Give the relationship between luminosity and brightness.
7. How does the color of a star vary with surface temperature ?
8. What are galactic clusters ?
9. Why do stars pulsate ?
10. Explain the supernovae remnants.
11. Distinguish between spiral and elliptical galaxies.
12. A galaxy has an observed Hα line at 662.9 nm. The rest wavelength of Hα is 656.3 nm. Calculate the redshift of the galaxy and its velocity of recession.

(Ceiling 20 marks)

Section B - Paragraph / Problem type.

Answer **all** *questions in a paragraph of about half a page to one page, each correct answer carries a maximum of 5 marks.*

13. Distinguish between time like and space like intervals.
14. Explain why a moving clock runs slow.

Turn over

15. Explain the different stages of stellar evolution.

16. Draw the H-R diagram. Explain its key features.

17. Outline the internal structure of the sun.

18. Explain Cepheid variables and the period-luminosity relationship.

19. Write a note on gravitational lensing.

Section C - Essay type

Essays - Answer in about two pages, any **one** *question.*
Answer carries 10 marks.

20. Explain the Michelson-Morley experiment.

21. What are white dwarfs ? Explain its origin and evolution.