

Reg. No. : .....

Name : .....

**Sixth Semester B.Sc. Degree Examination, April 2022****First Degree Programme under CBCSS****Physics****Elective Course****PY 1661.2 : SPACE SCIENCE****(2018 & 2019 Admission)**

Time : 3 Hours

Max. Marks : 80

**SECTION – A**Answer **all** ten questions. **Each** carry of 1 mark.

1. What is the typical unit of time in Cosmology?
2. What is a nebula?
3. Which type of Galaxies are called Whirlpool?
4. Name the process by which energy is produced in stars.
5. The critical black hole radius is called as \_\_\_\_\_
6. How many years constitute a sunspot cycle?
7. What is a sun storm called?
8. Which atmosphere has highest pressure?

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9. Give the names of the radiation belts of Earth.
10. What is the shape of magnetosphere?

## SECTION – B

**(10 × 1 = 10 Marks)**

Answer any **eight** questions of **2** marks each.

11. How will you brief Herschel's picture?
12. What are Population III stars?
13. Briefly explain Hubble classification of galaxy.
14. Schematically illustrate E0 and E7 galaxy.
15. Plot the absolute magnitude of star against spectral class.
16. What are white dwarfs?
17. Explain the significance of Chandrasekhar limit.
18. What are umbra and penumbra?
19. What are the coronal features of sun?
20. What is the difference between solar wind and solar cosmic ray?
21. What causes atmospheric pressure on Earth?
22. Explain dynamo effect.
23. Briefly explain the magnetic field of Earth.
24. Define light year.
25. What is Magnetosphere?
26. What will happen to Earth's atmosphere during high sunspot activity?

**(8 × 2 = 16 Marks)**

## SECTION – C

Answer any **six** questions, not exceeding a paragraph. **Each** question carries 4 marks.

27. How pressure and density varies towards the centre from the Earth's surface?
28. Graphically illustrate the ionization density height profile of the Earth atmosphere.
29. Derive the expression for radius of a star.
30. Derive the equation for photon diffusion time in the core of a star.
31. The total luminosity of sun is  $3.9 \times 10^{26}$  watt, and radius is  $6.96 \times 10^8$ m. Assuming that the sun radiate like a black body, calculate its surface temperature.
32. A Galaxy NGC2342 has velocity of 5,690km/s and distance of 74Mpc away. What is the value of Hubble constant? What happens to Hubble constant if distance becomes halved?
33. Deduce the equation for internal temperature of a star.
34. An absorption feature of calcium usually has a wavelength  $3934\text{\AA}$ . It is observed in a distant galaxy to have wavelength of 8209. Is it moving away or towards us? Calculate the shift.
35. Discuss the production mechanism in ionosphere.
36. What are the general features of sunspot?
37. Discuss the salient ideas of Dungey's open magnetosphere.
38. What are the different layers of charges of Earth's atmosphere? How they vary with altitude?

(6 × 4 = 24 Marks)

## SECTION – D

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

39. (a) Explain Hubbles' law? Mention its importance.
- (b) "The universe is expanding" Comment on the statement with scientific support.
40. Briefly explain stellar evolution.
41. (a) What is solar wind? How solar wind is originated?
- (b) What are disturbed solar wind?
42. How will you explain the temperature profile of Earth's atmosphere? Explain the four thermal structure of the atmosphere of the Earth?
43. Compare the temperature distribution of troposphere with that of stratosphere, mesosphere and thermosphere.
44. (a) What do you mean by magnetosphere? What is its significance?
- (b) How will you describe the structure of magnetosphere?

(2 × 15 = 30 Marks)