

Reg. No. :

Name :

Sixth Semester B.Sc. Degree Examination, April 2023

First Degree Programme under CBCSS

Physics

Elective Course

PY 1661.2 : SPACE SCIENCE

(2013-2017 Admission)

Time : 3 Hours

Max. Marks : 80

PART – A

Answer all questions. Each question carries 1 mark.

1. What are Population I, II and III stars?
2. What is a quasar?
3. What is H-R diagram?
4. What is a 'protostar'?
5. What are the three layers of Sun's atmosphere?
6. What is the cause for sun spots?
7. Write down the empirical relationship between speed of sound and temperature in the atmosphere.

8. What are 'ionosondes' and 'topside sounders'?
9. What is the cause for the magnetic field of earth?
10. What are galactic cosmic rays?

(10 × 1 = 10 Marks)

PART – B

Answer any **eight** questions. Each question carries **2** marks.

11. What are 'voids'?
12. What is redshift?
13. What is a black hole?
14. Explain solar activity.
15. Write down the expression for the internal temperature of a star.
16. What is supernova explosion?
17. Explain the equation of hydrostatic equilibrium for a star.
18. How are temperatures in the high and low altitudes of earth measured?
19. What is 'ionosphere sounding'?
20. Explain the nature of existence of D, E and F layer in ionosphere.
21. What is the cause of earth's radiation belts?
22. What is plasma sheet?

(8 × 2 = 16 Marks)

PART – C

Answer any **six** questions. Each question carries **4** marks.

23. Explain Hubble's law.
24. Explain cosmic rays of solar origin.

25. Derive an expression for the internal temperature of a star.
26. Explain: (a) Scale height (b) Density variation
27. Explain the typical properties of solar winds.
28. Derive an expression for the adiabatic lapse rate in the Troposphere.
29. Show that the scale height of the ionized oxygen atoms is very nearly equal to that of the neutral gas.
30. Write a note on the Van Allen radiation belt.
31. Explain the Dungey's model of open magnetosphere.

PART – D

(6 × 4 = 24 Marks)

Answer any **two** questions. **Each** question carries **15** marks.

32. (a) Write a note on the coordinate systems used to locate celestial bodies.
(b) Explain the Harvard system of classification of stars.
33. Derive an expression for the gravitational potential energy of a star assuming linear star model.
34. Derive barometric law and explain the variation of atmospheric pressure with altitude.
35. Explain the Chapman-Ferraro theory of closed magnetosphere.

(2 × 15 = 30 Marks)