



DBY-1603010702020700 Seat No. _____

M. Sc. (Sem. II) (CBCS) Examination

July - 2022

CT-7 : Physics

(Space Physics)

Time : $2\frac{1}{2}$ Hours]

[Total Marks : **70**

Instruction : Attempt all questions. The figures on right indicate marks.

1 Answer any **seven** of the following : **14**

- (1) Define the scale height and write the equation.
- (2) List the parameters which can be derived using Langmuir probe.
- (3) Write the chemical composition of the Sun.
- (4) Why the geomagnetic field is so important?
- (5) Draw the Earth's geomagnetic cavity and name the regions.
- (6) Draw the energy level diagram of atomic oxygen.
- (7) What is solar flare?
- (8) Explain the Snell's law of refraction.
- (9) What is GPS and for which purpose it is used?
- (10) Name any two empirical models of the atmosphere.

2 Answer any **two** of the following. **14**

- (a) Explain the physical processes 'Enthalpy' and 'Entropy' with example.
- (b) Derive the integral form of hydrostatic equilibrium.
- (c) Classify the Earth's atmosphere based on vertical temperature profile. Explain each region in detail.

3 Answer the following : **14**

- (a) What are the assumptions of the Chapman for ionospheric production? Derive the equation for production function.
- (b) Describe the morphology of the ionosphere.

OR

3 Answer the following : **14**

- (a) Discuss how the radio wave is refracted by the ionosphere.
- (b) Explain the working and application of Ionosonde.

4 Answer any **two** of the following : **14**

- (a) Define the spectral reflectance. Show how the spectral signature is useful in identifying the different classes of tree.
- (b) Discuss the Earth's surface feature interaction with solar radiation. What are the different types of reflectors?
- (c) Describe the interaction of solar radiation with Earth's atmosphere. Define the term 'Atmospheric Window'.

5 Write short notes on any **two** of the following : **14**

- (a) Thermal balance in the Earth's atmosphere.
- (b) Production and loss of stratospheric ozone in the atmosphere.
- (c) Langmuir probe and Mass spectrometer techniques.
- (d) Scatter radar and its applications.
