



QP CODE: 21002289



21002289

Reg No :

Name :

M Sc DEGREE (CSS) EXAMINATION, NOVEMBER 2021

First Semester

M.Sc.Space Science

**CORE - PH030101 - INTRODUCTION TO ATMOSPHERIC SCIENCE AND SPACE
PHYSICS**

2019 ADMISSION ONWARDS

920B7D52

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

Weight 1 each.

1. What are Euler's angles?
2. Discuss the Euler's equation for a fluid whose motion is steady as well as irrotational.
3. Give an appropriate Lagrangian density for the longitudinal vibrations of a continuous elastic rod. Explain.
4. Sketch the radiation pattern and optical equivalent of Yagi-Uda antenna.
5. Explain the basic principle of tropospheric scattering.
6. What is the heat source for the stratosphere? How is that heat absorbed?
7. Define the term airparcel.
8. List out various ionospheric parameters?
9. How does the atmosphere affect the GNSS signals?
10. What are different types of GPS receivers?

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

Weight 2 each.

11. Deduce law of gravitation from Kepler's laws.
12. Consider scattering of particles by a rigid sphere of radius R and calculate the differential and total cross-sections.
13. What do you understand by normal modes of vibration? Show that both kinetic and potential energies are homogeneous quadratic functions when expressed in terms of normal coordinates.





14. Give a brief description of the environmental effects on propagation of electromagnetic waves.
15. What is a horn antenna? How is it fed? What are its applications?
16. What is ionosphere? With a neat sketch explain how ionosphere helps us in radiowave communication?
17. What is meant by anomaly in ionospheric studies? Briefly explain the equatorial ionization anomaly.
18. Describe how GPS errors are formed. Give suggestions to avoid them.

(6×2=12 weightage)

Part C (Essay Type Questions)

Answer any two questions.

Weight 5 each.

19. What are orthogonal transformations? Obtain the orthogonal transformation equations of a rigid body.
20. Explain in detail about the various antenna parameters.
21. Discuss in detail the atmospheric composition.
22. Discuss the different segments of GPS.

(2×5=10 weightage)

